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Client: Susan Huang
APTIM
4005 Port Chicago Hwy
Concord, CA 94520

Phone: 925-288-2099

Fax:

Identifier: 017QB **Date Rec:** 02/07/2019 **Report Date:** 02/14/2019

Client Project #: 501032 **Client Project Name:** Longhorn AAP - LHAAP-16

Purchase Order #: 204818

Analysis Requested: CENSUS, Miscellaneous

Reviewed By:

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CENSUS

Client: **APTIM**
Project: Longhorn AAP - LHAAP-16

MI Project Number: **017QB**
Date Received: 02/07/2019

Sample Information

Client Sample ID:	**16WW56-190206**
Sample Date:	02/06/2019
Units:	cells/mL
Analyst/Reviewer:	JS

Dechlorinating Bacteria

Dehalococcoides	*DHC*	**3.80E+00**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **2/7/2019**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	02/07/2019	02/14/2019	1 °C	107%	non-detect	non-detect

APTIM

COC ID: LHAAP16-JAN2019-MI-~~1901~~ 190206

TURNAROUND TIME: normal

RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	Microbial Insights, Inc.			Email Invoice To	fedinvoices@aptim.com		
Project Number	501032			Lab Contact	Customer Service						
Site	LHAAP-16			Email				Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10515 Research Drive			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Hwy		
City	Marshall	State	TX	City	Knoxville	State	TN	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	37932	Country	USA	Postal Code	94520	Country	USA
Phone Number	713.243.7264			Phone Number	865.573.8188						
Project Manager	Praveen Srivastav							Shipping Company			

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID/Number	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	Sample Container and Preservative # Of Cont.	ANALYSIS	1x1L HPDE, Ice DHC in Water (MI-DHC)									
16WW56-190206	LHAAP16	26.20	26.44		WG	2/6/19	1015	1		X					017QB1				
					WG														

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] /BHATE	2/6/19 1400	[signature] MI	2/7/19 1025

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Client: Kim Napier
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United States

Phone:

Fax:

Identifier: 043PJ **Date Rec:** 10/11/2018 **Report Date:** 10/23/2018

Client Project #: 501032 **Client Project Name:** Longhorn AAP-LHAAP-16

Purchase Order #: 204818

Analysis Requested: CENSUS, Miscellaneous

Reviewed By:

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CENSUS

Client: **APTIM**
Project: Longhorn AAP-LHAAP-16

MI Project Number: **043PJ**
Date Received: 10/11/2018

Sample Information

Client Sample ID:		**16WW43-181009**	**16WW26-181009**	**16WW41-181009**	**16WW25-181009**	**16EW02-181009**
Sample Date:		10/09/2018	10/09/2018	10/09/2018	10/09/2018	10/09/2018
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		JS	JS	JS	JS	JS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**2.10E+00**	**3.00E-01 (J)**	<5.00E-01	<5.00E-01	**2.00E-01 (J)**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

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CENSUS

Client: **APTIM**
Project: Longhorn AAP-LHAAP-16

MI Project Number: **043PJ**
Date Received: 10/11/2018

Sample Information

Client Sample ID:		**16WW36-181009**	**16WW24-181009**	**16EW06-181009**	**16WW35-181010**	**16WW16-181010**
Sample Date:		10/09/2018	10/09/2018	10/09/2018	10/10/2018	10/10/2018
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		JS	JS	JS	JS	JS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**2.02E+02**	**1.60E+00**	**1.70E+00**	**3.39E+01**	<5.00E-01

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

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CENSUS

Client: **APTIM**
Project: Longhorn AAP-LHAAP-16

MI Project Number: **043PJ**
Date Received: 10/11/2018

Sample Information

Client Sample ID:		**16WW22-181010**	**16WW29-181015**	**16WW55-181015**	**16WW48-181018**
Sample Date:		10/10/2018	10/15/2018	10/15/2018	10/18/2018
Units:		cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		JS	JS	JS	JS
Dechlorinating Bacteria					
Dehalococcoides	*DHC*	**5.20E+00**	**5.00E-01 (J)**	<5.00E-01	**3.00E-01 (J)**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **10/11/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/11/2018	10/23/2018	0 °C	102%	non-detect	non-detect

Samples Received **10/16/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/16/2018	10/23/2018	0 °C	102%	non-detect	non-detect

Samples Received **10/19/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/19/2018	10/23/2018	0 °C	106%	non-detect	non-detect

APTIM

COC ID: LHAAP16-OCT2018-MI-181010 TURNAROUND TIME: normal RUSH: Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	Microbial Insights, Inc.			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	Customer Service						
	LHAAP-50			Email				Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10515 Research Drive			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Knoxville	State	TN	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	37932	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	865.573.8188						
Project Manager	Praveen Srivastav							Shipping Company	UPS		

043PJ

	SAMPLE DETAILS								ANALYSIS REQUESTED										
	Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.		DHC IN Water (mi-dhc)								
1	16WW43-181009	16WW43	10.38	11.37	FT	GW	10/9/2018	949	1		1								
2	16WW26-181009	16WW26	18.39	19.39	FT	GW	10/9/2018	1118	1		1								
3	16WW41-181009	16WW41	27.73	28.24	FT	GW	10/9/2018	1125	1		1								
4	16WW25-181009	16WW25	19.28	19.67	FT	GW	10/9/2018	1312	1		1								
5	16EW02-181009	16EW02	24.4	24.59	FT	GW	10/9/2018	1340	1		1								
6	16WW36-181009	16WW36	18.88	19.41	FT	GW	10/9/2018	1453	1		1								
7	16WW24-181009	16WW24	10.17	11.1	FT	GW	10/9/2018	1445	1		1								
8	16EW06-181009	16EW06	24.15	24.33	FT	GW	10/9/2018	1455	1		1								
9	16WW35-181010	16WW35	19.48	20.29	FT	GW	10/10/2018	1311	1		1								
10	16WW16-181010	16WW16	23.28	23.43	FT	GW	10/10/2018	1315	1		1								
11	16WW22-181010	16WW22	29.17	29.53	FT	GW	10/10/2018	1500	1		1								

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	APTIM	10-10-18/1600	/MI	10/11/18 10:15

APTIM

COC ID: LHAAP16-OCT2018-MI-181015 **TURNAROUND TIME:** normal **RUSH:** Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	Microbial Insights, Inc.			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	Customer Service						
	LHAAP-16			Email				Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10515 Research Drive			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Knoxville	State	TN	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	37932	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	865.573.8188						
Project Manager	Praveen Srivastav							Shipping Company	UPS		

043PJ

SAMPLE DETAILS								ANALYSIS REQUESTED										
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.		DHC IN Water (mi-dhc)								
12 16WW29-181015	16WW29	8.73	8.83	FT	GW	10/15/2018	930	1		1								
13 16WW55-181015	16WW55	22.88	23.01	FT	GW	10/15/2018	1030	1		1								

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[illegible] APTIM	10/15/18 1520	MI	10/16/18 1045

APTIM

COC ID: LHAAP16-OCT2018-MI-181018 **TURNAROUND TIME:** normal **RUSH:** Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	Microbial Insights, Inc.			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	Customer Service						
	LHAAP-16			Email				Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10515 Research Drive			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Knoxville	State	TN	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	37932	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	865.573.8188						
Project Manager	Praveen Srivastav							Shipping Company	UPS		

SAMPLE DETAILS / **ANALYSIS REQUESTED**

043PJ
14

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	DHC IN Water (mi-dhc)
16WW48-181018	16WW48	**11.87**	**11.95**	**FT**	GW	**10/18/2018**	**1240**	1		**1**

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] APTIM	10-18-18/1455	[signature] MI	10/19/18 1020

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Phone: 925-288-2099

Fax:

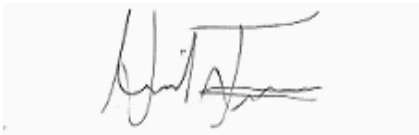
Identifier: 076QI **Date Rec:** 09/20/2019 **Report Date:** 09/27/2019

Client Project #: 501032 **Client Project Name:** LHAAP-16

Purchase Order #: 204818

Analysis Requested: CENSUS, Miscellaneous

Reviewed By:



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CENSUS

Client: **APTIM**
Project: LHAAP-16

MI Project Number: **076QI**
Date Received: 09/20/2019

Sample Information

Client Sample ID:		**16WW57-190918**	**16WW58-190918**
Sample Date:		09/18/2019	09/18/2019
Units:		cells/mL	cells/mL
Analyst/Reviewer:		HT	HT
Dechlorinating Bacteria			
Dehalococcoides	*DHC*	**3.53E+01**	**1.78E+01**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **9/20/2019**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	09/20/2019	09/27/2019	1 °C	109%	non-detect	non-detect

APTIM

COC ID: LHAAP16-SEPT2019-MI-1909 19

TURNAROUND TIME: normal

RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	Microbial Insights, Inc.			Email Invoice To	fedinvoices@aptim.com		
Project Number	501032			Lab Contact	Customer Service						
Site	LHAAP-16			Email				Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10515 Research Drive			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Hwy		
City	Marshall	State	TX	City	Knoxville	State	TN	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	37932	Country	USA	Postal Code	94520	Country	USA
Phone Number	713.243.7264			Phone Number	865.573.8188						
Project Manager	Praveen Srivastav							Shipping Company			

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID/Number	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	Sample Container and Preservative # Of Cont.	ANALYSIS	1x1L HPDE, Ice DHC in Water (MI-DHC)									
16WW57-190918						9/18/19	1530	1		X				076Q	I	1			
16WW58-1909						9/18/19	1409	1		X						2			
~~GTG-080519-412~~						~~Lab~~	~~Lab~~	~~2~~											

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature]	9/19/19 1130	[signature] MI	9/20/19 1020

How to Retrieve and Use Estimated Percentile Ranks from the Microbial Insights Database

The MI Database

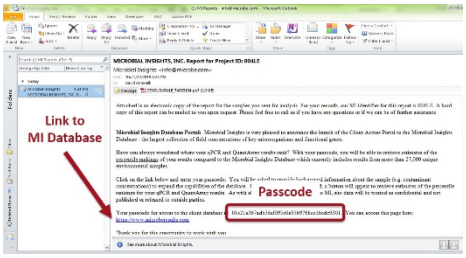
The Microbial Insights Database is the largest collection of field concentrations of key microorganisms and functional genes currently containing qPCR and QuantArray results for more than 40,000 unique groundwater, soil, and sediment samples from all 50 states and 33 countries worldwide.

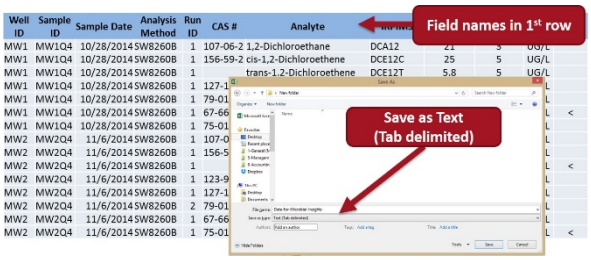
Is that low, medium or high?

In practice, biodegradation depends not just on the presence but the actual concentrations of the contaminant degrading microorganisms. The estimated percentile ranks retrieved from the MI Database answer the question "Is that low, medium or high?" by comparing your results to those of the literally thousands of other environmental samples submitted to MI for analysis over the last 20+ years.

Retrieving Estimated Percentile Ranks

With your report, you were emailed a passcode and link enabling you to login to the Client Portal. Just enter basic information about the sample (e.g. contaminant concentrations) to aid in understanding the links between environmental conditions and microbial populations and you can retrieve estimates of the percentile ranks of your results based on those compiled in the MI database at no additional charge.





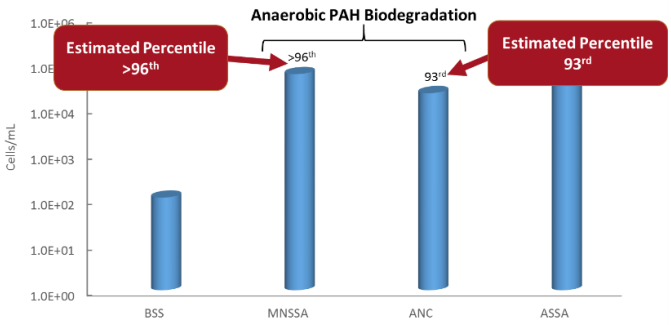
All site specific data will be treated as confidential and uploading is easy.

You can even upload chemical and geochemical data from EDDs. Just save as a Tab Delimited text file.

Example - Using Estimated Percentile for MNA Assessment at an MGP Site

CENSUS® qPCR was performed to quantify anaerobic naphthalene carboxylase (ANC) and naphthyl-2-methylsuccinate synthase (MNSSA) to assess anaerobic biodegradation of naphthalene and methyl-naphthalene under existing site conditions.

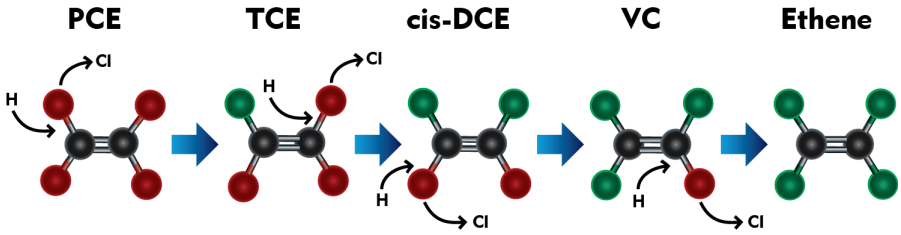
- Not only were ANC and MNSSA genes detected, but these functional genes responsible for anaerobic biodegradation of PAHs were present at concentrations "far better than average" based on the estimated percentile ranks.
- Demonstrating high concentrations of ANC and MNSSA gave an additional line of evidence indicating growth substantial populations of anaerobic PAH degraders and suggested a greater probability that monitored natural attenuation (MNA) will be successful.



DHC Interpretation

Dehalococcoides 16S rRNA gene (qDHC)

Under anaerobic conditions, tetrachloroethene (PCE) and trichloroethene (TCE) can undergo sequential reductive dechlorination through the daughter products *cis*-dichloroethene (*cis*-DCE) and vinyl chloride to nontoxic ethene (1,2).



While a number of bacterial cultures capable of utilizing PCE and TCE as growth supporting electron acceptors have been isolated (3-7), *Dehalococcoides* spp. may be the most important because they are the only bacterial group that has been isolated to date which is capable of complete reductive dechlorination of PCE to ethene (8). In fact, the presence of *Dehalococcoides* spp. has been associated with complete dechlorination to ethene at sites across North America and Europe (9).

Status	*Dehalococcoides spp.*	Observation
	≥ 10^4 (cells/mL)	Lu et al. proposed that a concentration of 1 x 10^4 DHC cells/mL could be used as a screening criterion to identify sites where reductive dechlorination will yield a generally useful biodegradation rate (10). Similarly, in an internal study conducted with nearly 1000 groundwater samples obtained from sites across the US, ethene production was observed in approximately 80% of samples in which CENSUS® qDHC results were greater than or equal to 10^4 DHC cells/mL.
	10^1 to < 10^4 (cells/mL)	When vinyl chloride reductase genes (See DHC functional genes discussion below) are also detected, complete reductive dechlorination of PCE and TCE to ethene may still occur even with moderate DHC concentrations. When the DHC population is below the 10^4 cells/mL criterion proposed by Lu et al. (10), project managers should carefully consider other site-specific data to determine whether subsurface conditions may be limiting reductive dechlorination. For example, the addition of an electron donor may be able to stimulate DHC growth and enhance anaerobic bioremediation.
	< 10^1 (cells/mL)	DHC concentrations are low suggesting that complete reductive dechlorination of PCE and TCE to ethene is unlikely to occur under existing conditions. Enhanced anaerobic bioremediation options (biostimulation or bioaugmentation) may need to be considered.

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DHC Functional Genes (*tce*A, *bvc*A, *vcr*A)

A "stall" where daughter products *cis*-DCE and vinyl chloride accumulate can occur at PCE- and TCE-impacted sites especially under MNA conditions. The accumulation of vinyl chloride, generally considered more carcinogenic than the parent compounds, is particularly problematic. Although elevated *Dehalococcoides* concentrations correspond to ethene production in numerous studies, the range of chlorinated ethenes metabolized and cometabolized varies among species and strains within the *Dehalococcoides* genus. For example, *Dehalococcoides ethenogenes* str. 195 metabolizes PCE, TCE, and *cis*-DCE and cometabolizes vinyl chloride (8) to produce ethene. Conversely, *Dehalococcoides* sp. CBDB1 utilizes PCE and TCE but does not cometabolize additional chloroethenes (11). Other *Dehalococcoides* strains, such as BAV1, GT and VS, are known to fully dechlorinate cis-DCE and VC to ethene (14,16,19). Quantification of reductive dehalogenase genes is used to more definitively confirm the potential for reductive dechlorination of TCE, cis-DCE, and vinyl chloride (12-15).

Functional Gene	Observation
TCE Reductase	
***tce*A gene**	The *tce*A gene encodes the enzyme responsible for reductive dechlorination of TCE to *cis*-DCE in some strains of *Dehalococcoides*. Absence of *tce*A does not preclude the potential for reductive dechlorination of TCE in the field since the *tce*A gene is not universally distributed among all DHC and is not present in other microorganisms capable of reductive dechlorination of TCE (e.g. *Dehalobacter*). Detection of the *tce*A gene provides an additional line of evidence indicating the potential for dechlorination of TCE.
Vinyl Chloride Reductase	
***bvc*A gene**	The *bvc*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of vinyl chloride to ethene by *Dehalococcoides* sp. str. BAV1 (16). Presence of *bvc*A gene indicates the potential for reductive dechlorination of VC to ethene. Absence of both *bvc*A and *vcr*A genes suggests VC may accumulate. An internal study with ~1,000 samples showed ethene production was observed in 80% of the samples that the DHC population was greater than or equal to 10^4 cells/mL. The *bvc*A gene was detected in over 50% of these samples. Van Der Zaan et al (17) noted that the bvcA gene was the only VC reductase gene detected at three of their sites. Alfred Spormann's laboratory at Stanford University (18) reported that the *bvc*A gene was the most abundant and active at the outflow of a PCE fed column study. This section of the column was in the DCE to VC stages of reductive dechlorination thus confirming the importance of the *bvc*A gene for complete reductive dechlorination.
***vcr*A gene**	The *vcr*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of *cis*-DCE and vinyl chloride by *Dehalococcoides* sp. strain VS (14). Presence of *vcr*A gene indicates the potential for reductive dechlorination of DCE and/or VC to ethene. Absence of both *bvc*A and *vcr*A genes suggest VC may accumulate. As with the *bvc*A gene, detection of the *vcr*A gene is associated with ethene production in internal studies (67%) and vinyl chloride reduction in independent studies (14, 17).

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Reporting

Microbial Insights can provide a variety of data packages and reporting levels to suit the needs of any project. Data packages range from simple analytical reports with results only to more complex data packages that include a report narrative, analytical results, QC data, and supporting materials including all raw data and chain-of-custody documentation. The figure below shows our standard report and explains the way values are reported.

Microbial Insights, Inc.

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CENSUS

Client: Company Name
Project: Your Project Name

MI Project Number: Unique Laboratory Identifier
Date Received: Date Samples Arrived

Sample Information

Client Sample ID:		Sample A	Sample B	Sample C
Sample Date:		00/00/0000	00/00/0000	00/00/0000
Units:		cells/mL	cells/mL	cells/mL
Analyst:		Intials	Intials	Intials
Dechlorinating Bacteria				
Dehalococcoides spp.	DHC	**1.84E+05**	**2.76E+02**	**2.28E+01 (J)**
Functional Genes				
tceA Reductase	TCE	**6.00E+01**	**3.23E+01**	<4.00E-01
bvcA Reductase	BVC	**1.17E+04**	**1.81E+01**	<4.00E-01
vcrA Reducatase	VCR	**8.42E+04**	**1.74E+02**	<4.00E-01

"J" value
Result is an estimated value. This data qualifier (flag) is used when the target gene is detected but at a concentration or abundance below the practical quantification limit (PQL).

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

< value
The target gene was not detected at the limit of quantitation (LOQ) reported for that sample.

"I" value
QA Procedure indicated that the sample may have exhibited PCR inhibition. Although relatively rare, PCR inhibition can occur due to the presence of metals or humic acids at high concentrations in the sample.

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Quality Assurance

Microbial Insights' comprehensive Quality Assurance (QA) Program is the foundation of all laboratory analyses, ensuring that our clients receive high-quality analytical services that are timely, reliable, and meet their intended purpose in a cost effective manner. MI is committed to providing quality data that surpasses regulatory and industry standards, thus enabling the client to make well-informed decisions. MI maintains strict standard operating procedures and QA/QC measures throughout all of the analyses offered. The following Table details specific QA/QC procedures that are used for CENSUS.

QA/QC	Description
Date of Extraction	DNA and RNA extractions are performed the day the samples are received by MI to minimize the possibility of any changes to the microbial community prior to analysis.
Laboratory Method Blanks	An extraction blank (no sample added) is processed alongside each set of field samples from DNA extraction through CENSUS® analysis to ensure that cross contamination has not occurred. Although MI has never experienced this issue, the detection of the CENSUS® target (e.g. *Dehalococcoides*) in an extraction blank is direct evidence of cross contamination with a sample or contamination of a reagent and would invalidate the results. If this were to occur, MI would re-extract the sample. If not possible to re-extract, MI would contact the client immediately and notate it on the laboratory report.
Laboratory Control Samples (LCS)	A laboratory control sample (LCS) or positive control (target DNA) is included with each CENSUS® plate to confirm amplification and as a continuing calibration check.
Negative Controls	A negative control (no DNA) is included with each CENSUS plate to ensure that cross contamination has not occurred during amplification. As with the extraction blank, detection of CENSUS target (e.g. DHC) in a negative control is direct evidence of contamination and would invalidate the results. If this were to occur, MI would rerun the analysis.

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How to Use Estimated Percentile Ranks from the Microbial Insights Database

The MI Database and Client Portal

The Microbial Insights Database is the largest collection of field concentrations of key microorganisms and functional genes currently containing qPCR and QuantArray results for more than 32,000 unique groundwater, soil, and sediment samples from all 50 states and 33 countries worldwide. Driven by field samples, the database reflects the impacts of common contaminants, geochemical conditions, and site management practices on critical microbial populations.

With your report, you received a passcode enabling you to retrieve estimates of the percentile ranks of your results based on those compiled in the MI database at no additional charge. When accessing the database, you will be asked to provide background information about the sample (e.g. contaminant concentrations) to aid in understanding the links between environmental conditions and microbial populations. As with all client information provided to MI, site specific data will be treated as confidential.

Is that low, medium or high?

In practice, biodegradation depends not just on the presence but the actual concentrations of the contaminant degrading microorganisms. Simply put, qPCR and QuantArray results demonstrating high concentrations of target microorganisms or functional genes suggest in situ selection, enrichment and growth of those specific contaminant degraders and therefore a greater probability that monitored natural attenuation (MNA) or bioremediation will be successful.

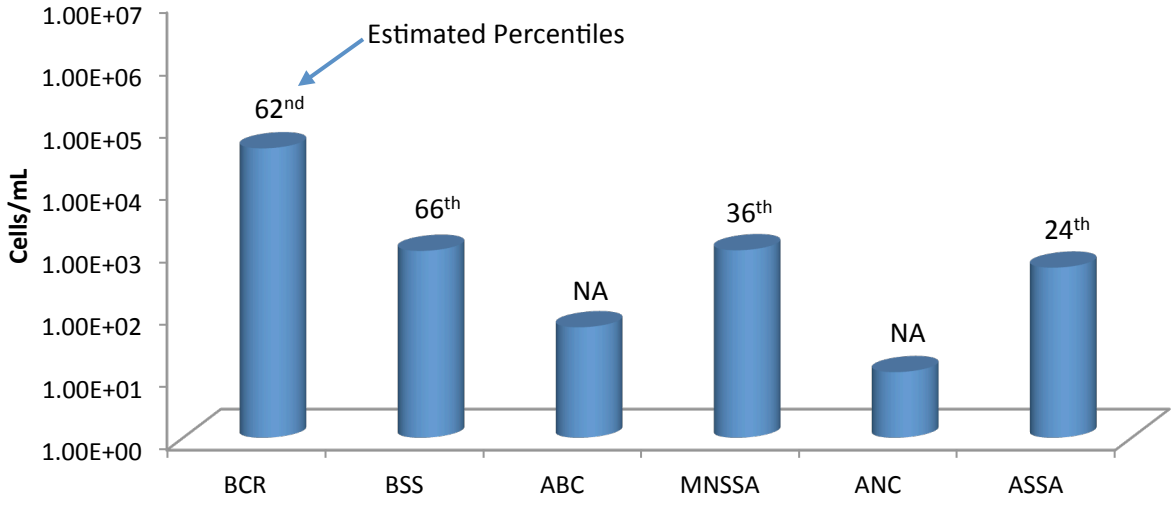
Is that a low, medium, or high concentration? The estimated percentile ranks retrieved from the MI Database answer that question by comparing your qPCR and QuantArray results to those of the literally thousands of other environmental samples submitted to MI for analysis over the last 20+ years.

Using the Estimated Percentile - Interpretation Examples

MNA Assessment – Petroleum Hydrocarbon Site:

Whenever possible, interpretation of qPCR and QuantArray results should include comparisons between samples obtained from background and impacted wells. The estimated percentile ranks however provide an additional avenue for comparison and evaluation of treatment options as shown below.

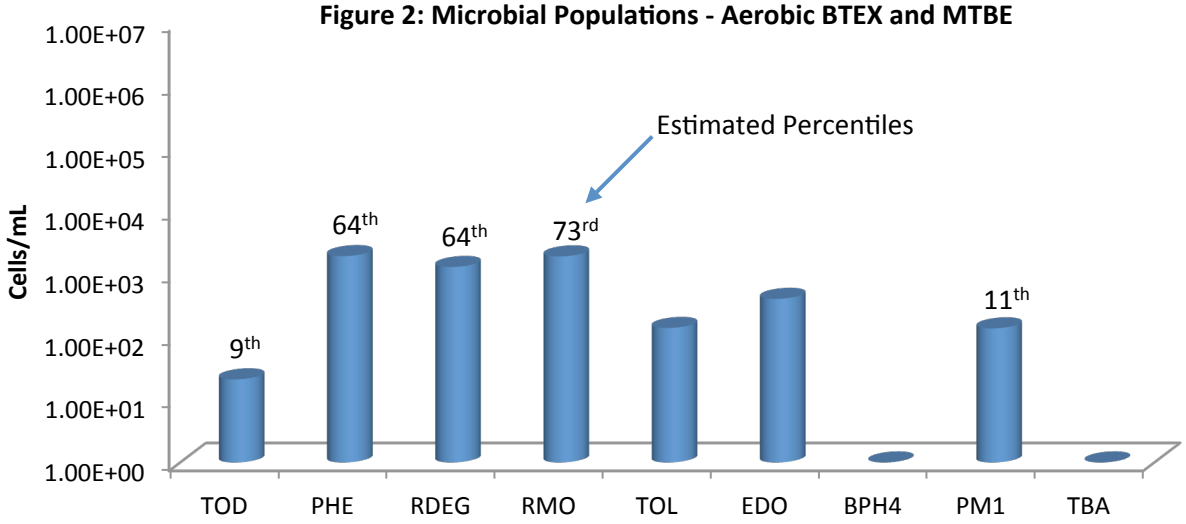
Figure 1: Microbial Populations - Anaerobic BTEX and PAHs



Anaerobic BTEX and PAH Biodegradation (Figure 1):

- With moderate concentrations of functional genes involved in anaerobic BTEX metabolism detected, the QuantArray-Petro® results were encouraging in terms of evaluating biodegradation potential under existing site conditions.
- More specifically, benzylsuccinate synthase (BSS) was detected on the order of nearly 10^3 cells/mL indicating the presence of a substantial population (66th percentile) capable of anaerobic biodegradation of toluene and other alkyl substituted benzenes.
- Naphthyl-2-methylsuccinate synthase (MNSSA) and alkylsuccinate synthase (ASSA) genes were also detected indicating the potential for anaerobic biodegradation of 2-methylnaphthalene and normal alkanes.
- The concentration of MNSSA genes would be considered modest with an estimated percentile of 36th.
- While the percentile rank for MNSSA would be "below average", a number of additional factors should be considered.
    - First, anaerobic hydrocarbon degraders are less prevalent than aerobic BTEX degraders and overall detection frequencies for many genes involved in anaerobic hydrocarbon biodegradation are less than 50%.
    - Therefore, the detection of genes like BSS, MNSSA, ASSA, anaerobic benzene carboxylase (ABC), and anaerobic naphthalene carboxylase (ANC) even at low concentrations is certainly noteworthy and inherently "better than average".
    - The estimated percentiles for all assays are based only on samples where the concentration of the target gene was greater than the practical quantitation limit (PQL).
    - For less commonly detected targets like many of the genes involved in anaerobic hydrocarbon biodegradation this is an especially important consideration.
    - Excluding samples where a gene target is below the PQL ensured that the median concentrations of less commonly detected targets would not be unduly biased low by the fact that the gene is not detected in most samples.
- Anaerobic benzene carboxylase (ABC) and naphthalene carboxylase (ANC) genes were also detected indicating the presence of bacterial populations capable of anaerobic biodegradation of benzene and naphthalene.
- For newly identified genes like ABC and ANC, estimated percentile ranks are not yet available due to the limited number of field samples that have been analyzed to date.
- However, like MNSSA and other genes involved in anaerobic hydrocarbon biodegradation, ABC and ANC detection frequencies are relatively low so the detection of these genes even at low concentrations should be considered when evaluating biodegradation potential under existing site conditions.

Figure 2: Microbial Populations - Aerobic BTEX and MTBE



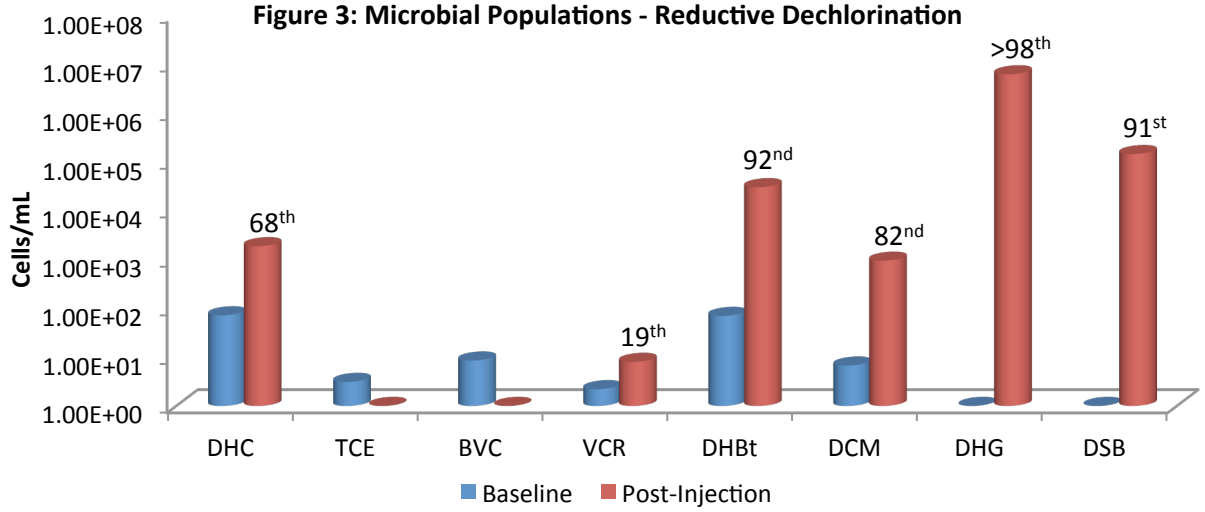
Aerobic BTEX and MTBE Biodegradation (Figure 2):

- With growing evidence that aromatic oxygenases function at low dissolved oxygen concentrations, aerobic BTEX biodegradation pathways should also be evaluated when considering MNA.
- Again, the QuantArray-Petro results were encouraging – genes encoding the first step in multiple pathways for aerobic BTEX biodegradation were detected indicating the presence of a diverse population of aerobic BTEX degraders.
- However, aerobic BTEX degraders are often considered ubiquitous. Therefore answering the question "Is that low, medium or high?" becomes especially important when evaluating aerobic BTEX biodegradation at petroleum hydrocarbon sites.
- In this case, the estimated percentile ranks of the concentrations of toluene/benzene monooxygenase (RMO and RDEG) and phenol hydroxylase (PHE) genes ranged from the 64th to 73rd percentile.
- In other words, the concentrations of RMO, RDEG, and PHE detected in this groundwater sample were greater than the concentrations detected in 64% to 73% of all other groundwater samples where these genes were analyzed and detected above the PQL.
- Aerobic BTEX degraders are common in the environment, but in this sample concentrations of toluene/benzene monooxygenase genes could be viewed as "better than average" when compared to the MI Database.

Biostimulation – Chlorinated Solvent Site:

Whenever possible, interpretation of qPCR and QuantArray results should include comparisons between baseline and post-injection monitoring events as shown below (Figure 3). The estimated percentile ranks however provide an additional avenue for comparison and evaluation of remedy performance.

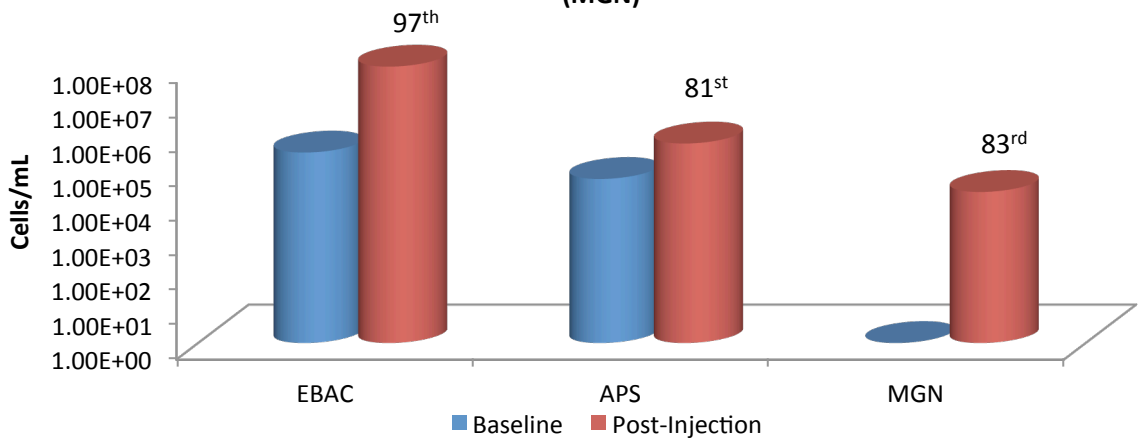
Figure 3: Microbial Populations - Reductive Dechlorination



- During the baseline groundwater sampling event, *Dehalococcoides* and vinyl chloride reductase genes were detected indicating the potential for complete reductive dechlorination of PCE and TCE to ethene.
- However, the *Dehalococcoides* concentration was well below the 10^4 cells/mL recommended by Lu et al. (2006) for generally effective rates of reductive dechlorination.
- Based on qPCR results as well as traditional groundwater monitoring, biostimulation with electron donor addition was selected as the site management plan.
- By the first monitoring event after injection, populations of halorespiring bacteria had increased substantially in response to electron donor addition.
    - *Dehalobacter* populations increased by more than two orders of magnitude to post-injection concentrations greater than 10^4 cells/mL (92nd percentile).
    - *Dehalogenimonas* (10^6 cells/mL) and *Desulfitobacterium* (10^5 cells/mL) which had not been detected prior electron donor addition were present at concentrations greater than observed in over 90% of other groundwater samples where these halorespiring bacteria were detected.
- After injection, *Dehalococcoides* populations increased by more than an order of magnitude to a concentration of over 10^3 cells/mL (68th percentile) demonstrating growth of this key group of halorespiring bacteria.
- Despite a substantial increase and a "better than average" concentration, the *Dehalococcoides* population was still below the 10^4 cells/mL threshold and vinyl chloride reductase gene copies were low (19th percentile).
    - In terms of electron donors and acceptors, the metabolic capabilities of *Dehalococcoides* are rather specialized (hydrogen utilizing obligate halorespiring bacteria) so the median concentration is low. With a low median concentration across the database, a "better than average" *Dehalococcoides* concentration in a given sample may not exceed the 10^4 cells/mL threshold established for effective reductive dechlorination (Lu et al. 2006) and ethene production (Microbial Insights, unpublished data).

- In this case, the initial growth of *Dehalococcoides* was substantial but may have been somewhat hindered by competition with sulfate reducing bacteria (Figure 4 below).
    - The baseline population of sulfate reducing bacteria was moderate (10^4 cells/mL; 63rd percentile). Consistent with an observed decreased in dissolved sulfate concentrations, populations of sulfate reducing bacteria increased and were detected at a relatively high concentration (81st percentile) after electron donor addition.
    - After injection, methanogen populations also increased to a relatively high concentration (83rd percentile) suggesting generation of methanogenic conditions.
- With sulfate depletion and generation of highly anaerobic conditions more conducive to reductive dechlorination, *Dehalococcoides* populations may continue to increase and exceed the 10^4 *Dehalococcoides* cells/mL threshold in subsequent monitoring events.
- Overall, QuantArray analysis conclusively demonstrated that electron donor addition stimulated growth of halorespiring bacteria with the estimated percentiles retrieved from the MI Database providing the "low, medium or high" perspective to the observed changes in microbial populations.

Figure 4: Total Bacteria (EBAC), Sulfate Reducering Bacteria (APS) and Methanogens (MGN)



References

Lu, X., J.T. Wilson, and D.H. Kampbell. 2006. Relationship between *Dehalococcoides* DNA in ground water and rates of reductive dechlorination at field scale. *Water Research* 40 no. 16: 3131-3140.

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March 26, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18100492**

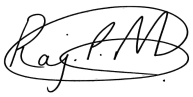
Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 10 sample(s) on Oct 10, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18100492

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18100492-01	16TB01-181009	Water	VBLKW 092618-22	09-Oct-2018 00:00	10-Oct-2018 09:15	☐
HS18100492-02	16WW43-181009	Water		09-Oct-2018 09:49	10-Oct-2018 09:15	☐
HS18100492-03	16WW26-181009	Water		09-Oct-2018 11:18	10-Oct-2018 09:15	☐
HS18100492-04	16WW41-181009	Water		09-Oct-2018 11:25	10-Oct-2018 09:15	☐
HS18100492-05	16WW25-181009	Water		09-Oct-2018 13:12	10-Oct-2018 09:15	☐
HS18100492-06	16EW02-181009	Water		09-Oct-2018 13:40	10-Oct-2018 09:15	☐
HS18100492-07	16WW36-181009	Water		09-Oct-2018 14:53	10-Oct-2018 09:15	☐
HS18100492-08	16WW24-181009	Water		09-Oct-2018 14:45	10-Oct-2018 09:15	☐
HS18100492-09	16WW24-181009-FD	Water		09-Oct-2018 14:45	10-Oct-2018 09:15	☐
HS18100492-10	16EW06-181009	Water		09-Oct-2018 14:55	10-Oct-2018 09:15	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant
Work Order: HS18100492

Work Order Comments

- Revised to update the VOC list.
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.
- The analysis for Total Organic Carbon was subcontracted to ALS Kelso, WA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R325683

Sample ID: 16WW24-181009 (HS18100492-08MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16WW24-181009 (HS18100492-08MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

GCMS Volatiles by Method SW8260

Batch ID: R325746

Sample ID: CCV

- Bromomethane and m,p-Xylenes exceeded %D limits on CCV. Samples ND.

Batch ID: R325554

Sample ID: CCV

- 2,2-Dichloropropane and Bromomethane exceeded %D limits on CCV. Samples ND.

Sample ID: 16WW24-181009 (HS18100492-08MS)

- MS and/or MSD recovered outside control limits for Dichlorodifluoromethane and 1,2-Dibromo-3-chloropropane

WetChemistry by Method SM2320B

Batch ID: R325372

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

WetChemistry by Method SW9056

Batch ID: R325252

Sample ID: 16WW24-181009 (HS18100492-08MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Chloride,Sulfate)

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18100492

CASE NARRATIVE

WetChemistry by Method SW9056

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16TB01-181009
Collection Date: 09-Oct-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Oct-2018 13:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:13
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	16-Oct-2018 13:13
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:13
Surr: 1,2-Dichloroethane-d4	*91.1*			**0**	*70-126*	*%REC*	*1*	*16-Oct-2018 13:13*
Surr: 4-Bromofluorobenzene	*97.7*			**0**	*81-113*	*%REC*	*1*	*16-Oct-2018 13:13*
Surr: Dibromofluoromethane	*95.9*			**0**	*77-123*	*%REC*	*1*	*16-Oct-2018 13:13*
Surr: Toluene-d8	*93.2*			**0**	*82-127*	*%REC*	*1*	*16-Oct-2018 13:13*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW43-181009
Collection Date: 09-Oct-2018 09:49

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Oct-2018 20:08
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:08
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	16-Oct-2018 20:08
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:08
Surr: 1,2-Dichloroethane-d4	*91.0*			**0**	*70-126*	*%REC*	*1*	*16-Oct-2018 20:08*
Surr: 4-Bromofluorobenzene	*97.7*			**0**	*81-113*	*%REC*	*1*	*16-Oct-2018 20:08*
Surr: Dibromofluoromethane	*99.3*			**0**	*77-123*	*%REC*	*1*	*16-Oct-2018 20:08*
Surr: Toluene-d8	*92.6*			**0**	*82-127*	*%REC*	*1*	*16-Oct-2018 20:08*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.00100	U	0.000144	0.00100	0.00100	mg/L	1	16-Oct-2018 12:35
Ethene	**0.00228**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 12:35
Methane	**0.133**		**0.000535**	**0.00250**	**0.00250**	**mg/L**	5	16-Oct-2018 12:58
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**104**		**5.00**	**5.00**	**5.00**	**mg/L**	1	12-Oct-2018 22:00
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.173**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 01:11
Chloride	**31.7**		**0.200**	**0.500**	**0.500**	**mg/L**	1	11-Oct-2018 01:11
Fluoride	**0.181**		**0.0500**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 01:11
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 01:11
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 01:11
Sulfate	**6.35**		**0.200**	**0.500**	**0.500**	**mg/L**	1	11-Oct-2018 01:11
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2018 09:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW26-181009
Collection Date: 09-Oct-2018 11:18

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	ug/L	5	18-Oct-2018 20:11
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	18-Oct-2018 20:11
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	18-Oct-2018 20:11
cis-1,2-Dichloroethene	**290**		**1.0**	**2.5**	**5.0**	**ug/L**	5	18-Oct-2018 20:11
Methylene chloride	5.0	U	5.0	5.0	10	ug/L	5	18-Oct-2018 20:11
Trichloroethene	**2,400**		**5.0**	**12**	**25**	**ug/L**	25	18-Oct-2018 20:38
Vinyl chloride	**5.0**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	18-Oct-2018 20:11
Surr: 1,2-Dichloroethane-d4	*88.0*			**0**	*70-126*	*%REC*	*25*	*18-Oct-2018 20:38*
Surr: 1,2-Dichloroethane-d4	*91.3*			**0**	*70-126*	*%REC*	*5*	*18-Oct-2018 20:11*
Surr: 4-Bromofluorobenzene	*96.6*			**0**	*81-113*	*%REC*	*5*	*18-Oct-2018 20:11*
Surr: 4-Bromofluorobenzene	*99.0*			**0**	*81-113*	*%REC*	*25*	*18-Oct-2018 20:38*
Surr: Dibromofluoromethane	*97.0*			**0**	*77-123*	*%REC*	*5*	*18-Oct-2018 20:11*
Surr: Dibromofluoromethane	*95.3*			**0**	*77-123*	*%REC*	*25*	*18-Oct-2018 20:38*
Surr: Toluene-d8	*91.7*			**0**	*82-127*	*%REC*	*5*	*18-Oct-2018 20:11*
Surr: Toluene-d8	*92.8*			**0**	*82-127*	*%REC*	*25*	*18-Oct-2018 20:38*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000591**	J	**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 15:57
Ethene	**0.00259**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 15:57
Methane	**0.0105**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	16-Oct-2018 15:57
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**12.0**		**5.00**	**5.00**	**5.00**	**mg/L**	1	12-Oct-2018 22:05
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 01:40
Chloride	**163**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 01:54
Fluoride	**0.128**		**0.0500**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 01:40
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 01:40
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 01:40
Sulfate	**1,170**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 01:54
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2018 09:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW41-181009
Collection Date: 09-Oct-2018 11:25

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	ug/L	10	18-Oct-2018 21:59
1,1-Dichloroethene	**17**		**2.0**	**5.0**	**10**	**ug/L**	10	18-Oct-2018 21:59
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	18-Oct-2018 21:59
cis-1,2-Dichloroethene	**1,200**		**2.0**	**5.0**	**10**	**ug/L**	10	18-Oct-2018 21:59
Methylene chloride	10	U	10	10	20	ug/L	10	18-Oct-2018 21:59
Trichloroethene	**9,800**		**20**	**50**	**100**	**ug/L**	100	18-Oct-2018 22:26
Vinyl chloride	**110**		**2.0**	**5.0**	**10**	**ug/L**	10	18-Oct-2018 21:59
Surr: 1,2-Dichloroethane-d4	*90.1*			**0**	*70-126*	*%REC*	*100*	*18-Oct-2018 22:26*
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*70-126*	*%REC*	*10*	*18-Oct-2018 21:59*
Surr: 4-Bromofluorobenzene	*97.2*			**0**	*81-113*	*%REC*	*10*	*18-Oct-2018 21:59*
Surr: 4-Bromofluorobenzene	*98.3*			**0**	*81-113*	*%REC*	*100*	*18-Oct-2018 22:26*
Surr: Dibromofluoromethane	*97.4*			**0**	*77-123*	*%REC*	*10*	*18-Oct-2018 21:59*
Surr: Dibromofluoromethane	*94.1*			**0**	*77-123*	*%REC*	*100*	*18-Oct-2018 22:26*
Surr: Toluene-d8	*90.6*			**0**	*82-127*	*%REC*	*10*	*18-Oct-2018 21:59*
Surr: Toluene-d8	*92.1*			**0**	*82-127*	*%REC*	*100*	*18-Oct-2018 22:26*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000281**	J	**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 16:09
Ethene	**0.00304**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 16:09
Methane	**0.00655**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	16-Oct-2018 16:09
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**951**		**5.00**	**5.00**	**5.00**	**mg/L**	1	12-Oct-2018 22:13
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.35**		**0.600**	**2.00**	**2.00**	**mg/L**	20	11-Oct-2018 02:23
Chloride	**733**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 02:23
Fluoride	**0.204**		**0.100**	**0.200**	**0.200**	**mg/L**	2	11-Oct-2018 02:09
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 02:09
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 02:09
Sulfate	**9,260**		**40.0**	**100**	**100**	**mg/L**	200	11-Oct-2018 14:53
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2018 09:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW25-181009
Collection Date: 09-Oct-2018 13:12

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Oct-2018 20:33
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:33
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:33
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:33
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	16-Oct-2018 20:33
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:33
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 20:33
Surr: 1,2-Dichloroethane-d4	*92.1*			**0**	*70-126*	*%REC*	*1*	*16-Oct-2018 20:33*
Surr: 4-Bromofluorobenzene	*97.8*			**0**	*81-113*	*%REC*	*1*	*16-Oct-2018 20:33*
Surr: Dibromofluoromethane	*97.1*			**0**	*77-123*	*%REC*	*1*	*16-Oct-2018 20:33*
Surr: Toluene-d8	*91.1*			**0**	*82-127*	*%REC*	*1*	*16-Oct-2018 20:33*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000316**	J	**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 16:58
Ethene	**0.000954**	J	**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 16:58
Methane	**0.0137**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	16-Oct-2018 16:58
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**69.0**		**5.00**	**5.00**	**5.00**	**mg/L**	1	12-Oct-2018 22:19
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.86**		**0.600**	**2.00**	**2.00**	**mg/L**	20	11-Oct-2018 03:22
Chloride	**489**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 03:22
Fluoride	**0.0660**	J	**0.0500**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 03:07
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 03:07
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 10:46
Sulfate	**5,710**		**40.0**	**100**	**100**	**mg/L**	200	11-Oct-2018 15:07
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2018 09:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW02-181009
Collection Date: 09-Oct-2018 13:40

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	25	U	15	25	50	ug/L	50	18-Oct-2018 22:51
1,1-Dichloroethene	**100**		**10**	**25**	**50**	**ug/L**	50	18-Oct-2018 22:51
1,2-Dichloroethane	25	U	10	25	50	ug/L	50	18-Oct-2018 22:51
cis-1,2-Dichloroethene	**16,000**		**100**	**250**	**500**	**ug/L**	500	18-Oct-2018 23:18
Methylene chloride	50	U	50	50	100	ug/L	50	18-Oct-2018 22:51
Trichloroethene	**24,000**		**100**	**250**	**500**	**ug/L**	500	18-Oct-2018 23:18
Vinyl chloride	**470**		**10**	**25**	**50**	**ug/L**	50	18-Oct-2018 22:51
Surr: 1,2-Dichloroethane-d4	*93.1*			**0**	*70-126*	*%REC*	*50*	*18-Oct-2018 22:51*
Surr: 1,2-Dichloroethane-d4	*90.1*			**0**	*70-126*	*%REC*	*500*	*18-Oct-2018 23:18*
Surr: 4-Bromofluorobenzene	*96.7*			**0**	*81-113*	*%REC*	*50*	*18-Oct-2018 22:51*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*81-113*	*%REC*	*500*	*18-Oct-2018 23:18*
Surr: Dibromofluoromethane	*95.9*			**0**	*77-123*	*%REC*	*50*	*18-Oct-2018 22:51*
Surr: Dibromofluoromethane	*96.7*			**0**	*77-123*	*%REC*	*500*	*18-Oct-2018 23:18*
Surr: Toluene-d8	*91.4*			**0**	*82-127*	*%REC*	*50*	*18-Oct-2018 22:51*
Surr: Toluene-d8	*92.0*			**0**	*82-127*	*%REC*	*500*	*18-Oct-2018 23:18*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.00116**		**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 17:25
Ethene	**0.00881**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 17:25
Methane	**0.0336**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	16-Oct-2018 17:25
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**438**		**5.00**	**5.00**	**5.00**	**mg/L**	1	12-Oct-2018 22:42
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.66**		**0.600**	**2.00**	**2.00**	**mg/L**	20	11-Oct-2018 03:51
Chloride	**513**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 03:51
Fluoride	**0.121**		**0.0500**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 03:36
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 03:36
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 11:00
Sulfate	**2,130**		**8.00**	**20.0**	**20.0**	**mg/L**	40	11-Oct-2018 16:10
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2018 09:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW36-181009
Collection Date: 09-Oct-2018 14:53

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	25	U	15	25	50	ug/L	50	18-Oct-2018 23:42
1,1-Dichloroethene	**450**		**10**	**25**	**50**	**ug/L**	50	18-Oct-2018 23:42
1,2-Dichloroethane	**34**	J	**10**	**25**	**50**	**ug/L**	50	18-Oct-2018 23:42
cis-1,2-Dichloroethene	**66,000**		**100**	**250**	**500**	**ug/L**	500	19-Oct-2018 00:09
Methylene chloride	50	U	50	50	100	ug/L	50	18-Oct-2018 23:42
Trichloroethene	**22,000**		**100**	**250**	**500**	**ug/L**	500	19-Oct-2018 00:09
Vinyl chloride	**610**		**10**	**25**	**50**	**ug/L**	50	18-Oct-2018 23:42
Surr: 1,2-Dichloroethane-d4	*93.9*			**0**	*70-126*	*%REC*	*50*	*18-Oct-2018 23:42*
Surr: 1,2-Dichloroethane-d4	*92.1*			**0**	*70-126*	*%REC*	*500*	*19-Oct-2018 00:09*
Surr: 4-Bromofluorobenzene	*97.4*			**0**	*81-113*	*%REC*	*50*	*18-Oct-2018 23:42*
Surr: 4-Bromofluorobenzene	*100*			**0**	*81-113*	*%REC*	*500*	*19-Oct-2018 00:09*
Surr: Dibromofluoromethane	*96.2*			**0**	*77-123*	*%REC*	*50*	*18-Oct-2018 23:42*
Surr: Dibromofluoromethane	*95.8*			**0**	*77-123*	*%REC*	*500*	*19-Oct-2018 00:09*
Surr: Toluene-d8	*91.7*			**0**	*82-127*	*%REC*	*50*	*18-Oct-2018 23:42*
Surr: Toluene-d8	*92.9*			**0**	*82-127*	*%REC*	*500*	*19-Oct-2018 00:09*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.00100	U	0.000144	0.00100	0.00100	mg/L	1	16-Oct-2018 17:40
Ethene	**0.0123**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 17:40
Methane	**0.175**		**0.000535**	**0.00250**	**0.00250**	**mg/L**	5	16-Oct-2018 17:55
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**613**		**5.00**	**5.00**	**5.00**	**mg/L**	1	12-Oct-2018 22:49
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.70**		**0.600**	**2.00**	**2.00**	**mg/L**	20	11-Oct-2018 04:20
Chloride	**793**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 04:20
Fluoride	**0.251**		**0.100**	**0.200**	**0.200**	**mg/L**	2	11-Oct-2018 04:05
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 04:05
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 11:15
Sulfate	**6,290**		**40.0**	**100**	**100**	**mg/L**	200	11-Oct-2018 16:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2018 09:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW24-181009
Collection Date: 09-Oct-2018 14:45

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Oct-2018 13:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:37
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	16-Oct-2018 13:37
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Oct-2018 13:37
Surr: 1,2-Dichloroethane-d4	*91.0*			**0**	*70-126*	*%REC*	*1*	*16-Oct-2018 13:37*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*81-113*	*%REC*	*1*	*16-Oct-2018 13:37*
Surr: Dibromofluoromethane	*95.6*			**0**	*77-123*	*%REC*	*1*	*16-Oct-2018 13:37*
Surr: Toluene-d8	*91.6*			**0**	*82-127*	*%REC*	*1*	*16-Oct-2018 13:37*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000256**	J	**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 18:18
Ethene	**0.00139**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 18:18
Methane	**0.00165**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	16-Oct-2018 18:18
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	5.00	U	5.00	5.00	5.00	mg/L	1	12-Oct-2018 22:52
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.26**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 04:34
Chloride	**287**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Oct-2018 05:18
Fluoride	**0.326**		**0.0500**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 11:29
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 04:34
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 11:29
Sulfate	**905**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Oct-2018 05:18
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2018 09:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW24-181009-FD
Collection Date: 09-Oct-2018 14:45

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	18-Oct-2018 17:18
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:18
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:18
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:18
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	18-Oct-2018 17:18
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:18
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:18
Surr: 1,2-Dichloroethane-d4	*88.3*			**0**	*70-126*	*%REC*	*1*	*18-Oct-2018 17:18*
Surr: 4-Bromofluorobenzene	*97.3*			**0**	*81-113*	*%REC*	*1*	*18-Oct-2018 17:18*
Surr: Dibromofluoromethane	*95.9*			**0**	*77-123*	*%REC*	*1*	*18-Oct-2018 17:18*
Surr: Toluene-d8	*92.0*			**0**	*82-127*	*%REC*	*1*	*18-Oct-2018 17:18*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000555**	J	**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 19:18
Ethene	**0.00124**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 19:18
Methane	**0.00327**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	16-Oct-2018 19:18
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	5.00	U	5.00	5.00	5.00	mg/L	1	12-Oct-2018 22:57
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.32**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 06:31
Chloride	**284**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 06:45
Fluoride	**0.330**		**0.0500**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 06:31
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 06:31
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 13:01
Sulfate	**898**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 06:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2018 09:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW06-181009
Collection Date: 09-Oct-2018 14:55

ANALYTICAL REPORT
WorkOrder:HS18100492
Lab ID:HS18100492-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	ug/L	5	18-Oct-2018 21:05
1,1-Dichloroethene	**25**		**1.0**	**2.5**	**5.0**	**ug/L**	5	18-Oct-2018 21:05
1,2-Dichloroethane	**4.6**	J	**1.0**	**2.5**	**5.0**	**ug/L**	5	18-Oct-2018 21:05
cis-1,2-Dichloroethene	**3,700**		**10**	**25**	**50**	**ug/L**	50	18-Oct-2018 21:32
Methylene chloride	5.0	U	5.0	5.0	10	ug/L	5	18-Oct-2018 21:05
Trichloroethene	**5,500**		**10**	**25**	**50**	**ug/L**	50	18-Oct-2018 21:32
Vinyl chloride	**240**		**1.0**	**2.5**	**5.0**	**ug/L**	5	18-Oct-2018 21:05
Surr: 1,2-Dichloroethane-d4	*91.6*			**0**	*70-126*	*%REC*	*5*	*18-Oct-2018 21:05*
Surr: 1,2-Dichloroethane-d4	*91.6*			**0**	*70-126*	*%REC*	*50*	*18-Oct-2018 21:32*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*81-113*	*%REC*	*5*	*18-Oct-2018 21:05*
Surr: 4-Bromofluorobenzene	*97.1*			**0**	*81-113*	*%REC*	*50*	*18-Oct-2018 21:32*
Surr: Dibromofluoromethane	*93.8*			**0**	*77-123*	*%REC*	*5*	*18-Oct-2018 21:05*
Surr: Dibromofluoromethane	*95.6*			**0**	*77-123*	*%REC*	*50*	*18-Oct-2018 21:32*
Surr: Toluene-d8	*91.3*			**0**	*82-127*	*%REC*	*5*	*18-Oct-2018 21:05*
Surr: Toluene-d8	*92.5*			**0**	*82-127*	*%REC*	*50*	*18-Oct-2018 21:32*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000310**	J	**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 19:28
Ethene	**0.00376**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	16-Oct-2018 19:28
Methane	**0.00839**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	16-Oct-2018 19:28
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**438**		**5.00**	**5.00**	**5.00**	**mg/L**	1	12-Oct-2018 23:04
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.38**		**0.600**	**2.00**	**2.00**	**mg/L**	20	11-Oct-2018 07:14
Chloride	**683**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 07:14
Fluoride	**0.208**		**0.100**	**0.200**	**0.200**	**mg/L**	2	11-Oct-2018 07:00
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 07:00
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 13:40
Sulfate	**6,120**		**40.0**	**100**	**100**	**mg/L**	200	11-Oct-2018 16:53
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Oct-2018 09:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant **DATES REPORT**
WorkOrder: HS18100492

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R325252 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS18100492-02	16WW43-181009	09 Oct 2018 09:49			11 Oct 2018 01:11	1
HS18100492-03	16WW26-181009	09 Oct 2018 11:18			11 Oct 2018 01:54	20
HS18100492-03	16WW26-181009	09 Oct 2018 11:18			11 Oct 2018 01:40	1
HS18100492-04	16WW41-181009	09 Oct 2018 11:25			11 Oct 2018 14:53	200
HS18100492-04	16WW41-181009	09 Oct 2018 11:25			11 Oct 2018 02:23	20
HS18100492-04	16WW41-181009	09 Oct 2018 11:25			11 Oct 2018 02:09	2
HS18100492-05	16WW25-181009	09 Oct 2018 13:12			11 Oct 2018 15:07	200
HS18100492-05	16WW25-181009	09 Oct 2018 13:12			11 Oct 2018 10:46	2
HS18100492-05	16WW25-181009	09 Oct 2018 13:12			11 Oct 2018 03:22	20
HS18100492-05	16WW25-181009	09 Oct 2018 13:12			11 Oct 2018 03:07	1
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			11 Oct 2018 11:00	2
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			11 Oct 2018 16:10	40
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			11 Oct 2018 03:51	20
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			11 Oct 2018 03:36	1
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			11 Oct 2018 16:39	200
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			11 Oct 2018 11:15	2
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			11 Oct 2018 04:20	20
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			11 Oct 2018 04:05	2
HS18100492-08	16WW24-181009	09 Oct 2018 14:45			11 Oct 2018 11:29	1
HS18100492-08	16WW24-181009	09 Oct 2018 14:45			11 Oct 2018 05:18	10
HS18100492-08	16WW24-181009	09 Oct 2018 14:45			11 Oct 2018 04:34	1
HS18100492-09	16WW24-181009-FD	09 Oct 2018 14:45			11 Oct 2018 13:01	2
HS18100492-09	16WW24-181009-FD	09 Oct 2018 14:45			11 Oct 2018 06:45	20
HS18100492-09	16WW24-181009-FD	09 Oct 2018 14:45			11 Oct 2018 06:31	1
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			11 Oct 2018 13:40	2
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			11 Oct 2018 16:53	200
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			11 Oct 2018 07:14	20
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			11 Oct 2018 07:00	2
Batch ID: R325372 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Water	
HS18100492-02	16WW43-181009	09 Oct 2018 09:49			12 Oct 2018 22:00	1
HS18100492-03	16WW26-181009	09 Oct 2018 11:18			12 Oct 2018 22:05	1
HS18100492-04	16WW41-181009	09 Oct 2018 11:25			12 Oct 2018 22:13	1
HS18100492-05	16WW25-181009	09 Oct 2018 13:12			12 Oct 2018 22:19	1
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			12 Oct 2018 22:42	1
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			12 Oct 2018 22:49	1
HS18100492-08	16WW24-181009	09 Oct 2018 14:45			12 Oct 2018 22:52	1
HS18100492-09	16WW24-181009-FD	09 Oct 2018 14:45			12 Oct 2018 22:57	1
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			12 Oct 2018 23:04	1

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant **DATES REPORT**
WorkOrder: HS18100492

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R325554 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS18100492-01	16TB01-181009	09 Oct 2018 00:00			16 Oct 2018 13:13	1
HS18100492-02	16WW43-181009	09 Oct 2018 09:49			16 Oct 2018 20:08	1
HS18100492-05	16WW25-181009	09 Oct 2018 13:12			16 Oct 2018 20:33	1
HS18100492-08	16WW24-181009	09 Oct 2018 14:45			16 Oct 2018 13:37	1
Batch ID: R325683 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS18100492-02	16WW43-181009	09 Oct 2018 09:49			16 Oct 2018 12:58	5
HS18100492-02	16WW43-181009	09 Oct 2018 09:49			16 Oct 2018 12:35	1
HS18100492-03	16WW26-181009	09 Oct 2018 11:18			16 Oct 2018 15:57	1
HS18100492-04	16WW41-181009	09 Oct 2018 11:25			16 Oct 2018 16:09	1
HS18100492-05	16WW25-181009	09 Oct 2018 13:12			16 Oct 2018 16:58	1
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			16 Oct 2018 17:25	1
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			16 Oct 2018 17:55	5
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			16 Oct 2018 17:40	1
HS18100492-08	16WW24-181009	09 Oct 2018 14:45			16 Oct 2018 18:18	1
HS18100492-09	16WW24-181009-FD	09 Oct 2018 14:45			16 Oct 2018 19:18	1
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			16 Oct 2018 19:28	1
Batch ID: R325746 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS18100492-03	16WW26-181009	09 Oct 2018 11:18			18 Oct 2018 20:38	25
HS18100492-03	16WW26-181009	09 Oct 2018 11:18			18 Oct 2018 20:11	5
HS18100492-04	16WW41-181009	09 Oct 2018 11:25			18 Oct 2018 22:26	100
HS18100492-04	16WW41-181009	09 Oct 2018 11:25			18 Oct 2018 21:59	10
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			18 Oct 2018 23:18	500
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			18 Oct 2018 22:51	50
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			19 Oct 2018 00:09	500
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			18 Oct 2018 23:42	50
HS18100492-09	16WW24-181009-FD	09 Oct 2018 14:45			18 Oct 2018 17:18	1
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			18 Oct 2018 21:32	50
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			18 Oct 2018 21:05	5
Batch ID: R325853 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS18100492-02	16WW43-181009	09 Oct 2018 09:49			22 Oct 2018 09:40	1
HS18100492-03	16WW26-181009	09 Oct 2018 11:18			22 Oct 2018 09:40	1
HS18100492-04	16WW41-181009	09 Oct 2018 11:25			22 Oct 2018 09:40	1
HS18100492-05	16WW25-181009	09 Oct 2018 13:12			22 Oct 2018 09:40	1
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			22 Oct 2018 09:40	1
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			22 Oct 2018 09:40	1
HS18100492-08	16WW24-181009	09 Oct 2018 14:45			22 Oct 2018 09:40	1
HS18100492-09	16WW24-181009-FD	09 Oct 2018 14:45			22 Oct 2018 09:40	1
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			22 Oct 2018 09:40	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant **DATES REPORT**
WorkOrder: HS18100492

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R325934 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS18100492-02	16WW43-181009	09 Oct 2018 09:49			23 Oct 2018 09:23	1
HS18100492-03	16WW26-181009	09 Oct 2018 11:18			23 Oct 2018 09:23	1
HS18100492-04	16WW41-181009	09 Oct 2018 11:25			23 Oct 2018 09:23	1
HS18100492-05	16WW25-181009	09 Oct 2018 13:12			23 Oct 2018 09:23	1
HS18100492-06	16EW02-181009	09 Oct 2018 13:40			23 Oct 2018 09:23	1
HS18100492-07	16WW36-181009	09 Oct 2018 14:53			23 Oct 2018 09:23	1
HS18100492-08	16WW24-181009	09 Oct 2018 14:45			23 Oct 2018 09:23	1
HS18100492-09	16WW24-181009-FD	09 Oct 2018 14:45			23 Oct 2018 09:23	1
HS18100492-10	16EW06-181009	09 Oct 2018 14:55			23 Oct 2018 09:23	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325683 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-181016** Units: **mg/L** Analysis Date: **16-Oct-2018 12:09**
Client ID: Run ID: **FID-4_325683** SeqNo: **4778290** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00100	0.00100								U
Ethene	0.00100	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-181016** Units: **mg/L** Analysis Date: **16-Oct-2018 10:48**
Client ID: Run ID: **FID-4_325683** SeqNo: **4778288** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0180	0.00100	0.01804	0	99.8	75 - 125				
Ethene	0.0167	0.00100	0.0168	0	99.5	75 - 125				
Methane	0.00815	0.000500	0.009647	0	84.5	75 - 125				

LCSD Sample ID: **LCSD-181016** Units: **mg/L** Analysis Date: **16-Oct-2018 11:28**
Client ID: Run ID: **FID-4_325683** SeqNo: **4778289** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0174	0.00100	0.01804	0	96.5	75 - 125	0.01801	3.37	30	
Ethene	0.0161	0.00100	0.0168	0	95.6	75 - 125	0.01672	4.05	30	
Methane	0.00910	0.000500	0.009647	0	94.4	75 - 125	0.008152	11	30	

MS Sample ID: **HS18100492-08MS** Units: **mg/L** Analysis Date: **16-Oct-2018 18:28**
Client ID: **16WW24-181009** Run ID: **FID-4_325683** SeqNo: **4778301** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0240	0.00100	0.01804	0.0002557	131	75 - 125				S
Ethene	0.0279	0.00100	0.0168	0.001386	158	75 - 125				S
Methane	0.0119	0.000500	0.009647	0.001652	106	75 - 125				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325683 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MSD Sample ID: **HS18100492-08MSD** Units: **mg/L** Analysis Date: **16-Oct-2018 18:53**
Client ID: **16WW24-181009** Run ID: **FID-4_325683** SeqNo: **4778302** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0238	0.00100	0.01804	0.0002557	130	75 - 125	0.02398	0.78	30	S
Ethene	0.0267	0.00100	0.0168	0.001386	151	75 - 125	0.02790	4.24	30	S
Methane	0.0112	0.000500	0.009647	0.001652	98.9	75 - 125	0.01192	6.3	30	

The following samples were analyzed in this batch:

HS18100492-02	HS18100492-03	HS18100492-04	HS18100492-05
HS18100492-06	HS18100492-07	HS18100492-08	HS18100492-09
HS18100492-10			

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181016** Units: **ug/L** Analysis Date: **16-Oct-2018 12:00**
Client ID: Run ID: **VOA2_325554** SeqNo: **4775026** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181016** Units: **ug/L** Analysis Date: **16-Oct-2018 12:00**
Client ID: Run ID: **VOA2_325554** SeqNo: **4775026** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.54*	*1.0*	*50*	*0*	*91.1*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.61*	*1.0*	*50*	*0*	*97.2*	*82 - 115*				
Surr: Dibromofluoromethane	*48.76*	*1.0*	*50*	*0*	*97.5*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: **R325554 (0)** **Instrument:** **VOA2** **Method:** **LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181016** Units: **ug/L** Analysis Date: **16-Oct-2018 12:00**
Client ID: Run ID: **VOA2_325554** SeqNo: **4775026** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.7*	*1.0*	*50*	*0*	*93.4*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181016** Units: **ug/L** Analysis Date: **16-Oct-2018 11:11**
Client ID: Run ID: **VOA2_325554** SeqNo: **4775048** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.58	1.0	20	0	103	77 - 118				
1,1,1-Trichloroethane	18.55	1.0	20	0	92.8	70 - 130				
1,1,2,2-Tetrachloroethane	17.73	1.0	20	0	88.7	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	20.68	1.0	20	0	103	70 - 130				
1,1,2-Trichloroethane	20.26	1.0	20	0	101	77 - 113				
1,1-Dichloroethane	19.29	1.0	20	0	96.5	71 - 122				
1,1-Dichloroethene	19.69	1.0	20	0	98.4	70 - 130				
1,1-Dichloropropene	21.74	1.0	20	0	109	78 - 118				
1,2,3-Trichlorobenzene	18.49	1.0	20	0	92.5	70 - 130				
1,2,3-Trichloropropane	17.73	1.0	20	0	88.7	70 - 127				
1,2,4-Trichlorobenzene	18.8	1.0	20	0	94.0	77 - 126				
1,2,4-Trimethylbenzene	20.98	1.0	20	0	105	73 - 121				
1,2-Dibromo-3-chloropropane	16.3	1.0	20	0	81.5	70 - 130				
1,2-Dibromoethane	20.71	1.0	20	0	104	76 - 123				
1,2-Dichlorobenzene	19.49	1.0	20	0	97.4	77 - 113				
1,2-Dichloroethane	19.79	1.0	20	0	98.9	70 - 124				
1,2-Dichloropropane	21.02	1.0	20	0	105	72 - 119				
1,3,5-Trimethylbenzene	19.32	1.0	20	0	96.6	75 - 118				
1,3-Dichlorobenzene	19.9	1.0	20	0	99.5	78 - 118				
1,3-Dichloropropane	20.54	1.0	20	0	103	75 - 116				
1,4-Dichlorobenzene	19.87	1.0	20	0	99.4	79 - 113				
2,2-Dichloropropane	21.5	1.0	20	0	108	70 - 130				
2-Butanone	35.56	2.0	40	0	88.9	70 - 130				
2-Chlorotoluene	21.45	1.0	20	0	107	70 - 128				
2-Hexanone	36.32	2.0	40	0	90.8	70 - 130				
4-Chlorotoluene	21.51	1.0	20	0	108	74 - 126				
4-Isopropyltoluene	18.61	1.0	20	0	93.0	74 - 126				
4-Methyl-2-pentanone	36.57	2.0	40	0	91.4	70 - 130				
Acetone	35.34	2.0	40	0	88.4	70 - 130				
Benzene	20.57	1.0	20	0	103	74 - 120				
Bromobenzene	19.89	1.0	20	0	99.5	78 - 113				
Bromochloromethane	20.37	1.0	20	0	102	76 - 124				
Bromodichloromethane	20.7	1.0	20	0	103	74 - 122				
Bromoform	19.36	1.0	20	0	96.8	73 - 128				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181016** Units: **ug/L** Analysis Date: **16-Oct-2018 11:11**
Client ID: Run ID: **VOA2_325554** SeqNo: **4775048** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.4	1.0	20	0	122	70 - 130				
Carbon disulfide	37.98	2.0	40	0	94.9	70 - 130				
Carbon tetrachloride	21.53	1.0	20	0	108	71 - 125				
Chlorobenzene	20.91	1.0	20	0	105	76 - 113				
Chloroethane	18.96	1.0	20	0	94.8	70 - 130				
Chloroform	19.14	1.0	20	0	95.7	71 - 121				
Chloromethane	17.29	1.0	20	0	86.5	70 - 129				
cis-1,2-Dichloroethene	19.8	1.0	20	0	99.0	75 - 122				
cis-1,3-Dichloropropene	22.1	1.0	20	0	111	73 - 127				
Dibromochloromethane	20.07	1.0	20	0	100	77 - 122				
Dibromomethane	20.75	1.0	20	0	104	78 - 121				
Dichlorodifluoromethane	14.26	1.0	20	0	71.3	70 - 130				
Ethylbenzene	22.74	1.0	20	0	114	77 - 117				
Hexachlorobutadiene	20	1.0	20	0	100.0	70 - 130				
Isopropylbenzene	20.12	1.0	20	0	101	73 - 127				
m,p-Xylene	44.51	2.0	40	0	111	77 - 122				
Methylene chloride	19.92	2.0	20	0	99.6	70 - 127				
Naphthalene	16.85	1.0	20	0	84.2	70 - 130				
n-Butylbenzene	20.68	1.0	20	0	103	72 - 130				
n-Propylbenzene	21.77	1.0	20	0	109	73 - 124				
o-Xylene	22.42	1.0	20	0	112	75 - 119				
sec-Butylbenzene	19.01	1.0	20	0	95.0	73 - 128				
Styrene	20.91	1.0	20	0	105	72 - 126				
tert-Butylbenzene	21.32	1.0	20	0	107	73 - 124				
Tetrachloroethene	20.34	1.0	20	0	102	76 - 119				
Toluene	20.29	1.0	20	0	101	77 - 118				
trans-1,2-Dichloroethene	20.13	1.0	20	0	101	72 - 127				
trans-1,3-Dichloropropene	22.29	1.0	20	0	111	77 - 119				
Trichloroethene	20.09	1.0	20	0	100	77 - 121				
Trichlorofluoromethane	19.06	1.0	20	0	95.3	70 - 130				
Vinyl chloride	19.02	1.0	20	0	95.1	70 - 130				
Surr: 1,2-Dichloroethane-d4	*46.55*	*1.0*	*50*	*0*	*93.1*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.46*	*1.0*	*50*	*0*	*101*	*82 - 115*				
Surr: Dibromofluoromethane	*46.48*	*1.0*	*50*	*0*	*93.0*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: **R325554 (0)** **Instrument:** **VOA2** **Method:** **LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181016** Units: **ug/L** Analysis Date: **16-Oct-2018 11:11**
Client ID: Run ID: **VOA2_325554** SeqNo: **4775048** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.1*	*1.0*	*50*	*0*	*90.2*	*81 - 120*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100492-08MS** Units: **ug/L** Analysis Date: **16-Oct-2018 14:51**
Client ID: **16WW24-181009** Run ID: **VOA2_325554** SeqNo: **4775138** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.72	1.0	20	0	98.6	70 - 120				
1,1,1-Trichloroethane	18.92	1.0	20	0	94.6	70 - 130				
1,1,2,2-Tetrachloroethane	15.75	1.0	20	0	78.8	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	20.97	1.0	20	0	105	70 - 130				
1,1,2-Trichloroethane	19.44	1.0	20	0	97.2	70 - 117				
1,1-Dichloroethane	19.22	1.0	20	0	96.1	70 - 127				
1,1-Dichloroethene	19.8	1.0	20	0	99.0	70 - 130				
1,1-Dichloropropene	21.64	1.0	20	0	108	70 - 129				
1,2,3-Trichlorobenzene	16.42	1.0	20	0	82.1	70 - 130				
1,2,3-Trichloropropane	15.58	1.0	20	0	77.9	70 - 130				
1,2,4-Trichlorobenzene	17.58	1.0	20	0	87.9	70 - 125				
1,2,4-Trimethylbenzene	20.18	1.0	20	0	101	70 - 125				
1,2-Dibromo-3-chloropropane	15.21	1.0	20	0	76.0	70 - 130				
1,2-Dibromoethane	19.47	1.0	20	0	97.4	70 - 124				
1,2-Dichlorobenzene	17.85	1.0	20	0	89.3	70 - 115				
1,2-Dichloroethane	19.72	1.0	20	0	98.6	70 - 127				
1,2-Dichloropropane	20.78	1.0	20	0	104	70 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	70 - 126				
1,3-Dichlorobenzene	18.33	1.0	20	0	91.6	70 - 119				
1,3-Dichloropropane	19.35	1.0	20	0	96.8	70 - 121				
1,4-Dichlorobenzene	18.27	1.0	20	0	91.4	70 - 114				
2,2-Dichloropropane	21.75	1.0	20	0	109	70 - 130				
2-Butanone	33.88	2.0	40	0	84.7	70 - 130				
2-Chlorotoluene	19.06	1.0	20	0	95.3	70 - 130				
2-Hexanone	35.2	2.0	40	0	88.0	70 - 130				
4-Chlorotoluene	19.55	1.0	20	0	97.8	70 - 130				
4-Isopropyltoluene	17.9	1.0	20	0	89.5	70 - 130				
4-Methyl-2-pentanone	36.51	2.0	40	0	91.3	70 - 130				
Acetone	29.52	2.0	40	0	73.8	70 - 130				
Benzene	20.31	1.0	20	0	102	70 - 127				
Bromobenzene	18.1	1.0	20	0	90.5	70 - 115				
Bromochloromethane	19.61	1.0	20	0	98.1	70 - 127				
Bromodichloromethane	19.93	1.0	20	0	99.6	70 - 124				
Bromoform	17.96	1.0	20	0	89.8	70 - 129				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100492-08MS** Units: **ug/L** Analysis Date: **16-Oct-2018 14:51**
Client ID: **16WW24-181009** Run ID: **VOA2_325554** SeqNo: **4775138** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	22.7	1.0	20	0	113	70 - 130				
Carbon disulfide	39.24	2.0	40	0	98.1	70 - 130				
Carbon tetrachloride	20.62	1.0	20	0	103	70 - 130				
Chlorobenzene	20.63	1.0	20	0	103	70 - 114				
Chloroethane	18.62	1.0	20	0	93.1	70 - 130				
Chloroform	18.79	1.0	20	0	93.9	70 - 125				
Chloromethane	16	1.0	20	0	80.0	70 - 130				
cis-1,2-Dichloroethene	19.94	1.0	20	0	99.7	70 - 128				
cis-1,3-Dichloropropene	21.18	1.0	20	0	106	70 - 125				
Dibromochloromethane	18.77	1.0	20	0	93.8	70 - 124				
Dibromomethane	20.79	1.0	20	0	104	70 - 124				
Dichlorodifluoromethane	13.27	1.0	20	0	66.4	70 - 130				S
Ethylbenzene	22.39	1.0	20	0	112	70 - 124				
Hexachlorobutadiene	18.17	1.0	20	0	90.9	70 - 130				
Isopropylbenzene	20.18	1.0	20	0	101	70 - 130				
m,p-Xylene	44.95	2.0	40	0	112	70 - 130				
Methylene chloride	18.94	2.0	20	0	94.7	70 - 128				
Naphthalene	17.58	1.0	20	0	87.9	70 - 130				
n-Butylbenzene	19.94	1.0	20	0	99.7	70 - 130				
n-Propylbenzene	20.65	1.0	20	0	103	70 - 130				
o-Xylene	22.29	1.0	20	0	111	70 - 124				
sec-Butylbenzene	18.26	1.0	20	0	91.3	70 - 130				
Styrene	20.53	1.0	20	0	103	70 - 130				
tert-Butylbenzene	19.67	1.0	20	0	98.4	70 - 130				
Tetrachloroethene	20.67	1.0	20	0	103	70 - 130				
Toluene	20.28	1.0	20	0	101	70 - 123				
trans-1,2-Dichloroethene	20.6	1.0	20	0	103	70 - 130				
trans-1,3-Dichloropropene	20.87	1.0	20	0	104	70 - 121				
Trichloroethene	20.4	1.0	20	0	102	70 - 129				
Trichlorofluoromethane	20.15	1.0	20	0	101	70 - 130				
Vinyl chloride	19.5	1.0	20	0	97.5	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.21*	*1.0*	*50*	*0*	*94.4*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.61*	*1.0*	*50*	*0*	*103*	*81 - 113*				
Surr: Dibromofluoromethane	*48.17*	*1.0*	*50*	*0*	*96.3*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100492-08MS** Units: **ug/L** Analysis Date: **16-Oct-2018 14:51**
Client ID: **16WW24-181009** Run ID: **VOA2_325554** SeqNo: **4775138** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.42*	*1.0*	*50*	*0*	*90.8*	*82 - 127*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100492-08MSD** Units: **ug/L** Analysis Date: **16-Oct-2018 15:15**
Client ID: **16WW24-181009** Run ID: **VOA2_325554** SeqNo: **4775139** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.04	1.0	20	0	95.2	70 - 120	19.72	3.51	20	
1,1,1-Trichloroethane	17.71	1.0	20	0	88.5	70 - 130	18.92	6.6	20	
1,1,2,2-Tetrachloroethane	15.5	1.0	20	0	77.5	70 - 123	15.75	1.57	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	19.32	1.0	20	0	96.6	70 - 130	20.97	8.21	20	
1,1,2-Trichloroethane	18.63	1.0	20	0	93.1	70 - 117	19.44	4.29	20	
1,1-Dichloroethane	18.45	1.0	20	0	92.3	70 - 127	19.22	4.05	20	
1,1-Dichloroethene	18.48	1.0	20	0	92.4	70 - 130	19.8	6.89	20	
1,1-Dichloropropene	19.76	1.0	20	0	98.8	70 - 129	21.64	9.04	20	
1,2,3-Trichlorobenzene	16.67	1.0	20	0	83.3	70 - 130	16.42	1.48	20	
1,2,3-Trichloropropane	15.51	1.0	20	0	77.6	70 - 130	15.58	0.434	20	
1,2,4-Trichlorobenzene	18.36	1.0	20	0	91.8	70 - 125	17.58	4.37	20	
1,2,4-Trimethylbenzene	19.71	1.0	20	0	98.6	70 - 125	20.18	2.33	20	
1,2-Dibromo-3-chloropropane	13.75	1.0	20	0	68.8	70 - 130	15.21	10	20	S
1,2-Dibromoethane	18.86	1.0	20	0	94.3	70 - 124	19.47	3.21	20	
1,2-Dichlorobenzene	18.08	1.0	20	0	90.4	70 - 115	17.85	1.26	20	
1,2-Dichloroethane	18.76	1.0	20	0	93.8	70 - 127	19.72	5	20	
1,2-Dichloropropane	19.99	1.0	20	0	99.9	70 - 122	20.78	3.88	20	
1,3,5-Trimethylbenzene	17.75	1.0	20	0	88.7	70 - 126	18.27	2.91	20	
1,3-Dichlorobenzene	18.31	1.0	20	0	91.5	70 - 119	18.33	0.115	20	
1,3-Dichloropropane	18.66	1.0	20	0	93.3	70 - 121	19.35	3.63	20	
1,4-Dichlorobenzene	18.45	1.0	20	0	92.2	70 - 114	18.27	0.957	20	
2,2-Dichloropropane	20.56	1.0	20	0	103	70 - 130	21.75	5.61	20	
2-Butanone	32.12	2.0	40	0	80.3	70 - 130	33.88	5.35	20	
2-Chlorotoluene	19.76	1.0	20	0	98.8	70 - 130	19.06	3.56	20	
2-Hexanone	32.82	2.0	40	0	82.1	70 - 130	35.2	6.98	20	
4-Chlorotoluene	19.65	1.0	20	0	98.2	70 - 130	19.55	0.494	20	
4-Isopropyltoluene	17.33	1.0	20	0	86.6	70 - 130	17.9	3.23	20	
4-Methyl-2-pentanone	33.84	2.0	40	0	84.6	70 - 130	36.51	7.6	20	
Acetone	32.47	2.0	40	0	81.2	70 - 130	29.52	9.52	20	
Benzene	19.46	1.0	20	0	97.3	70 - 127	20.31	4.25	20	
Bromobenzene	18.12	1.0	20	0	90.6	70 - 115	18.1	0.0776	20	
Bromochloromethane	19.55	1.0	20	0	97.8	70 - 127	19.61	0.307	20	
Bromodichloromethane	19.56	1.0	20	0	97.8	70 - 124	19.93	1.87	20	
Bromoform	17.46	1.0	20	0	87.3	70 - 129	17.96	2.81	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100492-08MSD** Units: **ug/L** Analysis Date: **16-Oct-2018 15:15**
Client ID: **16WW24-181009** Run ID: **VOA2_325554** SeqNo: **4775139** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	22.15	1.0	20	0	111	70 - 130	22.7	2.43	20	
Carbon disulfide	35.74	2.0	40	0	89.4	70 - 130	39.24	9.31	20	
Carbon tetrachloride	19.45	1.0	20	0	97.2	70 - 130	20.62	5.87	20	
Chlorobenzene	19.85	1.0	20	0	99.3	70 - 114	20.63	3.83	20	
Chloroethane	17.24	1.0	20	0	86.2	70 - 130	18.62	7.69	20	
Chloroform	18.45	1.0	20	0	92.3	70 - 125	18.79	1.79	20	
Chloromethane	15.17	1.0	20	0	75.9	70 - 130	16	5.34	20	
cis-1,2-Dichloroethene	19.37	1.0	20	0	96.8	70 - 128	19.94	2.92	20	
cis-1,3-Dichloropropene	20.68	1.0	20	0	103	70 - 125	21.18	2.38	20	
Dibromochloromethane	18.6	1.0	20	0	93.0	70 - 124	18.77	0.878	20	
Dibromomethane	19.29	1.0	20	0	96.4	70 - 124	20.79	7.5	20	
Dichlorodifluoromethane	12.09	1.0	20	0	60.5	70 - 130	13.27	9.29	20	S
Ethylbenzene	21.52	1.0	20	0	108	70 - 124	22.39	3.97	20	
Hexachlorobutadiene	18.06	1.0	20	0	90.3	70 - 130	18.17	0.611	20	
Isopropylbenzene	18.98	1.0	20	0	94.9	70 - 130	20.18	6.17	20	
m,p-Xylene	42.25	2.0	40	0	106	70 - 130	44.95	6.18	20	
Methylene chloride	19.14	2.0	20	0	95.7	70 - 128	18.94	1.05	20	
Naphthalene	16.23	1.0	20	0	81.1	70 - 130	17.58	7.99	20	
n-Butylbenzene	19	1.0	20	0	95.0	70 - 130	19.94	4.86	20	
n-Propylbenzene	19.9	1.0	20	0	99.5	70 - 130	20.65	3.75	20	
o-Xylene	20.86	1.0	20	0	104	70 - 124	22.29	6.6	20	
sec-Butylbenzene	17.69	1.0	20	0	88.4	70 - 130	18.26	3.16	20	
Styrene	20.16	1.0	20	0	101	70 - 130	20.53	1.82	20	
tert-Butylbenzene	19.22	1.0	20	0	96.1	70 - 130	19.67	2.33	20	
Tetrachloroethene	18.91	1.0	20	0	94.6	70 - 130	20.67	8.86	20	
Toluene	19.01	1.0	20	0	95.1	70 - 123	20.28	6.44	20	
trans-1,2-Dichloroethene	19.08	1.0	20	0	95.4	70 - 130	20.6	7.68	20	
trans-1,3-Dichloropropene	20.51	1.0	20	0	103	70 - 121	20.87	1.76	20	
Trichloroethene	19.41	1.0	20	0	97.1	70 - 129	20.4	4.94	20	
Trichlorofluoromethane	18.31	1.0	20	0	91.6	70 - 130	20.15	9.54	20	
Vinyl chloride	17.78	1.0	20	0	88.9	70 - 130	19.5	9.25	20	
Surr: 1,2-Dichloroethane-d4	*46.43*	*1.0*	*50*	*0*	*92.9*	*70 - 126*	*47.21*	*1.66*	*20*	
Surr: 4-Bromofluorobenzene	*51.22*	*1.0*	*50*	*0*	*102*	*81 - 113*	*51.61*	*0.766*	*20*	
Surr: Dibromofluoromethane	*47.38*	*1.0*	*50*	*0*	*94.8*	*77 - 123*	*48.17*	*1.66*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325554 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100492-08MSD** Units: **ug/L** Analysis Date: **16-Oct-2018 15:15**
Client ID: **16WW24-181009** Run ID: **VOA2_325554** SeqNo: **4775139** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.16*	*1.0*	*50*	*0*	*90.3*	*82 - 127*	*45.42*	*0.585*	*20*	

The following samples were analyzed in this batch: HS18100492-01 HS18100492-02 HS18100492-05 HS18100492-08

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 15:16**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779648** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 15:16**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779648** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.36*	*1.0*	*50*	*0*	*86.7*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.8*	*1.0*	*50*	*0*	*97.6*	*82 - 115*				
Surr: Dibromofluoromethane	*48.22*	*1.0*	*50*	*0*	*96.4*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 15:16**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779648** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.49*	*1.0*	*50*	*0*	*93.0*	*81 - 120*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 14:27**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779646** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.53	1.0	20	0	103	77 - 118				
1,1,1-Trichloroethane	18.86	1.0	20	0	94.3	70 - 130				
1,1,2,2-Tetrachloroethane	16.63	1.0	20	0	83.2	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	21.18	1.0	20	0	106	70 - 130				
1,1,2-Trichloroethane	19.93	1.0	20	0	99.7	77 - 113				
1,1-Dichloroethane	19.8	1.0	20	0	99.0	71 - 122				
1,1-Dichloroethene	19.33	1.0	20	0	96.6	70 - 130				
1,1-Dichloropropene	21.51	1.0	20	0	108	78 - 118				
1,2,3-Trichlorobenzene	17.37	1.0	20	0	86.8	70 - 130				
1,2,3-Trichloropropane	16.89	1.0	20	0	84.5	70 - 127				
1,2,4-Trichlorobenzene	18.68	1.0	20	0	93.4	77 - 126				
1,2,4-Trimethylbenzene	21.51	1.0	20	0	108	73 - 121				
1,2-Dibromo-3-chloropropane	14.83	1.0	20	0	74.1	70 - 130				
1,2-Dibromoethane	20.01	1.0	20	0	100	76 - 123				
1,2-Dichlorobenzene	19.65	1.0	20	0	98.2	77 - 113				
1,2-Dichloroethane	19.51	1.0	20	0	97.5	70 - 124				
1,2-Dichloropropane	21.49	1.0	20	0	107	72 - 119				
1,3,5-Trimethylbenzene	19.75	1.0	20	0	98.7	75 - 118				
1,3-Dichlorobenzene	19.83	1.0	20	0	99.1	78 - 118				
1,3-Dichloropropane	20	1.0	20	0	100.0	75 - 116				
1,4-Dichlorobenzene	20.55	1.0	20	0	103	79 - 113				
2,2-Dichloropropane	22.17	1.0	20	0	111	70 - 130				
2-Butanone	32.82	2.0	40	0	82.0	70 - 130				
2-Chlorotoluene	21.38	1.0	20	0	107	70 - 128				
2-Hexanone	33.25	2.0	40	0	83.1	70 - 130				
4-Chlorotoluene	21.73	1.0	20	0	109	74 - 126				
4-Isopropyltoluene	19	1.0	20	0	95.0	74 - 126				
4-Methyl-2-pentanone	34.53	2.0	40	0	86.3	70 - 130				
Acetone	32.89	2.0	40	0	82.2	70 - 130				
Benzene	20.78	1.0	20	0	104	74 - 120				
Bromobenzene	19.94	1.0	20	0	99.7	78 - 113				
Bromochloromethane	20.73	1.0	20	0	104	76 - 124				
Bromodichloromethane	20.89	1.0	20	0	104	74 - 122				
Bromoform	19.09	1.0	20	0	95.5	73 - 128				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 14:27**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779646** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	25.23	1.0	20	0	126	70 - 130				
Carbon disulfide	38.37	2.0	40	0	95.9	70 - 130				
Carbon tetrachloride	21.25	1.0	20	0	106	71 - 125				
Chlorobenzene	20.82	1.0	20	0	104	76 - 113				
Chloroethane	20.03	1.0	20	0	100	70 - 130				
Chloroform	19.22	1.0	20	0	96.1	71 - 121				
Chloromethane	18.25	1.0	20	0	91.2	70 - 129				
cis-1,2-Dichloroethene	20.34	1.0	20	0	102	75 - 122				
cis-1,3-Dichloropropene	22.11	1.0	20	0	111	73 - 127				
Dibromochloromethane	19.77	1.0	20	0	98.9	77 - 122				
Dibromomethane	20.5	1.0	20	0	102	78 - 121				
Dichlorodifluoromethane	14.82	1.0	20	0	74.1	70 - 130				
Ethylbenzene	22.7	1.0	20	0	114	77 - 117				
Hexachlorobutadiene	20.48	1.0	20	0	102	70 - 130				
Isopropylbenzene	20.48	1.0	20	0	102	73 - 127				
m,p-Xylene	46.4	2.0	40	0	116	77 - 122				
Methylene chloride	20.02	2.0	20	0	100	70 - 127				
Naphthalene	15.31	1.0	20	0	76.5	70 - 130				
n-Butylbenzene	20.82	1.0	20	0	104	72 - 130				
n-Propylbenzene	22.11	1.0	20	0	111	73 - 124				
o-Xylene	22.33	1.0	20	0	112	75 - 119				
sec-Butylbenzene	19.32	1.0	20	0	96.6	73 - 128				
Styrene	21.17	1.0	20	0	106	72 - 126				
tert-Butylbenzene	21.25	1.0	20	0	106	73 - 124				
Tetrachloroethene	20.36	1.0	20	0	102	76 - 119				
Toluene	20.46	1.0	20	0	102	77 - 118				
trans-1,2-Dichloroethene	20.52	1.0	20	0	103	72 - 127				
trans-1,3-Dichloropropene	22.37	1.0	20	0	112	77 - 119				
Trichloroethene	21.27	1.0	20	0	106	77 - 121				
Trichlorofluoromethane	20.65	1.0	20	0	103	70 - 130				
Vinyl chloride	19.94	1.0	20	0	99.7	70 - 130				
Surr: 1,2-Dichloroethane-d4	*45.03*	*1.0*	*50*	*0*	*90.1*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.78*	*1.0*	*50*	*0*	*102*	*82 - 115*				
Surr: Dibromofluoromethane	*47.4*	*1.0*	*50*	*0*	*94.8*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: **R325746 (0)** **Instrument:** **VOA2** **Method:** **LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 14:27**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779646** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.21*	*1.0*	*50*	*0*	*90.4*	*81 - 120*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100548-11MS** Units: **ug/L** Analysis Date: **18-Oct-2018 16:29**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779651** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.9	1.0	20	0	99.5	70 - 120				
1,1,1-Trichloroethane	19.85	1.0	20	0	99.2	70 - 130				
1,1,2,2-Tetrachloroethane	16.75	1.0	20	0	83.8	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	23.06	1.0	20	0	115	70 - 130				
1,1,2-Trichloroethane	19.23	1.0	20	0	96.2	70 - 117				
1,1-Dichloroethane	20.23	1.0	20	0	101	70 - 127				
1,1-Dichloroethene	21.12	1.0	20	0	106	70 - 130				
1,1-Dichloropropene	22.98	1.0	20	0	115	70 - 129				
1,2,3-Trichlorobenzene	16.79	1.0	20	0	84.0	70 - 130				
1,2,3-Trichloropropane	17.04	1.0	20	0	85.2	70 - 130				
1,2,4-Trichlorobenzene	18.35	1.0	20	0	91.7	70 - 125				
1,2,4-Trimethylbenzene	20.2	1.0	20	0	101	70 - 125				
1,2-Dibromo-3-chloropropane	15.11	1.0	20	0	75.5	70 - 130				
1,2-Dibromoethane	20.23	1.0	20	0	101	70 - 124				
1,2-Dichlorobenzene	18.84	1.0	20	0	94.2	70 - 115				
1,2-Dichloroethane	19.51	1.0	20	0	97.5	70 - 127				
1,2-Dichloropropane	20.81	1.0	20	0	104	70 - 122				
1,3,5-Trimethylbenzene	18.84	1.0	20	0	94.2	70 - 126				
1,3-Dichlorobenzene	19.38	1.0	20	0	96.9	70 - 119				
1,3-Dichloropropane	19.78	1.0	20	0	98.9	70 - 121				
1,4-Dichlorobenzene	20.14	1.0	20	0	101	70 - 114				
2,2-Dichloropropane	24.13	1.0	20	0	121	70 - 130				
2-Butanone	36.01	2.0	40	0	90.0	70 - 130				
2-Chlorotoluene	20.76	1.0	20	0	104	70 - 130				
2-Hexanone	35.65	2.0	40	0	89.1	70 - 130				
4-Chlorotoluene	21.04	1.0	20	0	105	70 - 130				
4-Isopropyltoluene	18.65	1.0	20	0	93.3	70 - 130				
4-Methyl-2-pentanone	35.73	2.0	40	0	89.3	70 - 130				
Acetone	33.5	2.0	40	0	83.8	70 - 130				
Benzene	20.4	1.0	20	0	102	70 - 127				
Bromobenzene	19.03	1.0	20	0	95.1	70 - 115				
Bromochloromethane	20.07	1.0	20	0	100	70 - 127				
Bromodichloromethane	20.4	1.0	20	0	102	70 - 124				
Bromoform	18.89	1.0	20	0	94.5	70 - 129				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100548-11MS** Units: **ug/L** Analysis Date: **18-Oct-2018 16:29**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779651** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.14	1.0	20	0	121	70 - 130				
Carbon disulfide	40.53	2.0	40	0	101	70 - 130				
Carbon tetrachloride	21.38	1.0	20	0	107	70 - 130				
Chlorobenzene	20.81	1.0	20	0	104	70 - 114				
Chloroethane	20.23	1.0	20	0	101	70 - 130				
Chloroform	19.57	1.0	20	0	97.8	70 - 125				
Chloromethane	17.45	1.0	20	0	87.2	70 - 130				
cis-1,2-Dichloroethene	20.83	1.0	20	0	104	70 - 128				
cis-1,3-Dichloropropene	22.19	1.0	20	0	111	70 - 125				
Dibromochloromethane	19.34	1.0	20	0	96.7	70 - 124				
Dibromomethane	19.74	1.0	20	0	98.7	70 - 124				
Dichlorodifluoromethane	15.84	1.0	20	0	79.2	70 - 130				
Ethylbenzene	22.34	1.0	20	0	112	70 - 124				
Hexachlorobutadiene	19.43	1.0	20	0	97.2	70 - 130				
Isopropylbenzene	20.2	1.0	20	0	101	70 - 130				
m,p-Xylene	45.94	2.0	40	0	115	70 - 130				
Methylene chloride	19.93	2.0	20	0	99.7	70 - 128				
Naphthalene	15.61	1.0	20	0	78.1	70 - 130				
n-Butylbenzene	20.82	1.0	20	0	104	70 - 130				
n-Propylbenzene	21.93	1.0	20	0	110	70 - 130				
o-Xylene	22.17	1.0	20	0	111	70 - 124				
sec-Butylbenzene	18.87	1.0	20	0	94.4	70 - 130				
Styrene	20.53	1.0	20	0	103	70 - 130				
tert-Butylbenzene	20.84	1.0	20	0	104	70 - 130				
Tetrachloroethene	20.61	1.0	20	0	103	70 - 130				
Toluene	20.26	1.0	20	0	101	70 - 123				
trans-1,2-Dichloroethene	21.62	1.0	20	0	108	70 - 130				
trans-1,3-Dichloropropene	22.47	1.0	20	0	112	70 - 121				
Trichloroethene	21.67	1.0	20	0	108	70 - 129				
Trichlorofluoromethane	21.58	1.0	20	0	108	70 - 130				
Vinyl chloride	20.35	1.0	20	0	102	70 - 130				
Surr: 1,2-Dichloroethane-d4	*46.9*	*1.0*	*50*	*0*	*93.8*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.07*	*1.0*	*50*	*0*	*100*	*81 - 113*				
Surr: Dibromofluoromethane	*47.92*	*1.0*	*50*	*0*	*95.8*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: **R325746 (0)** **Instrument:** **VOA2** **Method:** **LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100548-11MS** Units: **ug/L** Analysis Date: **18-Oct-2018 16:29**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779651** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.76*	*1.0*	*50*	*0*	*89.5*	*82 - 127*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100548-11MSD** Units: **ug/L** Analysis Date: **18-Oct-2018 16:54**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779652** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.2	1.0	20	0	101	70 - 120	19.9	1.5	20	
1,1,1-Trichloroethane	19.2	1.0	20	0	96.0	70 - 130	19.85	3.32	20	
1,1,2,2-Tetrachloroethane	16.62	1.0	20	0	83.1	70 - 123	16.75	0.827	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	22.8	1.0	20	0	114	70 - 130	23.06	1.15	20	
1,1,2-Trichloroethane	19.9	1.0	20	0	99.5	70 - 117	19.23	3.42	20	
1,1-Dichloroethane	20.03	1.0	20	0	100	70 - 127	20.23	0.952	20	
1,1-Dichloroethene	19.86	1.0	20	0	99.3	70 - 130	21.12	6.18	20	
1,1-Dichloropropene	21.75	1.0	20	0	109	70 - 129	22.98	5.5	20	
1,2,3-Trichlorobenzene	17.13	1.0	20	0	85.6	70 - 130	16.79	1.97	20	
1,2,3-Trichloropropane	16.97	1.0	20	0	84.9	70 - 130	17.04	0.369	20	
1,2,4-Trichlorobenzene	18.81	1.0	20	0	94.0	70 - 125	18.35	2.46	20	
1,2,4-Trimethylbenzene	20.52	1.0	20	0	103	70 - 125	20.2	1.57	20	
1,2-Dibromo-3-chloropropane	15.33	1.0	20	0	76.6	70 - 130	15.11	1.44	20	
1,2-Dibromoethane	20.16	1.0	20	0	101	70 - 124	20.23	0.37	20	
1,2-Dichlorobenzene	19.28	1.0	20	0	96.4	70 - 115	18.84	2.29	20	
1,2-Dichloroethane	20.92	1.0	20	0	105	70 - 127	19.51	7.02	20	
1,2-Dichloropropane	20.94	1.0	20	0	105	70 - 122	20.81	0.596	20	
1,3,5-Trimethylbenzene	18.98	1.0	20	0	94.9	70 - 126	18.84	0.721	20	
1,3-Dichlorobenzene	19.63	1.0	20	0	98.2	70 - 119	19.38	1.28	20	
1,3-Dichloropropane	20.12	1.0	20	0	101	70 - 121	19.78	1.7	20	
1,4-Dichlorobenzene	20.06	1.0	20	0	100	70 - 114	20.14	0.375	20	
2,2-Dichloropropane	23.11	1.0	20	0	116	70 - 130	24.13	4.33	20	
2-Butanone	34.47	2.0	40	0	86.2	70 - 130	36.01	4.36	20	
2-Chlorotoluene	21.04	1.0	20	0	105	70 - 130	20.76	1.33	20	
2-Hexanone	35.39	2.0	40	0	88.5	70 - 130	35.65	0.739	20	
4-Chlorotoluene	21.03	1.0	20	0	105	70 - 130	21.04	0.0438	20	
4-Isopropyltoluene	18.45	1.0	20	0	92.3	70 - 130	18.65	1.06	20	
4-Methyl-2-pentanone	36.16	2.0	40	0	90.4	70 - 130	35.73	1.22	20	
Acetone	30.54	2.0	40	0	76.3	70 - 130	33.5	9.26	20	
Benzene	20.35	1.0	20	0	102	70 - 127	20.4	0.246	20	
Bromobenzene	19.19	1.0	20	0	96.0	70 - 115	19.03	0.872	20	
Bromochloromethane	20.28	1.0	20	0	101	70 - 127	20.07	1.03	20	
Bromodichloromethane	20.64	1.0	20	0	103	70 - 124	20.4	1.2	20	
Bromoform	18.83	1.0	20	0	94.1	70 - 129	18.89	0.357	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100548-11MSD** Units: **ug/L** Analysis Date: **18-Oct-2018 16:54**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779652** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	22.95	1.0	20	0	115	70 - 130	24.14	5.05	20	
Carbon disulfide	39.61	2.0	40	0	99.0	70 - 130	40.53	2.28	20	
Carbon tetrachloride	20.83	1.0	20	0	104	70 - 130	21.38	2.61	20	
Chlorobenzene	21.12	1.0	20	0	106	70 - 114	20.81	1.47	20	
Chloroethane	18.88	1.0	20	0	94.4	70 - 130	20.23	6.88	20	
Chloroform	19.61	1.0	20	0	98.0	70 - 125	19.57	0.197	20	
Chloromethane	16.16	1.0	20	0	80.8	70 - 130	17.45	7.66	20	
cis-1,2-Dichloroethene	20.13	1.0	20	0	101	70 - 128	20.83	3.39	20	
cis-1,3-Dichloropropene	21.94	1.0	20	0	110	70 - 125	22.19	1.12	20	
Dibromochloromethane	19.44	1.0	20	0	97.2	70 - 124	19.34	0.484	20	
Dibromomethane	20.65	1.0	20	0	103	70 - 124	19.74	4.48	20	
Dichlorodifluoromethane	14.38	1.0	20	0	71.9	70 - 130	15.84	9.68	20	
Ethylbenzene	22.5	1.0	20	0	113	70 - 124	22.34	0.717	20	
Hexachlorobutadiene	19.41	1.0	20	0	97.0	70 - 130	19.43	0.114	20	
Isopropylbenzene	20.13	1.0	20	0	101	70 - 130	20.2	0.341	20	
m,p-Xylene	46.12	2.0	40	0	115	70 - 130	45.94	0.383	20	
Methylene chloride	20.76	2.0	20	0	104	70 - 128	19.93	4.07	20	
Naphthalene	15.84	1.0	20	0	79.2	70 - 130	15.61	1.43	20	
n-Butylbenzene	20.53	1.0	20	0	103	70 - 130	20.82	1.37	20	
n-Propylbenzene	21.64	1.0	20	0	108	70 - 130	21.93	1.32	20	
o-Xylene	22.18	1.0	20	0	111	70 - 124	22.17	0.0606	20	
sec-Butylbenzene	18.67	1.0	20	0	93.3	70 - 130	18.87	1.11	20	
Styrene	20.71	1.0	20	0	104	70 - 130	20.53	0.897	20	
tert-Butylbenzene	20.77	1.0	20	0	104	70 - 130	20.84	0.363	20	
Tetrachloroethene	20.55	1.0	20	0	103	70 - 130	20.61	0.29	20	
Toluene	20.33	1.0	20	0	102	70 - 123	20.26	0.353	20	
trans-1,2-Dichloroethene	21.28	1.0	20	0	106	70 - 130	21.62	1.59	20	
trans-1,3-Dichloropropene	21.79	1.0	20	0	109	70 - 121	22.47	3.08	20	
Trichloroethene	20.97	1.0	20	0	105	70 - 129	21.67	3.27	20	
Trichlorofluoromethane	20.34	1.0	20	0	102	70 - 130	21.58	5.94	20	
Vinyl chloride	19.17	1.0	20	0	95.9	70 - 130	20.35	5.96	20	
Surr: 1,2-Dichloroethane-d4	*45.87*	*1.0*	*50*	*0*	*91.7*	*70 - 126*	*46.9*	*2.21*	*20*	
Surr: 4-Bromofluorobenzene	*50.49*	*1.0*	*50*	*0*	*101*	*81 - 113*	*50.07*	*0.838*	*20*	
Surr: Dibromofluoromethane	*47.6*	*1.0*	*50*	*0*	*95.2*	*77 - 123*	*47.92*	*0.666*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100548-11MSD** Units: **ug/L** Analysis Date: **18-Oct-2018 16:54**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779652** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.91*	*1.0*	*50*	*0*	*89.8*	*82 - 127*	*44.76*	*0.336*	*20*	

The following samples were analyzed in this batch: HS18100492-03 HS18100492-04 HS18100492-06 HS18100492-07 HS18100492-09 HS18100492-10

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325252 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-101018** Units: **mg/L** Analysis Date: **10-Oct-2018 21:18**
Client ID: Run ID: **ICS2100_325252** SeqNo: **4768832** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Chloride	0.500	0.500								U
Fluoride	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-101018** Units: **mg/L** Analysis Date: **10-Oct-2018 21:33**
Client ID: Run ID: **ICS2100_325252** SeqNo: **4768833** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.725	0.100	4	0	93.1	80 - 120				
Chloride	20.31	0.500	20	0	102	80 - 120				
Fluoride	4.275	0.100	4	0	107	80 - 120				
Nitrogen, Nitrate (As N)	3.98	0.100	4	0	99.5	80 - 120				
Nitrogen, Nitrite (As N)	4.243	0.100	4	0	106	80 - 120				
Sulfate	20.22	0.500	20	0	101	80 - 120				

LCSD Sample ID: **WLCSDW1-101018** Units: **mg/L** Analysis Date: **10-Oct-2018 21:47**
Client ID: Run ID: **ICS2100_325252** SeqNo: **4768834** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.677	0.100	4	0	91.9	80 - 120	3.725	1.3	20	
Chloride	20.01	0.500	20	0	100	80 - 120	20.31	1.49	20	
Fluoride	4.223	0.100	4	0	106	80 - 120	4.275	1.22	20	
Nitrogen, Nitrate (As N)	3.915	0.100	4	0	97.9	80 - 120	3.98	1.65	20	
Nitrogen, Nitrite (As N)	4.181	0.100	4	0	105	80 - 120	4.243	1.47	20	
Sulfate	20.01	0.500	20	0	100	80 - 120	20.22	1.02	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325252 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MS Sample ID: **HS18100492-08MS** Units: **mg/L** Analysis Date: **11-Oct-2018 04:49**
Client ID: **16WW24-181009** Run ID: **ICS2100_325252** SeqNo: **4768840** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.24	0.100	2	1.257	99.2	80 - 120				
Chloride	290.3	0.500	10	273.9	164	80 - 120				SEO
Fluoride	2.345	0.100	2	0.319	101	80 - 120				
Nitrogen, Nitrite (As N)	2.22	0.100	2	0	111	80 - 120				
Sulfate	885.2	0.500	10	852.3	330	80 - 120				SEO

MS Sample ID: **HS18100492-08MS** Units: **mg/L** Analysis Date: **11-Oct-2018 06:02**
Client ID: **16WW24-181009** Run ID: **ICS2100_325252** SeqNo: **4768845** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	19.39	1.00	20	1.766	88.1	80 - 120				
Chloride	380.1	5.00	100	286.7	93.5	80 - 120				
Fluoride	21.6	1.00	20	0	108	80 - 120				
Nitrogen, Nitrate (As N)	23.12	1.00	20	0	116	80 - 120				
Nitrogen, Nitrite (As N)	21.15	1.00	20	0	106	80 - 120				
Sulfate	965.3	5.00	100	904.7	60.6	80 - 120				SO

MS Sample ID: **HS18100492-08MS** Units: **mg/L** Analysis Date: **11-Oct-2018 14:23**
Client ID: **16WW24-181009** Run ID: **ICS2100_325252** SeqNo: **4768869** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	35.51	2.00	40	2.318	83.0	80 - 120				
Chloride	455.1	10.0	200	271.7	91.7	80 - 120				
Fluoride	40.46	2.00	40	1.826	96.6	80 - 120				
Nitrogen, Nitrate (As N)	42.02	2.00	40	0	105	80 - 120				
Nitrogen, Nitrite (As N)	40.58	2.00	40	0	101	80 - 120				
Sulfate	992.9	10.0	200	853.2	69.9	80 - 120				SO

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325252 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MS Sample ID: **HS18100492-08MS** Units: **mg/L** Analysis Date: **11-Oct-2018 12:28**
Client ID: **16WW24-181009** Run ID: **ICS2100_325252** SeqNo: **4768864** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.22	0.100	2	1.315	95.2	80 - 120				
Chloride	292.7	0.500	10	280.7	120	80 - 120				EO
Fluoride	2.368	0.100	2	0.326	102	80 - 120				
Nitrogen, Nitrite (As N)	2.198	0.100	2	0	110	80 - 120				
Sulfate	888.8	0.500	10	870.9	179	80 - 120				SEO

MSD Sample ID: **HS18100492-08MSD** Units: **mg/L** Analysis Date: **11-Oct-2018 06:16**
Client ID: **16WW24-181009** Run ID: **ICS2100_325252** SeqNo: **4768846** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	19.26	1.00	20	1.766	87.5	80 - 120	19.39	0.704	20	
Chloride	376.5	5.00	100	286.7	89.9	80 - 120	380.1	0.953	20	
Fluoride	21.03	1.00	20	0	105	80 - 120	21.6	2.72	20	
Nitrogen, Nitrate (As N)	23.01	1.00	20	0	115	80 - 120	23.12	0.451	20	
Nitrogen, Nitrite (As N)	21.02	1.00	20	0	105	80 - 120	21.15	0.626	20	
Sulfate	957.5	5.00	100	904.7	52.8	80 - 120	965.3	0.811	20	SO

MSD Sample ID: **HS18100492-08MSD** Units: **mg/L** Analysis Date: **11-Oct-2018 12:47**
Client ID: **16WW24-181009** Run ID: **ICS2100_325252** SeqNo: **4768865** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.14	0.100	2	1.315	91.2	80 - 120	3.22	2.52	20	
Chloride	283	0.500	10	280.7	22.8	80 - 120	292.7	3.37	20	SEO
Fluoride	2.23	0.100	2	0.326	95.2	80 - 120	2.368	6	20	
Nitrogen, Nitrite (As N)	2.105	0.100	2	0	105	80 - 120	2.198	4.32	20	
Sulfate	865.7	0.500	10	870.9	-51.5	80 - 120	888.8	2.62	20	SEO

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325252 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS18100492-08MSD** Units: **mg/L** Analysis Date: **11-Oct-2018 14:38**
Client ID: **16WW24-181009** Run ID: **ICS2100_325252** SeqNo: **4768870** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	37.04	2.00	40	2.318	86.8	80 - 120	35.51	4.23	20	
Chloride	473.2	10.0	200	271.7	101	80 - 120	455.1	3.91	20	
Fluoride	42.38	2.00	40	1.826	101	80 - 120	40.46	4.64	20	
Nitrogen, Nitrate (As N)	43.92	2.00	40	0	110	80 - 120	42.02	4.42	20	
Nitrogen, Nitrite (As N)	42.26	2.00	40	0	106	80 - 120	40.58	4.06	20	
Sulfate	1032	10.0	200	853.2	89.4	80 - 120	992.9	3.86	20	O

MSD Sample ID: **HS18100492-08MSD** Units: **mg/L** Analysis Date: **11-Oct-2018 05:03**
Client ID: **16WW24-181009** Run ID: **ICS2100_325252** SeqNo: **4768841** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.109	0.100	2	1.257	92.6	80 - 120	3.22	3.51	20	
Chloride	277.8	0.500	10	273.9	39.5	80 - 120	292.7	5.21	20	SEO
Fluoride	2.258	0.100	2	0.319	97.0	80 - 120	2.368	4.76	20	
Nitrogen, Nitrite (As N)	2.142	0.100	2	0	107	80 - 120	2.198	2.58	20	
Sulfate	848.5	0.500	10	852.3	-37.9	80 - 120	888.8	4.64	20	SEO

The following samples were analyzed in this batch:

HS18100492-02	HS18100492-03	HS18100492-04	HS18100492-05
HS18100492-06	HS18100492-07	HS18100492-08	HS18100492-09
HS18100492-10			

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100492

QC BATCH REPORT

Batch ID: R325372 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-181012** Units: **mg/L** Analysis Date: **12-Oct-2018 20:03**
Client ID: Run ID: **ManTech01_325372** SeqNo: **4771186** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCSw1-181012** Units: **mg/L** Analysis Date: **12-Oct-2018 20:12**
Client ID: Run ID: **ManTech01_325372** SeqNo: **4771187** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1077	5.00	1000	0	108	85 - 115				

LCSD Sample ID: **WLCSDw1-181012** Units: **mg/L** Analysis Date: **12-Oct-2018 20:22**
Client ID: Run ID: **ManTech01_325372** SeqNo: **4771188** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1079	5.00	1000	0	108	85 - 115	1077	0.153	20	

DUP Sample ID: **HS18100492-08DUP** Units: **mg/L** Analysis Date: **12-Oct-2018 22:55**
Client ID: **16WW24-181009** Run ID: **ManTech01_325372** SeqNo: **4771211** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00					0	0	20	U

The following samples were analyzed in this batch:

HS18100492-02	HS18100492-03	HS18100492-04	HS18100492-05
HS18100492-06	HS18100492-07	HS18100492-08	HS18100492-09
HS18100492-10			

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS18100492**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

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Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18100492

Date/Time Received: **10-Oct-2018 09:15**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 10-Oct-2018 Date

Reviewed by: *RJ Modashia* eSignature 11-Oct-2018 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.1c/1.8c, 2.7c/1.4c UC/C	IR25	
Cooler(s)/Kit(s):	Blue		
Date/Time sample(s) sent to storage:	10/10/2018 15:10		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Sx collection times differ 16WW43: COC=0949, Sx=0950, 16WW26: COC=1118, Sx=1120, 16WW25: COC=1312, Sx=1315, 16WW36: COC=1453, Sx=1455. Sx 16WW43 ID differs on Perchlorate bottle: bottle label = 16WW44. Id'd by collection date/time, logged in as 16WW43.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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APTIM

COC ID: LHAAP16-OCT2018-GW-ALSHT-181009 TURNAROUND TIME: normal RUSH: Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-50			Email	RJ.Modashia@alsglobal.com			Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stanciff Rd., Suite 210			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FED EX		

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	VOCs in Water by 8260B	Perchlorate in Water by 6850	Anions in Water by E300.0 & Alkalinity in Water by E2320b	Bromide by E300.0	Dissolved Gases in Water by RSK175	TOC in Water by SW9060
16TB01-181009	FIELD QC				LIQ	10/9/2018	830	2		2					
16WW43-181009	16WW43	10.38	11.37	FT	GW	10/9/2018	949	11		3	1	1	1	3	2
16WW26-181009	16WW26	18.39	19.39	FT	GW	10/9/2018	1118	11		3	1	1	1	3	2
16WW41-181009	16WW41	27.73	28.24	FT	GW	10/9/2018	1125	11		3	1	1	1	3	2
16WW25-181009	16WW25	19.28	19.67	FT	GW	10/9/2018	1312	11		3	1	1	1	3	2
16EW02-181009	16EW02	24.4	24.59	FT	GW	10/9/2018	1340	11		3	1	1	1	3	2
16WW36-181009	16WW36	18.88	19.41	FT	GW	10/9/2018	1453	11		3	1	1	1	3	2
16WW24-181009	16WW24	10.17	11.1	FT	GW	10/9/2018	1445	11		3	1	1	1	3	2
16WW24-181009-FD	16WW24	10.17	11.1	FT	GW	10/9/2018	1445	11		3	1	1	1	3	2
16WW24-181009-MS	16WW24	10.17	11.1	FT	GW	10/9/2018	1445	11		3	1	1	1	3	2
16WW24-181009-MSD	16WW24	10.17	11.1	FT	GW	10/9/2018	1445	11		3	1	1	1	3	2
16EW06-181009	16EW06	24.15	24.33	FT	GW	10/9/2018	1455	11		3	1	1	1	3	2

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant

HS18100492

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	APTIM	10/8/ 1800	J. Munson / ALS	10/12/18 09:15

Cooler - Blue
Temp 2.1
IR25 CF-0.3

Cooler - Blue-Green
Temp 2.7
IR25 CF-0.3

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APTIM

COC ID: LHAAP16-OCT2018-GW-ALSHT-181009 **TURNAROUND TIME:** normal **RUSH:** Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-50			Email	RJ.Modashia@alsglobal.com			Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FED EX		

SAMPLE DETAILS

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.
16TB01-181009	FIELD QC				LIQ	10/9/2018	830	2
16WW43-181009	16WW43	10.38	11.37	FT	GW	10/9/2018	949	11
16WW26-181009	16WW26	18.39	19.39	FT	GW	10/9/2018	1118	11
16WW41-181009	16WW41	27.73	28.24	FT	GW	10/9/2018	1125	11
16WW25-181009	16WW25	19.28	19.67	FT	GW	10/9/2018	1312	11
16EW02-181009	16EW02	24.4	24.59	FT	GW	10/9/2018	1340	11
16WW36-181009	16WW36	18.88	19.41	FT	GW	10/9/2018	1453	11
16WW24-181009	16WW24	10.17	11.1	FT	GW	10/9/2018	1445	11
16WW24-181009-FD	16WW24	10.17	11.1	FT	GW	10/9/2018	1445	11
16WW24-181009-MS	16WW24	10.17	11.1	FT	GW	10/9/2018	1445	11
16WW24-181009-MSD	16WW24	10.17	11.1	FT	GW	10/9/2018	1445	11
16EW06-181009	16EW06	24.15	24.33	FT	GW	10/9/2018	1455	11

ANALYSIS REQUESTED

ANALYSIS	VOCs in Water by 8260B	Perchlorate in Water by 6850	Anions in Water by E300.0 & Alkalinity in Water by E2320b	Bromide by E300.0	Dissolved Gases in Water by RSK175	TOC in Water by SW9060				
	2									
	3	1	1	1	3	2				
	3	1	1	1	3	2				
	3	1	1	1	3	2				
	3	1	1	1	3	2				
	3	1	1	1	3	2				
	3	1	1	1	3	2				
	3	1	1	1	3	2				
	3	1	1	1	3	2				
	3	1	1	1	3	2				
	3	1	1	1	3	2				
	3	1	1	1	3	2				

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
APTIM	10/9/ 1800	J. McHenry / ALS	10/10/18 09:15

Cooler - Blue 1125
Temp 2.7 CF-0.3

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ALS
10450 Stanclift Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 10-09-18 Time: 185
Name:
Company:

Seal Broken By:
Date: 10/10/18

CUSTODY SEAL
DATE: 10-09-18
Signature:
LHAAP

OCT 10 2018

CUSTODY SEAL
DATE: 10-09-18 10/10/18
Signature:
LHAAP

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-18-BO 61499-RI

RMA:

FedEx Express

FedEx
TRK# 0221 4380 9533 1[illegible]55

WED - 10 OCT 10:30A
PRIORITY OVERNIGHT

AB SG[illegible]

77099
TX-US IAH

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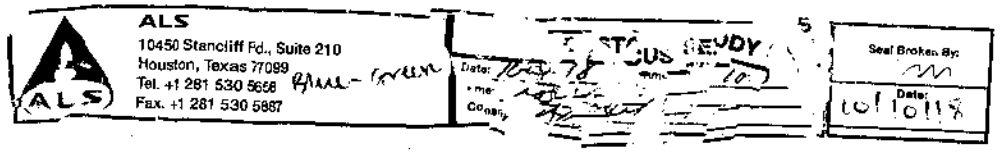

Blue - Green OCT 1 0 2018

CUSTODY SEAL
DATE: 10-09-18
Signature:
LHAAP

Blue Green
CUSTODY SEAL
DATE: 10-09-18
Signature:
LHAAP

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-16-BO 61490-RJ
RMA:
Blue - Green
FedEx Express
FedEx
TRK# (0221) 4380 9533 8377
WED - 10 OCT 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US IAH

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1828235; 1828552

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2155 (225024)

General Set Information: There were ten field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: NA

Method QC data: The method blank (LMB 623352) was less than 1/2 the CRDL. The recovery for the LCS (623353) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1828552008/09 (Client ID: 16WW24-181009). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1. Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual integrations were performed for datafiles 17OCTP09-12/19.

Thomas Bosch October 22, 2018
Analyst Date

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ANALYTICAL REPORT

Report Date: October 22, 2018

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1828552**
Project ID: HS18100492 100918
Purchase Order: HS18100492
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16WW43-181009	1828552001	10/09/18	10/11/18	
16WW26-181009	1828552002	10/09/18	10/11/18	
16WW41-181009	1828552003	10/09/18	10/11/18	
16WW25-181009	1828552004	10/09/18	10/11/18	
16WW02-181009	1828552005	10/09/18	10/11/18	
16WW36-181009	1828552006	10/09/18	10/11/18	
16WW24-181009	1828552007	10/09/18	10/11/18	
16WW24-181009-FD	1828552010	10/09/18	10/11/18	
16WW06-181009	1828552011	10/09/18	10/11/18	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
16WW24-181009MS	1828552008	10/09/18	10/11/18	
16WW24-181009MSD	1828552009	10/09/18	10/11/18	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1828552
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW43-181009** | Sampling Site: NA | Collected: 10/09/2018
Lab ID: 1828552001 | Media: 125 mL Nalgene | Received: 10/11/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2155 (HBN: 225024) | **Percent Solid:** NA
Analyzed: 10/17/2018 10:05 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW26-181009** | Sampling Site: NA | Collected: 10/09/2018
Lab ID: 1828552002 | Media: 125 mL Nalgene | Received: 10/11/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2155 (HBN: 225024) | **Percent Solid:** NA
Analyzed: 10/17/2018 10:19 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW41-181009** | Sampling Site: NA | Collected: 10/09/2018
Lab ID: 1828552003 | Media: 125 mL Nalgene | Received: 10/11/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2155 (HBN: 225024) | **Percent Solid:** NA
Analyzed: 10/17/2018 10:34 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**60**	1.0	2.0	4.0	1	

Sample ID: **16WW25-181009** | Sampling Site: NA | Collected: 10/09/2018
Lab ID: 1828552004 | Media: 125 mL Nalgene | Received: 10/11/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2155 (HBN: 225024) | **Percent Solid:** NA
Analyzed: 10/17/2018 10:48 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1828552
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW02-181009** | Sampling Site: NA | Collected: 10/09/2018
Lab ID: 1828552005 | Media: 125 mL Nalgene | Received: 10/11/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2155 (HBN: 225024) | **Percent Solid:** NA
Analyzed: 10/17/2018 11:02 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW36-181009** | Sampling Site: NA | Collected: 10/09/2018
Lab ID: 1828552006 | Media: 125 mL Nalgene | Received: 10/11/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2155 (HBN: 225024) | **Percent Solid:** NA
Analyzed: 10/17/2018 11:16 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW24-181009** | Sampling Site: NA | Collected: 10/09/2018
Lab ID: 1828552007 | Media: 125 mL Nalgene | Received: 10/11/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2155 (HBN: 225024) | **Percent Solid:** NA
Analyzed: 10/17/2018 11:30 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW24-181009-FD** | Sampling Site: NA | Collected: 10/09/2018
Lab ID: 1828552010 | Media: 125 mL Nalgene | Received: 10/11/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2155 (HBN: 225024) | **Percent Solid:** NA
Analyzed: 10/17/2018 12:13 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1828552
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID:	**16WW06-181009**	Sampling Site:	NA	Collected:	10/09/2018
Lab ID:	1828552011	Media:	125 mL Nalgene	Received:	10/11/2018
Matrix:	Water	Sampling Parameter:	NA		

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2155 (HBN: 225024)	**Percent Solid:** NA
	Analyzed: 10/17/2018 13:01	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/19/2018 15:23	/S/ Stephen Brose 10/22/2018 13:43

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1828552
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body	Certificate Number	Website
Environmental	PJLA (DoD ELAP)		
	Utah (TNI)		
	Nevada		
	Oklahoma		
	Iowa		

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1828552

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2155 (HBN: 225024)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 623352
Analyzed: 10/17/2018 09:21
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 623353
Analyzed: 10/17/2018 09:35
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.74	5.00	94.9	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1828552007	**MS:** 1828552008	**MSD:** 1828552009
Analyzed: 10/17/2018 11:30	**Analyzed:** 10/17/2018 11:44	**Analyzed:** 10/17/2018 11:58
Dilution: 1	**Dilution:** 1	**Dilution:** 1
Units: ug/L	**Units:** ug/L	**Units:** ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.94	5	78.9	78.8	123.8	4.09	81.9	3.7	0.0	20.0

Continuing Calibration Verification

CCV: 623349	**CCV:** 623354	**CCV:** 623466
Analyzed: 10/17/2018 08:37	**Analyzed:** 10/17/2018 12:30	**Analyzed:** 10/17/2018 14:12
Units: ug/L	**Units:** ug/L	**Units:** ug/L
Criteria: ± 15%	**Criteria:** ± 15%	**Criteria:** ± 15%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	24.6	25.0	98.4	23.9	25.0	95.5	24.5	25.0	98.0

Interference Check Sample

ICSA: 623351
Analyzed: 10/17/2018 09:07
Units: ug/L
Criteria: ± 30%

Analyte	Result	Target	% Rec.
Perchlorate	1.05	1.00	105

Limit of Detection Verification

LODV: 623350	**LODV:** 623355	**LODV:** 623467
Analyzed: 10/17/2018 08:53	**Analyzed:** 10/17/2018 12:44	**Analyzed:** 10/17/2018 14:26
Units: ug/L	**Units:** ug/L	**Units:** ug/L
Criteria: ± 50%	**Criteria:** ± 50%	**Criteria:** ± 50%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	0.968	1.00	96.8	0.984	1.00	98.4	1.02	1.00	102

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Quality Control Sample
Batch Report

Analysis Information

Workorder: **1828552**

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2155 (HBN: 225024)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
10/19/2018 15:23	10/22/2018 13:43

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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18698/#2

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

1828552

tract Chain of Custody

COC ID: 9987

1828552

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18100492
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18100492-02**	**16WW43-181009**	**Water**	**09 Oct 2018 09:49**
	SUB_Perch-6850			18 Oct 2018
2.	**HS18100492-03**	**16WW26-181009**	**Water**	**09 Oct 2018 11:18**
	SUB_Perch-6850			18 Oct 2018
3.	**HS18100492-04**	**16WW41-181009**	**Water**	**09 Oct 2018 11:25**
	SUB_Perch-6850			18 Oct 2018
4.	**HS18100492-05**	**16WW25-181009**	**Water**	**09 Oct 2018 13:12**
	SUB_Perch-6850			18 Oct 2018
5.	**HS18100492-06**	**16WW02-181009**	**Water**	**09 Oct 2018 13:40**
	SUB_Perch-6850			18 Oct 2018
6.	**HS18100492-07**	**16WW36-181009**	**Water**	**09 Oct 2018 14:53**
	SUB_Perch-6850			18 Oct 2018
7.	**HS18100492-08**	**16WW24-181009**	**Water**	**09 Oct 2018 14:45** MS/MSD
	SUB_Perch-6850			18 Oct 2018
8.	**HS18100492-09**	**16WW24-181009-FD**	**Water**	**09 Oct 2018 14:45**
	SUB_Perch-6850			18 Oct 2018
9.	**HS18100492-10**	**16WW06-181009**	**Water**	**09 Oct 2018 14:55**

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Subcontract Chain of Custody

COC ID: 9987

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
SUB_Perch-6850			18 Oct 2018

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

HS18100492-08 MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. [illegible] Date/Time: 10/10/18 18:00

Received By: [signature] Date/Time: 10/11/18 9:50

Cooler ID(s): Temperature(s):

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18100492	Split:	Workorder ID: 1828552	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	10/09/2018 09:49	16WW43-181009	1828552001		Water	A	1	A
2	10/09/2018 11:18	16WW26-181009	1828552002		Water	A	1	A
3	10/09/2018 11:25	16WW41-181009	1828552003		Water	A	1	A
4	10/09/2018 13:12	16WW25-181009	1828552004		Water	A	1	A
5	10/09/2018 13:40	16WW02-181009	1828552005		Water	A	1	A
6	10/09/2018 14:53	16WW36-181009	1828552006		Water	A	1	A
7	10/09/2018 14:45	16WW24-181009	1828552007		Water	A	1	A
8	10/09/2018 14:45	16WW24-181009MS	1828552008	MS	Water	A	1	A
9	10/09/2018 14:45	16WW24-181009MSD	1828552009	MSD	Water	A	1	A
10	10/09/2018 14:45	16WW24-181009-FD	1828552010	FLDDUP	Water	A	1	A

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Vafath, Julie	10/11/2018 09:50	ALS Sample Receiving	Sample Login
[signature]	10/12/18 1140	14B	Storage
R-33.1	10-10-18/11:07	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18100492	***Split:***	**Workorder ID:** 1828552	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM	COOL
11	10/09/2018 14:55	16WW06-181009	1828552011		Water	A	1	A	
12									
13									
14									
15									
16									
17									
18									
19									
20									

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	10/11/2018 09:50	ALS Sample Receiving	Sample Login
Julie Warath	10/12/18 1140	14B	storage
R-33.1	10-16-18/11:07	T. Bosch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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ALS-Salt Lake City-Related Information Report (CRIR) 1828552

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: HS18100492 / 9987

Date/Time of Receipt: 10/11/2018 9:50

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C18 8817	2 °C	4	C18	°C	7	C18	°C
2	C18	°C	5	C18	°C	8	C18	°C
3	C18	°C	6	C18	°C	9	C18	°C

Taken By: DeSinee Hill (Signature) DeSinee Hill (Printed Name) 10/11/2018 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

For sample HS18100492-8 has 3 containers to include MS/MSD.

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018

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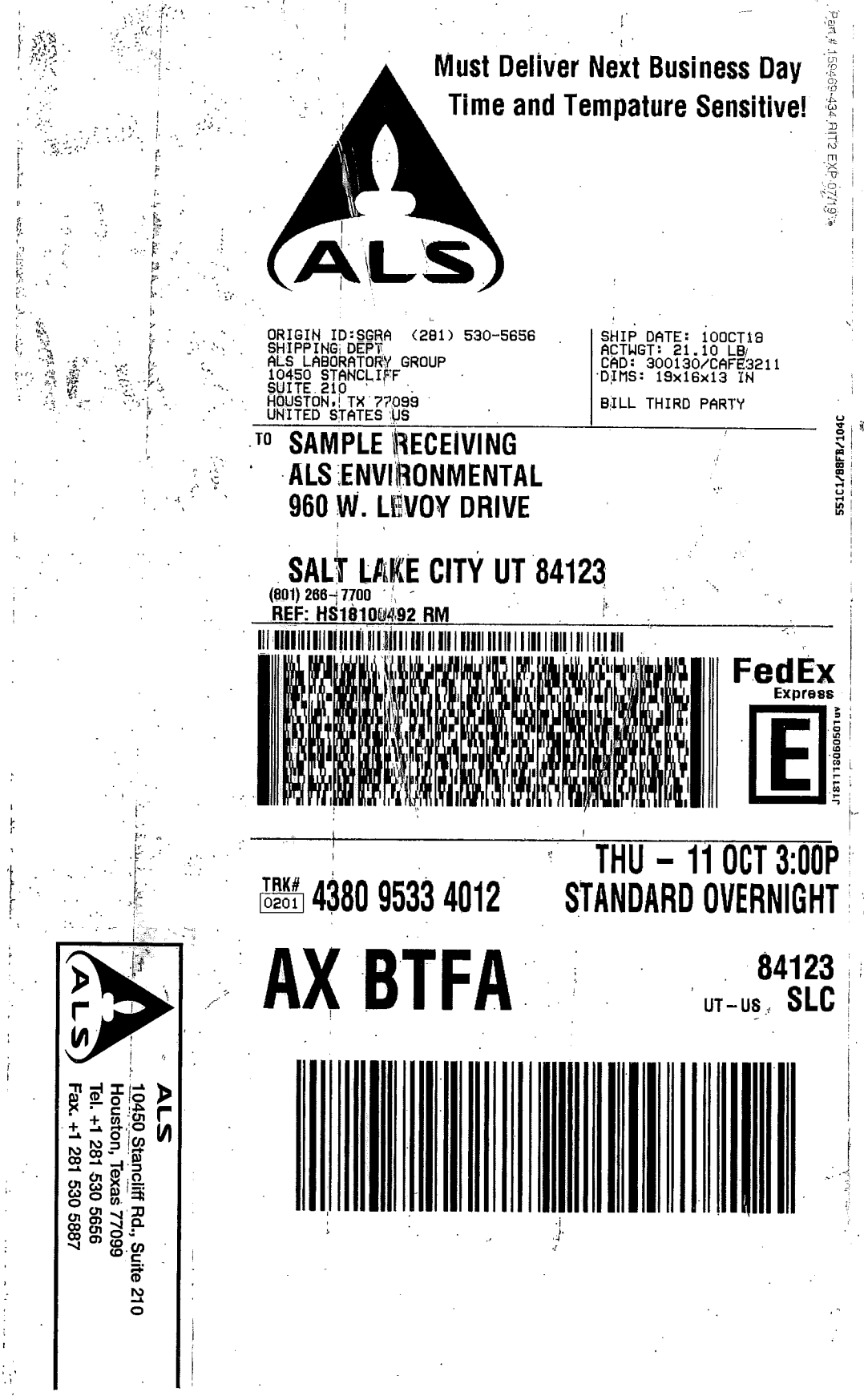

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 158469-434 RIT2 EXP 07/19

ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 10OCT18
ACTWGT: 21.10 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS18100492 RM

5S1C1/88FB/104C

FedEx Express

THU - 11 OCT 3:00P
STANDARD OVERNIGHT

TRK# 0201 4380 9533 4012

AX BTFA

84123
UT-US SLC

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

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Batch Worklist

Batch: ELMS/ 2155 **Created:** 10/17/2018 07:46 **Instrument:** **HBN:** 225024

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1828235 [ENV_LVL4]

Workorder: 1828552 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	623349	CCV for HBN 225024 [ELMS/2155]				CCV	3		E685041C3Q	5311		10/22/2018	
2	623350	LODV for HBN 225024 [ELMS/2155				LODV	3		E6850..D3Q	5311		10/22/2018	
3	623351	ICS for HBN 225024 [ELMS/2155]				ICS	3		E6850..D3Q	5311		10/22/2018	
4	623352	LMB for HBN 225024 [ELMS/2155]				LMB	3		E6850Q413Q	5311		10/22/2018	
5	623353	LCS for HBN 225024 [ELMS/2155]				LCS	3		E6850Q413Q	5311		10/22/2018	
6	1828235001	LH18/24-SP650_100418_BIX				SAMPLE	3	1828235001-A	E6850Q41.3	5480	11/1/2018	10/22/2018	
7	1828552001	16WW43-181009				SAMPLE	3	1828552001-A	E6850Q41.3	5480	11/6/2018	10/24/2018	
8	1828552002	16WW26-181009				SAMPLE	3	1828552002-A	E6850Q41.3	5480	11/6/2018	10/24/2018	
9	1828552003	16WW41-181009				SAMPLE	3	1828552003-A	E6850Q41.3	5480	11/6/2018	10/24/2018	
10	1828552004	16WW25-181009				SAMPLE	3	1828552004-A	E6850Q41.3	5480	11/6/2018	10/24/2018	
11	1828552005	16WW02-181009				SAMPLE	3	1828552005-A	E6850Q41.3	5480	11/6/2018	10/24/2018	
12	1828552006	16WW36-181009				SAMPLE	3	1828552006-A	E6850Q41.3	5480	11/6/2018	10/24/2018	
13	1828552007	16WW24-181009				SAMPLE	3	1828552007-A	E6850Q41.3	5480	11/6/2018	10/24/2018	
14	1828552008	16WW24-181009MS				MS	3	1828552008-A	E6850Q413Q	5480		10/22/2018	
15	1828552009	16WW24-181009MSD				MSD	3	1828552009-A	E6850Q413Q	5480		10/22/2018	
16	1828552010	16WW24-181009-FD				FLDDUP	3	1828552010-A	E6850Q41.3	5480	11/6/2018	10/24/2018	
17	1828552011	16WW06-181009				SAMPLE	3	1828552011-A	E6850Q41.3	5480	11/6/2018	10/24/2018	
18	623354	CCV for HBN 225024 [ELMS/2155]				CCV	3		E685041C3Q	5311		10/22/2018	
19	623355	LODV for HBN 225024 [ELMS/2155				LODV	3		E6850..D3Q	5311		10/22/2018	
20	623466	CCV for HBN 225024 [ELMS/2155]				CCV	3		E685041C3Q	5311		10/22/2018	
21	623467	LODV for HBN 225024 [ELMS/2155				LODV	3		E6850..D3Q	5311		10/22/2018	

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1828235 (001); 1828552 (001-15)
ELMS Batch/HBN ID: 2155 (225024)
Prep Date: 10/15/2018 Analysis Date: 10/17/2018 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\OCT\17OCT18D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 10/08/2018, sequence 08OCT18D.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 2 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.80
5.0	0.80
5.3	0.25
10.0	0.25
10.5	0.80
12.5	0.80

QC DATA: 5.0µL of QC Solution Horizon ID 41830 was used for LCS 623353; Target = 5.0µg/L. ASTM type II water was used for LMB 623352.

MS/MSD: MS/MSD was performed on samples 1828552008/09 (Client ID: 16WW24-181009). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Samples 1828552005/06/11 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2018\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\225024-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual integrations were performed for datafiles 17OCTP09-12/19.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria **Batch(es)/SDG:** ELMS: 2155 (HBN: 225024) **Sample Set IDs if Applicable:** 1828235 / 1828552	**Analyst Initials**	**Reviewer Initials**
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

T.B, 10.22.18
SB 10/22/18

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Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L
Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description** - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — **Description - Perchlorate ISTD Wrk 1,000ug/L**

Standard:	**43730**	**Created By:**	Thomas Bosch	**Amount:**	25 mL
MFG:	ALS/SLC	**Create Date:**	09/20/2018 09:09AM	**Expires:**	09/20/2019
MFG Lot:	TNB: 05/09/2018	**Verified By:**	Thomas Bosch	**Usable:**	Yes
Pipette ID:	Not Provided	**Verify Date:**		**Lab Lot:**	CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 09/20/2018 09:09AM	**Expires:** 04/28/2026
MFG Lot: SDFF-012A	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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www.alsglobal.com

October 22, 2018

Analytical Report for Service Request No: K1809960

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

RE: HS18100492

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 11, 2018
For your reference, these analyses have been assigned our service request number **K1809960.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

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Acronyms

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

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Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

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Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS18100492
Sample Matrix: Water

Service Request: K1809960
Date Received: 10/11/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

Nine water samples were received for analysis at ALS Environmental on 10/11/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Bovejoy Page 95 of 106 Date 10/22/2018

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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www.alsglobal.com

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

Subcontract Chain of Custody

COC ID: 9988

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18100492
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18100492-02**	**16WW43-181009**	**Water**	**09 Oct 2018 09:49**
	TOC Analysis with DOD Level IV			18 Oct 2018
2.	**HS18100492-03**	**16WW26-181009**	**Water**	**09 Oct 2018 11:18**
	TOC Analysis with DOD Level IV			18 Oct 2018
3.	**HS18100492-04**	**16WW41-181009**	**Water**	**09 Oct 2018 11:25**
	TOC Analysis with DOD Level IV			18 Oct 2018
4.	**HS18100492-05**	**16WW25-181009**	**Water**	**09 Oct 2018 13:12**
	TOC Analysis with DOD Level IV			18 Oct 2018
5.	**HS18100492-06**	**16WW02-181009**	**Water**	**09 Oct 2018 13:40**
	TOC Analysis with DOD Level IV			18 Oct 2018
6.	**HS18100492-07**	**16WW36-181009**	**Water**	**09 Oct 2018 14:53**
	TOC Analysis with DOD Level IV			18 Oct 2018
7.	**HS18100492-08**	**16WW24-181009**	**Water**	**09 Oct 2018 14:45**
	TOC Analysis with DOD Level IV			18 Oct 2018
8.	**HS18100492-09**	**16WW24-181009-FD**	**Water**	**09 Oct 2018 14:45**
	TOC Analysis with DOD Level IV			18 Oct 2018
9.	**HS18100492-10**	**16WW06-181009**	**Water**	**09 Oct 2018 14:55**

Subcontract Chain of Custody

COC ID: 9988

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
TOC Analysis with DOD Level IV			18 Oct 2018

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

HS18100492-08 MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Munson Date/Time: 10/10/18 18:00

Received By: R Morrow ALS Kelso Date/Time: 10/11/18 0920

Cooler ID(s): Temperature(s):

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PC KL

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request *K18* 99960

Received: 10/11/18 Opened: 10/11/18 By: [signature] Unloaded: 10/11/18 By: [signature]

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.8	0.6	N/A 1.9	N/A 2.1	+0.2	308	9988	Accidentally Discarded.	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: RUSH

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General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1809960
Project:	HS18100492	**Date Collected:**	10/9/18
Sample Matrix:	Water	**Date Received:**	10/11/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW43-181009	K1809960-001	**9.46**	0.50	0.20	0.07	1	10/18/18 01:39	
16WW26-181009	K1809960-002	**5.03**	0.50	0.20	0.07	1	10/18/18 02:11	
16WW41-181009	K1809960-003	**58**	10	4	2	20	10/18/18 03:16	
16WW25-181009	K1809960-004	**23.8**	0.50	0.20	0.07	1	10/18/18 03:47	
16WW02-181009	K1809960-005	**10.3**	0.50	0.20	0.07	1	10/18/18 04:19	
16WW36-181009	K1809960-006	**33**	10	4	2	20	10/18/18 04:51	
16WW24-181009	K1809960-007	**2.76**	0.50	0.20	0.07	1	10/18/18 05:23	
16WW24-181009-FD	K1809960-008	**2.65**	0.50	0.20	0.07	1	10/18/18 06:27	
16WW06-181009	K1809960-009	**31**	10	4	2	20	10/18/18 06:59	
Method Blank	K1809960-MB1	ND U	0.50	0.20	0.07	1	10/17/18 23:15	
Method Blank	K1809960-MB2	ND U	0.50	0.20	0.07	1	10/18/18 08:36	

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Client:	ALS Environmental - US	**Service Request:**	K1809960
Project	HS18100492	**Date Collected:**	10/09/18
Sample Matrix:	Water	**Date Received:**	10/11/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	LOQ	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16WW43-181009	K1809960-001DUP	0.50	0.20	0.07	9.46	9.32	9.39	1	10	10/18/18
16WW26-181009	K1809960-002DUP	0.50	0.20	0.07	5.03	4.74	4.89	6	10	10/18/18
16WW41-181009	K1809960-003DUP	10	4	2	58	56	57.0	4	10	10/18/18
16WW25-181009	K1809960-004DUP	0.50	0.20	0.07	23.8	23.3	23.5	2	10	10/18/18
16WW02-181009	K1809960-005DUP	0.50	0.20	0.07	10.3	9.86	10.1	5	10	10/18/18
16WW36-181009	K1809960-006DUP	10	4	2	33	33	33.0	2	10	10/18/18
16WW24-181009	K1809960-007DUP	0.50	0.20	0.07	2.76	2.51	2.64	9	10	10/18/18
16WW24-181009-FD	K1809960-008DUP	0.50	0.20	0.07	2.65	2.46	2.56	7	10	10/18/18
16WW06-181009	K1809960-009DUP	10	4	2	31	32	31.5	6	10	10/18/18

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1809960
Project:	HS18100492	**Date Collected:**	10/09/18
Sample Matrix:	Water	**Date Received:**	10/11/18
		Date Analyzed:	10/18/18
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW24-181009	**Units:**	mg/L
Lab Code:	K1809960-007	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1809960-007MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	2.76	27.6	25.0	99	83-117

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1809960
Project:	HS18100492	**Date Analyzed:**	10/17/18
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	611322

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1809960-LCS1	21.6	21.9	99	83-117
Lab Control Sample	K1809960-LCS2	21.4	21.9	98	83-117

Client: ALS Environmental - US **Service Request:** K1809960
Project: HS18100492

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	611322	KQ1814953-06	10/17/18 22:41	25.0	23.9	95	90-110
CCV2	611322	KQ1814953-07	10/18/18 02:43	25.0	24.4	98	90-110
CCV3	611322	KQ1814953-08	10/18/18 08:02	25.0	24.0	96	90-110
CCV4	611322	KQ1814953-09	10/18/18 12:20	25.0	23.8	95	90-110
CCV5	611322	KQ1814953-10	10/18/18 14:30	25.0	23.7	95	90-110

Client: ALS Environmental - US **Service Request:**K1809960
Project: HS18100492

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	611322	KQ1814953-01	10/17/18 22:58	0.50	0.20	0.07	ND	U
CCB2	611322	KQ1814953-02	10/18/18 02:59	0.50	0.20	0.07	0.09	J
CCB3	611322	KQ1814953-03	10/18/18 08:19	0.50	0.20	0.07	ND	U
CCB4	611322	KQ1814953-04	10/18/18 12:37	0.50	0.20	0.07	ND	U
CCB5	611322	KQ1814953-05	10/18/18 14:46	0.50	0.20	0.07	ND	U

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March 26, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18100548**

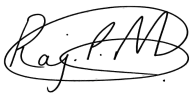
Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP 50**

Dear Susan,

ALS Environmental received 14 sample(s) on Oct 11, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA

RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Work Order: HS18100548

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18100548-01	16TB02-181010	Water	VBLKW 092618-19	10-Oct-2018 08:30	11-Oct-2018 09:05	☐
HS18100548-02	16WW38-181010	Groundwater		10-Oct-2018 09:49	11-Oct-2018 09:05	☐
HS18100548-03	16WW44-181010	Groundwater		10-Oct-2018 10:05	11-Oct-2018 09:05	☐
HS18100548-04	16WW33-181010	Groundwater		10-Oct-2018 10:20	11-Oct-2018 09:05	☐
HS18100548-05	16WW37-181010	Groundwater		10-Oct-2018 10:39	11-Oct-2018 09:05	☐
HS18100548-06	16WW45-181010	Groundwater		10-Oct-2018 11:10	11-Oct-2018 09:05	☐
HS18100548-07	16WW14-181010	Groundwater		10-Oct-2018 12:02	11-Oct-2018 09:05	☐
HS18100548-08	16WW34-181010	Groundwater		10-Oct-2018 13:05	11-Oct-2018 09:05	☐
HS18100548-09	16WW35-181010	Groundwater		10-Oct-2018 13:11	11-Oct-2018 09:05	☐
HS18100548-10	16WW16-181010	Groundwater		10-Oct-2018 13:15	11-Oct-2018 09:05	☐
HS18100548-11	16WW31-181010	Groundwater		10-Oct-2018 14:30	11-Oct-2018 09:05	☐
HS18100548-12	16WW31-181010-FD	Groundwater		10-Oct-2018 14:30	11-Oct-2018 09:05	☐
HS18100548-13	16WW22-181010	Groundwater		10-Oct-2018 15:00	11-Oct-2018 09:05	☐
HS18100548-14	16WW39-181010	Groundwater		10-Oct-2018 15:39	11-Oct-2018 09:05	☐

Revision:1

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Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP 50
Work Order: HS18100548

Work Order Comments

- Revised to updated the VOC list.
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.
- The analysis for TOC was subcontracted to ALS Kelso WA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R325736

Sample ID: HS18100713-02MS

- MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R325746

Sample ID: CCV

- Bromomethane and m,p-Xylenes exceeded %D limits on CCV. Samples ND.

Batch ID: R325772

Sample ID: CCV

- Bromomethane and m,p-Xylenes exceeded %D limits on CCV. Samples ND.

Sample ID: VLCSW-181018

- Ethylbenzene exceeded %recovery limits on LCS. Samples ND.

Batch ID: R325826

Sample ID: HS18100727-08MS

- MS and MSD were performed on unrelated sample.

WetChemistry by Method SM2320B

Batch ID: R325562

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

WetChemistry by Method SW9056

Batch ID: R325461

Sample ID: 16WW35-181010 (HS18100548-09)

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Nitrogen, Nitrate (As N),Nitrogen, Nitrite (As N))

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Work Order: HS18100548

CASE NARRATIVE

WetChemistry by Method SW9056

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16TB02-181010
Collection Date: 10-Oct-2018 08:30

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**							Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	18-Oct-2018 15:40
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 15:40
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 15:40
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 15:40
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	18-Oct-2018 15:40
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 15:40
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 15:40
Surr: 1,2-Dichloroethane-d4	*88.5*			**0**	*70-126*	*%REC*	*1*	*18-Oct-2018 15:40*
Surr: 4-Bromofluorobenzene	*97.5*			**0**	*81-113*	*%REC*	*1*	*18-Oct-2018 15:40*
Surr: Dibromofluoromethane	*97.1*			**0**	*77-123*	*%REC*	*1*	*18-Oct-2018 15:40*
Surr: Toluene-d8	*93.7*			**0**	*82-127*	*%REC*	*1*	*18-Oct-2018 15:40*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder:HS18100548
Sample ID: 16WW38-181010
Lab ID:HS18100548-02
Collection Date: 10-Oct-2018 09:49
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	ug/L	10	19-Oct-2018 16:52
1,1-Dichloroethene	**21**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 16:52
1,2-Dibromoethane	5.0	U	2.0	5.0	10	ug/L	10	19-Oct-2018 16:52
cis-1,2-Dichloroethene	**240**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 16:52
Methylene chloride	10	U	10	10	20	ug/L	10	19-Oct-2018 16:52
Trichloroethene	**4,400**		**20**	**50**	**100**	**ug/L**	100	19-Oct-2018 17:20
Vinyl chloride	**160**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 16:52
Surr: 1,2-Dichloroethane-d4	*92.5*			**0**	*70-126*	*%REC*	*10*	*19-Oct-2018 16:52*
Surr: 1,2-Dichloroethane-d4	*92.0*			**0**	*70-126*	*%REC*	*100*	*19-Oct-2018 17:20*
Surr: 4-Bromofluorobenzene	*98.9*			**0**	*81-113*	*%REC*	*10*	*19-Oct-2018 16:52*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*81-113*	*%REC*	*100*	*19-Oct-2018 17:20*
Surr: Dibromofluoromethane	*96.8*			**0**	*77-123*	*%REC*	*10*	*19-Oct-2018 16:52*
Surr: Dibromofluoromethane	*96.0*			**0**	*77-123*	*%REC*	*100*	*19-Oct-2018 17:20*
Surr: Toluene-d8	*90.6*			**0**	*82-127*	*%REC*	*10*	*19-Oct-2018 16:52*
Surr: Toluene-d8	*91.3*			**0**	*82-127*	*%REC*	*100*	*19-Oct-2018 17:20*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW44-181010
Collection Date: 10-Oct-2018 10:05

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	18-Oct-2018 17:42
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:42
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:42
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:42
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	18-Oct-2018 17:42
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:42
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 17:42
Surr: 1,2-Dichloroethane-d4	*90.3*			**0**	*70-126*	*%REC*	*1*	*18-Oct-2018 17:42*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*81-113*	*%REC*	*1*	*18-Oct-2018 17:42*
Surr: Dibromofluoromethane	*95.2*			**0**	*77-123*	*%REC*	*1*	*18-Oct-2018 17:42*
Surr: Toluene-d8	*92.6*			**0**	*82-127*	*%REC*	*1*	*18-Oct-2018 17:42*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW33-181010
Collection Date: 10-Oct-2018 10:20

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	18-Oct-2018 18:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:07
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:07
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	18-Oct-2018 18:07
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:07
Surr: 1,2-Dichloroethane-d4	*89.0*			**0**	*70-126*	*%REC*	*1*	*18-Oct-2018 18:07*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*81-113*	*%REC*	*1*	*18-Oct-2018 18:07*
Surr: Dibromofluoromethane	*94.2*			**0**	*77-123*	*%REC*	*1*	*18-Oct-2018 18:07*
Surr: Toluene-d8	*92.0*			**0**	*82-127*	*%REC*	*1*	*18-Oct-2018 18:07*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW37-181010
Collection Date: 10-Oct-2018 10:39

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	18-Oct-2018 18:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:31
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:31
cis-1,2-Dichloroethene	**5.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	18-Oct-2018 18:31
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	18-Oct-2018 18:31
Trichloroethene	**84**		**0.20**	**0.50**	**1.0**	**ug/L**	1	18-Oct-2018 18:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:31
Surr: 1,2-Dichloroethane-d4	*89.9*			**0**	*70-126*	*%REC*	*1*	*18-Oct-2018 18:31*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*81-113*	*%REC*	*1*	*18-Oct-2018 18:31*
Surr: Dibromofluoromethane	*95.6*			**0**	*77-123*	*%REC*	*1*	*18-Oct-2018 18:31*
Surr: Toluene-d8	*92.3*			**0**	*82-127*	*%REC*	*1*	*18-Oct-2018 18:31*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW45-181010
Collection Date: 10-Oct-2018 11:10

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	18-Oct-2018 18:56
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:56
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:56
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	18-Oct-2018 18:56
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 18:56
Surr: 1,2-Dichloroethane-d4	*88.6*			**0**	*70-126*	*%REC*	*1*	*18-Oct-2018 18:56*
Surr: 4-Bromofluorobenzene	*97.3*			**0**	*81-113*	*%REC*	*1*	*18-Oct-2018 18:56*
Surr: Dibromofluoromethane	*96.6*			**0**	*77-123*	*%REC*	*1*	*18-Oct-2018 18:56*
Surr: Toluene-d8	*92.6*			**0**	*82-127*	*%REC*	*1*	*18-Oct-2018 18:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW14-181010
Collection Date: 10-Oct-2018 12:02

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	18-Oct-2018 19:20
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 19:20
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 19:20
cis-1,2-Dichloroethene	**2.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	18-Oct-2018 19:20
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	18-Oct-2018 19:20
Trichloroethene	**42**		**0.20**	**0.50**	**1.0**	**ug/L**	1	18-Oct-2018 19:20
Vinyl chloride	**1.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	18-Oct-2018 19:20
Surr: 1,2-Dichloroethane-d4	*90.8*			**0**	*70-126*	*%REC*	*1*	*18-Oct-2018 19:20*
Surr: 4-Bromofluorobenzene	*97.4*			**0**	*81-113*	*%REC*	*1*	*18-Oct-2018 19:20*
Surr: Dibromofluoromethane	*96.2*			**0**	*77-123*	*%REC*	*1*	*18-Oct-2018 19:20*
Surr: Toluene-d8	*92.7*			**0**	*82-127*	*%REC*	*1*	*18-Oct-2018 19:20*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW34-181010
Collection Date: 10-Oct-2018 13:05

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	18-Oct-2018 19:45
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 19:45
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 19:45
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 19:45
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	18-Oct-2018 19:45
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 19:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 19:45
Surr: 1,2-Dichloroethane-d4	*87.6*			**0**	*70-126*	*%REC*	*1*	*18-Oct-2018 19:45*
Surr: 4-Bromofluorobenzene	*96.6*			**0**	*81-113*	*%REC*	*1*	*18-Oct-2018 19:45*
Surr: Dibromofluoromethane	*95.3*			**0**	*77-123*	*%REC*	*1*	*18-Oct-2018 19:45*
Surr: Toluene-d8	*93.8*			**0**	*82-127*	*%REC*	*1*	*18-Oct-2018 19:45*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW35-181010
Collection Date: 10-Oct-2018 13:11

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	25	U	15	25	50	ug/L	50	19-Oct-2018 10:50
1,1-Dichloroethene	**190**		**10**	**25**	**50**	**ug/L**	50	19-Oct-2018 10:50
1,2-Dibromoethane	25	U	10	25	50	ug/L	50	19-Oct-2018 10:50
cis-1,2-Dichloroethene	**19,000**		**100**	**250**	**500**	**ug/L**	500	19-Oct-2018 11:17
Methylene chloride	50	U	50	50	100	ug/L	50	19-Oct-2018 10:50
Trichloroethene	**21,000**		**100**	**250**	**500**	**ug/L**	500	19-Oct-2018 11:17
Vinyl chloride	**170**		**10**	**25**	**50**	**ug/L**	50	19-Oct-2018 10:50
Surr: 1,2-Dichloroethane-d4	*94.4*			**0**	*70-126*	*%REC*	*50*	*19-Oct-2018 10:50*
Surr: 1,2-Dichloroethane-d4	*90.2*			**0**	*70-126*	*%REC*	*500*	*19-Oct-2018 11:17*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*81-113*	*%REC*	*50*	*19-Oct-2018 10:50*
Surr: 4-Bromofluorobenzene	*98.6*			**0**	*81-113*	*%REC*	*500*	*19-Oct-2018 11:17*
Surr: Dibromofluoromethane	*96.6*			**0**	*77-123*	*%REC*	*500*	*19-Oct-2018 11:17*
Surr: Dibromofluoromethane	*95.7*			**0**	*77-123*	*%REC*	*50*	*19-Oct-2018 10:50*
Surr: Toluene-d8	*91.4*			**0**	*82-127*	*%REC*	*50*	*19-Oct-2018 10:50*
Surr: Toluene-d8	*92.4*			**0**	*82-127*	*%REC*	*500*	*19-Oct-2018 11:17*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000644**	J	**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	18-Oct-2018 13:37
Ethene	**0.00438**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	18-Oct-2018 13:37
Methane	**0.0550**		**0.000214**	**0.00100**	**0.00100**	**mg/L**	2	18-Oct-2018 14:20
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**969**		**5.00**	**5.00**	**5.00**	**mg/L**	1	16-Oct-2018 14:19
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 21:36
Chloride	**699**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 21:50
Fluoride	**0.272**		**0.100**	**0.200**	**0.200**	**mg/L**	2	11-Oct-2018 21:36
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 21:36
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	11-Oct-2018 21:36
Sulfate	**8,400**		**40.0**	**100**	**100**	**mg/L**	200	11-Oct-2018 22:05
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW16-181010
Collection Date: 10-Oct-2018 13:15

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	25	U	15	25	50	ug/L	50	19-Oct-2018 11:42
1,1-Dichloroethene	25	U	10	25	50	ug/L	50	19-Oct-2018 11:42
1,2-Dibromoethane	25	U	10	25	50	ug/L	50	19-Oct-2018 11:42
cis-1,2-Dichloroethene	**8,500**		**10**	**25**	**50**	**ug/L**	50	19-Oct-2018 11:42
Methylene chloride	50	U	50	50	100	ug/L	50	19-Oct-2018 11:42
Trichloroethene	**21,000**		**100**	**250**	**500**	**ug/L**	500	19-Oct-2018 12:08
Vinyl chloride	**330**		**10**	**25**	**50**	**ug/L**	50	19-Oct-2018 11:42
Surr: 1,2-Dichloroethane-d4	*91.8*			**0**	*70-126*	*%REC*	*50*	*19-Oct-2018 11:42*
Surr: 1,2-Dichloroethane-d4	*90.4*			**0**	*70-126*	*%REC*	*500*	*19-Oct-2018 12:08*
Surr: 4-Bromofluorobenzene	*97.1*			**0**	*81-113*	*%REC*	*50*	*19-Oct-2018 11:42*
Surr: 4-Bromofluorobenzene	*97.7*			**0**	*81-113*	*%REC*	*500*	*19-Oct-2018 12:08*
Surr: Dibromofluoromethane	*95.0*			**0**	*77-123*	*%REC*	*50*	*19-Oct-2018 11:42*
Surr: Dibromofluoromethane	*94.1*			**0**	*77-123*	*%REC*	*500*	*19-Oct-2018 12:08*
Surr: Toluene-d8	*90.1*			**0**	*82-127*	*%REC*	*50*	*19-Oct-2018 11:42*
Surr: Toluene-d8	*92.5*			**0**	*82-127*	*%REC*	*500*	*19-Oct-2018 12:08*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.00231**		**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	18-Oct-2018 14:59
Ethene	**0.00498**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	18-Oct-2018 14:59
Methane	**0.403**		**0.00214**	**0.0100**	**0.0100**	**mg/L**	20	18-Oct-2018 15:22
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**362**		**5.00**	**5.00**	**5.00**	**mg/L**	1	16-Oct-2018 14:25
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.69**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 22:19
Chloride	**1,100**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 22:34
Fluoride	**0.172**		**0.0500**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 22:19
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 22:19
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 22:19
Sulfate	**722**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 22:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW31-181010
Collection Date: 10-Oct-2018 14:30

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	18-Oct-2018 16:05
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 16:05
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 16:05
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 16:05
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	18-Oct-2018 16:05
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 16:05
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	18-Oct-2018 16:05
Surr: 1,2-Dichloroethane-d4	*89.6*			**0**	*70-126*	*%REC*	*1*	*18-Oct-2018 16:05*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*81-113*	*%REC*	*1*	*18-Oct-2018 16:05*
Surr: Dibromofluoromethane	*96.3*			**0**	*77-123*	*%REC*	*1*	*18-Oct-2018 16:05*
Surr: Toluene-d8	*94.1*			**0**	*82-127*	*%REC*	*1*	*18-Oct-2018 16:05*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW31-181010-FD
Collection Date: 10-Oct-2018 14:30

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 06:16
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 06:16
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 06:16
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 06:16
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 06:16
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 06:16
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 06:16
Surr: 1,2-Dichloroethane-d4	*89.3*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 06:16*
Surr: 4-Bromofluorobenzene	*98.9*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 06:16*
Surr: Dibromofluoromethane	*97.7*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 06:16*
Surr: Toluene-d8	*92.6*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 06:16*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW22-181010
Collection Date: 10-Oct-2018 15:00

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 06:41
1,1-Dichloroethene	**1.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 06:41
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 06:41
cis-1,2-Dichloroethene	**19**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 06:41
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 06:41
Trichloroethene	**150**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 06:41
Vinyl chloride	**4.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 06:41
Surr: 1,2-Dichloroethane-d4	*92.8*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 06:41*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 06:41*
Surr: Dibromofluoromethane	*96.3*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 06:41*
Surr: Toluene-d8	*91.4*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 06:41*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.00100	U	0.000144	0.00100	0.00100	mg/L	1	18-Oct-2018 15:49
Ethene	**0.00156**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	18-Oct-2018 15:49
Methane	**0.00246**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	18-Oct-2018 15:49
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**239**		**5.00**	**5.00**	**5.00**	**mg/L**	1	16-Oct-2018 14:47
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.46**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 22:48
Chloride	**997**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 23:03
Fluoride	**0.207**		**0.0500**	**0.100**	**0.100**	**mg/L**	1	11-Oct-2018 22:48
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 22:48
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	11-Oct-2018 22:48
Sulfate	**772**		**4.00**	**10.0**	**10.0**	**mg/L**	20	11-Oct-2018 23:03
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	22-Oct-2018 09:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
Sample ID: 16WW39-181010
Collection Date: 10-Oct-2018 15:39

ANALYTICAL REPORT
WorkOrder:HS18100548
Lab ID:HS18100548-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	ug/L	10	19-Oct-2018 09:59
1,1-Dichloroethene	5.0	U	2.0	5.0	10	ug/L	10	19-Oct-2018 09:59
1,2-Dibromoethane	5.0	U	2.0	5.0	10	ug/L	10	19-Oct-2018 09:59
cis-1,2-Dichloroethene	**220**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 09:59
Methylene chloride	10	U	10	10	20	ug/L	10	19-Oct-2018 09:59
Trichloroethene	**3,900**		**20**	**50**	**100**	**ug/L**	100	19-Oct-2018 10:26
Vinyl chloride	**15**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 09:59
Surr: 1,2-Dichloroethane-d4	*89.3*			**0**	*70-126*	*%REC*	*10*	*19-Oct-2018 09:59*
Surr: 1,2-Dichloroethane-d4	*91.3*			**0**	*70-126*	*%REC*	*100*	*19-Oct-2018 10:26*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*81-113*	*%REC*	*10*	*19-Oct-2018 09:59*
Surr: 4-Bromofluorobenzene	*97.2*			**0**	*81-113*	*%REC*	*100*	*19-Oct-2018 10:26*
Surr: Dibromofluoromethane	*96.1*			**0**	*77-123*	*%REC*	*10*	*19-Oct-2018 09:59*
Surr: Dibromofluoromethane	*96.5*			**0**	*77-123*	*%REC*	*100*	*19-Oct-2018 10:26*
Surr: Toluene-d8	*91.7*			**0**	*82-127*	*%REC*	*10*	*19-Oct-2018 09:59*
Surr: Toluene-d8	*92.5*			**0**	*82-127*	*%REC*	*100*	*19-Oct-2018 10:26*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.20**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	11-Oct-2018 23:17
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Oct-2018 10:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R325461 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			11 Oct 2018 22:05	200
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			11 Oct 2018 21:50	20
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			11 Oct 2018 21:36	2
HS18100548-10	16WW16-181010	10 Oct 2018 13:15			11 Oct 2018 22:34	20
HS18100548-10	16WW16-181010	10 Oct 2018 13:15			11 Oct 2018 22:19	1
HS18100548-13	16WW22-181010	10 Oct 2018 15:00			11 Oct 2018 23:03	20
HS18100548-13	16WW22-181010	10 Oct 2018 15:00			11 Oct 2018 22:48	1
HS18100548-14	16WW39-181010	10 Oct 2018 15:39			11 Oct 2018 23:17	2
Batch ID: R325562 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			16 Oct 2018 14:19	1
HS18100548-10	16WW16-181010	10 Oct 2018 13:15			16 Oct 2018 14:25	1
HS18100548-13	16WW22-181010	10 Oct 2018 15:00			16 Oct 2018 14:47	1
Batch ID: R325736 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			18 Oct 2018 14:20	2
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			18 Oct 2018 13:37	1
HS18100548-10	16WW16-181010	10 Oct 2018 13:15			18 Oct 2018 15:22	20
HS18100548-10	16WW16-181010	10 Oct 2018 13:15			18 Oct 2018 14:59	1
HS18100548-13	16WW22-181010	10 Oct 2018 15:00			18 Oct 2018 15:49	1
Batch ID: R325746 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Groundwater	
HS18100548-03	16WW44-181010	10 Oct 2018 10:05			18 Oct 2018 17:42	1
HS18100548-04	16WW33-181010	10 Oct 2018 10:20			18 Oct 2018 18:07	1
HS18100548-05	16WW37-181010	10 Oct 2018 10:39			18 Oct 2018 18:31	1
HS18100548-06	16WW45-181010	10 Oct 2018 11:10			18 Oct 2018 18:56	1
HS18100548-07	16WW14-181010	10 Oct 2018 12:02			18 Oct 2018 19:20	1
HS18100548-08	16WW34-181010	10 Oct 2018 13:05			18 Oct 2018 19:45	1
HS18100548-11	16WW31-181010	10 Oct 2018 14:30			18 Oct 2018 16:05	1
Batch ID: R325746 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS18100548-01	16TB02-181010	10 Oct 2018 08:30			18 Oct 2018 15:40	1
Batch ID: R325772 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Groundwater	
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			19 Oct 2018 11:17	500
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			19 Oct 2018 10:50	50
HS18100548-10	16WW16-181010	10 Oct 2018 13:15			19 Oct 2018 12:08	500
HS18100548-10	16WW16-181010	10 Oct 2018 13:15			19 Oct 2018 11:42	50
HS18100548-12	16WW31-181010-FD	10 Oct 2018 14:30			19 Oct 2018 06:16	1
HS18100548-13	16WW22-181010	10 Oct 2018 15:00			19 Oct 2018 06:41	1
HS18100548-14	16WW39-181010	10 Oct 2018 15:39			19 Oct 2018 10:26	100
HS18100548-14	16WW39-181010	10 Oct 2018 15:39			19 Oct 2018 09:59	10

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R325826 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Groundwater	
HS18100548-02	16WW38-181010	10 Oct 2018 09:49			19 Oct 2018 17:20	100
HS18100548-02	16WW38-181010	10 Oct 2018 09:49			19 Oct 2018 16:52	10
Batch ID: R325853 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			22 Oct 2018 09:40	1
HS18100548-10	16WW16-181010	10 Oct 2018 13:15			22 Oct 2018 09:40	1
HS18100548-13	16WW22-181010	10 Oct 2018 15:00			22 Oct 2018 09:40	1
Batch ID: R326185 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS18100548-02	16WW38-181010	10 Oct 2018 09:49			26 Oct 2018 10:05	1
HS18100548-03	16WW44-181010	10 Oct 2018 10:05			26 Oct 2018 10:05	1
HS18100548-04	16WW33-181010	10 Oct 2018 10:20			26 Oct 2018 10:05	1
HS18100548-05	16WW37-181010	10 Oct 2018 10:39			26 Oct 2018 10:05	1
HS18100548-06	16WW45-181010	10 Oct 2018 11:10			26 Oct 2018 10:05	1
HS18100548-07	16WW14-181010	10 Oct 2018 12:02			26 Oct 2018 10:05	1
HS18100548-08	16WW34-181010	10 Oct 2018 13:05			26 Oct 2018 10:05	1
HS18100548-09	16WW35-181010	10 Oct 2018 13:11			26 Oct 2018 10:05	1
HS18100548-10	16WW16-181010	10 Oct 2018 13:15			26 Oct 2018 10:05	1
HS18100548-11	16WW31-181010	10 Oct 2018 14:30			26 Oct 2018 10:05	1
HS18100548-12	16WW31-181010-FD	10 Oct 2018 14:30			26 Oct 2018 10:05	1
HS18100548-13	16WW22-181010	10 Oct 2018 15:00			26 Oct 2018 10:05	1
HS18100548-14	16WW39-181010	10 Oct 2018 15:39			26 Oct 2018 10:05	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325736 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-181018** Units: **mg/L** Analysis Date: **18-Oct-2018 13:19**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784197** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00100	0.00100								U
Ethene	0.00100	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-181018** Units: **mg/L** Analysis Date: **18-Oct-2018 12:58**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0167	0.00100	0.01804	0	92.5	75 - 125				
Ethene	0.0158	0.00100	0.0168	0	93.9	75 - 125				
Methane	0.00883	0.000500	0.009647	0	91.5	75 - 125				

LCSD Sample ID: **LCSD-181018** Units: **mg/L** Analysis Date: **18-Oct-2018 13:09**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784196** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0171	0.00100	0.01804	0	94.7	75 - 125	0.01668	2.36	30	
Ethene	0.0164	0.00100	0.0168	0	97.4	75 - 125	0.01577	3.66	30	
Methane	0.00805	0.000500	0.009647	0	83.4	75 - 125	0.008831	9.29	30	

MS Sample ID: **HS18100713-02MS** Units: **mg/L** Analysis Date: **18-Oct-2018 16:40**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784204** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0220	0.00100	0.01804	0.0004656	119	75 - 125				
Ethene	0.0255	0.00100	0.0168	0.002499	137	75 - 125				S
Methane	0.0294	0.000500	0.009647	0.01297	170	75 - 125				S

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325736 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MSD Sample ID: **HS18100713-02MSD** Units: **mg/L** Analysis Date: **18-Oct-2018 17:05**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784205** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0213	0.00100	0.01804	0.0004656	116	75 - 125	0.02200	3.2	30	
Ethene	0.0238	0.00100	0.0168	0.002499	127	75 - 125	0.02546	6.57	30	S
Methane	0.0332	0.000500	0.009647	0.01297	210	75 - 125	0.02937	12.3	30	S

The following samples were analyzed in this batch: HS18100548-09 HS18100548-10 HS18100548-13

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 15:16**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779648** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 15:16**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779648** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.36*	*1.0*	*50*	*0*	*86.7*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.8*	*1.0*	*50*	*0*	*97.6*	*82 - 115*				
Surr: Dibromofluoromethane	*48.22*	*1.0*	*50*	*0*	*96.4*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 15:16**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779648** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.49*	*1.0*	*50*	*0*	*93.0*	*81 - 120*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 14:27**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779646** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.53	1.0	20	0	103	77 - 118				
1,1,1-Trichloroethane	18.86	1.0	20	0	94.3	70 - 130				
1,1,2,2-Tetrachloroethane	16.63	1.0	20	0	83.2	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	21.18	1.0	20	0	106	70 - 130				
1,1,2-Trichloroethane	19.93	1.0	20	0	99.7	77 - 113				
1,1-Dichloroethane	19.8	1.0	20	0	99.0	71 - 122				
1,1-Dichloroethene	19.33	1.0	20	0	96.6	70 - 130				
1,1-Dichloropropene	21.51	1.0	20	0	108	78 - 118				
1,2,3-Trichlorobenzene	17.37	1.0	20	0	86.8	70 - 130				
1,2,3-Trichloropropane	16.89	1.0	20	0	84.5	70 - 127				
1,2,4-Trichlorobenzene	18.68	1.0	20	0	93.4	77 - 126				
1,2,4-Trimethylbenzene	21.51	1.0	20	0	108	73 - 121				
1,2-Dibromo-3-chloropropane	14.83	1.0	20	0	74.1	70 - 130				
1,2-Dibromoethane	20.01	1.0	20	0	100	76 - 123				
1,2-Dichlorobenzene	19.65	1.0	20	0	98.2	77 - 113				
1,2-Dichloroethane	19.51	1.0	20	0	97.5	70 - 124				
1,2-Dichloropropane	21.49	1.0	20	0	107	72 - 119				
1,3,5-Trimethylbenzene	19.75	1.0	20	0	98.7	75 - 118				
1,3-Dichlorobenzene	19.83	1.0	20	0	99.1	78 - 118				
1,3-Dichloropropane	20	1.0	20	0	100.0	75 - 116				
1,4-Dichlorobenzene	20.55	1.0	20	0	103	79 - 113				
2,2-Dichloropropane	22.17	1.0	20	0	111	70 - 130				
2-Butanone	32.82	2.0	40	0	82.0	70 - 130				
2-Chlorotoluene	21.38	1.0	20	0	107	70 - 128				
2-Hexanone	33.25	2.0	40	0	83.1	70 - 130				
4-Chlorotoluene	21.73	1.0	20	0	109	74 - 126				
4-Isopropyltoluene	19	1.0	20	0	95.0	74 - 126				
4-Methyl-2-pentanone	34.53	2.0	40	0	86.3	70 - 130				
Acetone	32.89	2.0	40	0	82.2	70 - 130				
Benzene	20.78	1.0	20	0	104	74 - 120				
Bromobenzene	19.94	1.0	20	0	99.7	78 - 113				
Bromochloromethane	20.73	1.0	20	0	104	76 - 124				
Bromodichloromethane	20.89	1.0	20	0	104	74 - 122				
Bromoform	19.09	1.0	20	0	95.5	73 - 128				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 14:27**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779646** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	25.23	1.0	20	0	126	70 - 130				
Carbon disulfide	38.37	2.0	40	0	95.9	70 - 130				
Carbon tetrachloride	21.25	1.0	20	0	106	71 - 125				
Chlorobenzene	20.82	1.0	20	0	104	76 - 113				
Chloroethane	20.03	1.0	20	0	100	70 - 130				
Chloroform	19.22	1.0	20	0	96.1	71 - 121				
Chloromethane	18.25	1.0	20	0	91.2	70 - 129				
cis-1,2-Dichloroethene	20.34	1.0	20	0	102	75 - 122				
cis-1,3-Dichloropropene	22.11	1.0	20	0	111	73 - 127				
Dibromochloromethane	19.77	1.0	20	0	98.9	77 - 122				
Dibromomethane	20.5	1.0	20	0	102	78 - 121				
Dichlorodifluoromethane	14.82	1.0	20	0	74.1	70 - 130				
Ethylbenzene	22.7	1.0	20	0	114	77 - 117				
Hexachlorobutadiene	20.48	1.0	20	0	102	70 - 130				
Isopropylbenzene	20.48	1.0	20	0	102	73 - 127				
m,p-Xylene	46.4	2.0	40	0	116	77 - 122				
Methylene chloride	20.02	2.0	20	0	100	70 - 127				
Naphthalene	15.31	1.0	20	0	76.5	70 - 130				
n-Butylbenzene	20.82	1.0	20	0	104	72 - 130				
n-Propylbenzene	22.11	1.0	20	0	111	73 - 124				
o-Xylene	22.33	1.0	20	0	112	75 - 119				
sec-Butylbenzene	19.32	1.0	20	0	96.6	73 - 128				
Styrene	21.17	1.0	20	0	106	72 - 126				
tert-Butylbenzene	21.25	1.0	20	0	106	73 - 124				
Tetrachloroethene	20.36	1.0	20	0	102	76 - 119				
Toluene	20.46	1.0	20	0	102	77 - 118				
trans-1,2-Dichloroethene	20.52	1.0	20	0	103	72 - 127				
trans-1,3-Dichloropropene	22.37	1.0	20	0	112	77 - 119				
Trichloroethene	21.27	1.0	20	0	106	77 - 121				
Trichlorofluoromethane	20.65	1.0	20	0	103	70 - 130				
Vinyl chloride	19.94	1.0	20	0	99.7	70 - 130				
Surr: 1,2-Dichloroethane-d4	*45.03*	*1.0*	*50*	*0*	*90.1*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.78*	*1.0*	*50*	*0*	*102*	*82 - 115*				
Surr: Dibromofluoromethane	*47.4*	*1.0*	*50*	*0*	*94.8*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **18-Oct-2018 14:27**
Client ID: Run ID: **VOA2_325746** SeqNo: **4779646** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.21*	*1.0*	*50*	*0*	*90.4*	*81 - 120*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100548-11MS** Units: **ug/L** Analysis Date: **18-Oct-2018 16:29**
Client ID: **16WW31-181010** Run ID: **VOA2_325746** SeqNo: **4779651** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.9	1.0	20	0	99.5	70 - 120				
1,1,1-Trichloroethane	19.85	1.0	20	0	99.2	70 - 130				
1,1,2,2-Tetrachloroethane	16.75	1.0	20	0	83.8	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	23.06	1.0	20	0	115	70 - 130				
1,1,2-Trichloroethane	19.23	1.0	20	0	96.2	70 - 117				
1,1-Dichloroethane	20.23	1.0	20	0	101	70 - 127				
1,1-Dichloroethene	21.12	1.0	20	0	106	70 - 130				
1,1-Dichloropropene	22.98	1.0	20	0	115	70 - 129				
1,2,3-Trichlorobenzene	16.79	1.0	20	0	84.0	70 - 130				
1,2,3-Trichloropropane	17.04	1.0	20	0	85.2	70 - 130				
1,2,4-Trichlorobenzene	18.35	1.0	20	0	91.7	70 - 125				
1,2,4-Trimethylbenzene	20.2	1.0	20	0	101	70 - 125				
1,2-Dibromo-3-chloropropane	15.11	1.0	20	0	75.5	70 - 130				
1,2-Dibromoethane	20.23	1.0	20	0	101	70 - 124				
1,2-Dichlorobenzene	18.84	1.0	20	0	94.2	70 - 115				
1,2-Dichloroethane	19.51	1.0	20	0	97.5	70 - 127				
1,2-Dichloropropane	20.81	1.0	20	0	104	70 - 122				
1,3,5-Trimethylbenzene	18.84	1.0	20	0	94.2	70 - 126				
1,3-Dichlorobenzene	19.38	1.0	20	0	96.9	70 - 119				
1,3-Dichloropropane	19.78	1.0	20	0	98.9	70 - 121				
1,4-Dichlorobenzene	20.14	1.0	20	0	101	70 - 114				
2,2-Dichloropropane	24.13	1.0	20	0	121	70 - 130				
2-Butanone	36.01	2.0	40	0	90.0	70 - 130				
2-Chlorotoluene	20.76	1.0	20	0	104	70 - 130				
2-Hexanone	35.65	2.0	40	0	89.1	70 - 130				
4-Chlorotoluene	21.04	1.0	20	0	105	70 - 130				
4-Isopropyltoluene	18.65	1.0	20	0	93.3	70 - 130				
4-Methyl-2-pentanone	35.73	2.0	40	0	89.3	70 - 130				
Acetone	33.5	2.0	40	0	83.8	70 - 130				
Benzene	20.4	1.0	20	0	102	70 - 127				
Bromobenzene	19.03	1.0	20	0	95.1	70 - 115				
Bromochloromethane	20.07	1.0	20	0	100	70 - 127				
Bromodichloromethane	20.4	1.0	20	0	102	70 - 124				
Bromoform	18.89	1.0	20	0	94.5	70 - 129				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100548-11MS** Units: **ug/L** Analysis Date: **18-Oct-2018 16:29**
Client ID: **16WW31-181010** Run ID: **VOA2_325746** SeqNo: **4779651** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	24.14	1.0	20	0	121	70 - 130				
Carbon disulfide	40.53	2.0	40	0	101	70 - 130				
Carbon tetrachloride	21.38	1.0	20	0	107	70 - 130				
Chlorobenzene	20.81	1.0	20	0	104	70 - 114				
Chloroethane	20.23	1.0	20	0	101	70 - 130				
Chloroform	19.57	1.0	20	0	97.8	70 - 125				
Chloromethane	17.45	1.0	20	0	87.2	70 - 130				
cis-1,2-Dichloroethene	20.83	1.0	20	0	104	70 - 128				
cis-1,3-Dichloropropene	22.19	1.0	20	0	111	70 - 125				
Dibromochloromethane	19.34	1.0	20	0	96.7	70 - 124				
Dibromomethane	19.74	1.0	20	0	98.7	70 - 124				
Dichlorodifluoromethane	15.84	1.0	20	0	79.2	70 - 130				
Ethylbenzene	22.34	1.0	20	0	112	70 - 124				
Hexachlorobutadiene	19.43	1.0	20	0	97.2	70 - 130				
Isopropylbenzene	20.2	1.0	20	0	101	70 - 130				
m,p-Xylene	45.94	2.0	40	0	115	70 - 130				
Methylene chloride	19.93	2.0	20	0	99.7	70 - 128				
Naphthalene	15.61	1.0	20	0	78.1	70 - 130				
n-Butylbenzene	20.82	1.0	20	0	104	70 - 130				
n-Propylbenzene	21.93	1.0	20	0	110	70 - 130				
o-Xylene	22.17	1.0	20	0	111	70 - 124				
sec-Butylbenzene	18.87	1.0	20	0	94.4	70 - 130				
Styrene	20.53	1.0	20	0	103	70 - 130				
tert-Butylbenzene	20.84	1.0	20	0	104	70 - 130				
Tetrachloroethene	20.61	1.0	20	0	103	70 - 130				
Toluene	20.26	1.0	20	0	101	70 - 123				
trans-1,2-Dichloroethene	21.62	1.0	20	0	108	70 - 130				
trans-1,3-Dichloropropene	22.47	1.0	20	0	112	70 - 121				
Trichloroethene	21.67	1.0	20	0	108	70 - 129				
Trichlorofluoromethane	21.58	1.0	20	0	108	70 - 130				
Vinyl chloride	20.35	1.0	20	0	102	70 - 130				
Surr: 1,2-Dichloroethane-d4	*46.9*	*1.0*	*50*	*0*	*93.8*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.07*	*1.0*	*50*	*0*	*100*	*81 - 113*				
Surr: Dibromofluoromethane	*47.92*	*1.0*	*50*	*0*	*95.8*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100548-11MS** Units: **ug/L** Analysis Date: **18-Oct-2018 16:29**
Client ID: **16WW31-181010** Run ID: **VOA2_325746** SeqNo: **4779651** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.76*	*1.0*	*50*	*0*	*89.5*	*82 - 127*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100548-11MSD** Units: **ug/L** Analysis Date: **18-Oct-2018 16:54**
Client ID: **16WW31-181010** Run ID: **VOA2_325746** SeqNo: **4779652** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.2	1.0	20	0	101	70 - 120	19.9	1.5	20	
1,1,1-Trichloroethane	19.2	1.0	20	0	96.0	70 - 130	19.85	3.32	20	
1,1,2,2-Tetrachloroethane	16.62	1.0	20	0	83.1	70 - 123	16.75	0.827	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	22.8	1.0	20	0	114	70 - 130	23.06	1.15	20	
1,1,2-Trichloroethane	19.9	1.0	20	0	99.5	70 - 117	19.23	3.42	20	
1,1-Dichloroethane	20.03	1.0	20	0	100	70 - 127	20.23	0.952	20	
1,1-Dichloroethene	19.86	1.0	20	0	99.3	70 - 130	21.12	6.18	20	
1,1-Dichloropropene	21.75	1.0	20	0	109	70 - 129	22.98	5.5	20	
1,2,3-Trichlorobenzene	17.13	1.0	20	0	85.6	70 - 130	16.79	1.97	20	
1,2,3-Trichloropropane	16.97	1.0	20	0	84.9	70 - 130	17.04	0.369	20	
1,2,4-Trichlorobenzene	18.81	1.0	20	0	94.0	70 - 125	18.35	2.46	20	
1,2,4-Trimethylbenzene	20.52	1.0	20	0	103	70 - 125	20.2	1.57	20	
1,2-Dibromo-3-chloropropane	15.33	1.0	20	0	76.6	70 - 130	15.11	1.44	20	
1,2-Dibromoethane	20.16	1.0	20	0	101	70 - 124	20.23	0.37	20	
1,2-Dichlorobenzene	19.28	1.0	20	0	96.4	70 - 115	18.84	2.29	20	
1,2-Dichloroethane	20.92	1.0	20	0	105	70 - 127	19.51	7.02	20	
1,2-Dichloropropane	20.94	1.0	20	0	105	70 - 122	20.81	0.596	20	
1,3,5-Trimethylbenzene	18.98	1.0	20	0	94.9	70 - 126	18.84	0.721	20	
1,3-Dichlorobenzene	19.63	1.0	20	0	98.2	70 - 119	19.38	1.28	20	
1,3-Dichloropropane	20.12	1.0	20	0	101	70 - 121	19.78	1.7	20	
1,4-Dichlorobenzene	20.06	1.0	20	0	100	70 - 114	20.14	0.375	20	
2,2-Dichloropropane	23.11	1.0	20	0	116	70 - 130	24.13	4.33	20	
2-Butanone	34.47	2.0	40	0	86.2	70 - 130	36.01	4.36	20	
2-Chlorotoluene	21.04	1.0	20	0	105	70 - 130	20.76	1.33	20	
2-Hexanone	35.39	2.0	40	0	88.5	70 - 130	35.65	0.739	20	
4-Chlorotoluene	21.03	1.0	20	0	105	70 - 130	21.04	0.0438	20	
4-Isopropyltoluene	18.45	1.0	20	0	92.3	70 - 130	18.65	1.06	20	
4-Methyl-2-pentanone	36.16	2.0	40	0	90.4	70 - 130	35.73	1.22	20	
Acetone	30.54	2.0	40	0	76.3	70 - 130	33.5	9.26	20	
Benzene	20.35	1.0	20	0	102	70 - 127	20.4	0.246	20	
Bromobenzene	19.19	1.0	20	0	96.0	70 - 115	19.03	0.872	20	
Bromochloromethane	20.28	1.0	20	0	101	70 - 127	20.07	1.03	20	
Bromodichloromethane	20.64	1.0	20	0	103	70 - 124	20.4	1.2	20	
Bromoform	18.83	1.0	20	0	94.1	70 - 129	18.89	0.357	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100548-11MSD** Units: **ug/L** Analysis Date: **18-Oct-2018 16:54**
Client ID: **16WW31-181010** Run ID: **VOA2_325746** SeqNo: **4779652** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	22.95	1.0	20	0	115	70 - 130	24.14	5.05	20	
Carbon disulfide	39.61	2.0	40	0	99.0	70 - 130	40.53	2.28	20	
Carbon tetrachloride	20.83	1.0	20	0	104	70 - 130	21.38	2.61	20	
Chlorobenzene	21.12	1.0	20	0	106	70 - 114	20.81	1.47	20	
Chloroethane	18.88	1.0	20	0	94.4	70 - 130	20.23	6.88	20	
Chloroform	19.61	1.0	20	0	98.0	70 - 125	19.57	0.197	20	
Chloromethane	16.16	1.0	20	0	80.8	70 - 130	17.45	7.66	20	
cis-1,2-Dichloroethene	20.13	1.0	20	0	101	70 - 128	20.83	3.39	20	
cis-1,3-Dichloropropene	21.94	1.0	20	0	110	70 - 125	22.19	1.12	20	
Dibromochloromethane	19.44	1.0	20	0	97.2	70 - 124	19.34	0.484	20	
Dibromomethane	20.65	1.0	20	0	103	70 - 124	19.74	4.48	20	
Dichlorodifluoromethane	14.38	1.0	20	0	71.9	70 - 130	15.84	9.68	20	
Ethylbenzene	22.5	1.0	20	0	113	70 - 124	22.34	0.717	20	
Hexachlorobutadiene	19.41	1.0	20	0	97.0	70 - 130	19.43	0.114	20	
Isopropylbenzene	20.13	1.0	20	0	101	70 - 130	20.2	0.341	20	
m,p-Xylene	46.12	2.0	40	0	115	70 - 130	45.94	0.383	20	
Methylene chloride	20.76	2.0	20	0	104	70 - 128	19.93	4.07	20	
Naphthalene	15.84	1.0	20	0	79.2	70 - 130	15.61	1.43	20	
n-Butylbenzene	20.53	1.0	20	0	103	70 - 130	20.82	1.37	20	
n-Propylbenzene	21.64	1.0	20	0	108	70 - 130	21.93	1.32	20	
o-Xylene	22.18	1.0	20	0	111	70 - 124	22.17	0.0606	20	
sec-Butylbenzene	18.67	1.0	20	0	93.3	70 - 130	18.87	1.11	20	
Styrene	20.71	1.0	20	0	104	70 - 130	20.53	0.897	20	
tert-Butylbenzene	20.77	1.0	20	0	104	70 - 130	20.84	0.363	20	
Tetrachloroethene	20.55	1.0	20	0	103	70 - 130	20.61	0.29	20	
Toluene	20.33	1.0	20	0	102	70 - 123	20.26	0.353	20	
trans-1,2-Dichloroethene	21.28	1.0	20	0	106	70 - 130	21.62	1.59	20	
trans-1,3-Dichloropropene	21.79	1.0	20	0	109	70 - 121	22.47	3.08	20	
Trichloroethene	20.97	1.0	20	0	105	70 - 129	21.67	3.27	20	
Trichlorofluoromethane	20.34	1.0	20	0	102	70 - 130	21.58	5.94	20	
Vinyl chloride	19.17	1.0	20	0	95.9	70 - 130	20.35	5.96	20	
Surr: 1,2-Dichloroethane-d4	*45.87*	*1.0*	*50*	*0*	*91.7*	*70 - 126*	*46.9*	*2.21*	*20*	
Surr: 4-Bromofluorobenzene	*50.49*	*1.0*	*50*	*0*	*101*	*81 - 113*	*50.07*	*0.838*	*20*	
Surr: Dibromofluoromethane	*47.6*	*1.0*	*50*	*0*	*95.2*	*77 - 123*	*47.92*	*0.666*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325746 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100548-11MSD** Units: **ug/L** Analysis Date: **18-Oct-2018 16:54**
Client ID: **16WW31-181010** Run ID: **VOA2_325746** SeqNo: **4779652** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.91*	*1.0*	*50*	*0*	*89.8*	*82 - 127*	*44.76*	*0.336*	*20*	

The following samples were analyzed in this batch:

HS18100548-01	HS18100548-03	HS18100548-04	HS18100548-05
HS18100548-06	HS18100548-07	HS18100548-08	HS18100548-11

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.77*	*1.0*	*50*	*0*	*89.5*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.49*	*1.0*	*50*	*0*	*99.0*	*82 - 115*				
Surr: Dibromofluoromethane	*48.4*	*1.0*	*50*	*0*	*96.8*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.29*	*1.0*	*50*	*0*	*92.6*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.9	1.0	20	0	110	77 - 118				
1,1,1-Trichloroethane	20.17	1.0	20	0	101	70 - 130				
1,1,2,2-Tetrachloroethane	18.73	1.0	20	0	93.7	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.13	1.0	20	0	111	70 - 130				
1,1,2-Trichloroethane	21.59	1.0	20	0	108	77 - 113				
1,1-Dichloroethane	20.69	1.0	20	0	103	71 - 122				
1,1-Dichloroethene	20.65	1.0	20	0	103	70 - 130				
1,1-Dichloropropene	22.03	1.0	20	0	110	78 - 118				
1,2,3-Trichlorobenzene	20.23	1.0	20	0	101	70 - 130				
1,2,3-Trichloropropane	18.8	1.0	20	0	94.0	70 - 127				
1,2,4-Trichlorobenzene	21.62	1.0	20	0	108	77 - 126				
1,2,4-Trimethylbenzene	22.46	1.0	20	0	112	73 - 121				
1,2-Dibromo-3-chloropropane	17.54	1.0	20	0	87.7	70 - 130				
1,2-Dibromoethane	22.39	1.0	20	0	112	76 - 123				
1,2-Dichlorobenzene	21.11	1.0	20	0	106	77 - 113				
1,2-Dichloroethane	22.56	1.0	20	0	113	70 - 124				
1,2-Dichloropropane	22.14	1.0	20	0	111	72 - 119				
1,3,5-Trimethylbenzene	19.98	1.0	20	0	99.9	75 - 118				
1,3-Dichlorobenzene	20.97	1.0	20	0	105	78 - 118				
1,3-Dichloropropane	21.84	1.0	20	0	109	75 - 116				
1,4-Dichlorobenzene	21.68	1.0	20	0	108	79 - 113				
2,2-Dichloropropane	22.14	1.0	20	0	111	70 - 130				
2-Butanone	39.81	2.0	40	0	99.5	70 - 130				
2-Chlorotoluene	22.93	1.0	20	0	115	70 - 128				
2-Hexanone	39.54	2.0	40	0	98.9	70 - 130				
4-Chlorotoluene	22.78	1.0	20	0	114	74 - 126				
4-Isopropyltoluene	19.4	1.0	20	0	97.0	74 - 126				
4-Methyl-2-pentanone	40.5	2.0	40	0	101	70 - 130				
Acetone	40.41	2.0	40	0	101	70 - 130				
Benzene	21.64	1.0	20	0	108	74 - 120				
Bromobenzene	20.92	1.0	20	0	105	78 - 113				
Bromochloromethane	22.15	1.0	20	0	111	76 - 124				
Bromodichloromethane	22.39	1.0	20	0	112	74 - 122				
Bromoform	21.3	1.0	20	0	107	73 - 128				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.16	1.0	20	0	121	70 - 130				
Carbon disulfide	40.05	2.0	40	0	100	70 - 130				
Carbon tetrachloride	21.81	1.0	20	0	109	71 - 125				
Chlorobenzene	22.48	1.0	20	0	112	76 - 113				
Chloroethane	18.82	1.0	20	0	94.1	70 - 130				
Chloroform	20.57	1.0	20	0	103	71 - 121				
Chloromethane	18.22	1.0	20	0	91.1	70 - 129				
cis-1,2-Dichloroethene	21.8	1.0	20	0	109	75 - 122				
cis-1,3-Dichloropropene	23.68	1.0	20	0	118	73 - 127				
Dibromochloromethane	21.85	1.0	20	0	109	77 - 122				
Dibromomethane	22.8	1.0	20	0	114	78 - 121				
Dichlorodifluoromethane	16.02	1.0	20	0	80.1	70 - 130				
Ethylbenzene	23.45	1.0	20	0	117	77 - 117				S
Hexachlorobutadiene	20.75	1.0	20	0	104	70 - 130				
Isopropylbenzene	21.35	1.0	20	0	107	73 - 127				
m,p-Xylene	48.78	2.0	40	0	122	77 - 122				
Methylene chloride	21.65	2.0	20	0	108	70 - 127				
Naphthalene	19.4	1.0	20	0	97.0	70 - 130				
n-Butylbenzene	21.53	1.0	20	0	108	72 - 130				
n-Propylbenzene	22.93	1.0	20	0	115	73 - 124				
o-Xylene	23.76	1.0	20	0	119	75 - 119				
sec-Butylbenzene	19.62	1.0	20	0	98.1	73 - 128				
Styrene	22.74	1.0	20	0	114	72 - 126				
tert-Butylbenzene	22.15	1.0	20	0	111	73 - 124				
Tetrachloroethene	21.25	1.0	20	0	106	76 - 119				
Toluene	21.16	1.0	20	0	106	77 - 118				
trans-1,2-Dichloroethene	22.17	1.0	20	0	111	72 - 127				
trans-1,3-Dichloropropene	23.72	1.0	20	0	119	77 - 119				
Trichloroethene	23.1	1.0	20	0	115	77 - 121				
Trichlorofluoromethane	20.46	1.0	20	0	102	70 - 130				
Vinyl chloride	19.55	1.0	20	0	97.8	70 - 130				
Surr: 1,2-Dichloroethane-d4	*46.15*	*1.0*	*50*	*0*	*92.3*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.86*	*1.0*	*50*	*0*	*102*	*82 - 115*				
Surr: Dibromofluoromethane	*47.17*	*1.0*	*50*	*0*	*94.3*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.26*	*1.0*	*50*	*0*	*90.5*	*81 - 120*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.93	1.0	20	0	99.6	70 - 120				
1,1,1-Trichloroethane	19.47	1.0	20	0	97.3	70 - 130				
1,1,2,2-Tetrachloroethane	16.62	1.0	20	0	83.1	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	21.64	1.0	20	0	108	70 - 130				
1,1,2-Trichloroethane	19.52	1.0	20	0	97.6	70 - 117				
1,1-Dichloroethane	19.44	1.0	20	0	97.2	70 - 127				
1,1-Dichloroethene	20.24	1.0	20	0	101	70 - 130				
1,1-Dichloropropene	22.55	1.0	20	0	113	70 - 129				
1,2,3-Trichlorobenzene	16.48	1.0	20	0	82.4	70 - 130				
1,2,3-Trichloropropane	16.73	1.0	20	0	83.6	70 - 130				
1,2,4-Trichlorobenzene	17.65	1.0	20	0	88.3	70 - 125				
1,2,4-Trimethylbenzene	19.83	1.0	20	0	99.2	70 - 125				
1,2-Dibromo-3-chloropropane	14.87	1.0	20	0	74.4	70 - 130				
1,2-Dibromoethane	19.89	1.0	20	0	99.5	70 - 124				
1,2-Dichlorobenzene	18.74	1.0	20	0	93.7	70 - 115				
1,2-Dichloroethane	19.14	1.0	20	0	95.7	70 - 127				
1,2-Dichloropropane	20.52	1.0	20	0	103	70 - 122				
1,3,5-Trimethylbenzene	18.38	1.0	20	0	91.9	70 - 126				
1,3-Dichlorobenzene	18.85	1.0	20	0	94.2	70 - 119				
1,3-Dichloropropane	19.64	1.0	20	0	98.2	70 - 121				
1,4-Dichlorobenzene	19.01	1.0	20	0	95.1	70 - 114				
2,2-Dichloropropane	20.09	1.0	20	0	100	70 - 130				
2-Butanone	34.38	2.0	40	0	86.0	70 - 130				
2-Chlorotoluene	20.71	1.0	20	0	104	70 - 130				
2-Hexanone	34.15	2.0	40	0	85.4	70 - 130				
4-Chlorotoluene	20.55	1.0	20	0	103	70 - 130				
4-Isopropyltoluene	17.83	1.0	20	0	89.2	70 - 130				
4-Methyl-2-pentanone	36.27	2.0	40	0	90.7	70 - 130				
Acetone	35.8	2.0	40	0	89.5	70 - 130				
Benzene	20.48	1.0	20	0	102	70 - 127				
Bromobenzene	19.06	1.0	20	0	95.3	70 - 115				
Bromochloromethane	19.62	1.0	20	0	98.1	70 - 127				
Bromodichloromethane	20.37	1.0	20	0	102	70 - 124				
Bromoform	18.57	1.0	20	0	92.9	70 - 129				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	23.12	1.0	20	0	116	70 - 130				
Carbon disulfide	39.49	2.0	40	0	98.7	70 - 130				
Carbon tetrachloride	21.31	1.0	20	0	107	70 - 130				
Chlorobenzene	20.51	1.0	20	0	103	70 - 114				
Chloroethane	19.96	1.0	20	0	99.8	70 - 130				
Chloroform	18.95	1.0	20	0	94.7	70 - 125				
Chloromethane	16.31	1.0	20	0	81.5	70 - 130				
cis-1,2-Dichloroethene	20.24	1.0	20	0	101	70 - 128				
cis-1,3-Dichloropropene	21.1	1.0	20	0	106	70 - 125				
Dibromochloromethane	19.32	1.0	20	0	96.6	70 - 124				
Dibromomethane	20.47	1.0	20	0	102	70 - 124				
Dichlorodifluoromethane	16.46	1.0	20	0	82.3	70 - 130				
Ethylbenzene	22.32	1.0	20	0	112	70 - 124				
Hexachlorobutadiene	18.59	1.0	20	0	92.9	70 - 130				
Isopropylbenzene	19.83	1.0	20	0	99.2	70 - 130				
m,p-Xylene	44.08	2.0	40	0	110	70 - 130				
Methylene chloride	19.79	2.0	20	0	99.0	70 - 128				
Naphthalene	14.85	1.0	20	0	74.2	70 - 130				
n-Butylbenzene	19.62	1.0	20	0	98.1	70 - 130				
n-Propylbenzene	21.13	1.0	20	0	106	70 - 130				
o-Xylene	21.69	1.0	20	0	108	70 - 124				
sec-Butylbenzene	18.74	1.0	20	0	93.7	70 - 130				
Styrene	19.72	1.0	20	0	98.6	70 - 130				
tert-Butylbenzene	20.67	1.0	20	0	103	70 - 130				
Tetrachloroethene	20.42	1.0	20	0	102	70 - 130				
Toluene	20.05	1.0	20	0	100	70 - 123				
trans-1,2-Dichloroethene	20.57	1.0	20	0	103	70 - 130				
trans-1,3-Dichloropropene	21.52	1.0	20	0	108	70 - 121				
Trichloroethene	21.28	1.0	20	0	106	70 - 129				
Trichlorofluoromethane	21.09	1.0	20	0	105	70 - 130				
Vinyl chloride	20.12	1.0	20	0	101	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.12*	*1.0*	*50*	*0*	*94.2*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.83*	*1.0*	*50*	*0*	*104*	*81 - 113*				
Surr: Dibromofluoromethane	*47.28*	*1.0*	*50*	*0*	*94.6*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.83*	*1.0*	*50*	*0*	*89.7*	*82 - 127*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.67	1.0	20	0	98.3	70 - 120	19.93	1.3	20	
1,1,1-Trichloroethane	18.24	1.0	20	0	91.2	70 - 130	19.47	6.49	20	
1,1,2,2-Tetrachloroethane	15.89	1.0	20	0	79.5	70 - 123	16.62	4.49	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	19.82	1.0	20	0	99.1	70 - 130	21.64	8.76	20	
1,1,2-Trichloroethane	19.13	1.0	20	0	95.7	70 - 117	19.52	2	20	
1,1-Dichloroethane	18.24	1.0	20	0	91.2	70 - 127	19.44	6.36	20	
1,1-Dichloroethene	18.81	1.0	20	0	94.0	70 - 130	20.24	7.34	20	
1,1-Dichloropropene	20.91	1.0	20	0	105	70 - 129	22.55	7.55	20	
1,2,3-Trichlorobenzene	16.77	1.0	20	0	83.8	70 - 130	16.48	1.73	20	
1,2,3-Trichloropropane	16.43	1.0	20	0	82.1	70 - 130	16.73	1.82	20	
1,2,4-Trichlorobenzene	17.98	1.0	20	0	89.9	70 - 125	17.65	1.85	20	
1,2,4-Trimethylbenzene	19.53	1.0	20	0	97.7	70 - 125	19.83	1.53	20	
1,2-Dibromo-3-chloropropane	14.25	1.0	20	0	71.3	70 - 130	14.87	4.25	20	
1,2-Dibromoethane	19.34	1.0	20	0	96.7	70 - 124	19.89	2.81	20	
1,2-Dichlorobenzene	18.24	1.0	20	0	91.2	70 - 115	18.74	2.71	20	
1,2-Dichloroethane	19.32	1.0	20	0	96.6	70 - 127	19.14	0.916	20	
1,2-Dichloropropane	20.11	1.0	20	0	101	70 - 122	20.52	1.99	20	
1,3,5-Trimethylbenzene	17.6	1.0	20	0	88.0	70 - 126	18.38	4.3	20	
1,3-Dichlorobenzene	18.73	1.0	20	0	93.6	70 - 119	18.85	0.636	20	
1,3-Dichloropropane	18.95	1.0	20	0	94.7	70 - 121	19.64	3.62	20	
1,4-Dichlorobenzene	18.82	1.0	20	0	94.1	70 - 114	19.01	1.04	20	
2,2-Dichloropropane	18.81	1.0	20	0	94.0	70 - 130	20.09	6.58	20	
2-Butanone	34.35	2.0	40	0	85.9	70 - 130	34.38	0.0911	20	
2-Chlorotoluene	19.91	1.0	20	0	99.6	70 - 130	20.71	3.92	20	
2-Hexanone	34.65	2.0	40	0	86.6	70 - 130	34.15	1.46	20	
4-Chlorotoluene	20.09	1.0	20	0	100	70 - 130	20.55	2.26	20	
4-Isopropyltoluene	17.1	1.0	20	0	85.5	70 - 130	17.83	4.21	20	
4-Methyl-2-pentanone	35.68	2.0	40	0	89.2	70 - 130	36.27	1.63	20	
Acetone	32.18	2.0	40	0	80.4	70 - 130	35.8	10.7	20	
Benzene	19.68	1.0	20	0	98.4	70 - 127	20.48	3.98	20	
Bromobenzene	18.59	1.0	20	0	93.0	70 - 115	19.06	2.49	20	
Bromochloromethane	19.83	1.0	20	0	99.1	70 - 127	19.62	1.07	20	
Bromodichloromethane	19.79	1.0	20	0	98.9	70 - 124	20.37	2.89	20	
Bromoform	18.27	1.0	20	0	91.3	70 - 129	18.57	1.65	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	20.98	1.0	20	0	105	70 - 130	23.12	9.72	20	
Carbon disulfide	36.19	2.0	40	0	90.5	70 - 130	39.49	8.72	20	
Carbon tetrachloride	20.74	1.0	20	0	104	70 - 130	21.31	2.73	20	
Chlorobenzene	19.53	1.0	20	0	97.6	70 - 114	20.51	4.92	20	
Chloroethane	18.48	1.0	20	0	92.4	70 - 130	19.96	7.72	20	
Chloroform	18.47	1.0	20	0	92.4	70 - 125	18.95	2.55	20	
Chloromethane	15.83	1.0	20	0	79.1	70 - 130	16.31	3.01	20	
cis-1,2-Dichloroethene	19.71	1.0	20	0	98.5	70 - 128	20.24	2.69	20	
cis-1,3-Dichloropropene	20.74	1.0	20	0	104	70 - 125	21.1	1.73	20	
Dibromochloromethane	18.89	1.0	20	0	94.5	70 - 124	19.32	2.25	20	
Dibromomethane	20.01	1.0	20	0	100	70 - 124	20.47	2.29	20	
Dichlorodifluoromethane	14.34	1.0	20	0	71.7	70 - 130	16.46	13.8	20	
Ethylbenzene	20.91	1.0	20	0	105	70 - 124	22.32	6.53	20	
Hexachlorobutadiene	17.83	1.0	20	0	89.2	70 - 130	18.59	4.17	20	
Isopropylbenzene	18.68	1.0	20	0	93.4	70 - 130	19.83	5.99	20	
m,p-Xylene	41.93	2.0	40	0	105	70 - 130	44.08	5	20	
Methylene chloride	19.21	2.0	20	0	96.1	70 - 128	19.79	2.98	20	
Naphthalene	15.43	1.0	20	0	77.2	70 - 130	14.85	3.84	20	
n-Butylbenzene	18.9	1.0	20	0	94.5	70 - 130	19.62	3.74	20	
n-Propylbenzene	19.91	1.0	20	0	99.6	70 - 130	21.13	5.92	20	
o-Xylene	20.75	1.0	20	0	104	70 - 124	21.69	4.43	20	
sec-Butylbenzene	17.69	1.0	20	0	88.5	70 - 130	18.74	5.72	20	
Styrene	19.17	1.0	20	0	95.8	70 - 130	19.72	2.83	20	
tert-Butylbenzene	19.41	1.0	20	0	97.1	70 - 130	20.67	6.26	20	
Tetrachloroethene	19.01	1.0	20	0	95.0	70 - 130	20.42	7.18	20	
Toluene	18.86	1.0	20	0	94.3	70 - 123	20.05	6.11	20	
trans-1,2-Dichloroethene	19.55	1.0	20	0	97.8	70 - 130	20.57	5.06	20	
trans-1,3-Dichloropropene	21.15	1.0	20	0	106	70 - 121	21.52	1.72	20	
Trichloroethene	20.09	1.0	20	0	100	70 - 129	21.28	5.75	20	
Trichlorofluoromethane	19.62	1.0	20	0	98.1	70 - 130	21.09	7.23	20	
Vinyl chloride	18.52	1.0	20	0	92.6	70 - 130	20.12	8.3	20	
Surr: 1,2-Dichloroethane-d4	*46.4*	*1.0*	*50*	*0*	*92.8*	*70 - 126*	*47.12*	*1.54*	*20*	
Surr: 4-Bromofluorobenzene	*50.76*	*1.0*	*50*	*0*	*102*	*81 - 113*	*51.83*	*2.1*	*20*	
Surr: Dibromofluoromethane	*46.93*	*1.0*	*50*	*0*	*93.9*	*77 - 123*	*47.28*	*0.751*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.83*	*1.0*	*50*	*0*	*89.7*	*82 - 127*	*44.83*	*0.00577*	*20*	

The following samples were analyzed in this batch: HS18100548-09 HS18100548-10 HS18100548-12 HS18100548-13 HS18100548-14

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 15:34**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782254** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 15:34**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782254** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.18*	*1.0*	*50*	*0*	*90.4*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.92*	*1.0*	*50*	*0*	*97.8*	*82 - 115*				
Surr: Dibromofluoromethane	*48*	*1.0*	*50*	*0*	*96.0*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MBLK Sample ID: **VBLKW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 15:34**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782254** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.88*	*1.0*	*50*	*0*	*91.8*	*81 - 120*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 14:45**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782252** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.75	1.0	20	0	109	77 - 118				
1,1,1-Trichloroethane	19.47	1.0	20	0	97.4	70 - 130				
1,1,2,2-Tetrachloroethane	19.27	1.0	20	0	96.4	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.29	1.0	20	0	111	70 - 130				
1,1,2-Trichloroethane	21.3	1.0	20	0	107	77 - 113				
1,1-Dichloroethane	20.01	1.0	20	0	100	71 - 122				
1,1-Dichloroethene	20.15	1.0	20	0	101	70 - 130				
1,1-Dichloropropene	21.55	1.0	20	0	108	78 - 118				
1,2,3-Trichlorobenzene	20.5	1.0	20	0	103	70 - 130				
1,2,3-Trichloropropane	19.93	1.0	20	0	99.7	70 - 127				
1,2,4-Trichlorobenzene	20.89	1.0	20	0	104	77 - 126				
1,2,4-Trimethylbenzene	21.83	1.0	20	0	109	73 - 121				
1,2-Dibromo-3-chloropropane	19.8	1.0	20	0	99.0	70 - 130				
1,2-Dibromoethane	21.98	1.0	20	0	110	76 - 123				
1,2-Dichlorobenzene	20.64	1.0	20	0	103	77 - 113				
1,2-Dichloroethane	21.37	1.0	20	0	107	70 - 124				
1,2-Dichloropropane	21.87	1.0	20	0	109	72 - 119				
1,3,5-Trimethylbenzene	19.61	1.0	20	0	98.1	75 - 118				
1,3-Dichlorobenzene	20.77	1.0	20	0	104	78 - 118				
1,3-Dichloropropane	21.46	1.0	20	0	107	75 - 116				
1,4-Dichlorobenzene	20.68	1.0	20	0	103	79 - 113				
2,2-Dichloropropane	23.09	1.0	20	0	115	70 - 130				
2-Butanone	43.1	2.0	40	0	108	70 - 130				
2-Chlorotoluene	21.68	1.0	20	0	108	70 - 128				
2-Hexanone	44.08	2.0	40	0	110	70 - 130				
4-Chlorotoluene	22.11	1.0	20	0	111	74 - 126				
4-Isopropyltoluene	19.02	1.0	20	0	95.1	74 - 126				
4-Methyl-2-pentanone	44.25	2.0	40	0	111	70 - 130				
Acetone	43.75	2.0	40	0	109	70 - 130				
Benzene	21.17	1.0	20	0	106	74 - 120				
Bromobenzene	20.29	1.0	20	0	101	78 - 113				
Bromochloromethane	20.85	1.0	20	0	104	76 - 124				
Bromodichloromethane	21.72	1.0	20	0	109	74 - 122				
Bromoform	21.81	1.0	20	0	109	73 - 128				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 14:45**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782252** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.93	1.0	20	0	125	70 - 130				
Carbon disulfide	39.37	2.0	40	0	98.4	70 - 130				
Carbon tetrachloride	19.96	1.0	20	0	99.8	71 - 125				
Chlorobenzene	21.63	1.0	20	0	108	76 - 113				
Chloroethane	20.34	1.0	20	0	102	70 - 130				
Chloroform	19.75	1.0	20	0	98.8	71 - 121				
Chloromethane	18.4	1.0	20	0	92.0	70 - 129				
cis-1,2-Dichloroethene	21.1	1.0	20	0	106	75 - 122				
cis-1,3-Dichloropropene	22.84	1.0	20	0	114	73 - 127				
Dibromochloromethane	21.45	1.0	20	0	107	77 - 122				
Dibromomethane	21.93	1.0	20	0	110	78 - 121				
Dichlorodifluoromethane	14.93	1.0	20	0	74.7	70 - 130				
Ethylbenzene	22.99	1.0	20	0	115	77 - 117				
Hexachlorobutadiene	20.85	1.0	20	0	104	70 - 130				
Isopropylbenzene	20.82	1.0	20	0	104	73 - 127				
m,p-Xylene	47.43	2.0	40	0	119	77 - 122				
Methylene chloride	21.37	2.0	20	0	107	70 - 127				
Naphthalene	19.83	1.0	20	0	99.1	70 - 130				
n-Butylbenzene	21.2	1.0	20	0	106	72 - 130				
n-Propylbenzene	22.35	1.0	20	0	112	73 - 124				
o-Xylene	23.2	1.0	20	0	116	75 - 119				
sec-Butylbenzene	19.45	1.0	20	0	97.2	73 - 128				
Styrene	21.99	1.0	20	0	110	72 - 126				
tert-Butylbenzene	21.99	1.0	20	0	110	73 - 124				
Tetrachloroethene	20.63	1.0	20	0	103	76 - 119				
Toluene	20.87	1.0	20	0	104	77 - 118				
trans-1,2-Dichloroethene	21.21	1.0	20	0	106	72 - 127				
trans-1,3-Dichloropropene	23.25	1.0	20	0	116	77 - 119				
Trichloroethene	21.88	1.0	20	0	109	77 - 121				
Trichlorofluoromethane	21.23	1.0	20	0	106	70 - 130				
Vinyl chloride	19.55	1.0	20	0	97.8	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.95*	*1.0*	*50*	*0*	*95.9*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.45*	*1.0*	*50*	*0*	*101*	*82 - 115*				
Surr: Dibromofluoromethane	*46.69*	*1.0*	*50*	*0*	*93.4*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

LCS Sample ID: **VLCSW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 14:45**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782252** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.49*	*1.0*	*50*	*0*	*89.0*	*81 - 120*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100727-05MS** Units: **ug/L** Analysis Date: **19-Oct-2018 17:44**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.18	1.0	20	0	101	70 - 120				
1,1,1-Trichloroethane	19.32	1.0	20	0	96.6	70 - 130				
1,1,2,2-Tetrachloroethane	17.91	1.0	20	0	89.5	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	24.02	1.0	20	0	120	70 - 130				
1,1,2-Trichloroethane	20.01	1.0	20	0	100	70 - 117				
1,1-Dichloroethane	19.4	1.0	20	0	97.0	70 - 127				
1,1-Dichloroethene	22.7	1.0	20	3.55	95.8	70 - 130				
1,1-Dichloropropene	22.16	1.0	20	0	111	70 - 129				
1,2,3-Trichlorobenzene	17.36	1.0	20	0	86.8	70 - 130				
1,2,3-Trichloropropane	18.33	1.0	20	0	91.6	70 - 130				
1,2,4-Trichlorobenzene	18.21	1.0	20	0	91.1	70 - 125				
1,2,4-Trimethylbenzene	19.62	1.0	20	0	98.1	70 - 125				
1,2-Dibromo-3-chloropropane	17.74	1.0	20	0	88.7	70 - 130				
1,2-Dibromoethane	20.65	1.0	20	0	103	70 - 124				
1,2-Dichlorobenzene	18.6	1.0	20	0	93.0	70 - 115				
1,2-Dichloroethane	24.04	1.0	20	3.762	101	70 - 127				
1,2-Dichloropropane	20.83	1.0	20	0	104	70 - 122				
1,3,5-Trimethylbenzene	18.19	1.0	20	0	90.9	70 - 126				
1,3-Dichlorobenzene	18.98	1.0	20	0	94.9	70 - 119				
1,3-Dichloropropane	20.27	1.0	20	0	101	70 - 121				
1,4-Dichlorobenzene	18.95	1.0	20	0	94.7	70 - 114				
2,2-Dichloropropane	21.02	1.0	20	0	105	70 - 130				
2-Butanone	38.13	2.0	40	0	95.3	70 - 130				
2-Chlorotoluene	20.09	1.0	20	0	100	70 - 130				
2-Hexanone	41.2	2.0	40	0	103	70 - 130				
4-Chlorotoluene	20.48	1.0	20	0	102	70 - 130				
4-Isopropyltoluene	17.74	1.0	20	0	88.7	70 - 130				
4-Methyl-2-pentanone	41.05	2.0	40	0	103	70 - 130				
Acetone	34.42	2.0	40	0	86.0	70 - 130				
Benzene	20.81	1.0	20	0.5277	101	70 - 127				
Bromobenzene	18.59	1.0	20	0	92.9	70 - 115				
Bromochloromethane	20.15	1.0	20	0	101	70 - 127				
Bromodichloromethane	20.29	1.0	20	0	101	70 - 124				
Bromoform	20.42	1.0	20	0	102	70 - 129				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100727-05MS** Units: **ug/L** Analysis Date: **19-Oct-2018 17:44**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	21.92	1.0	20	0	110	70 - 130				
Carbon disulfide	40.63	2.0	40	0	102	70 - 130				
Carbon tetrachloride	21.78	1.0	20	0	109	70 - 130				
Chlorobenzene	20.6	1.0	20	0	103	70 - 114				
Chloroethane	21.35	1.0	20	0	107	70 - 130				
Chloroform	19	1.0	20	0	95.0	70 - 125				
Chloromethane	16.72	1.0	20	0	83.6	70 - 130				
cis-1,2-Dichloroethene	232.9	1.0	20	212.7	101	70 - 128				EO
cis-1,3-Dichloropropene	20.64	1.0	20	0	103	70 - 125				
Dibromochloromethane	19.61	1.0	20	0	98.1	70 - 124				
Dibromomethane	21.09	1.0	20	0	105	70 - 124				
Dichlorodifluoromethane	14.69	1.0	20	0	73.5	70 - 130				
Ethylbenzene	22.17	1.0	20	0	111	70 - 124				
Hexachlorobutadiene	18.11	1.0	20	0	90.6	70 - 130				
Isopropylbenzene	19.88	1.0	20	0	99.4	70 - 130				
m,p-Xylene	43.96	2.0	40	0	110	70 - 130				
Methylene chloride	19.7	2.0	20	0	98.5	70 - 128				
Naphthalene	16.84	1.0	20	0	84.2	70 - 130				
n-Butylbenzene	19.56	1.0	20	0	97.8	70 - 130				
n-Propylbenzene	20.51	1.0	20	0	103	70 - 130				
o-Xylene	21.5	1.0	20	0	108	70 - 124				
sec-Butylbenzene	18.26	1.0	20	0	91.3	70 - 130				
Styrene	20	1.0	20	0	100	70 - 130				
tert-Butylbenzene	20.09	1.0	20	0	100	70 - 130				
Tetrachloroethene	19.95	1.0	20	0	99.8	70 - 130				
Toluene	20.04	1.0	20	0	100	70 - 123				
trans-1,2-Dichloroethene	21.73	1.0	20	0	109	70 - 130				
trans-1,3-Dichloropropene	21.62	1.0	20	0	108	70 - 121				
Trichloroethene	573.1	1.0	20	561.2	59.8	70 - 129				SEO
Trichlorofluoromethane	20.48	1.0	20	0	102	70 - 130				
Vinyl chloride	23.88	1.0	20	4.474	97.0	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.93*	*1.0*	*50*	*0*	*95.9*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.6*	*1.0*	*50*	*0*	*103*	*81 - 113*				
Surr: Dibromofluoromethane	*47.71*	*1.0*	*50*	*0*	*95.4*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100727-05MS** Units: **ug/L** Analysis Date: **19-Oct-2018 17:44**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.93*	*1.0*	*50*	*0*	*89.9*	*82 - 127*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100727-05MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 18:09**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.75	1.0	20	0	98.8	70 - 120	20.18	2.13	20	
1,1,1-Trichloroethane	17.42	1.0	20	0	87.1	70 - 130	19.32	10.3	20	
1,1,2,2-Tetrachloroethane	18.3	1.0	20	0	91.5	70 - 123	17.91	2.14	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	20.52	1.0	20	0	103	70 - 130	24.02	15.7	20	
1,1,2-Trichloroethane	19.87	1.0	20	0	99.3	70 - 117	20.01	0.72	20	
1,1-Dichloroethane	19.19	1.0	20	0	96.0	70 - 127	19.4	1.06	20	
1,1-Dichloroethene	21.37	1.0	20	3.55	89.1	70 - 130	22.7	6.05	20	
1,1-Dichloropropene	20.34	1.0	20	0	102	70 - 129	22.16	8.57	20	
1,2,3-Trichlorobenzene	17.64	1.0	20	0	88.2	70 - 130	17.36	1.57	20	
1,2,3-Trichloropropane	18.31	1.0	20	0	91.5	70 - 130	18.33	0.113	20	
1,2,4-Trichlorobenzene	18.38	1.0	20	0	91.9	70 - 125	18.21	0.926	20	
1,2,4-Trimethylbenzene	19.65	1.0	20	0	98.2	70 - 125	19.62	0.144	20	
1,2-Dibromo-3-chloropropane	17.5	1.0	20	0	87.5	70 - 130	17.74	1.34	20	
1,2-Dibromoethane	20.23	1.0	20	0	101	70 - 124	20.65	2.05	20	
1,2-Dichlorobenzene	18.6	1.0	20	0	93.0	70 - 115	18.6	0.00724	20	
1,2-Dichloroethane	23.89	1.0	20	3.762	101	70 - 127	24.04	0.603	20	
1,2-Dichloropropane	19.7	1.0	20	0	98.5	70 - 122	20.83	5.58	20	
1,3,5-Trimethylbenzene	17.62	1.0	20	0	88.1	70 - 126	18.19	3.19	20	
1,3-Dichlorobenzene	18.81	1.0	20	0	94.1	70 - 119	18.98	0.881	20	
1,3-Dichloropropane	19.74	1.0	20	0	98.7	70 - 121	20.27	2.64	20	
1,4-Dichlorobenzene	18.94	1.0	20	0	94.7	70 - 114	18.95	0.0219	20	
2,2-Dichloropropane	18.98	1.0	20	0	94.9	70 - 130	21.02	10.2	20	
2-Butanone	37.77	2.0	40	0	94.4	70 - 130	38.13	0.952	20	
2-Chlorotoluene	19.64	1.0	20	0	98.2	70 - 130	20.09	2.25	20	
2-Hexanone	40.96	2.0	40	0	102	70 - 130	41.2	0.589	20	
4-Chlorotoluene	20.09	1.0	20	0	100	70 - 130	20.48	1.92	20	
4-Isopropyltoluene	17.08	1.0	20	0	85.4	70 - 130	17.74	3.8	20	
4-Methyl-2-pentanone	41.01	2.0	40	0	103	70 - 130	41.05	0.0964	20	
Acetone	39.27	2.0	40	0	98.2	70 - 130	34.42	13.2	20	
Benzene	19.75	1.0	20	0.5277	96.1	70 - 127	20.81	5.25	20	
Bromobenzene	18.67	1.0	20	0	93.4	70 - 115	18.59	0.463	20	
Bromochloromethane	19.71	1.0	20	0	98.5	70 - 127	20.15	2.25	20	
Bromodichloromethane	19.76	1.0	20	0	98.8	70 - 124	20.29	2.64	20	
Bromoform	19.86	1.0	20	0	99.3	70 - 129	20.42	2.82	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100727-05MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 18:09**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	19.91	1.0	20	0	99.6	70 - 130	21.92	9.62	20	
Carbon disulfide	37.59	2.0	40	0	94.0	70 - 130	40.63	7.77	20	
Carbon tetrachloride	20.65	1.0	20	0	103	70 - 130	21.78	5.29	20	
Chlorobenzene	19.96	1.0	20	0	99.8	70 - 114	20.6	3.11	20	
Chloroethane	20.59	1.0	20	0	103	70 - 130	21.35	3.64	20	
Chloroform	18.04	1.0	20	0	90.2	70 - 125	19	5.2	20	
Chloromethane	15.25	1.0	20	0	76.3	70 - 130	16.72	9.16	20	
cis-1,2-Dichloroethene	226.8	1.0	20	212.7	70.6	70 - 128	232.9	2.64	20	EO
cis-1,3-Dichloropropene	20.87	1.0	20	0	104	70 - 125	20.64	1.09	20	
Dibromochloromethane	19.47	1.0	20	0	97.4	70 - 124	19.61	0.734	20	
Dibromomethane	20.41	1.0	20	0	102	70 - 124	21.09	3.26	20	
Dichlorodifluoromethane	13.19	1.0	20	0	66.0	70 - 130	14.69	10.8	20	S
Ethylbenzene	21.25	1.0	20	0	106	70 - 124	22.17	4.2	20	
Hexachlorobutadiene	17.97	1.0	20	0	89.9	70 - 130	18.11	0.764	20	
Isopropylbenzene	18.93	1.0	20	0	94.7	70 - 130	19.88	4.86	20	
m,p-Xylene	42.1	2.0	40	0	105	70 - 130	43.96	4.32	20	
Methylene chloride	18.35	2.0	20	0	91.7	70 - 128	19.7	7.1	20	
Naphthalene	17.85	1.0	20	0	89.3	70 - 130	16.84	5.84	20	
n-Butylbenzene	18.9	1.0	20	0	94.5	70 - 130	19.56	3.4	20	
n-Propylbenzene	19.58	1.0	20	0	97.9	70 - 130	20.51	4.64	20	
o-Xylene	20.28	1.0	20	0	101	70 - 124	21.5	5.87	20	
sec-Butylbenzene	17.48	1.0	20	0	87.4	70 - 130	18.26	4.4	20	
Styrene	19.66	1.0	20	0	98.3	70 - 130	20	1.72	20	
tert-Butylbenzene	19.54	1.0	20	0	97.7	70 - 130	20.09	2.76	20	
Tetrachloroethene	18.79	1.0	20	0	94.0	70 - 130	19.95	5.97	20	
Toluene	18.93	1.0	20	0	94.6	70 - 123	20.04	5.7	20	
trans-1,2-Dichloroethene	20.47	1.0	20	0	102	70 - 130	21.73	5.95	20	
trans-1,3-Dichloropropene	21.43	1.0	20	0	107	70 - 121	21.62	0.868	20	
Trichloroethene	549.7	1.0	20	561.2	-57.6	70 - 129	573.1	4.18	20	SEO
Trichlorofluoromethane	18.47	1.0	20	0	92.3	70 - 130	20.48	10.3	20	
Vinyl chloride	21.31	1.0	20	4.474	84.2	70 - 130	23.88	11.4	20	
Surr: 1,2-Dichloroethane-d4	*47.26*	*1.0*	*50*	*0*	*94.5*	*70 - 126*	*47.93*	*1.42*	*20*	
Surr: 4-Bromofluorobenzene	*50.98*	*1.0*	*50*	*0*	*102*	*81 - 113*	*51.6*	*1.21*	*20*	
Surr: Dibromofluoromethane	*47.27*	*1.0*	*50*	*0*	*94.5*	*77 - 123*	*47.71*	*0.931*	*20*	

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100727-05MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 18:09**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.75*	*1.0*	*50*	*0*	*89.5*	*82 - 127*	*44.93*	*0.394*	*20*	

The following samples were analyzed in this batch: HS18100548-02

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325461 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-101118** Units: **mg/L** Analysis Date: **11-Oct-2018 18:26**
Client ID: Run ID: **ICS2100_325461** SeqNo: **4773169** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Chloride	0.500	0.500								U
Fluoride	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-101118** Units: **mg/L** Analysis Date: **11-Oct-2018 18:41**
Client ID: Run ID: **ICS2100_325461** SeqNo: **4773170** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.764	0.100	4	0	94.1	80 - 120				
Chloride	20.54	0.500	20	0	103	80 - 120				
Fluoride	4.321	0.100	4	0	108	80 - 120				
Nitrogen, Nitrate (As N)	4.021	0.100	4	0	101	80 - 120				
Nitrogen, Nitrite (As N)	4.286	0.100	4	0	107	80 - 120				
Sulfate	20.29	0.500	20	0	101	80 - 120				

LCSD Sample ID: **WLCSDW1-101118** Units: **mg/L** Analysis Date: **11-Oct-2018 18:56**
Client ID: Run ID: **ICS2100_325461** SeqNo: **4773171** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.7	0.100	4	0	92.5	80 - 120	3.764	1.71	20	
Chloride	20.14	0.500	20	0	101	80 - 120	20.54	1.96	20	
Fluoride	4.244	0.100	4	0	106	80 - 120	4.321	1.8	20	
Nitrogen, Nitrate (As N)	3.951	0.100	4	0	98.8	80 - 120	4.021	1.76	20	
Nitrogen, Nitrite (As N)	4.214	0.100	4	0	105	80 - 120	4.286	1.69	20	
Sulfate	19.99	0.500	20	0	100.0	80 - 120	20.29	1.47	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325461 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MS Sample ID: **HS18100564-02MS** Units: **mg/L** Analysis Date: **11-Oct-2018 19:54**
Client ID: Run ID: **ICS2100_325461** SeqNo: **4773173** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.685	0.100	2	0	84.2	80 - 120				
Chloride	17.58	0.500	10	7.274	103	80 - 120				
Fluoride	2.472	0.100	2	0.248	111	80 - 120				
Nitrogen, Nitrate (As N)	2.005	0.100	2	0	100	80 - 120				
Nitrogen, Nitrite (As N)	2.106	0.100	2	0	105	80 - 120				
Sulfate	21.24	0.500	10	11.06	102	80 - 120				

MSD Sample ID: **HS18100564-02MSD** Units: **mg/L** Analysis Date: **11-Oct-2018 20:08**
Client ID: Run ID: **ICS2100_325461** SeqNo: **4773174** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.686	0.100	2	0	84.3	80 - 120	1.685	0.0593	20	
Chloride	17.63	0.500	10	7.274	104	80 - 120	17.58	0.295	20	
Fluoride	2.484	0.100	2	0.248	112	80 - 120	2.472	0.484	20	
Nitrogen, Nitrate (As N)	2.005	0.100	2	0	100	80 - 120	2.005	0	20	
Nitrogen, Nitrite (As N)	2.107	0.100	2	0	105	80 - 120	2.106	0.0475	20	
Sulfate	21.27	0.500	10	11.06	102	80 - 120	21.24	0.136	20	

The following samples were analyzed in this batch: HS18100548-09 HS18100548-10 HS18100548-13 HS18100548-14

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: HS18100548

QC BATCH REPORT

Batch ID: R325562 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-181016** Units: **mg/L** Analysis Date: **16-Oct-2018 13:21**
Client ID: Run ID: **ManTech01_325562** SeqNo: **4775229** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS1-181016** Units: **mg/L** Analysis Date: **16-Oct-2018 13:30**
Client ID: Run ID: **ManTech01_325562** SeqNo: **4775230** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1077	5.00	1000	0	108	85 - 115				

LCSD Sample ID: **WLCSD1-181016** Units: **mg/L** Analysis Date: **16-Oct-2018 13:39**
Client ID: Run ID: **ManTech01_325562** SeqNo: **4775231** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1070	5.00	1000	0	107	85 - 115	1077	0.645	20	

DUP Sample ID: **HS18100431-03DUP** Units: **mg/L** Analysis Date: **16-Oct-2018 13:56**
Client ID: Run ID: **ManTech01_325562** SeqNo: **4775233** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	916.4	5.00					921.3	0.53	20	

The following samples were analyzed in this batch: HS18100548-09 HS18100548-10 HS18100548-13

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP 50
WorkOrder: **HS18100548**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

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Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18100548

Date/Time Received: **11-Oct-2018 09:05**
Received by: **RPG**

Checklist completed by: *Jared R. Makan* eSignature 11-Oct-2018 Date

Reviewed by: *RJ Modashia* eSignature 11-Oct-2018 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.8c/2.4c UC/C	IR11
Cooler(s)/Kit(s):	25093	
Date/Time sample(s) sent to storage:	10/11/2018 12:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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APTIM

COC ID: LHAAP16-OCT2018-GW-ALSHT-181010 TURNAROUND TIME: normal RUSH: Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-50			Email	RJ.Modashia@alsglobal.com			Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FED EX		

SAMPLE DETAILS									ANALYSIS REQUESTED								
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	VOCs in Water by 8260B	Perchlorate in Water by 6850	Anions in Water by E300.0 & Alkalinity in Water by E2320b	Bromide by E300.0	Dissolved Gases in Water by RSK175	TOC in Water by SW9060			
16TB02-181010	FIELD QC				LIQ	10/10/2018	830	2	2								
16WW38-181010	16WW38	29.18	29.48	FT	GW	10/10/2018	949	4	3	1							
16WW44-181010	16WW44	25.8	26.76	FT	GW	10/10/2018	1005	4	3	1							
16WW33-181010	16WW33	31.39	31.75	FT	GW	10/10/2018	1020	4	3	1							
16WW37-181010	16WW37	29.28	30.29	FT	GW	10/10/2018	1039	4	3	1							
16WW45-181010	16WW45	25.81	26.73	FT	GW	10/10/2018	1110	4	3	1							
16WW14-181010	16WW14	26.71	26.96	FT	GW	10/10/2018	1202	4	3	1							
16WW34-181010	16WW34	31.35	31.82	FT	GW	10/10/2018	1305	4	3	1							
16WW35-181010	16WW35	19.48	20.29	FT	GW	10/10/2018	1311	11	3	1	1	1	3	2			
16WW16-181010	16WW16	23.28	23.43	FT	GW	10/10/2018	1315	11	3	1	1	1	3	2			
16WW31-181010	16WW31	31.45	31.55	FT	GW	10/10/2018	1430	4	3	1							
16WW31-181010-FD	16WW31	31.45	31.55	FT	GW	10/10/2018	1430	4	3	1							
16WW31-181010-MS	16WW31	31.45	31.55	FT	GW	10/10/2018	1430	4	3	1							
16WW31-181010-MSD	16WW31	31.45	31.55	FT	GW	10/10/2018	1430	4	3	1							
16WW22-181010	16WW22	29.17	29.53	FT	GW	10/10/2018	1500	11	3	1	1	1	3	2			
16WW39-181010	16WW39	21.66	22.04	FT	GW	10/10/2018	1539	5	3	1		1					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	[illegible]/APTIM	10/10/18 1815	RCJ	10/11/18 0410

HS18100548

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant LHAAP 50

25013 ALC 2.5
10 X 11 ALC-2.4

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CUST ratory Group
DATE: 10 cliff Rd. Ste#210
Signature: n, TX 77099
LH 530.565[illegible]

ALS Labo DY SEAL
10450 Star 10-18 10/11/18
Houst
281 IAAP

CUSTOD Y SEAL
DATE: 10-10 -18 10/11/18
Signature:
LHA AP

ALS Laborat ory Group
10450 Stanclif f Rd. Ste#210
Houston, TX 77099
281.53 0.5656

FedEx
TRK# 0221 4380 9533 1403

AB SGRA

THU - 11 OCT 10:30A
PRIORITY OVERNIGHT

TX-US IAH 77099

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1828819; 1828820; 1828821; 1828822

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2156 (225255)

General Set Information: There were sixteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1828821001 was analyzed and reported from a 1:1,000 dilution. Field samples 1828822008/09/15 were analyzed and reported from a 1:10 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 623846) was less than 1/2 the CRDL. The recovery for the LCS (623847) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 18288011/12 (Client ID: 16WW31-181010). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1

Thomas Bosch October 25, 2018
Analyst Date

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ANALYTICAL REPORT

Report Date: October 25, 2018

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1828822**
Project ID: HS18100548 101018
Purchase Order: HS18100548
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16WW38-181010	1828822001	10/10/18	10/12/18	
16WW44-181010	1828822002	10/10/18	10/12/18	
16WW33-181010	1828822003	10/10/18	10/12/18	
16WW37-181010	1828822004	10/10/18	10/12/18	
16WW45-181010	1828822005	10/10/18	10/12/18	
16WW14-181010	1828822006	10/10/18	10/12/18	
16WW34-181010	1828822007	10/10/18	10/12/18	
16WW35-181010	1828822008	10/10/18	10/12/18	
16WW16-181010	1828822009	10/10/18	10/12/18	
16WW31-181010	1828822010	10/10/18	10/12/18	
16WW31-181010-FD	1828822013	10/10/18	10/12/18	
16WW22-181010	1828822014	10/10/18	10/12/18	
16WW39-181010	1828822015	10/10/18	10/12/18	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
16WW31-181010MS	1828822011	10/10/18	10/12/18	
16WW31-181010MSD	1828822012	10/10/18	10/12/18	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1828822
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW38-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822001 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 09:59 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW44-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822002 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 10:13 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW33-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822003 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 10:27 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW37-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822004 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 10:42 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1828822
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW45-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822005 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 10:56 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW14-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822006 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 11:10 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW34-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822007 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 11:24 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW35-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822008 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 12:07 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**420**	10	20	40	10	

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ANALYTICAL REPORT

Workorder: 34-1828822
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW16-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822009 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 12:21 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**420**	10	20	40	10	

Sample ID: **16WW31-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822010 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 12:35 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW31-181010-FD** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822013 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 14:00 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW22-181010** | Sampling Site: NA | Collected: 10/10/2018
Lab ID: 1828822014 | Media: 125 mL Nalgene | Received: 10/12/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2156 (HBN: 225255) | **Percent Solid:** NA
Analyzed: 10/19/2018 14:14 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**5.5**	1.0	2.0	4.0	1	

ANALYTICAL REPORT

Workorder: 34-1828822
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW39-181010**	Sampling Site: NA	Collected: 10/10/2018
Lab ID: 1828822015	Media: 125 mL Nalgene	Received: 10/12/2018
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2156 (HBN: 225255)	**Percent Solid:** NA
	Analyzed: 10/19/2018 14:33	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**120**	10	20	40	10	

Comments

Workorder: **1828822**

Field samples 1828822008/09/15 were analyzed and reported from a 1:10 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/24/2018 13:21	/S/ Stephen Brose 10/25/2018 13:31

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1828822
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body	Certificate Number	Website
Environmental	PJLA (DoD ELAP)		
	Utah (TNI)		
	Nevada		
	Oklahoma		
	Iowa		

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1828822

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2156 (HBN: 225255)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 623846
Analyzed: 10/19/2018 08:46
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 623847
Analyzed: 10/19/2018 09:00
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.90	5.00	98.0	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1828822010	**MS:** 1828822011	**MSD:** 1828822012
Analyzed: 10/19/2018 12:35	**Analyzed:** 10/19/2018 13:32	**Analyzed:** 10/19/2018 14:47
Dilution: 1	**Dilution:** 1	**Dilution:** 1
Units: ug/L	**Units:** ug/L	**Units:** ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.96	5	99.1	78.8	123.8	4.83	96.5	2.69	0.0	20.0

Continuing Calibration Verification

CCV: 623843	**CCV:** 623848	**CCV:** 623850
Analyzed: 10/19/2018 08:02	**Analyzed:** 10/19/2018 11:38	**Analyzed:** 10/19/2018 15:03
Units: ug/L	**Units:** ug/L	**Units:** ug/L
Criteria: ± 15%	**Criteria:** ± 15%	**Criteria:** ± 15%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	24.4	25.0	97.8	24.7	25.0	98.6	24.4	25.0	97.6

Interference Check Sample

ICSA: 623845
Analyzed: 10/19/2018 08:32
Units: ug/L
Criteria: ± 30%

Analyte	Result	Target	% Rec.
Perchlorate	1.01	1.00	101

Limit of Detection Verification

LODV: 623844	**LODV:** 623849	**LODV:** 623851
Analyzed: 10/19/2018 08:18	**Analyzed:** 10/19/2018 11:52	**Analyzed:** 10/19/2018 15:17
Units: ug/L	**Units:** ug/L	**Units:** ug/L
Criteria: ± 50%	**Criteria:** ± 50%	**Criteria:** ± 50%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	0.978	1.00	97.8	1.02	1.00	102	0.983	1.00	98.3

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Quality Control Sample
Batch Report

Analysis Information

Workorder: **1828822**

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2156 (HBN: 225255)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
10/24/2018 13:21	10/25/2018 13:31

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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18698/#2

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

W 1828822

ract Chain of Custody

COC ID: 9999

1828822

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18100548
TSR:	Sonia West

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS18100548-02**	**16WW38-181010**	**Groundwater**	**10 Oct 2018 09:49**
	SUB_Perch-6850			19 Oct 2018
2.	**HS18100548-03**	**16WW44-181010**	**Groundwater**	**10 Oct 2018 10:05**
	SUB_Perch-6850			19 Oct 2018
3.	**HS18100548-04**	**16WW33-181010**	**Groundwater**	**10 Oct 2018 10:20**
	SUB_Perch-6850			19 Oct 2018
4.	**HS18100548-05**	**16WW37-181010**	**Groundwater**	**10 Oct 2018 10:39**
	SUB_Perch-6850			19 Oct 2018
5.	**HS18100548-06**	**16WW45-181010**	**Groundwater**	**10 Oct 2018 11:10**
	SUB_Perch-6850			19 Oct 2018
6.	**HS18100548-07**	**16WW14-181010**	**Groundwater**	**10 Oct 2018 12:02**
	SUB_Perch-6850			19 Oct 2018
7.	**HS18100548-08**	**16WW34-181010**	**Groundwater**	**10 Oct 2018 13:05**
	SUB_Perch-6850			19 Oct 2018
8.	**HS18100548-09**	**16WW35-181010**	**Groundwater**	**10 Oct 2018 13:11**
	SUB_Perch-6850			19 Oct 2018
9.	**HS18100548-10**	**16WW16-181010**	**Groundwater**	**10 Oct 2018 13:15**

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Subcontract Chain of Custody

COC ID: 9999

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
	SUB_Perch-6850			19 Oct 2018
10.	**HS18100548-11**	**16WW31-181010**	**Groundwater**	**10 Oct 2018 14:30** MS/MSD
	SUB_Perch-6850			19 Oct 2018
11.	**HS18100548-12**	**16WW31-181010-FD**	**Groundwater**	**10 Oct 2018 14:30**
	SUB_Perch-6850			19 Oct 2018
12.	**HS18100548-13**	**16WW22-181010**	**Groundwater**	**10 Oct 2018 15:00**
	SUB_Perch-6850			19 Oct 2018
13.	**HS18100548-14**	**16WW39-181010**	**Groundwater**	**10 Oct 2018 15:39**
	SUB_Perch-6850			19 Oct 2018

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

HS18100548-11 MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Johnson Date/Time: 10/11/18 18:00

Received By: M Schmidt Date/Time: 10/12/2018 9040

Cooler ID(s): Temperature(s):

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18100548	Split:	Workorder ID: 1828822	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	10/10/2018 09:40	16WW38-181010	1828822001		Water	A	1	A
2	10/10/2018 10:05	16WW44-181010	1828822002		Water	A	1	A
3	10/10/2018 10:20	16WW33-181010	1828822003		Water	A	1	A
4	10/10/2018 10:39	16WW37-181010	1828822004		Water	A	1	A
5	10/10/2018 11:10	16WW45-181010	1828822005		Water	A	1	A
6	10/10/2018 12:02	16WW14-181010	1828822006		Water	A	1	A
7	10/10/2018 13:05	16WW34-181010	1828822007		Water	A	1	A
8	10/10/2018 13:11	16WW35-181010	1828822008		Water	A	1	A
9	10/10/2018 13:15	16WW16-181010	1828822009		Water	A	1	A
10	10/10/2018 14:30	16WW31-181010	1828822010		Water	A	1	A

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	10/12/2018 09:40	ALS Sample Receiving	Sample Login
Julie Warath 10/15/18 1100		4C	storage
R.33.1 10.17.18/08:45		T.Boyd	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18100548	Split:	Workorder ID: 1828822	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
11	10/10/2018 14:30	16WW31-181010MS	1828822011	MS	Water	A	1	A
12	10/10/2018 14:30	16WW31-181010MSD	1828822012	MSD	Water	A	1	A
13	10/10/2018 14:30	16WW31-181010-FD	1828822013	FLDDUP	Water	A	1	A
14	10/10/2018 15:00	16WW22-181010	1828822014		Water	A	1	A
15	10/10/2018 15:39	16WW39-181010	1828822015		Water	A	1	A
16								
17								
18								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	10/12/2018 09:40	ALS Sample Receiving	Sample Login
Julie Warath 10/15/18 1100		YC	Storage
R.33.1	10.17.18/08:45	T.Bosch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 182882

Date/Time of Receipt: 9:40 10/12/2018

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C18 8821	2 °C	4	C18	°C	7	C18	°C
2	C18	°C	5	C18	°C	8	C18	°C
3	C18	°C	6	C18	°C	9	C18	°C

Taken By: M. Schmidt (Signature) M Schmidt (Printed Name) 10/12/2018 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ No ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

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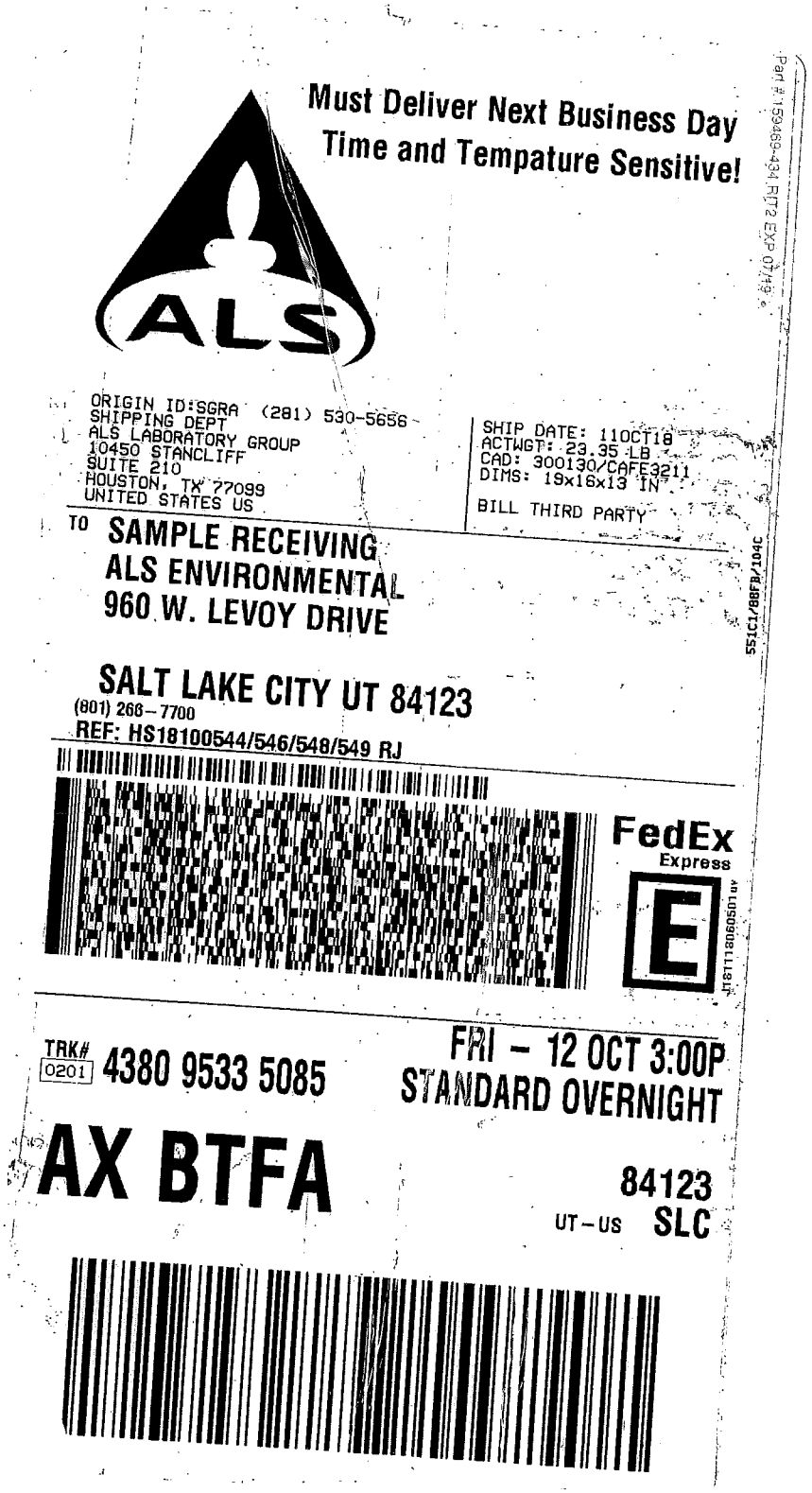

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-434 RJT2 EXP 07/19

ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 11OCT18
ACTWGT: 23.35 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN
BILL THIRD PARTY

551C1/88FB/104C

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 268-7700
REF: HS18100544/546/548/549 RJ

FedEx Express

TRK# 0201 4380 9533 5085

FRI - 12 OCT 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

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Batch Worklist

Batch: ELMS/ 2156 | Created: 10/19/2018 07:56 | Instrument: | HBN: 225255
Rule: EPA 6850, DoD QSM Water | Analyst: T. Bosch | Status: WP

Workorder: 1828819 [ENV_LVL4]
Workorder: 1828820 [ENV_LVL4]
Workorder: 1828821 [ENV_LVL4]
Workorder: 1828822 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
	623843	CCV for HBN 225255 [ELMS/2156]				CCV	3		E685041C3Q	5311		10/25/2018	
	623844	LODV for HBN 225255 [ELMS/2156				LODV	3		E6850..D3Q	5311		10/25/2018	
	623845	ICS for HBN 225255 [ELMS/2156]				ICS	3		E6850..D3Q	5311		10/25/2018	
	623846	LMB for HBN 225255 [ELMS/2156]				LMB	3		E6850Q413Q	5311		10/25/2018	
	623847	LCS for HBN 225255 [ELMS/2156]				LCS	3		E6850Q413Q	5311		10/25/2018	
	1828819001	LH18/24-SP650_101018_AIX				SAMPLE	3	1828819001-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
	1828820001	LH18/24-SP650_101018_AIX				SAMPLE	3	1828820001-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
	1828821001	LH18/24-SP140_101018				SAMPLE	3	1828821001-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
	1828822001	16WW38-181010				SAMPLE	3	1828822001-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
0	1828822002	16WW44-181010				SAMPLE	3	1828822002-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
1	1828822003	16WW33-181010				SAMPLE	3	1828822003-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
2	1828822004	16WW37-181010				SAMPLE	3	1828822004-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
3	1828822005	16WW45-181010				SAMPLE	3	1828822005-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
4	1828822006	16WW14-181010				SAMPLE	3	1828822006-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
5	1828822007	16WW34-181010				SAMPLE	3	1828822007-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
6	623848	CCV for HBN 225255 [ELMS/2156]				CCV	3		E685041C3Q	5311		10/25/2018	
7	623849	LODV for HBN 225255 [ELMS/2156				LODV	3		E6850..D3Q	5311		10/25/2018	
8	1828822008	16WW35-181010				SAMPLE	3	1828822008-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
9	1828822009	16WW16-181010				SAMPLE	3	1828822009-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
0	1828822010	16WW31-181010				SAMPLE	3	1828822010-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
1	1828822011	16WW31-181010MS				MS	3	1828822011-A	E6850Q413Q	5480		10/25/2018	
2	1828822012	16WW31-181010MSD				MSD	3	1828822012-A	E6850Q413Q	5480		10/25/2018	
3	1828822013	16WW31-181010-FD				FLDDUP	3	1828822013-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
4	1828822014	16WW22-181010				SAMPLE	3	1828822014-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
5	1828822015	16WW39-181010				SAMPLE	3	1828822015-A	E6850Q41.3	5480	11/7/2018	10/25/2018	
5	623850	CCV for HBN 225255 [ELMS/2156]				CCV	3		E685041C3Q	5311		10/25/2018	

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Batch Worklist

os	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
	623851	LODV for HBN 225255 [ELMS/2156				LODV	3		E6850..D3Q	5311		10/25/2018	

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1828819 (001); 1828820 (001); 1828821 (001); 1828822 (001-15)
ELMS Batch/HBN ID: 2155 (225024)
Prep Date: 10/17/2018 Analysis Date: 10/19/2018 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\OCT\19OCT18D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 10/08/2018, sequence 08OCT18D.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 2 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.80
5.0	0.80
5.3	0.25
10.0	0.25
10.5	0.80
12.5	0.80

QC DATA: 5.0µL of QC Solution Horizon ID 41830 was used for LCS 623847; Target = 5.0µg/L. ASTM type II water was used for LMB 623846.

MS/MSD: MS/MSD was performed on samples 1828822011/12 (Client ID: 16WW31-181010). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field sample 1828821001 was analyzed and reported from a 1:1,000 dilution. Field samples 1828822008/09/15 were analyzed and reported from a 1:10 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2018\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\225255-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS 2156 HBN 225255 Sample Set IDs if Applicable: 1808819/1808820/1808824/1808822	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	
Standards traceability checked and meets criteria	TB	
Standard curve coefficients evaluated and meet criteria	TB	
ICVs analyzed and meet acceptance criteria	TB	
CCVs analyzed and meet acceptance criteria	TB	
Method Blanks analyzed and meet acceptance criteria	TB	
Retention Time Windows checked	TB	
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	
Surrogate recoveries checked and appropriately addressed	—	
Method Preparation Blanks analyzed and meet acceptance criteria	TB	
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	
RLVS analyzed	TB	
Preparation and analysis hold times met	TB	
Preparation deviations and re-preparations noted when performed	TB	
Analysis deviations and re-analyses noted when performed	TB	
Sample dilution factors noted on reports	TB	
Electronic records in HBN transcription accuracy and completeness checked	TB	
Preparation and analysis calculations checked	TB	
NCRs are completed as necessary NC/CAR#	—	
Report forms are complete and accurate	TB	
Manual integrations checked	TB	

TB 10.25.18

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Working Standard - CLO4 WRK

CLO4 WRK — **Description - 6850 WKG Std 100.ug/L**

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		**Description - ASTM Type II Water**
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025
MFG Lot: Not Provided		**Usable:** Yes
Part ID: Not Provided		**Lab Lot:** LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109 MFG: DCL In House MFG Lot: Not Provided Part ID: Not Provided	Created By: ALS Support (Lims) Create Date: 10/06/2005 09:10AM	Amount: 1000 L Expires: 11/07/2025 Usable: Yes Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		**Description - Perchlorate ISTD Wrk 1,000ug/L**
Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		**Description - Perchlorate ISTD Stock**
Standard: 43729	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 09/20/2018 09:09AM	**Expires:** 04/28/2026
MFG Lot: SDFF-012A	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

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Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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New Haven, CT 06513
USA

AccuStandard®

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Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

Just Standards

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (1804, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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October 22, 2018 **Analytical Report for Service Request No:** K1810021

RJ Modashia
ALS Group USA, Corp.
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS18100548

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 12, 2018
For your reference, these analyses have been assigned our service request number **K1810021.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

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Acronyms

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

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Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

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Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS18100548
Sample Matrix: Water

Service Request: K1810021
Date Received: 10/12/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 10/12/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Page 108 of 141 Date 10/22/2018

Chain of Custody

ALS Environmental—Kelso Laboratory
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10450 Stancliff Rd, Ste 210
Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 9998

K1810071

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18100548
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18100548-09**	**16WW35-181010**	**Groundwater**	**10 Oct 2018 13:11**
	TOC Analysis with DOD Level IV			19 Oct 2018
2.	**HS18100548-10**	**16WW16-181010**	**Groundwater**	**10 Oct 2018 13:15**
	TOC Analysis with DOD Level IV			19 Oct 2018
3.	**HS18100548-13**	**16WW22-181010**	**Groundwater**	**10 Oct 2018 15:00**
	TOC Analysis with DOD Level IV			19 Oct 2018

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Modashia	Date/Time:	10/11/18 18:00
Received By:	David Rumsey	Date/Time:	10.12.18 1020
Cooler ID(s):		Temperature(s):	

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PC EC

Cooler Receipt and Preservation Form

Client ALS - Houston Service Request *K18* 100271

Received: 10-12-18 Opened: 10-12-18 By: JSP Unloaded: 10-12-18 By: JSP

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number NA	Filed
-0.2	0.0	1.0	1.2	+0.2	298		4380 9533 5096	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

RUSH

General Chemistry

ALS Environmental—Kelso Laboratory
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www.alsglobal.com

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1810021
Project:	HS18100548	**Date Collected:**	10/10/18
Sample Matrix:	Water	**Date Received:**	10/12/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW35-181010	K1810021-001	**44**	10	4	2	20	10/18/18 07:31	
16WW16-181010	K1810021-002	**4.34**	0.50	0.20	0.07	1	10/18/18 09:08	
16WW22-181010	K1810021-003	**2.62**	0.50	0.20	0.07	1	10/18/18 10:13	
Method Blank	K1810021-MB1	ND U	0.50	0.20	0.07	1	10/17/18 23:15	
Method Blank	K1810021-MB2	ND U	0.50	0.20	0.07	1	10/18/18 08:36	

Client:	ALS Environmental - US	**Service Request:**	K1810021
Project	HS18100548	**Date Collected:**	10/10/18
Sample Matrix:	Water	**Date Received:**	10/12/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	LOQ	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16WW35-181010	K1810021-001DUP	10	4	2	44	47	45.5	5	10	10/18/18
16WW16-181010	K1810021-002DUP	0.50	0.20	0.07	4.34	4.02	4.18	8	10	10/18/18
16WW22-181010	K1810021-003DUP	0.50	0.20	0.07	2.62	2.45	2.53	6	10	10/18/18

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1810021
Project:	HS18100548	**Date Collected:**	10/10/18
Sample Matrix:	Water	**Date Received:**	10/12/18
		Date Analyzed:	10/18/18
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW16-181010	**Units:**	mg/L
Lab Code:	K1810021-002	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1810021-002MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	4.34	26.3	25.0	88	83-117

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1810021
Project:	HS18100548	**Date Analyzed:**	10/17/18
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	611322

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1810021-LCS1	21.6	21.9	99	83-117
Lab Control Sample	K1810021-LCS2	21.4	21.9	98	83-117

Client: ALS Environmental - US **Service Request:** K1810021
Project: HS18100548

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	611322	KQ1814953-06	10/17/18 22:41	25.0	23.9	95	90-110
CCV2	611322	KQ1814953-07	10/18/18 02:43	25.0	24.4	98	90-110
CCV3	611322	KQ1814953-08	10/18/18 08:02	25.0	24.0	96	90-110
CCV4	611322	KQ1814953-09	10/18/18 12:20	25.0	23.8	95	90-110
CCV5	611322	KQ1814953-10	10/18/18 14:30	25.0	23.7	95	90-110

Client: ALS Environmental - US **Service Request:**K1810021
Project: HS18100548

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	611322	KQ1814953-01	10/17/18 22:58	0.50	0.20	0.07	ND	U
CCB2	611322	KQ1814953-02	10/18/18 02:59	0.50	0.20	0.07	0.09	J
CCB3	611322	KQ1814953-03	10/18/18 08:19	0.50	0.20	0.07	ND	U
CCB4	611322	KQ1814953-04	10/18/18 12:37	0.50	0.20	0.07	ND	U
CCB5	611322	KQ1814953-05	10/18/18 14:46	0.50	0.20	0.07	ND	U

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Raw Data

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General Chemistry

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Work Request # Original ( ) K1809029, K1809828, K1809960, K1810021, K1810023, K1810100

Tier: IV IV IV IV IV IV

Date Analyzed: 10/17/18

Analyst: BCD / CES

Run # 611322

Analysis: TOC

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS:

RA K1810023-1 %R not within acceptance limits.

RA 0100-1 RPD not within acceptance limits.

Final Approved by: [signature] Date: 10/19/18

DQREPORT

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 611322 **Method/Testcode:** SM 5310 C/TOC T

Id	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
1809029-010	Carbon, Total Organic	N/A		Water	1.98 mg/L	10 ml	1.98 mg/L	1	0.07	0.50			10/18/18 00:04	N	IV
1809828-001	Carbon, Total Organic	N/A		Water	3.83 mg/L	10 ml	7.7 mg/L	2	0.2	1.0			10/18/18 00:35	N	IV
1809960-001	Carbon, Total Organic	N/A		Water	9.46 mg/L	10 ml	9.46 mg/L	1	0.07	0.50			10/18/18 01:39	N	IV
1809960-002	Carbon, Total Organic	N/A		Water	5.03 mg/L	10 ml	5.03 mg/L	1	0.07	0.50			10/18/18 02:11	N	IV
1809960-003	Carbon, Total Organic	N/A		Water	2.91 mg/L	10 ml	58 mg/L	20	2	10			10/18/18 03:16	N	IV
1809960-004	Carbon, Total Organic	N/A		Water	23.76 mg/L	10 ml	23.8 mg/L	1	0.07	0.50			10/18/18 03:47	N	IV
1809960-005	Carbon, Total Organic	N/A		Water	10.33 mg/L	10 ml	10.3 mg/L	1	0.07	0.50			10/18/18 04:19	N	IV
1809960-006	Carbon, Total Organic	N/A		Water	1.64 mg/L	10 ml	33 mg/L	20	2	10			10/18/18 04:51	N	IV
1809960-007	Carbon, Total Organic	N/A		Water	2.76 mg/L	10 ml	2.76 mg/L	1	0.07	0.50			10/18/18 05:23	Y	IV
1809960-008	Carbon, Total Organic	N/A		Water	2.65 mg/L	10 ml	2.65 mg/L	1	0.07	0.50			10/18/18 06:27	N	IV
1809960-009	Carbon, Total Organic	N/A		Water	1.53 mg/L	10 ml	31 mg/L	20	2	10			10/18/18 06:59	N	IV
1810021-001	Carbon, Total Organic	N/A		Water	2.22 mg/L	10 ml	44 mg/L	20	2	10			10/18/18 07:31	N	IV
1810021-002	Carbon, Total Organic	N/A		Water	4.34 mg/L	10 ml	4.34 mg/L	1	0.07	0.50			10/18/18 09:08	N	IV
1810021-003	Carbon, Total Organic	N/A		Water	2.62 mg/L	10 ml	2.62 mg/L	1	0.07	0.50			10/18/18 10:13	N	IV
1810023-001	Carbon, Total Organic	N/A		Water	41.16 mg/L	10 ml	41.2 mg/L	1	0.07	0.50			10/18/18 10:45	N	IV
1810100-001	Carbon, Total Organic	N/A		Ground Water	3.22 mg/L	10 ml	3.22 mg/L	1	0.07	0.50			10/18/18 11:49	Y	IV
1810100-002	Carbon, Total Organic	N/A		Ground Water	1.01 mg/L	10 ml	20 mg/L	20	2	10			10/18/18 13:26	N	IV
1810100-003	Carbon, Total Organic	N/A		Ground Water	1.00 mg/L	10 ml	20 mg/L	20	2	10			10/18/18 13:58	N	IV
Q1814953-01	Carbon, Total Organic	CCB		Water	-0.05 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/17/18 22:58	N	IV
Q1814953-02	Carbon, Total Organic	CCB		Water	0.09 mg/L	10 ml	0.09 mg/L J	1	0.07	0.50			10/18/18 02:59	N	IV
Q1814953-03	Carbon, Total Organic	CCB		Water	5.590000000000001E-02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/18/18 08:19	N	IV
KQ1814953-04	Carbon, Total Organic	CCB		Water	4.340000000000001E-02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/18/18 12:37	N	IV
KQ1814953-05	Carbon, Total Organic	CCB		Water	-0.05 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/18/18 14:46	N	IV
KQ1814953-06	Carbon, Total Organic	CCV		Water	23.86 mg/L	10 ml	23.9 mg/L	1			96		10/17/18 22:41	N	IV
KQ1814953-07	Carbon, Total Organic	CCV		Water	24.45 mg/L	10 ml	24.4 mg/L	1			98		10/18/18 02:43	N	IV
KQ1814953-08	Carbon, Total Organic	CCV		Water	24.01 mg/L	10 ml	24.0 mg/L	1			96		10/18/18 08:02	N	IV
KQ1814953-09	Carbon, Total Organic	CCV		Water	23.77 mg/L	10 ml	23.8 mg/L	1			95		10/18/18 12:20	N	IV
KQ1814953-10	Carbon, Total Organic	CCV		Water	23.67 mg/L	10 ml	23.7 mg/L	1			95		10/18/18 14:30	N	IV
KQ1814953-11	Carbon, Total Organic	MB		Water	-0.09 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/17/18 23:15	N	IV
KQ1814953-12	Carbon, Total Organic	LCS		Water	21.61 mg/L	10 ml	21.6 mg/L	1	0.07	0.50	99		10/17/18 23:31	N	IV
KQ1814953-13	Carbon, Total Organic	MB		Water	1.000000000000011E-02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			10/18/18 08:36	N	IV
KQ1814953-14	Carbon, Total Organic	LCS		Water	21.37 mg/L	10 ml	21.4 mg/L	1	0.07	0.50	98		10/18/18 08:52	N	IV
KQ1814953-15	Carbon, Total Organic	MS	K1809828-001	Water	28.28 mg/L	10 ml	56.6 mg/L	2	0.2	1.0	98		10/18/18 01:07	N	IV
KQ1814953-16	Carbon, Total Organic	DUP	K1809828-001	Water	3.81 mg/L	10 ml	7.6 mg/L	2	0.2	1.0		<1	10/18/18 00:35	N	IV

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

BCD 10/18/18

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 611322 **Method/Testcode:** SM 5310 C/TOC T

I Cod	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1814953-17	Carbon, Total Organic	DUP	K1809029-010	Water	1.93 mg/L	10 ml	1.93 mg/L	1	0.07	0.50		3	10/18/18 00:04	N	IV
Q1814953-18	Carbon, Total Organic	DUP	K1809960-001	Water	9.32 mg/L	10 ml	9.32 mg/L	1	0.07	0.50		1	10/18/18 01:39	N	IV
KQ1814953-19	Carbon, Total Organic	DUP	K1809960-002	Water	4.74 mg/L	10 ml	4.74 mg/L	1	0.07	0.50		6	10/18/18 02:11	N	IV
Q1814953-20	Carbon, Total Organic	DUP	K1809960-003	Water	2.79 mg/L	10 ml	56 mg/L	20	2	10		4	10/18/18 03:16	N	IV
KQ1814953-21	Carbon, Total Organic	DUP	K1809960-004	Water	23.31 mg/L	10 ml	23.3 mg/L	1	0.07	0.50		2	10/18/18 03:47	N	IV
Q1814953-22	Carbon, Total Organic	DUP	K1809960-005	Water	9.86 mg/L	10 ml	9.86 mg/L	1	0.07	0.50		5	10/18/18 04:19	N	IV
KQ1814953-23	Carbon, Total Organic	DUP	K1809960-006	Water	1.67 mg/L	10 ml	33 mg/L	20	2	10		2	10/18/18 04:51	N	IV
Q1814953-24	Carbon, Total Organic	MS	K1809960-007	Water	27.59 mg/L	10 ml	27.6 mg/L	1	0.07	0.50	99		10/18/18 05:55	N	IV
KQ1814953-25	Carbon, Total Organic	DUP	K1809960-007	Water	2.51 mg/L	10 ml	2.51 mg/L	1	0.07	0.50		9	10/18/18 05:23	N	IV
KQ1814953-26	Carbon, Total Organic	DUP	K1809960-008	Water	2.46 mg/L	10 ml	2.46 mg/L	1	0.07	0.50		7	10/18/18 06:27	N	IV
KQ1814953-27	Carbon, Total Organic	DUP	K1809960-009	Water	1.62 mg/L	10 ml	32 mg/L	20	2	10		6	10/18/18 06:59	N	IV
Q1814953-28	Carbon, Total Organic	DUP	K1810021-001	Water	2.34 mg/L	10 ml	47 mg/L	20	2	10		5	10/18/18 07:31	N	IV
KQ1814953-29	Carbon, Total Organic	MS	K1810021-002	Water	26.33 mg/L	10 ml	26.3 mg/L	1	0.07	0.50	88		10/18/18 09:40	N	IV
KQ1814953-30	Carbon, Total Organic	DUP	K1810021-002	Water	4.02 mg/L	10 ml	4.02 mg/L	1	0.07	0.50		8	10/18/18 09:08	N	IV
KQ1814953-31	Carbon, Total Organic	DUP	K1810021-003	Water	2.45 mg/L	10 ml	2.45 mg/L	1	0.07	0.50		6	10/18/18 10:13	N	IV
KQ1814953-32	Carbon, Total Organic	MS	K1810023-001	Water	45.22 mg/L	10 ml	45.2 mg/L	1	0.07	0.50	16*		10/18/18 11:16	N	IV
KQ1814953-33	Carbon, Total Organic	DUP	K1810023-001	Water	39.31 mg/L	10 ml	39.3 mg/L	1	0.07	0.50		5	10/18/18 10:45	N	IV
KQ1814953-34	Carbon, Total Organic	DUP	K1810100-001	Ground Water	2.84 mg/L	10 ml	2.84 mg/L	1	0.07	0.50		13*	10/18/18 11:49	N	IV
KQ1814953-35	Carbon, Total Organic	MS	K1810100-001	Ground Water	27.74 mg/L	10 ml	27.7 mg/L	1	0.07	0.50	98		10/18/18 12:54	N	IV
KQ1814953-36	Carbon, Total Organic	DUP	K1810100-002	Ground Water	1.04 mg/L	10 ml	21 mg/L	20	2	10		3	10/18/18 13:26	N	IV
KQ1814953-37	Carbon, Total Organic	DUP	K1810100-003	Ground Water	1.08 mg/L	10 ml	22 mg/L	20	2	10		8	10/18/18 13:58	N	IV

10/09/18

CES 10/19/18

10/18/18

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

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0.960	0.960	0.960	0.960	OBSERVATIONS	7	0.9599
0.924				STD Deviation	0.06509	BELOW
1.099				AVERAGE	1.00966	ABOVE
1.065	1.065	1.065	1.065	UCL	1.07474	1.0648
1.010	1.010	1.010	1.010	LCL	0.94457	1.0099
1.052	1.052	1.052	1.052			1.0523
0.958	0.958	0.958	0.958			0.9576
				OBSERVATIONS	5	BELOW
				STD Deviation	0.33877	BELOW
				AVERAGE	1.00890	BELOW
				UCL	1.34767	BELOW
				LCL	0.67013	BELOW
						BELOW
						BELOW
				OBSERVATIONS	5	BELOW
				STD Deviation	0.33877	BELOW
				AVERAGE	1.00890	BELOW
				UCL	1.34767	BELOW
				LCL	0.67013	BELOW
						BELOW
						BELOW
				OBSERVATIONS	5	BELOW
				STD Deviation	0.05602	BELOW
				AVERAGE	1.00890	BELOW
						BELOW
						BELOW
						BELOW
						BELOW
						BELOW

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TOC : 611322

Schedule: 10172018

Version: 9
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2018/10/17 19:01 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	4
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	K1809029-010.16	Extended Reaction 021711 (Extended Reaction 021711)	2
5	Sample	K1809828-001.01 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
6	Sample	K1809828-001.01 ms 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
7	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
8	Sample	K1809960-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
9	Sample	K1809960-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1809960-003.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1809960-004.01	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K1809960-005.01	Extended Reaction 021711 (Extended Reaction 021711)	2
13	Sample	K1809960-006.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
14	Sample	K1809960-007.02	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	K1809960-007.02 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
16	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
17	Sample	K1809960-008.02	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K1809960-009.02 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K1810021-001.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Check Standard	[TOC] LCS ER [21.9 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1810021-002.02	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K1810021-002.02 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
23	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
24	Sample	K1810021-003.01	Extended Reaction 021711 (Extended Reaction 021711)	2
25	Sample	K1810023-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K1810023-001.02 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
27	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
28	Sample	K1810100-001.05	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1810100-001.05 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
30	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
31	Sample	K1810100-002.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
32	Sample	K1810100-003.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

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Printed on: October 18, 2018 15:37:13

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Fusion Report - 10172018
Wednesday, October 17, 2018 07:07 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2018/10/18 15:37 - Thursday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	10172018	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v9)		
Comment:			

Report Results

10/19/18

Sample Type: Clean — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2018/10/17 19:07

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.22	15.26	4.04	49.34	05:29
2	TC Clean	4.60	8.22	3.62	49.68	07:18
3	TC Clean	2.90	6.86	3.97	49.70	07:01
4	TC Clean	2.10	5.94	3.84	49.71	07:01

Sample Type: Clean — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2018/10/17 19:39

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.70	4.30	3.60	49.32	07:57
2	TC Clean	4.08	7.75	3.67	49.71	07:18
3	TC Clean	2.98	6.77	3.79	49.72	07:01
4	TC Clean	2.49	6.28	3.79	49.68	07:03

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Sample Type: Clean — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2018/10/17 20:13

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.75	4.37	3.62	49.29	07:58
2	TC Clean	5.03	8.77	3.74	49.66	07:16
3	TC Clean	3.42	7.31	3.89	49.69	07:03
4	TC Clean	3.15	6.92	3.76	49.70	07:02

Sample Type: Blank (Creating v1163) — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2018/10/17 20:47

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.40	4.27	3.87	49.25	07:59
2	TC Clean	5.80	9.60	3.80	49.66	07:16
3	TC Clean	4.01	7.89	3.88	49.69	07:00
4	TC Clean	3.40	7.27	3.87	49.65	07:00
5	Reagent Blank	8.15	11.94	3.79	49.68	08:13
6	Acid Blank	1.55	5.02	3.47	49.19	08:02

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	1.0897 ppm	0.2033 ppm	18.6600%	2018/10/17 21:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3926	13.9262	24.26	28.19	3.94	49.90	12:23
2	TOC	0.9590	9.5901	21.17	24.92	3.75	49.88	12:23
3	TOC	1.0149	10.1486	21.57	25.29	3.73	49.84	12:23
4	TOC	0.9921	9.9213	21.40	25.20	3.79	49.81	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

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Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity NA / NA	24.8725 ppm (PASS)	0.0000 ppm	0%	2018/10/17 22:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8725	248.7252	192.57	196.27	3.70	49.83	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.9599 ppm (PASS)	0.0000 ppm	0%	2018/10/17 22:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.9599	9.5987	22.16	26.01	3.85	49.79	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.9239 ppm	0.0000 ppm	0.0000%	2018/10/17 23:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9239	9.2393	20.92	24.80	3.88	49.83	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	22.6232 ppm (PASS)	0.0000 ppm	0%	2018/10/17 23:31

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Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	22.6232	226.2320	176.54	180.32	3.78	49.80	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	ICS	1.4691 ppm	0.0000 ppm	0.0000%	2018/10/17 23:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4691	14.6910	24.80	28.73	3.93	49.76	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1809029-010.16	2.9650 ppm	0.0397 ppm	1.3400%	2018/10/18 00:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9931	29.9307	35.66	39.67	4.01	49.79	12:25
2	TOC	2.9369	29.3694	35.26	39.24	3.97	49.76	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1809828-001.01 2x	4.8337 ppm	0.0142 ppm	0.2900%	2018/10/18 00:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8437	48.4372	48.85	52.65	3.80	49.79	12:24
2	TOC	4.8237	48.2365	48.71	52.65	3.94	49.74	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1809828-001.01 ms 2x	29.2899 ppm	0.0000 ppm	0.0000%	2018/10/18 01:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.2899	292.8989	223.06	226.95	3.89	49.76	12:32

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TO	RB	1.2972 m	0.0000 m	0.0000%	2018/10/18 01:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2972	12.9720	23.58	27.54	3.96	49.74	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1809960-001.02	10.3992 ppm	0.0963 ppm	0.9300%	2018/10/18 01:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.4672	104.6723	88.93	92.87	3.94	49.74	12:21
2	TOC	10.3311	103.3112	87.96	91.80	3.84	49.76	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1809960-002.01	5.8943 ppm	0.2065 ppm	3.5000%	2018/10/18 02:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0403	60.4030	57.38	61.26	3.88	49.76	12:26
2	TOC	5.7483	57.4827	55.30	59.37	4.07	49.74	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	25.4559 ppm (PASS)	0.0000 ppm	0%	2018/10/18 02:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4559	254.5586	196.73	200.66	3.93	49.74	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

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Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	1.0992 ppm (PASS)	0.0000 ppm	0%	2018/10/18 02:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	1.0992	10.9922	23.16	27.20	4.04	49.74	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1809960-003.01 20x	3.8581 ppm	0.0898 ppm	2.3300%	2018/10/18 03:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9216	39.2162	42.28	46.14	3.86	49.72	12:28
2	TOC	3.7946	37.9462	41.38	45.22	3.85	49.72	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1809960-004.01	24.5450 ppm	0.3216 ppm	1.3100%	2018/10/18 03:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.7724	247.7244	190.87	194.79	3.92	49.70	12:24
2	TOC	24.3176	243.1764	187.63	191.36	3.74	49.72	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1809960-005.01	11.1005 ppm	0.3334 ppm	3.0000%	2018/10/18 04:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.3363	113.3629	95.12	98.95	3.83	49.74	12:23
2	TOC	10.8648	108.6478	91.76	95.62	3.86	49.71	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1809960-006.01 20x	2.6592 ppm	0.0210 ppm	0.7900%	2018/10/18 04:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6444	26.4435	33.18	36.93	3.75	49.69	12:26
2	TOC	2.6741	26.7410	33.39	37.20	3.81	49.69	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1809960-007.02	3.6445 ppm	0.1708 ppm	4.6900%	2018/10/18 05:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.7653	37.6530	41.17	45.04	3.87	49.69	12:29
2	TOC	3.5238	35.2379	39.45	43.21	3.77	49.68	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1809960-007.02 ms	28.6021 ppm	0.0000 ppm	0.0000%	2018/10/18 05:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.6021	286.0214	218.16	222.10	3.94	49.68	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	RB	1.0050 ppm	0.0000 ppm	0.0000%	2018/10/18 06:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0050	10.0504	21.50	25.34	3.84	49.67	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1809960-008.02	3.5674 ppm	0.1329 ppm	3.7200%	2018/10/18 06:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6613	36.6131	40.43	44.29	3.86	49.68	12:25
2	TOC	3.4734	34.7341	39.09	42.94	3.85	49.66	12:25

Dilution	Blank Contribution	Method	Calibration

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1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1809960-009.02 20x	2.5830 ppm	0.0621 ppm	2.4000%	2018/10/18 06:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5391	25.3911	32.43	36.33	3.90	49.62	12:27
2	TOC	2.6270	26.2695	33.06	36.97	3.92	49.65	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1810021-001.01 20x	3.2860 ppm	0.0848 ppm	2.5800%	2018/10/18 07:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2260	32.2601	37.32	41.15	3.83	49.64	12:29
2	TOC	3.3460	33.4599	38.18	42.01	3.83	49.58	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	25.0182 ppm (PASS)	0.0000 ppm	0%	2018/10/18 08:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0182	250.1818	193.61	197.45	3.85	49.67	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	1.0648 ppm (PASS)	0.0000 ppm	0%	2018/10/18 08:19

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

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D	TOC	0.0 ppm	1	1.0648	10.6484	22.91	26.75	3.84	49.67	12:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	1.0099 ppm	0.0000 ppm	0.0000%	2018/10/18 08:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0099	10.0995	21.53	25.32	3.79	49.63	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> LCS ER — From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	2	TOC	21.9000	1:1	[TOC] LCS ER [21.9 ppm]	0 / infinity (NA / NA)	22.3789 ppm (PASS)	0.0000 ppm	0%	2018/10/18 08:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
2	TOC	21.9 ppm	1	22.3789	223.7888	174.80	178.50	3.70	49.67	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos 2
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	21.9 ppmC

Sample Type: Sample — From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1810021-002.02	5.1891 ppm	0.2256 ppm	4.3500%	2018/10/18 09:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.3486	53.4862	52.45	56.30	3.85	49.68	12:26
2	TOC	5.0295	50.2951	50.18	54.18	4.00	49.82	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1810021-002.02 ms	27.3431 ppm	0.0000 ppm	0.0000%	2018/10/18 09:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.3431	273.4312	209.19	212.91	3.72	49.90	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	RB	1.1033 ppm	0.0000 ppm	0.0000%	2018/10/18 09:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1033	11.0327	22.20	26.17	3.97	49.95	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1810021-003.01	3.5438 ppm	0.1162 ppm	3.2800%	2018/10/18 10:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6259	36.2595	40.17	44.00	3.83	49.97	12:29
2	TOC	3.4616	34.6162	39.00	42.90	3.89	49.97	12:22

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1810023-001.02	41.2414 ppm	1.3101 ppm	3.1800%	2018/10/18 10:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	42.1678	421.6782	314.83	318.79	3.97	49.99	12:25
2	TOC	40.3151	403.1506	301.63	306.05	4.42	49.99	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1810023-001.02 ms	46.2330 ppm	0.0000 ppm	0.0000%	2018/10/18 11:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	46.2330	462.3299	343.80	348.08	4.28	49.98	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

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

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◈	27	TOC	RB	4.3357 ppm	0.0000 ppm	0.0000%	2018/10/18 11:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3357	43.3573	45.23	49.57	4.34	49.97	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1810100-001.05	4.0352 ppm	0.2676 ppm	6.6300%	2018/10/18 11:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2244	42.2445	44.44	48.45	4.01	49.95	12:26
2	TOC	3.8460	38.4598	41.74	45.67	3.92	49.93	12:20

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.7744 ppm (PASS)	0.0000 ppm	0%	2018/10/18 12:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7744	247.7443	191.87	195.78	3.91	49.91	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	1.0523 ppm (PASS)	0.0000 ppm	0%	2018/10/18 12:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	1.0523	10.5235	22.82	26.64	3.82	49.96	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

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Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1810100-001.05 ms	28.7458 ppm	0.0000 ppm	0.0000%	2018/10/18 12:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.7458	287.4584	219.18	222.94	3.75	49.93	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	RB	1.0766 ppm	0.0000 ppm	0.0000%	2018/10/18 13:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0766	10.7661	22.01	25.87	3.87	49.90	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1810100-002.01 20x	2.0339 ppm	0.0223 ppm	1.1000%	2018/10/18 13:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0181	20.1807	28.72	32.56	3.84	49.84	12:31
2	TOC	2.0496	20.4964	28.94	32.75	3.81	49.82	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1810100-003.01 20x	2.0473 ppm	0.0610 ppm	2.9800%	2018/10/18 13:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0042	20.0418	28.62	32.51	3.90	49.77	12:27
2	TOC	2.0905	20.9048	29.23	32.95	3.72	49.80	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 14.3350 (IC) (v1163)	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV	0 / infinity	24.6815	0.0000	0%	2018/10/18 14:30

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					021711 [25 ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6815	246.8153	191.21	195.04	3.83	49.76	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.9576 ppm (PASS)	0.0000 ppm	0%	2018/10/18 14:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.9576	9.5763	22.15	25.92	3.77	49.78	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v3)	Extended Reaction 021711 (v17)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1162	1.8893	1.4700	0.0000	0.0000	0.0000	2018/10/17 15:04	Fusion1 (Fusion1)
v1163	2.7177	1.5490	0.0000	0.0000	0.0000	2018/10/17 21:38	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version:	v17	Calibration curve formula:	TOC: y = 7.126x + 15.324
Ver Creation:	2018/03/13 21:33	r^2 value:	TOC: r^2 = 0.99994
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

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Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	15.2500	0.0000		2018/03/13 19:55
0.50 ppm	18.8060	0.5000		2018/03/13 20:12
00 ppm	21.6980	1.0000		2018/03/13 20:
5.00 ppm	50.8680	5.0000		2018/03/13 20:43
10.0 ppm	88.5720	10.0000		2018/03/13 21:00
25.0 ppm	192.2360	25.0000		2018/03/13 21:16
50.0 ppm	371.8790	50.0000		2018/03/13 21:32

Methods

Name: Extended Reaction 021711 (TOC)

Version: v3 Operator: Gen Chem Lab (Fusion1)
Ver Creation: 2013/02/04 11:44
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	7
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	7
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

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Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2018/10/18 15:05

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StarLIMS Run: 610600, 610601, 610602, 610627

Analysis: TOC/DOC

Method: SM 5310C/415.1/TOC T/DOC T

CCV: 11-GEN-05-70B 50 ppm LCS: 11-GEN-05-66C 24.0 ppm

ICAL Date: 3/13/18

ICAL ID: 11-GEN-05-65A

ICS ID: 11-GEN-05-66K

ICS TV: 25.0 ppm ICS % R = 1

Spike ID: 11-GEN-05-65K 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-70C

21 % H3PO4: 11-GEN-05-70D

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, N11314F, Marge

FILTER ID: NA

Analyzed By: BCD	Date Analyzed: 10/17/18
Reviewed By: [signature]	Date Reviewed: 10/19/18

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March 26, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18100725**

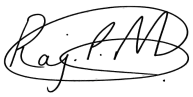
Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 3 sample(s) on Oct 13, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18100725

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18100725-01	16TB03-181011	Liquid		11-Oct-2018 08:30	13-Oct-2018 09:40	☐
HS18100725-02	16WW32-181011	GW		11-Oct-2018 09:28	13-Oct-2018 09:40	☐
HS18100725-03	16EW05-181011	GW		11-Oct-2018 11:01	13-Oct-2018 09:40	☐

Revision:1

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Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant
Work Order: HS18100725

Work Order Comments

- Revised to updated the VOC list.
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

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

GCMS Volatiles by Method SW8260

Batch ID: R325772

Sample ID: CCV

- Bromomethane and m,p-Xylenes exceeded %D limits on CCV. Samples ND.

Sample ID: VLCSW-181018

- Ethylbenzene exceeded %recovery limits on LCS. Samples ND.

WetChemistry by Method SW9056

Batch ID: R325666

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

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16TB03-181011
Collection Date: 11-Oct-2018 08:30

ANALYTICAL REPORT
WorkOrder:HS18100725
Lab ID:HS18100725-01
Matrix:Liquid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 03:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 03:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 03:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 03:50
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 03:50
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 03:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 03:50
Surr: 1,2-Dichloroethane-d4	*87.5*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 03:50*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 03:50*
Surr: Dibromofluoromethane	*95.8*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 03:50*
Surr: Toluene-d8	*93.3*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 03:50*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW32-181011
Collection Date: 11-Oct-2018 09:28

ANALYTICAL REPORT
WorkOrder:HS18100725
Lab ID:HS18100725-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 07:05
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:05
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:05
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:05
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 07:05
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:05
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:05
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 07:05*
Surr: 4-Bromofluorobenzene	*96.7*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 07:05*
Surr: Dibromofluoromethane	*97.0*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 07:05*
Surr: Toluene-d8	*92.5*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 07:05*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW05-181011
Collection Date: 11-Oct-2018 11:01

ANALYTICAL REPORT
WorkOrder:HS18100725
Lab ID:HS18100725-03
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.10**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 09:20

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R325666 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS18100725-03	16EW05-181011	11 Oct 2018 11:01			17 Oct 2018 09:20	10
Batch ID: R325772 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** GW	
HS18100725-02	16WW32-181011	11 Oct 2018 09:28			19 Oct 2018 07:05	1
Batch ID: R325772 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Liquid	
HS18100725-01	16TB03-181011	11 Oct 2018 08:30			19 Oct 2018 03:50	1
Batch ID: R326322 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** GW	
HS18100725-02	16WW32-181011	11 Oct 2018 09:28			29 Oct 2018 15:58	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.77*	*1.0*	*50*	*0*	*89.5*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.49*	*1.0*	*50*	*0*	*99.0*	*82 - 115*				
Surr: Dibromofluoromethane	*48.4*	*1.0*	*50*	*0*	*96.8*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: **R325772 (0)** **Instrument:** **VOA2** **Method:** **LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.29*	*1.0*	*50*	*0*	*92.6*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.9	1.0	20	0	110	77 - 118				
1,1,1-Trichloroethane	20.17	1.0	20	0	101	70 - 130				
1,1,2,2-Tetrachloroethane	18.73	1.0	20	0	93.7	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.13	1.0	20	0	111	70 - 130				
1,1,2-Trichloroethane	21.59	1.0	20	0	108	77 - 113				
1,1-Dichloroethane	20.69	1.0	20	0	103	71 - 122				
1,1-Dichloroethene	20.65	1.0	20	0	103	70 - 130				
1,1-Dichloropropene	22.03	1.0	20	0	110	78 - 118				
1,2,3-Trichlorobenzene	20.23	1.0	20	0	101	70 - 130				
1,2,3-Trichloropropane	18.8	1.0	20	0	94.0	70 - 127				
1,2,4-Trichlorobenzene	21.62	1.0	20	0	108	77 - 126				
1,2,4-Trimethylbenzene	22.46	1.0	20	0	112	73 - 121				
1,2-Dibromo-3-chloropropane	17.54	1.0	20	0	87.7	70 - 130				
1,2-Dibromoethane	22.39	1.0	20	0	112	76 - 123				
1,2-Dichlorobenzene	21.11	1.0	20	0	106	77 - 113				
1,2-Dichloroethane	22.56	1.0	20	0	113	70 - 124				
1,2-Dichloropropane	22.14	1.0	20	0	111	72 - 119				
1,3,5-Trimethylbenzene	19.98	1.0	20	0	99.9	75 - 118				
1,3-Dichlorobenzene	20.97	1.0	20	0	105	78 - 118				
1,3-Dichloropropane	21.84	1.0	20	0	109	75 - 116				
1,4-Dichlorobenzene	21.68	1.0	20	0	108	79 - 113				
2,2-Dichloropropane	22.14	1.0	20	0	111	70 - 130				
2-Butanone	39.81	2.0	40	0	99.5	70 - 130				
2-Chlorotoluene	22.93	1.0	20	0	115	70 - 128				
2-Hexanone	39.54	2.0	40	0	98.9	70 - 130				
4-Chlorotoluene	22.78	1.0	20	0	114	74 - 126				
4-Isopropyltoluene	19.4	1.0	20	0	97.0	74 - 126				
4-Methyl-2-pentanone	40.5	2.0	40	0	101	70 - 130				
Acetone	40.41	2.0	40	0	101	70 - 130				
Benzene	21.64	1.0	20	0	108	74 - 120				
Bromobenzene	20.92	1.0	20	0	105	78 - 113				
Bromochloromethane	22.15	1.0	20	0	111	76 - 124				
Bromodichloromethane	22.39	1.0	20	0	112	74 - 122				
Bromoform	21.3	1.0	20	0	107	73 - 128				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.16	1.0	20	0	121	70 - 130				
Carbon disulfide	40.05	2.0	40	0	100	70 - 130				
Carbon tetrachloride	21.81	1.0	20	0	109	71 - 125				
Chlorobenzene	22.48	1.0	20	0	112	76 - 113				
Chloroethane	18.82	1.0	20	0	94.1	70 - 130				
Chloroform	20.57	1.0	20	0	103	71 - 121				
Chloromethane	18.22	1.0	20	0	91.1	70 - 129				
cis-1,2-Dichloroethene	21.8	1.0	20	0	109	75 - 122				
cis-1,3-Dichloropropene	23.68	1.0	20	0	118	73 - 127				
Dibromochloromethane	21.85	1.0	20	0	109	77 - 122				
Dibromomethane	22.8	1.0	20	0	114	78 - 121				
Dichlorodifluoromethane	16.02	1.0	20	0	80.1	70 - 130				
Ethylbenzene	23.45	1.0	20	0	117	77 - 117				S
Hexachlorobutadiene	20.75	1.0	20	0	104	70 - 130				
Isopropylbenzene	21.35	1.0	20	0	107	73 - 127				
m,p-Xylene	48.78	2.0	40	0	122	77 - 122				
Methylene chloride	21.65	2.0	20	0	108	70 - 127				
Naphthalene	19.4	1.0	20	0	97.0	70 - 130				
n-Butylbenzene	21.53	1.0	20	0	108	72 - 130				
n-Propylbenzene	22.93	1.0	20	0	115	73 - 124				
o-Xylene	23.76	1.0	20	0	119	75 - 119				
sec-Butylbenzene	19.62	1.0	20	0	98.1	73 - 128				
Styrene	22.74	1.0	20	0	114	72 - 126				
tert-Butylbenzene	22.15	1.0	20	0	111	73 - 124				
Tetrachloroethene	21.25	1.0	20	0	106	76 - 119				
Toluene	21.16	1.0	20	0	106	77 - 118				
trans-1,2-Dichloroethene	22.17	1.0	20	0	111	72 - 127				
trans-1,3-Dichloropropene	23.72	1.0	20	0	119	77 - 119				
Trichloroethene	23.1	1.0	20	0	115	77 - 121				
Trichlorofluoromethane	20.46	1.0	20	0	102	70 - 130				
Vinyl chloride	19.55	1.0	20	0	97.8	70 - 130				
Surr: 1,2-Dichloroethane-d4	*46.15*	*1.0*	*50*	*0*	*92.3*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.86*	*1.0*	*50*	*0*	*102*	*82 - 115*				
Surr: Dibromofluoromethane	*47.17*	*1.0*	*50*	*0*	*94.3*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: **R325772 (0)** **Instrument:** **VOA2** **Method:** **LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.26*	*1.0*	*50*	*0*	*90.5*	*81 - 120*				

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.93	1.0	20	0	99.6	70 - 120				
1,1,1-Trichloroethane	19.47	1.0	20	0	97.3	70 - 130				
1,1,2,2-Tetrachloroethane	16.62	1.0	20	0	83.1	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	21.64	1.0	20	0	108	70 - 130				
1,1,2-Trichloroethane	19.52	1.0	20	0	97.6	70 - 117				
1,1-Dichloroethane	19.44	1.0	20	0	97.2	70 - 127				
1,1-Dichloroethene	20.24	1.0	20	0	101	70 - 130				
1,1-Dichloropropene	22.55	1.0	20	0	113	70 - 129				
1,2,3-Trichlorobenzene	16.48	1.0	20	0	82.4	70 - 130				
1,2,3-Trichloropropane	16.73	1.0	20	0	83.6	70 - 130				
1,2,4-Trichlorobenzene	17.65	1.0	20	0	88.3	70 - 125				
1,2,4-Trimethylbenzene	19.83	1.0	20	0	99.2	70 - 125				
1,2-Dibromo-3-chloropropane	14.87	1.0	20	0	74.4	70 - 130				
1,2-Dibromoethane	19.89	1.0	20	0	99.5	70 - 124				
1,2-Dichlorobenzene	18.74	1.0	20	0	93.7	70 - 115				
1,2-Dichloroethane	19.14	1.0	20	0	95.7	70 - 127				
1,2-Dichloropropane	20.52	1.0	20	0	103	70 - 122				
1,3,5-Trimethylbenzene	18.38	1.0	20	0	91.9	70 - 126				
1,3-Dichlorobenzene	18.85	1.0	20	0	94.2	70 - 119				
1,3-Dichloropropane	19.64	1.0	20	0	98.2	70 - 121				
1,4-Dichlorobenzene	19.01	1.0	20	0	95.1	70 - 114				
2,2-Dichloropropane	20.09	1.0	20	0	100	70 - 130				
2-Butanone	34.38	2.0	40	0	86.0	70 - 130				
2-Chlorotoluene	20.71	1.0	20	0	104	70 - 130				
2-Hexanone	34.15	2.0	40	0	85.4	70 - 130				
4-Chlorotoluene	20.55	1.0	20	0	103	70 - 130				
4-Isopropyltoluene	17.83	1.0	20	0	89.2	70 - 130				
4-Methyl-2-pentanone	36.27	2.0	40	0	90.7	70 - 130				
Acetone	35.8	2.0	40	0	89.5	70 - 130				
Benzene	20.48	1.0	20	0	102	70 - 127				
Bromobenzene	19.06	1.0	20	0	95.3	70 - 115				
Bromochloromethane	19.62	1.0	20	0	98.1	70 - 127				
Bromodichloromethane	20.37	1.0	20	0	102	70 - 124				
Bromoform	18.57	1.0	20	0	92.9	70 - 129				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	23.12	1.0	20	0	116	70 - 130				
Carbon disulfide	39.49	2.0	40	0	98.7	70 - 130				
Carbon tetrachloride	21.31	1.0	20	0	107	70 - 130				
Chlorobenzene	20.51	1.0	20	0	103	70 - 114				
Chloroethane	19.96	1.0	20	0	99.8	70 - 130				
Chloroform	18.95	1.0	20	0	94.7	70 - 125				
Chloromethane	16.31	1.0	20	0	81.5	70 - 130				
cis-1,2-Dichloroethene	20.24	1.0	20	0	101	70 - 128				
cis-1,3-Dichloropropene	21.1	1.0	20	0	106	70 - 125				
Dibromochloromethane	19.32	1.0	20	0	96.6	70 - 124				
Dibromomethane	20.47	1.0	20	0	102	70 - 124				
Dichlorodifluoromethane	16.46	1.0	20	0	82.3	70 - 130				
Ethylbenzene	22.32	1.0	20	0	112	70 - 124				
Hexachlorobutadiene	18.59	1.0	20	0	92.9	70 - 130				
Isopropylbenzene	19.83	1.0	20	0	99.2	70 - 130				
m,p-Xylene	44.08	2.0	40	0	110	70 - 130				
Methylene chloride	19.79	2.0	20	0	99.0	70 - 128				
Naphthalene	14.85	1.0	20	0	74.2	70 - 130				
n-Butylbenzene	19.62	1.0	20	0	98.1	70 - 130				
n-Propylbenzene	21.13	1.0	20	0	106	70 - 130				
o-Xylene	21.69	1.0	20	0	108	70 - 124				
sec-Butylbenzene	18.74	1.0	20	0	93.7	70 - 130				
Styrene	19.72	1.0	20	0	98.6	70 - 130				
tert-Butylbenzene	20.67	1.0	20	0	103	70 - 130				
Tetrachloroethene	20.42	1.0	20	0	102	70 - 130				
Toluene	20.05	1.0	20	0	100	70 - 123				
trans-1,2-Dichloroethene	20.57	1.0	20	0	103	70 - 130				
trans-1,3-Dichloropropene	21.52	1.0	20	0	108	70 - 121				
Trichloroethene	21.28	1.0	20	0	106	70 - 129				
Trichlorofluoromethane	21.09	1.0	20	0	105	70 - 130				
Vinyl chloride	20.12	1.0	20	0	101	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.12*	*1.0*	*50*	*0*	*94.2*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.83*	*1.0*	*50*	*0*	*104*	*81 - 113*				
Surr: Dibromofluoromethane	*47.28*	*1.0*	*50*	*0*	*94.6*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.83*	*1.0*	*50*	*0*	*89.7*	*82 - 127*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.67	1.0	20	0	98.3	70 - 120	19.93	1.3	20	
1,1,1-Trichloroethane	18.24	1.0	20	0	91.2	70 - 130	19.47	6.49	20	
1,1,2,2-Tetrachloroethane	15.89	1.0	20	0	79.5	70 - 123	16.62	4.49	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	19.82	1.0	20	0	99.1	70 - 130	21.64	8.76	20	
1,1,2-Trichloroethane	19.13	1.0	20	0	95.7	70 - 117	19.52	2	20	
1,1-Dichloroethane	18.24	1.0	20	0	91.2	70 - 127	19.44	6.36	20	
1,1-Dichloroethene	18.81	1.0	20	0	94.0	70 - 130	20.24	7.34	20	
1,1-Dichloropropene	20.91	1.0	20	0	105	70 - 129	22.55	7.55	20	
1,2,3-Trichlorobenzene	16.77	1.0	20	0	83.8	70 - 130	16.48	1.73	20	
1,2,3-Trichloropropane	16.43	1.0	20	0	82.1	70 - 130	16.73	1.82	20	
1,2,4-Trichlorobenzene	17.98	1.0	20	0	89.9	70 - 125	17.65	1.85	20	
1,2,4-Trimethylbenzene	19.53	1.0	20	0	97.7	70 - 125	19.83	1.53	20	
1,2-Dibromo-3-chloropropane	14.25	1.0	20	0	71.3	70 - 130	14.87	4.25	20	
1,2-Dibromoethane	19.34	1.0	20	0	96.7	70 - 124	19.89	2.81	20	
1,2-Dichlorobenzene	18.24	1.0	20	0	91.2	70 - 115	18.74	2.71	20	
1,2-Dichloroethane	19.32	1.0	20	0	96.6	70 - 127	19.14	0.916	20	
1,2-Dichloropropane	20.11	1.0	20	0	101	70 - 122	20.52	1.99	20	
1,3,5-Trimethylbenzene	17.6	1.0	20	0	88.0	70 - 126	18.38	4.3	20	
1,3-Dichlorobenzene	18.73	1.0	20	0	93.6	70 - 119	18.85	0.636	20	
1,3-Dichloropropane	18.95	1.0	20	0	94.7	70 - 121	19.64	3.62	20	
1,4-Dichlorobenzene	18.82	1.0	20	0	94.1	70 - 114	19.01	1.04	20	
2,2-Dichloropropane	18.81	1.0	20	0	94.0	70 - 130	20.09	6.58	20	
2-Butanone	34.35	2.0	40	0	85.9	70 - 130	34.38	0.0911	20	
2-Chlorotoluene	19.91	1.0	20	0	99.6	70 - 130	20.71	3.92	20	
2-Hexanone	34.65	2.0	40	0	86.6	70 - 130	34.15	1.46	20	
4-Chlorotoluene	20.09	1.0	20	0	100	70 - 130	20.55	2.26	20	
4-Isopropyltoluene	17.1	1.0	20	0	85.5	70 - 130	17.83	4.21	20	
4-Methyl-2-pentanone	35.68	2.0	40	0	89.2	70 - 130	36.27	1.63	20	
Acetone	32.18	2.0	40	0	80.4	70 - 130	35.8	10.7	20	
Benzene	19.68	1.0	20	0	98.4	70 - 127	20.48	3.98	20	
Bromobenzene	18.59	1.0	20	0	93.0	70 - 115	19.06	2.49	20	
Bromochloromethane	19.83	1.0	20	0	99.1	70 - 127	19.62	1.07	20	
Bromodichloromethane	19.79	1.0	20	0	98.9	70 - 124	20.37	2.89	20	
Bromoform	18.27	1.0	20	0	91.3	70 - 129	18.57	1.65	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	20.98	1.0	20	0	105	70 - 130	23.12	9.72	20	
Carbon disulfide	36.19	2.0	40	0	90.5	70 - 130	39.49	8.72	20	
Carbon tetrachloride	20.74	1.0	20	0	104	70 - 130	21.31	2.73	20	
Chlorobenzene	19.53	1.0	20	0	97.6	70 - 114	20.51	4.92	20	
Chloroethane	18.48	1.0	20	0	92.4	70 - 130	19.96	7.72	20	
Chloroform	18.47	1.0	20	0	92.4	70 - 125	18.95	2.55	20	
Chloromethane	15.83	1.0	20	0	79.1	70 - 130	16.31	3.01	20	
cis-1,2-Dichloroethene	19.71	1.0	20	0	98.5	70 - 128	20.24	2.69	20	
cis-1,3-Dichloropropene	20.74	1.0	20	0	104	70 - 125	21.1	1.73	20	
Dibromochloromethane	18.89	1.0	20	0	94.5	70 - 124	19.32	2.25	20	
Dibromomethane	20.01	1.0	20	0	100	70 - 124	20.47	2.29	20	
Dichlorodifluoromethane	14.34	1.0	20	0	71.7	70 - 130	16.46	13.8	20	
Ethylbenzene	20.91	1.0	20	0	105	70 - 124	22.32	6.53	20	
Hexachlorobutadiene	17.83	1.0	20	0	89.2	70 - 130	18.59	4.17	20	
Isopropylbenzene	18.68	1.0	20	0	93.4	70 - 130	19.83	5.99	20	
m,p-Xylene	41.93	2.0	40	0	105	70 - 130	44.08	5	20	
Methylene chloride	19.21	2.0	20	0	96.1	70 - 128	19.79	2.98	20	
Naphthalene	15.43	1.0	20	0	77.2	70 - 130	14.85	3.84	20	
n-Butylbenzene	18.9	1.0	20	0	94.5	70 - 130	19.62	3.74	20	
n-Propylbenzene	19.91	1.0	20	0	99.6	70 - 130	21.13	5.92	20	
o-Xylene	20.75	1.0	20	0	104	70 - 124	21.69	4.43	20	
sec-Butylbenzene	17.69	1.0	20	0	88.5	70 - 130	18.74	5.72	20	
Styrene	19.17	1.0	20	0	95.8	70 - 130	19.72	2.83	20	
tert-Butylbenzene	19.41	1.0	20	0	97.1	70 - 130	20.67	6.26	20	
Tetrachloroethene	19.01	1.0	20	0	95.0	70 - 130	20.42	7.18	20	
Toluene	18.86	1.0	20	0	94.3	70 - 123	20.05	6.11	20	
trans-1,2-Dichloroethene	19.55	1.0	20	0	97.8	70 - 130	20.57	5.06	20	
trans-1,3-Dichloropropene	21.15	1.0	20	0	106	70 - 121	21.52	1.72	20	
Trichloroethene	20.09	1.0	20	0	100	70 - 129	21.28	5.75	20	
Trichlorofluoromethane	19.62	1.0	20	0	98.1	70 - 130	21.09	7.23	20	
Vinyl chloride	18.52	1.0	20	0	92.6	70 - 130	20.12	8.3	20	
Surr: 1,2-Dichloroethane-d4	*46.4*	*1.0*	*50*	*0*	*92.8*	*70 - 126*	*47.12*	*1.54*	*20*	
Surr: 4-Bromofluorobenzene	*50.76*	*1.0*	*50*	*0*	*102*	*81 - 113*	*51.83*	*2.1*	*20*	
Surr: Dibromofluoromethane	*46.93*	*1.0*	*50*	*0*	*93.9*	*77 - 123*	*47.28*	*0.751*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.83*	*1.0*	*50*	*0*	*89.7*	*82 - 127*	*44.83*	*0.00577*	*20*	

The following samples were analyzed in this batch: HS18100725-01 HS18100725-02

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100725

QC BATCH REPORT

Batch ID: R325666 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-101618** Units: **mg/L** Analysis Date: **17-Oct-2018 02:03**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777661** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW2-101618** Units: **mg/L** Analysis Date: **17-Oct-2018 02:18**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777662** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.648	0.100	4	0	91.2	80 - 120				

LCSD Sample ID: **WLCSDW2-101618** Units: **mg/L** Analysis Date: **17-Oct-2018 02:32**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777663** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.65	0.100	4	0	91.2	80 - 120	3.648	0.0548	20	

MS Sample ID: **HS18100727-05MS** Units: **mg/L** Analysis Date: **17-Oct-2018 08:22**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777687** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	23.55	1.00	20	5.566	89.9	80 - 120				

MSD Sample ID: **HS18100727-05MSD** Units: **mg/L** Analysis Date: **17-Oct-2018 08:36**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777688** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	23.94	1.00	20	5.566	91.8	80 - 120	23.55	1.62	20	

The following samples were analyzed in this batch: HS18100725-03

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS18100725**

QUALIFIERS, ACRONYMS, UNITS

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

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

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

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Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18100725

Date/Time Received: **13-Oct-2018 09:40**
Received by: **PJM**

Checklist completed by: *Pablo Marinez* eSignature 13-Oct-2018 Date

Reviewed by: *RJ Modashia* eSignature 15-Oct-2018 Date

Matrices: **WATER**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.3C/1.0C UC/C	IR # 25
Cooler(s)/Kit(s):	44084	
Date/Time sample(s) sent to storage:	10/13/2018 17:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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APTIM

COC ID: LHAAP16-OCT2018-GW-ALSHT-181011 **TURNAROUND TIME:** normal **RUSH:** Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	Fedinvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-50			Email	RJ.Modashia@alsglobal.com			Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FED EX		

SAMPLE DETAILS

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.
16TB03-181011	FIELD QC				LIQ	10/11/2018	830	2
16WW32-181011	16WW32	31.58	32.24	FT	GW	10/11/2018	928	4
16EW05-181011	16EW05	28.58	29.06	FT	GW	10/11/2018	1101	1

ANALYSIS REQUESTED

ANALYSIS	VOCs in Water by 8260B	Perchlorate in Water by 6850	Anions in Water by E300.0 & Alkalinity in Water by E2320b	Bromide by E300.0	Dissolved Gases in Water by RSK175	TOC in Water by SW9060
16TB03-181011	2					
16WW32-181011	3	1				
16EW05-181011				1		

HS18100725

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	[illegible] APTIM	10/12/18	ALS PM	10-13-18 9:40

44084 VC 1.3C IR 25 CF 03

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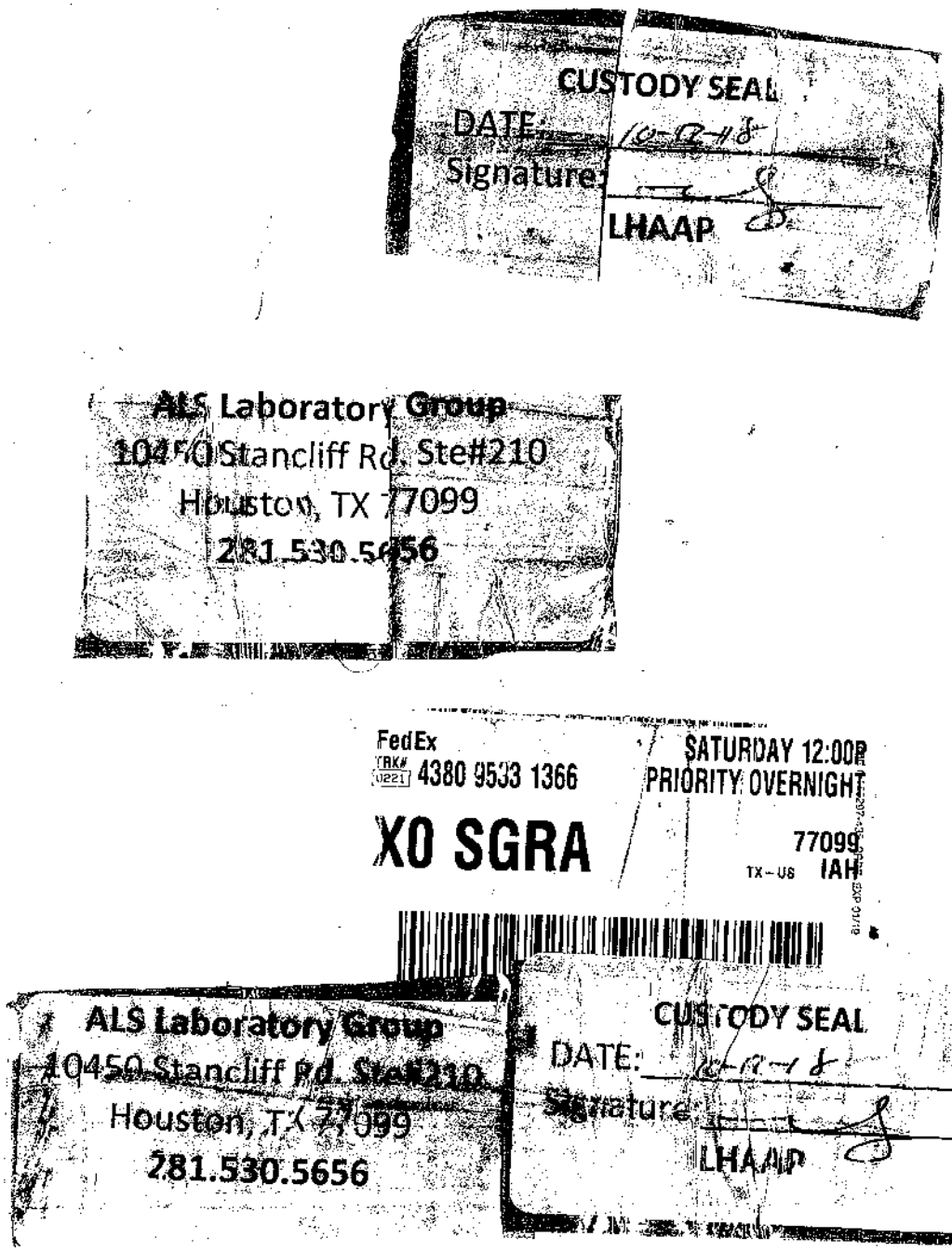

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1828987; 1828988; 1828989; 1829115

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2159 (225647)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1829115002 was analyzed and reported from a 1:10 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 624449) was less than 1/2 the CRDL. The recovery for the LCS (624450) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1828988002/03 and 1828989005/06 (Client ID's: 16WW32-181011/16WW40-181012). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The Matrix Spike duplicate (MSD - 1828989006) failed QC acceptance criteria for percent recovery, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent differences (RPD's) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1

Thomas Bosch October 25, 2018
Analyst Date

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ANALYTICAL REPORT

Report Date: October 29, 2018

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1828987**
Project ID: HS18100725 101118
Purchase Order: HS18100725
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16WW32-181011	1828987001	10/11/18	10/16/18	

ANALYTICAL REPORT

Workorder: 34-1828987
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID:	**16WW32-181011**	Sampling Site:	NA	Collected:	10/11/2018
Lab ID:	1828987001	Media:	125 mL Nalgene	Received:	10/16/2018
Matrix:	Water	Sampling Parameter:	NA		

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:**	LCMS04
	Batch: ELMS/2159 (HBN: 225647)	**Percent Solid:**	NA
	Analyzed: 10/24/2018 09:25	**Report Basis:**	Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/25/2018 14:54	/S/ Stephen Brose 10/29/2018 08:45

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1828987
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body	Certificate Number	Website
Environmental	PJLA (DoD ELAP)		
	Utah (TNI)		
	Nevada		
	Oklahoma		
	Iowa		

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1828987

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2159 (HBN: 225647)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 624449
Analyzed: 10/24/2018 08:55
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 624450
Analyzed: 10/24/2018 09:09
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.90	5.00	97.9	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1828988001	**MS:**	1828988002			**MSD:**	1828988003				
Analyzed:	10/24/2018 09:40	**Analyzed:**	10/24/2018 09:54			**Analyzed:**	10/24/2018 10:08				
Dilution:	1	**Dilution:**	1			**Dilution:**	1				
Units:	ug/L	**Units:**	ug/L			**Units:**	ug/L				

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.75	5	94.9	78.8	123.8	4.67	93.3	1.7	0.0	20.0

Sample:	1828989004	**MS:**	1828989005			**MSD:**	1828989006				
Analyzed:	10/24/2018 11:47	**Analyzed:**	10/24/2018 12:29			**Analyzed:**	10/24/2018 12:43				
Dilution:	1	**Dilution:**	1			**Dilution:**	1				
Units:	ug/L	**Units:**	ug/L			**Units:**	ug/L				

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.4	5	108	78.8	123.8	6.26	# 125	14.7	0.0	20.0

Continuing Calibration Verification

CCV:	624446	**CCV:**	624451			**CCV:**	624453		
Analyzed:	10/24/2018 08:12	**Analyzed:**	10/24/2018 12:01			**Analyzed:**	10/24/2018 15:06		
Units:	ug/L	**Units:**	ug/L			**Units:**	ug/L		
Criteria:	± 15%	**Criteria:**	± 15%			**Criteria:**	± 15%		

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	24.4	25.0	97.6	23.5	25.0	94.0	23.5	25.0	94.2

Interference Check Sample

ICSA: 624448
Analyzed: 10/24/2018 08:41
Units: ug/L
Criteria: ± 30%

Analyte	Result	Target	% Rec.
Perchlorate	0.985	1.00	98.5

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Quality Control Sample
Batch Report

Analysis Information

Workorder: **1828987**

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2159 (HBN: 225647)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Limit of Detection Verification

LODV:	624447			**LODV:**	624452			**LODV:**	624454		
Analyzed:	10/24/2018 08:27			**Analyzed:**	10/24/2018 12:15			**Analyzed:**	10/24/2018 15:20		
Units:	ug/L			**Units:**	ug/L			**Units:**	ug/L		
Criteria:	± 50%			**Criteria:**	± 50%			**Criteria:**	± 50%		
Analyte	**Result**	**Target**	**% Rec.**	**Result**	**Target**	**% Rec.**		**Result**	**Target**	**% Rec.**
Perchlorate	1.03	1.00	103	0.970	1.00	97.0		1.02	1.00	102

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
10/25/2018 14:54	10/29/2018 08:45

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◓ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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18698/#2

10450 Stancliff Rd, Ste 210
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 10011

1828987

SUBCONTRACT TO:

ALS Laboratory Group
960 West LeVoy Drive
Salt Lake City, UT 84123

Phone: +1 800 356 9135

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18100725
TSR:	Sonia West

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS18100725-02**	**16WW32-181011**	**GW**	**11 Oct 2018 09:28**
	SUB_Perch-6850			23 Oct 2018

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 10/15/18 1800

Received By: _____ Date/Time: 10/16/18 10:20

Cooler ID(s): _____ Temperature(s): _____

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18100725	Split:	Workorder ID: 1828987	Level: ENV_LVL4	Requested Analysis
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly	
Comments:			Preservatives: COOL	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850, DoD QSM
1	10/11/2018 09:28	16WW32-181011	1828987001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	10/16/2018 10:20	ALS Sample Receiving	Sample Login
Julie Warath	Matrix 1000	3C	Storage
R.33.1	10.23.18/14:10	T. Bosh	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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10/16/18

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: HS18100725/10011

Date/Time of Receipt: 10/16/2018 10:20

Number of Coolers Received: 1

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	(Yes)/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C18 8831	2 °C	4	C18	°C	7	C18	°C
2	C18	°C	5	C18	°C	8	C18	°C
3	C18	°C	6	C18	°C	9	C18	°C

Taken By: Desiree Hill (Signature) Desiree Hill (Printed Name) 10/16/2018 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

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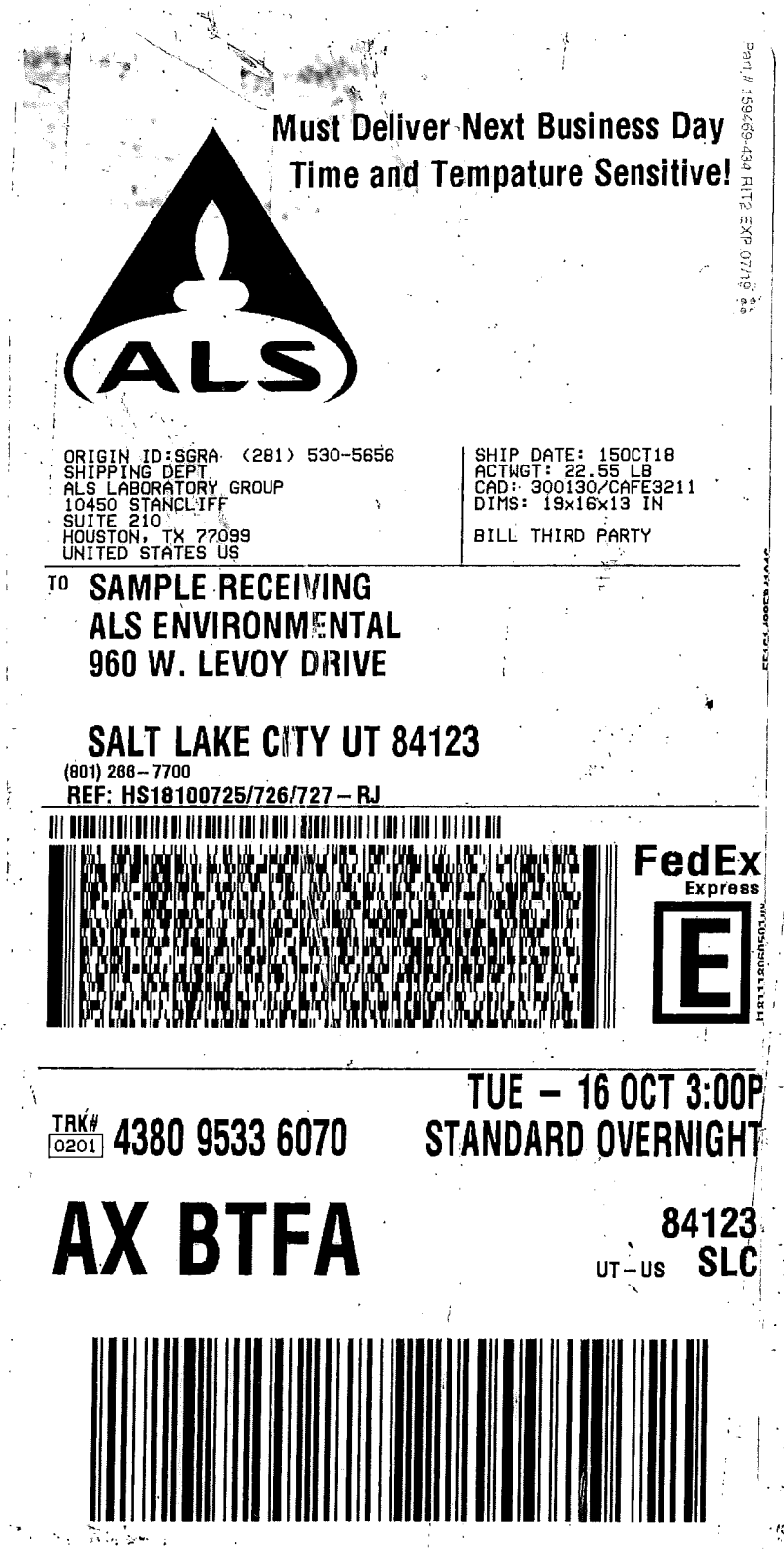

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159669-434 RIT2 EXP 07/19

ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 15OCT18
ACTWGT: 22.55 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS18100725/726/727 - RJ

FedEx Express

TRK# 0201 4380 9533 6070

TUE - 16 OCT 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

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Batch Worklist

Batch: ELMS/ 2159 **Created:** 10/23/2018 18:03 **Instrument:** **HBN:** 225647

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1828987 [ENV_LVL4]
Workorder: 1828988 [ENV_LVL4]
Workorder: 1828989 [ENV_LVL4]
Workorder: 1829115 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	624446	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
2	624447	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	
3	624448	ICS for HBN 225647 [ELMS/2159]				ICS	3		E6850..D3Q	5311		10/29/2018	
4	624449	LMB for HBN 225647 [ELMS/2159]				LMB	3		E6850Q413Q	5311		10/29/2018	
5	624450	LCS for HBN 225647 [ELMS/2159]				LCS	3		E6850Q413Q	5311		10/29/2018	
6	1828987001	16WW32-181011				SAMPLE	3	1828987001-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
7	1828988001	16SW01-181011				SAMPLE	3	1828988001-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
8	1828988002	16SW01-181011MS				MS	3	1828988002-A	E6850Q413Q	5480		10/29/2018	
9	1828988003	16SW01-181011MSD				MSD	3	1828988003-A	E6850Q413Q	5480		10/29/2018	
10	1828988004	16SW01-181011-FD				FLDDUP	3	1828988004-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
11	1828988005	16SW02-181011				SAMPLE	3	1828988005-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
12	1828988006	16SW03-181011				SAMPLE	3	1828988006-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
13	1828989001	16WW30-181012				SAMPLE	3	1828989001-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
14	1828989002	16WW46-181012				SAMPLE	3	1828989002-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
15	1828989003	16WW23-181012				SAMPLE	3	1828989003-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
16	1828989004	16WW40-181012				SAMPLE	3	1828989004-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
17	624451	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
18	624452	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	
19	1828989005	16WW40-181012MS				MS	3	1828989005-A	E6850Q413Q	5480		10/29/2018	
20	1828989006	16WW40-181012MSD				MSD	3	1828989006-A	E6850Q413Q	5480		10/29/2018	
21	1828989007	16WW40-181012-FD				FLDDUP	3	1828989007-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
22	1828989008	16WW27-181012				SAMPLE	3	1828989008-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
23	1828989009	16WW12-181012				SAMPLE	3	1828989009-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
24	1828989010	16WW42-181012				SAMPLE	3	1828989010-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
25	1828989011	16WW13-181012				SAMPLE	3	1828989011-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
26	1828989012	16WW21-181012				SAMPLE	3	1828989012-A	E6850Q41.3	5480	11/9/2018	10/29/2018	

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Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
27	1828989013	16EB01-181012				EQBK	3	1828989013-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
28	1829115001	16WW29-181015				SAMPLE	3	1829115001-A	E6850Q41.3	5480	11/12/2018	10/30/2018	
29	1829115002	16WW55-181015				SAMPLE	3	1829115002-A	E6850Q41.3	5480	11/12/2018	10/30/2018	
30	624453	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
31	624454	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	

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Analytical Documentation

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Work Order #'s & Sample #( )'s: 1828987 (001); 1828988 (001-06); 1828989 (001-13); 1829115 (001,02)
ELMS Batch/HBN ID: 2159 (225647)
Prep Date: 10/23/2018 Analysis Date: 10/24/2018 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\OCT\24OCT18D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 10/08/2018, sequence 08OCT18D.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 2 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.80
5.0	0.80
5.3	0.25
10.0	0.25
10.5	0.80
12.5	0.80

QC DATA: 5.0µL of QC Solution Horizon ID 41830 was used for LCS 624450; Target = 5.0µg/L. ASTM type II water was used for LMB 624449.

MS/MSD: MS/MSD was performed on samples 1828988002/03 and 1828989005/06 (Client ID's: 16WW32-181011/16WW40-181012). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field sample 1829115002 was analyzed and reported from a 1:10 dilution. The reporting limit has been adjusted accordingly. Samples 1828989004/07 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The Matrix Spike duplicate (MSD - 1828989006) failed QC acceptance criteria for percent recovery, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2018\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\225647-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS 2159 HBN 225647 Sample Set IDs if Applicable: 18-28987/18289888/18289889/18291115	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

TB. 10.26.18
SB 10/29/18

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Working Standard - CLO4 WRK

CLO4 WRK — **Description - 6850 WKG Std 100.ug/L**

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** No
Part ID: IC-PER-10X-1		**Lab Lot:** CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 09/20/2018 09:09AM	**Expires:** 04/28/2026
MFG Lot: SDFF-012A	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

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125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safely information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 26, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18100726**

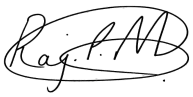
Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 5 sample(s) on Oct 13, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18100726

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18100726-01	16TB04-181011	Liquid	VBLKW-092618-18	11-Oct-2018 13:00	13-Oct-2018 09:40	☐
HS18100726-02	16SW01-181011	Surface Water		11-Oct-2018 13:55	13-Oct-2018 09:40	☐
HS18100726-03	16SW01-181011-FD	Surface Water		11-Oct-2018 13:55	13-Oct-2018 09:40	☐
HS18100726-04	16SW02-181011	Surface Water		11-Oct-2018 15:10	13-Oct-2018 09:40	☐
HS18100726-05	16SW03-181011	Surface Water		11-Oct-2018 16:30	13-Oct-2018 09:40	☐

Revision:2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant
Work Order: HS18100726

Work Order Comments

- Revised to updated the VOC list.
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

- Revised to add the the correct Perchlorate Data Package

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

GCMS Volatiles by Method SW8260

Batch ID: R325772

Sample ID: CCV

- Bromomethane and m,p-Xylenes exceeded %D limits on CCV. Samples ND.

Sample ID: VLCSW-181018

- Ethylbenzene exceeded %recovery limits on LCS. Samples ND.

Metals by Method SW6020

Batch ID: 133599

Sample ID: 16SW01-181011 (HS18100726-02MS)

- The MS recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Manganese

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16TB04-181011
Collection Date: 11-Oct-2018 13:00

ANALYTICAL REPORT
WorkOrder:HS18100726
Lab ID:HS18100726-01
Matrix:Liquid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 04:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:14
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:14
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 04:14
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:14
Surr: 1,2-Dichloroethane-d4	*89.8*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 04:14*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 04:14*
Surr: Dibromofluoromethane	*96.4*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 04:14*
Surr: Toluene-d8	*92.2*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 04:14*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16SW01-181011
Collection Date: 11-Oct-2018 13:55

ANALYTICAL REPORT
WorkOrder:HS18100726
Lab ID:HS18100726-02
Matrix:Surface Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 05:03
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 05:03
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 05:03
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 05:03
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 05:03
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 05:03
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 05:03
Surr: 1,2-Dichloroethane-d4	*90.7*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 05:03*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 05:03*
Surr: Dibromofluoromethane	*95.4*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 05:03*
Surr: Toluene-d8	*92.1*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 05:03*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 16-Oct-2018		Analyst: ALR
Arsenic	**0.00204**		**0.000400**	**0.00100**	**0.00200**	**mg/L**	1	24-Oct-2018 17:24
Chromium	**0.000499**	J	**0.000400**	**0.00100**	**0.00400**	**mg/L**	1	24-Oct-2018 17:24
Manganese	**0.545**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	24-Oct-2018 17:24
Nickel	**0.00756**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	24-Oct-2018 17:24
Thallium	**0.000418**	J	**0.000200**	**0.00100**	**0.00200**	**mg/L**	1	24-Oct-2018 17:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

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

Revision: 2

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16SW01-181011-FD
Collection Date: 11-Oct-2018 13:55

ANALYTICAL REPORT
WorkOrder:HS18100726
Lab ID:HS18100726-03
Matrix:Surface Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 07:30
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:30
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:30
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:30
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 07:30
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:30
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:30
Surr: 1,2-Dichloroethane-d4	*90.6*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 07:30*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 07:30*
Surr: Dibromofluoromethane	*97.4*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 07:30*
Surr: Toluene-d8	*92.2*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 07:30*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 16-Oct-2018		Analyst: ALR
Arsenic	**0.00212**		**0.000400**	**0.00100**	**0.00200**	**mg/L**	1	24-Oct-2018 17:34
Chromium	**0.000515**	J	**0.000400**	**0.00100**	**0.00400**	**mg/L**	1	24-Oct-2018 17:34
Manganese	**0.586**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	24-Oct-2018 17:34
Nickel	**0.00786**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	24-Oct-2018 17:34
Thallium	0.00100	U	0.000200	0.00100	0.00200	mg/L	1	24-Oct-2018 17:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16SW02-181011
Collection Date: 11-Oct-2018 15:10

ANALYTICAL REPORT
WorkOrder:HS18100726
Lab ID:HS18100726-04
Matrix:Surface Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 07:54
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:54
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:54
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:54
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 07:54
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:54
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 07:54
Surr: 1,2-Dichloroethane-d4	*91.3*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 07:54*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 07:54*
Surr: Dibromofluoromethane	*98.1*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 07:54*
Surr: Toluene-d8	*94.2*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 07:54*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 16-Oct-2018		Analyst: ALR
Arsenic	**0.00198**	J	**0.000400**	**0.00100**	**0.00200**	**mg/L**	1	24-Oct-2018 17:36
Chromium	0.00100	U	0.000400	0.00100	0.00400	mg/L	1	24-Oct-2018 17:36
Manganese	**0.485**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	24-Oct-2018 17:36
Nickel	**0.00725**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	24-Oct-2018 17:36
Thallium	0.00100	U	0.000200	0.00100	0.00200	mg/L	1	24-Oct-2018 17:36
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16SW03-181011
Collection Date: 11-Oct-2018 16:30

ANALYTICAL REPORT
WorkOrder:HS18100726
Lab ID:HS18100726-05
Matrix:Surface Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 08:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 08:19
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 08:19
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 08:19
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 08:19
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 08:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 08:19
Surr: 1,2-Dichloroethane-d4	*90.2*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 08:19*
Surr: 4-Bromofluorobenzene	*97.9*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 08:19*
Surr: Dibromofluoromethane	*97.0*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 08:19*
Surr: Toluene-d8	*92.3*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 08:19*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 16-Oct-2018		Analyst: ALR
Arsenic	**0.00194**	J	**0.000400**	**0.00100**	**0.00200**	**mg/L**	1	24-Oct-2018 17:42
Chromium	0.00100	U	0.000400	0.00100	0.00400	mg/L	1	24-Oct-2018 17:42
Manganese	**0.360**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	24-Oct-2018 17:42
Nickel	**0.00668**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	24-Oct-2018 17:42
Thallium	0.00100	U	0.000200	0.00100	0.00200	mg/L	1	24-Oct-2018 17:42
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

Weight / Prep Log

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

Batch ID: 133599 **Start Date:** 16 Oct 2018 14:00 **End Date:** 16 Oct 2018 18:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100726-02		10 (mL)	10 (mL)	1
HS18100726-03		10 (mL)	10 (mL)	1
HS18100726-04		10 (mL)	10 (mL)	1
HS18100726-05		10 (mL)	10 (mL)	1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 133599 (0)	**Test Name :** ICP-MS METALS BY SW6020A				**Matrix:** Surface Water	
HS18100726-02	16SW01-181011	11 Oct 2018 13:55		16 Oct 2018 14:00	24 Oct 2018 17:24	1
HS18100726-03	16SW01-181011-FD	11 Oct 2018 13:55		16 Oct 2018 14:00	24 Oct 2018 17:34	1
HS18100726-04	16SW02-181011	11 Oct 2018 15:10		16 Oct 2018 14:00	24 Oct 2018 17:36	1
HS18100726-05	16SW03-181011	11 Oct 2018 16:30		16 Oct 2018 14:00	24 Oct 2018 17:42	1
Batch ID: R325772 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Surface Water	
HS18100726-02	16SW01-181011	11 Oct 2018 13:55			19 Oct 2018 05:03	1
HS18100726-03	16SW01-181011-FD	11 Oct 2018 13:55			19 Oct 2018 07:30	1
HS18100726-04	16SW02-181011	11 Oct 2018 15:10			19 Oct 2018 07:54	1
HS18100726-05	16SW03-181011	11 Oct 2018 16:30			19 Oct 2018 08:19	1
Batch ID: R325772 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Liquid	
HS18100726-01	16TB04-181011	11 Oct 2018 13:00			19 Oct 2018 04:14	1
Batch ID: R326322 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Surface Water	
HS18100726-02	16SW01-181011	11 Oct 2018 13:55			29 Oct 2018 15:58	1
HS18100726-03	16SW01-181011-FD	11 Oct 2018 13:55			29 Oct 2018 15:58	1
HS18100726-04	16SW02-181011	11 Oct 2018 15:10			29 Oct 2018 15:58	1
HS18100726-05	16SW03-181011	11 Oct 2018 16:30			29 Oct 2018 15:58	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: 133599 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-133599** Units: **mg/L** Analysis Date: **24-Oct-2018 17:20**
Client ID: Run ID: **ICPMS05_326035** SeqNo: **4788130** PrepDate: **16-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00200								U
Chromium	0.00100	0.00400								U
Manganese	0.002255	0.00500								J
Nickel	0.00100	0.00200								U
Thallium	0.00100	0.00200								U

LCS Sample ID: **LCS-133599** Units: **mg/L** Analysis Date: **24-Oct-2018 17:22**
Client ID: Run ID: **ICPMS05_326035** SeqNo: **4788131** PrepDate: **16-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04537	0.00200	0.05	0	90.7	80 - 120				
Chromium	0.04643	0.00400	0.05	0	92.9	80 - 120				
Manganese	0.04849	0.00500	0.05	0	97.0	80 - 120				
Nickel	0.04682	0.00200	0.05	0	93.6	80 - 120				
Thallium	0.0458	0.00200	0.05	0	91.6	80 - 120				

MS Sample ID: **HS18100726-02MS** Units: **mg/L** Analysis Date: **24-Oct-2018 17:28**
Client ID: **16SW01-181011** Run ID: **ICPMS05_326035** SeqNo: **4788134** PrepDate: **16-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.048	0.00200	0.05	0.002043	91.9	80 - 120				
Chromium	0.0471	0.00400	0.05	0.000499	93.2	80 - 120				
Manganese	0.5837	0.00500	0.05	0.545	77.3	80 - 120				SO
Nickel	0.05435	0.00200	0.05	0.007556	93.6	80 - 120				
Thallium	0.04694	0.00200	0.05	0.000418	93.0	80 - 120				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: 133599 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS18100726-02MSD** Units: **mg/L** Analysis Date: **24-Oct-2018 17:30**
Client ID: **16SW01-181011** Run ID: **ICPMS05_326035** SeqNo: **4788135** PrepDate: **16-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04767	0.00200	0.05	0.002043	91.3	80 - 120	0.048	0.684	20	
Chromium	0.04732	0.00400	0.05	0.000499	93.6	80 - 120	0.0471	0.466	20	
Manganese	0.5968	0.00500	0.05	0.545	104	80 - 120	0.5837	2.22	20	O
Nickel	0.05352	0.00200	0.05	0.007556	91.9	80 - 120	0.05435	1.53	20	
Thallium	0.04671	0.00200	0.05	0.000418	92.6	80 - 120	0.04694	0.502	20	

PDS Sample ID: **HS18100726-02PDS** Units: **mg/L** Analysis Date: **24-Oct-2018 17:32**
Client ID: **16SW01-181011** Run ID: **ICPMS05_326035** SeqNo: **4788136** PrepDate: **16-Oct-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.09579	0.00200	0.1	0.002043	93.8	75 - 125				
Chromium	0.09506	0.00400	0.1	0.000499	94.6	75 - 125				
Manganese	0.6447	0.00500	0.1	0.545	99.6	75 - 125				O
Nickel	0.1027	0.00200	0.1	0.007556	95.2	75 - 125				
Thallium	0.1006	0.00200	0.1	0.000418	100	75 - 125				

SD Sample ID: **HS18100726-02SD** Units: **mg/L** Analysis Date: **24-Oct-2018 17:26**
Client ID: **16SW01-181011** Run ID: **ICPMS05_326035** SeqNo: **4788133** PrepDate: **16-Oct-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.002165	0.0100					0.002043	0	10	J
Chromium	0.00500	0.0200					0.000499	0	10	U
Manganese	0.5552	0.0250					0.545	1.87	10	
Nickel	0.006768	0.0100					0.007556	0	10	J
Thallium	0.00500	0.0100					0.000418	0	10	U

The following samples were analyzed in this batch: HS18100726-02 HS18100726-03 HS18100726-04 HS18100726-05

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.77*	*1.0*	*50*	*0*	*89.5*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.49*	*1.0*	*50*	*0*	*99.0*	*82 - 115*				
Surr: Dibromofluoromethane	*48.4*	*1.0*	*50*	*0*	*96.8*	*73 - 126*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.29*	*1.0*	*50*	*0*	*92.6*	*81 - 120*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.9	1.0	20	0	110	77 - 118				
1,1,1-Trichloroethane	20.17	1.0	20	0	101	70 - 130				
1,1,2,2-Tetrachloroethane	18.73	1.0	20	0	93.7	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.13	1.0	20	0	111	70 - 130				
1,1,2-Trichloroethane	21.59	1.0	20	0	108	77 - 113				
1,1-Dichloroethane	20.69	1.0	20	0	103	71 - 122				
1,1-Dichloroethene	20.65	1.0	20	0	103	70 - 130				
1,1-Dichloropropene	22.03	1.0	20	0	110	78 - 118				
1,2,3-Trichlorobenzene	20.23	1.0	20	0	101	70 - 130				
1,2,3-Trichloropropane	18.8	1.0	20	0	94.0	70 - 127				
1,2,4-Trichlorobenzene	21.62	1.0	20	0	108	77 - 126				
1,2,4-Trimethylbenzene	22.46	1.0	20	0	112	73 - 121				
1,2-Dibromo-3-chloropropane	17.54	1.0	20	0	87.7	70 - 130				
1,2-Dibromoethane	22.39	1.0	20	0	112	76 - 123				
1,2-Dichlorobenzene	21.11	1.0	20	0	106	77 - 113				
1,2-Dichloroethane	22.56	1.0	20	0	113	70 - 124				
1,2-Dichloropropane	22.14	1.0	20	0	111	72 - 119				
1,3,5-Trimethylbenzene	19.98	1.0	20	0	99.9	75 - 118				
1,3-Dichlorobenzene	20.97	1.0	20	0	105	78 - 118				
1,3-Dichloropropane	21.84	1.0	20	0	109	75 - 116				
1,4-Dichlorobenzene	21.68	1.0	20	0	108	79 - 113				
2,2-Dichloropropane	22.14	1.0	20	0	111	70 - 130				
2-Butanone	39.81	2.0	40	0	99.5	70 - 130				
2-Chlorotoluene	22.93	1.0	20	0	115	70 - 128				
2-Hexanone	39.54	2.0	40	0	98.9	70 - 130				
4-Chlorotoluene	22.78	1.0	20	0	114	74 - 126				
4-Isopropyltoluene	19.4	1.0	20	0	97.0	74 - 126				
4-Methyl-2-pentanone	40.5	2.0	40	0	101	70 - 130				
Acetone	40.41	2.0	40	0	101	70 - 130				
Benzene	21.64	1.0	20	0	108	74 - 120				
Bromobenzene	20.92	1.0	20	0	105	78 - 113				
Bromochloromethane	22.15	1.0	20	0	111	76 - 124				
Bromodichloromethane	22.39	1.0	20	0	112	74 - 122				
Bromoform	21.3	1.0	20	0	107	73 - 128				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.16	1.0	20	0	121	70 - 130				
Carbon disulfide	40.05	2.0	40	0	100	70 - 130				
Carbon tetrachloride	21.81	1.0	20	0	109	71 - 125				
Chlorobenzene	22.48	1.0	20	0	112	76 - 113				
Chloroethane	18.82	1.0	20	0	94.1	70 - 130				
Chloroform	20.57	1.0	20	0	103	71 - 121				
Chloromethane	18.22	1.0	20	0	91.1	70 - 129				
cis-1,2-Dichloroethene	21.8	1.0	20	0	109	75 - 122				
cis-1,3-Dichloropropene	23.68	1.0	20	0	118	73 - 127				
Dibromochloromethane	21.85	1.0	20	0	109	77 - 122				
Dibromomethane	22.8	1.0	20	0	114	78 - 121				
Dichlorodifluoromethane	16.02	1.0	20	0	80.1	70 - 130				
Ethylbenzene	23.45	1.0	20	0	117	77 - 117				S
Hexachlorobutadiene	20.75	1.0	20	0	104	70 - 130				
Isopropylbenzene	21.35	1.0	20	0	107	73 - 127				
m,p-Xylene	48.78	2.0	40	0	122	77 - 122				
Methylene chloride	21.65	2.0	20	0	108	70 - 127				
Naphthalene	19.4	1.0	20	0	97.0	70 - 130				
n-Butylbenzene	21.53	1.0	20	0	108	72 - 130				
n-Propylbenzene	22.93	1.0	20	0	115	73 - 124				
o-Xylene	23.76	1.0	20	0	119	75 - 119				
sec-Butylbenzene	19.62	1.0	20	0	98.1	73 - 128				
Styrene	22.74	1.0	20	0	114	72 - 126				
tert-Butylbenzene	22.15	1.0	20	0	111	73 - 124				
Tetrachloroethene	21.25	1.0	20	0	106	76 - 119				
Toluene	21.16	1.0	20	0	106	77 - 118				
trans-1,2-Dichloroethene	22.17	1.0	20	0	111	72 - 127				
trans-1,3-Dichloropropene	23.72	1.0	20	0	119	77 - 119				
Trichloroethene	23.1	1.0	20	0	115	77 - 121				
Trichlorofluoromethane	20.46	1.0	20	0	102	70 - 130				
Vinyl chloride	19.55	1.0	20	0	97.8	70 - 130				
Surr: 1,2-Dichloroethane-d4	*46.15*	*1.0*	*50*	*0*	*92.3*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.86*	*1.0*	*50*	*0*	*102*	*82 - 115*				
Surr: Dibromofluoromethane	*47.17*	*1.0*	*50*	*0*	*94.3*	*73 - 126*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.26*	*1.0*	*50*	*0*	*90.5*	*81 - 120*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: **16SW01-181011** Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.93	1.0	20	0	99.6	70 - 120				
1,1,1-Trichloroethane	19.47	1.0	20	0	97.3	70 - 130				
1,1,2,2-Tetrachloroethane	16.62	1.0	20	0	83.1	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	21.64	1.0	20	0	108	70 - 130				
1,1,2-Trichloroethane	19.52	1.0	20	0	97.6	70 - 117				
1,1-Dichloroethane	19.44	1.0	20	0	97.2	70 - 127				
1,1-Dichloroethene	20.24	1.0	20	0	101	70 - 130				
1,1-Dichloropropene	22.55	1.0	20	0	113	70 - 129				
1,2,3-Trichlorobenzene	16.48	1.0	20	0	82.4	70 - 130				
1,2,3-Trichloropropane	16.73	1.0	20	0	83.6	70 - 130				
1,2,4-Trichlorobenzene	17.65	1.0	20	0	88.3	70 - 125				
1,2,4-Trimethylbenzene	19.83	1.0	20	0	99.2	70 - 125				
1,2-Dibromo-3-chloropropane	14.87	1.0	20	0	74.4	70 - 130				
1,2-Dibromoethane	19.89	1.0	20	0	99.5	70 - 124				
1,2-Dichlorobenzene	18.74	1.0	20	0	93.7	70 - 115				
1,2-Dichloroethane	19.14	1.0	20	0	95.7	70 - 127				
1,2-Dichloropropane	20.52	1.0	20	0	103	70 - 122				
1,3,5-Trimethylbenzene	18.38	1.0	20	0	91.9	70 - 126				
1,3-Dichlorobenzene	18.85	1.0	20	0	94.2	70 - 119				
1,3-Dichloropropane	19.64	1.0	20	0	98.2	70 - 121				
1,4-Dichlorobenzene	19.01	1.0	20	0	95.1	70 - 114				
2,2-Dichloropropane	20.09	1.0	20	0	100	70 - 130				
2-Butanone	34.38	2.0	40	0	86.0	70 - 130				
2-Chlorotoluene	20.71	1.0	20	0	104	70 - 130				
2-Hexanone	34.15	2.0	40	0	85.4	70 - 130				
4-Chlorotoluene	20.55	1.0	20	0	103	70 - 130				
4-Isopropyltoluene	17.83	1.0	20	0	89.2	70 - 130				
4-Methyl-2-pentanone	36.27	2.0	40	0	90.7	70 - 130				
Acetone	35.8	2.0	40	0	89.5	70 - 130				
Benzene	20.48	1.0	20	0	102	70 - 127				
Bromobenzene	19.06	1.0	20	0	95.3	70 - 115				
Bromochloromethane	19.62	1.0	20	0	98.1	70 - 127				
Bromodichloromethane	20.37	1.0	20	0	102	70 - 124				
Bromoform	18.57	1.0	20	0	92.9	70 - 129				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: **16SW01-181011** Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	23.12	1.0	20	0	116	70 - 130				
Carbon disulfide	39.49	2.0	40	0	98.7	70 - 130				
Carbon tetrachloride	21.31	1.0	20	0	107	70 - 130				
Chlorobenzene	20.51	1.0	20	0	103	70 - 114				
Chloroethane	19.96	1.0	20	0	99.8	70 - 130				
Chloroform	18.95	1.0	20	0	94.7	70 - 125				
Chloromethane	16.31	1.0	20	0	81.5	70 - 130				
cis-1,2-Dichloroethene	20.24	1.0	20	0	101	70 - 128				
cis-1,3-Dichloropropene	21.1	1.0	20	0	106	70 - 125				
Dibromochloromethane	19.32	1.0	20	0	96.6	70 - 124				
Dibromomethane	20.47	1.0	20	0	102	70 - 124				
Dichlorodifluoromethane	16.46	1.0	20	0	82.3	70 - 130				
Ethylbenzene	22.32	1.0	20	0	112	70 - 124				
Hexachlorobutadiene	18.59	1.0	20	0	92.9	70 - 130				
Isopropylbenzene	19.83	1.0	20	0	99.2	70 - 130				
m,p-Xylene	44.08	2.0	40	0	110	70 - 130				
Methylene chloride	19.79	2.0	20	0	99.0	70 - 128				
Naphthalene	14.85	1.0	20	0	74.2	70 - 130				
n-Butylbenzene	19.62	1.0	20	0	98.1	70 - 130				
n-Propylbenzene	21.13	1.0	20	0	106	70 - 130				
o-Xylene	21.69	1.0	20	0	108	70 - 124				
sec-Butylbenzene	18.74	1.0	20	0	93.7	70 - 130				
Styrene	19.72	1.0	20	0	98.6	70 - 130				
tert-Butylbenzene	20.67	1.0	20	0	103	70 - 130				
Tetrachloroethene	20.42	1.0	20	0	102	70 - 130				
Toluene	20.05	1.0	20	0	100	70 - 123				
trans-1,2-Dichloroethene	20.57	1.0	20	0	103	70 - 130				
trans-1,3-Dichloropropene	21.52	1.0	20	0	108	70 - 121				
Trichloroethene	21.28	1.0	20	0	106	70 - 129				
Trichlorofluoromethane	21.09	1.0	20	0	105	70 - 130				
Vinyl chloride	20.12	1.0	20	0	101	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.12*	*1.0*	*50*	*0*	*94.2*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.83*	*1.0*	*50*	*0*	*104*	*81 - 113*				
Surr: Dibromofluoromethane	*47.28*	*1.0*	*50*	*0*	*94.6*	*77 - 123*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: **16SW01-181011** Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.83*	*1.0*	*50*	*0*	*89.7*	*82 - 127*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: **16SW01-181011** Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.67	1.0	20	0	98.3	70 - 120	19.93	1.3	20	
1,1,1-Trichloroethane	18.24	1.0	20	0	91.2	70 - 130	19.47	6.49	20	
1,1,2,2-Tetrachloroethane	15.89	1.0	20	0	79.5	70 - 123	16.62	4.49	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	19.82	1.0	20	0	99.1	70 - 130	21.64	8.76	20	
1,1,2-Trichloroethane	19.13	1.0	20	0	95.7	70 - 117	19.52	2	20	
1,1-Dichloroethane	18.24	1.0	20	0	91.2	70 - 127	19.44	6.36	20	
1,1-Dichloroethene	18.81	1.0	20	0	94.0	70 - 130	20.24	7.34	20	
1,1-Dichloropropene	20.91	1.0	20	0	105	70 - 129	22.55	7.55	20	
1,2,3-Trichlorobenzene	16.77	1.0	20	0	83.8	70 - 130	16.48	1.73	20	
1,2,3-Trichloropropane	16.43	1.0	20	0	82.1	70 - 130	16.73	1.82	20	
1,2,4-Trichlorobenzene	17.98	1.0	20	0	89.9	70 - 125	17.65	1.85	20	
1,2,4-Trimethylbenzene	19.53	1.0	20	0	97.7	70 - 125	19.83	1.53	20	
1,2-Dibromo-3-chloropropane	14.25	1.0	20	0	71.3	70 - 130	14.87	4.25	20	
1,2-Dibromoethane	19.34	1.0	20	0	96.7	70 - 124	19.89	2.81	20	
1,2-Dichlorobenzene	18.24	1.0	20	0	91.2	70 - 115	18.74	2.71	20	
1,2-Dichloroethane	19.32	1.0	20	0	96.6	70 - 127	19.14	0.916	20	
1,2-Dichloropropane	20.11	1.0	20	0	101	70 - 122	20.52	1.99	20	
1,3,5-Trimethylbenzene	17.6	1.0	20	0	88.0	70 - 126	18.38	4.3	20	
1,3-Dichlorobenzene	18.73	1.0	20	0	93.6	70 - 119	18.85	0.636	20	
1,3-Dichloropropane	18.95	1.0	20	0	94.7	70 - 121	19.64	3.62	20	
1,4-Dichlorobenzene	18.82	1.0	20	0	94.1	70 - 114	19.01	1.04	20	
2,2-Dichloropropane	18.81	1.0	20	0	94.0	70 - 130	20.09	6.58	20	
2-Butanone	34.35	2.0	40	0	85.9	70 - 130	34.38	0.0911	20	
2-Chlorotoluene	19.91	1.0	20	0	99.6	70 - 130	20.71	3.92	20	
2-Hexanone	34.65	2.0	40	0	86.6	70 - 130	34.15	1.46	20	
4-Chlorotoluene	20.09	1.0	20	0	100	70 - 130	20.55	2.26	20	
4-Isopropyltoluene	17.1	1.0	20	0	85.5	70 - 130	17.83	4.21	20	
4-Methyl-2-pentanone	35.68	2.0	40	0	89.2	70 - 130	36.27	1.63	20	
Acetone	32.18	2.0	40	0	80.4	70 - 130	35.8	10.7	20	
Benzene	19.68	1.0	20	0	98.4	70 - 127	20.48	3.98	20	
Bromobenzene	18.59	1.0	20	0	93.0	70 - 115	19.06	2.49	20	
Bromochloromethane	19.83	1.0	20	0	99.1	70 - 127	19.62	1.07	20	
Bromodichloromethane	19.79	1.0	20	0	98.9	70 - 124	20.37	2.89	20	
Bromoform	18.27	1.0	20	0	91.3	70 - 129	18.57	1.65	20	

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: **16SW01-181011** Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	20.98	1.0	20	0	105	70 - 130	23.12	9.72	20	
Carbon disulfide	36.19	2.0	40	0	90.5	70 - 130	39.49	8.72	20	
Carbon tetrachloride	20.74	1.0	20	0	104	70 - 130	21.31	2.73	20	
Chlorobenzene	19.53	1.0	20	0	97.6	70 - 114	20.51	4.92	20	
Chloroethane	18.48	1.0	20	0	92.4	70 - 130	19.96	7.72	20	
Chloroform	18.47	1.0	20	0	92.4	70 - 125	18.95	2.55	20	
Chloromethane	15.83	1.0	20	0	79.1	70 - 130	16.31	3.01	20	
cis-1,2-Dichloroethene	19.71	1.0	20	0	98.5	70 - 128	20.24	2.69	20	
cis-1,3-Dichloropropene	20.74	1.0	20	0	104	70 - 125	21.1	1.73	20	
Dibromochloromethane	18.89	1.0	20	0	94.5	70 - 124	19.32	2.25	20	
Dibromomethane	20.01	1.0	20	0	100	70 - 124	20.47	2.29	20	
Dichlorodifluoromethane	14.34	1.0	20	0	71.7	70 - 130	16.46	13.8	20	
Ethylbenzene	20.91	1.0	20	0	105	70 - 124	22.32	6.53	20	
Hexachlorobutadiene	17.83	1.0	20	0	89.2	70 - 130	18.59	4.17	20	
Isopropylbenzene	18.68	1.0	20	0	93.4	70 - 130	19.83	5.99	20	
m,p-Xylene	41.93	2.0	40	0	105	70 - 130	44.08	5	20	
Methylene chloride	19.21	2.0	20	0	96.1	70 - 128	19.79	2.98	20	
Naphthalene	15.43	1.0	20	0	77.2	70 - 130	14.85	3.84	20	
n-Butylbenzene	18.9	1.0	20	0	94.5	70 - 130	19.62	3.74	20	
n-Propylbenzene	19.91	1.0	20	0	99.6	70 - 130	21.13	5.92	20	
o-Xylene	20.75	1.0	20	0	104	70 - 124	21.69	4.43	20	
sec-Butylbenzene	17.69	1.0	20	0	88.5	70 - 130	18.74	5.72	20	
Styrene	19.17	1.0	20	0	95.8	70 - 130	19.72	2.83	20	
tert-Butylbenzene	19.41	1.0	20	0	97.1	70 - 130	20.67	6.26	20	
Tetrachloroethene	19.01	1.0	20	0	95.0	70 - 130	20.42	7.18	20	
Toluene	18.86	1.0	20	0	94.3	70 - 123	20.05	6.11	20	
trans-1,2-Dichloroethene	19.55	1.0	20	0	97.8	70 - 130	20.57	5.06	20	
trans-1,3-Dichloropropene	21.15	1.0	20	0	106	70 - 121	21.52	1.72	20	
Trichloroethene	20.09	1.0	20	0	100	70 - 129	21.28	5.75	20	
Trichlorofluoromethane	19.62	1.0	20	0	98.1	70 - 130	21.09	7.23	20	
Vinyl chloride	18.52	1.0	20	0	92.6	70 - 130	20.12	8.3	20	
Surr: 1,2-Dichloroethane-d4	*46.4*	*1.0*	*50*	*0*	*92.8*	*70 - 126*	*47.12*	*1.54*	*20*	
Surr: 4-Bromofluorobenzene	*50.76*	*1.0*	*50*	*0*	*102*	*81 - 113*	*51.83*	*2.1*	*20*	
Surr: Dibromofluoromethane	*46.93*	*1.0*	*50*	*0*	*93.9*	*77 - 123*	*47.28*	*0.751*	*20*	

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100726

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: **16SW01-181011** Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.83*	*1.0*	*50*	*0*	*89.7*	*82 - 127*	*44.83*	*0.00577*	*20*	

The following samples were analyzed in this batch: HS18100726-01 HS18100726-02 HS18100726-03 HS18100726-04 HS18100726-05

Revision: 2

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS18100726**

QUALIFIERS, ACRONYMS, UNITS

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

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

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18100726

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18100726-01	16TB04-181011	Login	10/13/2018 4:52:50 PM	PJM	VOA259

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18100726

Date/Time Received: **13-Oct-2018 09:40**
Received by: **PJM**

Checklist completed by: *Pablo Marinez* 13-Oct-2018
eSignature | Date

Reviewed by: _____
eSignature | Date

Matrices: **WATER**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.3C/1.0C UC/C	IR # 25
Cooler(s)/Kit(s):	44084	
Date/Time sample(s) sent to storage:	10/13/2018 17:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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APTIM

COC ID: LHAAP16-OCT2018-SW-ALSHT-181011 TURNAROUND TIME: normal RUSH: Page 1 of 6

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-50			Email	RJ.Modashia@alsglobal.com			Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FED EX		

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	VOCs in Water by 8260B	Perchlorate in Water by 6850	Metals by 6020 (As, Cr, Mn, Ni, Tl)
16TB04-181011	FIELD QC				LIQ	10/11/2018	1300	2		2		
16SW01-181011	16SW01				SW	10/11/2018	1355	5		3	1	1
16SW01-181011-FD	16SW01				SW	10/11/2018	1355	5		3	1	1
16SW01-181011-MS	16SW01				SW	10/11/2018	1355	5		3	1	1
16SW01-181011-MSD	16SW01				SW	10/11/2018	1355	5		3	1	1
16SW02-181011	16SW02				SW	10/11/2018	1510	5		3	1	1
16SW03-181011	16SW03				SW	10/11/2018	1630	5		3	1	1

HS18100726

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	APTIM	10/12/18 1810	ALS PM	10/13/18 9:4[illegible]

UU, SH MC IR CF

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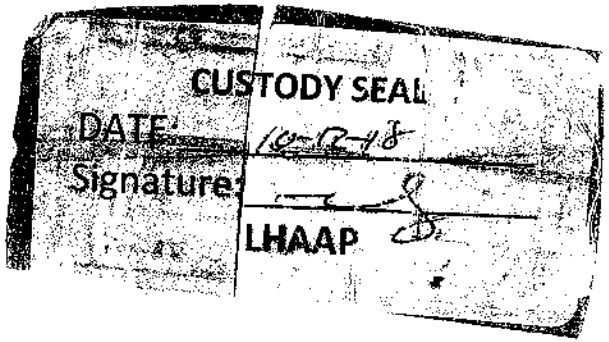

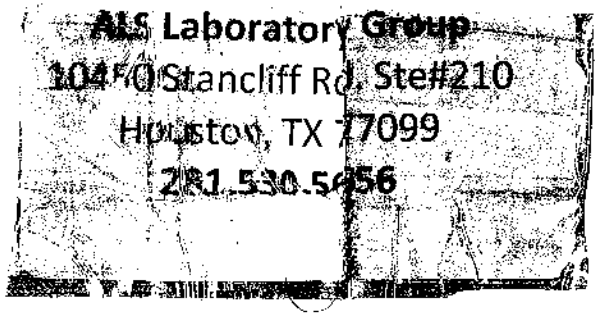

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1828987; 1828988; 1828989; 1829115

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2159 (225647)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1829115002 was analyzed and reported from a 1:10 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 624449) was less than 1/2 the CRDL. The recovery for the LCS (624450) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1828988002/03 and 1828989005/06 (Client ID's: 16WW32-181011/16WW40-181012). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The Matrix Spike duplicate (MSD - 1828989006) failed QC acceptance criteria for percent recovery, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent differences (RPD's) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1

Thomas Bosch October 25, 2018
Analyst Date

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ANALYTICAL REPORT

Report Date: October 29, 2018

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1828988**

Project ID: HS18100726 101118

Purchase Order: HS18100726

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16SW01-181011	1828988001	10/11/18	10/16/18	
16SW01-181011-FD	1828988004	10/11/18	10/16/18	
16SW02-181011	1828988005	10/11/18	10/16/18	
16SW03-181011	1828988006	10/11/18	10/16/18	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
16SW01-181011MS	1828988002	10/11/18	10/16/18	
16SW01-181011MSD	1828988003	10/11/18	10/16/18	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1828988
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16SW01-181011** | Sampling Site: NA | Collected: 10/11/2018
Lab ID: 1828988001 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 09:40 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16SW01-181011-FD** | Sampling Site: NA | Collected: 10/11/2018
Lab ID: 1828988004 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 10:22 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16SW02-181011** | Sampling Site: NA | Collected: 10/11/2018
Lab ID: 1828988005 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 10:36 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16SW03-181011** | Sampling Site: NA | Collected: 10/11/2018
Lab ID: 1828988006 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 10:50 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1828988
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/25/2018 14:54	/S/ Stephen Brose 10/29/2018 08:45

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body	Certificate Number	Website
Environmental	PJLA (DoD ELAP)		
	Utah (TNI)		
	Nevada		
	Oklahoma		
	Iowa		

Workorder: 34-1828988
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1828988

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2159 (HBN: 225647)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 624449
Analyzed: 10/24/2018 08:55
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 624450
Analyzed: 10/24/2018 09:09
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.90	5.00	97.9	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1828988001	**MS:**	1828988002			**MSD:**	1828988003				
Analyzed:	10/24/2018 09:40	**Analyzed:**	10/24/2018 09:54			**Analyzed:**	10/24/2018 10:08				
Dilution:	1	**Dilution:**	1			**Dilution:**	1				
Units:	ug/L	**Units:**	ug/L			**Units:**	ug/L				

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.75	5	94.9	78.8	123.8	4.67	93.3	1.7	0.0	20.0

Sample:	1828989004	**MS:**	1828989005			**MSD:**	1828989006				
Analyzed:	10/24/2018 11:47	**Analyzed:**	10/24/2018 12:29			**Analyzed:**	10/24/2018 12:43				
Dilution:	1	**Dilution:**	1			**Dilution:**	1				
Units:	ug/L	**Units:**	ug/L			**Units:**	ug/L				

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.4	5	108	78.8	123.8	6.26	# 125	14.7	0.0	20.0

Continuing Calibration Verification

CCV:	624446			**CCV:**	624451			**CCV:**	624453		
Analyzed:	10/24/2018 08:12			**Analyzed:**	10/24/2018 12:01			**Analyzed:**	10/24/2018 15:06		
Units:	ug/L			**Units:**	ug/L			**Units:**	ug/L		
Criteria:	± 15%			**Criteria:**	± 15%			**Criteria:**	± 15%		

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	24.4	25.0	97.6	23.5	25.0	94.0	23.5	25.0	94.2

Interference Check Sample

ICSA: 624448
Analyzed: 10/24/2018 08:41
Units: ug/L
Criteria: ± 30%

Analyte	Result	Target	% Rec.
Perchlorate	0.985	1.00	98.5

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Quality Control Sample
Batch Report

Analysis Information

Workorder: **1828988**

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2159 (HBN: 225647)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Limit of Detection Verification

LODV:	624447			**LODV:**	624452			**LODV:**	624454		
Analyzed:	10/24/2018 08:27			**Analyzed:**	10/24/2018 12:15			**Analyzed:**	10/24/2018 15:20		
Units:	ug/L			**Units:**	ug/L			**Units:**	ug/L		
Criteria:	± 50%			**Criteria:**	± 50%			**Criteria:**	± 50%		
Analyte	**Result**	**Target**	**% Rec.**	**Result**	**Target**	**% Rec.**		**Result**	**Target**	**% Rec.**
Perchlorate	1.03	1.00	103	0.970	1.00	97.0		1.02	1.00	102

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
10/25/2018 14:54	10/29/2018 08:45

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◓ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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18698/#2

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

1828988

Subcontract Chain of Custody

COC ID: 10012

1828188

SUBCONTRACT TO:

ALS Laboratory Group
960 West LeVoy Drive
Salt Lake City, UT 84123

Phone: +1 800 356 9135

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18100726
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18100726-02**	**16SW01-181011**	**Surface Water**	**11 Oct 2018 13:55** MS/MSD
	SUB_Perch-6850			23 Oct 2018
2.	**HS18100726-03**	**16SW01-181011-FD**	**Surface Water**	**11 Oct 2018 13:55**
	SUB_Perch-6850			23 Oct 2018
3.	**HS18100726-04**	**16SW02-181011**	**Surface Water**	**11 Oct 2018 15:10**
	SUB_Perch-6850			23 Oct 2018
4.	**HS18100726-05**	**16SW03-181011**	**Surface Water**	**11 Oct 2018 16:30**
	SUB_Perch-6850			23 Oct 2018

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 10/15/18 1800.

Received By: Dustin Hill Date/Time: 10/16/2018 10:20

Cooler ID(s): _____ Temperature(s): _____

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18100726	***Split:***	**Workorder ID:** 1828988	**Level:** ENV_LVL4	**Requested Analysis**	
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly		
Comments:			**Preservatives**		
			COOL		
			Containers		

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	EPA 6850, DoD QSM
1	10/11/2018 13:55	16SW01-181011	1828988001		Water	A	1	A
2	10/11/2018 13:55	16SW01-181011MS	1828988002	MS	Water	A	1	A
3	10/11/2018 13:55	16SW01-181011MSD	1828988003	MSD	Water	A	1	A
4	10/11/2018 13:55	16SW01-181011-FD	1828988004	FLDDUP	Water	A	1	A
5	10/11/2018 15:10	16SW02-181011	1828988005		Water	A	1	A
6	10/11/2018 16:30	16SW03-181011	1828988006		Water	A	1	A
7								
8								
9								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	10/16/2018 10:20	ALS Sample Receiving	Sample Login
Julie Warath	10/17/18 1000	3C	storage
R.33.1	10/23-18/14:10	T. Boss	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR) 188488

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: HS18100726/10012

Date/Time of Receipt: 10/16/2018 10:20

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C18 88201	2 °C	4	C18	°C	7	C18	°C
2	C18	°C	5	C18	°C	8	C18	°C
3	C18	°C	6	C18	°C	9	C18	°C

Taken By: Desiree Hill (Signature) Desiree Hill (Printed Name) 10/16/2018 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Received 3 bottles for sample HS18100726-02

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018

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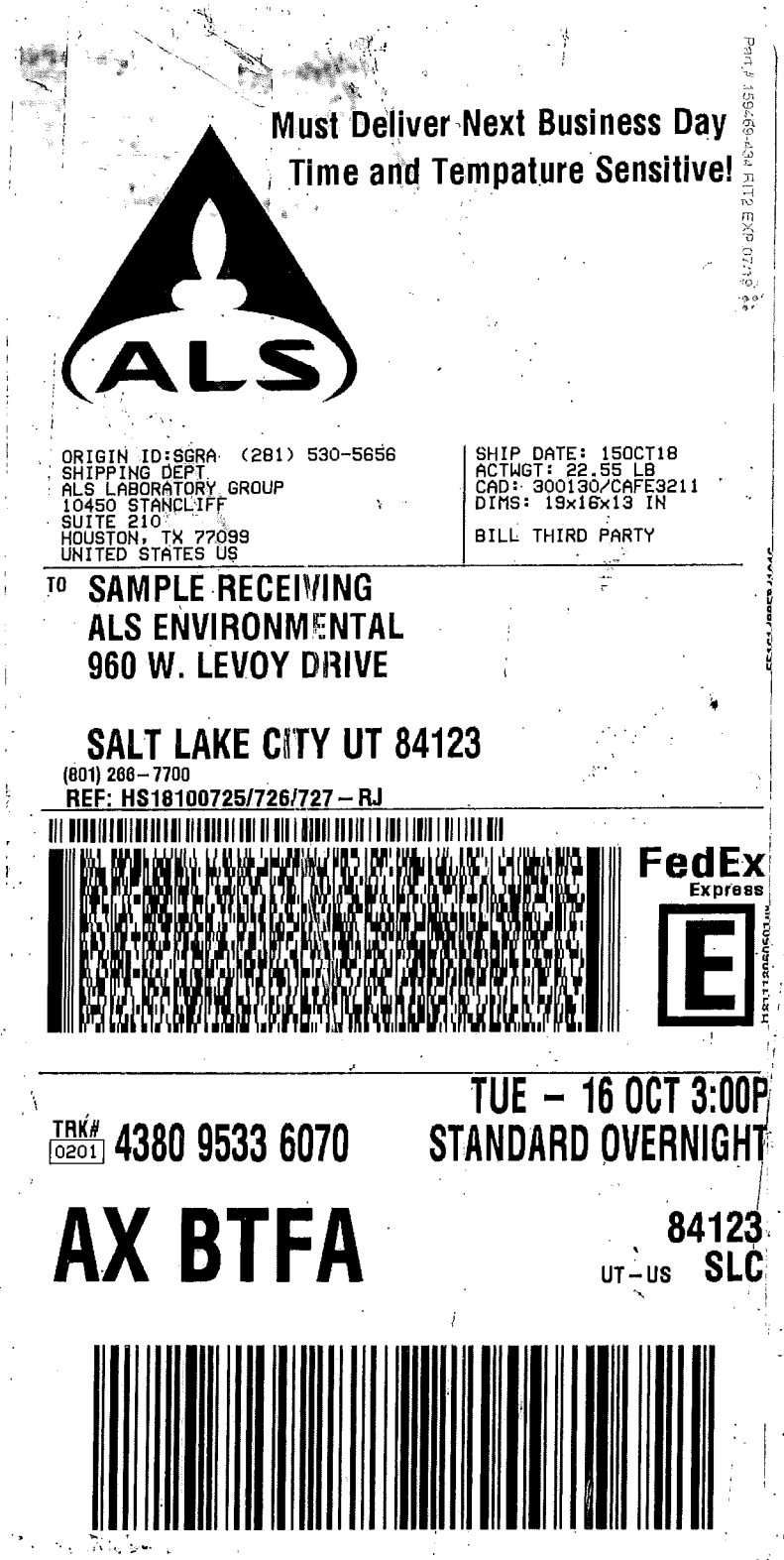

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 15OCT18
ACTWGT: 22.55 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS18100725/726/727 - RJ

FedEx Express

TRK# 0201 4380 9533 6070

TUE - 16 OCT 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

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Batch Worklist

Batch: ELMS/ 2159 **Created:** 10/23/2018 18:03 **Instrument:** **HBN:** 225647

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1828987 [ENV_LVL4]
Workorder: 1828988 [ENV_LVL4]
Workorder: 1828989 [ENV_LVL4]
Workorder: 1829115 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	624446	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
2	624447	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	
3	624448	ICS for HBN 225647 [ELMS/2159]				ICS	3		E6850..D3Q	5311		10/29/2018	
4	624449	LMB for HBN 225647 [ELMS/2159]				LMB	3		E6850Q413Q	5311		10/29/2018	
5	624450	LCS for HBN 225647 [ELMS/2159]				LCS	3		E6850Q413Q	5311		10/29/2018	
6	1828987001	16WW32-181011				SAMPLE	3	1828987001-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
7	1828988001	16SW01-181011				SAMPLE	3	1828988001-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
8	1828988002	16SW01-181011MS				MS	3	1828988002-A	E6850Q413Q	5480		10/29/2018	
9	1828988003	16SW01-181011MSD				MSD	3	1828988003-A	E6850Q413Q	5480		10/29/2018	
10	1828988004	16SW01-181011-FD				FLDDUP	3	1828988004-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
11	1828988005	16SW02-181011				SAMPLE	3	1828988005-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
12	1828988006	16SW03-181011				SAMPLE	3	1828988006-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
13	1828989001	16WW30-181012				SAMPLE	3	1828989001-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
14	1828989002	16WW46-181012				SAMPLE	3	1828989002-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
15	1828989003	16WW23-181012				SAMPLE	3	1828989003-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
16	1828989004	16WW40-181012				SAMPLE	3	1828989004-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
17	624451	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
18	624452	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	
19	1828989005	16WW40-181012MS				MS	3	1828989005-A	E6850Q413Q	5480		10/29/2018	
20	1828989006	16WW40-181012MSD				MSD	3	1828989006-A	E6850Q413Q	5480		10/29/2018	
21	1828989007	16WW40-181012-FD				FLDDUP	3	1828989007-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
22	1828989008	16WW27-181012				SAMPLE	3	1828989008-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
23	1828989009	16WW12-181012				SAMPLE	3	1828989009-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
24	1828989010	16WW42-181012				SAMPLE	3	1828989010-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
25	1828989011	16WW13-181012				SAMPLE	3	1828989011-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
26	1828989012	16WW21-181012				SAMPLE	3	1828989012-A	E6850Q41.3	5480	11/9/2018	10/29/2018	

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Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
27	1828989013	16EB01-181012				EQBK	3	1828989013-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
28	1829115001	16WW29-181015				SAMPLE	3	1829115001-A	E6850Q41.3	5480	11/12/2018	10/30/2018	
29	1829115002	16WW55-181015				SAMPLE	3	1829115002-A	E6850Q41.3	5480	11/12/2018	10/30/2018	
30	624453	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
31	624454	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	

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Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1828987 (001); 1828988 (001-06); 1828989 (001-13); 1829115 (001,02)
ELMS Batch/HBN ID: 2159 (225647)
Prep Date: 10/23/2018 Analysis Date: 10/24/2018 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\OCT\24OCT18D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 10/08/2018, sequence 08OCT18D.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 2 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.80
5.0	0.80
5.3	0.25
10.0	0.25
10.5	0.80
12.5	0.80

QC DATA: 5.0µL of QC Solution Horizon ID 41830 was used for LCS 624450; Target = 5.0µg/L. ASTM type II water was used for LMB 624449.

MS/MSD: MS/MSD was performed on samples 1828988002/03 and 1828989005/06 (Client ID's: 16WW32-181011/16WW40-181012). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field sample 1829115002 was analyzed and reported from a 1:10 dilution. The reporting limit has been adjusted accordingly. Samples 1828989004/07 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The Matrix Spike duplicate (MSD - 1828989006) failed QC acceptance criteria for percent recovery, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2018\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\225647-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS 2159 HBN 225647 Sample Set IDs if Applicable: 18.28987/1828988/1828989/1829115	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

T.B. 10.26.18
SB 10/29/18

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Working Standard - CLO4 WRK

CLO4 WRK — **Description - 6850 WKG Std 100.ug/L**

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** No
Part ID: IC-PER-10X-1		**Lab Lot:** CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 09/20/2018 09:09AM	**Expires:** 04/28/2026
MFG Lot: SDFF-012A	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

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125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safely information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 26, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18100727**

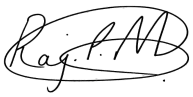
Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 12 sample(s) on Oct 13, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18100727

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18100727-01	16TB05-181012	Liquid	VBLKW-092618-50	12-Oct-2018 08:30	13-Oct-2018 09:40	☐
HS18100727-02	16WW30-181012	GW		12-Oct-2018 10:30	13-Oct-2018 09:40	☐
HS18100727-03	16WW46-181012	GW		12-Oct-2018 11:05	13-Oct-2018 09:40	☐
HS18100727-04	16WW23-181012	GW		12-Oct-2018 11:55	13-Oct-2018 09:40	☐
HS18100727-05	16WW40-181012	GW		12-Oct-2018 12:35	13-Oct-2018 09:40	☐
HS18100727-06	16WW40-181012-FD	GW		12-Oct-2018 12:35	13-Oct-2018 09:40	☐
HS18100727-07	16WW27-181012	GW		12-Oct-2018 13:10	13-Oct-2018 09:40	☐
HS18100727-08	16WW12-181012	GW		12-Oct-2018 13:50	13-Oct-2018 09:40	☐
HS18100727-09	16WW42-181012	GW		12-Oct-2018 14:25	13-Oct-2018 09:40	☐
HS18100727-10	16WW13-181012	GW		12-Oct-2018 15:15	13-Oct-2018 09:40	☐
HS18100727-11	16WW21-181012	GW		12-Oct-2018 15:40	13-Oct-2018 09:40	☐
HS18100727-12	16EB01-181012	GW		12-Oct-2018 16:30	13-Oct-2018 09:40	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant
Work Order: HS18100727

Work Order Comments

- Revised to updated the VOC list.
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

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

GCMS Volatiles by Method SW8260

Batch ID: R325772

Sample ID: CCV

- Bromomethane and m,p-Xylenes exceeded %D limits on CCV. Samples ND.

Sample ID: VLCSW-181018

- Ethylbenzene exceeded %recovery limits on LCS. Samples ND.

Batch ID: R325826

Sample ID: 16WW40-181012 (HS18100727-05MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 16WW40-181012 (HS18100727-05MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

Batch ID: ,R325844

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

WetChemistry by Method SW9056

Batch ID: R325666

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

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16TB05-181012
Collection Date: 12-Oct-2018 08:30

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-01
Matrix:Liquid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 04:39
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:39
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:39
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:39
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 04:39
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:39
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 04:39
Surr: 1,2-Dichloroethane-d4	*89.5*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 04:39*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 04:39*
Surr: Dibromofluoromethane	*97.3*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 04:39*
Surr: Toluene-d8	*93.2*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 04:39*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW30-181012
Collection Date: 12-Oct-2018 10:30

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 08:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 08:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 08:43
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 08:43
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 08:43
Trichloroethene	**1.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 08:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 08:43
Surr: 1,2-Dichloroethane-d4	*88.8*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 08:43*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 08:43*
Surr: Dibromofluoromethane	*92.9*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 08:43*
Surr: Toluene-d8	*92.4*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 08:43*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.22**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 07:52
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW46-181012
Collection Date: 12-Oct-2018 11:05

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-03
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 09:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 09:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 09:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 09:07
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 09:07
Trichloroethene	**3.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 09:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 09:07
Surr: 1,2-Dichloroethane-d4	*88.0*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 09:07*
Surr: 4-Bromofluorobenzene	*96.8*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 09:07*
Surr: Dibromofluoromethane	*95.5*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 09:07*
Surr: Toluene-d8	*91.2*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 09:07*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW23-181012
Collection Date: 12-Oct-2018 11:55

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-04
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 09:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 09:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 09:32
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 09:32
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 09:32
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 09:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 09:32
Surr: 1,2-Dichloroethane-d4	*90.8*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 09:32*
Surr: 4-Bromofluorobenzene	*96.6*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 09:32*
Surr: Dibromofluoromethane	*97.7*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 09:32*
Surr: Toluene-d8	*93.5*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 09:32*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW40-181012
Collection Date: 12-Oct-2018 12:35

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-05
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 15:58
1,1-Dichloroethene	**3.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 15:58
1,2-Dichloroethane	**3.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 15:58
cis-1,2-Dichloroethene	**220**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 16:25
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 15:58
Trichloroethene	**660**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 16:25
Vinyl chloride	**4.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 15:58
Surr: 1,2-Dichloroethane-d4	*94.4*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 15:58*
Surr: 1,2-Dichloroethane-d4	*89.8*			**0**	*70-126*	*%REC*	*10*	*19-Oct-2018 16:25*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 15:58*
Surr: 4-Bromofluorobenzene	*98.6*			**0**	*81-113*	*%REC*	*10*	*19-Oct-2018 16:25*
Surr: Dibromofluoromethane	*93.0*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 15:58*
Surr: Dibromofluoromethane	*94.0*			**0**	*77-123*	*%REC*	*10*	*19-Oct-2018 16:25*
Surr: Toluene-d8	*92.1*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 15:58*
Surr: Toluene-d8	*93.0*			**0**	*82-127*	*%REC*	*10*	*19-Oct-2018 16:25*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**5.57**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 08:07
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW40-181012-FD
Collection Date: 12-Oct-2018 12:35

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-06
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 20:36
1,1-Dichloroethene	**3.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 20:36
1,2-Dichloroethane	**3.8**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 20:36
cis-1,2-Dichloroethene	**240**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 21:03
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 20:36
Trichloroethene	**640**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 21:03
Vinyl chloride	**4.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 20:36
Surr: 1,2-Dichloroethane-d4	*94.8*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 20:36*
Surr: 1,2-Dichloroethane-d4	*92.0*			**0**	*70-126*	*%REC*	*10*	*19-Oct-2018 21:03*
Surr: 4-Bromofluorobenzene	*98.4*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 20:36*
Surr: 4-Bromofluorobenzene	*98.3*			**0**	*81-113*	*%REC*	*10*	*19-Oct-2018 21:03*
Surr: Dibromofluoromethane	*96.5*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 20:36*
Surr: Dibromofluoromethane	*95.7*			**0**	*77-123*	*%REC*	*10*	*19-Oct-2018 21:03*
Surr: Toluene-d8	*91.3*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 20:36*
Surr: Toluene-d8	*91.5*			**0**	*82-127*	*%REC*	*10*	*19-Oct-2018 21:03*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**5.72**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 08:51
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW27-181012
Collection Date: 12-Oct-2018 13:10

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-07
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 18:58
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 18:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 18:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 18:58
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 18:58
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Oct-2018 13:17
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 18:58
Surr: 1,2-Dichloroethane-d4	*92.0*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 18:58*
Surr: 1,2-Dichloroethane-d4	*88.0*			**0**	*70-126*	*%REC*	*1*	*20-Oct-2018 13:17*
Surr: 4-Bromofluorobenzene	*98.5*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 18:58*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*81-113*	*%REC*	*1*	*20-Oct-2018 13:17*
Surr: Dibromofluoromethane	*96.5*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 18:58*
Surr: Dibromofluoromethane	*95.9*			**0**	*77-123*	*%REC*	*1*	*20-Oct-2018 13:17*
Surr: Toluene-d8	*92.9*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 18:58*
Surr: Toluene-d8	*93.1*			**0**	*82-127*	*%REC*	*1*	*20-Oct-2018 13:17*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW12-181012
Collection Date: 12-Oct-2018 13:50

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-08
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	ug/L	10	19-Oct-2018 21:30
1,1-Dichloroethene	5.0	U	2.0	5.0	10	ug/L	10	19-Oct-2018 21:30
1,2-Dichloroethane	**16**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 21:30
cis-1,2-Dichloroethene	**86**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 21:30
Methylene chloride	10	U	10	10	20	ug/L	10	19-Oct-2018 21:30
Trichloroethene	**4,100**		**20**	**50**	**100**	**ug/L**	100	19-Oct-2018 21:57
Vinyl chloride	**12**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 21:30
Surr: 1,2-Dichloroethane-d4	*91.5*			**0**	*70-126*	*%REC*	*10*	*19-Oct-2018 21:30*
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*70-126*	*%REC*	*100*	*19-Oct-2018 21:57*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*81-113*	*%REC*	*10*	*19-Oct-2018 21:30*
Surr: 4-Bromofluorobenzene	*98.9*			**0**	*81-113*	*%REC*	*100*	*19-Oct-2018 21:57*
Surr: Dibromofluoromethane	*96.1*			**0**	*77-123*	*%REC*	*10*	*19-Oct-2018 21:30*
Surr: Dibromofluoromethane	*95.2*			**0**	*77-123*	*%REC*	*100*	*19-Oct-2018 21:57*
Surr: Toluene-d8	*90.9*			**0**	*82-127*	*%REC*	*10*	*19-Oct-2018 21:30*
Surr: Toluene-d8	*92.7*			**0**	*82-127*	*%REC*	*100*	*19-Oct-2018 21:57*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.90**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 07:09
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW42-181012
Collection Date: 12-Oct-2018 14:25

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-09
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 19:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 19:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 19:22
cis-1,2-Dichloroethene	**42**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 19:22
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 19:22
Trichloroethene	**6.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	19-Oct-2018 19:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 19:22
Surr: 1,2-Dichloroethane-d4	*94.0*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 19:22*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 19:22*
Surr: Dibromofluoromethane	*97.3*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 19:22*
Surr: Toluene-d8	*91.3*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 19:22*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.182**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	17-Oct-2018 05:12
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW13-181012
Collection Date: 12-Oct-2018 15:15

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-10
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	ug/L	10	19-Oct-2018 22:24
1,1-Dichloroethene	5.0	U	2.0	5.0	10	ug/L	10	19-Oct-2018 22:24
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	19-Oct-2018 22:24
cis-1,2-Dichloroethene	**1,700**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 22:24
Methylene chloride	10	U	10	10	20	ug/L	10	19-Oct-2018 22:24
Trichloroethene	**4,400**		**20**	**50**	**100**	**ug/L**	100	19-Oct-2018 22:51
Vinyl chloride	**51**		**2.0**	**5.0**	**10**	**ug/L**	10	19-Oct-2018 22:24
Surr: 1,2-Dichloroethane-d4	*90.6*			**0**	*70-126*	*%REC*	*100*	*19-Oct-2018 22:51*
Surr: 1,2-Dichloroethane-d4	*94.2*			**0**	*70-126*	*%REC*	*10*	*19-Oct-2018 22:24*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*81-113*	*%REC*	*10*	*19-Oct-2018 22:24*
Surr: 4-Bromofluorobenzene	*97.7*			**0**	*81-113*	*%REC*	*100*	*19-Oct-2018 22:51*
Surr: Dibromofluoromethane	*95.0*			**0**	*77-123*	*%REC*	*10*	*19-Oct-2018 22:24*
Surr: Dibromofluoromethane	*95.6*			**0**	*77-123*	*%REC*	*100*	*19-Oct-2018 22:51*
Surr: Toluene-d8	*91.4*			**0**	*82-127*	*%REC*	*10*	*19-Oct-2018 22:24*
Surr: Toluene-d8	*91.2*			**0**	*82-127*	*%REC*	*100*	*19-Oct-2018 22:51*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.929**		**0.150**	**0.500**	**0.500**	**mg/L**	5	17-Oct-2018 10:14
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW21-181012
Collection Date: 12-Oct-2018 15:40

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-11
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 19:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 19:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 19:47
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 19:47
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 19:47
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Oct-2018 13:42
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 19:47
Surr: 1,2-Dichloroethane-d4	*91.9*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 19:47*
Surr: 1,2-Dichloroethane-d4	*91.6*			**0**	*70-126*	*%REC*	*1*	*20-Oct-2018 13:42*
Surr: 4-Bromofluorobenzene	*96.3*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 19:47*
Surr: 4-Bromofluorobenzene	*97.9*			**0**	*81-113*	*%REC*	*1*	*20-Oct-2018 13:42*
Surr: Dibromofluoromethane	*94.5*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 19:47*
Surr: Dibromofluoromethane	*96.5*			**0**	*77-123*	*%REC*	*1*	*20-Oct-2018 13:42*
Surr: Toluene-d8	*91.9*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 19:47*
Surr: Toluene-d8	*92.7*			**0**	*82-127*	*%REC*	*1*	*20-Oct-2018 13:42*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.218**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	17-Oct-2018 05:41
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EB01-181012
Collection Date: 12-Oct-2018 16:30

ANALYTICAL REPORT
WorkOrder:HS18100727
Lab ID:HS18100727-12
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	19-Oct-2018 20:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 20:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 20:11
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 20:11
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	19-Oct-2018 20:11
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 20:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	19-Oct-2018 20:11
Surr: 1,2-Dichloroethane-d4	*91.1*			**0**	*70-126*	*%REC*	*1*	*19-Oct-2018 20:11*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*81-113*	*%REC*	*1*	*19-Oct-2018 20:11*
Surr: Dibromofluoromethane	*93.7*			**0**	*77-123*	*%REC*	*1*	*19-Oct-2018 20:11*
Surr: Toluene-d8	*92.8*			**0**	*82-127*	*%REC*	*1*	*19-Oct-2018 20:11*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	0.100	U	0.0300	0.100	0.100	mg/L	1	17-Oct-2018 04:58
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R325666 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS18100727-02	16WW30-181012	12 Oct 2018 10:30			17 Oct 2018 07:52	10
HS18100727-05	16WW40-181012	12 Oct 2018 12:35			17 Oct 2018 08:07	10
HS18100727-06	16WW40-181012-FD	12 Oct 2018 12:35			17 Oct 2018 08:51	10
HS18100727-08	16WW12-181012	12 Oct 2018 13:50			17 Oct 2018 07:09	10
HS18100727-09	16WW42-181012	12 Oct 2018 14:25			17 Oct 2018 05:12	1
HS18100727-10	16WW13-181012	12 Oct 2018 15:15			17 Oct 2018 10:14	5
HS18100727-11	16WW21-181012	12 Oct 2018 15:40			17 Oct 2018 05:41	1
HS18100727-12	16EB01-181012	12 Oct 2018 16:30			17 Oct 2018 04:58	1
Batch ID: R325772 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** GW	
HS18100727-02	16WW30-181012	12 Oct 2018 10:30			19 Oct 2018 08:43	1
HS18100727-03	16WW46-181012	12 Oct 2018 11:05			19 Oct 2018 09:07	1
HS18100727-04	16WW23-181012	12 Oct 2018 11:55			19 Oct 2018 09:32	1
Batch ID: R325772 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Liquid	
HS18100727-01	16TB05-181012	12 Oct 2018 08:30			19 Oct 2018 04:39	1
Batch ID: R325826 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** GW	
HS18100727-05	16WW40-181012	12 Oct 2018 12:35			19 Oct 2018 16:25	10
HS18100727-05	16WW40-181012	12 Oct 2018 12:35			19 Oct 2018 15:58	1
HS18100727-06	16WW40-181012-FD	12 Oct 2018 12:35			19 Oct 2018 21:03	10
HS18100727-06	16WW40-181012-FD	12 Oct 2018 12:35			19 Oct 2018 20:36	1
HS18100727-07	16WW27-181012	12 Oct 2018 13:10			19 Oct 2018 18:58	1
HS18100727-08	16WW12-181012	12 Oct 2018 13:50			19 Oct 2018 21:57	100
HS18100727-08	16WW12-181012	12 Oct 2018 13:50			19 Oct 2018 21:30	10
HS18100727-09	16WW42-181012	12 Oct 2018 14:25			19 Oct 2018 19:22	1
HS18100727-10	16WW13-181012	12 Oct 2018 15:15			19 Oct 2018 22:51	100
HS18100727-10	16WW13-181012	12 Oct 2018 15:15			19 Oct 2018 22:24	10
HS18100727-11	16WW21-181012	12 Oct 2018 15:40			19 Oct 2018 19:47	1
HS18100727-12	16EB01-181012	12 Oct 2018 16:30			19 Oct 2018 20:11	1
Batch ID: R325844 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** GW	
HS18100727-07	16WW27-181012	12 Oct 2018 13:10			20 Oct 2018 13:17	1
HS18100727-11	16WW21-181012	12 Oct 2018 15:40			20 Oct 2018 13:42	1

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R326322 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** GW	
HS18100727-02	16WW30-181012	12 Oct 2018 10:30			29 Oct 2018 15:58	1
HS18100727-03	16WW46-181012	12 Oct 2018 11:05			29 Oct 2018 15:58	1
HS18100727-04	16WW23-181012	12 Oct 2018 11:55			29 Oct 2018 15:58	1
HS18100727-05	16WW40-181012	12 Oct 2018 12:35			29 Oct 2018 15:58	1
HS18100727-06	16WW40-181012-FD	12 Oct 2018 12:35			29 Oct 2018 15:58	1
HS18100727-07	16WW27-181012	12 Oct 2018 13:10			29 Oct 2018 15:58	1
HS18100727-08	16WW12-181012	12 Oct 2018 13:50			29 Oct 2018 15:58	1
HS18100727-09	16WW42-181012	12 Oct 2018 14:25			29 Oct 2018 15:58	1
HS18100727-10	16WW13-181012	12 Oct 2018 15:15			29 Oct 2018 15:58	1
HS18100727-11	16WW21-181012	12 Oct 2018 15:40			29 Oct 2018 15:58	1
HS18100727-12	16EB01-181012	12 Oct 2018 16:30			29 Oct 2018 15:58	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.77*	*1.0*	*50*	*0*	*89.5*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.49*	*1.0*	*50*	*0*	*99.0*	*82 - 115*				
Surr: Dibromofluoromethane	*48.4*	*1.0*	*50*	*0*	*96.8*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MBLK Sample ID: **VBLKW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:25**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.29*	*1.0*	*50*	*0*	*92.6*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.9	1.0	20	0	110	77 - 118				
1,1,1-Trichloroethane	20.17	1.0	20	0	101	70 - 130				
1,1,2,2-Tetrachloroethane	18.73	1.0	20	0	93.7	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.13	1.0	20	0	111	70 - 130				
1,1,2-Trichloroethane	21.59	1.0	20	0	108	77 - 113				
1,1-Dichloroethane	20.69	1.0	20	0	103	71 - 122				
1,1-Dichloroethene	20.65	1.0	20	0	103	70 - 130				
1,1-Dichloropropene	22.03	1.0	20	0	110	78 - 118				
1,2,3-Trichlorobenzene	20.23	1.0	20	0	101	70 - 130				
1,2,3-Trichloropropane	18.8	1.0	20	0	94.0	70 - 127				
1,2,4-Trichlorobenzene	21.62	1.0	20	0	108	77 - 126				
1,2,4-Trimethylbenzene	22.46	1.0	20	0	112	73 - 121				
1,2-Dibromo-3-chloropropane	17.54	1.0	20	0	87.7	70 - 130				
1,2-Dibromoethane	22.39	1.0	20	0	112	76 - 123				
1,2-Dichlorobenzene	21.11	1.0	20	0	106	77 - 113				
1,2-Dichloroethane	22.56	1.0	20	0	113	70 - 124				
1,2-Dichloropropane	22.14	1.0	20	0	111	72 - 119				
1,3,5-Trimethylbenzene	19.98	1.0	20	0	99.9	75 - 118				
1,3-Dichlorobenzene	20.97	1.0	20	0	105	78 - 118				
1,3-Dichloropropane	21.84	1.0	20	0	109	75 - 116				
1,4-Dichlorobenzene	21.68	1.0	20	0	108	79 - 113				
2,2-Dichloropropane	22.14	1.0	20	0	111	70 - 130				
2-Butanone	39.81	2.0	40	0	99.5	70 - 130				
2-Chlorotoluene	22.93	1.0	20	0	115	70 - 128				
2-Hexanone	39.54	2.0	40	0	98.9	70 - 130				
4-Chlorotoluene	22.78	1.0	20	0	114	74 - 126				
4-Isopropyltoluene	19.4	1.0	20	0	97.0	74 - 126				
4-Methyl-2-pentanone	40.5	2.0	40	0	101	70 - 130				
Acetone	40.41	2.0	40	0	101	70 - 130				
Benzene	21.64	1.0	20	0	108	74 - 120				
Bromobenzene	20.92	1.0	20	0	105	78 - 113				
Bromochloromethane	22.15	1.0	20	0	111	76 - 124				
Bromodichloromethane	22.39	1.0	20	0	112	74 - 122				
Bromoform	21.3	1.0	20	0	107	73 - 128				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.16	1.0	20	0	121	70 - 130				
Carbon disulfide	40.05	2.0	40	0	100	70 - 130				
Carbon tetrachloride	21.81	1.0	20	0	109	71 - 125				
Chlorobenzene	22.48	1.0	20	0	112	76 - 113				
Chloroethane	18.82	1.0	20	0	94.1	70 - 130				
Chloroform	20.57	1.0	20	0	103	71 - 121				
Chloromethane	18.22	1.0	20	0	91.1	70 - 129				
cis-1,2-Dichloroethene	21.8	1.0	20	0	109	75 - 122				
cis-1,3-Dichloropropene	23.68	1.0	20	0	118	73 - 127				
Dibromochloromethane	21.85	1.0	20	0	109	77 - 122				
Dibromomethane	22.8	1.0	20	0	114	78 - 121				
Dichlorodifluoromethane	16.02	1.0	20	0	80.1	70 - 130				
Ethylbenzene	23.45	1.0	20	0	117	77 - 117				S
Hexachlorobutadiene	20.75	1.0	20	0	104	70 - 130				
Isopropylbenzene	21.35	1.0	20	0	107	73 - 127				
m,p-Xylene	48.78	2.0	40	0	122	77 - 122				
Methylene chloride	21.65	2.0	20	0	108	70 - 127				
Naphthalene	19.4	1.0	20	0	97.0	70 - 130				
n-Butylbenzene	21.53	1.0	20	0	108	72 - 130				
n-Propylbenzene	22.93	1.0	20	0	115	73 - 124				
o-Xylene	23.76	1.0	20	0	119	75 - 119				
sec-Butylbenzene	19.62	1.0	20	0	98.1	73 - 128				
Styrene	22.74	1.0	20	0	114	72 - 126				
tert-Butylbenzene	22.15	1.0	20	0	111	73 - 124				
Tetrachloroethene	21.25	1.0	20	0	106	76 - 119				
Toluene	21.16	1.0	20	0	106	77 - 118				
trans-1,2-Dichloroethene	22.17	1.0	20	0	111	72 - 127				
trans-1,3-Dichloropropene	23.72	1.0	20	0	119	77 - 119				
Trichloroethene	23.1	1.0	20	0	115	77 - 121				
Trichlorofluoromethane	20.46	1.0	20	0	102	70 - 130				
Vinyl chloride	19.55	1.0	20	0	97.8	70 - 130				
Surr: 1,2-Dichloroethane-d4	*46.15*	*1.0*	*50*	*0*	*92.3*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.86*	*1.0*	*50*	*0*	*102*	*82 - 115*				
Surr: Dibromofluoromethane	*47.17*	*1.0*	*50*	*0*	*94.3*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: **R325772 (0)** **Instrument:** **VOA2** **Method:** **LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181018** Units: **ug/L** Analysis Date: **19-Oct-2018 03:01**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.26*	*1.0*	*50*	*0*	*90.5*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.93	1.0	20	0	99.6	70 - 120				
1,1,1-Trichloroethane	19.47	1.0	20	0	97.3	70 - 130				
1,1,2,2-Tetrachloroethane	16.62	1.0	20	0	83.1	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	21.64	1.0	20	0	108	70 - 130				
1,1,2-Trichloroethane	19.52	1.0	20	0	97.6	70 - 117				
1,1-Dichloroethane	19.44	1.0	20	0	97.2	70 - 127				
1,1-Dichloroethene	20.24	1.0	20	0	101	70 - 130				
1,1-Dichloropropene	22.55	1.0	20	0	113	70 - 129				
1,2,3-Trichlorobenzene	16.48	1.0	20	0	82.4	70 - 130				
1,2,3-Trichloropropane	16.73	1.0	20	0	83.6	70 - 130				
1,2,4-Trichlorobenzene	17.65	1.0	20	0	88.3	70 - 125				
1,2,4-Trimethylbenzene	19.83	1.0	20	0	99.2	70 - 125				
1,2-Dibromo-3-chloropropane	14.87	1.0	20	0	74.4	70 - 130				
1,2-Dibromoethane	19.89	1.0	20	0	99.5	70 - 124				
1,2-Dichlorobenzene	18.74	1.0	20	0	93.7	70 - 115				
1,2-Dichloroethane	19.14	1.0	20	0	95.7	70 - 127				
1,2-Dichloropropane	20.52	1.0	20	0	103	70 - 122				
1,3,5-Trimethylbenzene	18.38	1.0	20	0	91.9	70 - 126				
1,3-Dichlorobenzene	18.85	1.0	20	0	94.2	70 - 119				
1,3-Dichloropropane	19.64	1.0	20	0	98.2	70 - 121				
1,4-Dichlorobenzene	19.01	1.0	20	0	95.1	70 - 114				
2,2-Dichloropropane	20.09	1.0	20	0	100	70 - 130				
2-Butanone	34.38	2.0	40	0	86.0	70 - 130				
2-Chlorotoluene	20.71	1.0	20	0	104	70 - 130				
2-Hexanone	34.15	2.0	40	0	85.4	70 - 130				
4-Chlorotoluene	20.55	1.0	20	0	103	70 - 130				
4-Isopropyltoluene	17.83	1.0	20	0	89.2	70 - 130				
4-Methyl-2-pentanone	36.27	2.0	40	0	90.7	70 - 130				
Acetone	35.8	2.0	40	0	89.5	70 - 130				
Benzene	20.48	1.0	20	0	102	70 - 127				
Bromobenzene	19.06	1.0	20	0	95.3	70 - 115				
Bromochloromethane	19.62	1.0	20	0	98.1	70 - 127				
Bromodichloromethane	20.37	1.0	20	0	102	70 - 124				
Bromoform	18.57	1.0	20	0	92.9	70 - 129				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	23.12	1.0	20	0	116	70 - 130				
Carbon disulfide	39.49	2.0	40	0	98.7	70 - 130				
Carbon tetrachloride	21.31	1.0	20	0	107	70 - 130				
Chlorobenzene	20.51	1.0	20	0	103	70 - 114				
Chloroethane	19.96	1.0	20	0	99.8	70 - 130				
Chloroform	18.95	1.0	20	0	94.7	70 - 125				
Chloromethane	16.31	1.0	20	0	81.5	70 - 130				
cis-1,2-Dichloroethene	20.24	1.0	20	0	101	70 - 128				
cis-1,3-Dichloropropene	21.1	1.0	20	0	106	70 - 125				
Dibromochloromethane	19.32	1.0	20	0	96.6	70 - 124				
Dibromomethane	20.47	1.0	20	0	102	70 - 124				
Dichlorodifluoromethane	16.46	1.0	20	0	82.3	70 - 130				
Ethylbenzene	22.32	1.0	20	0	112	70 - 124				
Hexachlorobutadiene	18.59	1.0	20	0	92.9	70 - 130				
Isopropylbenzene	19.83	1.0	20	0	99.2	70 - 130				
m,p-Xylene	44.08	2.0	40	0	110	70 - 130				
Methylene chloride	19.79	2.0	20	0	99.0	70 - 128				
Naphthalene	14.85	1.0	20	0	74.2	70 - 130				
n-Butylbenzene	19.62	1.0	20	0	98.1	70 - 130				
n-Propylbenzene	21.13	1.0	20	0	106	70 - 130				
o-Xylene	21.69	1.0	20	0	108	70 - 124				
sec-Butylbenzene	18.74	1.0	20	0	93.7	70 - 130				
Styrene	19.72	1.0	20	0	98.6	70 - 130				
tert-Butylbenzene	20.67	1.0	20	0	103	70 - 130				
Tetrachloroethene	20.42	1.0	20	0	102	70 - 130				
Toluene	20.05	1.0	20	0	100	70 - 123				
trans-1,2-Dichloroethene	20.57	1.0	20	0	103	70 - 130				
trans-1,3-Dichloropropene	21.52	1.0	20	0	108	70 - 121				
Trichloroethene	21.28	1.0	20	0	106	70 - 129				
Trichlorofluoromethane	21.09	1.0	20	0	105	70 - 130				
Vinyl chloride	20.12	1.0	20	0	101	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.12*	*1.0*	*50*	*0*	*94.2*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.83*	*1.0*	*50*	*0*	*104*	*81 - 113*				
Surr: Dibromofluoromethane	*47.28*	*1.0*	*50*	*0*	*94.6*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100726-02MS** Units: **ug/L** Analysis Date: **19-Oct-2018 05:28**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781190** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.83*	*1.0*	*50*	*0*	*89.7*	*82 - 127*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.67	1.0	20	0	98.3	70 - 120	19.93	1.3	20	
1,1,1-Trichloroethane	18.24	1.0	20	0	91.2	70 - 130	19.47	6.49	20	
1,1,2,2-Tetrachloroethane	15.89	1.0	20	0	79.5	70 - 123	16.62	4.49	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	19.82	1.0	20	0	99.1	70 - 130	21.64	8.76	20	
1,1,2-Trichloroethane	19.13	1.0	20	0	95.7	70 - 117	19.52	2	20	
1,1-Dichloroethane	18.24	1.0	20	0	91.2	70 - 127	19.44	6.36	20	
1,1-Dichloroethene	18.81	1.0	20	0	94.0	70 - 130	20.24	7.34	20	
1,1-Dichloropropene	20.91	1.0	20	0	105	70 - 129	22.55	7.55	20	
1,2,3-Trichlorobenzene	16.77	1.0	20	0	83.8	70 - 130	16.48	1.73	20	
1,2,3-Trichloropropane	16.43	1.0	20	0	82.1	70 - 130	16.73	1.82	20	
1,2,4-Trichlorobenzene	17.98	1.0	20	0	89.9	70 - 125	17.65	1.85	20	
1,2,4-Trimethylbenzene	19.53	1.0	20	0	97.7	70 - 125	19.83	1.53	20	
1,2-Dibromo-3-chloropropane	14.25	1.0	20	0	71.3	70 - 130	14.87	4.25	20	
1,2-Dibromoethane	19.34	1.0	20	0	96.7	70 - 124	19.89	2.81	20	
1,2-Dichlorobenzene	18.24	1.0	20	0	91.2	70 - 115	18.74	2.71	20	
1,2-Dichloroethane	19.32	1.0	20	0	96.6	70 - 127	19.14	0.916	20	
1,2-Dichloropropane	20.11	1.0	20	0	101	70 - 122	20.52	1.99	20	
1,3,5-Trimethylbenzene	17.6	1.0	20	0	88.0	70 - 126	18.38	4.3	20	
1,3-Dichlorobenzene	18.73	1.0	20	0	93.6	70 - 119	18.85	0.636	20	
1,3-Dichloropropane	18.95	1.0	20	0	94.7	70 - 121	19.64	3.62	20	
1,4-Dichlorobenzene	18.82	1.0	20	0	94.1	70 - 114	19.01	1.04	20	
2,2-Dichloropropane	18.81	1.0	20	0	94.0	70 - 130	20.09	6.58	20	
2-Butanone	34.35	2.0	40	0	85.9	70 - 130	34.38	0.0911	20	
2-Chlorotoluene	19.91	1.0	20	0	99.6	70 - 130	20.71	3.92	20	
2-Hexanone	34.65	2.0	40	0	86.6	70 - 130	34.15	1.46	20	
4-Chlorotoluene	20.09	1.0	20	0	100	70 - 130	20.55	2.26	20	
4-Isopropyltoluene	17.1	1.0	20	0	85.5	70 - 130	17.83	4.21	20	
4-Methyl-2-pentanone	35.68	2.0	40	0	89.2	70 - 130	36.27	1.63	20	
Acetone	32.18	2.0	40	0	80.4	70 - 130	35.8	10.7	20	
Benzene	19.68	1.0	20	0	98.4	70 - 127	20.48	3.98	20	
Bromobenzene	18.59	1.0	20	0	93.0	70 - 115	19.06	2.49	20	
Bromochloromethane	19.83	1.0	20	0	99.1	70 - 127	19.62	1.07	20	
Bromodichloromethane	19.79	1.0	20	0	98.9	70 - 124	20.37	2.89	20	
Bromoform	18.27	1.0	20	0	91.3	70 - 129	18.57	1.65	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	20.98	1.0	20	0	105	70 - 130	23.12	9.72	20	
Carbon disulfide	36.19	2.0	40	0	90.5	70 - 130	39.49	8.72	20	
Carbon tetrachloride	20.74	1.0	20	0	104	70 - 130	21.31	2.73	20	
Chlorobenzene	19.53	1.0	20	0	97.6	70 - 114	20.51	4.92	20	
Chloroethane	18.48	1.0	20	0	92.4	70 - 130	19.96	7.72	20	
Chloroform	18.47	1.0	20	0	92.4	70 - 125	18.95	2.55	20	
Chloromethane	15.83	1.0	20	0	79.1	70 - 130	16.31	3.01	20	
cis-1,2-Dichloroethene	19.71	1.0	20	0	98.5	70 - 128	20.24	2.69	20	
cis-1,3-Dichloropropene	20.74	1.0	20	0	104	70 - 125	21.1	1.73	20	
Dibromochloromethane	18.89	1.0	20	0	94.5	70 - 124	19.32	2.25	20	
Dibromomethane	20.01	1.0	20	0	100	70 - 124	20.47	2.29	20	
Dichlorodifluoromethane	14.34	1.0	20	0	71.7	70 - 130	16.46	13.8	20	
Ethylbenzene	20.91	1.0	20	0	105	70 - 124	22.32	6.53	20	
Hexachlorobutadiene	17.83	1.0	20	0	89.2	70 - 130	18.59	4.17	20	
Isopropylbenzene	18.68	1.0	20	0	93.4	70 - 130	19.83	5.99	20	
m,p-Xylene	41.93	2.0	40	0	105	70 - 130	44.08	5	20	
Methylene chloride	19.21	2.0	20	0	96.1	70 - 128	19.79	2.98	20	
Naphthalene	15.43	1.0	20	0	77.2	70 - 130	14.85	3.84	20	
n-Butylbenzene	18.9	1.0	20	0	94.5	70 - 130	19.62	3.74	20	
n-Propylbenzene	19.91	1.0	20	0	99.6	70 - 130	21.13	5.92	20	
o-Xylene	20.75	1.0	20	0	104	70 - 124	21.69	4.43	20	
sec-Butylbenzene	17.69	1.0	20	0	88.5	70 - 130	18.74	5.72	20	
Styrene	19.17	1.0	20	0	95.8	70 - 130	19.72	2.83	20	
tert-Butylbenzene	19.41	1.0	20	0	97.1	70 - 130	20.67	6.26	20	
Tetrachloroethene	19.01	1.0	20	0	95.0	70 - 130	20.42	7.18	20	
Toluene	18.86	1.0	20	0	94.3	70 - 123	20.05	6.11	20	
trans-1,2-Dichloroethene	19.55	1.0	20	0	97.8	70 - 130	20.57	5.06	20	
trans-1,3-Dichloropropene	21.15	1.0	20	0	106	70 - 121	21.52	1.72	20	
Trichloroethene	20.09	1.0	20	0	100	70 - 129	21.28	5.75	20	
Trichlorofluoromethane	19.62	1.0	20	0	98.1	70 - 130	21.09	7.23	20	
Vinyl chloride	18.52	1.0	20	0	92.6	70 - 130	20.12	8.3	20	
Surr: 1,2-Dichloroethane-d4	*46.4*	*1.0*	*50*	*0*	*92.8*	*70 - 126*	*47.12*	*1.54*	*20*	
Surr: 4-Bromofluorobenzene	*50.76*	*1.0*	*50*	*0*	*102*	*81 - 113*	*51.83*	*2.1*	*20*	
Surr: Dibromofluoromethane	*46.93*	*1.0*	*50*	*0*	*93.9*	*77 - 123*	*47.28*	*0.751*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325772 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100726-02MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 05:52**
Client ID: Run ID: **VOA2_325772** SeqNo: **4781191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.83*	*1.0*	*50*	*0*	*89.7*	*82 - 127*	*44.83*	*0.00577*	*20*	

The following samples were analyzed in this batch: HS18100727-01 HS18100727-02 HS18100727-03 HS18100727-04

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 15:34**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782254** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 15:34**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782254** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.18*	*1.0*	*50*	*0*	*90.4*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.92*	*1.0*	*50*	*0*	*97.8*	*82 - 115*				
Surr: Dibromofluoromethane	*48*	*1.0*	*50*	*0*	*96.0*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MBLK Sample ID: **VBLKW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 15:34**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782254** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.88*	*1.0*	*50*	*0*	*91.8*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 14:45**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782252** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.75	1.0	20	0	109	77 - 118				
1,1,1-Trichloroethane	19.47	1.0	20	0	97.4	70 - 130				
1,1,2,2-Tetrachloroethane	19.27	1.0	20	0	96.4	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.29	1.0	20	0	111	70 - 130				
1,1,2-Trichloroethane	21.3	1.0	20	0	107	77 - 113				
1,1-Dichloroethane	20.01	1.0	20	0	100	71 - 122				
1,1-Dichloroethene	20.15	1.0	20	0	101	70 - 130				
1,1-Dichloropropene	21.55	1.0	20	0	108	78 - 118				
1,2,3-Trichlorobenzene	20.5	1.0	20	0	103	70 - 130				
1,2,3-Trichloropropane	19.93	1.0	20	0	99.7	70 - 127				
1,2,4-Trichlorobenzene	20.89	1.0	20	0	104	77 - 126				
1,2,4-Trimethylbenzene	21.83	1.0	20	0	109	73 - 121				
1,2-Dibromo-3-chloropropane	19.8	1.0	20	0	99.0	70 - 130				
1,2-Dibromoethane	21.98	1.0	20	0	110	76 - 123				
1,2-Dichlorobenzene	20.64	1.0	20	0	103	77 - 113				
1,2-Dichloroethane	21.37	1.0	20	0	107	70 - 124				
1,2-Dichloropropane	21.87	1.0	20	0	109	72 - 119				
1,3,5-Trimethylbenzene	19.61	1.0	20	0	98.1	75 - 118				
1,3-Dichlorobenzene	20.77	1.0	20	0	104	78 - 118				
1,3-Dichloropropane	21.46	1.0	20	0	107	75 - 116				
1,4-Dichlorobenzene	20.68	1.0	20	0	103	79 - 113				
2,2-Dichloropropane	23.09	1.0	20	0	115	70 - 130				
2-Butanone	43.1	2.0	40	0	108	70 - 130				
2-Chlorotoluene	21.68	1.0	20	0	108	70 - 128				
2-Hexanone	44.08	2.0	40	0	110	70 - 130				
4-Chlorotoluene	22.11	1.0	20	0	111	74 - 126				
4-Isopropyltoluene	19.02	1.0	20	0	95.1	74 - 126				
4-Methyl-2-pentanone	44.25	2.0	40	0	111	70 - 130				
Acetone	43.75	2.0	40	0	109	70 - 130				
Benzene	21.17	1.0	20	0	106	74 - 120				
Bromobenzene	20.29	1.0	20	0	101	78 - 113				
Bromochloromethane	20.85	1.0	20	0	104	76 - 124				
Bromodichloromethane	21.72	1.0	20	0	109	74 - 122				
Bromoform	21.81	1.0	20	0	109	73 - 128				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 14:45**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782252** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.93	1.0	20	0	125	70 - 130				
Carbon disulfide	39.37	2.0	40	0	98.4	70 - 130				
Carbon tetrachloride	19.96	1.0	20	0	99.8	71 - 125				
Chlorobenzene	21.63	1.0	20	0	108	76 - 113				
Chloroethane	20.34	1.0	20	0	102	70 - 130				
Chloroform	19.75	1.0	20	0	98.8	71 - 121				
Chloromethane	18.4	1.0	20	0	92.0	70 - 129				
cis-1,2-Dichloroethene	21.1	1.0	20	0	106	75 - 122				
cis-1,3-Dichloropropene	22.84	1.0	20	0	114	73 - 127				
Dibromochloromethane	21.45	1.0	20	0	107	77 - 122				
Dibromomethane	21.93	1.0	20	0	110	78 - 121				
Dichlorodifluoromethane	14.93	1.0	20	0	74.7	70 - 130				
Ethylbenzene	22.99	1.0	20	0	115	77 - 117				
Hexachlorobutadiene	20.85	1.0	20	0	104	70 - 130				
Isopropylbenzene	20.82	1.0	20	0	104	73 - 127				
m,p-Xylene	47.43	2.0	40	0	119	77 - 122				
Methylene chloride	21.37	2.0	20	0	107	70 - 127				
Naphthalene	19.83	1.0	20	0	99.1	70 - 130				
n-Butylbenzene	21.2	1.0	20	0	106	72 - 130				
n-Propylbenzene	22.35	1.0	20	0	112	73 - 124				
o-Xylene	23.2	1.0	20	0	116	75 - 119				
sec-Butylbenzene	19.45	1.0	20	0	97.2	73 - 128				
Styrene	21.99	1.0	20	0	110	72 - 126				
tert-Butylbenzene	21.99	1.0	20	0	110	73 - 124				
Tetrachloroethene	20.63	1.0	20	0	103	76 - 119				
Toluene	20.87	1.0	20	0	104	77 - 118				
trans-1,2-Dichloroethene	21.21	1.0	20	0	106	72 - 127				
trans-1,3-Dichloropropene	23.25	1.0	20	0	116	77 - 119				
Trichloroethene	21.88	1.0	20	0	109	77 - 121				
Trichlorofluoromethane	21.23	1.0	20	0	106	70 - 130				
Vinyl chloride	19.55	1.0	20	0	97.8	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.95*	*1.0*	*50*	*0*	*95.9*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.45*	*1.0*	*50*	*0*	*101*	*82 - 115*				
Surr: Dibromofluoromethane	*46.69*	*1.0*	*50*	*0*	*93.4*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

LCS Sample ID: **VLCSW-181019** Units: **ug/L** Analysis Date: **19-Oct-2018 14:45**
Client ID: Run ID: **VOA2_325826** SeqNo: **4782252** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.49*	*1.0*	*50*	*0*	*89.0*	*81 - 120*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100727-05MS** Units: **ug/L** Analysis Date: **19-Oct-2018 17:44**
Client ID: **16WW40-181012** Run ID: **VOA2_325826** SeqNo: **4782259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.18	1.0	20	0	101	70 - 120				
1,1,1-Trichloroethane	19.32	1.0	20	0	96.6	70 - 130				
1,1,2,2-Tetrachloroethane	17.91	1.0	20	0	89.5	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	24.02	1.0	20	0	120	70 - 130				
1,1,2-Trichloroethane	20.01	1.0	20	0	100	70 - 117				
1,1-Dichloroethane	19.4	1.0	20	0	97.0	70 - 127				
1,1-Dichloroethene	22.7	1.0	20	3.55	95.8	70 - 130				
1,1-Dichloropropene	22.16	1.0	20	0	111	70 - 129				
1,2,3-Trichlorobenzene	17.36	1.0	20	0	86.8	70 - 130				
1,2,3-Trichloropropane	18.33	1.0	20	0	91.6	70 - 130				
1,2,4-Trichlorobenzene	18.21	1.0	20	0	91.1	70 - 125				
1,2,4-Trimethylbenzene	19.62	1.0	20	0	98.1	70 - 125				
1,2-Dibromo-3-chloropropane	17.74	1.0	20	0	88.7	70 - 130				
1,2-Dibromoethane	20.65	1.0	20	0	103	70 - 124				
1,2-Dichlorobenzene	18.6	1.0	20	0	93.0	70 - 115				
1,2-Dichloroethane	24.04	1.0	20	3.762	101	70 - 127				
1,2-Dichloropropane	20.83	1.0	20	0	104	70 - 122				
1,3,5-Trimethylbenzene	18.19	1.0	20	0	90.9	70 - 126				
1,3-Dichlorobenzene	18.98	1.0	20	0	94.9	70 - 119				
1,3-Dichloropropane	20.27	1.0	20	0	101	70 - 121				
1,4-Dichlorobenzene	18.95	1.0	20	0	94.7	70 - 114				
2,2-Dichloropropane	21.02	1.0	20	0	105	70 - 130				
2-Butanone	38.13	2.0	40	0	95.3	70 - 130				
2-Chlorotoluene	20.09	1.0	20	0	100	70 - 130				
2-Hexanone	41.2	2.0	40	0	103	70 - 130				
4-Chlorotoluene	20.48	1.0	20	0	102	70 - 130				
4-Isopropyltoluene	17.74	1.0	20	0	88.7	70 - 130				
4-Methyl-2-pentanone	41.05	2.0	40	0	103	70 - 130				
Acetone	34.42	2.0	40	0	86.0	70 - 130				
Benzene	20.81	1.0	20	0.5277	101	70 - 127				
Bromobenzene	18.59	1.0	20	0	92.9	70 - 115				
Bromochloromethane	20.15	1.0	20	0	101	70 - 127				
Bromodichloromethane	20.29	1.0	20	0	101	70 - 124				
Bromoform	20.42	1.0	20	0	102	70 - 129				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18100727-05MS** Units: **ug/L** Analysis Date: **19-Oct-2018 17:44**
Client ID: **16WW40-181012** Run ID: **VOA2_325826** SeqNo: **4782259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	21.92	1.0	20	0	110	70 - 130				
Carbon disulfide	40.63	2.0	40	0	102	70 - 130				
Carbon tetrachloride	21.78	1.0	20	0	109	70 - 130				
Chlorobenzene	20.6	1.0	20	0	103	70 - 114				
Chloroethane	21.35	1.0	20	0	107	70 - 130				
Chloroform	19	1.0	20	0	95.0	70 - 125				
Chloromethane	16.72	1.0	20	0	83.6	70 - 130				
cis-1,2-Dichloroethene	232.9	1.0	20	212.7	101	70 - 128				EO
cis-1,3-Dichloropropene	20.64	1.0	20	0	103	70 - 125				
Dibromochloromethane	19.61	1.0	20	0	98.1	70 - 124				
Dibromomethane	21.09	1.0	20	0	105	70 - 124				
Dichlorodifluoromethane	14.69	1.0	20	0	73.5	70 - 130				
Ethylbenzene	22.17	1.0	20	0	111	70 - 124				
Hexachlorobutadiene	18.11	1.0	20	0	90.6	70 - 130				
Isopropylbenzene	19.88	1.0	20	0	99.4	70 - 130				
m,p-Xylene	43.96	2.0	40	0	110	70 - 130				
Methylene chloride	19.7	2.0	20	0	98.5	70 - 128				
Naphthalene	16.84	1.0	20	0	84.2	70 - 130				
n-Butylbenzene	19.56	1.0	20	0	97.8	70 - 130				
n-Propylbenzene	20.51	1.0	20	0	103	70 - 130				
o-Xylene	21.5	1.0	20	0	108	70 - 124				
sec-Butylbenzene	18.26	1.0	20	0	91.3	70 - 130				
Styrene	20	1.0	20	0	100	70 - 130				
tert-Butylbenzene	20.09	1.0	20	0	100	70 - 130				
Tetrachloroethene	19.95	1.0	20	0	99.8	70 - 130				
Toluene	20.04	1.0	20	0	100	70 - 123				
trans-1,2-Dichloroethene	21.73	1.0	20	0	109	70 - 130				
trans-1,3-Dichloropropene	21.62	1.0	20	0	108	70 - 121				
Trichloroethene	573.1	1.0	20	561.2	59.8	70 - 129				SEO
Trichlorofluoromethane	20.48	1.0	20	0	102	70 - 130				
Vinyl chloride	23.88	1.0	20	4.474	97.0	70 - 130				
Surr: 1,2-Dichloroethane-d4	*47.93*	*1.0*	*50*	*0*	*95.9*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.6*	*1.0*	*50*	*0*	*103*	*81 - 113*				
Surr: Dibromofluoromethane	*47.71*	*1.0*	*50*	*0*	*95.4*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18100727-05MS** Units: **ug/L** Analysis Date: **19-Oct-2018 17:44**
Client ID: **16WW40-181012** Run ID: **VOA2_325826** SeqNo: **4782259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.93*	*1.0*	*50*	*0*	*89.9*	*82 - 127*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100727-05MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 18:09**
Client ID: **16WW40-181012** Run ID: **VOA2_325826** SeqNo: **4782260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.75	1.0	20	0	98.8	70 - 120	20.18	2.13	20	
1,1,1-Trichloroethane	17.42	1.0	20	0	87.1	70 - 130	19.32	10.3	20	
1,1,2,2-Tetrachloroethane	18.3	1.0	20	0	91.5	70 - 123	17.91	2.14	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	20.52	1.0	20	0	103	70 - 130	24.02	15.7	20	
1,1,2-Trichloroethane	19.87	1.0	20	0	99.3	70 - 117	20.01	0.72	20	
1,1-Dichloroethane	19.19	1.0	20	0	96.0	70 - 127	19.4	1.06	20	
1,1-Dichloroethene	21.37	1.0	20	3.55	89.1	70 - 130	22.7	6.05	20	
1,1-Dichloropropene	20.34	1.0	20	0	102	70 - 129	22.16	8.57	20	
1,2,3-Trichlorobenzene	17.64	1.0	20	0	88.2	70 - 130	17.36	1.57	20	
1,2,3-Trichloropropane	18.31	1.0	20	0	91.5	70 - 130	18.33	0.113	20	
1,2,4-Trichlorobenzene	18.38	1.0	20	0	91.9	70 - 125	18.21	0.926	20	
1,2,4-Trimethylbenzene	19.65	1.0	20	0	98.2	70 - 125	19.62	0.144	20	
1,2-Dibromo-3-chloropropane	17.5	1.0	20	0	87.5	70 - 130	17.74	1.34	20	
1,2-Dibromoethane	20.23	1.0	20	0	101	70 - 124	20.65	2.05	20	
1,2-Dichlorobenzene	18.6	1.0	20	0	93.0	70 - 115	18.6	0.00724	20	
1,2-Dichloroethane	23.89	1.0	20	3.762	101	70 - 127	24.04	0.603	20	
1,2-Dichloropropane	19.7	1.0	20	0	98.5	70 - 122	20.83	5.58	20	
1,3,5-Trimethylbenzene	17.62	1.0	20	0	88.1	70 - 126	18.19	3.19	20	
1,3-Dichlorobenzene	18.81	1.0	20	0	94.1	70 - 119	18.98	0.881	20	
1,3-Dichloropropane	19.74	1.0	20	0	98.7	70 - 121	20.27	2.64	20	
1,4-Dichlorobenzene	18.94	1.0	20	0	94.7	70 - 114	18.95	0.0219	20	
2,2-Dichloropropane	18.98	1.0	20	0	94.9	70 - 130	21.02	10.2	20	
2-Butanone	37.77	2.0	40	0	94.4	70 - 130	38.13	0.952	20	
2-Chlorotoluene	19.64	1.0	20	0	98.2	70 - 130	20.09	2.25	20	
2-Hexanone	40.96	2.0	40	0	102	70 - 130	41.2	0.589	20	
4-Chlorotoluene	20.09	1.0	20	0	100	70 - 130	20.48	1.92	20	
4-Isopropyltoluene	17.08	1.0	20	0	85.4	70 - 130	17.74	3.8	20	
4-Methyl-2-pentanone	41.01	2.0	40	0	103	70 - 130	41.05	0.0964	20	
Acetone	39.27	2.0	40	0	98.2	70 - 130	34.42	13.2	20	
Benzene	19.75	1.0	20	0.5277	96.1	70 - 127	20.81	5.25	20	
Bromobenzene	18.67	1.0	20	0	93.4	70 - 115	18.59	0.463	20	
Bromochloromethane	19.71	1.0	20	0	98.5	70 - 127	20.15	2.25	20	
Bromodichloromethane	19.76	1.0	20	0	98.8	70 - 124	20.29	2.64	20	
Bromoform	19.86	1.0	20	0	99.3	70 - 129	20.42	2.82	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100727-05MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 18:09**
Client ID: **16WW40-181012** Run ID: **VOA2_325826** SeqNo: **4782260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	19.91	1.0	20	0	99.6	70 - 130	21.92	9.62	20	
Carbon disulfide	37.59	2.0	40	0	94.0	70 - 130	40.63	7.77	20	
Carbon tetrachloride	20.65	1.0	20	0	103	70 - 130	21.78	5.29	20	
Chlorobenzene	19.96	1.0	20	0	99.8	70 - 114	20.6	3.11	20	
Chloroethane	20.59	1.0	20	0	103	70 - 130	21.35	3.64	20	
Chloroform	18.04	1.0	20	0	90.2	70 - 125	19	5.2	20	
Chloromethane	15.25	1.0	20	0	76.3	70 - 130	16.72	9.16	20	
cis-1,2-Dichloroethene	226.8	1.0	20	212.7	70.6	70 - 128	232.9	2.64	20	EO
cis-1,3-Dichloropropene	20.87	1.0	20	0	104	70 - 125	20.64	1.09	20	
Dibromochloromethane	19.47	1.0	20	0	97.4	70 - 124	19.61	0.734	20	
Dibromomethane	20.41	1.0	20	0	102	70 - 124	21.09	3.26	20	
Dichlorodifluoromethane	13.19	1.0	20	0	66.0	70 - 130	14.69	10.8	20	S
Ethylbenzene	21.25	1.0	20	0	106	70 - 124	22.17	4.2	20	
Hexachlorobutadiene	17.97	1.0	20	0	89.9	70 - 130	18.11	0.764	20	
Isopropylbenzene	18.93	1.0	20	0	94.7	70 - 130	19.88	4.86	20	
m,p-Xylene	42.1	2.0	40	0	105	70 - 130	43.96	4.32	20	
Methylene chloride	18.35	2.0	20	0	91.7	70 - 128	19.7	7.1	20	
Naphthalene	17.85	1.0	20	0	89.3	70 - 130	16.84	5.84	20	
n-Butylbenzene	18.9	1.0	20	0	94.5	70 - 130	19.56	3.4	20	
n-Propylbenzene	19.58	1.0	20	0	97.9	70 - 130	20.51	4.64	20	
o-Xylene	20.28	1.0	20	0	101	70 - 124	21.5	5.87	20	
sec-Butylbenzene	17.48	1.0	20	0	87.4	70 - 130	18.26	4.4	20	
Styrene	19.66	1.0	20	0	98.3	70 - 130	20	1.72	20	
tert-Butylbenzene	19.54	1.0	20	0	97.7	70 - 130	20.09	2.76	20	
Tetrachloroethene	18.79	1.0	20	0	94.0	70 - 130	19.95	5.97	20	
Toluene	18.93	1.0	20	0	94.6	70 - 123	20.04	5.7	20	
trans-1,2-Dichloroethene	20.47	1.0	20	0	102	70 - 130	21.73	5.95	20	
trans-1,3-Dichloropropene	21.43	1.0	20	0	107	70 - 121	21.62	0.868	20	
Trichloroethene	549.7	1.0	20	561.2	-57.6	70 - 129	573.1	4.18	20	SEO
Trichlorofluoromethane	18.47	1.0	20	0	92.3	70 - 130	20.48	10.3	20	
Vinyl chloride	21.31	1.0	20	4.474	84.2	70 - 130	23.88	11.4	20	
Surr: 1,2-Dichloroethane-d4	*47.26*	*1.0*	*50*	*0*	*94.5*	*70 - 126*	*47.93*	*1.42*	*20*	
Surr: 4-Bromofluorobenzene	*50.98*	*1.0*	*50*	*0*	*102*	*81 - 113*	*51.6*	*1.21*	*20*	
Surr: Dibromofluoromethane	*47.27*	*1.0*	*50*	*0*	*94.5*	*77 - 123*	*47.71*	*0.931*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325826 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18100727-05MSD** Units: **ug/L** Analysis Date: **19-Oct-2018 18:09**
Client ID: **16WW40-181012** Run ID: **VOA2_325826** SeqNo: **4782260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.75*	*1.0*	*50*	*0*	*89.5*	*82 - 127*	*44.93*	*0.394*	*20*	

The following samples were analyzed in this batch:

HS18100727-05	HS18100727-06	HS18100727-07	HS18100727-08
HS18100727-09	HS18100727-10	HS18100727-11	HS18100727-12

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325844 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181020** Units: **ug/L** Analysis Date: **20-Oct-2018 12:29**
Client ID: Run ID: **VOA2_325844** SeqNo: **4782667** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.64*	*1.0*	*50*	*0*	*89.3*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.17*	*1.0*	*50*	*0*	*96.3*	*82 - 115*				
Surr: Dibromofluoromethane	*48.88*	*1.0*	*50*	*0*	*97.8*	*73 - 126*				
Surr: Toluene-d8	*46.85*	*1.0*	*50*	*0*	*93.7*	*81 - 120*				

LCS Sample ID: **VLCSW-181020** Units: **ug/L** Analysis Date: **20-Oct-2018 12:04**
Client ID: Run ID: **VOA2_325844** SeqNo: **4782666** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	21.37	1.0	20	0	107	77 - 121				
Surr: 1,2-Dichloroethane-d4	*46.04*	*1.0*	*50*	*0*	*92.1*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.61*	*1.0*	*50*	*0*	*101*	*82 - 115*				
Surr: Dibromofluoromethane	*47.06*	*1.0*	*50*	*0*	*94.1*	*73 - 126*				
Surr: Toluene-d8	*45.39*	*1.0*	*50*	*0*	*90.8*	*81 - 120*				

MS Sample ID: **HS18100713-03MS** Units: **ug/L** Analysis Date: **20-Oct-2018 16:38**
Client ID: Run ID: **VOA2_325844** SeqNo: **4782671** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	22.55	1.0	20	0	113	70 - 129				
Surr: 1,2-Dichloroethane-d4	*47.33*	*1.0*	*50*	*0*	*94.7*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.42*	*1.0*	*50*	*0*	*101*	*81 - 113*				
Surr: Dibromofluoromethane	*47.83*	*1.0*	*50*	*0*	*95.7*	*77 - 123*				
Surr: Toluene-d8	*45.27*	*1.0*	*50*	*0*	*90.5*	*82 - 127*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325844 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18100713-03MSD** Units: **ug/L** Analysis Date: **20-Oct-2018 17:02**
Client ID: Run ID: **VOA2_325844** SeqNo: **4782672** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	20.75	1.0	20	0	104	70 - 129	22.55	8.31	20	
Surr: 1,2-Dichloroethane-d4	*46.86*	*1.0*	*50*	*0*	*93.7*	*70 - 126*	*47.33*	*0.999*	*20*	
Surr: 4-Bromofluorobenzene	*51.58*	*1.0*	*50*	*0*	*103*	*81 - 113*	*50.42*	*2.28*	*20*	
Surr: Dibromofluoromethane	*47.15*	*1.0*	*50*	*0*	*94.3*	*77 - 123*	*47.83*	*1.44*	*20*	
Surr: Toluene-d8	*45.62*	*1.0*	*50*	*0*	*91.2*	*82 - 127*	*45.27*	*0.751*	*20*	

The following samples were analyzed in this batch: HS18100727-07 HS18100727-11

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18100727

QC BATCH REPORT

Batch ID: R325666 (0) **Instrument:** ICS2100 **Method:** ANIONS BY SW9056A

MBLK Sample ID: **WBLKW2-101618** Units: **mg/L** Analysis Date: **17-Oct-2018 02:03**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777661** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW2-101618** Units: **mg/L** Analysis Date: **17-Oct-2018 02:18**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777662** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.648	0.100	4	0	91.2	80 - 120				

LCSD Sample ID: **WLCSDW2-101618** Units: **mg/L** Analysis Date: **17-Oct-2018 02:32**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777663** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.65	0.100	4	0	91.2	80 - 120	3.648	0.0548	20	

MS Sample ID: **HS18100727-05MS** Units: **mg/L** Analysis Date: **17-Oct-2018 08:22**
Client ID: **16WW40-181012** Run ID: **ICS2100_325666** SeqNo: **4777687** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	23.55	1.00	20	5.566	89.9	80 - 120				

MSD Sample ID: **HS18100727-05MSD** Units: **mg/L** Analysis Date: **17-Oct-2018 08:36**
Client ID: **16WW40-181012** Run ID: **ICS2100_325666** SeqNo: **4777688** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	23.94	1.00	20	5.566	91.8	80 - 120	23.55	1.62	20	

The following samples were analyzed in this batch:

HS18100727-02	HS18100727-05	HS18100727-06	HS18100727-08
HS18100727-09	HS18100727-10	HS18100727-11	HS18100727-12

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS18100727**

QUALIFIERS, ACRONYMS, UNITS

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18100727

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18100727-01	16TB05-181012	Login	10/13/2018 5:09:13 PM	PJM	VOA259
HS18100727-02	16WW30-181012	Login	10/13/2018 5:09:13 PM	PJM	Sub
HS18100727-02	16WW30-181012	Login	10/13/2018 5:09:13 PM	PJM	VOA259

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18100727

Date/Time Received: **13-Oct-2018 09:40**
Received by: **PJM**

Checklist completed by: *Pablo Marinez* eSignature 13-Oct-2018 Date

Reviewed by: *RJ Modashia* eSignature 15-Oct-2018 Date

Matrices: **WATER**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.3C/1.0C UC/C	IR # 25
Cooler(s)/Kit(s):	44084	
Date/Time sample(s) sent to storage:	10/13/2018 17:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

RIGHT SOLUTIONS | RIGHT PARTNER

APTIM

COC ID: LHAAP16-OCT2018-GW-ALSHT-181012 TURNAROUND TIME: normal RUSH: Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-50			Email	RJ.Modashia@alsglobal.com			Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stanciff Rd., Suite 210			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FED EX		

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	VOCs in Water by 8260B	Perchlorate in Water by 6850	Anions in Water by E300.0 & Alkalinity in Water by E2320b	Bromide by E300.0	Dissolved Gases in Water by RSK175	TOC in Water by SW9060
16TB05-181012	FIELD QC				LIQ	10/12/2018	830	2		2					
16WW30-181012	16WW30	9.27	9.62	FT	GW	10/12/2018	1030	5		3	1		1		
16WW46-181012	16WW46	15.83	16.09	FT	GW	10/12/2018	1105	4		3	1				
16WW23-181012	16WW23	9.23	9.64	FT	GW	10/12/2018	1155	4		3	1				
16WW40-181012	16WW40	12.31	12.56	FT	GW	10/12/2018	1235	5		3	1		1		
16WW40-181012--FD	16WW40	12.31	12.56	FT	GW	10/12/2018	1235	5		3	1		1		
16WW40-181012-MS	16WW40	12.31	12.56	FT	GW	10/12/2018	1235	5		3	1		1		
16WW40-181012-MSD	16WW40	12.31	12.56	FT	GW	10/12/2018	1235	5		3	1		1		
16WW27-181012	16WW27	8.91	9.32	FT	GW	10/12/2018	1310	4		3	1				
16WW12-181012	16WW12	18.63	18.78	FT	GW	10/12/2018	1350	5		3	1		1		
16WW42-181012	16WW42	10.95	12.24	FT	GW	10/12/2018	1425	5		3	1		1		
16WW13-181012	16WW13	9.06	10.07	FT	GW	10/12/2018	1515	5		3	1		1		
16WW21-181012	16WW21	26.75	26.9	FT	GW	10/12/2018	1540	5		3	1		1		
16EB01-181012	FIELD QC			FT	GW	10/12/2018	1630	5		3	1		1		

HS18100727

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	APTIM	10-12-18/1810	ALS PM	10/13-16 9:40
16EB01-181012 is an equipment rinse sample and is not field filtered for perchlorate.				

44084 WC IR CF

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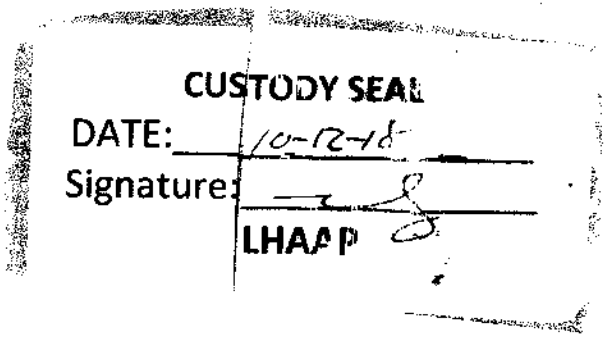
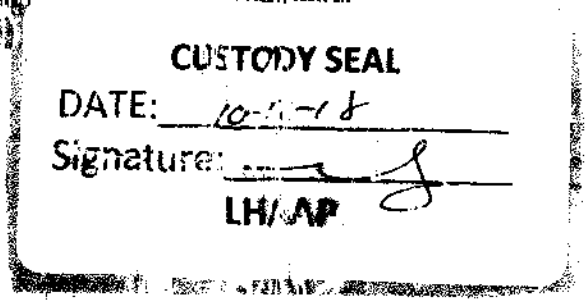


ALS Laboratory Group
10450 Stancliff Rd. Ste#210
Houston, TX 77099
281.530.5656

FedEx
SATURDAY 12:00P
4380 3533 1366
PRIORITY OVERNIGHT
XO SGRA
77099
TX-US IAH

ALS Laboratory Group
10450 Stancliff Rd. Ste#210
Houston, TX 77099
281.530.5656



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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1828987; 1828988; 1828989; 1829115

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2159 (225647)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1829115002 was analyzed and reported from a 1:10 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 624449) was less than 1/2 the CRDL. The recovery for the LCS (624450) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1828988002/03 and 1828989005/06 (Client ID's: 16WW32-181011/16WW40-181012). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The Matrix Spike duplicate (MSD - 1828989006) failed QC acceptance criteria for percent recovery, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent differences (RPD's) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1

Thomas Bosch October 25, 2018
Analyst Date

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ANALYTICAL REPORT

Report Date: October 29, 2018

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1828989**
Project ID: HS18100727 101218
Purchase Order: HS18100727
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16WW30-181012	1828989001	10/12/18	10/16/18	
16WW46-181012	1828989002	10/12/18	10/16/18	
16WW23-181012	1828989003	10/12/18	10/16/18	
16WW40-181012	1828989004	10/12/18	10/16/18	
16WW40-181012-FD	1828989007	10/12/18	10/16/18	
16WW27-181012	1828989008	10/12/18	10/16/18	
16WW12-181012	1828989009	10/12/18	10/16/18	
16WW42-181012	1828989010	10/12/18	10/16/18	
16WW13-181012	1828989011	10/12/18	10/16/18	
16WW21-181012	1828989012	10/12/18	10/16/18	
16EB01-181012	1828989013	10/12/18	10/16/18	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
16WW40-181012MS	1828989005	10/12/18	10/16/18	
16WW40-181012MSD	1828989006	10/12/18	10/16/18	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1828989
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW30-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989001 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 11:05 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW46-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989002 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 11:19 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW23-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989003 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 11:33 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW40-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989004 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 11:47 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1828989
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW40-181012-FD** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989007 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 12:58 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW27-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989008 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 13:12 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW12-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989009 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 13:26 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**12**	1.0	2.0	4.0	1	

Sample ID: **16WW42-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989010 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 13:40 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1828989
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW13-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989011 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 13:54 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW21-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989012 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 14:09 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16EB01-181012** | Sampling Site: NA | Collected: 10/12/2018
Lab ID: 1828989013 | Media: 125 mL Nalgene | Received: 10/16/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 14:23 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/25/2018 14:54	/S/ Stephen Brose 10/29/2018 08:45

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1828989
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body	Certificate Number	Website
Environmental	PJLA (DoD ELAP)		
	Utah (TNI)		
	Nevada		
	Oklahoma		
	Iowa		

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1828989

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2159 (HBN: 225647)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 624449
Analyzed: 10/24/2018 08:55
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 624450
Analyzed: 10/24/2018 09:09
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.90	5.00	97.9	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample: 1828988001	MS: 1828988002	MSD: 1828988003
	Analyzed: 10/24/2018 09:40	Analyzed: 10/24/2018 09:54	Analyzed: 10/24/2018 10:08
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.75	5	94.9	78.8	123.8	4.67	93.3	1.7	0.0	20.0

	Sample: 1828989004	MS: 1828989005	MSD: 1828989006
	Analyzed: 10/24/2018 11:47	Analyzed: 10/24/2018 12:29	Analyzed: 10/24/2018 12:43
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.4	5	108	78.8	123.8	6.26	# 125	14.7	0.0	20.0

Continuing Calibration Verification

	CCV: 624446	CCV: 624451	CCV: 624453
	Analyzed: 10/24/2018 08:12	Analyzed: 10/24/2018 12:01	Analyzed: 10/24/2018 15:06
	Units: ug/L	Units: ug/L	Units: ug/L
	Criteria: ± 15%	Criteria: ± 15%	Criteria: ± 15%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	24.4	25.0	97.6	23.5	25.0	94.0	23.5	25.0	94.2

Interference Check Sample

ICSA: 624448
Analyzed: 10/24/2018 08:41
Units: ug/L
Criteria: ± 30%

Analyte	Result	Target	% Rec.
Perchlorate	0.985	1.00	98.5

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Quality Control Sample
Batch Report

Analysis Information

Workorder: **1828989**

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2159 (HBN: 225647)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Limit of Detection Verification

LODV:	624447			**LODV:**	624452			**LODV:**	624454		
Analyzed:	10/24/2018 08:27			**Analyzed:**	10/24/2018 12:15			**Analyzed:**	10/24/2018 15:20		
Units:	ug/L			**Units:**	ug/L			**Units:**	ug/L		
Criteria:	± 50%			**Criteria:**	± 50%			**Criteria:**	± 50%		
Analyte	**Result**	**Target**	**% Rec.**	**Result**	**Target**	**% Rec.**		**Result**	**Target**	**% Rec.**
Perchlorate	1.03	1.00	103	0.970	1.00	97.0		1.02	1.00	102

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
10/25/2018 14:54	10/29/2018 08:45

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◓ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ✹ - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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18698/#2

1828989

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www.alsglobal.com

Subcontract Chain of Custody

COC ID: 10013

1828989

SUBCONTRACT TO:

ALS Laboratory Group
960 West LeVoy Drive
Salt Lake City, UT 84123

Phone: +1 800 356 9135

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18100727
TSR:	Sonia West

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS18100727-02**	**16WW30-181012**	**GW**	**12 Oct 2018 10:30**
	SUB_Perch-6850			23 Oct 2018
2.	**HS18100727-03**	**16WW46-181012**	**GW**	**12 Oct 2018 11:05**
	SUB_Perch-6850			23 Oct 2018
3.	**HS18100727-04**	**16WW23-181012**	**GW**	**12 Oct 2018 11:55**
	SUB_Perch-6850			23 Oct 2018
4.	**HS18100727-05**	**16WW40-181012**	**GW**	**12 Oct 2018 12:35**
	SUB_Perch-6850			23 Oct 2018
5.	**HS18100727-06**	**16WW40-181012-FD**	**GW**	**12 Oct 2018 12:35**
	SUB_Perch-6850			23 Oct 2018
6.	**HS18100727-07**	**16WW27-181012**	**GW**	**12 Oct 2018 13:10**
	SUB_Perch-6850			23 Oct 2018
7.	**HS18100727-08**	**16WW12-181012**	**GW**	**12 Oct 2018 13:50**
	SUB_Perch-6850			23 Oct 2018
8.	**HS18100727-09**	**16WW42-181012**	**GW**	**12 Oct 2018 14:25**
	SUB_Perch-6850			23 Oct 2018
9.	**HS18100727-10**	**16WW13-181012**	**GW**	**12 Oct 2018 15:15**

Extra volume MS/MSD

Subcontract Chain of Custody

COC ID: 10013

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	SUB_Perch-6850			23 Oct 2018
10.	**HS18100727-11**	**16WW21-181012**	**GW**	**12 Oct 2018 15:40**
	SUB_Perch-6850			23 Oct 2018
11.	**HS18100727-12**	**16EB01-181012**	**GW**	**12 Oct 2018 16:30**
	SUB_Perch-6850			23 Oct 2018

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 10/15/18 1800

Received By: _____ Date/Time: 10/16/2018 10:20

Cooler ID(s): _____ Temperature(s): _____

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18100727	***Split:***	**Workorder ID:** 1828989	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Preservatives COOL	Requested Analysis EPA 8850, DoD QSM
1	10/12/2018 10:30	16WW30-181012	1828989001		Water	A	1		A
2	10/12/2018 11:05	16WW46-181012	1828989002		Water	A	1		A
3	10/12/2018 11:55	16WW23-181012	1828989003		Water	A	1		A
4	10/12/2018 12:35	16WW40-181012	1828989004		Water	A	1		A
5	10/12/2018 12:35	16WW40-181012MS	1828989005	MS	Water	A	1		A
6	10/12/2018 12:35	16WW40-181012MSD	1828989006	MSD	Water	A	1		A
7	10/12/2018 12:35	16WW40-181012-FD	1828989007	FLDDUP	Water	A	1		A
8	10/12/2018 13:10	16WW27-181012	1828989008		Water	A	1		A
9	10/12/2018 13:50	16WW12-181012	1828989009		Water	A	1		A
10	10/12/2018 14:25	16WW42-181012	1828989010		Water	A	1		A

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	10/16/2018 10:20	ALS Sample Receiving	Sample Login
[signature]	10/17/18 1000	3C	storage
R.33.1	10/23-18/14:10	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18100727	***Split:***	**Workorder ID:** 1828989	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives** COOL

Requested Analysis

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850, DoD QSM
11	10/12/2018 15:15	16WW13-181012	1828989011		Water	A	1	A
12	10/12/2018 15:40	16WW21-181012	1828989012		Water	A	1	A
13	10/12/2018 16:30	16EB01-181012	1828989013	EQBK	Water	A	1	A
14								
15								
16								
17								
18								
19								
20								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	10/16/2018 10:20	ALS Sample Receiving	Sample Login
Julie Warath	10/17/18 1000	3C	Storage
R 33.1	10.23 18/14:10	T. Busch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

Page 2 of 2 Tue, 10/16/18 1:11 PM ALSCOCV3.1

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ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR) 1828989

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: HS18100727 / 10013

Date/Time of Receipt: 10/16/2018 10:20

Number of Coolers Received: 1

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Cooler)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	(Yes)/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C18 8830	2 °C	4	C18	°C	7	C18	°C
2	C18	°C	5	C18	°C	8	C18	°C
3	C18	°C	6	C18	°C	9	C18	°C

Taken By: Desiree Hill (Signature) Desiree Hill (Printed Name) 10/16/2018 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Received 3 bottles for sample HS18100727-05

Client Notified? YES ☐ No ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018

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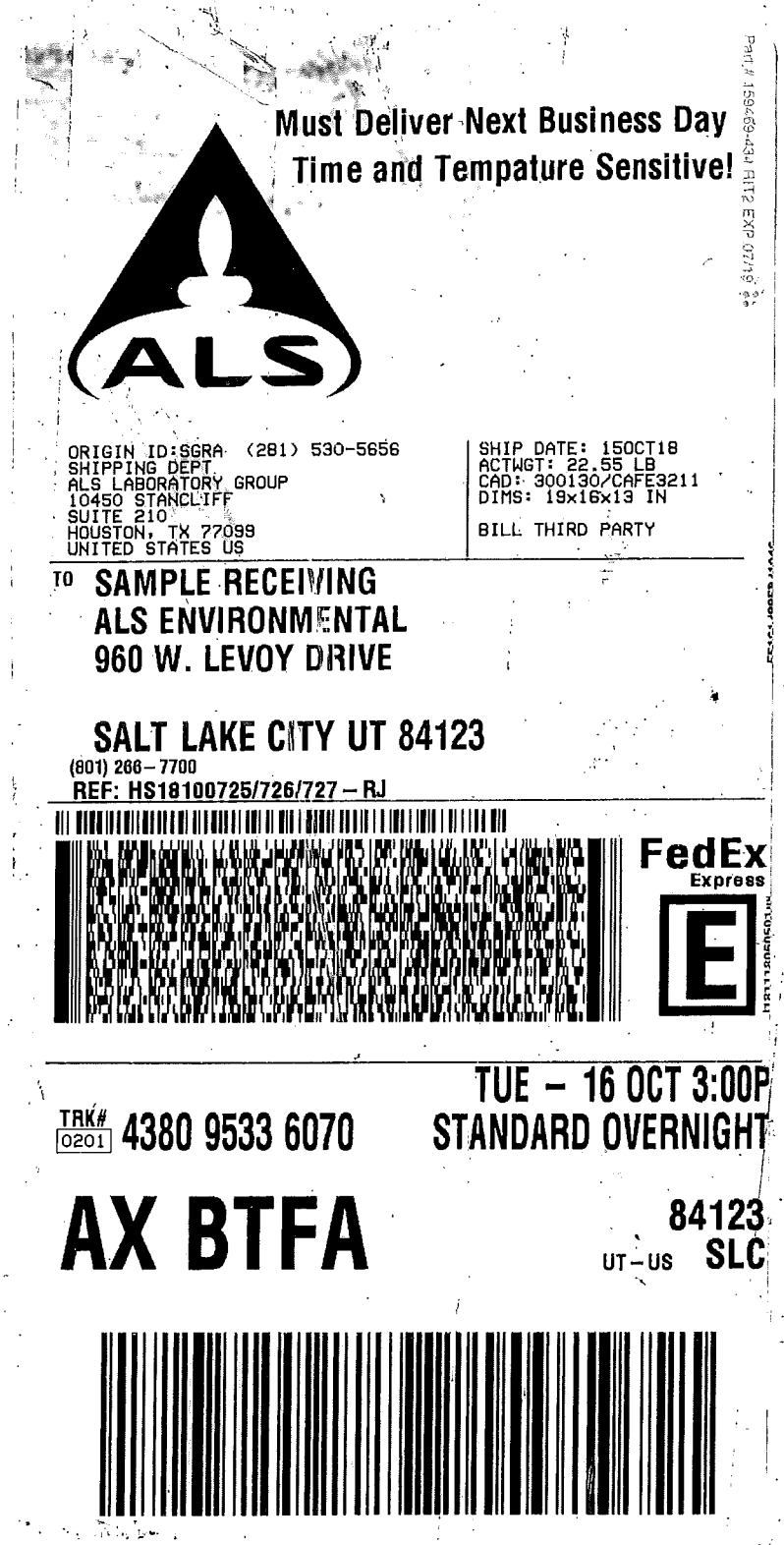

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Batch Worklist

Batch: ELMS/ 2159 **Created:** 10/23/2018 18:03 **Instrument:** **HBN:** 225647

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1828987 [ENV_LVL4]
Workorder: 1828988 [ENV_LVL4]
Workorder: 1828989 [ENV_LVL4]
Workorder: 1829115 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	624446	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
2	624447	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	
3	624448	ICS for HBN 225647 [ELMS/2159]				ICS	3		E6850..D3Q	5311		10/29/2018	
4	624449	LMB for HBN 225647 [ELMS/2159]				LMB	3		E6850Q413Q	5311		10/29/2018	
5	624450	LCS for HBN 225647 [ELMS/2159]				LCS	3		E6850Q413Q	5311		10/29/2018	
6	1828987001	16WW32-181011				SAMPLE	3	1828987001-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
	1828988001	16SW01-181011				SAMPLE	3	1828988001-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
	1828988002	16SW01-181011MS				MS	3	1828988002-A	E6850Q413Q	5480		10/29/2018	
	1828988003	16SW01-181011MSD				MSD	3	1828988003-A	E6850Q413Q	5480		10/29/2018	
	1828988004	16SW01-181011-FD				FLDDUP	3	1828988004-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
11	1828988005	16SW02-181011				SAMPLE	3	1828988005-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
12	1828988006	16SW03-181011				SAMPLE	3	1828988006-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
13	1828989001	16WW30-181012				SAMPLE	3	1828989001-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
14	1828989002	16WW46-181012				SAMPLE	3	1828989002-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
15	1828989003	16WW23-181012				SAMPLE	3	1828989003-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
16	1828989004	16WW40-181012				SAMPLE	3	1828989004-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
17	624451	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
18	624452	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	
19	1828989005	16WW40-181012MS				MS	3	1828989005-A	E6850Q413Q	5480		10/29/2018	
20	1828989006	16WW40-181012MSD				MSD	3	1828989006-A	E6850Q413Q	5480		10/29/2018	
21	1828989007	16WW40-181012-FD				FLDDUP	3	1828989007-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
22	1828989008	16WW27-181012				SAMPLE	3	1828989008-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
23	1828989009	16WW12-181012				SAMPLE	3	1828989009-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
24	1828989010	16WW42-181012				SAMPLE	3	1828989010-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
25	1828989011	16WW13-181012				SAMPLE	3	1828989011-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
26	1828989012	16WW21-181012				SAMPLE	3	1828989012-A	E6850Q41.3	5480	11/9/2018	10/29/2018	

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Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
27	1828989013	16EB01-181012				EQBK	3	1828989013-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
28	1829115001	16WW29-181015				SAMPLE	3	1829115001-A	E6850Q41.3	5480	11/12/2018	10/30/2018	
29	1829115002	16WW55-181015				SAMPLE	3	1829115002-A	E6850Q41.3	5480	11/12/2018	10/30/2018	
30	624453	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
31	624454	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	

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Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1828987 (001); 1828988 (001-06); 1828989 (001-13); 1829115 (001,02)
ELMS Batch/HBN ID: 2159 (225647)
Prep Date: 10/23/2018 Analysis Date: 10/24/2018 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\OCT\24OCT18D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 10/08/2018, sequence 08OCT18D.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 2 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.80
5.0	0.80
5.3	0.25
10.0	0.25
10.5	0.80
12.5	0.80

QC DATA: 5.0µL of QC Solution Horizon ID 41830 was used for LCS 624450; Target = 5.0µg/L. ASTM type II water was used for LMB 624449.

MS/MSD: MS/MSD was performed on samples 1828988002/03 and 1828989005/06 (Client ID's: 16WW32-181011/16WW40-181012). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field sample 1829115002 was analyzed and reported from a 1:10 dilution. The reporting limit has been adjusted accordingly. Samples 1828989004/07 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The Matrix Spike duplicate (MSD - 1828989006) failed QC acceptance criteria for percent recovery, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2018\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\225647-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS 2159 HBN 225647 Sample Set IDs if Applicable: 18-28987/18289888/18289889/18291115	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

TB. 10.26.18
SB 10/29/18

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Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L
Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** No
Part ID: IC-PER-10X-1		**Lab Lot:** CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 09/20/2018 09:09AM	**Expires:** 04/28/2026
MFG Lot: SDFF-012A	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL
ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

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125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safely information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 26, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18100823**

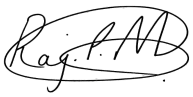
Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 10 sample(s) on Oct 16, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS18100823

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18100823-01	16EW08-181013	Groundwater		13-Oct-2018 10:45	16-Oct-2018 09:15	☐
HS18100823-02	16EW07-181013	Groundwater		13-Oct-2018 11:00	16-Oct-2018 09:15	☐
HS18100823-03	16EW15-181013	Groundwater		13-Oct-2018 12:20	16-Oct-2018 09:15	☐
HS18100823-04	16EW11-181013	Groundwater		13-Oct-2018 12:55	16-Oct-2018 09:15	☐
HS18100823-05	16EW14B-181013	Groundwater		13-Oct-2018 13:20	16-Oct-2018 09:15	☐
HS18100823-06	16EW12B-181013	Groundwater		13-Oct-2018 13:30	16-Oct-2018 09:15	☐
HS18100823-07	16EW13-181013	Groundwater		13-Oct-2018 14:05	16-Oct-2018 09:15	☐
HS18100823-08	16TB06-181015	Water	VBLKW 092618-21	15-Oct-2018 08:45	16-Oct-2018 09:15	☐
HS18100823-09	16WW29-181015	Groundwater		15-Oct-2018 09:30	16-Oct-2018 09:15	☐
HS18100823-10	16WW55-181015	Groundwater		15-Oct-2018 10:30	16-Oct-2018 09:15	☐

Revision:1

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Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS18100823

Work Order Comments

- Revised to updated the VOC list.
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.
- The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R325736

Sample ID: HS18100713-02MS

- MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R325941

Sample ID: CCV

- Bromomethane exceeded %D limits on CCV. Samples ND.

Sample ID: HS18101139-07MS

- MS and MSD are for an unrelated sample.

WetChemistry by Method SM2320B

Batch ID: R325707

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

WetChemistry by Method SW9056

Batch ID: R325666

Sample ID: HS18100727-05MSD

- MSD is for an unrelated sample (Chloride,Sulfate)

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Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: LHAAP-16 WorkOrder:HS18100823
Sample ID: 16EW08-181013 Lab ID:HS18100823-01
Collection Date: 13-Oct-2018 10:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Bromide	**1.11**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 04:00

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: LHAAP-16
WorkOrder:HS18100823
Sample ID: 16EW07-181013
Lab ID:HS18100823-02
Collection Date: 13-Oct-2018 11:00
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Bromide	**2.14**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 04:14

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: LHAAP-16
WorkOrder:HS18100823
Sample ID: 16EW15-181013
Lab ID:HS18100823-03
Collection Date: 13-Oct-2018 12:20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Bromide	**1.86**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 05:56

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: LHAAP-16 WorkOrder:HS18100823
Sample ID: 16EW11-181013 Lab ID:HS18100823-04
Collection Date: 13-Oct-2018 12:55 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Bromide	**4.68**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 06:11

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW14B-181013
Collection Date: 13-Oct-2018 13:20

ANALYTICAL REPORT
WorkOrder:HS18100823
Lab ID:HS18100823-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.40**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 06:25

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: LHAAP-16
WorkOrder:HS18100823
Sample ID: 16EW12B-181013
Lab ID:HS18100823-06
Collection Date: 13-Oct-2018 13:30
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Bromide	**3.82**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 06:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: LHAAP-16
WorkOrder:HS18100823
Sample ID: 16EW13-181013
Lab ID:HS18100823-07
Collection Date: 13-Oct-2018 14:05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Bromide	**2.91**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Oct-2018 06:54

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: LHAAP-16 WorkOrder:HS18100823
Sample ID: 16TB06-181015 Lab ID:HS18100823-08
Collection Date: 15-Oct-2018 08:45 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**							Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Oct-2018 00:17
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 00:17
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 00:17
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 00:17
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	23-Oct-2018 00:17
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 00:17
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 00:17
Surr: 1,2-Dichloroethane-d4	*94.2*			**0**	*70-126*	*%REC*	*1*	*23-Oct-2018 00:17*
Surr: 4-Bromofluorobenzene	*98.4*			**0**	*81-113*	*%REC*	*1*	*23-Oct-2018 00:17*
Surr: Dibromofluoromethane	*97.0*			**0**	*77-123*	*%REC*	*1*	*23-Oct-2018 00:17*
Surr: Toluene-d8	*93.0*			**0**	*82-127*	*%REC*	*1*	*23-Oct-2018 00:17*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW29-181015
Collection Date: 15-Oct-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18100823
Lab ID:HS18100823-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Oct-2018 02:20
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 02:20
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 02:20
cis-1,2-Dichloroethene	**8.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Oct-2018 02:20
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	23-Oct-2018 02:20
Trichloroethene	**3.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Oct-2018 02:20
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 02:20
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*70-126*	*%REC*	*1*	*23-Oct-2018 02:20*
Surr: 4-Bromofluorobenzene	*99.6*			**0**	*81-113*	*%REC*	*1*	*23-Oct-2018 02:20*
Surr: Dibromofluoromethane	*97.8*			**0**	*77-123*	*%REC*	*1*	*23-Oct-2018 02:20*
Surr: Toluene-d8	*92.6*			**0**	*82-127*	*%REC*	*1*	*23-Oct-2018 02:20*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	0.00100	U	0.000144	0.00100	0.00100	mg/L	1	18-Oct-2018 18:15
Ethene	**0.00187**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	18-Oct-2018 18:15
Methane	**0.00241**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	18-Oct-2018 18:15
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**45.9**		**5.00**	**5.00**	**5.00**	**mg/L**	1	18-Oct-2018 00:11
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.218**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	17-Oct-2018 02:47
Chloride	**45.4**		**0.200**	**0.500**	**0.500**	**mg/L**	1	17-Oct-2018 02:47
Fluoride	**0.0530**	J	**0.0500**	**0.100**	**0.100**	**mg/L**	1	17-Oct-2018 02:47
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	17-Oct-2018 02:47
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	17-Oct-2018 02:47
Sulfate	**99.2**		**2.00**	**5.00**	**5.00**	**mg/L**	10	17-Oct-2018 03:01
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	01-Nov-2018 11:28

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW55-181015
Collection Date: 15-Oct-2018 10:30

ANALYTICAL REPORT
WorkOrder:HS18100823
Lab ID:HS18100823-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	ug/L	10	23-Oct-2018 02:46
1,1-Dichloroethene	5.0	U	2.0	5.0	10	ug/L	10	23-Oct-2018 02:46
1,2-Dichloroethane	5.0	U	2.0	5.0	10	ug/L	10	23-Oct-2018 02:46
cis-1,2-Dichloroethene	**540**		**2.0**	**5.0**	**10**	**ug/L**	10	23-Oct-2018 02:46
Methylene chloride	10	U	10	10	20	ug/L	10	23-Oct-2018 02:46
Trichloroethene	**5,900**		**20**	**50**	**100**	**ug/L**	100	23-Oct-2018 03:13
Vinyl chloride	5.0	U	2.0	5.0	10	ug/L	10	23-Oct-2018 02:46
Surr: 1,2-Dichloroethane-d4	*92.7*			**0**	*70-126*	*%REC*	*10*	*23-Oct-2018 02:46*
Surr: 1,2-Dichloroethane-d4	*94.1*			**0**	*70-126*	*%REC*	*100*	*23-Oct-2018 03:13*
Surr: 4-Bromofluorobenzene	*100*			**0**	*81-113*	*%REC*	*10*	*23-Oct-2018 02:46*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*81-113*	*%REC*	*100*	*23-Oct-2018 03:13*
Surr: Dibromofluoromethane	*97.6*			**0**	*77-123*	*%REC*	*10*	*23-Oct-2018 02:46*
Surr: Dibromofluoromethane	*94.7*			**0**	*77-123*	*%REC*	*100*	*23-Oct-2018 03:13*
Surr: Toluene-d8	*91.8*			**0**	*82-127*	*%REC*	*10*	*23-Oct-2018 02:46*
Surr: Toluene-d8	*91.7*			**0**	*82-127*	*%REC*	*100*	*23-Oct-2018 03:13*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000749**	J	**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	18-Oct-2018 18:24
Ethene	**0.00379**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	18-Oct-2018 18:24
Methane	**0.136**		**0.000535**	**0.00250**	**0.00250**	**mg/L**	5	18-Oct-2018 18:34
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**347**		**5.00**	**5.00**	**5.00**	**mg/L**	1	18-Oct-2018 00:17
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.12**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	17-Oct-2018 03:16
Chloride	**1,000**		**20.0**	**50.0**	**50.0**	**mg/L**	100	17-Oct-2018 03:45
Fluoride	**0.152**		**0.0500**	**0.100**	**0.100**	**mg/L**	1	17-Oct-2018 03:16
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	17-Oct-2018 03:16
Nitrogen, Nitrite (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	17-Oct-2018 03:16
Sulfate	**1,110**		**20.0**	**50.0**	**50.0**	**mg/L**	100	17-Oct-2018 03:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	29-Oct-2018 15:58
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0			1	01-Nov-2018 11:28

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R325666 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS18100823-01	16EW08-181013	13 Oct 2018 10:45			17 Oct 2018 04:00	10
HS18100823-02	16EW07-181013	13 Oct 2018 11:00			17 Oct 2018 04:14	10
HS18100823-03	16EW15-181013	13 Oct 2018 12:20			17 Oct 2018 05:56	10
HS18100823-04	16EW11-181013	13 Oct 2018 12:55			17 Oct 2018 06:11	10
HS18100823-05	16EW14B-181013	13 Oct 2018 13:20			17 Oct 2018 06:25	10
HS18100823-06	16EW12B-181013	13 Oct 2018 13:30			17 Oct 2018 06:40	10
HS18100823-07	16EW13-181013	13 Oct 2018 14:05			17 Oct 2018 06:54	10
HS18100823-09	16WW29-181015	15 Oct 2018 09:30			17 Oct 2018 03:01	10
HS18100823-09	16WW29-181015	15 Oct 2018 09:30			17 Oct 2018 02:47	1
HS18100823-10	16WW55-181015	15 Oct 2018 10:30			17 Oct 2018 03:45	100
HS18100823-10	16WW55-181015	15 Oct 2018 10:30			17 Oct 2018 03:16	1
Batch ID: R325707 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS18100823-09	16WW29-181015	15 Oct 2018 09:30			18 Oct 2018 00:11	1
HS18100823-10	16WW55-181015	15 Oct 2018 10:30			18 Oct 2018 00:17	1
Batch ID: R325736 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS18100823-09	16WW29-181015	15 Oct 2018 09:30			18 Oct 2018 18:15	1
HS18100823-10	16WW55-181015	15 Oct 2018 10:30			18 Oct 2018 18:34	5
HS18100823-10	16WW55-181015	15 Oct 2018 10:30			18 Oct 2018 18:24	1
Batch ID: R325941 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Groundwater	
HS18100823-09	16WW29-181015	15 Oct 2018 09:30			23 Oct 2018 02:20	1
HS18100823-10	16WW55-181015	15 Oct 2018 10:30			23 Oct 2018 03:13	100
HS18100823-10	16WW55-181015	15 Oct 2018 10:30			23 Oct 2018 02:46	10
Batch ID: R325941 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS18100823-08	16TB06-181015	15 Oct 2018 08:45			23 Oct 2018 00:17	1
Batch ID: R326322 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS18100823-09	16WW29-181015	15 Oct 2018 09:30			29 Oct 2018 15:58	1
HS18100823-10	16WW55-181015	15 Oct 2018 10:30			29 Oct 2018 15:58	1
Batch ID: R326589 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS18100823-09	16WW29-181015	15 Oct 2018 09:30			01 Nov 2018 11:28	1
HS18100823-10	16WW55-181015	15 Oct 2018 10:30			01 Nov 2018 11:28	1

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325736 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-181018** Units: **mg/L** Analysis Date: **18-Oct-2018 13:19**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784197** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00100	0.00100								U
Ethene	0.00100	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-181018** Units: **mg/L** Analysis Date: **18-Oct-2018 12:58**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0167	0.00100	0.01804	0	92.5	75 - 125				
Ethene	0.0158	0.00100	0.0168	0	93.9	75 - 125				
Methane	0.00883	0.000500	0.009647	0	91.5	75 - 125				

LCSD Sample ID: **LCSD-181018** Units: **mg/L** Analysis Date: **18-Oct-2018 13:09**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784196** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0171	0.00100	0.01804	0	94.7	75 - 125	0.01668	2.36	30	
Ethene	0.0164	0.00100	0.0168	0	97.4	75 - 125	0.01577	3.66	30	
Methane	0.00805	0.000500	0.009647	0	83.4	75 - 125	0.008831	9.29	30	

MS Sample ID: **HS18100713-02MS** Units: **mg/L** Analysis Date: **18-Oct-2018 16:40**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784204** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0220	0.00100	0.01804	0.0004656	119	75 - 125				
Ethene	0.0255	0.00100	0.0168	0.002499	137	75 - 125				S
Methane	0.0294	0.000500	0.009647	0.01297	170	75 - 125				S

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325736 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MSD Sample ID: **HS18100713-02MSD** Units: **mg/L** Analysis Date: **18-Oct-2018 17:05**
Client ID: Run ID: **FID-4_325736** SeqNo: **4784205** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0213	0.00100	0.01804	0.0004656	116	75 - 125	0.02200	3.2	30	
Ethene	0.0238	0.00100	0.0168	0.002499	127	75 - 125	0.02546	6.57	30	S
Methane	0.0332	0.000500	0.009647	0.01297	210	75 - 125	0.02937	12.3	30	S

The following samples were analyzed in this batch: HS18100823-09 HS18100823-10

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:53**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:53**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.3*	*1.0*	*50*	*0*	*92.6*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.52*	*1.0*	*50*	*0*	*99.0*	*82 - 115*				
Surr: Dibromofluoromethane	*49.27*	*1.0*	*50*	*0*	*98.5*	*73 - 126*				

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MBLK Sample ID: **VBLKW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:53**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.76*	*1.0*	*50*	*0*	*93.5*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:04**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785142** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.98	1.0	20	0	105	77 - 118				
1,1,1-Trichloroethane	19.64	1.0	20	0	98.2	70 - 130				
1,1,2,2-Tetrachloroethane	17.96	1.0	20	0	89.8	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	20.99	1.0	20	0	105	70 - 130				
1,1,2-Trichloroethane	20.41	1.0	20	0	102	77 - 113				
1,1-Dichloroethane	20.53	1.0	20	0	103	71 - 122				
1,1-Dichloroethene	20.06	1.0	20	0	100	70 - 130				
1,1-Dichloropropene	22.5	1.0	20	0	112	78 - 118				
1,2,3-Trichlorobenzene	17.77	1.0	20	0	88.9	70 - 130				
1,2,3-Trichloropropane	17.7	1.0	20	0	88.5	70 - 127				
1,2,4-Trichlorobenzene	18.89	1.0	20	0	94.4	77 - 126				
1,2,4-Trimethylbenzene	21.53	1.0	20	0	108	73 - 121				
1,2-Dibromo-3-chloropropane	16.42	1.0	20	0	82.1	70 - 130				
1,2-Dibromoethane	20.99	1.0	20	0	105	76 - 123				
1,2-Dichlorobenzene	19.8	1.0	20	0	99.0	77 - 113				
1,2-Dichloroethane	22.4	1.0	20	0	112	70 - 124				
1,2-Dichloropropane	21.68	1.0	20	0	108	72 - 119				
1,3,5-Trimethylbenzene	19.63	1.0	20	0	98.1	75 - 118				
1,3-Dichlorobenzene	20.39	1.0	20	0	102	78 - 118				
1,3-Dichloropropane	20.76	1.0	20	0	104	75 - 116				
1,4-Dichlorobenzene	20.48	1.0	20	0	102	79 - 113				
2,2-Dichloropropane	21.26	1.0	20	0	106	70 - 130				
2-Butanone	37.26	2.0	40	0	93.1	70 - 130				
2-Chlorotoluene	21.74	1.0	20	0	109	70 - 128				
2-Hexanone	37.73	2.0	40	0	94.3	70 - 130				
4-Chlorotoluene	22.05	1.0	20	0	110	74 - 126				
4-Isopropyltoluene	18.57	1.0	20	0	92.9	74 - 126				
4-Methyl-2-pentanone	38.58	2.0	40	0	96.4	70 - 130				
Acetone	35.79	2.0	40	0	89.5	70 - 130				
Benzene	20.87	1.0	20	0	104	74 - 120				
Bromobenzene	20.17	1.0	20	0	101	78 - 113				
Bromochloromethane	21.03	1.0	20	0	105	76 - 124				
Bromodichloromethane	21.68	1.0	20	0	108	74 - 122				
Bromoform	20.1	1.0	20	0	100	73 - 128				

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:04**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785142** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.27	1.0	20	0	121	70 - 130				
Carbon disulfide	39	2.0	40	0	97.5	70 - 130				
Carbon tetrachloride	21.91	1.0	20	0	110	71 - 125				
Chlorobenzene	21.19	1.0	20	0	106	76 - 113				
Chloroethane	20.22	1.0	20	0	101	70 - 130				
Chloroform	19.9	1.0	20	0	99.5	71 - 121				
Chloromethane	17.84	1.0	20	0	89.2	70 - 129				
cis-1,2-Dichloroethene	20.75	1.0	20	0	104	75 - 122				
cis-1,3-Dichloropropene	22.35	1.0	20	0	112	73 - 127				
Dibromochloromethane	20.66	1.0	20	0	103	77 - 122				
Dibromomethane	21.73	1.0	20	0	109	78 - 121				
Dichlorodifluoromethane	14.06	1.0	20	0	70.3	70 - 130				
Ethylbenzene	22.66	1.0	20	0	113	77 - 117				
Hexachlorobutadiene	19.74	1.0	20	0	98.7	70 - 130				
Isopropylbenzene	20.29	1.0	20	0	101	73 - 127				
m,p-Xylene	45.44	2.0	40	0	114	77 - 122				
Methylene chloride	20.98	2.0	20	0	105	70 - 127				
Naphthalene	15.92	1.0	20	0	79.6	70 - 130				
n-Butylbenzene	20.72	1.0	20	0	104	72 - 130				
n-Propylbenzene	22.1	1.0	20	0	111	73 - 124				
o-Xylene	22.51	1.0	20	0	113	75 - 119				
sec-Butylbenzene	19.08	1.0	20	0	95.4	73 - 128				
Styrene	21.44	1.0	20	0	107	72 - 126				
tert-Butylbenzene	21.37	1.0	20	0	107	73 - 124				
Tetrachloroethene	20.51	1.0	20	0	103	76 - 119				
Toluene	20.48	1.0	20	0	102	77 - 118				
trans-1,2-Dichloroethene	21.45	1.0	20	0	107	72 - 127				
trans-1,3-Dichloropropene	22.37	1.0	20	0	112	77 - 119				
Trichloroethene	20.69	1.0	20	0	103	77 - 121				
Trichlorofluoromethane	20.23	1.0	20	0	101	70 - 130				
Vinyl chloride	19.59	1.0	20	0	98.0	70 - 130				
Surr: 1,2-Dichloroethane-d4	*48.23*	*1.0*	*50*	*0*	*96.5*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.84*	*1.0*	*50*	*0*	*102*	*82 - 115*				
Surr: Dibromofluoromethane	*47.26*	*1.0*	*50*	*0*	*94.5*	*73 - 126*				

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

LCS Sample ID: **VLCSW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:04**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785142** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.21*	*1.0*	*50*	*0*	*90.4*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18101139-07MS** Units: **ug/L** Analysis Date: **23-Oct-2018 03:38**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.41	1.0	20	0	97.0	70 - 120				
1,1,1-Trichloroethane	19.4	1.0	20	0	97.0	70 - 130				
1,1,2,2-Tetrachloroethane	17.37	1.0	20	0	86.9	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.03	1.0	20	0	110	70 - 130				
1,1,2-Trichloroethane	19.17	1.0	20	0	95.9	70 - 117				
1,1-Dichloroethane	19.29	1.0	20	0	96.5	70 - 127				
1,1-Dichloroethene	19.68	1.0	20	0	98.4	70 - 130				
1,1-Dichloropropene	21.95	1.0	20	0	110	70 - 129				
1,2,3-Trichlorobenzene	16.44	1.0	20	0	82.2	70 - 130				
1,2,3-Trichloropropane	17.16	1.0	20	0	85.8	70 - 130				
1,2,4-Trichlorobenzene	17.6	1.0	20	0	88.0	70 - 125				
1,2,4-Trimethylbenzene	61.55	1.0	20	43.59	89.8	70 - 125				
1,2-Dibromo-3-chloropropane	16.6	1.0	20	0	83.0	70 - 130				
1,2-Dibromoethane	19.67	1.0	20	0	98.3	70 - 124				
1,2-Dichlorobenzene	18.3	1.0	20	0	91.5	70 - 115				
1,2-Dichloroethane	20.17	1.0	20	0	101	70 - 127				
1,2-Dichloropropane	20.54	1.0	20	0	103	70 - 122				
1,3,5-Trimethylbenzene	30.62	1.0	20	12.44	90.9	70 - 126				
1,3-Dichlorobenzene	18.83	1.0	20	0	94.1	70 - 119				
1,3-Dichloropropane	19.02	1.0	20	0	95.1	70 - 121				
1,4-Dichlorobenzene	18.72	1.0	20	0	93.6	70 - 114				
2,2-Dichloropropane	20.55	1.0	20	0	103	70 - 130				
2-Butanone	38.86	2.0	40	0	97.1	70 - 130				
2-Chlorotoluene	23.52	1.0	20	0	118	70 - 130				
2-Hexanone	38.24	2.0	40	0	95.6	70 - 130				
4-Chlorotoluene	21.57	1.0	20	0	108	70 - 130				
4-Isopropyltoluene	18.47	1.0	20	0	92.3	70 - 130				
4-Methyl-2-pentanone	38.16	2.0	40	0	95.4	70 - 130				
Acetone	38.75	2.0	40	0	96.9	70 - 130				
Benzene	181	1.0	20	166.5	72.4	70 - 127				O
Bromobenzene	18.48	1.0	20	0	92.4	70 - 115				
Bromochloromethane	20.63	1.0	20	0	103	70 - 127				
Bromodichloromethane	20.54	1.0	20	0	103	70 - 124				
Bromoform	18.6	1.0	20	0	93.0	70 - 129				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18101139-07MS** Units: **ug/L** Analysis Date: **23-Oct-2018 03:38**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	20.17	1.0	20	0	101	70 - 130				
Carbon disulfide	40.08	2.0	40	0	100	70 - 130				
Carbon tetrachloride	22.3	1.0	20	0	111	70 - 130				
Chlorobenzene	19.87	1.0	20	0	99.4	70 - 114				
Chloroethane	19.12	1.0	20	0	95.6	70 - 130				
Chloroform	19.62	1.0	20	0	98.1	70 - 125				
Chloromethane	15.44	1.0	20	0	77.2	70 - 130				
cis-1,2-Dichloroethene	20.24	1.0	20	0	101	70 - 128				
cis-1,3-Dichloropropene	20.64	1.0	20	0	103	70 - 125				
Dibromochloromethane	19.47	1.0	20	0	97.3	70 - 124				
Dibromomethane	20.21	1.0	20	0	101	70 - 124				
Dichlorodifluoromethane	14.4	1.0	20	0	72.0	70 - 130				
Ethylbenzene	75.37	1.0	20	55.91	97.3	70 - 124				
Hexachlorobutadiene	17.18	1.0	20	0	85.9	70 - 130				
Isopropylbenzene	25.53	1.0	20	6.06	97.3	70 - 130				
m,p-Xylene	248.5	2.0	40	210.2	95.9	70 - 130				O
Methylene chloride	18.9	2.0	20	0	94.5	70 - 128				
Naphthalene	26.9	1.0	20	5.256	108	70 - 130				
n-Butylbenzene	20.25	1.0	20	0	101	70 - 130				
n-Propylbenzene	26.25	1.0	20	2.169	120	70 - 130				
o-Xylene	123.6	1.0	20	102.9	104	70 - 124				O
sec-Butylbenzene	18.85	1.0	20	0.6856	90.8	70 - 130				
Styrene	21.79	1.0	20	0	109	70 - 130				
tert-Butylbenzene	20.62	1.0	20	0	103	70 - 130				
Tetrachloroethene	19.94	1.0	20	0	99.7	70 - 130				
Toluene	21.22	1.0	20	1.768	97.3	70 - 123				
trans-1,2-Dichloroethene	20.6	1.0	20	0	103	70 - 130				
trans-1,3-Dichloropropene	20.59	1.0	20	0	103	70 - 121				
Trichloroethene	26.83	1.0	20	0	134	70 - 129				S
Trichlorofluoromethane	20.86	1.0	20	0	104	70 - 130				
Vinyl chloride	19.93	1.0	20	0	99.7	70 - 130				
Surr: 1,2-Dichloroethane-d4	*50.27*	*1.0*	*50*	*0*	*101*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.87*	*1.0*	*50*	*0*	*102*	*81 - 113*				
Surr: Dibromofluoromethane	*47.55*	*1.0*	*50*	*0*	*95.1*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18101139-07MS** Units: **ug/L** Analysis Date: **23-Oct-2018 03:38**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.73*	*1.0*	*50*	*0*	*89.5*	*82 - 127*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18101139-07MSD** Units: **ug/L** Analysis Date: **23-Oct-2018 04:03**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.51	1.0	20	0	97.6	70 - 120	19.41	0.545	20	
1,1,1-Trichloroethane	18.79	1.0	20	0	94.0	70 - 130	19.4	3.19	20	
1,1,2,2-Tetrachloroethane	17.04	1.0	20	0	85.2	70 - 123	17.37	1.92	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	21.24	1.0	20	0	106	70 - 130	22.03	3.67	20	
1,1,2-Trichloroethane	19.25	1.0	20	0	96.2	70 - 117	19.17	0.375	20	
1,1-Dichloroethane	19.05	1.0	20	0	95.3	70 - 127	19.29	1.27	20	
1,1-Dichloroethene	18.7	1.0	20	0	93.5	70 - 130	19.68	5.12	20	
1,1-Dichloropropene	21.31	1.0	20	0	107	70 - 129	21.95	2.97	20	
1,2,3-Trichlorobenzene	17.51	1.0	20	0	87.6	70 - 130	16.44	6.3	20	
1,2,3-Trichloropropane	16.89	1.0	20	0	84.4	70 - 130	17.16	1.61	20	
1,2,4-Trichlorobenzene	18.72	1.0	20	0	93.6	70 - 125	17.6	6.18	20	
1,2,4-Trimethylbenzene	61.24	1.0	20	43.59	88.2	70 - 125	61.55	0.505	20	
1,2-Dibromo-3-chloropropane	15.91	1.0	20	0	79.5	70 - 130	16.6	4.27	20	
1,2-Dibromoethane	20.02	1.0	20	0	100	70 - 124	19.67	1.78	20	
1,2-Dichlorobenzene	18.41	1.0	20	0	92.1	70 - 115	18.3	0.633	20	
1,2-Dichloroethane	20	1.0	20	0	100.0	70 - 127	20.17	0.868	20	
1,2-Dichloropropane	0.5000	1.0	20	0	0	70 - 122	20.54	0	20	SU
1,3,5-Trimethylbenzene	29.85	1.0	20	12.44	87.1	70 - 126	30.62	2.53	20	
1,3-Dichlorobenzene	18.95	1.0	20	0	94.7	70 - 119	18.83	0.622	20	
1,3-Dichloropropane	19.72	1.0	20	0	98.6	70 - 121	19.02	3.59	20	
1,4-Dichlorobenzene	18.92	1.0	20	0	94.6	70 - 114	18.72	1.02	20	
2,2-Dichloropropane	19.62	1.0	20	0	98.1	70 - 130	20.55	4.62	20	
2-Butanone	38.43	2.0	40	0	96.1	70 - 130	38.86	1.1	20	
2-Chlorotoluene	23.1	1.0	20	0	116	70 - 130	23.52	1.78	20	
2-Hexanone	38.81	2.0	40	0	97.0	70 - 130	38.24	1.49	20	
4-Chlorotoluene	21.41	1.0	20	0	107	70 - 130	21.57	0.73	20	
4-Isopropyltoluene	18.2	1.0	20	0	91.0	70 - 130	18.47	1.48	20	
4-Methyl-2-pentanone	37.86	2.0	40	0	94.6	70 - 130	38.16	0.788	20	
Acetone	37.12	2.0	40	0	92.8	70 - 130	38.75	4.29	20	
Benzene	176.2	1.0	20	166.5	48.2	70 - 127	181	2.7	20	SO
Bromobenzene	18.46	1.0	20	0	92.3	70 - 115	18.48	0.0757	20	
Bromochloromethane	20.08	1.0	20	0	100	70 - 127	20.63	2.68	20	
Bromodichloromethane	20.57	1.0	20	0	103	70 - 124	20.54	0.16	20	
Bromoform	18.81	1.0	20	0	94.1	70 - 129	18.6	1.15	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18101139-07MSD** Units: **ug/L** Analysis Date: **23-Oct-2018 04:03**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	20.56	1.0	20	0	103	70 - 130	20.17	1.91	20	
Carbon disulfide	37.77	2.0	40	0	94.4	70 - 130	40.08	5.93	20	
Carbon tetrachloride	20.71	1.0	20	0	104	70 - 130	22.3	7.36	20	
Chlorobenzene	20.38	1.0	20	0	102	70 - 114	19.87	2.51	20	
Chloroethane	20.74	1.0	20	0	104	70 - 130	19.12	8.11	20	
Chloroform	18.96	1.0	20	0	94.8	70 - 125	19.62	3.4	20	
Chloromethane	15.67	1.0	20	0	78.3	70 - 130	15.44	1.47	20	
cis-1,2-Dichloroethene	19.73	1.0	20	0	98.6	70 - 128	20.24	2.57	20	
cis-1,3-Dichloropropene	20.93	1.0	20	0	105	70 - 125	20.64	1.37	20	
Dibromochloromethane	19.42	1.0	20	0	97.1	70 - 124	19.47	0.244	20	
Dibromomethane	20.66	1.0	20	0	103	70 - 124	20.21	2.2	20	
Dichlorodifluoromethane	14.09	1.0	20	0	70.4	70 - 130	14.4	2.23	20	
Ethylbenzene	75.65	1.0	20	55.91	98.7	70 - 124	75.37	0.358	20	
Hexachlorobutadiene	16.59	1.0	20	0	83.0	70 - 130	17.18	3.49	20	
Isopropylbenzene	25.15	1.0	20	6.06	95.5	70 - 130	25.53	1.48	20	
m,p-Xylene	249	2.0	40	210.2	97.1	70 - 130	248.5	0.187	20	O
Methylene chloride	18.53	2.0	20	0	92.7	70 - 128	18.9	1.96	20	
Naphthalene	28.74	1.0	20	5.256	117	70 - 130	26.9	6.61	20	
n-Butylbenzene	19.84	1.0	20	0	99.2	70 - 130	20.25	2	20	
n-Propylbenzene	25.31	1.0	20	2.169	116	70 - 130	26.25	3.62	20	
o-Xylene	123.5	1.0	20	102.9	103	70 - 124	123.6	0.113	20	O
sec-Butylbenzene	18.22	1.0	20	0.6856	87.7	70 - 130	18.85	3.44	20	
Styrene	22.52	1.0	20	0	113	70 - 130	21.79	3.29	20	
tert-Butylbenzene	20.03	1.0	20	0	100	70 - 130	20.62	2.92	20	
Tetrachloroethene	19.39	1.0	20	0	96.9	70 - 130	19.94	2.83	20	
Toluene	21.02	1.0	20	1.768	96.3	70 - 123	21.22	0.942	20	
trans-1,2-Dichloroethene	19.86	1.0	20	0	99.3	70 - 130	20.6	3.63	20	
trans-1,3-Dichloropropene	21.55	1.0	20	0	108	70 - 121	20.59	4.54	20	
Trichloroethene	22.9	1.0	20	0	115	70 - 129	26.83	15.8	20	
Trichlorofluoromethane	19.67	1.0	20	0	98.3	70 - 130	20.86	5.91	20	
Vinyl chloride	18.77	1.0	20	0	93.9	70 - 130	19.93	5.98	20	
Surr: 1,2-Dichloroethane-d4	*47.89*	*1.0*	*50*	*0*	*95.8*	*70 - 126*	*50.27*	*4.85*	*20*	
Surr: 4-Bromofluorobenzene	*52.06*	*1.0*	*50*	*0*	*104*	*81 - 113*	*50.87*	*2.32*	*20*	
Surr: Dibromofluoromethane	*47.8*	*1.0*	*50*	*0*	*95.6*	*77 - 123*	*47.55*	*0.523*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MSD Sample ID: **HS18101139-07MSD** Units: **ug/L** Analysis Date: **23-Oct-2018 04:03**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.94*	*1.0*	*50*	*0*	*89.9*	*82 - 127*	*44.73*	*0.476*	*20*	

The following samples were analyzed in this batch: HS18100823-08 HS18100823-09 HS18100823-10

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325666 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-101618** Units: **mg/L** Analysis Date: **17-Oct-2018 02:03**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777661** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Chloride	0.500	0.500								U
Fluoride	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW2-101618** Units: **mg/L** Analysis Date: **17-Oct-2018 02:18**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777662** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.648	0.100	4	0	91.2	80 - 120				
Chloride	20.21	0.500	20	0	101	80 - 120				
Fluoride	4.345	0.100	4	0	109	80 - 120				
Nitrogen, Nitrate (As N)	3.932	0.100	4	0	98.3	80 - 120				
Nitrogen, Nitrite (As N)	4.194	0.100	4	0	105	80 - 120				
Sulfate	20.01	0.500	20	0	100	80 - 120				

LCSD Sample ID: **WLCSDW2-101618** Units: **mg/L** Analysis Date: **17-Oct-2018 02:32**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777663** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.65	0.100	4	0	91.2	80 - 120	3.648	0.0548	20	
Chloride	20.16	0.500	20	0	101	80 - 120	20.21	0.268	20	
Fluoride	4.338	0.100	4	0	108	80 - 120	4.345	0.161	20	
Nitrogen, Nitrate (As N)	3.912	0.100	4	0	97.8	80 - 120	3.932	0.51	20	
Nitrogen, Nitrite (As N)	4.185	0.100	4	0	105	80 - 120	4.194	0.215	20	
Sulfate	20	0.500	20	0	100	80 - 120	20.01	0.03	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325666 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MS Sample ID: **HS18100727-05MS** Units: **mg/L** Analysis Date: **17-Oct-2018 08:22**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777687** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	23.55	1.00	20	5.566	89.9	80 - 120				
Chloride	1480	5.00	100	1372	108	80 - 120				EO
Fluoride	21.04	1.00	20	0.258	104	80 - 120				
Nitrogen, Nitrate (As N)	20.58	1.00	20	0	103	80 - 120				
Nitrogen, Nitrite (As N)	21.98	1.00	20	0	110	80 - 120				
Sulfate	1577	5.00	100	1474	103	80 - 120				EO

MSD Sample ID: **HS18100727-05MSD** Units: **mg/L** Analysis Date: **17-Oct-2018 08:36**
Client ID: Run ID: **ICS2100_325666** SeqNo: **4777688** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	23.94	1.00	20	5.566	91.8	80 - 120	23.55	1.62	20	
Chloride	1503	5.00	100	1372	131	80 - 120	1480	1.52	20	SEO
Fluoride	21.43	1.00	20	0.258	106	80 - 120	21.04	1.82	20	
Nitrogen, Nitrate (As N)	20.74	1.00	20	0	104	80 - 120	20.58	0.77	20	
Nitrogen, Nitrite (As N)	22.33	1.00	20	0	112	80 - 120	21.98	1.58	20	
Sulfate	1602	5.00	100	1474	129	80 - 120	1577	1.59	20	SEO

The following samples were analyzed in this batch:

HS18100823-01	HS18100823-02	HS18100823-03	HS18100823-04
HS18100823-05	HS18100823-06	HS18100823-07	HS18100823-09
HS18100823-10			

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS18100823

QC BATCH REPORT

Batch ID: R325707 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-181018** Units: **mg/L** Analysis Date: **17-Oct-2018 22:11**
Client ID: Run ID: **ManTech01_325707** SeqNo: **4778804** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS1-181018** Units: **mg/L** Analysis Date: **17-Oct-2018 22:20**
Client ID: Run ID: **ManTech01_325707** SeqNo: **4778805** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1077	5.00	1000	0	108	85 - 115				

LCSD Sample ID: **WLCSD1-181018** Units: **mg/L** Analysis Date: **17-Oct-2018 22:29**
Client ID: Run ID: **ManTech01_325707** SeqNo: **4778806** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1077	5.00	1000	0	108	85 - 115	1077	0.026	20	

DUP Sample ID: **HS18100849-01DUP** Units: **mg/L** Analysis Date: **18-Oct-2018 00:05**
Client ID: Run ID: **ManTech01_325707** SeqNo: **4778820** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	162.6	5.00					162.3	0.234	20	

The following samples were analyzed in this batch: HS18100823-09 HS18100823-10

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS18100823**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/L	Milligrams per Liter

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

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Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18100823

Date/Time Received: **16-Oct-2018 09:15**
Received by: **NDR**

Checklist completed by: *Jared R. Makan* 16-Oct-2018
eSignature | Date

Reviewed by: _____
eSignature | Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.6c/0.3c UC/C	IR25
Cooler(s)/Kit(s):	44118	
Date/Time sample(s) sent to storage:	10/16/2018 10:30	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: 16WW29 collection time differs: COC = 09:30, Sample containers = 10:05. Logged in per COC.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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APTIM

COC ID: LHAAP16-OCT2018-GW-ALSHT-181015 **TURNAROUND TIME:** normal **RUSH:** Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FED EX		

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	VOCs in Water by 8260B	Perchlorate in Water by 6850	Anions in Water by E300.0 & Alkalinity in Water by E2320b	Bromide by E300.0	Dissolved Gases in Water by RSK175	TOC in Water by SW9060
16EW08-181013	16EW08	9.3	9.61	FT	GW	10/13/2018	1045	1					1		
16EW07-181013	16EW07	14.36	14.67	FT	GW	10/13/2018	1100	1					1		
16EW15-181013	16EW15	17.84	18.97	FT	GW	10/13/2018	1220	1					1		
16EW11-181013	16EW11	20.76	21.35	FT	GW	10/13/2018	1255	1					1		
16EW14B-181013	16EW14B	16.73	16.94	FT	GW	10/13/2018	1320	1					1		
16EW12B-181013	16EW12B	17.46	17.9	FT	GW	10/13/2018	1330	1					1		
16EW13-181013	16EW13	17.4	17.93	FT	GW	10/13/2018	1405	1					1		
16TB06-181015	FIELD QC				LIQ	10/15/2018	845	2		2					
16WW29-181015	16WW29	8.73	8.83	FT	GW	10/15/2018	930	11		3	1	1	1	3	2
16WW55-181015	16WW55	22.88	23.01	FT	GW	10/15/2018	1030	11		3	1	1	1	3	2

HS18100823

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	[signature] Aptim	10/14/1300	NR ALS	10/16/18 09:15

44118 Temp ctc 0.6

IR # 25 [illegible]

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FedEx
4380 9533 1399

TUE - 16 OCT 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

ALS Laboratory Group
10450 Stancliff Rd. Ste#210
Houston, TX 77099
281.530.5656

CUSTODY SEAL
DATE: 10-17-18
Signature:
LHAAP
Jm 10/16/18

CUSTODY SEAL
DATE: 10-17-18
Signature:
LHAAP
Jm 10/16/18

ALS Laboratory Group
10450 Stancliff Rd. Ste#210
Houston, TX 77099
281.530.5656

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October 31, 2018

Analytical Report for Service Request No: K1810155

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

RE: ALS Houston DOD TOC

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 17, 2018
For your reference, these analyses have been assigned our service request number **K1810155.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

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Acronyms

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

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Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

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

Service Request: K1810155
Date Received: 10/17/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

Two ground water samples were received for analysis at ALS Environmental on 10/17/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

Method SM 5310 C, 10/30/2018:The Relative Percent Difference (RPD) criterion for the replicate analysis of Total Organic Carbon in sample 16WW29-181015 was not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

Approved by Kelley Lovejoy Date 10/31/2018

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Chain of Custody

ALS Environmental—Kelso Laboratory
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K1810155

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Subcontract Chain of Custody

COC ID: 10025

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18100823
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18100823-09**	**16WW29-181015**	**Groundwater**	**15 Oct 2018 09:30**
	TOC Analysis with DOD Level IV			30 Oct 2018
2.	**HS18100823-10**	**16WW55-181015**	**Groundwater**	**15 Oct 2018 10:30**
	TOC Analysis with DOD Level IV			30 Oct 2018

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: Patty Maines Date/Time: 10-16-18 18:00

Received By: Dana Russell Date/Time: 10-17-18 0950

Cooler ID(s): Temperature(s):

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PC KL

Cooler Receipt and Preservation Form

Client ALS - Houston Service Request K18 10155

Received: 10-17-18 Opened: 10-17-18 By: JSP Unloaded: 10-17-18 By: JSP

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.0	-0.2	1.7	1.5	-0.2	371	10075	4380 4533 6265	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

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www.alsglobal.com

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1810155
Project:	ALS Houston DOD TOC	**Date Collected:**	10/15/18
Sample Matrix:	Ground Water	**Date Received:**	10/17/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW29-181015	K1810155-001	**1.80**	0.50	0.20	0.07	1	10/30/18 15:36	
16WW55-181015	K1810155-002	**7.32**	0.50	0.20	0.07	1	10/30/18 16:57	
Method Blank	K1810155-MB	ND U	0.50	0.20	0.07	1	10/30/18 11:21	

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1810155
Project	ALS Houston DOD TOC	**Date Collected:**	10/15/18
Sample Matrix:	Ground Water	**Date Received:**	10/17/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	LOQ	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16WW29-181015	K1810155-001DUP	0.50	0.20	0.07	1.80	1.51	1.66	17 *	10	10/30/18
16WW55-181015	K1810155-002DUP	0.50	0.20	0.07	7.32	6.82	7.07	7	10	10/30/18

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

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

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

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Client:	ALS Environmental - US	**Service Request:**	K1810155
Project:	ALS Houston DOD TOC	**Date Collected:**	10/15/18
Sample Matrix:	Ground Water	**Date Received:**	10/17/18
		Date Analyzed:	10/30/18
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW29-181015	**Units:**	mg/L
Lab Code:	K1810155-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1810155-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.80	28.3	25.0	106	83-117

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

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

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

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Client:	ALS Environmental - US	**Service Request:**	K1810155
Project:	ALS Houston DOD TOC	**Date Analyzed:**	10/30/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	613206

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1810155-LCS	19.8	21.9	91	83-117

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Client: ALS Environmental - US **Service Request:** K1810155
Project: ALS Houston DOD TOC

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	613206	KQ1815864-36	10/30/18 04:57	25.0	25.2	101	90-110
CCV2	613206	KQ1815864-37	10/30/18 10:48	25.0	24.7	99	90-110
CCV3	613206	KQ1815864-38	10/30/18 16:24	25.0	24.4	98	90-110
CCV4	613206	KQ1815864-39	10/30/18 22:45	25.0	24.8	99	90-110
CCV5	613206	KQ1815864-40	10/31/18 03:19	25.0	24.9	99	90-110
CCV6	613206	KQ1815864-41	10/31/18 09:08	25.0	24.6	98	90-110

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Client: ALS Environmental - US **Service Request:**K1810155
Project: ALS Houston DOD TOC

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	613206	KQ1815864-42	10/30/18 05:14	0.50	0.20	0.07	ND	U
CCB2	613206	KQ1815864-43	10/30/18 11:04	0.50	0.20	0.07	ND	U
CCB3	613206	KQ1815864-44	10/30/18 16:40	0.50	0.20	0.07	ND	U
CCB4	613206	KQ1815864-45	10/30/18 23:01	0.50	0.20	0.07	ND	U
CCB5	613206	KQ1815864-46	10/31/18 03:35	0.50	0.20	0.07	ND	U
CCB6	613206	KQ1815864-47	10/31/18 09:25	0.50	0.20	0.07	ND	U

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1828987; 1828988; 1828989; 1829115

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2159 (225647)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1829115002 was analyzed and reported from a 1:10 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 624449) was less than 1/2 the CRDL. The recovery for the LCS (624450) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1828988002/03 and 1828989005/06 (Client ID's: 16WW32-181011/16WW40-181012). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The Matrix Spike duplicate (MSD - 1828989006) failed QC acceptance criteria for percent recovery, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent differences (RPD's) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1

Thomas Bosch October 25, 2018
Analyst Date

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ANALYTICAL REPORT

Report Date: October 29, 2018

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1829115**
Project ID: HS18100823
Purchase Order: HS18100823
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16WW29-181015	1829115001	10/15/18	10/17/18	
16WW55-181015	1829115002	10/15/18	10/17/18	

ANALYTICAL REPORT

Workorder: 34-1829115
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW29-181015** | Sampling Site: NA | Collected: 10/15/2018
Lab ID: 1829115001 | Media: 125 mL Nalgene | Received: 10/17/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 14:37 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW55-181015** | Sampling Site: NA | Collected: 10/15/2018
Lab ID: 1829115002 | Media: 125 mL Nalgene | Received: 10/17/2018
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2159 (HBN: 225647) | **Percent Solid:** NA
Analyzed: 10/24/2018 14:51 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**400**	10	20	40	10	

Comments

Workorder: 1829115

Field sample 1829115002 was analyzed and reported from a 1:10 dilution. The reporting limit has been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/25/2018 14:54	/S/ Stephen Brose 10/29/2018 08:45

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1829115
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body	Certificate Number	Website
Environmental	PJLA (DoD ELAP)		
	Utah (TNI)		
	Nevada		
	Oklahoma		
	Iowa		

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1829115

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2159 (HBN: 225647)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 624449
Analyzed: 10/24/2018 08:55
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 624450
Analyzed: 10/24/2018 09:09
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.90	5.00	97.9	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1828988001	**MS:**	1828988002			**MSD:**	1828988003				
Analyzed:	10/24/2018 09:40	**Analyzed:**	10/24/2018 09:54			**Analyzed:**	10/24/2018 10:08				
Dilution:	1	**Dilution:**	1			**Dilution:**	1				
Units:	ug/L	**Units:**	ug/L			**Units:**	ug/L				

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.75	5	94.9	78.8	123.8	4.67	93.3	1.7	0.0	20.0

Sample:	1828989004	**MS:**	1828989005			**MSD:**	1828989006				
Analyzed:	10/24/2018 11:47	**Analyzed:**	10/24/2018 12:29			**Analyzed:**	10/24/2018 12:43				
Dilution:	1	**Dilution:**	1			**Dilution:**	1				
Units:	ug/L	**Units:**	ug/L			**Units:**	ug/L				

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.4	5	108	78.8	123.8	6.26	# 125	14.7	0.0	20.0

Continuing Calibration Verification

CCV:	624446	**CCV:**	624451			**CCV:**	624453		
Analyzed:	10/24/2018 08:12	**Analyzed:**	10/24/2018 12:01			**Analyzed:**	10/24/2018 15:06		
Units:	ug/L	**Units:**	ug/L			**Units:**	ug/L		
Criteria:	± 15%	**Criteria:**	± 15%			**Criteria:**	± 15%		

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	24.4	25.0	97.6	23.5	25.0	94.0	23.5	25.0	94.2

Interference Check Sample

ICSA: 624448
Analyzed: 10/24/2018 08:41
Units: ug/L
Criteria: ± 30%

Analyte	Result	Target	% Rec.
Perchlorate	0.985	1.00	98.5

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Quality Control Sample
Batch Report

Analysis Information

Workorder: 1829115

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2159 (HBN: 225647)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Limit of Detection Verification

LODV:	624447			**LODV:**	624452			**LODV:**	624454		
Analyzed:	10/24/2018 08:27			**Analyzed:**	10/24/2018 12:15			**Analyzed:**	10/24/2018 15:20		
Units:	ug/L			**Units:**	ug/L			**Units:**	ug/L		
Criteria:	± 50%			**Criteria:**	± 50%			**Criteria:**	± 50%		
Analyte	**Result**	**Target**	**% Rec.**	**Result**	**Target**	**% Rec.**		**Result**	**Target**	**% Rec.**
Perchlorate	1.03	1.00	103	0.970	1.00	97.0		1.02	1.00	102

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
10/25/2018 14:54	10/29/2018 08:45

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◓ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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18698/#2

W 1829115

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

Subcontract Chain of Custody

COC ID: 10026

1829115

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18100823
TSR:	Sonia West

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS18100823-09**	**16WW29-181015**	**Groundwater**	**15 Oct 2018 09:30**
	SUB_Perch-6850			30 Oct 2018
2.	**HS18100823-10**	**16WW55-181015**	**Groundwater**	**15 Oct 2018 10:30**
	SUB_Perch-6850			30 Oct 2018

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:	Pall Maines	Date/Time:	10-16-18 18:00
Received By:	[signature]	Date/Time:	10/17/18/ 905
Cooler ID(s):	8835	Temperature(s):	3°

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18100823	***Split:***	**Workorder ID:** 1829115	**Level:** ENV_LVL4	**Requested Analysis**	
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly		
Comments:			**Preservatives**		
			COOL		
			Containers		

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	EPA 6850, DoD QSM
1	10/15/2018 09:30	16WW29-181015	1829115001		Water	A	1	A
2	10/15/2018 10:30	16WW55-181015	1829115002		Water	A	1	A
3								
4								
5								
6								
7								
8								
9								
10								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	10/17/2018 09:05	ALS Sample Receiving	Sample Login
Julie Worcott	10/17/18 1310	3C	storage
R.33.1	10/23.18/14:10	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 182915

Date/Time of Receipt: 10/17/18 9:05

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C18 8835	3 °C	4	C18	°C	7	C18	°C
2	C18	°C	5	C18	°C	8	C18	°C
3	C18	°C	6	C18	°C	9	C18	°C

Taken By: Meredith Edens (Signature) Meredith E. Edens (Printed Name) 10/17/18 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018

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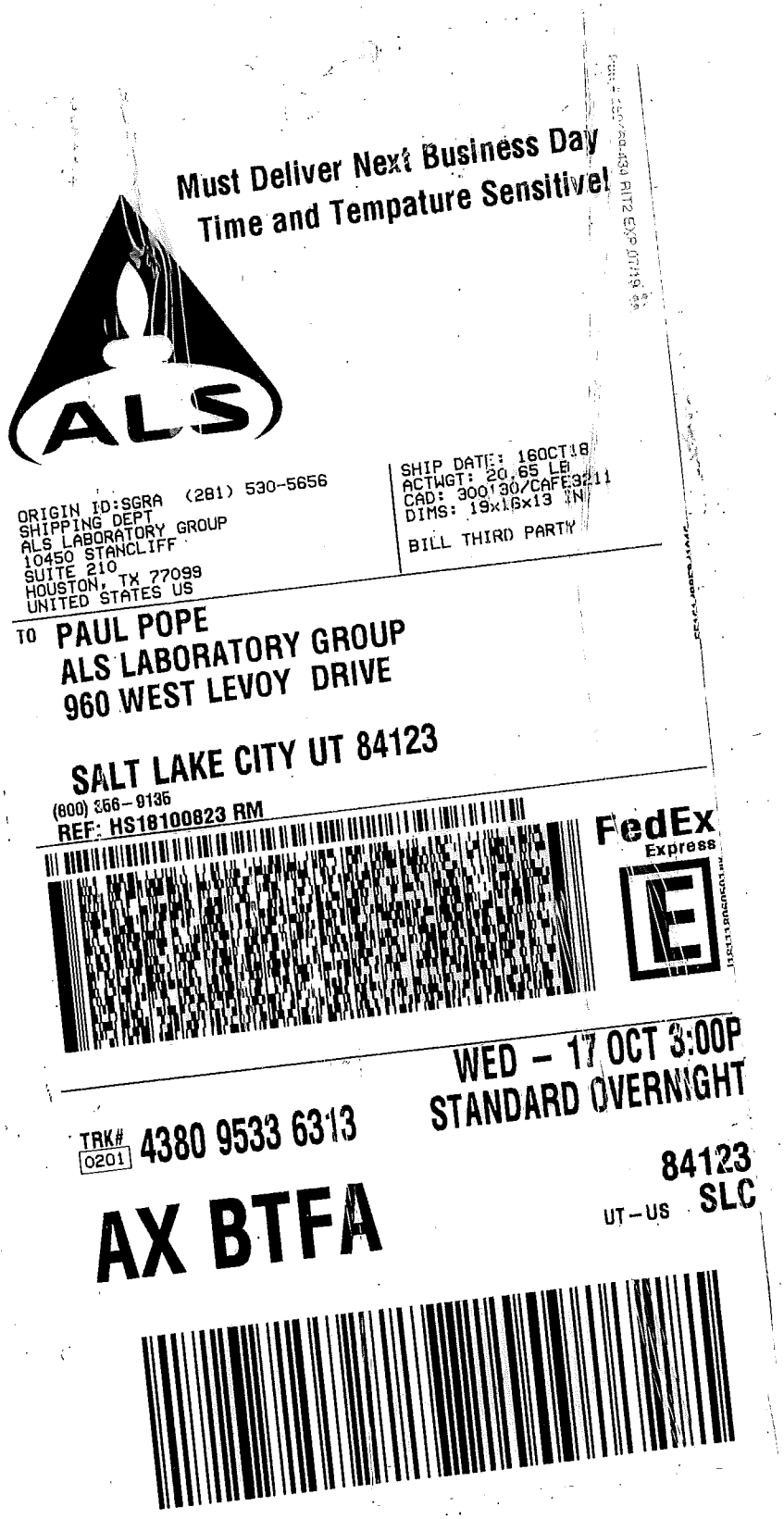

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Batch Worklist

Batch: ELMS/ 2159 **Created:** 10/23/2018 18:03 **Instrument:** **HBN:** 225647

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1828987 [ENV_LVL4]
Workorder: 1828988 [ENV_LVL4]
Workorder: 1828989 [ENV_LVL4]
Workorder: 1829115 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	624446	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
2	624447	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	
3	624448	ICS for HBN 225647 [ELMS/2159]				ICS	3		E6850..D3Q	5311		10/29/2018	
4	624449	LMB for HBN 225647 [ELMS/2159]				LMB	3		E6850Q413Q	5311		10/29/2018	
5	624450	LCS for HBN 225647 [ELMS/2159]				LCS	3		E6850Q413Q	5311		10/29/2018	
6	1828987001	16WW32-181011				SAMPLE	3	1828987001-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
7	1828988001	16SW01-181011				SAMPLE	3	1828988001-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
8	1828988002	16SW01-181011MS				MS	3	1828988002-A	E6850Q413Q	5480		10/29/2018	
9	1828988003	16SW01-181011MSD				MSD	3	1828988003-A	E6850Q413Q	5480		10/29/2018	
10	1828988004	16SW01-181011-FD				FLDDUP	3	1828988004-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
11	1828988005	16SW02-181011				SAMPLE	3	1828988005-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
12	1828988006	16SW03-181011				SAMPLE	3	1828988006-A	E6850Q41.3	5480	11/8/2018	10/29/2018	
13	1828989001	16WW30-181012				SAMPLE	3	1828989001-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
14	1828989002	16WW46-181012				SAMPLE	3	1828989002-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
15	1828989003	16WW23-181012				SAMPLE	3	1828989003-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
16	1828989004	16WW40-181012				SAMPLE	3	1828989004-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
17	624451	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
18	624452	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	
19	1828989005	16WW40-181012MS				MS	3	1828989005-A	E6850Q413Q	5480		10/29/2018	
20	1828989006	16WW40-181012MSD				MSD	3	1828989006-A	E6850Q413Q	5480		10/29/2018	
21	1828989007	16WW40-181012-FD				FLDDUP	3	1828989007-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
22	1828989008	16WW27-181012				SAMPLE	3	1828989008-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
23	1828989009	16WW12-181012				SAMPLE	3	1828989009-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
24	1828989010	16WW42-181012				SAMPLE	3	1828989010-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
25	1828989011	16WW13-181012				SAMPLE	3	1828989011-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
26	1828989012	16WW21-181012				SAMPLE	3	1828989012-A	E6850Q41.3	5480	11/9/2018	10/29/2018	

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Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
27	1828989013	16EB01-181012				EQBK	3	1828989013-A	E6850Q41.3	5480	11/9/2018	10/29/2018	
28	1829115001	16WW29-181015				SAMPLE	3	1829115001-A	E6850Q41.3	5480	11/12/2018	10/30/2018	
29	1829115002	16WW55-181015				SAMPLE	3	1829115002-A	E6850Q41.3	5480	11/12/2018	10/30/2018	
30	624453	CCV for HBN 225647 [ELMS/2159]				CCV	3		E685041C3Q	5311		10/29/2018	
31	624454	LODV for HBN 225647 [ELMS/2159				LODV	3		E6850..D3Q	5311		10/29/2018	

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Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1828987 (001); 1828988 (001-06); 1828989 (001-13); 1829115 (001,02)
ELMS Batch/HBN ID: 2159 (225647)
Prep Date: 10/23/2018 Analysis Date: 10/24/2018 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\OCT\24OCT18D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 10/08/2018, sequence 08OCT18D.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 2 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.80
5.0	0.80
5.3	0.25
10.0	0.25
10.5	0.80
12.5	0.80

QC DATA: 5.0µL of QC Solution Horizon ID 41830 was used for LCS 624450; Target = 5.0µg/L. ASTM type II water was used for LMB 624449.

MS/MSD: MS/MSD was performed on samples 1828988002/03 and 1828989005/06 (Client ID's: 16WW32-181011/16WW40-181012). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field sample 1829115002 was analyzed and reported from a 1:10 dilution. The reporting limit has been adjusted accordingly. Samples 1828989004/07 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The Matrix Spike duplicate (MSD - 1828989006) failed QC acceptance criteria for percent recovery, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2018\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\225647-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS 2159 HBN 225647 Sample Set IDs if Applicable: 18-28987/18289888/18289889/18291115	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

TB. 10.26.18
SB 10/29/18

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Working Standard - CLO4 WRK

CLO4 WRK — **Description - 6850 WKG Std 100.ug/L**

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** No
Part ID: IC-PER-10X-1		**Lab Lot:** CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 09/20/2018 09:09AM	**Expires:** 04/28/2026
MFG Lot: SDFF-012A	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL
ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

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125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safely information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

Not Standard

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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March 26, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18101079**

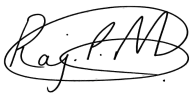
Laboratory Results for: **LHAAP 16**

Dear Susan,

ALS Environmental received 2 sample(s) on Oct 19, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Work Order: HS18101079

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18101079-01	16TB07-101018	Water	VBLKW 092618-47	18-Oct-2018 11:30	19-Oct-2018 08:50	☐
HS18101079-02	16WW48-181018	Groundwater		18-Oct-2018 12:40	19-Oct-2018 08:50	☐

Revision:1

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Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP 16
Work Order: HS18101079

Work Order Comments

- Revised to update the VOC list
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.
- The analysis for TOC was subcontracted to ALS Kelso WA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R326129

Sample ID: HS18101079-02DUP

- Duplicate RPD was below the control limits.

GCMS Volatiles by Method SW8260

Batch ID: R325941

Sample ID: CCV

- Bromomethane exceeded %D limits on CCV. Samples ND.

Sample ID: HS18101139-07MS

- MS and MSD are for an unrelated sample.

Batch ID: R326114

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

WetChemistry by Method SM2320B

Batch ID: R325855

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

WetChemistry by Method SW9056

Batch ID: R325867

Sample ID: HS18101069-01MS

- MS and MSD are for an unrelated sample (Bromide)

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Sample ID: 16TB07-101018
Collection Date: 18-Oct-2018 11:30

ANALYTICAL REPORT
WorkOrder:HS18101079
Lab ID:HS18101079-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C	**Method:SW8260**							Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Oct-2018 01:06
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 01:06
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 01:06
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 01:06
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	23-Oct-2018 01:06
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 01:06
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Oct-2018 01:06
Surr: 1,2-Dichloroethane-d4	*93.5*			**0**	*70-126*	*%REC*	*1*	*23-Oct-2018 01:06*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*81-113*	*%REC*	*1*	*23-Oct-2018 01:06*
Surr: Dibromofluoromethane	*96.4*			**0**	*77-123*	*%REC*	*1*	*23-Oct-2018 01:06*
Surr: Toluene-d8	*93.3*			**0**	*82-127*	*%REC*	*1*	*23-Oct-2018 01:06*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
Sample ID: 16WW48-181018
Collection Date: 18-Oct-2018 12:40

ANALYTICAL REPORT
WorkOrder:HS18101079
Lab ID:HS18101079-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**						Analyst: AKP
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Oct-2018 04:52
1,1-Dichloroethene	**11**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Oct-2018 04:52
1,2-Dichloroethane	**12**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Oct-2018 04:52
cis-1,2-Dichloroethene	**2,600**		**20**	**50**	**100**	**ug/L**	100	24-Oct-2018 22:27
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	23-Oct-2018 04:52
Trichloroethene	**8,800**		**20**	**50**	**100**	**ug/L**	100	24-Oct-2018 22:27
Vinyl chloride	**15**		**0.20**	**0.50**	**1.0**	**ug/L**	1	23-Oct-2018 04:52
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*70-126*	*%REC*	*1*	*23-Oct-2018 04:52*
Surr: 1,2-Dichloroethane-d4	*91.7*			**0**	*70-126*	*%REC*	*100*	*24-Oct-2018 22:27*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*81-113*	*%REC*	*1*	*23-Oct-2018 04:52*
Surr: 4-Bromofluorobenzene	*98.4*			**0**	*81-113*	*%REC*	*100*	*24-Oct-2018 22:27*
Surr: Dibromofluoromethane	*97.6*			**0**	*77-123*	*%REC*	*1*	*23-Oct-2018 04:52*
Surr: Dibromofluoromethane	*96.2*			**0**	*77-123*	*%REC*	*100*	*24-Oct-2018 22:27*
Surr: Toluene-d8	*90.8*			**0**	*82-127*	*%REC*	*1*	*23-Oct-2018 04:52*
Surr: Toluene-d8	*92.1*			**0**	*82-127*	*%REC*	*100*	*24-Oct-2018 22:27*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000174**	J	**0.000144**	**0.00100**	**0.00100**	**mg/L**	1	25-Oct-2018 12:05
Ethene	**0.00219**		**0.000234**	**0.00100**	**0.00100**	**mg/L**	1	25-Oct-2018 12:05
Methane	**0.00221**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	25-Oct-2018 12:05
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJA
Alkalinity, Total (As CaCO3)	**259**		**5.00**	**5.00**	**5.00**	**mg/L**	1	20-Oct-2018 18:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.33**		**0.0600**	**0.200**	**0.200**	**mg/L**	2	19-Oct-2018 20:15
Chloride	**1,090**		**10.0**	**25.0**	**25.0**	**mg/L**	50	19-Oct-2018 20:29
Fluoride	**0.181**	J	**0.100**	**0.200**	**0.200**	**mg/L**	2	19-Oct-2018 20:15
Nitrogen, Nitrate (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	19-Oct-2018 20:15
Nitrogen, Nitrite (As N)	0.200	U	0.0600	0.200	0.200	mg/L	2	19-Oct-2018 20:15
Sulfate	**1,770**		**10.0**	**25.0**	**25.0**	**mg/L**	50	19-Oct-2018 20:29
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Nov-2018 14:57
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	**See Attached**		**0**	**0**	**0**		1	01-Nov-2018 11:28

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R325855 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Groundwater	
HS18101079-02	16WW48-181018	18 Oct 2018 12:40			20 Oct 2018 18:16	1
Batch ID: R325867 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS18101079-02	16WW48-181018	18 Oct 2018 12:40			19 Oct 2018 20:29	50
HS18101079-02	16WW48-181018	18 Oct 2018 12:40			19 Oct 2018 20:15	2
Batch ID: R325941 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Groundwater	
HS18101079-02	16WW48-181018	18 Oct 2018 12:40			23 Oct 2018 04:52	1
Batch ID: R325941 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS18101079-01	16TB07-101018	18 Oct 2018 11:30			23 Oct 2018 01:06	1
Batch ID: R326114 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Groundwater	
HS18101079-02	16WW48-181018	18 Oct 2018 12:40			24 Oct 2018 22:27	100
Batch ID: R326129 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS18101079-02	16WW48-181018	18 Oct 2018 12:40			25 Oct 2018 12:05	1
Batch ID: R326589 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS18101079-02	16WW48-181018	18 Oct 2018 12:40			01 Nov 2018 11:28	1
Batch ID: R326624 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS18101079-02	16WW48-181018	18 Oct 2018 12:40			01 Nov 2018 14:57	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R326129 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-181025** Units: **mg/L** Analysis Date: **25-Oct-2018 11:51**
Client ID: Run ID: **FID-4_326129** SeqNo: **4792632** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00100	0.00100								U
Ethene	0.00100	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-181025** Units: **mg/L** Analysis Date: **25-Oct-2018 11:11**
Client ID: Run ID: **FID-4_326129** SeqNo: **4792630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0143	0.00100	0.01804	0	79.4	75 - 125				
Ethene	0.0159	0.00100	0.0168	0	94.9	75 - 125				
Methane	0.00831	0.000500	0.009647	0	86.1	75 - 125				

LCSD Sample ID: **LCSD-181025** Units: **mg/L** Analysis Date: **25-Oct-2018 11:22**
Client ID: Run ID: **FID-4_326129** SeqNo: **4792631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0144	0.00100	0.01804	0	79.8	75 - 125	0.01433	0.465	30	
Ethene	0.0133	0.00100	0.0168	0	79.1	75 - 125	0.01593	18.1	30	
Methane	0.00952	0.000500	0.009647	0	98.7	75 - 125	0.008310	13.6	30	

DUP Sample ID: **HS18101079-02DUP** Units: **mg/L** Analysis Date: **25-Oct-2018 12:19**
Client ID: **16WW48-181018** Run ID: **FID-4_326129** SeqNo: **4792634** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.00100	0.00100					0.0001737	0	30	U
Ethene	0.00134	0.00100					0.002189	47.8	30	R
Methane	0.00159	0.000500					0.002213	32.9	30	R

The following samples were analyzed in this batch: HS18101079-02

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:53**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:53**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.3*	*1.0*	*50*	*0*	*92.6*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.52*	*1.0*	*50*	*0*	*99.0*	*82 - 115*				
Surr: Dibromofluoromethane	*49.27*	*1.0*	*50*	*0*	*98.5*	*73 - 126*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MBLK Sample ID: **VBLKW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:53**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785144** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.76*	*1.0*	*50*	*0*	*93.5*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:04**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785142** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.98	1.0	20	0	105	77 - 118				
1,1,1-Trichloroethane	19.64	1.0	20	0	98.2	70 - 130				
1,1,2,2-Tetrachloroethane	17.96	1.0	20	0	89.8	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	20.99	1.0	20	0	105	70 - 130				
1,1,2-Trichloroethane	20.41	1.0	20	0	102	77 - 113				
1,1-Dichloroethane	20.53	1.0	20	0	103	71 - 122				
1,1-Dichloroethene	20.06	1.0	20	0	100	70 - 130				
1,1-Dichloropropene	22.5	1.0	20	0	112	78 - 118				
1,2,3-Trichlorobenzene	17.77	1.0	20	0	88.9	70 - 130				
1,2,3-Trichloropropane	17.7	1.0	20	0	88.5	70 - 127				
1,2,4-Trichlorobenzene	18.89	1.0	20	0	94.4	77 - 126				
1,2,4-Trimethylbenzene	21.53	1.0	20	0	108	73 - 121				
1,2-Dibromo-3-chloropropane	16.42	1.0	20	0	82.1	70 - 130				
1,2-Dibromoethane	20.99	1.0	20	0	105	76 - 123				
1,2-Dichlorobenzene	19.8	1.0	20	0	99.0	77 - 113				
1,2-Dichloroethane	22.4	1.0	20	0	112	70 - 124				
1,2-Dichloropropane	21.68	1.0	20	0	108	72 - 119				
1,3,5-Trimethylbenzene	19.63	1.0	20	0	98.1	75 - 118				
1,3-Dichlorobenzene	20.39	1.0	20	0	102	78 - 118				
1,3-Dichloropropane	20.76	1.0	20	0	104	75 - 116				
1,4-Dichlorobenzene	20.48	1.0	20	0	102	79 - 113				
2,2-Dichloropropane	21.26	1.0	20	0	106	70 - 130				
2-Butanone	37.26	2.0	40	0	93.1	70 - 130				
2-Chlorotoluene	21.74	1.0	20	0	109	70 - 128				
2-Hexanone	37.73	2.0	40	0	94.3	70 - 130				
4-Chlorotoluene	22.05	1.0	20	0	110	74 - 126				
4-Isopropyltoluene	18.57	1.0	20	0	92.9	74 - 126				
4-Methyl-2-pentanone	38.58	2.0	40	0	96.4	70 - 130				
Acetone	35.79	2.0	40	0	89.5	70 - 130				
Benzene	20.87	1.0	20	0	104	74 - 120				
Bromobenzene	20.17	1.0	20	0	101	78 - 113				
Bromochloromethane	21.03	1.0	20	0	105	76 - 124				
Bromodichloromethane	21.68	1.0	20	0	108	74 - 122				
Bromoform	20.1	1.0	20	0	100	73 - 128				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:04**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785142** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	24.27	1.0	20	0	121	70 - 130				
Carbon disulfide	39	2.0	40	0	97.5	70 - 130				
Carbon tetrachloride	21.91	1.0	20	0	110	71 - 125				
Chlorobenzene	21.19	1.0	20	0	106	76 - 113				
Chloroethane	20.22	1.0	20	0	101	70 - 130				
Chloroform	19.9	1.0	20	0	99.5	71 - 121				
Chloromethane	17.84	1.0	20	0	89.2	70 - 129				
cis-1,2-Dichloroethene	20.75	1.0	20	0	104	75 - 122				
cis-1,3-Dichloropropene	22.35	1.0	20	0	112	73 - 127				
Dibromochloromethane	20.66	1.0	20	0	103	77 - 122				
Dibromomethane	21.73	1.0	20	0	109	78 - 121				
Dichlorodifluoromethane	14.06	1.0	20	0	70.3	70 - 130				
Ethylbenzene	22.66	1.0	20	0	113	77 - 117				
Hexachlorobutadiene	19.74	1.0	20	0	98.7	70 - 130				
Isopropylbenzene	20.29	1.0	20	0	101	73 - 127				
m,p-Xylene	45.44	2.0	40	0	114	77 - 122				
Methylene chloride	20.98	2.0	20	0	105	70 - 127				
Naphthalene	15.92	1.0	20	0	79.6	70 - 130				
n-Butylbenzene	20.72	1.0	20	0	104	72 - 130				
n-Propylbenzene	22.1	1.0	20	0	111	73 - 124				
o-Xylene	22.51	1.0	20	0	113	75 - 119				
sec-Butylbenzene	19.08	1.0	20	0	95.4	73 - 128				
Styrene	21.44	1.0	20	0	107	72 - 126				
tert-Butylbenzene	21.37	1.0	20	0	107	73 - 124				
Tetrachloroethene	20.51	1.0	20	0	103	76 - 119				
Toluene	20.48	1.0	20	0	102	77 - 118				
trans-1,2-Dichloroethene	21.45	1.0	20	0	107	72 - 127				
trans-1,3-Dichloropropene	22.37	1.0	20	0	112	77 - 119				
Trichloroethene	20.69	1.0	20	0	103	77 - 121				
Trichlorofluoromethane	20.23	1.0	20	0	101	70 - 130				
Vinyl chloride	19.59	1.0	20	0	98.0	70 - 130				
Surr: 1,2-Dichloroethane-d4	*48.23*	*1.0*	*50*	*0*	*96.5*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*50.84*	*1.0*	*50*	*0*	*102*	*82 - 115*				
Surr: Dibromofluoromethane	*47.26*	*1.0*	*50*	*0*	*94.5*	*73 - 126*				

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

LCS Sample ID: **VLCSW-181022** Units: **ug/L** Analysis Date: **22-Oct-2018 23:04**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785142** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*45.21*	*1.0*	*50*	*0*	*90.4*	*81 - 120*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18101139-07MS** Units: **ug/L** Analysis Date: **23-Oct-2018 03:38**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.41	1.0	20	0	97.0	70 - 120				
1,1,1-Trichloroethane	19.4	1.0	20	0	97.0	70 - 130				
1,1,2,2-Tetrachloroethane	17.37	1.0	20	0	86.9	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.03	1.0	20	0	110	70 - 130				
1,1,2-Trichloroethane	19.17	1.0	20	0	95.9	70 - 117				
1,1-Dichloroethane	19.29	1.0	20	0	96.5	70 - 127				
1,1-Dichloroethene	19.68	1.0	20	0	98.4	70 - 130				
1,1-Dichloropropene	21.95	1.0	20	0	110	70 - 129				
1,2,3-Trichlorobenzene	16.44	1.0	20	0	82.2	70 - 130				
1,2,3-Trichloropropane	17.16	1.0	20	0	85.8	70 - 130				
1,2,4-Trichlorobenzene	17.6	1.0	20	0	88.0	70 - 125				
1,2,4-Trimethylbenzene	61.55	1.0	20	43.59	89.8	70 - 125				
1,2-Dibromo-3-chloropropane	16.6	1.0	20	0	83.0	70 - 130				
1,2-Dibromoethane	19.67	1.0	20	0	98.3	70 - 124				
1,2-Dichlorobenzene	18.3	1.0	20	0	91.5	70 - 115				
1,2-Dichloroethane	20.17	1.0	20	0	101	70 - 127				
1,2-Dichloropropane	20.54	1.0	20	0	103	70 - 122				
1,3,5-Trimethylbenzene	30.62	1.0	20	12.44	90.9	70 - 126				
1,3-Dichlorobenzene	18.83	1.0	20	0	94.1	70 - 119				
1,3-Dichloropropane	19.02	1.0	20	0	95.1	70 - 121				
1,4-Dichlorobenzene	18.72	1.0	20	0	93.6	70 - 114				
2,2-Dichloropropane	20.55	1.0	20	0	103	70 - 130				
2-Butanone	38.86	2.0	40	0	97.1	70 - 130				
2-Chlorotoluene	23.52	1.0	20	0	118	70 - 130				
2-Hexanone	38.24	2.0	40	0	95.6	70 - 130				
4-Chlorotoluene	21.57	1.0	20	0	108	70 - 130				
4-Isopropyltoluene	18.47	1.0	20	0	92.3	70 - 130				
4-Methyl-2-pentanone	38.16	2.0	40	0	95.4	70 - 130				
Acetone	38.75	2.0	40	0	96.9	70 - 130				
Benzene	181	1.0	20	166.5	72.4	70 - 127				O
Bromobenzene	18.48	1.0	20	0	92.4	70 - 115				
Bromochloromethane	20.63	1.0	20	0	103	70 - 127				
Bromodichloromethane	20.54	1.0	20	0	103	70 - 124				
Bromoform	18.6	1.0	20	0	93.0	70 - 129				

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS18101139-07MS** Units: **ug/L** Analysis Date: **23-Oct-2018 03:38**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	20.17	1.0	20	0	101	70 - 130				
Carbon disulfide	40.08	2.0	40	0	100	70 - 130				
Carbon tetrachloride	22.3	1.0	20	0	111	70 - 130				
Chlorobenzene	19.87	1.0	20	0	99.4	70 - 114				
Chloroethane	19.12	1.0	20	0	95.6	70 - 130				
Chloroform	19.62	1.0	20	0	98.1	70 - 125				
Chloromethane	15.44	1.0	20	0	77.2	70 - 130				
cis-1,2-Dichloroethene	20.24	1.0	20	0	101	70 - 128				
cis-1,3-Dichloropropene	20.64	1.0	20	0	103	70 - 125				
Dibromochloromethane	19.47	1.0	20	0	97.3	70 - 124				
Dibromomethane	20.21	1.0	20	0	101	70 - 124				
Dichlorodifluoromethane	14.4	1.0	20	0	72.0	70 - 130				
Ethylbenzene	75.37	1.0	20	55.91	97.3	70 - 124				
Hexachlorobutadiene	17.18	1.0	20	0	85.9	70 - 130				
Isopropylbenzene	25.53	1.0	20	6.06	97.3	70 - 130				
m,p-Xylene	248.5	2.0	40	210.2	95.9	70 - 130				O
Methylene chloride	18.9	2.0	20	0	94.5	70 - 128				
Naphthalene	26.9	1.0	20	5.256	108	70 - 130				
n-Butylbenzene	20.25	1.0	20	0	101	70 - 130				
n-Propylbenzene	26.25	1.0	20	2.169	120	70 - 130				
o-Xylene	123.6	1.0	20	102.9	104	70 - 124				O
sec-Butylbenzene	18.85	1.0	20	0.6856	90.8	70 - 130				
Styrene	21.79	1.0	20	0	109	70 - 130				
tert-Butylbenzene	20.62	1.0	20	0	103	70 - 130				
Tetrachloroethene	19.94	1.0	20	0	99.7	70 - 130				
Toluene	21.22	1.0	20	1.768	97.3	70 - 123				
trans-1,2-Dichloroethene	20.6	1.0	20	0	103	70 - 130				
trans-1,3-Dichloropropene	20.59	1.0	20	0	103	70 - 121				
Trichloroethene	26.83	1.0	20	0	134	70 - 129				S
Trichlorofluoromethane	20.86	1.0	20	0	104	70 - 130				
Vinyl chloride	19.93	1.0	20	0	99.7	70 - 130				
Surr: 1,2-Dichloroethane-d4	*50.27*	*1.0*	*50*	*0*	*101*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.87*	*1.0*	*50*	*0*	*102*	*81 - 113*				
Surr: Dibromofluoromethane	*47.55*	*1.0*	*50*	*0*	*95.1*	*77 - 123*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument:** VOA2 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS18101139-07MS** Units: **ug/L** Analysis Date: **23-Oct-2018 03:38**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785151** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.73*	*1.0*	*50*	*0*	*89.5*	*82 - 127*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18101139-07MSD** Units: **ug/L** Analysis Date: **23-Oct-2018 04:03**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.51	1.0	20	0	97.6	70 - 120	19.41	0.545	20	
1,1,1-Trichloroethane	18.79	1.0	20	0	94.0	70 - 130	19.4	3.19	20	
1,1,2,2-Tetrachloroethane	17.04	1.0	20	0	85.2	70 - 123	17.37	1.92	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	21.24	1.0	20	0	106	70 - 130	22.03	3.67	20	
1,1,2-Trichloroethane	19.25	1.0	20	0	96.2	70 - 117	19.17	0.375	20	
1,1-Dichloroethane	19.05	1.0	20	0	95.3	70 - 127	19.29	1.27	20	
1,1-Dichloroethene	18.7	1.0	20	0	93.5	70 - 130	19.68	5.12	20	
1,1-Dichloropropene	21.31	1.0	20	0	107	70 - 129	21.95	2.97	20	
1,2,3-Trichlorobenzene	17.51	1.0	20	0	87.6	70 - 130	16.44	6.3	20	
1,2,3-Trichloropropane	16.89	1.0	20	0	84.4	70 - 130	17.16	1.61	20	
1,2,4-Trichlorobenzene	18.72	1.0	20	0	93.6	70 - 125	17.6	6.18	20	
1,2,4-Trimethylbenzene	61.24	1.0	20	43.59	88.2	70 - 125	61.55	0.505	20	
1,2-Dibromo-3-chloropropane	15.91	1.0	20	0	79.5	70 - 130	16.6	4.27	20	
1,2-Dibromoethane	20.02	1.0	20	0	100	70 - 124	19.67	1.78	20	
1,2-Dichlorobenzene	18.41	1.0	20	0	92.1	70 - 115	18.3	0.633	20	
1,2-Dichloroethane	20	1.0	20	0	100.0	70 - 127	20.17	0.868	20	
1,2-Dichloropropane	0.5000	1.0	20	0	0	70 - 122	20.54	0	20	SU
1,3,5-Trimethylbenzene	29.85	1.0	20	12.44	87.1	70 - 126	30.62	2.53	20	
1,3-Dichlorobenzene	18.95	1.0	20	0	94.7	70 - 119	18.83	0.622	20	
1,3-Dichloropropane	19.72	1.0	20	0	98.6	70 - 121	19.02	3.59	20	
1,4-Dichlorobenzene	18.92	1.0	20	0	94.6	70 - 114	18.72	1.02	20	
2,2-Dichloropropane	19.62	1.0	20	0	98.1	70 - 130	20.55	4.62	20	
2-Butanone	38.43	2.0	40	0	96.1	70 - 130	38.86	1.1	20	
2-Chlorotoluene	23.1	1.0	20	0	116	70 - 130	23.52	1.78	20	
2-Hexanone	38.81	2.0	40	0	97.0	70 - 130	38.24	1.49	20	
4-Chlorotoluene	21.41	1.0	20	0	107	70 - 130	21.57	0.73	20	
4-Isopropyltoluene	18.2	1.0	20	0	91.0	70 - 130	18.47	1.48	20	
4-Methyl-2-pentanone	37.86	2.0	40	0	94.6	70 - 130	38.16	0.788	20	
Acetone	37.12	2.0	40	0	92.8	70 - 130	38.75	4.29	20	
Benzene	176.2	1.0	20	166.5	48.2	70 - 127	181	2.7	20	SO
Bromobenzene	18.46	1.0	20	0	92.3	70 - 115	18.48	0.0757	20	
Bromochloromethane	20.08	1.0	20	0	100	70 - 127	20.63	2.68	20	
Bromodichloromethane	20.57	1.0	20	0	103	70 - 124	20.54	0.16	20	
Bromoform	18.81	1.0	20	0	94.1	70 - 129	18.6	1.15	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18101139-07MSD** Units: **ug/L** Analysis Date: **23-Oct-2018 04:03**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	20.56	1.0	20	0	103	70 - 130	20.17	1.91	20	
Carbon disulfide	37.77	2.0	40	0	94.4	70 - 130	40.08	5.93	20	
Carbon tetrachloride	20.71	1.0	20	0	104	70 - 130	22.3	7.36	20	
Chlorobenzene	20.38	1.0	20	0	102	70 - 114	19.87	2.51	20	
Chloroethane	20.74	1.0	20	0	104	70 - 130	19.12	8.11	20	
Chloroform	18.96	1.0	20	0	94.8	70 - 125	19.62	3.4	20	
Chloromethane	15.67	1.0	20	0	78.3	70 - 130	15.44	1.47	20	
cis-1,2-Dichloroethene	19.73	1.0	20	0	98.6	70 - 128	20.24	2.57	20	
cis-1,3-Dichloropropene	20.93	1.0	20	0	105	70 - 125	20.64	1.37	20	
Dibromochloromethane	19.42	1.0	20	0	97.1	70 - 124	19.47	0.244	20	
Dibromomethane	20.66	1.0	20	0	103	70 - 124	20.21	2.2	20	
Dichlorodifluoromethane	14.09	1.0	20	0	70.4	70 - 130	14.4	2.23	20	
Ethylbenzene	75.65	1.0	20	55.91	98.7	70 - 124	75.37	0.358	20	
Hexachlorobutadiene	16.59	1.0	20	0	83.0	70 - 130	17.18	3.49	20	
Isopropylbenzene	25.15	1.0	20	6.06	95.5	70 - 130	25.53	1.48	20	
m,p-Xylene	249	2.0	40	210.2	97.1	70 - 130	248.5	0.187	20	O
Methylene chloride	18.53	2.0	20	0	92.7	70 - 128	18.9	1.96	20	
Naphthalene	28.74	1.0	20	5.256	117	70 - 130	26.9	6.61	20	
n-Butylbenzene	19.84	1.0	20	0	99.2	70 - 130	20.25	2	20	
n-Propylbenzene	25.31	1.0	20	2.169	116	70 - 130	26.25	3.62	20	
o-Xylene	123.5	1.0	20	102.9	103	70 - 124	123.6	0.113	20	O
sec-Butylbenzene	18.22	1.0	20	0.6856	87.7	70 - 130	18.85	3.44	20	
Styrene	22.52	1.0	20	0	113	70 - 130	21.79	3.29	20	
tert-Butylbenzene	20.03	1.0	20	0	100	70 - 130	20.62	2.92	20	
Tetrachloroethene	19.39	1.0	20	0	96.9	70 - 130	19.94	2.83	20	
Toluene	21.02	1.0	20	1.768	96.3	70 - 123	21.22	0.942	20	
trans-1,2-Dichloroethene	19.86	1.0	20	0	99.3	70 - 130	20.6	3.63	20	
trans-1,3-Dichloropropene	21.55	1.0	20	0	108	70 - 121	20.59	4.54	20	
Trichloroethene	22.9	1.0	20	0	115	70 - 129	26.83	15.8	20	
Trichlorofluoromethane	19.67	1.0	20	0	98.3	70 - 130	20.86	5.91	20	
Vinyl chloride	18.77	1.0	20	0	93.9	70 - 130	19.93	5.98	20	
Surr: 1,2-Dichloroethane-d4	*47.89*	*1.0*	*50*	*0*	*95.8*	*70 - 126*	*50.27*	*4.85*	*20*	
Surr: 4-Bromofluorobenzene	*52.06*	*1.0*	*50*	*0*	*104*	*81 - 113*	*50.87*	*2.32*	*20*	
Surr: Dibromofluoromethane	*47.8*	*1.0*	*50*	*0*	*95.6*	*77 - 123*	*47.55*	*0.523*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325941 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18101139-07MSD** Units: **ug/L** Analysis Date: **23-Oct-2018 04:03**
Client ID: Run ID: **VOA2_325941** SeqNo: **4785152** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*44.94*	*1.0*	*50*	*0*	*89.9*	*82 - 127*	*44.73*	*0.476*	*20*	

The following samples were analyzed in this batch: HS18101079-01 HS18101079-02

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R326114 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-181024** Units: **ug/L** Analysis Date: **24-Oct-2018 13:35**
Client ID: Run ID: **VOA2_326114** SeqNo: **4788873** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.05*	*1.0*	*50*	*0*	*92.1*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.12*	*1.0*	*50*	*0*	*98.2*	*82 - 115*				
Surr: Dibromofluoromethane	*49.21*	*1.0*	*50*	*0*	*98.4*	*73 - 126*				
Surr: Toluene-d8	*46.29*	*1.0*	*50*	*0*	*92.6*	*81 - 120*				

LCS Sample ID: **VLCSW-181024** Units: **ug/L** Analysis Date: **24-Oct-2018 13:11**
Client ID: Run ID: **VOA2_326114** SeqNo: **4788872** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	21.63	1.0	20	0	108	75 - 122				
Trichloroethene	21.43	1.0	20	0	107	77 - 121				
Surr: 1,2-Dichloroethane-d4	*48.81*	*1.0*	*50*	*0*	*97.6*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*51.4*	*1.0*	*50*	*0*	*103*	*82 - 115*				
Surr: Dibromofluoromethane	*47.62*	*1.0*	*50*	*0*	*95.2*	*73 - 126*				
Surr: Toluene-d8	*44.82*	*1.0*	*50*	*0*	*89.6*	*81 - 120*				

MS Sample ID: **HS18101128-11MS** Units: **ug/L** Analysis Date: **24-Oct-2018 16:51**
Client ID: Run ID: **VOA2_326114** SeqNo: **4788875** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	20.63	1.0	20	0	103	70 - 128				
Trichloroethene	20.51	1.0	20	0	103	70 - 129				
Surr: 1,2-Dichloroethane-d4	*48.17*	*1.0*	*50*	*0*	*96.3*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.06*	*1.0*	*50*	*0*	*102*	*81 - 113*				
Surr: Dibromofluoromethane	*47.56*	*1.0*	*50*	*0*	*95.1*	*77 - 123*				
Surr: Toluene-d8	*45.37*	*1.0*	*50*	*0*	*90.7*	*82 - 127*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R326114 (0) **Instrument: VOA2** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS18101128-11MSD** Units: **ug/L** Analysis Date: **24-Oct-2018 17:15**
Client ID: Run ID: **VOA2_326114** SeqNo: **4788876** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	19.44	1.0	20	0	97.2	70 - 128	20.63	5.96	20	
Trichloroethene	19.47	1.0	20	0	97.4	70 - 129	20.51	5.21	20	
Surr: 1,2-Dichloroethane-d4	*47.79*	*1.0*	*50*	*0*	*95.6*	*70 - 126*	*48.17*	*0.807*	*20*	
Surr: 4-Bromofluorobenzene	*51.74*	*1.0*	*50*	*0*	*103*	*81 - 113*	*51.06*	*1.31*	*20*	
Surr: Dibromofluoromethane	*48.16*	*1.0*	*50*	*0*	*96.3*	*77 - 123*	*47.56*	*1.25*	*20*	
Surr: Toluene-d8	*44.82*	*1.0*	*50*	*0*	*89.6*	*82 - 127*	*45.37*	*1.23*	*20*	

The following samples were analyzed in this batch: HS18101079-02

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325855 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW1-181020** Units: **mg/L** Analysis Date: **20-Oct-2018 17:26**
Client ID: Run ID: **ManTech01_325855** SeqNo: **4782938** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS1-181020** Units: **mg/L** Analysis Date: **20-Oct-2018 17:35**
Client ID: Run ID: **ManTech01_325855** SeqNo: **4782939** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1063	5.00	1000	0	106	85 - 115				

LCSD Sample ID: **WLCSD1-181020** Units: **mg/L** Analysis Date: **20-Oct-2018 17:44**
Client ID: Run ID: **ManTech01_325855** SeqNo: **4782940** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1064	5.00	1000	0	106	85 - 115	1063	0.147	20	

DUP Sample ID: **HS18100985-01DUP** Units: **mg/L** Analysis Date: **20-Oct-2018 18:10**
Client ID: Run ID: **ManTech01_325855** SeqNo: **4782944** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	16.64	5.00					15.2	9.05	20	

The following samples were analyzed in this batch: HS18101079-02

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325867 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-101918** Units: **mg/L** Analysis Date: **19-Oct-2018 14:57**
Client ID: Run ID: **ICS2100_325867** SeqNo: **4783215** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Chloride	0.500	0.500								U
Fluoride	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-101918** Units: **mg/L** Analysis Date: **19-Oct-2018 15:12**
Client ID: Run ID: **ICS2100_325867** SeqNo: **4783216** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.679	0.100	4	0	92.0	80 - 120				
Chloride	20.29	0.500	20	0	101	80 - 120				
Fluoride	4.356	0.100	4	0	109	80 - 120				
Nitrogen, Nitrate (As N)	4.06	0.100	4	0	102	80 - 120				
Nitrogen, Nitrite (As N)	4.223	0.100	4	0	106	80 - 120				
Sulfate	19.81	0.500	20	0	99.1	80 - 120				

LCSD Sample ID: **WLCSDW1-101918** Units: **mg/L** Analysis Date: **19-Oct-2018 15:26**
Client ID: Run ID: **ICS2100_325867** SeqNo: **4783217** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.671	0.100	4	0	91.8	80 - 120	3.679	0.218	20	
Chloride	20.3	0.500	20	0	102	80 - 120	20.29	0.064	20	
Fluoride	4.39	0.100	4	0	110	80 - 120	4.356	0.777	20	
Nitrogen, Nitrate (As N)	4.066	0.100	4	0	102	80 - 120	4.06	0.148	20	
Nitrogen, Nitrite (As N)	4.214	0.100	4	0	105	80 - 120	4.223	0.213	20	
Sulfate	19.84	0.500	20	0	99.2	80 - 120	19.81	0.146	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: HS18101079

QC BATCH REPORT

Batch ID: R325867 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MS Sample ID: **HS18101069-01MS** Units: **mg/L** Analysis Date: **19-Oct-2018 18:06**
Client ID: Run ID: **ICS2100_325867** SeqNo: **4783221** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.801	0.100	2	0.243	77.9	80 - 120				S
Chloride	46.26	0.500	10	36.89	93.6	80 - 120				
Fluoride	2.037	0.100	2	0.058	99.0	80 - 120				
Nitrogen, Nitrate (As N)	3.087	0.100	2	1.149	96.9	80 - 120				
Nitrogen, Nitrite (As N)	1.997	0.100	2	0.058	97.0	80 - 120				
Sulfate	13.24	0.500	10	3.789	94.6	80 - 120				

MSD Sample ID: **HS18101069-01MSD** Units: **mg/L** Analysis Date: **19-Oct-2018 18:21**
Client ID: Run ID: **ICS2100_325867** SeqNo: **4783222** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.849	0.100	2	0.243	80.3	80 - 120	1.801	2.63	20	
Chloride	47.25	0.500	10	36.89	104	80 - 120	46.26	2.12	20	
Fluoride	2.077	0.100	2	0.058	101	80 - 120	2.037	1.94	20	
Nitrogen, Nitrate (As N)	3.173	0.100	2	1.149	101	80 - 120	3.087	2.75	20	
Nitrogen, Nitrite (As N)	2.051	0.100	2	0.058	99.6	80 - 120	1.997	2.67	20	
Sulfate	13.46	0.500	10	3.789	96.7	80 - 120	13.24	1.61	20	

The following samples were analyzed in this batch: HS18101079-02

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 16
WorkOrder: **HS18101079**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

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Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18101079

Date/Time Received: **19-Oct-2018 08:50**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature — 19-Oct-2018 Date

Reviewed by: *RJ Modashia* eSignature — 19-Oct-2018 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.1c/1.8c UC/C	IR25
Cooler(s)/Kit(s):	43603	
Date/Time sample(s) sent to storage:	10/19/2018 14:20	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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APTIM

COC ID:	LHAAP16-OCT2018-GW-ALSHT-181018	TURNAROUND TIME: normal	RUSH:	Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FED EX		

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	VOCs in Water by 8260B	Perchlorate in Water by 6850	Anions in Water by E300.0 & Alkalinity in Water by E2320b	Bromide by E300.0	Dissolved Gases in Water by RSK175	TOC in Water by SW9060				
16TB07-181018	FIELD QC				LIQ	10/18/2018	1130	2		2									
16WW48-181018	16WW48	11.87	11.95	FT	GW	10/18/2018	1240	11		3	1	1	1	3	2				

HS18101079

Aptim Environmental & Infrastucture. Inc.

LHAAP 16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	[illegible] APTIM	10-18-18 1655	PMC 08:50 ALS KS	10/19/18
			cooler # 43603	
			TEMP - 2-1c	IR#25 CF-0.3c

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ALS Laboratory Group
10450 Stancliff Rd. Ste#210
Houston, TX 77099
281.530.5656

CUSTODY SEAL
DATE: 10-18-18
Signature:
LHAAP

CUSTODY SEAL
DATE: 10-18-18
Signature:
LHAAP

ALS Laboratory Group
10450 Stancliff Rd. Ste#210
Houston, TX 77099
281.530.5656

FedEx
TRK# 0221 7376 9751 4863
FRI – 19 OCT 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

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ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
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F : +1 360 636 1068
www.alsglobal.com

November 01, 2018 **Analytical Report for Service Request No:** K1810282

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

RE: HS18101079 / HS18101079

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 20, 2018
For your reference, these analyses have been assigned our service request number **K1810282.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager

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Acronyms

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

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Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS18101079
Sample Matrix: Ground Water

Service Request: K1810282
Date Received: 10/20/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

One ground water sample was received for analysis at ALS Environmental on 10/20/2018. The sample was received in good condition and consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Bourjoy

Date 11/01/2018

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Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
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K1810282

10450 Stancliff Rd, Ste 210
Houston, TX 77099
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Subcontract Chain of Custody

COC ID: 10063

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18101079
TSR:	Sonia West

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. **HS18101079-02**	**16WW48-181018**	**Groundwater**	**18 Oct 2018 12:40**
TOC Analysis with DOD Level IV			29 Oct 2018

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 10/19/18 1800.

Received By: _____ Date/Time: 10-20-18 0900

Cooler ID(s): _____ Temperature(s): _____

PC KL

Cooler Receipt and Preservation Form

Client ALS - Houston Service Request *K18* 10282

Received: 10-20-18 Opened: 10-20-18 By: KSP Unloaded: 10-20-18 By: KSP

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.0	0.1	1.9	2.0	10.1	393	10063	4380 9533 7645	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1810282
Project:	HS18101079/HS18101079	**Date Collected:**	10/18/18
Sample Matrix:	Ground Water	**Date Received:**	10/20/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW48-181018	K1810282-001	**8.78**	0.50	0.20	0.07	1	10/30/18 09:44	
Method Blank	K1810282-MB	ND U	0.50	0.20	0.07	1	10/30/18 11:21	

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1810282
Project	HS18101079/HS18101079	**Date Collected:**	10/18/18
Sample Matrix:	Ground Water	**Date Received:**	10/20/18
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	LOQ	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16WW48-181018	K1810282-001DUP	0.50	0.20	0.07	8.78	8.21	8.50	7	10	10/30/18

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

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

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

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Client:	ALS Environmental - US	**Service Request:**	K1810282
Project:	HS18101079/HS18101079	**Date Collected:**	N/A
Sample Matrix:	Ground Water	**Date Received:**	N/A
		Date Analyzed:	10/30/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Carbon, Total Organic

Sample Name:	Batch QC	**Units:**	mg/L
Lab Code:	K1810023-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		K1810023-001MS			K1810023-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	242	2930	2500	107	2820	2500	103	83-117	4	10

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

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

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

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Client:	ALS Environmental - US	**Service Request:**	K1810282
Project:	HS18101079/HS18101079	**Date Analyzed:**	10/30/18
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	613206

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1810282-LCS	19.8	21.9	91	83-117

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Client: ALS Environmental - US **Service Request:** K1810282
Project: HS18101079/HS18101079

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	613206	KQ1815864-36	10/30/18 04:57	25.0	25.2	101	90-110
CCV2	613206	KQ1815864-37	10/30/18 10:48	25.0	24.7	99	90-110
CCV3	613206	KQ1815864-38	10/30/18 16:24	25.0	24.4	98	90-110
CCV4	613206	KQ1815864-39	10/30/18 22:45	25.0	24.8	99	90-110
CCV5	613206	KQ1815864-40	10/31/18 03:19	25.0	24.9	99	90-110
CCV6	613206	KQ1815864-41	10/31/18 09:08	25.0	24.6	98	90-110

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Client: ALS Environmental - US **Service Request:**K1810282
Project: HS18101079/HS18101079

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	613206	KQ1815864-42	10/30/18 05:14	0.50	0.20	0.07	ND	U
CCB2	613206	KQ1815864-43	10/30/18 11:04	0.50	0.20	0.07	ND	U
CCB3	613206	KQ1815864-44	10/30/18 16:40	0.50	0.20	0.07	ND	U
CCB4	613206	KQ1815864-45	10/30/18 23:01	0.50	0.20	0.07	ND	U
CCB5	613206	KQ1815864-46	10/31/18 03:35	0.50	0.20	0.07	ND	U
CCB6	613206	KQ1815864-47	10/31/18 09:25	0.50	0.20	0.07	ND	U

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1829354; 1829356; 1829552

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2160 (225755)

General Set Information: There were seven field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: NA

Method QC data: The method blank (LMB 624690) was less than 1/2 the CRDL. The recovery for the LCS (624691) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on sample 1829354001 (Client ID: HBW7_101718). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1

Thomas Bosch October 31, 2018
Analyst Date

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ANALYTICAL REPORT

Report Date: November 01, 2018

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: 34-1829552
Project ID: HS18101079
Purchase Order: HS18101079
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16WW48-181018	1829552001	10/18/18	10/20/18	

ANALYTICAL REPORT

Workorder: 34-1829552
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID:	16WW48-181018	Sampling Site:	NA	Collected:	10/18/2018
Lab ID:	1829552001	Media:	125 mL Nalgene	Received:	10/20/2018
Matrix:	Water	Sampling Parameter:	NA		

Analysis Method - EPA 6850, DoD QSM

Preparation:	Not Applicable	Analysis:	EPA 6850, DoD QSM Water	Instrument ID:	LCMS04
		Batch:	ELMS/2160 (HBN: 225755)	Percent Solid:	NA
		Analyzed:	10/25/2018 11:53	Report Basis:	Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	14	1.0	2.0	4.0	1	

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/25/2018 16:34	/S/ Stephen Brose 11/01/2018 07:58

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

Workorder: 34-1829552
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body	Certificate Number	Website
Environmental	PJLA (DoD ELAP)		
	Utah (TNI)		
	Nevada		
	Oklahoma		
	Iowa		

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

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Quality Control Sample
Batch Report

Analysis Information

Workorder: 1829552

Limits:	Client SOW/Contract Specified	Preparation:	NA	Analysis:	EPA 6850, DoD QSM
Basis:	DoD QSM	Batch:	NA	Batch:	ELMS/2160 (HBN: 225755)
		Prepared By:	NA	Analyzed By:	Thomas Bosch

Blank

LMB: 624690
Analyzed: 10/25/2018 09:02
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 624691
Analyzed: 10/25/2018 09:18
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.89	5.00	97.7	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1829354001	MS:	624692	MSD:	624693
Analyzed:	10/25/2018 10:00	Analyzed:	10/25/2018 10:14	Analyzed:	10/25/2018 10:28
Dilution:	1	Dilution:	1	Dilution:	1
Units:	ug/L	Units:	ug/L	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.83	5	96.6	78.8	123.8	5.03	101	4.09	0.0	20.0

Continuing Calibration Verification

CCV:	624687	CCV:	624694
Analyzed:	10/25/2018 08:14	Analyzed:	10/25/2018 12:10
Units:	ug/L	Units:	ug/L
Criteria:	± 15%	Criteria:	± 15%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	24.4	25.0	97.5	23.3	25.0	93.1

Interference Check Sample

ICSA: 624689
Analyzed: 10/25/2018 08:48
Units: ug/L
Criteria: ± 30%

Analyte	Result	Target	% Rec.
Perchlorate	1.01	1.00	101

Limit of Detection Verification

LODV:	624688	LODV:	624695
Analyzed:	10/25/2018 08:34	Analyzed:	10/25/2018 12:24
Units:	ug/L	Units:	ug/L
Criteria:	± 50%	Criteria:	± 50%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	1.02	1.00	102	0.996	1.00	99.6

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Analysis Information

Workorder: 1829552

Limits:	Client SOW/Contract Specified	Preparation:	NA	Analysis:	EPA 6850, DoD QSM
Basis:	DoD QSM	Batch:	NA	Batch:	ELMS/2160 (HBN: 225755)
		Prepared By:	NA	Analyzed By:	Thomas Bosch

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
10/25/2018 16:34	11/01/2018 07:58

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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18698/#2

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

1829552

Subcontract Chain of Custody

COC ID: 10064

1829552

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18101079
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18101079-02**	**16WW48-181018**	**Groundwater**	**18 Oct 2018 12:40**
	SUB_Perch-6850			29 Oct 2018

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 10/19/18 1800.

Received By: _____ Date/Time: 10/20/18 928

Cooler ID(s): 8 884 Temperature(s): 2°

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS18101079	Split:	Workorder ID: 1829552	Level: ENV_LVL4	Requested Analysis
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly	
Comments:			Preservatives	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	COOL	EPA 6850, DoD QSM
1	10/18/2018 12:40	16WW48-181018	1829552001		Water	A	1		A
2									
3									
4									
5									
6									
7									
8									
9									
10									

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Heath, Julie	10/20/2018 09:28	ALS Sample Receiving	Sample Login
[signature]	10/22/18 1205	3C	Storage
R.33.1	10-24-18 13:35	T. Bond	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: MS Houston — Project/Task/Site: 1829552

Date/Time of Receipt: 10/20/18 1928 — Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C18 [illegible]	2 °C	4	C18	°C	7	C18	°C
2	C18	°C	5	C18	°C	8	C18	°C
3	C18	°C	6	C18	°C	9	C18	°C

Taken By: [signature] (Signature) — Meredith Reed (Printed Name) — 10/20/18 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc — Revised 01/01/2018

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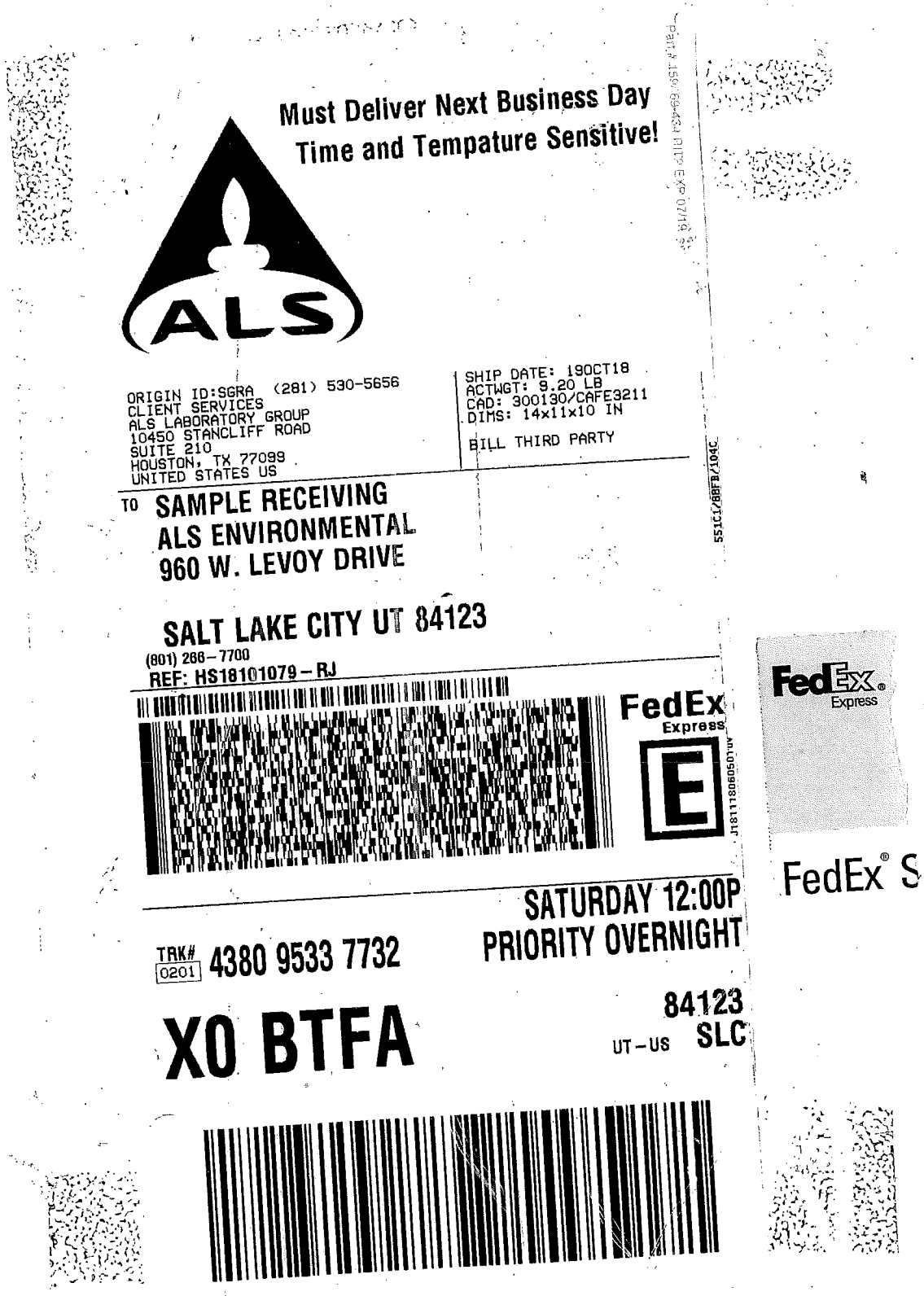

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Batch Worklist

Batch: ELMS/ 2160 **Created:** 10/25/2018 07:44 **Instrument:** **HBN:** 225755

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1829354 [ENV_LVL4]
Workorder: 1829356 [ENV_LVL4]
Workorder: 1829552 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	624687	CCV for HBN 225755 [ELMS/2160]				CCV	3		E685041C3Q	5311		11/1/2018	
2	624688	LODV for HBN 225755 [ELMS/2160				LODV	3		E6850..D3Q	5311		11/1/2018	
3	624689	ICS for HBN 225755 [ELMS/2160]				ICS	3		E6850..D3Q	5311		11/1/2018	
4	624690	LMB for HBN 225755 [ELMS/2160]				LMB	3		E6850Q413Q	5311		11/1/2018	
5	624691	LCS for HBN 225755 [ELMS/2160]				LCS	3		E6850Q413Q	5311		11/1/2018	
6	1829354001	HBW7_101718				SAMPLE	3	1829354001-A	E6850Q41.3	5480	11/14/2018	11/1/2018	
7	624692	HBW7_101718(1829354001MS)				MS	3		E6850Q413Q	5311		11/1/2018	
8	624693	HBW7_101718(1829354001MSD)				MSD	3		E6850Q413Q	5311		11/1/2018	
9	1829354002	HBW10_101718				SAMPLE	3	1829354002-A	E6850Q41.3	5480	11/14/2018	11/1/2018	
10	1829354003	HBW1_101718				SAMPLE	3	1829354003-A	E6850Q41.3	5480	11/14/2018	11/1/2018	
11	1829354004	GPW1_101718				SAMPLE	3	1829354004-A	E6850Q41.3	5480	11/14/2018	11/1/2018	
12	1829354005	GPW3_101718				SAMPLE	3	1829354005-A	E6850Q41.3	5480	11/14/2018	11/1/2018	
13	1829356001	LH18/24-SP650_101718_BIX				SAMPLE	3	1829356001-A	E6850Q41.3	5480	11/14/2018	11/1/2018	
14	1829552001	16WW48-181018				SAMPLE	3	1829552001-A	E6850Q41.3	5480	11/15/2018	11/1/2018	
15	624694	CCV for HBN 225755 [ELMS/2160]				CCV	3		E685041C3Q	5311		11/1/2018	
16	624695	LODV for HBN 225755 [ELMS/2160				LODV	3		E6850..D3Q	5311		11/1/2018	

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Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1829354 (001-05); 1829356 (001); 1829552 (001)
ELMS Batch/HBN ID: 2160 (225755)
Prep Date: 10/24/2018 Analysis Date: 10/25/2018 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\OCT\25OCT18D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 10/08/2018, sequence 08OCT18D.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 2 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.80
5.0	0.80
5.3	0.25
10.0	0.25
10.5	0.80
12.5	0.80

QC DATA: 5.0µL of QC Solution Horizon ID 41830 was used for LCS 624691; Target = 5.0µg/L. ASTM type II water was used for LMB 624690.

MS/MSD: MS/MSD was performed on sample 1829354001 (Client ID: HBW7_101718). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2018\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\225755-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS 2160 HBN: 325755 Sample Set IDs if Applicable: 1829354/ 1829356/ 1829552	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

TB 10-31-18

SB 11/1/18

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Working Standard - CLO4 WRK

CLO4 WRK — **Description - 6850 WKG Std 100.ug/L**

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** No
Part ID: IC-PER-10X-1		**Lab Lot:** CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description** - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description:** 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 09/20/2018 09:09AM	**Expires:** 04/28/2026
MFG Lot: SDFF-012A	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED TESTING LABORATORY

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125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
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www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

Standard

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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August 13, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18111186**

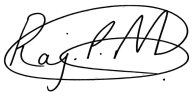
Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 4 sample(s) on Nov 20, 2018 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18111186

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18111186-01	16DRUM01-181117	Soil		17-Nov-2018 13:01	20-Nov-2018 09:20	☐
HS18111186-02	16DRUM02-181117	Soil		17-Nov-2018 13:59	20-Nov-2018 09:20	☐
HS18111186-03	16DRUM03-181117	Soil		17-Nov-2018 14:42	20-Nov-2018 09:20	☐
HS18111186-04	16DRUM04-181117	Soil		17-Nov-2018 15:38	20-Nov-2018 09:20	☐

Revision:1

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Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant
Work Order: HS18111186

Work Order Comments

• Manganese reported with E flag for Sample HS18111186-04 due to results marginally higher than UQL (Upper quantitation Limit)

Work Order Comments

• Revised to update the Metals select list to As, Cr, Tl, Ni and Mn

Work Order Comments

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

GCMS Volatiles by Method SW8260

Batch ID: R328402

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

Metals by Method SW6020

Batch ID: 135125

Sample ID: 16DRUM01-181117 (HS18111186-01MS)

• Chromium and Manganese failed on the MS\MSD but passed on the PDS.

WetChemistry by Method ASTM D2216

Batch ID: R328545

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

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16DRUM01-181117
Collection Date: 17-Nov-2018 13:01

ANALYTICAL REPORT
WorkOrder:HS18111186
Lab ID:HS18111186-01
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**						Analyst: WLR
1,1,2-Trichloroethane	0.0015	U	0.00060	0.0015	0.0060	mg/Kg-dry	1	30-Nov-2018 13:28
1,1-Dichloroethene	0.0015	U	0.00060	0.0015	0.0060	mg/Kg-dry	1	30-Nov-2018 13:28
1,2-Dichloroethane	0.0015	U	0.00073	0.0015	0.0060	mg/Kg-dry	1	30-Nov-2018 13:28
cis-1,2-Dichloroethene	0.0015	U	0.00097	0.0015	0.0060	mg/Kg-dry	1	30-Nov-2018 13:28
Methylene chloride	0.0030	U	0.0012	0.0030	0.012	mg/Kg-dry	1	30-Nov-2018 13:28
Trichloroethene	0.0015	U	0.00073	0.0015	0.0060	mg/Kg-dry	1	30-Nov-2018 13:28
Vinyl chloride	0.0015	U	0.00097	0.0015	0.0024	mg/Kg-dry	1	30-Nov-2018 13:28
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*70-126*	*%REC*	*1*	*30-Nov-2018 13:28*
Surr: 4-Bromofluorobenzene	*99.8*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 13:28*
Surr: Dibromofluoromethane	*100.0*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 13:28*
Surr: Toluene-d8	*101*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 13:28*
METALS BY SW6020A		**Method:SW6020**				Prep:SW3050A / 03-Dec-2018		Analyst: JCJ
Arsenic	**3.56**		**0.0826**	**0.118**	**0.590**	**mg/Kg-dry**	1	07-Dec-2018 21:04
Chromium	**12.2**		**0.0271**	**0.118**	**0.590**	**mg/Kg-dry**	1	07-Dec-2018 21:04
Manganese	**121**		**0.0507**	**0.118**	**0.590**	**mg/Kg-dry**	1	07-Dec-2018 21:04
Nickel	**11.7**		**0.0566**	**0.118**	**0.590**	**mg/Kg-dry**	1	07-Dec-2018 21:04
Thallium	0.295	U	0.263	0.295	0.590	mg/Kg-dry	1	07-Dec-2018 21:04
MOISTURE - ASTM D2216		**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**18.1**		**0.0100**	**0.0100**	**0.0100**	**wt%**	1	03-Dec-2018 10:56
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA-dry	1	10-Dec-2018 16:07

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16DRUM02-181117
Collection Date: 17-Nov-2018 13:59

ANALYTICAL REPORT
WorkOrder:HS18111186
Lab ID:HS18111186-02
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**						Analyst: WLR
1,1,2-Trichloroethane	0.0015	U	0.00062	0.0015	0.0062	mg/Kg-dry	1	30-Nov-2018 13:52
1,1-Dichloroethene	0.0015	U	0.00062	0.0015	0.0062	mg/Kg-dry	1	30-Nov-2018 13:52
1,2-Dichloroethane	0.0015	U	0.00074	0.0015	0.0062	mg/Kg-dry	1	30-Nov-2018 13:52
cis-1,2-Dichloroethene	0.0015	U	0.00099	0.0015	0.0062	mg/Kg-dry	1	30-Nov-2018 13:52
Methylene chloride	0.0031	U	0.0012	0.0031	0.012	mg/Kg-dry	1	30-Nov-2018 13:52
Trichloroethene	0.0015	U	0.00074	0.0015	0.0062	mg/Kg-dry	1	30-Nov-2018 13:52
Vinyl chloride	0.0015	U	0.00099	0.0015	0.0025	mg/Kg-dry	1	30-Nov-2018 13:52
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*70-126*	*%REC*	*1*	*30-Nov-2018 13:52*
Surr: 4-Bromofluorobenzene	*100*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 13:52*
Surr: Dibromofluoromethane	*99.7*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 13:52*
Surr: Toluene-d8	*97.8*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 13:52*
METALS BY SW6020A		**Method:SW6020**				Prep:SW3050A / 03-Dec-2018		Analyst: JCJ
Arsenic	**1.72**		**0.0831**	**0.119**	**0.593**	**mg/Kg-dry**	1	07-Dec-2018 21:22
Chromium	**15.0**		**0.0273**	**0.119**	**0.593**	**mg/Kg-dry**	1	07-Dec-2018 21:22
Manganese	**85.2**		**0.0510**	**0.119**	**0.593**	**mg/Kg-dry**	1	07-Dec-2018 21:22
Nickel	**12.5**		**0.0570**	**0.119**	**0.593**	**mg/Kg-dry**	1	07-Dec-2018 21:22
Thallium	0.297	U	0.265	0.297	0.593	mg/Kg-dry	1	07-Dec-2018 21:22
MOISTURE - ASTM D2216		**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**20.0**		**0.0100**	**0.0100**	**0.0100**	**wt%**	1	03-Dec-2018 10:56
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA-dry	1	10-Dec-2018 16:07

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16DRUM03-181117
Collection Date: 17-Nov-2018 14:42

ANALYTICAL REPORT
WorkOrder:HS18111186
Lab ID:HS18111186-03
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**						Analyst: WLR
1,1,2-Trichloroethane	0.0014	U	0.00059	0.0014	0.0059	mg/Kg-dry	1	30-Nov-2018 14:17
1,1-Dichloroethene	0.0014	U	0.00059	0.0014	0.0059	mg/Kg-dry	1	30-Nov-2018 14:17
1,2-Dichloroethane	0.0014	U	0.00071	0.0014	0.0059	mg/Kg-dry	1	30-Nov-2018 14:17
cis-1,2-Dichloroethene	0.0014	U	0.00094	0.0014	0.0059	mg/Kg-dry	1	30-Nov-2018 14:17
Methylene chloride	0.0029	U	0.0012	0.0029	0.012	mg/Kg-dry	1	30-Nov-2018 14:17
Trichloroethene	0.0014	U	0.00071	0.0014	0.0059	mg/Kg-dry	1	30-Nov-2018 14:17
Vinyl chloride	0.0014	U	0.00094	0.0014	0.0024	mg/Kg-dry	1	30-Nov-2018 14:17
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*70-126*	*%REC*	*1*	*30-Nov-2018 14:17*
Surr: 4-Bromofluorobenzene	*99.9*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 14:17*
Surr: Dibromofluoromethane	*99.6*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 14:17*
Surr: Toluene-d8	*104*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 14:17*
METALS BY SW6020A		**Method:SW6020**				Prep:SW3050A / 03-Dec-2018		Analyst: JCJ
Arsenic	**2.67**		**0.0775**	**0.111**	**0.554**	**mg/Kg-dry**	1	07-Dec-2018 21:24
Chromium	**9.18**		**0.0255**	**0.111**	**0.554**	**mg/Kg-dry**	1	07-Dec-2018 21:24
Manganese	**159**		**0.0476**	**0.111**	**0.554**	**mg/Kg-dry**	1	07-Dec-2018 21:24
Nickel	**11.0**		**0.0532**	**0.111**	**0.554**	**mg/Kg-dry**	1	07-Dec-2018 21:24
Thallium	0.277	U	0.247	0.277	0.554	mg/Kg-dry	1	07-Dec-2018 21:24
MOISTURE - ASTM D2216		**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**17.7**		**0.0100**	**0.0100**	**0.0100**	**wt%**	1	03-Dec-2018 10:56
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA-dry	1	10-Dec-2018 16:07

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16DRUM04-181117
Collection Date: 17-Nov-2018 15:38

ANALYTICAL REPORT
WorkOrder:HS18111186
Lab ID:HS18111186-04
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**						Analyst: WLR
1,1,2-Trichloroethane	0.0014	U	0.00058	0.0014	0.0058	mg/Kg-dry	1	30-Nov-2018 14:42
1,1-Dichloroethene	0.0014	U	0.00058	0.0014	0.0058	mg/Kg-dry	1	30-Nov-2018 14:42
1,2-Dichloroethane	0.0014	U	0.00070	0.0014	0.0058	mg/Kg-dry	1	30-Nov-2018 14:42
cis-1,2-Dichloroethene	0.0014	U	0.00093	0.0014	0.0058	mg/Kg-dry	1	30-Nov-2018 14:42
Methylene chloride	0.0029	U	0.0012	0.0029	0.012	mg/Kg-dry	1	30-Nov-2018 14:42
Trichloroethene	0.0014	U	0.00070	0.0014	0.0058	mg/Kg-dry	1	30-Nov-2018 14:42
Vinyl chloride	0.0014	U	0.00093	0.0014	0.0023	mg/Kg-dry	1	30-Nov-2018 14:42
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*70-126*	*%REC*	*1*	*30-Nov-2018 14:42*
Surr: 4-Bromofluorobenzene	*100*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 14:42*
Surr: Dibromofluoromethane	*100*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 14:42*
Surr: Toluene-d8	*99.1*			**0**	*70-130*	*%REC*	*1*	*30-Nov-2018 14:42*
METALS BY SW6020A		**Method:SW6020**				Prep:SW3050A / 03-Dec-2018		Analyst: JCJ
Arsenic	**2.35**		**0.0803**	**0.115**	**0.573**	**mg/Kg-dry**	1	07-Dec-2018 21:27
Chromium	**14.9**		**0.0264**	**0.115**	**0.573**	**mg/Kg-dry**	1	07-Dec-2018 21:27
Manganese	**215**	E	**0.0493**	**0.115**	**0.573**	**mg/Kg-dry**	1	07-Dec-2018 21:27
Nickel	**10.4**		**0.0550**	**0.115**	**0.573**	**mg/Kg-dry**	1	07-Dec-2018 21:27
Thallium	0.287	U	0.256	0.287	0.573	mg/Kg-dry	1	07-Dec-2018 21:27
MOISTURE - ASTM D2216		**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**17.7**		**0.0100**	**0.0100**	**0.0100**	**wt%**	1	03-Dec-2018 10:56
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA-dry	1	10-Dec-2018 16:07

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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WEIGHT LOG

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18111186

Batch ID: 2788 **Method:** VOLATILES BY SW8260C

SampID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS18111186-01	1	5.035 (g)	5 (mL)	0.99	Bulk (5030B)
HS18111186-02	1	5.042 (g)	5 (mL)	0.99	Bulk (5030B)
HS18111186-03	1	5.151 (g)	5 (mL)	0.97	Bulk (5030B)
HS18111186-04	1	5.216 (g)	5 (mL)	0.96	Bulk (5030B)

Batch ID: 135125 **Method:** METALS BY SW6020A **Prep:** 3050_I_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18111186-01	1	0.5174	50 (mL)	96.64
HS18111186-02	1	0.5267	50 (mL)	94.93
HS18111186-03	1	0.5486	50 (mL)	91.14
HS18111186-04	1	0.5298	50 (mL)	94.38

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18111186

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 135125 (0)	**Test Name :** METALS BY SW6020A				**Matrix:** Soil	
HS18111186-01	16DRUM01-181117	17 Nov 2018 13:01		03 Dec 2018 11:28	07 Dec 2018 21:04	1
HS18111186-02	16DRUM02-181117	17 Nov 2018 13:59		03 Dec 2018 11:28	07 Dec 2018 21:22	1
HS18111186-03	16DRUM03-181117	17 Nov 2018 14:42		03 Dec 2018 11:28	07 Dec 2018 21:24	1
HS18111186-04	16DRUM04-181117	17 Nov 2018 15:38		03 Dec 2018 11:28	07 Dec 2018 21:27	1
Batch ID: R328402 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Soil	
HS18111186-01	16DRUM01-181117	17 Nov 2018 13:01			30 Nov 2018 13:28	1
HS18111186-02	16DRUM02-181117	17 Nov 2018 13:59			30 Nov 2018 13:52	1
HS18111186-03	16DRUM03-181117	17 Nov 2018 14:42			30 Nov 2018 14:17	1
HS18111186-04	16DRUM04-181117	17 Nov 2018 15:38			30 Nov 2018 14:42	1
Batch ID: R328545 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS18111186-01	16DRUM01-181117	17 Nov 2018 13:01			03 Dec 2018 10:56	1
HS18111186-02	16DRUM02-181117	17 Nov 2018 13:59			03 Dec 2018 10:56	1
HS18111186-03	16DRUM03-181117	17 Nov 2018 14:42			03 Dec 2018 10:56	1
HS18111186-04	16DRUM04-181117	17 Nov 2018 15:38			03 Dec 2018 10:56	1
Batch ID: R328913 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Soil	
HS18111186-01	16DRUM01-181117	17 Nov 2018 13:01			10 Dec 2018 16:07	1
HS18111186-02	16DRUM02-181117	17 Nov 2018 13:59			10 Dec 2018 16:07	1
HS18111186-03	16DRUM03-181117	17 Nov 2018 14:42			10 Dec 2018 16:07	1
HS18111186-04	16DRUM04-181117	17 Nov 2018 15:38			10 Dec 2018 16:07	1

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18111186

QC BATCH REPORT

Batch ID: 135125 (0) **Instrument: ICPMS04** **Method: METALS BY SW6020A**

MBLK Sample ID: **MBLK-135125** Units: **mg/Kg** Analysis Date: **08-Dec-2018 13:31**
Client ID: Run ID: **ICPMS04_328834** SeqNo: **4854813** PrepDate: **03-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.100	0.500								U
Chromium	0.100	0.500								U
Manganese	0.100	0.500								U
Nickel	0.100	0.500								U
Thallium	0.250	0.500								U

LCS Sample ID: **LCS-135125** Units: **mg/Kg** Analysis Date: **07-Dec-2018 20:22**
Client ID: Run ID: **ICPMS04_328768** SeqNo: **4854471** PrepDate: **03-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.809	0.500	10	0	98.1	80 - 120				
Chromium	9.982	0.500	10	0	99.8	80 - 120				
Manganese	9.981	0.500	10	0	99.8	80 - 120				
Nickel	9.976	0.500	10	0	99.8	80 - 120				
Thallium	9.457	0.500	10	0	94.6	80 - 120				

MS Sample ID: **HS18111186-01MS** Units: **mg/Kg** Analysis Date: **07-Dec-2018 21:16**
Client ID: **16DRUM01-181117** Run ID: **ICPMS04_328768** SeqNo: **4854495** PrepDate: **03-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	12.34	0.481	9.628	2.913	97.9	75 - 125				
Chromium	23.52	0.481	9.628	10.02	140	75 - 125				S
Manganese	124.3	0.481	9.628	99.49	258	75 - 125				SO
Nickel	21	0.481	9.628	9.594	118	75 - 125				
Thallium	9.208	0.481	9.628	0	95.6	75 - 125				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18111186

QC BATCH REPORT

Batch ID: 135125 (0) **Instrument:** ICPMS04 **Method:** METALS BY SW6020A

MSD Sample ID: **HS18111186-01MSD** Units: **mg/Kg** Analysis Date: **07-Dec-2018 21:18**
Client ID: **16DRUM01-181117** Run ID: **ICPMS04_328768** SeqNo: **4854496** PrepDate: **03-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.69	0.485	9.699	2.913	90.5	75 - 125	12.34	5.38	20	
Chromium	26.33	0.485	9.699	10.02	168	75 - 125	23.52	11.3	20	S
Manganese	143.4	0.485	9.699	99.49	453	75 - 125	124.3	14.3	20	SO
Nickel	20.92	0.485	9.699	9.594	117	75 - 125	21	0.414	20	
Thallium	9.233	0.485	9.699	0	95.2	75 - 125	9.208	0.272	20	

PDS Sample ID: **HS18111186-01PDS** Units: **mg/Kg** Analysis Date: **07-Dec-2018 21:20**
Client ID: **16DRUM01-181117** Run ID: **ICPMS04_328768** SeqNo: **4854497** PrepDate: **03-Dec-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	12.24	0.483	9.664	2.913	96.5	75 - 125				
Chromium	18.68	0.483	9.664	10.02	89.7	75 - 125				
Manganese	107.9	0.483	9.664	99.49	86.8	75 - 125				O
Nickel	18.09	0.483	9.664	9.594	87.9	75 - 125				
Thallium	9.445	0.483	9.664	0	97.7	75 - 125				

SD Sample ID: **HS18111186-01SD** Units: **mg/Kg** Analysis Date: **07-Dec-2018 21:13**
Client ID: **16DRUM01-181117** Run ID: **ICPMS04_328768** SeqNo: **4854494** PrepDate: **03-Dec-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	2.892	2.42					2.913	0.723	10	
Chromium	10.65	2.42					10.02	6.27	10	
Manganese	104.8	2.42					99.49	5.33	10	
Nickel	9.814	2.42					9.594	2.29	10	
Thallium	1.21	2.42					0	0	10	U

The following samples were analyzed in this batch: HS18111186-01 HS18111186-02 HS18111186-03 HS18111186-04

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18111186

QC BATCH REPORT

Batch ID: R328402 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-113018** Units: **mg/Kg** Analysis Date: **30-Nov-2018 13:03**
Client ID: Run ID: **VOA5_328402** SeqNo: **4843518** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.0012	0.0050								U
1,1-Dichloroethene	0.0012	0.0050								U
1,2-Dichloroethane	0.0012	0.0050								U
cis-1,2-Dichloroethene	0.0012	0.0050								U
Methylene chloride	0.0025	0.010								U
Trichloroethene	0.0012	0.0050								U
Vinyl chloride	0.0012	0.0020								U
Surr: 1,2-Dichloroethane-d4	*0.050*	*0*	*0.05*	*0*	*101*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*0.050*	*0*	*0.05*	*0*	*99.2*	*80 - 120*				
Surr: Dibromofluoromethane	*0.050*	*0*	*0.05*	*0*	*99.7*	*80 - 119*				
Surr: Toluene-d8	*0.050*	*0*	*0.05*	*0*	*99.1*	*81 - 118*				

LCS Sample ID: **VLCSS1-113018** Units: **mg/Kg** Analysis Date: **30-Nov-2018 12:13**
Client ID: Run ID: **VOA5_328402** SeqNo: **4843517** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.053	0.0050	0.05	0	105	78 - 117				
1,1-Dichloroethene	0.053	0.0050	0.05	0	107	72 - 130				
1,2-Dichloroethane	0.055	0.0050	0.05	0	109	77 - 120				
cis-1,2-Dichloroethene	0.056	0.0050	0.05	0	112	77 - 125				
Methylene chloride	0.059	0.010	0.05	0	118	71 - 125				
Trichloroethene	0.053	0.0050	0.05	0	105	78 - 125				
Vinyl chloride	0.055	0.0020	0.05	0	109	70 - 130				
Surr: 1,2-Dichloroethane-d4	*0.050*	*0*	*0.05*	*0*	*99.2*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*0.050*	*0*	*0.05*	*0*	*100*	*80 - 120*				
Surr: Dibromofluoromethane	*0.050*	*0*	*0.05*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*0.050*	*0*	*0.05*	*0*	*101*	*81 - 118*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18111186

QC BATCH REPORT

Batch ID: R328402 (0) **Instrument:** VOA5 **Method:** VOLATILES BY SW8260C

MS Sample ID: **HS18111186-01MS** Units: **mg/Kg** Analysis Date: **30-Nov-2018 15:06**
Client ID: **16DRUM01-181117** Run ID: **VOA5_328402** SeqNo: **4843774** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.043	0.0050	0.0495	0	86.4	70 - 130				
1,1-Dichloroethene	0.045	0.0050	0.0495	0	91.4	70 - 130				
1,2-Dichloroethane	0.047	0.0050	0.0495	0	94.4	70 - 130				
cis-1,2-Dichloroethene	0.045	0.0050	0.0495	0	90.6	70 - 130				
Methylene chloride	0.047	0.0099	0.0495	0	95.8	70 - 130				
Trichloroethene	0.046	0.0050	0.0495	0	93.8	70 - 130				
Vinyl chloride	0.042	0.0020	0.0495	0	84.5	70 - 130				
Surr: 1,2-Dichloroethane-d4	*0.049*	*0*	*0.0495*	*0*	*99.6*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*0.050*	*0*	*0.0495*	*0*	*101*	*70 - 130*				
Surr: Dibromofluoromethane	*0.050*	*0*	*0.0495*	*0*	*100*	*70 - 130*				
Surr: Toluene-d8	*0.051*	*0*	*0.0495*	*0*	*102*	*70 - 130*				

MSD Sample ID: **HS18111186-01MSD** Units: **mg/Kg** Analysis Date: **30-Nov-2018 15:31**
Client ID: **16DRUM01-181117** Run ID: **VOA5_328402** SeqNo: **4843775** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.035	0.0049	0.049	0	71.8	70 - 130	0.04277	19.5	30	
1,1-Dichloroethene	0.040	0.0049	0.049	0	81.1	70 - 130	0.04525	13	30	
1,2-Dichloroethane	0.037	0.0049	0.049	0	75.2	70 - 130	0.04675	23.7	30	
cis-1,2-Dichloroethene	0.038	0.0049	0.049	0	77.0	70 - 130	0.04486	17.3	30	
Methylene chloride	0.039	0.0098	0.049	0	80.6	70 - 130	0.04743	18.3	30	
Trichloroethene	0.039	0.0049	0.049	0	79.2	70 - 130	0.04644	18	30	
Vinyl chloride	0.039	0.0020	0.049	0	79.0	70 - 130	0.04185	7.75	30	
Surr: 1,2-Dichloroethane-d4	*0.047*	*0*	*0.049*	*0*	*95.5*	*70 - 126*	*0.04931*	*5.24*	*30*	
Surr: 4-Bromofluorobenzene	*0.049*	*0*	*0.049*	*0*	*101*	*70 - 130*	*0.04977*	*0.924*	*30*	
Surr: Dibromofluoromethane	*0.049*	*0*	*0.049*	*0*	*100*	*70 - 130*	*0.04955*	*1.01*	*30*	
Surr: Toluene-d8	*0.050*	*0*	*0.049*	*0*	*103*	*70 - 130*	*0.05054*	*0.279*	*30*	

The following samples were analyzed in this batch: HS18111186-01 HS18111186-02 HS18111186-03 HS18111186-04

Revision: 1

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Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18111186

QC BATCH REPORT

Batch ID: **R328545 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS18120010-04DUP** Units: **wt%** Analysis Date: **03-Dec-2018 10:56**
Client ID: Run ID: **Balance1_328545** SeqNo: **4847316** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	24.6	0.0100					24.6	0	20	

The following samples were analyzed in this batch: HS18111186-01 HS18111186-02 HS18111186-03 HS18111186-04

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS18111186**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/Kg-dry	Milligrams per Kilogram- Dry weight corrected

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18111186
Date/Time Received: **20-Nov-2018 09:20**
Received by: **RPG**

Checklist completed by: *Paresh M. Giga* eSignature — 21-Nov-2018 Date
Reviewed by: *RJ Modashia* eSignature — 27-Nov-2018 Date

Matrices: **Soil**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:37-NOV2018-GW-ALSHT-181119
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.7c/2.1c U/c	IR11
Cooler(s)/Kit(s):	24812	
Date/Time sample(s) sent to storage:	11/20/18 20:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:
Contacted By: Regarding:

Comments:

Corrective Action:

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APTIM

COC ID:	LHAAP16-2018-ALSHT-181117	TURNAROUND TIME: normal	RUSH:	Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@Aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	kim.napier@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Kim Napier		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FED EX		

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Select VOCs by 8260	Perchlorate by 6850	Select Metals by 6020
16DRUM01-181117	LHAAP 16				SO	11/17/2018	1301	3		1	1	1
16DRUM02-181117	LHAAP 16				SO	11/17/2018	1359	3		1	1	1
16DRUM03-181117	LHAAP 16				SO	11/17/2018	1442	3		1	1	1
16DRUM04-181117	LHAAP 16				SO	11/17/2018	1538	3		1	1	1

HS18111186

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	[signature] APTIM	11/19/18 1450	R Giga ALSHS	11/20/18 08:20
Select Metals list: Chromium, Arsenic, Thallium, Nickel, and Manganese			cooler # 24512	
			IR #11 cf + 0.4c	
			Temp 1.7c	

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CUSTODY SEAL SM 11/20/18

DATE: 11-9-18

Signature:

24812 LHA AP

24812 NOV 20 2018

CUSTODY SEAL SM 11/20/18

DATE: 11-19-18

Signature:

24812 LHAAP

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656

24812

REF: LHAAP-37-BO 61933-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 4380 9534 1106

TUE - 20 NOV 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 11-9-18 Time: 1100
Name:
Company:

Seal Broken By: SM
Date: 11/20/18

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1833151

Client: ALS Laboratories (Houston, TX)
Matrix: Soil
ELMS Batch (HBN): 2177 (228801)

General Set Information: There were four field samples in this Work Order. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 1.00 to 1.20 g aliquot of each sample was combined with 9.95mL of ASTM Type II water. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, sonicated for at least 15 minutes and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe Filters. If necessary, the samples were centrifuged at 2700rpm for 15 minutes prior to filtering in order to remove excess particulates from the extract.

Holding Times: Holding times were met for all analyses.

Dilutions: NA

Method QC data: The method blank (631026) was less than 1/2 the CRDL. The recovery for the LCS (631027) was within acceptable parameters.

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MS/MSD Analysis: A Matrix Spike and Duplicate (MS/MSD) was performed on sample 1833151001 (Client ID: 16DRUM01-181117). The Matrix Spike/Duplicate passed QC acceptance criteria for percent recoveries and relative percent difference (RPD).

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): None were required for this set.

Sample Calculation: Samples were reported in µg/Kg. Results were calculated in µg/Kg by the equation (A)x(B)x(C)x(D),

where: A = Analyte concentration from the standard curve (µg/L)
B = Conversion factor from µg/L to µg/kg (10mL/1.0g)
C = Dilution performed at time of analysis
D = Moisture correction

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1, Table F-12.

Thomas Bosch December 10, 2018
Analyst Date

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ANALYTICAL REPORT

Report Date: December 10, 2018

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1833151**
Project ID: HS18111186
Purchase Order: HS18111186
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16DRUM01-181117	1833151001	11/17/18	11/27/18	
16DRUM02-181117	1833151002	11/17/18	11/27/18	
16DRUM03-181117	1833151003	11/17/18	11/27/18	
16DRUM04-181117	1833151004	11/17/18	11/27/18	

ANALYTICAL REPORT

Workorder: 34-1833151
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16DRUM01-181117** | Sampling Site: NA | Collected: 11/17/2018
Lab ID: 1833151001 | Media: 4 oz Amber Glass Jar | Received: 11/27/2018
Matrix: Soil/Solid/Sediment | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Soil | **Instrument ID:** LCMS04
Batch: ELMS/2177 (HBN: 228801) | **Percent Solid:** 82
Analyzed: 12/06/2018 10:29 | **Report Basis:** Dry

Analyte	Result (ug/Kg)	DL (ug/Kg)	LOD (ug/Kg)	LOQ (ug/Kg)	Dilution	Qual
Perchlorate	ND	12	12	24	1	U

Sample ID: **16DRUM02-181117** | Sampling Site: NA | Collected: 11/17/2018
Lab ID: 1833151002 | Media: 4 oz Amber Glass Jar | Received: 11/27/2018
Matrix: Soil/Solid/Sediment | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Soil | **Instrument ID:** LCMS04
Batch: ELMS/2177 (HBN: 228801) | **Percent Solid:** 81.2
Analyzed: 12/06/2018 11:10 | **Report Basis:** Dry

Analyte	Result (ug/Kg)	DL (ug/Kg)	LOD (ug/Kg)	LOQ (ug/Kg)	Dilution	Qual
Perchlorate	16	12	12	25	1	J

Sample ID: **16DRUM03-181117** | Sampling Site: NA | Collected: 11/17/2018
Lab ID: 1833151003 | Media: 4 oz Amber Glass Jar | Received: 11/27/2018
Matrix: Soil/Solid/Sediment | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Soil | **Instrument ID:** LCMS04
Batch: ELMS/2177 (HBN: 228801) | **Percent Solid:** 81.7
Analyzed: 12/06/2018 11:24 | **Report Basis:** Dry

Analyte	Result (ug/Kg)	DL (ug/Kg)	LOD (ug/Kg)	LOQ (ug/Kg)	Dilution	Qual
Perchlorate	ND	12	12	24	1	U

Sample ID: **16DRUM04-181117** | Sampling Site: NA | Collected: 11/17/2018
Lab ID: 1833151004 | Media: 4 oz Amber Glass Jar | Received: 11/27/2018
Matrix: Soil/Solid/Sediment | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Soil | **Instrument ID:** LCMS04
Batch: ELMS/2177 (HBN: 228801) | **Percent Solid:** 80.9
Analyzed: 12/06/2018 11:38 | **Report Basis:** Dry

Analyte	Result (ug/Kg)	DL (ug/Kg)	LOD (ug/Kg)	LOQ (ug/Kg)	Dilution	Qual
Perchlorate	ND	12	12	25	1	U

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ANALYTICAL REPORT

Workorder: 34-1833151
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/06/2018 14:17	/S/ Stephen Brose 12/10/2018 11:53
Solids/Moisture Determination	/S/ Ilse J. Ovalle 11/30/2018 11:33	/S/ Jeff Ward 12/03/2018 11:58

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body	Certificate Number	Website
Environmental	PJLA (DoD ELAP)		
	Utah (TNI) Nevada Oklahoma Iowa		

Workorder: 34-1833151
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1833151

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2177 (HBN: 228801)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 631026
Analyzed: 12/06/2018 09:59
Units: ug/Kg

Analyte	Result	MDL	RL
Perchlorate	ND	10	10.0

Laboratory Control Sample

LCS: 631027
Analyzed: 12/06/2018 10:13
Dilution: 1
Units: ug/Kg

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	46.6	50.0	93.2	84.0	121.0

Matrix Spike - Matrix Spike Duplicate

Sample: 1833151001
Analyzed: 12/06/2018 10:29
Dilution: 1
Units: ug/Kg

MS: 631028
Analyzed: 12/06/2018 10:43
Dilution: 1
Units: ug/Kg

MSD: 631029
Analyzed: 12/06/2018 10:57
Dilution: 1
Units: ug/Kg

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	52.9	50	106	78.8	123.8	53.9	108	2.02	0.0	20.0

Continuing Calibration Verification

CCV: 631023
Analyzed: 12/06/2018 09:17
Units: ug/L
Criteria: ± 15%

CCV: 631030
Analyzed: 12/06/2018 11:53
Units: ug/L
Criteria: ± 15%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	25.1	25.0	100	25.2	25.0	101

Interference Check Sample

ICSA: 631025
Analyzed: 12/06/2018 09:45
Units: ug/L
Criteria: ± 30%

Analyte	Result	Target	% Rec.
Perchlorate	1.10	1.00	110

Limit of Detection Verification

LODV: 631024
Analyzed: 12/06/2018 09:32
Units: ug/L
Criteria: ± 50%

LODV: 631031
Analyzed: 12/06/2018 12:07
Units: ug/L
Criteria: ± 50%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	1.04	1.00	104	1.06	1.00	106

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Quality Control Sample
Batch Report

Analysis Information

Workorder: **1833151**

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2177 (HBN: 228801)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
12/06/2018 14:17	12/10/2018 11:53

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

W 1833151

18698/#2

Subcontract Chain of Custody

COC ID: 10285

1833151

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18111186
TSR:	Sonia West

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS18111186-01**	**16DRUM01-181117**	**Soil**	**17 Nov 2018 13:01**
	SUB_Perch-6850			06 Dec 2018
2.	**HS18111186-02**	**16DRUM02-181117**	**Soil**	**17 Nov 2018 13:59**
	SUB_Perch-6850			06 Dec 2018
3.	**HS18111186-03**	**16DRUM03-181117**	**Soil**	**17 Nov 2018 14:42**
	SUB_Perch-6850			06 Dec 2018
4.	**HS18111186-04**	**16DRUM04-181117**	**Soil**	**17 Nov 2018 15:38**
	SUB_Perch-6850			06 Dec 2018

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	11/26/18 1500
Received By:		Date/Time:	11/27/18 10:10
Cooler ID(s):		Temperature(s):	

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ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR) 183315

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS HOUSTON

Project/Task/Site: HS18111186

Date/Time of Receipt: 11 27 18 10:10

Number of Coolers Received: (1)

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	(Yes)/No/NA
Ice Present:	(Yes)/No/NA		
	(Frozen)/Melted/NA	VOA Headspace Present?	Yes/No/(NA)

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C18 8966	1 °C	4	C18	°C	7	C18	°C
2	C18	°C	5	C18	°C	8	C18	°C
3	C18	°C	6	C18	°C	9	C18	°C

Taken By: [signature] GAYLEEN COATES 11 27 18

Signature / Printed Name / Date

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018

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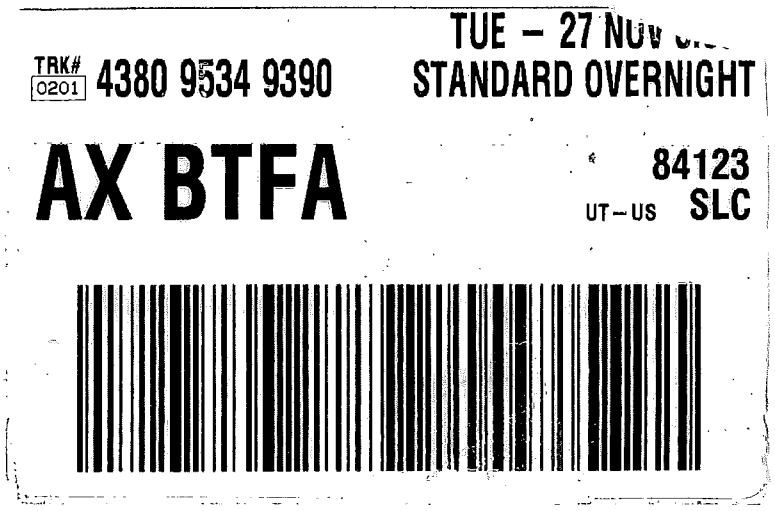

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ALS Environmental
CHAIN-OF-CUSTODY

oject / Job / Task: HS18111186	Split:	Workorder ID: 1833151	Level: ENV_LVL4
ient: ALS Environmental (Houston)		Account: 8101	Type: 4ozAGWM
omments:			Preservatives: COOL

Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850, DoD QSM										
11/17/2018 13:01	16DRUM01-181117	1833151001		Soil/Solid/Sediment	A	1	A		1.070		1.047		1.022				
11/17/2018 13:59	16DRUM02-181117	1833151002		Soil/Solid/Sediment	A	1	A			1.086							
11/17/2018 14:42	16DRUM03-181117	1833151003		Soil/Solid/Sediment	A	1	A			1.012							
11/17/2018 15:38	16DRUM04-181117	1833151004		Soil/Solid/Sediment	A	1	A			1.050							

Requested Analysis

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
ath, Julie	11/27/2018 10:10	ALS Sample Receiving	Sample Login
ulie Warath	11/27/18 1400	6B	storage
-33-1 6B IJO	11/29/18 11:15	Ilse J Ovalle	% soil
lse J Ovalle	11/29/18 16:30	R-33-1 6B IJO	storage
-33-1	12-5-18/08:00	T. Basch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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Batch Worklist

atch: ELMS/ 2177 | Created: 12/6/2018 07:46 | Instrument: | HBN: 228801

ule: EPA 6850, DoD QSM Soil | Analyst: T. Bosch | Status: WP

/orkorder: 1833151 [ENV_LVL4]

os	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
	631023	CCV for HBN 228801 [ELMS/2177]				CCV	3		E685041C4Q	5311		12/11/2018	
	631024	LODV for HBN 228801 [ELMS/2177				LODV	3		E6850..D4Q	5311		12/11/2018	
	631025	ICS for HBN 228801 [ELMS/2177]				ICS	3		E6850..D4Q	5311		12/11/2018	
	631026	LMB for HBN 228801 [ELMS/2177]				LMB	4		E6850Q414Q	5311		12/11/2018	
	631027	LCS for HBN 228801 [ELMS/2177]				LCS	4		E6850Q414Q	5311		12/11/2018	
	1833151001	16DRUM01-181117				SAMPLE	4	1833151001-A	E6850Q41.4	5480	12/15/2018	12/11/2018	
	631028	16DRUM01-181117(1833151001MS)				MS	4		E6850Q414Q	5311		12/11/2018	
	631029	16DRUM01-181117(1833151001MSD)				MSD	4		E6850Q414Q	5311		12/11/2018	
	1833151002	16DRUM02-181117				SAMPLE	4	1833151002-A	E6850Q41.4	5480	12/15/2018	12/11/2018	
	1833151003	16DRUM03-181117				SAMPLE	4	1833151003-A	E6850Q41.4	5480	12/15/2018	12/11/2018	
	1833151004	16DRUM04-181117				SAMPLE	4	1833151004-A	E6850Q41.4	5480	12/15/2018	12/11/2018	
	631030	CCV for HBN 228801 [ELMS/2177]				CCV	3		E685041C4Q	5311		12/11/2018	
	631031	LODV for HBN 228801 [ELMS/2177				LODV	3		E6850..D4Q	5311		12/11/2018	

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HS19090860 Longhorn Army Ammunition Plant
Cover Page

ALS WO# HS19090860

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ALS Group USA, Corp
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  - Sample Summary
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Dates Report
QC
Acronyms
Certifications
SampleReceiptCheckList
COC
HS19090860 ALS Salt Lake City 1927207-Combined Report
HS19090860 8260

10450 Stancliff Rd. Suite 210
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www.alsglobal.com

WorkOrder: HS19090860

Longhorn Army Ammunition Plant

Aptim Environmental & Infrastucture, Inc.

Susan Huang
2500 City West Blvd., Suite 1700
Houston TX 77042

14-Oct-2019

HS19090860 Longhorn Army Ammunition Plant Final

ALS WO# HS19090860

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October 02, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19090860**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

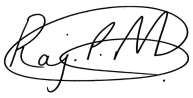
ALS Environmental received 16 sample(s) on Sep 18, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19090860

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090860-01	16WW14-190916	Water		16-Sep-2019 13:43	18-Sep-2019 09:00	☐
HS19090860-02	16WW16-190916	Water		16-Sep-2019 14:34	18-Sep-2019 09:00	☐
HS19090860-03	16WW36-190916	Water		16-Sep-2019 15:37	18-Sep-2019 09:00	☐
HS19090860-04	16WW42-190916	Water		16-Sep-2019 16:33	18-Sep-2019 09:00	☐
HS19090860-05	16WW22-190917	Water		17-Sep-2019 09:37	18-Sep-2019 09:00	☐
HS19090860-06	16WW41-190917	Water		17-Sep-2019 10:35	18-Sep-2019 09:00	☐
HS19090860-07	16WW39-190917	Water		17-Sep-2019 11:43	18-Sep-2019 09:00	☐
HS19090860-08	16WW56-190917	Water		17-Sep-2019 13:12	18-Sep-2019 09:00	☐
HS19090860-09	16WW40-190917	Water		17-Sep-2019 14:09	18-Sep-2019 09:00	☐
HS19090860-10	16WW55-190917	Water		17-Sep-2019 14:54	18-Sep-2019 09:00	☐
HS19090860-11	16WW43-190917	Water		17-Sep-2019 12:35	18-Sep-2019 09:00	☐
HS19090860-12	16WW23-190917	Water		17-Sep-2019 13:50	18-Sep-2019 09:00	☐
HS19090860-13	16WW24-190917	Water		17-Sep-2019 14:55	18-Sep-2019 09:00	☐
HS19090860-14	16WW27-190917	Water		17-Sep-2019 10:25	18-Sep-2019 09:00	☐
HS19090860-15	16LHAAP-TB1-190916	Water	C&G-080519-513	16-Sep-2019 00:00	18-Sep-2019 09:00	☐
HS19090860-16	16LHAAP-TB2-190916	Water	C&G-080519-516	16-Sep-2019 00:00	18-Sep-2019 09:00	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant
Work Order: HS19090860

Work Order Comments

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

GCMS Volatiles by Method SW8260

Batch ID: R346918,R347016,R347098

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW14-190916
Collection Date: 16-Sep-2019 13:43

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	24-Sep-2019 18:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 18:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 18:47
cis-1,2-Dichloroethene	**0.79**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	24-Sep-2019 18:47
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	24-Sep-2019 18:47
Trichloroethene	**25**		**0.20**	**0.50**	**1.0**	**UG/L**	1	24-Sep-2019 18:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 18:47
Surr: 1,2-Dichloroethane-d4	*91.2*			**0**	*81-118*	*%REC*	*1*	*24-Sep-2019 18:47*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*24-Sep-2019 18:47*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*24-Sep-2019 18:47*
Surr: Toluene-d8	*97.7*			**0**	*89-112*	*%REC*	*1*	*24-Sep-2019 18:47*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW16-190916
Collection Date: 16-Sep-2019 14:34

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	24-Sep-2019 19:11
1,1-Dichloroethene	**25**	J	**5.0**	**12**	**25**	**UG/L**	25	24-Sep-2019 19:11
1,2-Dichloroethane	**19**	J	**5.0**	**12**	**25**	**UG/L**	25	24-Sep-2019 19:11
cis-1,2-Dichloroethene	**6,600**		**50**	**120**	**250**	**UG/L**	250	24-Sep-2019 20:23
Methylene chloride	25	U	10	25	50	UG/L	25	24-Sep-2019 19:11
Trichloroethene	**13,000**		**50**	**120**	**250**	**UG/L**	250	24-Sep-2019 20:23
Vinyl chloride	**220**		**5.0**	**12**	**25**	**UG/L**	25	24-Sep-2019 19:11
Surr: 1,2-Dichloroethane-d4	*91.5*			**0**	*81-118*	*%REC*	*25*	*24-Sep-2019 19:11*
Surr: 1,2-Dichloroethane-d4	*92.0*			**0**	*81-118*	*%REC*	*250*	*24-Sep-2019 20:23*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*25*	*24-Sep-2019 19:11*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*250*	*24-Sep-2019 20:23*
Surr: Dibromofluoromethane	*93.6*			**0**	*80-119*	*%REC*	*25*	*24-Sep-2019 19:11*
Surr: Dibromofluoromethane	*94.3*			**0**	*80-119*	*%REC*	*250*	*24-Sep-2019 20:23*
Surr: Toluene-d8	*97.4*			**0**	*89-112*	*%REC*	*25*	*24-Sep-2019 19:11*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*250*	*24-Sep-2019 20:23*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW36-190916
Collection Date: 16-Sep-2019 15:37

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	25-Sep-2019 15:02
1,1-Dichloroethene	**190**		**5.0**	**12**	**25**	**UG/L**	25	25-Sep-2019 15:02
1,2-Dichloroethane	**13**	J	**5.0**	**12**	**25**	**UG/L**	25	25-Sep-2019 15:02
cis-1,2-Dichloroethene	**19,000**		**50**	**120**	**250**	**UG/L**	250	25-Sep-2019 16:14
Methylene chloride	25	U	10	25	50	UG/L	25	25-Sep-2019 15:02
Trichloroethene	**15,000**		**50**	**120**	**250**	**UG/L**	250	25-Sep-2019 16:14
Vinyl chloride	**230**		**5.0**	**12**	**25**	**UG/L**	25	25-Sep-2019 15:02
Surr: 1,2-Dichloroethane-d4	*91.9*			**0**	*81-118*	*%REC*	*25*	*25-Sep-2019 15:02*
Surr: 1,2-Dichloroethane-d4	*91.0*			**0**	*81-118*	*%REC*	*250*	*25-Sep-2019 16:14*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*25*	*25-Sep-2019 15:02*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*250*	*25-Sep-2019 16:14*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*25*	*25-Sep-2019 15:02*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*250*	*25-Sep-2019 16:14*
Surr: Toluene-d8	*96.6*			**0**	*89-112*	*%REC*	*25*	*25-Sep-2019 15:02*
Surr: Toluene-d8	*98.9*			**0**	*89-112*	*%REC*	*250*	*25-Sep-2019 16:14*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW42-190916
Collection Date: 16-Sep-2019 16:33

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 14:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 14:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 14:37
cis-1,2-Dichloroethene	**240**		**1.0**	**2.5**	**5.0**	**UG/L**	5	25-Sep-2019 16:38
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 14:37
Trichloroethene	**29**		**0.20**	**0.50**	**1.0**	**UG/L**	1	25-Sep-2019 14:37
Vinyl chloride	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	25-Sep-2019 14:37
Surr: 1,2-Dichloroethane-d4	*90.6*			**0**	*81-118*	*%REC*	*5*	*25-Sep-2019 16:38*
Surr: 1,2-Dichloroethane-d4	*91.2*			**0**	*81-118*	*%REC*	*1*	*25-Sep-2019 14:37*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*25-Sep-2019 14:37*
Surr: 4-Bromofluorobenzene	*108*			**0**	*85-114*	*%REC*	*5*	*25-Sep-2019 16:38*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*1*	*25-Sep-2019 14:37*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*5*	*25-Sep-2019 16:38*
Surr: Toluene-d8	*97.6*			**0**	*89-112*	*%REC*	*5*	*25-Sep-2019 16:38*
Surr: Toluene-d8	*98.9*			**0**	*89-112*	*%REC*	*1*	*25-Sep-2019 14:37*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW22-190917
Collection Date: 17-Sep-2019 09:37

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	24-Sep-2019 20:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 20:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 20:47
cis-1,2-Dichloroethene	**2.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	24-Sep-2019 20:47
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	24-Sep-2019 20:47
Trichloroethene	**34**		**0.20**	**0.50**	**1.0**	**UG/L**	1	24-Sep-2019 20:47
Vinyl chloride	**0.44**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	24-Sep-2019 20:47
Surr: 1,2-Dichloroethane-d4	*91.4*			**0**	*81-118*	*%REC*	*1*	*24-Sep-2019 20:47*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*24-Sep-2019 20:47*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*1*	*24-Sep-2019 20:47*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*1*	*24-Sep-2019 20:47*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW41-190917
Collection Date: 17-Sep-2019 10:35

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	25-Sep-2019 19:26
1,1-Dichloroethene	**11**		**2.0**	**5.0**	**10**	**UG/L**	10	25-Sep-2019 19:26
1,2-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	25-Sep-2019 19:26
cis-1,2-Dichloroethene	**1,300**		**2.0**	**5.0**	**10**	**UG/L**	10	25-Sep-2019 19:26
Methylene chloride	10	U	4.0	10	20	UG/L	10	25-Sep-2019 19:26
Trichloroethene	**3,900**		**20**	**50**	**100**	**UG/L**	100	25-Sep-2019 19:50
Vinyl chloride	**80**		**2.0**	**5.0**	**10**	**UG/L**	10	25-Sep-2019 19:26
Surr: 1,2-Dichloroethane-d4	*89.6*			**0**	*81-118*	*%REC*	*10*	*25-Sep-2019 19:26*
Surr: 1,2-Dichloroethane-d4	*90.1*			**0**	*81-118*	*%REC*	*100*	*25-Sep-2019 19:50*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*10*	*25-Sep-2019 19:26*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*100*	*25-Sep-2019 19:50*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*10*	*25-Sep-2019 19:26*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*100*	*25-Sep-2019 19:50*
Surr: Toluene-d8	*98.7*			**0**	*89-112*	*%REC*	*10*	*25-Sep-2019 19:26*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*100*	*25-Sep-2019 19:50*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW39-190917
Collection Date: 17-Sep-2019 11:43

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 00:50
1,1-Dichloroethene	**2.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 00:50
1,2-Dichloroethane	**2.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 00:50
cis-1,2-Dichloroethene	**110**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 00:50
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 00:50
Trichloroethene	**1,200**		**2.0**	**5.0**	**10**	**UG/L**	10	25-Sep-2019 20:14
Vinyl chloride	**7.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 00:50
Surr: 1,2-Dichloroethane-d4	*89.4*			**0**	*81-118*	*%REC*	*10*	*25-Sep-2019 20:14*
Surr: 1,2-Dichloroethane-d4	*85.4*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 00:50*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*10*	*25-Sep-2019 20:14*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 00:50*
Surr: Dibromofluoromethane	*91.7*			**0**	*80-119*	*%REC*	*10*	*25-Sep-2019 20:14*
Surr: Dibromofluoromethane	*89.4*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 00:50*
Surr: Toluene-d8	*99.5*			**0**	*89-112*	*%REC*	*10*	*25-Sep-2019 20:14*
Surr: Toluene-d8	*96.7*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 00:50*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW56-190917
Collection Date: 17-Sep-2019 13:12

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	24-Sep-2019 21:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 21:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 21:11
cis-1,2-Dichloroethene	**1.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	24-Sep-2019 21:11
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	24-Sep-2019 21:11
Trichloroethene	**27**		**0.20**	**0.50**	**1.0**	**UG/L**	1	24-Sep-2019 21:11
Vinyl chloride	**0.41**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	24-Sep-2019 21:11
Surr: 1,2-Dichloroethane-d4	*92.1*			**0**	*81-118*	*%REC*	*1*	*24-Sep-2019 21:11*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*24-Sep-2019 21:11*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*1*	*24-Sep-2019 21:11*
Surr: Toluene-d8	*98.4*			**0**	*89-112*	*%REC*	*1*	*24-Sep-2019 21:11*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW40-190917
Collection Date: 17-Sep-2019 14:09

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 00:26
1,1-Dichloroethene	**3.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 00:26
1,2-Dichloroethane	**3.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 00:26
cis-1,2-Dichloroethene	**130**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 00:26
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 00:26
Trichloroethene	**740**		**1.0**	**2.5**	**5.0**	**UG/L**	5	25-Sep-2019 18:38
Vinyl chloride	**3.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 00:26
Surr: 1,2-Dichloroethane-d4	*90.3*			**0**	*81-118*	*%REC*	*5*	*25-Sep-2019 18:38*
Surr: 1,2-Dichloroethane-d4	*85.5*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 00:26*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*5*	*25-Sep-2019 18:38*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 00:26*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*5*	*25-Sep-2019 18:38*
Surr: Dibromofluoromethane	*91.3*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 00:26*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*5*	*25-Sep-2019 18:38*
Surr: Toluene-d8	*96.7*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 00:26*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW55-190917
Collection Date: 17-Sep-2019 14:54

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	25-Sep-2019 21:02
1,1-Dichloroethene	**9.1**	J	**2.0**	**5.0**	**10**	**UG/L**	10	25-Sep-2019 21:02
1,2-Dichloroethane	**5.3**	J	**2.0**	**5.0**	**10**	**UG/L**	10	25-Sep-2019 21:02
cis-1,2-Dichloroethene	**310**		**2.0**	**5.0**	**10**	**UG/L**	10	25-Sep-2019 21:02
Methylene chloride	10	U	4.0	10	20	UG/L	10	25-Sep-2019 21:02
Trichloroethene	**3,200**		**20**	**50**	**100**	**UG/L**	100	25-Sep-2019 21:26
Vinyl chloride	**37**		**2.0**	**5.0**	**10**	**UG/L**	10	25-Sep-2019 21:02
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*10*	*25-Sep-2019 21:02*
Surr: 1,2-Dichloroethane-d4	*89.0*			**0**	*81-118*	*%REC*	*100*	*25-Sep-2019 21:26*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*10*	*25-Sep-2019 21:02*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*100*	*25-Sep-2019 21:26*
Surr: Dibromofluoromethane	*93.5*			**0**	*80-119*	*%REC*	*10*	*25-Sep-2019 21:02*
Surr: Dibromofluoromethane	*93.3*			**0**	*80-119*	*%REC*	*100*	*25-Sep-2019 21:26*
Surr: Toluene-d8	*99.9*			**0**	*89-112*	*%REC*	*10*	*25-Sep-2019 21:02*
Surr: Toluene-d8	*98.4*			**0**	*89-112*	*%REC*	*100*	*25-Sep-2019 21:26*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW43-190917
Collection Date: 17-Sep-2019 12:35

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-11
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	24-Sep-2019 21:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 21:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 21:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 21:36
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	24-Sep-2019 21:36
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 21:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 21:36
Surr: 1,2-Dichloroethane-d4	*91.2*			**0**	*81-118*	*%REC*	*1*	*24-Sep-2019 21:36*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*24-Sep-2019 21:36*
Surr: Dibromofluoromethane	*94.3*			**0**	*80-119*	*%REC*	*1*	*24-Sep-2019 21:36*
Surr: Toluene-d8	*99.3*			**0**	*89-112*	*%REC*	*1*	*24-Sep-2019 21:36*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW23-190917
Collection Date: 17-Sep-2019 13:50

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-12
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	24-Sep-2019 22:00
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 22:00
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 22:00
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 22:00
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	24-Sep-2019 22:00
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 22:00
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	24-Sep-2019 22:00
Surr: 1,2-Dichloroethane-d4	*91.5*			**0**	*81-118*	*%REC*	*1*	*24-Sep-2019 22:00*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*24-Sep-2019 22:00*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*24-Sep-2019 22:00*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*1*	*24-Sep-2019 22:00*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW24-190917
Collection Date: 17-Sep-2019 14:55

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-13
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 17:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:02
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:02
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 17:02
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:02
Surr: 1,2-Dichloroethane-d4	*90.7*			**0**	*81-118*	*%REC*	*1*	*25-Sep-2019 17:02*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*25-Sep-2019 17:02*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*1*	*25-Sep-2019 17:02*
Surr: Toluene-d8	*99.5*			**0**	*89-112*	*%REC*	*1*	*25-Sep-2019 17:02*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16WW27-190917
Collection Date: 17-Sep-2019 10:25

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-14
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 17:26
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:26
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:26
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:26
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 17:26
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:26
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:26
Surr: 1,2-Dichloroethane-d4	*90.6*			**0**	*81-118*	*%REC*	*1*	*25-Sep-2019 17:26*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*25-Sep-2019 17:26*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*1*	*25-Sep-2019 17:26*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*1*	*25-Sep-2019 17:26*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16LHAAP-TB1-190916
Collection Date: 16-Sep-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-15
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 13:49
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:49
Surr: 1,2-Dichloroethane-d4	*92.4*			**0**	*81-118*	*%REC*	*1*	*25-Sep-2019 13:49*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*25-Sep-2019 13:49*
Surr: Dibromofluoromethane	*94.6*			**0**	*80-119*	*%REC*	*1*	*25-Sep-2019 13:49*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*25-Sep-2019 13:49*

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16LHAAP-TB2-190916
Collection Date: 16-Sep-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19090860
Lab ID:HS19090860-16
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 14:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 14:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 14:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 14:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 14:13
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 14:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 14:13
Surr: 1,2-Dichloroethane-d4	*89.6*			**0**	*81-118*	*%REC*	*1*	*25-Sep-2019 14:13*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*25-Sep-2019 14:13*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*1*	*25-Sep-2019 14:13*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*1*	*25-Sep-2019 14:13*

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19090860

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346918 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19090860-01	16WW14-190916	16 Sep 2019 13:43			24 Sep 2019 18:47	1
HS19090860-02	16WW16-190916	16 Sep 2019 14:34			24 Sep 2019 20:23	250
HS19090860-02	16WW16-190916	16 Sep 2019 14:34			24 Sep 2019 19:11	25
HS19090860-05	16WW22-190917	17 Sep 2019 09:37			24 Sep 2019 20:47	1
HS19090860-08	16WW56-190917	17 Sep 2019 13:12			24 Sep 2019 21:11	1
HS19090860-11	16WW43-190917	17 Sep 2019 12:35			24 Sep 2019 21:36	1
HS19090860-12	16WW23-190917	17 Sep 2019 13:50			24 Sep 2019 22:00	1
Batch ID: R347016 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19090860-03	16WW36-190916	16 Sep 2019 15:37			25 Sep 2019 16:14	250
HS19090860-03	16WW36-190916	16 Sep 2019 15:37			25 Sep 2019 15:02	25
HS19090860-04	16WW42-190916	16 Sep 2019 16:33			25 Sep 2019 16:38	5
HS19090860-04	16WW42-190916	16 Sep 2019 16:33			25 Sep 2019 14:37	1
HS19090860-06	16WW41-190917	17 Sep 2019 10:35			25 Sep 2019 19:50	100
HS19090860-06	16WW41-190917	17 Sep 2019 10:35			25 Sep 2019 19:26	10
HS19090860-07	16WW39-190917	17 Sep 2019 11:43			25 Sep 2019 20:14	10
HS19090860-09	16WW40-190917	17 Sep 2019 14:09			25 Sep 2019 18:38	5
HS19090860-10	16WW55-190917	17 Sep 2019 14:54			25 Sep 2019 21:26	100
HS19090860-10	16WW55-190917	17 Sep 2019 14:54			25 Sep 2019 21:02	10
HS19090860-13	16WW24-190917	17 Sep 2019 14:55			25 Sep 2019 17:02	1
HS19090860-14	16WW27-190917	17 Sep 2019 10:25			25 Sep 2019 17:26	1
HS19090860-15	16LHAAP-TB1-190916	16 Sep 2019 00:00			25 Sep 2019 13:49	1
HS19090860-16	16LHAAP-TB2-190916	16 Sep 2019 00:00			25 Sep 2019 14:13	1
Batch ID: R347098 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19090860-07	16WW39-190917	17 Sep 2019 11:43			27 Sep 2019 00:50	1
HS19090860-09	16WW40-190917	17 Sep 2019 14:09			27 Sep 2019 00:26	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19090860

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R347481 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS19090860-01	16WW14-190916	16 Sep 2019 13:43			02 Oct 2019 16:54	1
HS19090860-02	16WW16-190916	16 Sep 2019 14:34			02 Oct 2019 16:54	1
HS19090860-03	16WW36-190916	16 Sep 2019 15:37			02 Oct 2019 16:54	1
HS19090860-04	16WW42-190916	16 Sep 2019 16:33			02 Oct 2019 16:54	1
HS19090860-05	16WW22-190917	17 Sep 2019 09:37			02 Oct 2019 16:54	1
HS19090860-06	16WW41-190917	17 Sep 2019 10:35			02 Oct 2019 16:54	1
HS19090860-07	16WW39-190917	17 Sep 2019 11:43			02 Oct 2019 16:54	1
HS19090860-08	16WW56-190917	17 Sep 2019 13:12			02 Oct 2019 16:54	1
HS19090860-09	16WW40-190917	17 Sep 2019 14:09			02 Oct 2019 16:54	1
HS19090860-10	16WW55-190917	17 Sep 2019 14:54			02 Oct 2019 16:54	1
HS19090860-11	16WW43-190917	17 Sep 2019 12:35			02 Oct 2019 16:54	1
HS19090860-12	16WW23-190917	17 Sep 2019 13:50			02 Oct 2019 16:54	1
HS19090860-13	16WW24-190917	17 Sep 2019 14:55			02 Oct 2019 16:54	1
HS19090860-14	16WW27-190917	17 Sep 2019 10:25			02 Oct 2019 16:54	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19090860

QC BATCH REPORT

Batch ID: R346918 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190924** Units: **UG/L** Analysis Date: **24-Sep-2019 18:23**
Client ID: Run ID: **VOA6_346918** SeqNo: **5267478** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.53*	*1.0*	*50*	*0*	*91.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.29*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*47.12*	*1.0*	*50*	*0*	*94.2*	*80 - 119*				
Surr: Toluene-d8	*48.88*	*1.0*	*50*	*0*	*97.8*	*89 - 112*				

LCS Sample ID: **VLCSW-190924** Units: **UG/L** Analysis Date: **24-Sep-2019 17:35**
Client ID: Run ID: **VOA6_346918** SeqNo: **5267477** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.45	1.0	20	0	102	80 - 119				
1,1-Dichloroethene	18.88	1.0	20	0	94.4	71 - 131				
1,2-Dichloroethane	19.55	1.0	20	0	97.8	73 - 128				
cis-1,2-Dichloroethene	19.25	1.0	20	0	96.3	78 - 123				
Methylene chloride	20.34	2.0	20	0	102	74 - 124				
Trichloroethene	18.17	1.0	20	0	90.8	79 - 123				
Vinyl chloride	18.42	1.0	20	0	92.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.06*	*1.0*	*50*	*0*	*104*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.67*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*52.07*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*46.27*	*1.0*	*50*	*0*	*92.5*	*89 - 112*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19090860

QC BATCH REPORT

Batch ID: R346918 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19090860-01MS** Units: **UG/L** Analysis Date: **24-Sep-2019 19:35**
Client ID: **16WW14-190916** Run ID: **VOA6_346918** SeqNo: **5267481** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.03	1.0	20	0	100	80 - 119				
1,1-Dichloroethene	18.21	1.0	20	0	91.1	71 - 131				
1,2-Dichloroethane	17.86	1.0	20	0	89.3	73 - 128				
cis-1,2-Dichloroethene	18.32	1.0	20	0.7892	87.6	78 - 123				
Methylene chloride	16.9	2.0	20	0	84.5	74 - 124				
Trichloroethene	45.53	1.0	20	25.26	101	79 - 123				
Vinyl chloride	15.24	1.0	20	0	76.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.98*	*1.0*	*50*	*0*	*92.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.99*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*47.76*	*1.0*	*50*	*0*	*95.5*	*80 - 119*				
Surr: Toluene-d8	*50.16*	*1.0*	*50*	*0*	*100*	*89 - 112*				

MSD Sample ID: **HS19090860-01MSD** Units: **UG/L** Analysis Date: **24-Sep-2019 19:59**
Client ID: **16WW14-190916** Run ID: **VOA6_346918** SeqNo: **5267482** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.13	1.0	20	0	95.7	80 - 119	20.03	4.57	20	
1,1-Dichloroethene	16.83	1.0	20	0	84.2	71 - 131	18.21	7.88	20	
1,2-Dichloroethane	17.29	1.0	20	0	86.5	73 - 128	17.86	3.25	20	
cis-1,2-Dichloroethene	17.19	1.0	20	0.7892	82.0	78 - 123	18.32	6.37	20	
Methylene chloride	15.87	2.0	20	0	79.4	74 - 124	16.9	6.3	20	
Trichloroethene	43.16	1.0	20	25.26	89.5	79 - 123	45.53	5.33	20	
Vinyl chloride	14.16	1.0	20	0	70.8	58 - 137	15.24	7.38	20	
Surr: 1,2-Dichloroethane-d4	*45.54*	*1.0*	*50*	*0*	*91.1*	*81 - 118*	*45.98*	*0.956*	*20*	
Surr: 4-Bromofluorobenzene	*51.94*	*1.0*	*50*	*0*	*104*	*85 - 114*	*50.99*	*1.85*	*20*	
Surr: Dibromofluoromethane	*47.56*	*1.0*	*50*	*0*	*95.1*	*80 - 119*	*47.76*	*0.403*	*20*	
Surr: Toluene-d8	*49.2*	*1.0*	*50*	*0*	*98.4*	*89 - 112*	*50.16*	*1.94*	*20*	

The following samples were analyzed in this batch: HS19090860-01 HS19090860-02 HS19090860-05 HS19090860-08 HS19090860-11 HS19090860-12

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19090860

QC BATCH REPORT

Batch ID: R347016 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190925** Units: **UG/L** Analysis Date: **25-Sep-2019 12:37**
Client ID: Run ID: **VOA6_347016** SeqNo: **5269438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.75*	*1.0*	*50*	*0*	*89.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.44*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*46.53*	*1.0*	*50*	*0*	*93.1*	*80 - 119*				
Surr: Toluene-d8	*50.44*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-190925** Units: **UG/L** Analysis Date: **25-Sep-2019 11:49**
Client ID: Run ID: **VOA6_347016** SeqNo: **5269437** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.5	1.0	20	0	102	80 - 119				
1,1-Dichloroethene	18.3	1.0	20	0	91.5	71 - 131				
1,2-Dichloroethane	19.2	1.0	20	0	96.0	73 - 128				
cis-1,2-Dichloroethene	18.83	1.0	20	0	94.1	78 - 123				
Methylene chloride	20.03	2.0	20	0	100	74 - 124				
Trichloroethene	17.97	1.0	20	0	89.9	79 - 123				
Vinyl chloride	17.8	1.0	20	0	89.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.58*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.54*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*52.18*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*47.71*	*1.0*	*50*	*0*	*95.4*	*89 - 112*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19090860

QC BATCH REPORT

Batch ID: R347016 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19090847-01MS** Units: **UG/L** Analysis Date: **25-Sep-2019 15:26**
Client ID: Run ID: **VOA6_347016** SeqNo: **5269445** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.48	1.0	20	0	97.4	80 - 119				
1,1-Dichloroethene	17.22	1.0	20	0	86.1	71 - 131				
1,2-Dichloroethane	17.76	1.0	20	0	88.8	73 - 128				
cis-1,2-Dichloroethene	19.9	1.0	20	2.121	88.9	78 - 123				
Methylene chloride	16.8	2.0	20	0	84.0	74 - 124				
Trichloroethene	19.82	1.0	20	1.026	94.0	79 - 123				
Vinyl chloride	14.35	1.0	20	0	71.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.47*	*1.0*	*50*	*0*	*90.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.55*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*46.94*	*1.0*	*50*	*0*	*93.9*	*80 - 119*				
Surr: Toluene-d8	*49.26*	*1.0*	*50*	*0*	*98.5*	*89 - 112*				

MSD Sample ID: **HS19090847-01MSD** Units: **UG/L** Analysis Date: **25-Sep-2019 15:50**
Client ID: Run ID: **VOA6_347016** SeqNo: **5269446** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.64	1.0	20	0	93.2	80 - 119	19.48	4.39	20	
1,1-Dichloroethene	15.96	1.0	20	0	79.8	71 - 131	17.22	7.58	20	
1,2-Dichloroethane	17.06	1.0	20	0	85.3	73 - 128	17.76	4.01	20	
cis-1,2-Dichloroethene	18.34	1.0	20	2.121	81.1	78 - 123	19.9	8.14	20	
Methylene chloride	16.12	2.0	20	0	80.6	74 - 124	16.8	4.15	20	
Trichloroethene	18.29	1.0	20	1.026	86.3	79 - 123	19.82	8.06	20	
Vinyl chloride	13.44	1.0	20	0	67.2	58 - 137	14.35	6.54	20	
Surr: 1,2-Dichloroethane-d4	*45.03*	*1.0*	*50*	*0*	*90.1*	*81 - 118*	*45.47*	*0.978*	*20*	
Surr: 4-Bromofluorobenzene	*52.22*	*1.0*	*50*	*0*	*104*	*85 - 114*	*50.55*	*3.25*	*20*	
Surr: Dibromofluoromethane	*47.19*	*1.0*	*50*	*0*	*94.4*	*80 - 119*	*46.94*	*0.529*	*20*	
Surr: Toluene-d8	*48.77*	*1.0*	*50*	*0*	*97.5*	*89 - 112*	*49.26*	*1*	*20*	

The following samples were analyzed in this batch:

HS19090860-03	HS19090860-04	HS19090860-06	HS19090860-07
HS19090860-09	HS19090860-10	HS19090860-13	HS19090860-14
HS19090860-15	HS19090860-16		

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19090860

QC BATCH REPORT

Batch ID: R347098 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190926** Units: **UG/L** Analysis Date: **26-Sep-2019 16:01**
Client ID: Run ID: **VOA6_347098** SeqNo: **5271542** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.43*	*1.0*	*50*	*0*	*88.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.49*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*46.58*	*1.0*	*50*	*0*	*93.2*	*80 - 119*				
Surr: Toluene-d8	*48.94*	*1.0*	*50*	*0*	*97.9*	*89 - 112*				

LCS Sample ID: **VLCSW-190926** Units: **UG/L** Analysis Date: **26-Sep-2019 15:13**
Client ID: Run ID: **VOA6_347098** SeqNo: **5271541** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.84	1.0	20	0	99.2	80 - 119				
1,1-Dichloroethene	18.21	1.0	20	0	91.1	71 - 131				
1,2-Dichloroethane	18.48	1.0	20	0	92.4	73 - 128				
cis-1,2-Dichloroethene	18.28	1.0	20	0	91.4	78 - 123				
Methylene chloride	18.89	2.0	20	0	94.5	74 - 124				
Vinyl chloride	17.83	1.0	20	0	89.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.73*	*1.0*	*50*	*0*	*93.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.1*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*48.37*	*1.0*	*50*	*0*	*96.7*	*80 - 119*				
Surr: Toluene-d8	*45.53*	*1.0*	*50*	*0*	*91.1*	*89 - 112*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19090860

QC BATCH REPORT

Batch ID: R347098 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19090962-12MS** Units: **UG/L** Analysis Date: **26-Sep-2019 18:25**
Client ID: Run ID: **VOA6_347098** SeqNo: **5271548** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.64	1.0	20	0	98.2	80 - 119				
1,1-Dichloroethene	17.64	1.0	20	0.5633	85.4	71 - 131				
1,2-Dichloroethane	17.08	1.0	20	0	85.4	73 - 128				
cis-1,2-Dichloroethene	16.97	1.0	20	0	84.8	78 - 123				
Methylene chloride	16.28	2.0	20	0	81.4	74 - 124				
Vinyl chloride	14.19	1.0	20	0	70.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.78*	*1.0*	*50*	*0*	*89.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.41*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*46.8*	*1.0*	*50*	*0*	*93.6*	*80 - 119*				
Surr: Toluene-d8	*49.33*	*1.0*	*50*	*0*	*98.7*	*89 - 112*				

MSD Sample ID: **HS19090962-12MSD** Units: **UG/L** Analysis Date: **26-Sep-2019 18:49**
Client ID: Run ID: **VOA6_347098** SeqNo: **5271549** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.39	1.0	20	0	97.0	80 - 119	19.64	1.26	20	
1,1-Dichloroethene	16.74	1.0	20	0.5633	80.9	71 - 131	17.64	5.28	20	
1,2-Dichloroethane	16.96	1.0	20	0	84.8	73 - 128	17.08	0.69	20	
cis-1,2-Dichloroethene	16.17	1.0	20	0	80.9	78 - 123	16.97	4.79	20	
Methylene chloride	15.61	2.0	20	0	78.0	74 - 124	16.28	4.25	20	
Vinyl chloride	12.99	1.0	20	0	65.0	58 - 137	14.19	8.78	20	
Surr: 1,2-Dichloroethane-d4	*43.8*	*1.0*	*50*	*0*	*87.6*	*81 - 118*	*44.78*	*2.21*	*20*	
Surr: 4-Bromofluorobenzene	*50.72*	*1.0*	*50*	*0*	*101*	*85 - 114*	*51.41*	*1.35*	*20*	
Surr: Dibromofluoromethane	*46.33*	*1.0*	*50*	*0*	*92.7*	*80 - 119*	*46.8*	*1.01*	*20*	
Surr: Toluene-d8	*49.14*	*1.0*	*50*	*0*	*98.3*	*89 - 112*	*49.33*	*0.388*	*20*	

The following samples were analyzed in this batch: HS19090860-07 HS19090860-09

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS19090860**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19090860

Date/Time Received: **18-Sep-2019 09:00**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature — 18-Sep-2019 Date

Reviewed by: *RJ Modashia* eSignature — 19-Sep-2019 Date

Matrices: **Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.4c; 3.3c U/c	IR25
Cooler(s)/Kit(s):	45192/43815	
Date/Time sample(s) sent to storage:	9/18/19 20:05	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: 16WW27-190917 not checked off for analysis on COC
Logged in with analysis

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID:	LHAAP16-SEPT2019-ALSHT-1909-17	TURNAROUND TIME: normal	RUSH:	Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY							
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories				Fedinvoices @aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com				Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210				Susan Huang		
	PMB 202								4005 Port Chicago Hwy		
City	Marshall	State	TX	City	Houston	State	TX		Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA		94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav										

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	VOCs in Water by 8260B (see required VOCs below)	Perchlorate in Water by 6850	Alkalinity (SM2320B)	Anions by E300.0 (see required anions below)	Dissolved Gases (methane, ethane, and ethene) by RSK-175	TOC by (SM5310C)
								Containers and Preservative	3x40 ml VOA, HCL	1x125 ml HPDE, Ice	1x250 ml HPDE, Ice		3x40 ml VOA, HCL	2x40 ml VOA, HsSO4
16WW14-190916						9/16/19	1343	4	X	X				
16WW16-190916						9/16/19	1434	4	X	X				
16WW36-190916						9/16/19	1537	4	X	X				
16WW42-190916						9/16/19	1633	4	X	X				
16WW22-190917						9/17/19	937	4	X	X				
16WW41-190917						9/17/19	1035	4	X	X				
16WW39-190917						9/17/19	1143	4	X	X				
16WW56-190917						9/17/19	1312	4	X	X				
16WW40-190917						9/17/19	1409	4	X	X				
16WW55-190917						9/17/19	1454	4	X	X				
16WW43-190917						9/17/19	1235	4	X	X				
16WW23-190917						9/17/19	1350	4	X	X				
16WW24-190917						9/17/19	1455	4	X	X				
16WW27-190917						9/17/19	1025	4						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	Wesley Owen Aptim	9/17/19 1900	AC ALS	9/18/19 09:00
Required anions are: (1) bromide for sample 16WW49; and (2) nitrate, sulfate and bromide for samples 16WW57 and 16WW58				

HS19090860

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant

43792 - Temp 4.4 ... 43815 - Temp 4.4 3.3

APTIM

COC ID: LHAAP16-SEPT2019-ALSHT-1909- | TURNAROUND TIME: normal | RUSH: | Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY					
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com	
Project Number	501032			Lab Contact	RJ Modashia				
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stanchiff Rd., Suite 210			Susan Huang	
	PMB 202							4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX	Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656				
Project Manager	Praveen Srivastav								

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS: Containers and Preservative	3x40 ml VOA, HCL: VOCs in Water by 8260B (see required VOCs below)	1x125 ml HPDE, Ice: Perchlorate in Water by 6850	1x250 ml HPDE, Ice: Alkalinity (SM2320B)	Anions by E300.0 (see required anions below)	3x40 ml VOA, HCL: Dissolved Gases (methane, ethane, and ethene) by RSK-175	2x40 ml VOA, H2SO4: TOC by (SM5310C)
16LHAAP-TB1-190916						9/16/19	0:5	2		X					
16LHAAP-TB2-190916						9/17/19	0:5	2		X					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride

Required anions are: (1) bromide for sample 16WW49; and (2) nitrate, sulfate and bromide for samples 16WW57 and 16WW58

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
[illegible]	9/17/19 1500	AC ALS	9/18/19 0700

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant

HS19090860

43815 - Temp ICC 3.3

45192 SEP 18 2019

45192

SHIP DATE: 17SEP19
ACTWGT: 29.70 LB
CAD: 6994980/SSHE2002
DIMS: 19x13x16 IN
BILL CREDIT CARD

WESLEY ALVINO GARCIA
102 RESACA LN
ROCKPORT, TX 78382
UNITED STATES US

TO ALS ENVIROMENT HOUSTON LA
ALS ENVIROMENT HOUSTON LAB
10450 STANCLIFF RD
STE 210
HOUSTON TX 77099

REF:
DEPT:

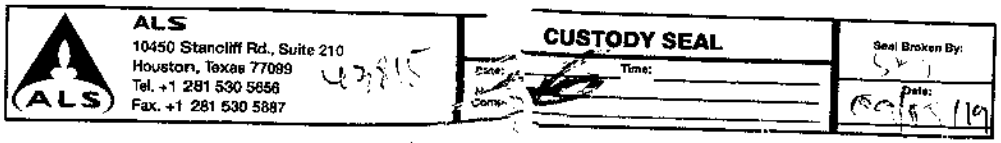
FedEx Express

TRK# 7898 7788 2822

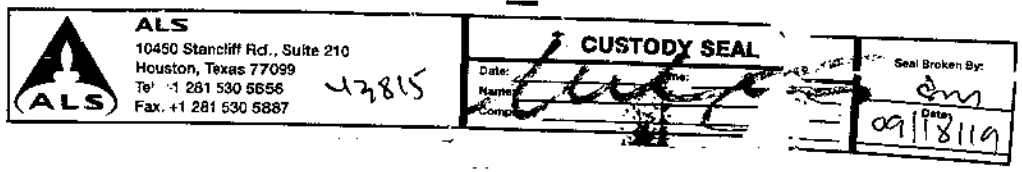
WED - 18 SEP 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH



43815 SEP 18 2019



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1927206; 1927207

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2294 (248518)

General Set Information: There were fifteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1927207002/07/10 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 675448) was less than 1/2 the CRDL. The recovery for the LCS (675449) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1927206001 (Client ID: LH18/24-SP650_091719_AIX). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 675446) is reported from the analysis of the Laboratory Control Sample (LCS – 675449) at a level of 3.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 20SEPD13/23. Field samples 1927207006/09 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.

Thomas Bosch September 26, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: October 01, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1927207**
Project ID: HS19090860
Purchase Order: HS19090860
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16WW14-190916	1927207001	09/16/19	09/21/19	
16WW16-190916	1927207002	09/16/19	09/21/19	
16WW36-190916	1927207003	09/16/19	09/21/19	
16WW42-190916	1927207004	09/16/19	09/21/19	
16WW22-190917	1927207005	09/17/19	09/21/19	
16WW41-190917	1927207006	09/17/19	09/21/19	
16WW39-190917	1927207007	09/17/19	09/21/19	
16WW56-190917	1927207008	09/17/19	09/21/19	
16WW40-190917	1927207009	09/17/19	09/21/19	
16WW55-190917	1927207010	09/17/19	09/21/19	
16WW43-190917	1927207011	09/17/19	09/21/19	
16WW23-190917	1927207012	09/17/19	09/21/19	
16WW24-190917	1927207013	09/17/19	09/21/19	
16WW27-190917	1927207014	09/17/19	09/21/19	

ANALYTICAL REPORT

Workorder: 34-1927207
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW14-190916** | Sampling Site: NA | Collected: 09/16/2019
Lab ID: 1927207001 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 10:15 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW16-190916** | Sampling Site: NA | Collected: 09/16/2019
Lab ID: 1927207002 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 10:28 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**460**	10	20	40	10	

Sample ID: **16WW36-190916** | Sampling Site: NA | Collected: 09/16/2019
Lab ID: 1927207003 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 10:42 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW42-190916** | Sampling Site: NA | Collected: 09/16/2019
Lab ID: 1927207004 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 10:56 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1927207
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW22-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207005 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 11:10 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW41-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207006 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 11:24 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW39-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207007 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 11:37 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**130**	10	20	40	10	

Sample ID: **16WW56-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207008 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 11:51 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1927207
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW40-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207009 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 12:05 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW55-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207010 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 12:34 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**480**	10	20	40	10	

Sample ID: **16WW43-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207011 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 12:48 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW23-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207012 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 13:02 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1927207
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW24-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207013 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 13:16 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW27-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927207014 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2294 (HBN: 248518) | **%Solids:** NA
Analyzed: 09/25/2019 13:30 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 09/26/2019 12:48	/S/ Stephen Brose 10/01/2019 11:46

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1927207
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1927207

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2294 (HBN: 248518)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 675448
Analyzed: 09/25/2019 09:19
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 675449
Analyzed: 09/25/2019 08:52
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.01	3.00	100	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1927206001	**MS:**	675450				**MSD:**	675451			
Analyzed:	09/25/2019 09:33	**Analyzed:**	09/25/2019 09:47				**Analyzed:**	09/25/2019 10:01			
Dilution:	1	**Dilution:**	1				**Dilution:**	1			
Units:	ug/L	**Units:**	ug/L				**Units:**	ug/L			

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	2.81	3	93.6	78.8	123.8	2.86	95.2	1.73	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
09/26/2019 12:51	10/01/2019 11:46

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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

1927207

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: **Texas**

COC ID: **12190**

1927207

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19090860
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19090860-01**	**16WW14-190916**	**Water**	**16 Sep 2019 13:43**
	SUB_Perch-6850			02 Oct 2019
2.	**HS19090860-02**	**16WW16-190916**	**Water**	**16 Sep 2019 14:34**
	SUB_Perch-6850			02 Oct 2019
3.	**HS19090860-03**	**16WW36-190916**	**Water**	**16 Sep 2019 15:37**
	SUB_Perch-6850			02 Oct 2019
4.	**HS19090860-04**	**16WW42-190916**	**Water**	**16 Sep 2019 16:33**
	SUB_Perch-6850			02 Oct 2019
5.	**HS19090860-05**	**16WW22-190917**	**Water**	**17 Sep 2019 09:37**
	SUB_Perch-6850			02 Oct 2019
6.	**HS19090860-06**	**16WW41-190917**	**Water**	**17 Sep 2019 10:35**
	SUB_Perch-6850			02 Oct 2019
7.	**HS19090860-07**	**16WW39-190917**	**Water**	**17 Sep 2019 11:43**
	SUB_Perch-6850			02 Oct 2019
8.	**HS19090860-08**	**16WW56-190917**	**Water**	**17 Sep 2019 13:12**
	SUB_Perch-6850			02 Oct 2019
9.	**HS19090860-09**	**16WW40-190917**	**Water**	**17 Sep 2019 14:09**

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12190**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	SUB_Perch-6850			02 Oct 2019
10.	**HS19090860-10**	**16WW55-190917**	**Water**	**17 Sep 2019 14:54**
	SUB_Perch-6850			02 Oct 2019
11.	**HS19090860-11**	**16WW43-190917**	**Water**	**17 Sep 2019 12:35**
	SUB_Perch-6850			02 Oct 2019
12.	**HS19090860-12**	**16WW23-190917**	**Water**	**17 Sep 2019 13:50**
	SUB_Perch-6850			02 Oct 2019
13.	**HS19090860-13**	**16WW24-190917**	**Water**	**17 Sep 2019 14:55**
	SUB_Perch-6850			02 Oct 2019
14.	**HS19090860-14**	**16WW27-190917**	**Water**	**17 Sep 2019 10:25**
	SUB_Perch-6850			02 Oct 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 9/19/19 1800.

Received By: Meredith Arlund Date/Time: 9/21/2019 915

Cooler ID(s): 9 8 10 Temperature(s): 2°

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston — Project/Task/Site: 1927207

Date/Time of Receipt: 9/21/19 1915 — Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 01890	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Meredith Blount (Signature) — Meredith Blount (Printed Name) — 9/21/2019 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc — Revised 01/01/2018

ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 20SEP19
ACTWGT: 41.45 LB
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19090804/860/962/964 - RJ

FedEx Express

TRK# 0201 1251 0289 7452

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO BTFA

84123
UT-US SLC

Part #-159469-434 RIT2 EXP 05/20 *

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19090860	***Split:***	**Workorder ID:** 1927207	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	09/16/2019 13:43	16WW14-190916	1927207001		Water	A	1	A
2	09/16/2019 14:34	16WW16-190916	1927207002		Water	A	1	A
3	09/16/2019 15:37	16WW36-190916	1927207003		Water	A	1	A
4	09/16/2019 16:33	16WW42-190916	1927207004		Water	A	1	A
5	09/17/2019 09:37	16WW22-190917	1927207005		Water	A	1	A
6	09/17/2019 10:35	16WW41-190917	1927207006		Water	A	1	A
7	09/17/2019 11:43	16WW39-190917	1927207007		Water	A	1	A
8	09/17/2019 13:12	16WW56-190917	1927207008		Water	A	1	A
9	09/17/2019 14:09	16WW40-190917	1927207009		Water	A	1	A
10	09/17/2019 14:54	16WW55-190917	1927207010		Water	A	1	A

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	09/21/2019 09:15	ALS Sample Receiving	Sample Login
Julie Warath 9/23/19 1600		ISC	Storage
R.33.1	09.24.19/09:00	T.Bush	COC ANALYSIS

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19090860	Split:	Workorder ID: 1927207	Level: ENV_LVL4	Requested Analysis
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly	
Comments:			Preservatives	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Count	EPA 6850, DoD QSM
11	09/17/2019 12:35	16WW43-190917	1927207011		Water	A	1	A
12	09/17/2019 13:50	16WW23-190917	1927207012		Water	A	1	A
13	09/17/2019 14:55	16WW24-190917	1927207013		Water	A	1	A
14	09/17/2019 10:25	16WW27-190917	1927207014		Water	A	1	A
15								
16								
17								
18								
19								
20								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	09/21/2019 09:15	ALS Sample Receiving	Sample Login
[signature]	9/23/19 1600	15C	Storage
R.33.1	09.24.19/09:00	T. Bond	CLOA ANALYSIS

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

Batch Worklist

Batch: ELMS/ 2294 **Created:** 9/25/2019 07:49 **Instrument:** **HBN:** 248518

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1927206 [ENV_LVL4]

Workorder: 1927207 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	675445	CCV for HBN 248518 [ELMS/2294]				CCV	3		E685041C3Q	5311		10/3/2019	
2	675446	RLVS for HBN 248518 [ELMS/2294				RLVS	3		E685041C3Q	5311		10/3/2019	
3	675447	ICS for HBN 248518 [ELMS/2294]				ICS	3		E6850..D3Q	5311		10/3/2019	
4	675448	LMB for HBN 248518 [ELMS/2294]				LMB	3		E6850Q413Q	5311		10/3/2019	
5	675449	LCS for HBN 248518 [ELMS/2294]				LCS	3		E6850Q413Q	5311		10/3/2019	
6	1927206001	LH18/24-SP650_091719_AIX				SAMPLE	3	1927206001-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
7	675450	LH18/24-SP650...(1927206001MS)				MS	3		E6850Q413Q	5311		10/3/2019	
8	675451	LH18/24-SP65...(1927206001MSD)				MSD	3		E6850Q413Q	5311		10/3/2019	
9	1927207001	16WW14-190916				SAMPLE	3	1927207001-A	E6850Q41.3	5480	10/14/2019	10/3/2019	
10	1927207002	16WW16-190916				SAMPLE	3	1927207002-A	E6850Q41.3	5480	10/14/2019	10/3/2019	
11	1927207003	16WW36-190916				SAMPLE	3	1927207003-A	E6850Q41.3	5480	10/14/2019	10/3/2019	
12	1927207004	16WW42-190916				SAMPLE	3	1927207004-A	E6850Q41.3	5480	10/14/2019	10/3/2019	
13	1927207005	16WW22-190917				SAMPLE	3	1927207005-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
14	1927207006	16WW41-190917				SAMPLE	3	1927207006-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
15	1927207007	16WW39-190917				SAMPLE	3	1927207007-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
16	1927207008	16WW56-190917				SAMPLE	3	1927207008-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
17	1927207009	16WW40-190917				SAMPLE	3	1927207009-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
18	675452	CCV for HBN 248518 [ELMS/2294]				CCV	3		E685041C3Q	5311		10/3/2019	
19	1927207010	16WW55-190917				SAMPLE	3	1927207010-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
20	1927207011	16WW43-190917				SAMPLE	3	1927207011-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
21	1927207012	16WW23-190917				SAMPLE	3	1927207012-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
22	1927207013	16WW24-190917				SAMPLE	3	1927207013-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
23	1927207014	16WW27-190917				SAMPLE	3	1927207014-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
24	675453	CCV for HBN 248518 [ELMS/2294]				CCV	3		E685041C3Q	5311		10/3/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 1927206 (001); 1927207 (001-14)
ELMS Batch/HBN ID: 2294 (248518)
Prep Date: 09/24/2019 Analysis Date: 09/25/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\25SEP19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 675449; Target = 3.0µg/L. ASTM type II water was used for LMB 675448.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1927206001 (Client ID: LH18/24-SP650_091719_AIX). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

1) Results reported in µg/L.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters. Field samples 1927207002/07/10 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly. Field samples 1927207006/09 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\SEP\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\248518-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 675446) is reported from the analysis of the Laboratory Control Sample (LCS – 675449) at a level of 3.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 25SEPD13/23.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria **Batch(es)/SDG:** ELMS. 2294 HBN: 248518 **Sample Set IDs if Applicable:** WO's 1927206/1927207	**Analyst Initials**	**Reviewer Initials**
Sample positions on autosampler verified against instrument sequence	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#_____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 49946	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/23/2019 03:09PM	**Expires:** 09/19/2020
MFG Lot: TNB: 09/20/2019	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 47863	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 05/23/2019 10:05AM	**Expires:** 12/05/2028
MFG Lot: SDIH-016	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — **Description - 6850 WKG Std 100.ug/L**

Standard: 49948
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025
MFG Lot: Not Provided		**Usable:** Yes
Part ID: Not Provided		**Lab Lot:** LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 49947
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/23/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025
MFG Lot: Not Provided		**Usable:** Yes
Part ID: Not Provided		**Lab Lot:** LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL
Standard: 36748	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: Ultra Scientific	**Create Date:** 05/11/2017 01:05PM	**Expires:** 03/31/2020
MFG Lot: CP-0860		**Usable:** Yes
Part ID: ICC-013		**Lab Lot:** CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT	Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S 47863

Product Name: PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
(Isotopic Label & Enrichment Specification)

Lot Number: SDIH-016

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: ≥ 98%

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

$NaCl^{18}O_4$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.
Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number . Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\25SEP19D\25SEP19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount	
*	675445 CCV@25	Vial 71	1	Control	1	1.52149e6	7.621	25.90224	
*	675449 QC@3.0	Vial 72	1	Control	2	2.08955e5	7.664	3.01179	
*	675447 ICS@3.0	Vial 73	1	Control	3	1.50319e5	7.482	2.88825	
*	675448 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000	
*	1927206001	Vial 75	1	Sample	5	0.00000	0.000	0.00000	
*	675450 272061S	Vial 76	1	Sample	6	1.39320e5	7.385	2.80679	
*	675451 272061D	Vial 77	1	Sample	7	1.44537e5	7.383	2.85574	
*	1927207001	Vial 78	1	Sample	8	0.00000	0.000	0.00000	
*	1927207002 10X	Vial 79	1	Sample	9	2.98854e6	7.478	460.20446	
*	1927207003	Vial 80	1	Sample	10	0.00000	0.000	0.00000	
*	1927207004	Vial 81	1	Sample	11	0.00000	0.000	0.00000	
*	1927207005	Vial 82	1	Sample	12	0.00000	0.000	0.00000	
*	1927207006	Vial 83	1	Sample	13	1.88187e6	6.100	~~31.07390~~	N.R.
*	1927207007 10X	Vial 84	1	Sample	14	6.93117e5	7.335	133.87397	
*	1927207008	Vial 85	1	Sample	15	0.00000	0.000	0.00000	
*	1927207009	Vial 86	1	Sample	16	1.11064e5	6.770	~~2.02579~~	N.R.
*	675452 CCV@25	Vial 71	1	Control	17	1.27962e6	7.772	24.90310	
*	1927207010 10X	Vial 87	1	Sample	18	2.74935e6	7.426	477.50326	
*	1927207011	Vial 88	1	Sample	19	0.00000	0.000	0.00000	
*	1927207012	Vial 89	1	Sample	20	0.00000	0.000	0.00000	
*	1927207013	Vial 90	1	Sample	21	0.00000	0.000	0.00000	
*	1927207014	Vial 91	1	Sample	22	0.00000	0.000	0.00000	
*	1927207006 MS-25	Vial 61	1	Sample	23	2.73287e6	6.121	46.55394	
*	675453 CCV@25	Vial 71	1	Control	24	1.22155e6	7.794	25.00337	

N.R. = NOT REPORTED / FAILS 83/85 ION RATIO. TB 9.26.19

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	675445 CCV@25	Vial 71	1	Control	1	1.99964e5	7.645	5.00000
*	675449 QC@3.0	Vial 72	1	Control	2	2.55289e5	7.691	5.00000
*	675447 ICS@3.0	Vial 73	1	Control	3	1.91396e5	7.499	5.00000
*	675448 LMB	Vial 74	1	Control	4	2.07016e5	7.793	5.00000
*	1927206001	Vial 75	1	Sample	5	1.87714e5	7.354	5.00000
*	675450 272061S	Vial 76	1	Sample	6	1.82459e5	7.412	5.00000
*	675451 272061D	Vial 77	1	Sample	7	1.86097e5	7.399	5.00000
*	1927207001	Vial 78	1	Sample	8	1.65317e5	7.285	5.00000
*	1927207002 10X	Vial 79	1	Sample	9	2.03978e5	7.497	50.00000
*	1927207003	Vial 80	1	Sample	10	1.67627e5	6.803	5.00000
*	1927207004	Vial 81	1	Sample	11	1.77077e5	7.239	5.00000
*	1927207005	Vial 82	1	Sample	12	1.82948e5	7.234	5.00000
*	1927207006	Vial 83	1	Sample	13	2.01848e5	6.105	5.00000
*	1927207007 10X	Vial 84	1	Sample	14	1.85568e5	7.362	50.00000
*	1927207008	Vial 85	1	Sample	15	1.84103e5	7.282	5.00000
*	1927207009	Vial 86	1	Sample	16	2.00027e5	6.810	5.00000
*	675452 CCV@25	Vial 71	1	Control	17	1.75644e5	7.785	5.00000
*	1927207010 10X	Vial 87	1	Sample	18	1.79651e5	7.448	50.00000
*	1927207011	Vial 88	1	Sample	19	1.92432e5	7.645	5.00000
*	1927207012	Vial 89	1	Sample	20	1.72716e5	7.183	5.00000
*	1927207013	Vial 90	1	Sample	21	1.74006e5	7.201	5.00000
*	1927207014	Vial 91	1	Sample	22	1.67770e5	7.044	5.00000
*	1927207006 MS-25	Vial 61	1	Sample	23	1.84010e5	6.106	5.00000
*	675453 CCV@25	Vial 71	1	Control	24	1.66933e5	7.808	5.00000

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	675445 CCV@25	Vial 71	1	Control	1	4.75826e5	7.629	26.51372
*	675449 QC@3.0	Vial 72	1	Control	2	6.60079e4	7.698	3.02994
*	675447 ICS@3.0	Vial 73	1	Control	3	5.41931e4	7.494	3.32936
*	675448 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000

Batch Report: C:\HPCHEM\1\DATA\25SEP19D\25SEP19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	1927206001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	675450 272061S	Vial 76	1	Sample	6	4.84273e4	7.404	3.11348
*	675451 272061D	Vial 77	1	Sample	7	4.86841e4	7.381	3.06706
*	1927207001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1927207002 10X	Vial 79	1	Sample	9	8.89517e5	7.494	453.30278
*	1927207003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1927207004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1927207005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1927207006	Vial 83	1	Sample	13	4.80235e5	6.116	26.51007
*	1927207007 10X	Vial 84	1	Sample	14	2.18926e5	7.354	137.66095
*	1927207008	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1927207009	Vial 86	1	Sample	16	1.33981e4	6.772	6.69602e-1
*	675452 CCV@25	Vial 71	1	Control	17	3.93113e5	7.793	25.07225
*	1927207010 10X	Vial 87	1	Sample	18	8.19119e5	7.441	470.94700
*	1927207011	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1927207012	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1927207013	Vial 90	1	Sample	21	0.00000	0.000	0.00000
*	1927207014	Vial 91	1	Sample	22	0.00000	0.000	0.00000
*	1927207006 MS-25	Vial 61	1	Sample	23	7.47216e5	6.137	42.62658
*	675453 CCV@25	Vial 71	1	Control	24	3.69756e5	7.817	24.83520

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\25SEP19D.S

Sequence Table:

Method and Injection Info Part:

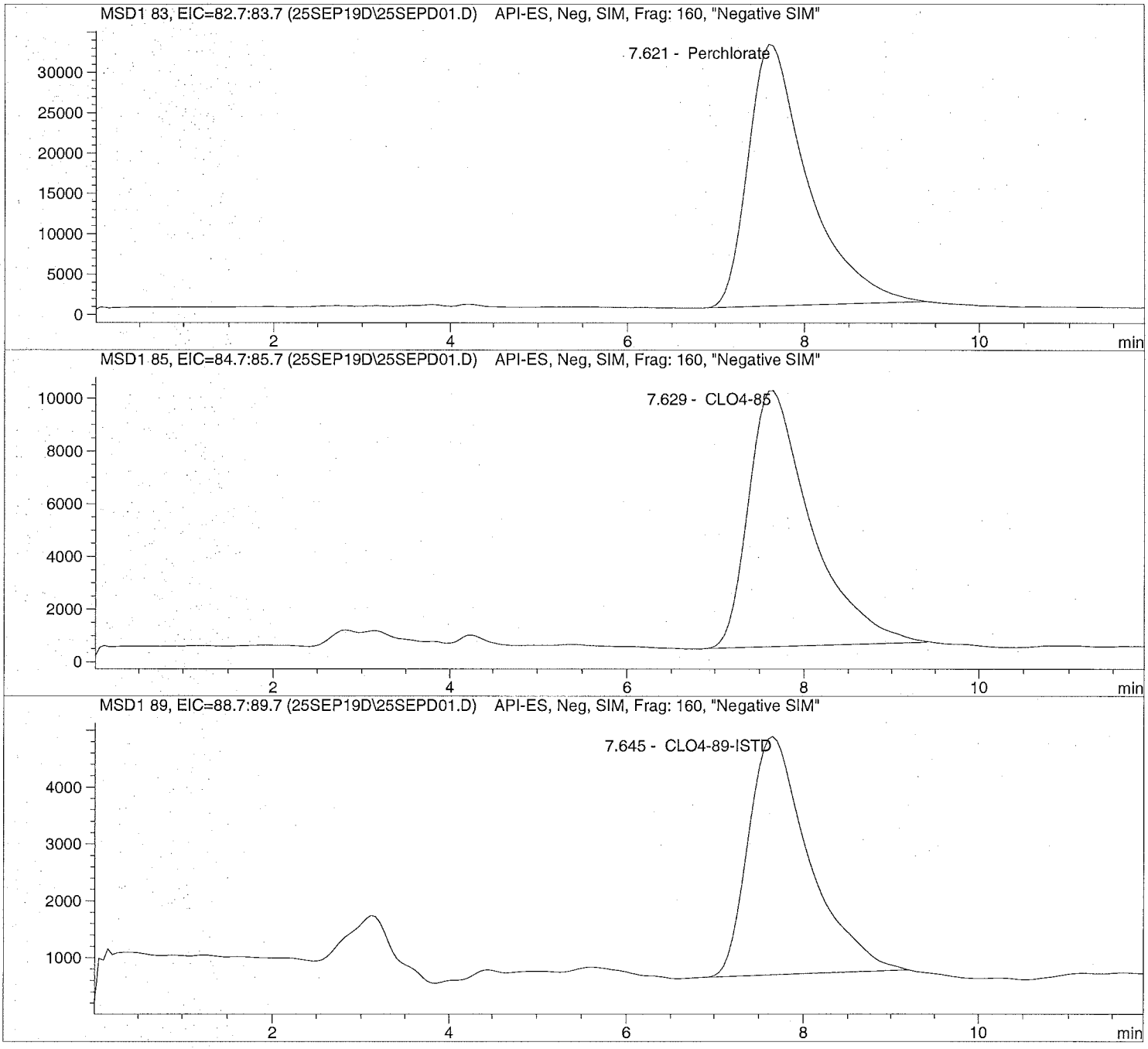
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	675445 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	675449 QC@3.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	675447 ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	675448 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1927206001	CLO4-AQN	1	Sample		
6	Vial 76	675450 272061S	CLO4-AQN	1	Sample		
7	Vial 77	675451 272061D	CLO4-AQN	1	Sample		
8	Vial 78	1927207001	CLO4-AQN	1	Sample		
9	Vial 79	1927207002 10X	CLO4-AQN	1	Sample		
10	Vial 80	1927207003	CLO4-AQN	1	Sample		
11	Vial 81	1927207004	CLO4-AQN	1	Sample		
12	Vial 82	1927207005	CLO4-AQN	1	Sample		
13	Vial 83	1927207006	CLO4-AQN	1	Sample		
14	Vial 84	1927207007 10X	CLO4-AQN	1	Sample		
15	Vial 85	1927207008	CLO4-AQN	1	Sample		
16	Vial 86	1927207009	CLO4-AQN	1	Sample		
17	Vial 71	675452 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1927207010 10X	CLO4-AQN	1	Sample		
19	Vial 88	1927207011	CLO4-AQN	1	Sample		
20	Vial 89	1927207012	CLO4-AQN	1	Sample		
21	Vial 90	1927207013	CLO4-AQN	1	Sample		
22	Vial 91	1927207014	CLO4-AQN	1	Sample		
23	Vial 61	1927207006 MS-25	CLO4-AQN	1	Sample		
24	Vial 71	675453 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD01.D Sample Name: 675445 CCV@25

Injection Date:	9/25/2019 08:33:38	Seq Line:	1
Sample Name:	675445 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD01.D Sample Name: 675445 CCV@25

Injection Date:	9/25/2019 08:33:38	Seq Line:	1
Sample Name:	675445 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.621	PBA	1521492.5	25.9022	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.629	PBA	475825.5	26.5137	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.645	PBA	199964.0	5.0000	CLO4-89-ISTD

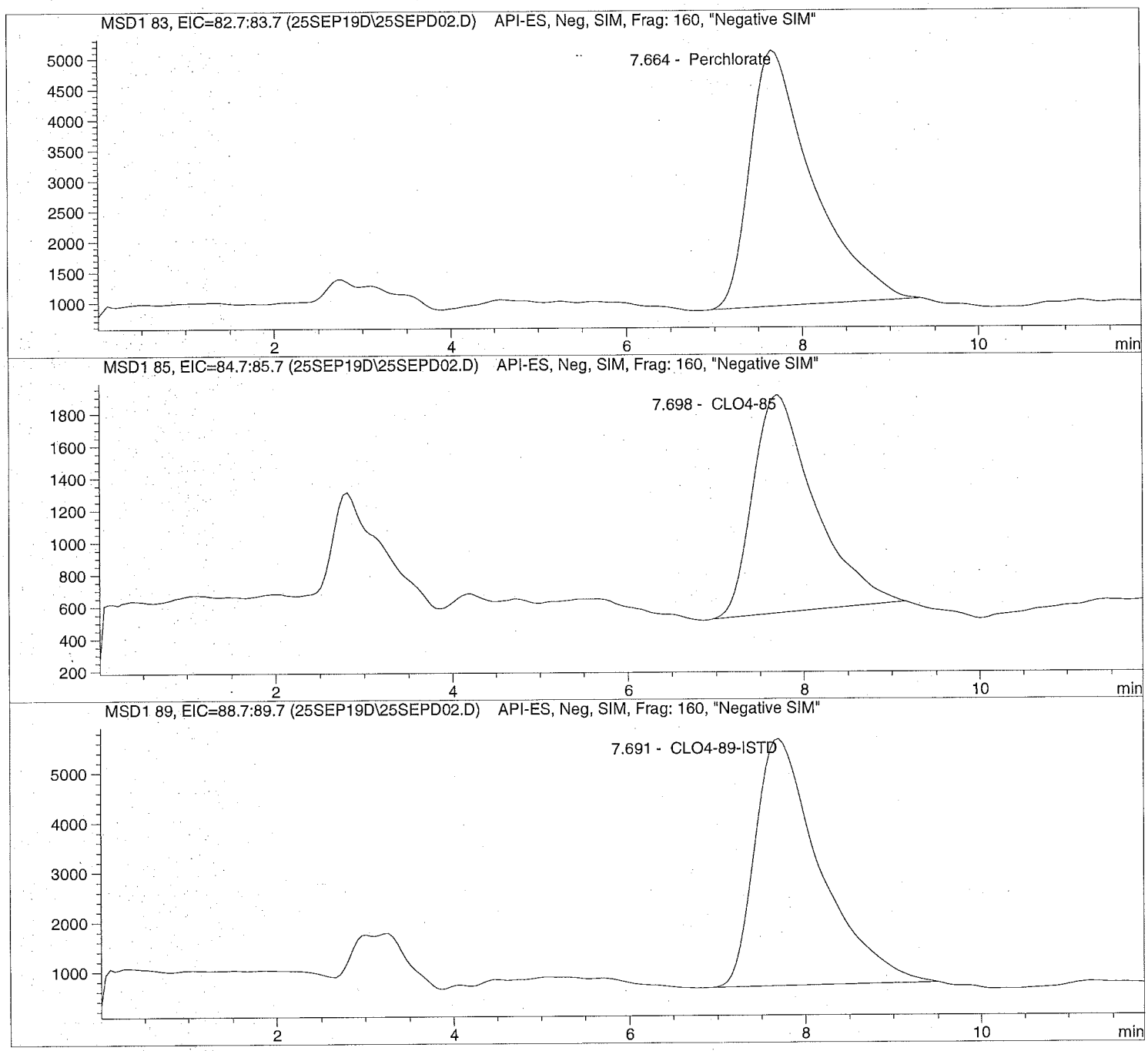
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD02.D Sample Name: 675449 QC@3.0

Injection Date:	9/25/2019 08:52:05	Seq Line:	2
Sample Name:	675449 QC@3.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD02.D Sample Name: 675449 QC@3.0

Injection Date:	9/25/2019 08:52:05	Seq Line:	2
Sample Name:	675449 QC@3.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.664	PBA	208955.0	3.0118	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.698	PBA	66007.9	3.0299	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.691	PBA	255289.4	5.0000	CLO4-89-ISTD

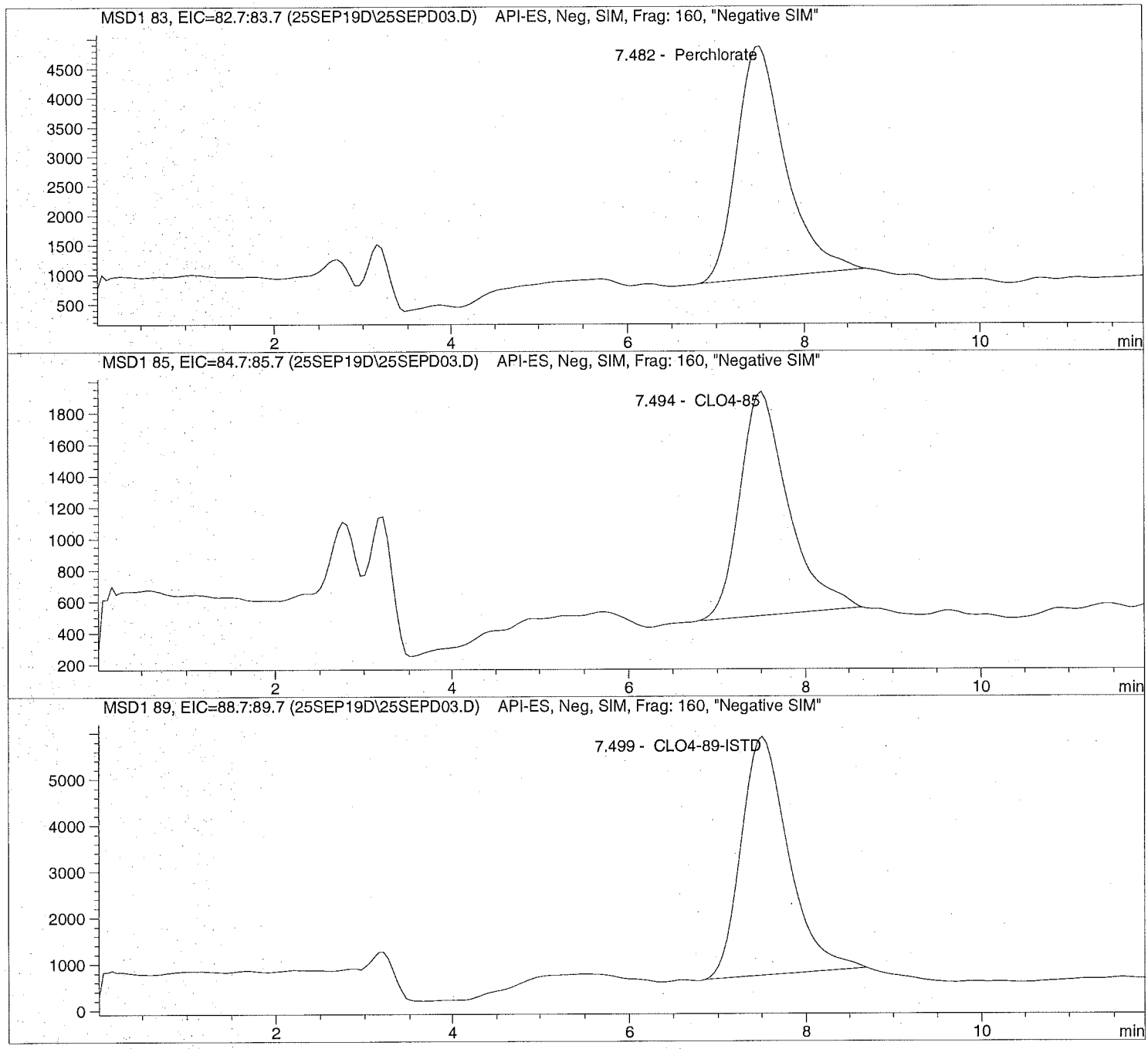
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD03.D Sample Name: 675447 ICS@3.0

Injection Date:	9/25/2019 09:05:53	Seq Line:	3
Sample Name:	675447 ICS@3.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD03.D Sample Name: 675447 ICS@3.0

Injection Date:	9/25/2019 09:05:53	Seq Line:	3
Sample Name:	675447 ICS@3.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.482	PBA	150319.5	2.8883	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.494	BBA	54193.1	3.3294	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.499	PBA	191395.7	5.0000	CLO4-89-ISTD

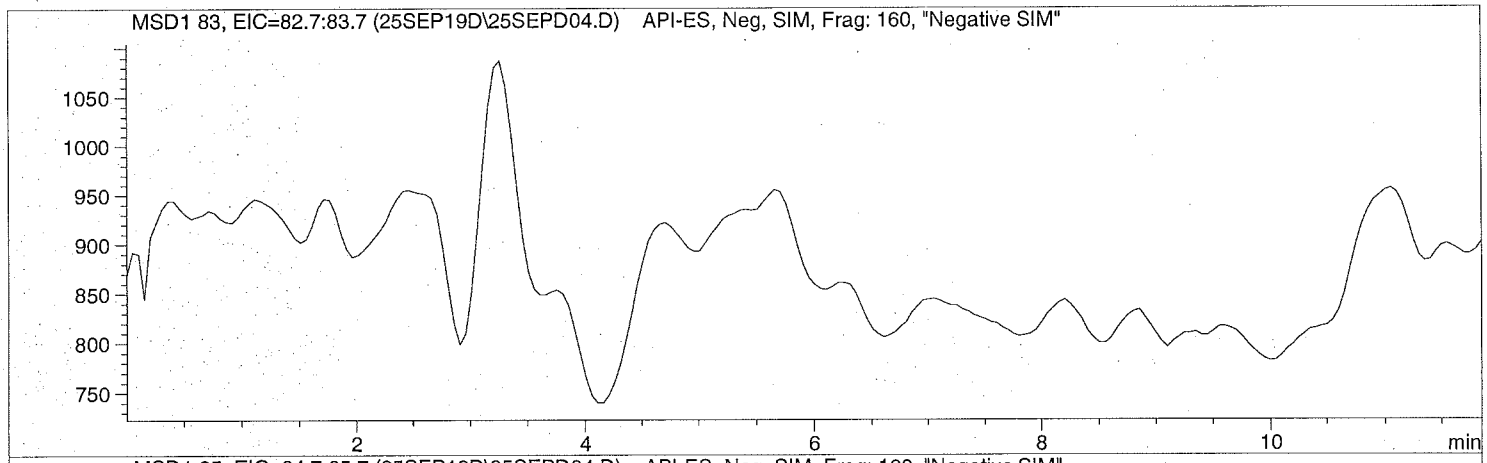
*** End of Report ***

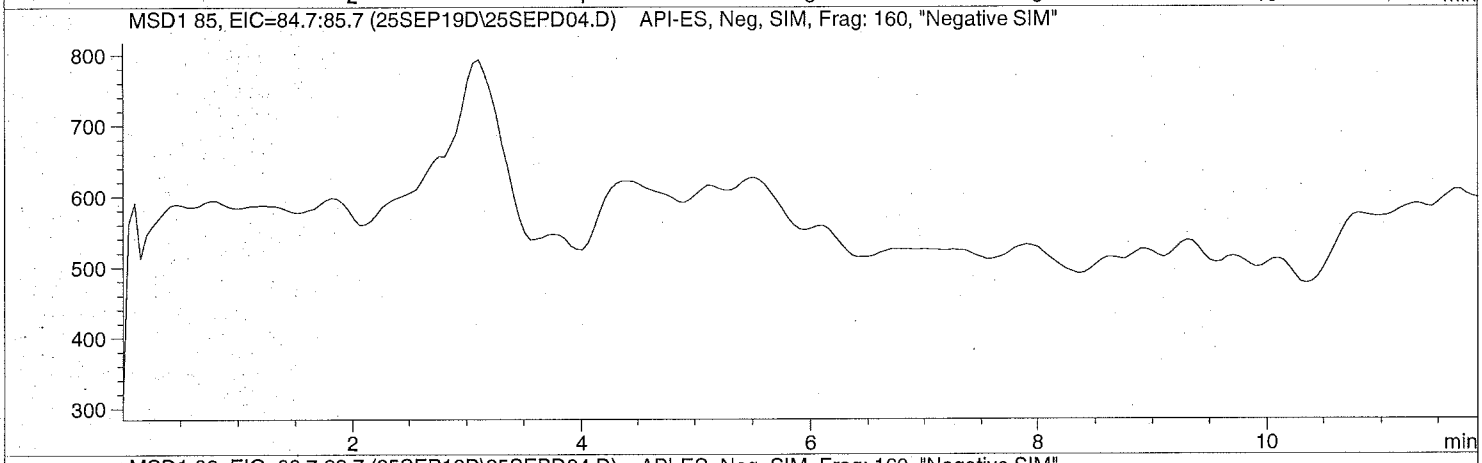
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD04.D Sample Name: 675448 LMB

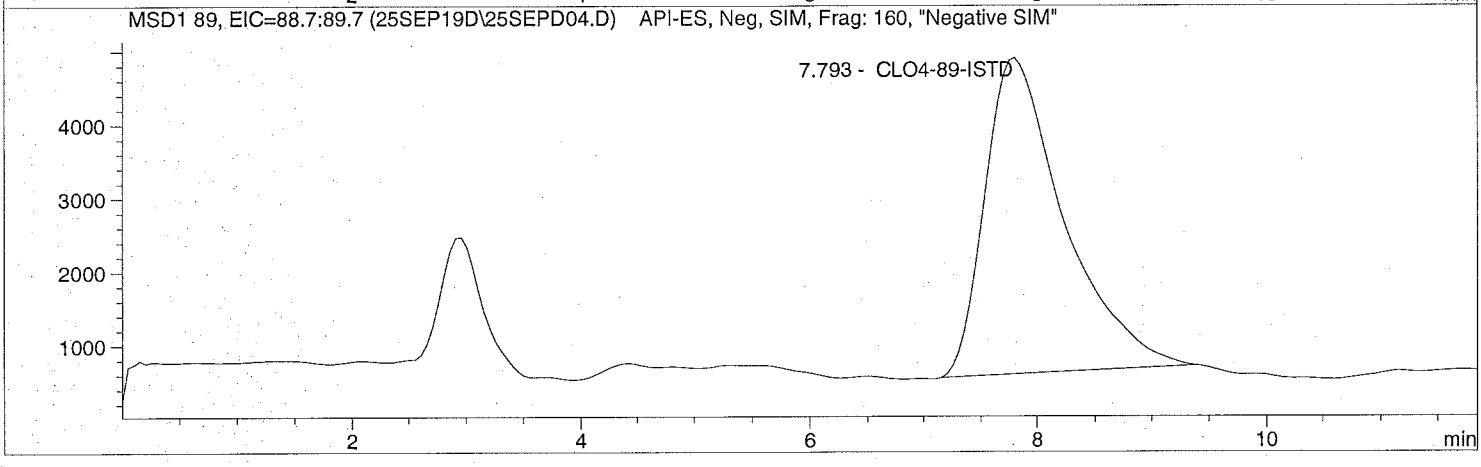
Injection Date:	9/25/2019 09:19:44	Seq Line:	4
Sample Name:	675448 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD04.D Sample Name: 675448 LMB

Injection Date:	9/25/2019 09:19:44	Seq Line:	4
Sample Name:	675448 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	207016.0	5.0000	CLO4-89-ISTD

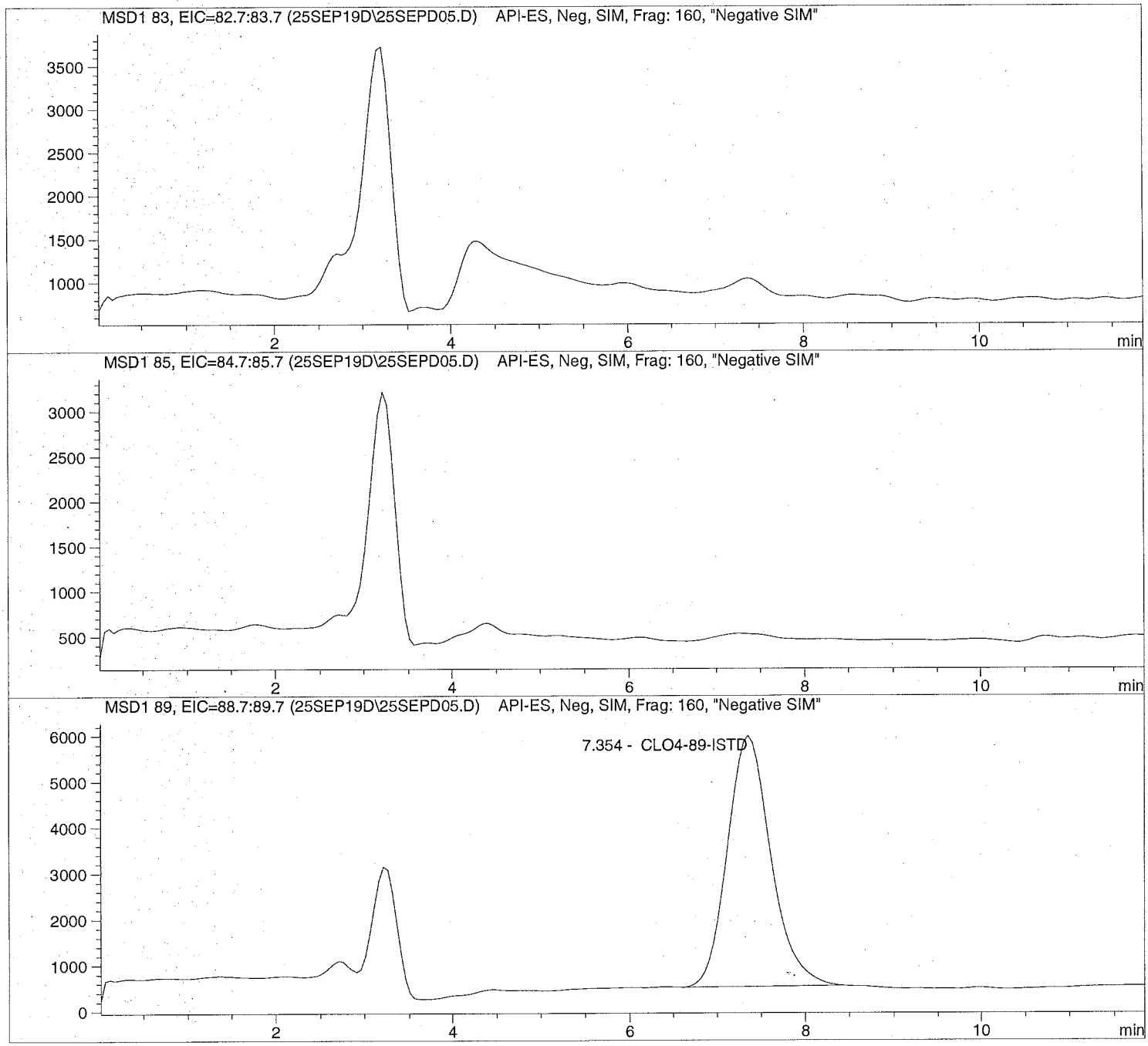
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD05.D Sample Name: 1927206001

Injection Date:	9/25/2019 09:33:36	Seq Line:	5
Sample Name:	1927206001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD05.D Sample Name: 1927206001

Injection Date:	9/25/2019 09:33:36	Seq Line:	5
Sample Name:	1927206001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.354	PBA	187714.1	5.0000	CLO4-89-ISTD

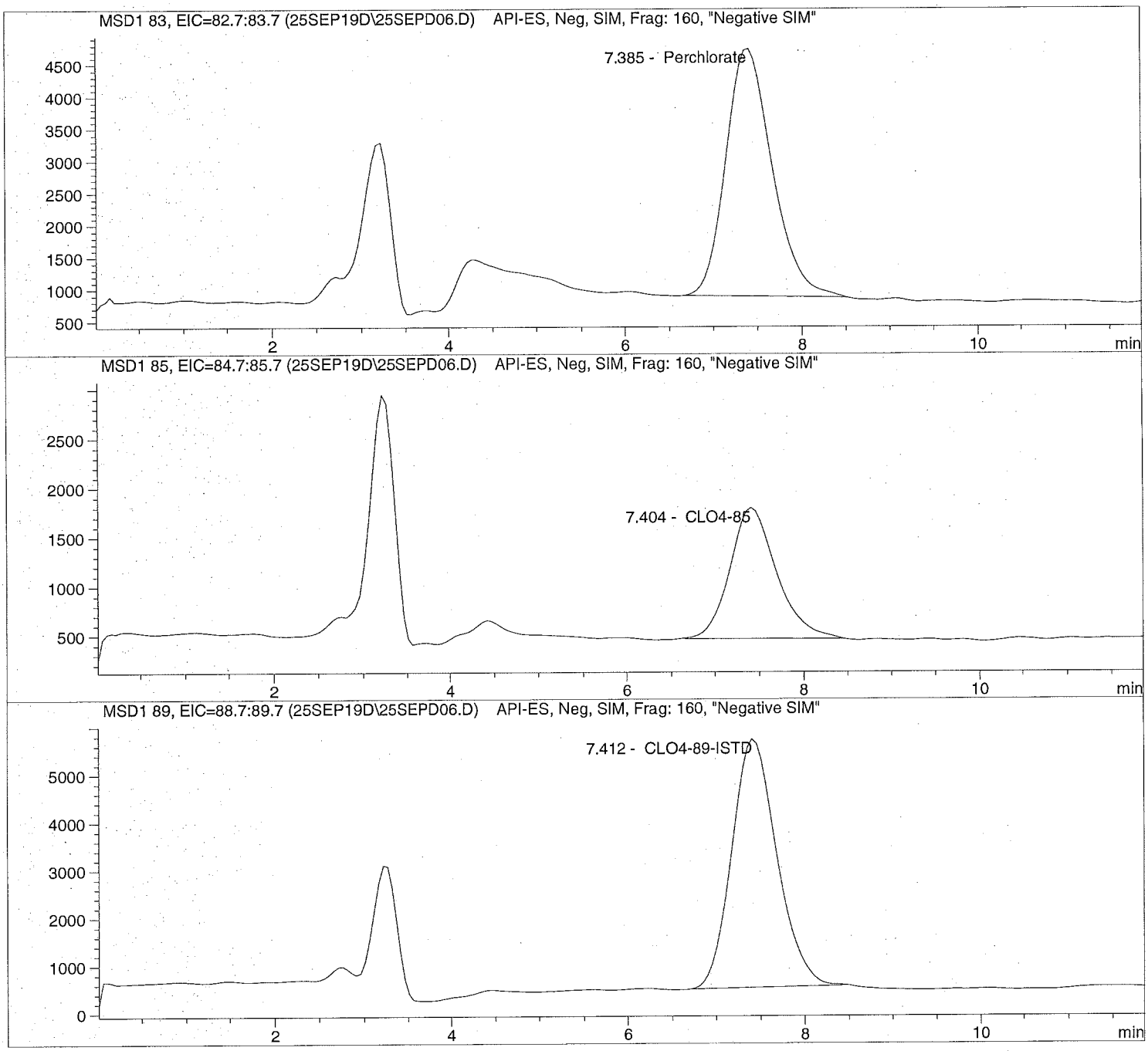
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD06.D Sample Name: 675450 272061S

Injection Date:	9/25/2019 09:47:24	Seq Line:	6
Sample Name:	675450 272061S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD06.D Sample Name: 675450 272061S

Injection Date:	9/25/2019 09:47:24	Seq Line:	6
Sample Name:	675450 272061S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.385	PBA	139320.0	2.8068	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.404	BBA	48427.3	3.1135	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.412	PBA	182458.8	5.0000	CLO4-89-ISTD

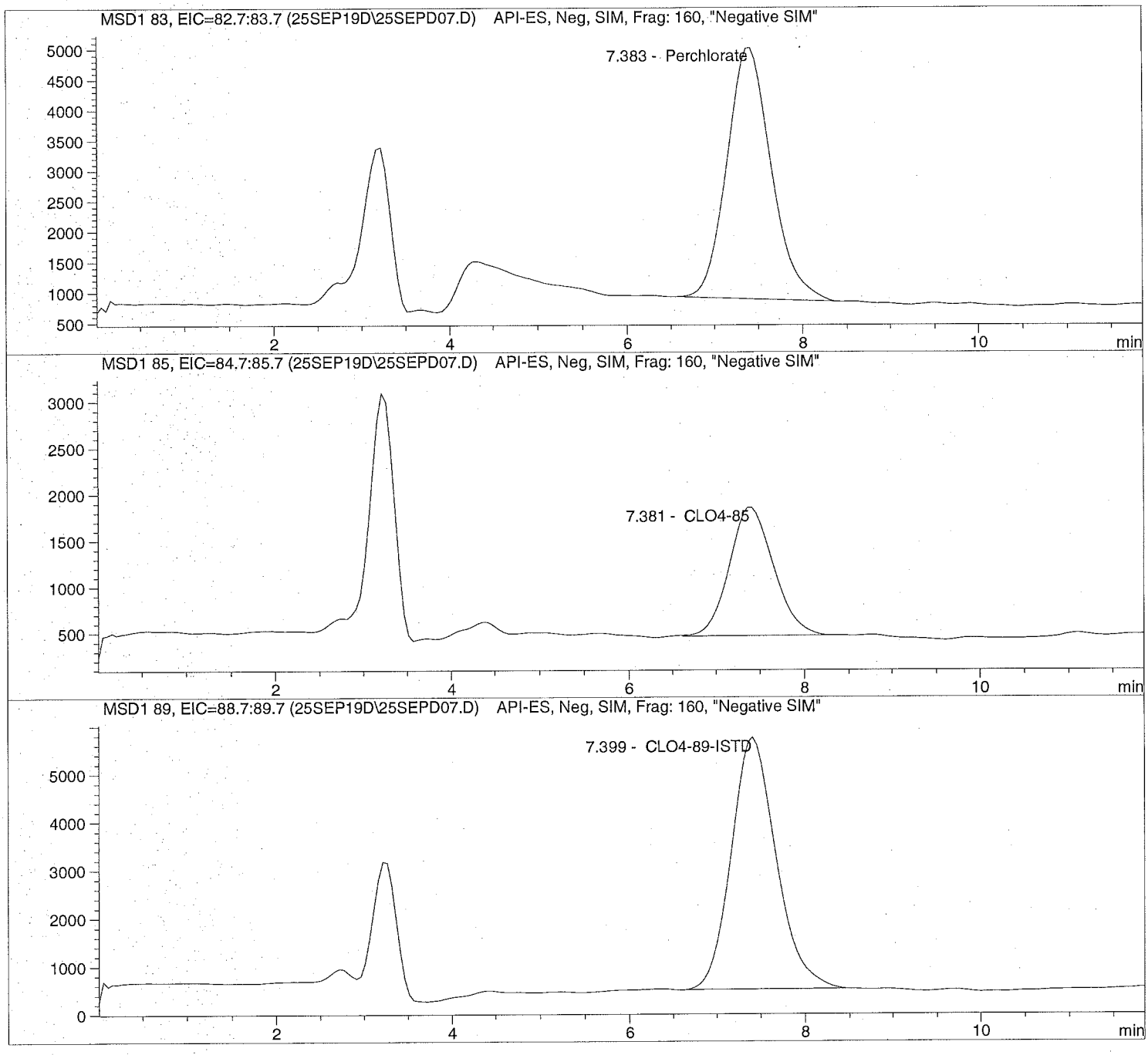
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD07.D Sample Name: 675451 272061D

Injection Date:	9/25/2019 10:01:16	Seq Line:	7
Sample Name:	675451 272061D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD07.D Sample Name: 675451 272061D

Injection Date:	9/25/2019 10:01:16	Seq Line:	7
Sample Name:	675451 272061D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.383	PBA	144537.4	2.8557	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.381	BBA	48684.1	3.0671	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.399	PBA	186097.0	5.0000	CLO4-89-ISTD

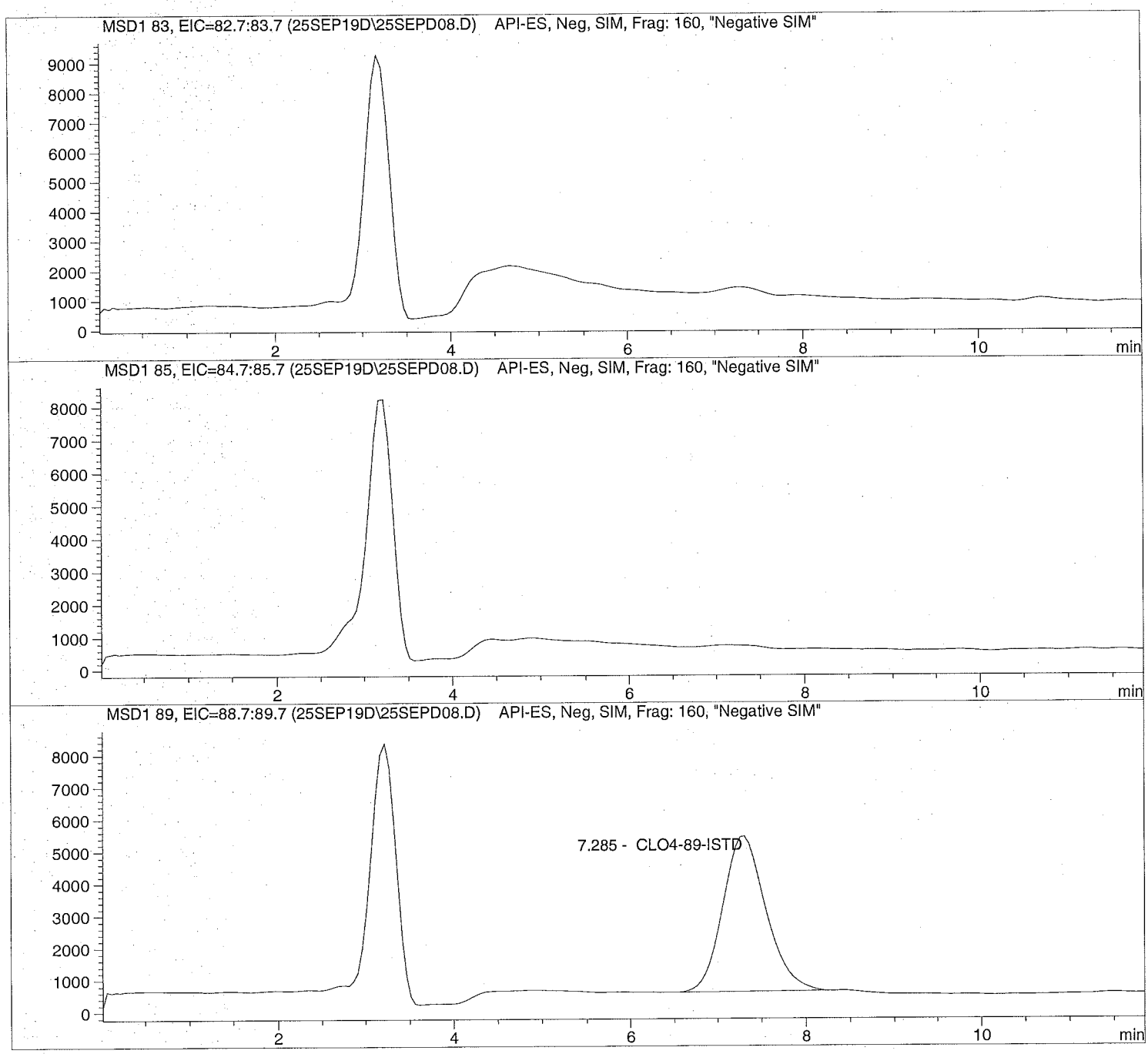
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD08.D Sample Name: 1927207001

Injection Date:	9/25/2019 10:15:04	Seq Line:	8
Sample Name:	1927207001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD08.D Sample Name: 1927207001

Injection Date:	9/25/2019 10:15:04	Seq Line:	8
Sample Name:	1927207001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.285	PBA	165317.4	5.0000	CLO4-89-ISTD

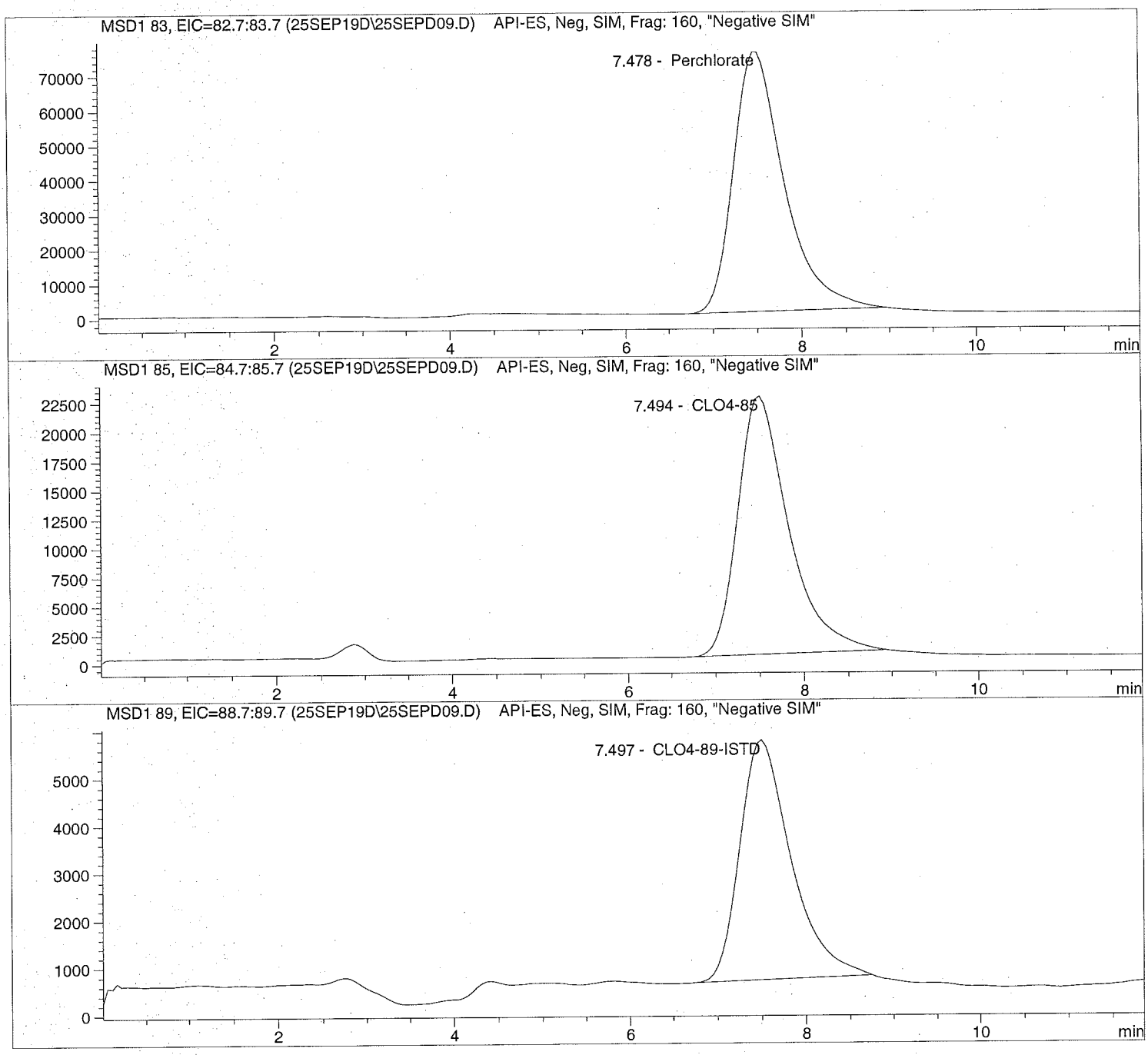
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD09.D Sample Name: 1927207002 10X

Injection Date:	9/25/2019 10:28:51	Seq Line:	9
Sample Name:	1927207002 10X	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD09.D Sample Name: 1927207002 10X

Injection Date:	9/25/2019 10:28:51	Seq Line:	9
Sample Name:	1927207002 10X	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.478	PBA	2988541.8	460.2045	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.494	PBA	889516.5	453.3028	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.497	PBA	203977.8	50.0000	CLO4-89-ISTD

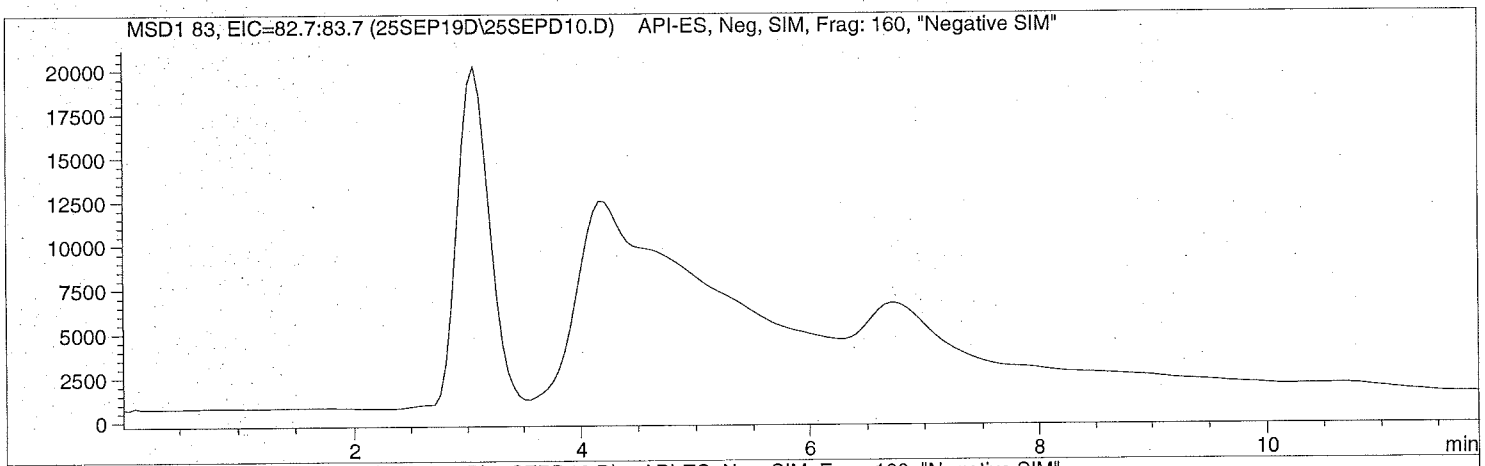
*** End of Report ***

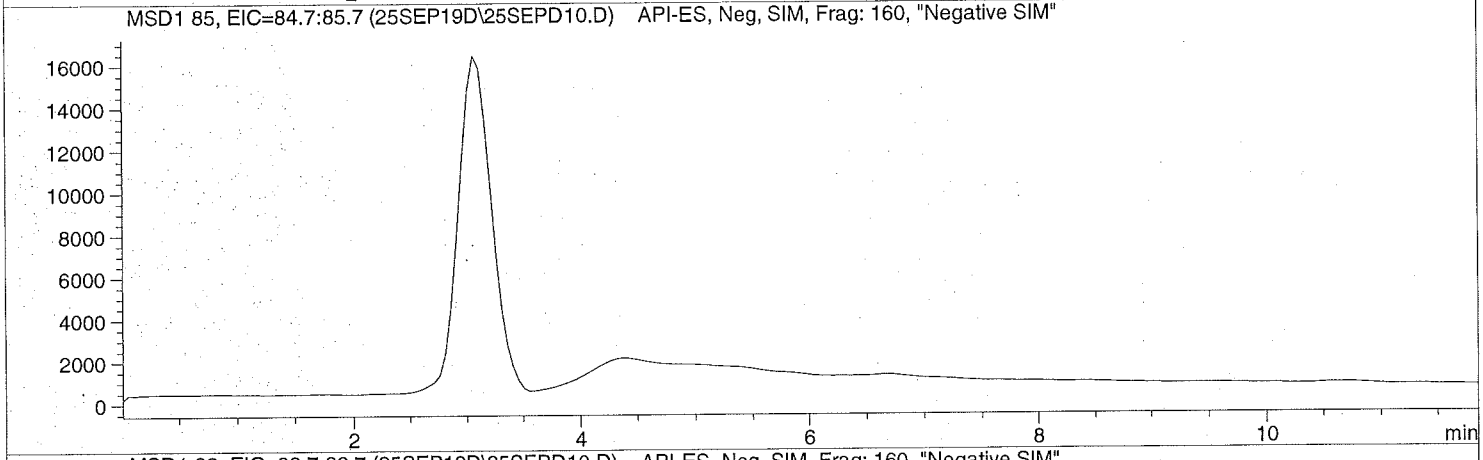
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD10.D Sample Name: 1927207003

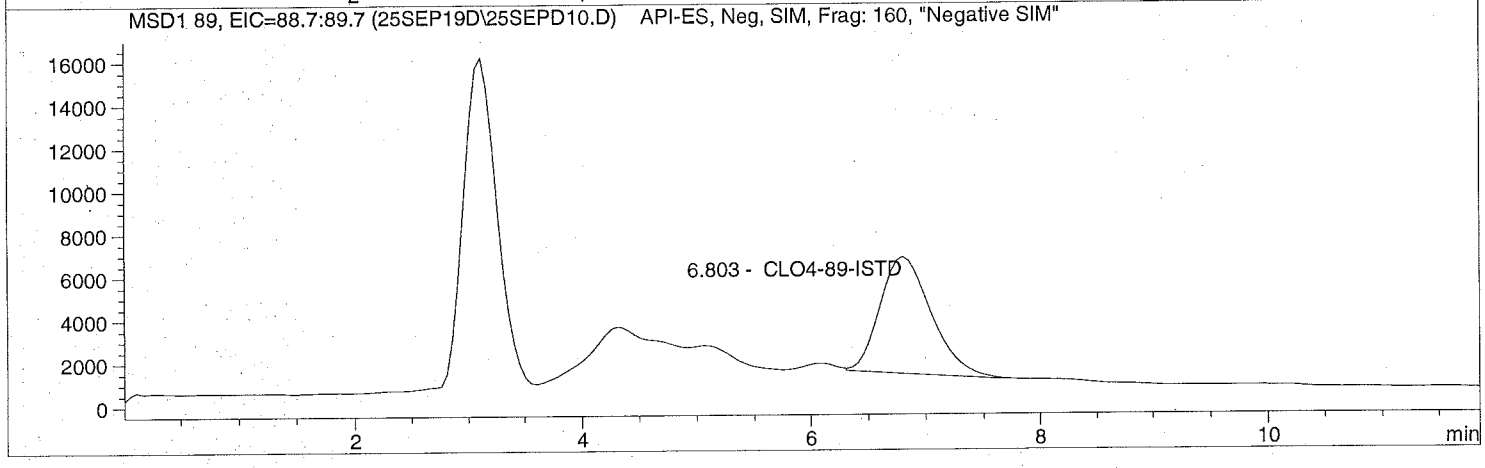
Injection Date:	9/25/2019 10:42:41	Seq Line:	10
Sample Name:	1927207003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD10.D Sample Name: 1927207003

Injection Date:	9/25/2019 10:42:41	Seq Line:	10
Sample Name:	1927207003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.803	BBA	167627.2	5.0000	CLO4-89-ISTD

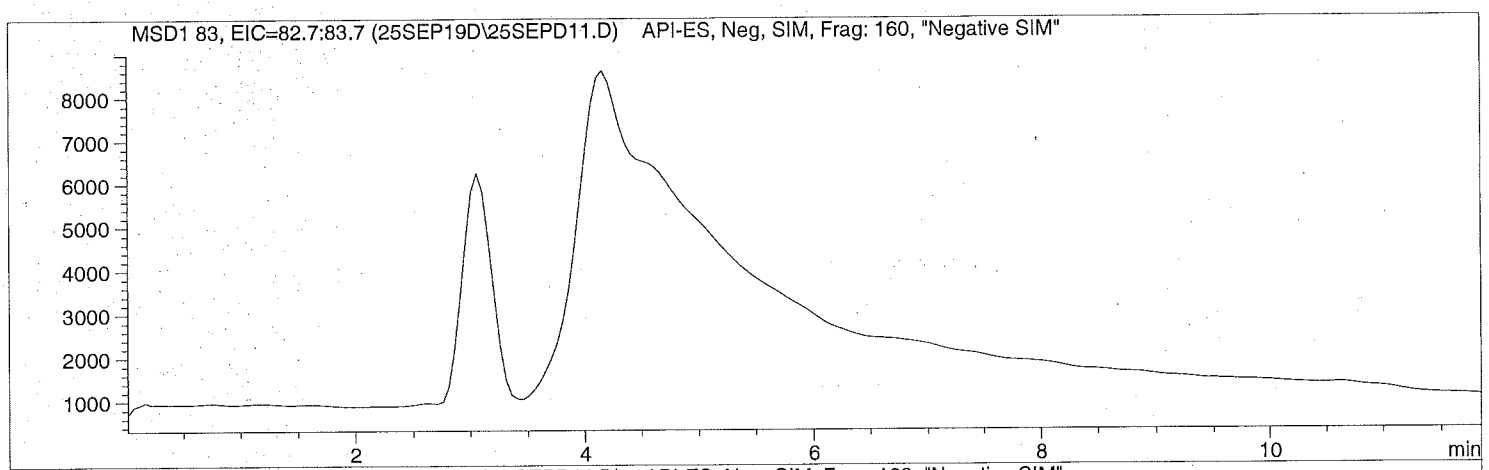
*** End of Report ***

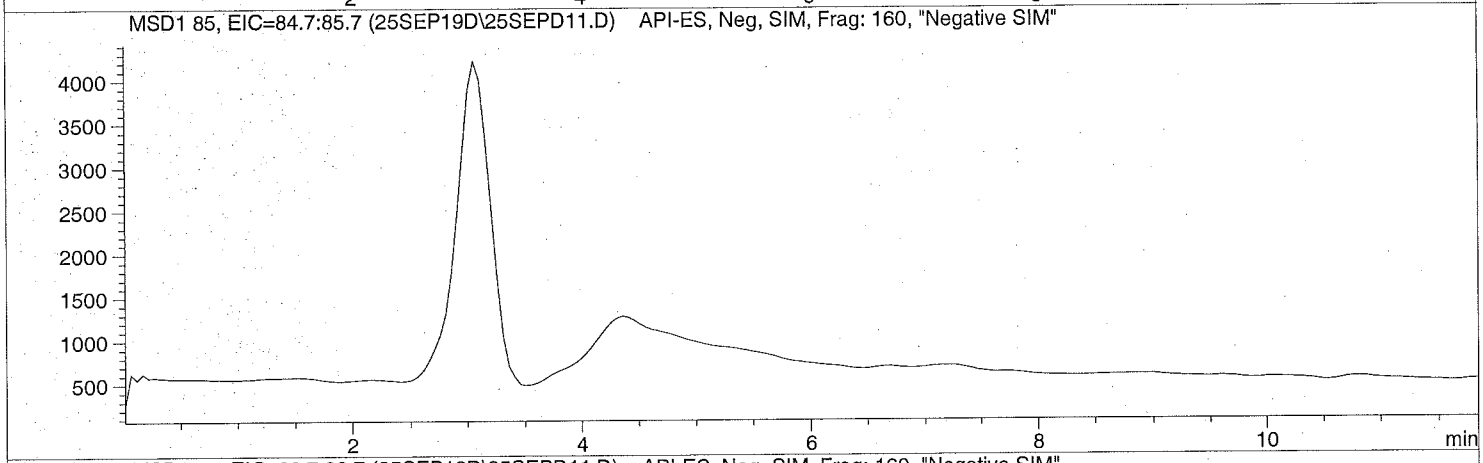
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD11.D Sample Name: 1927207004

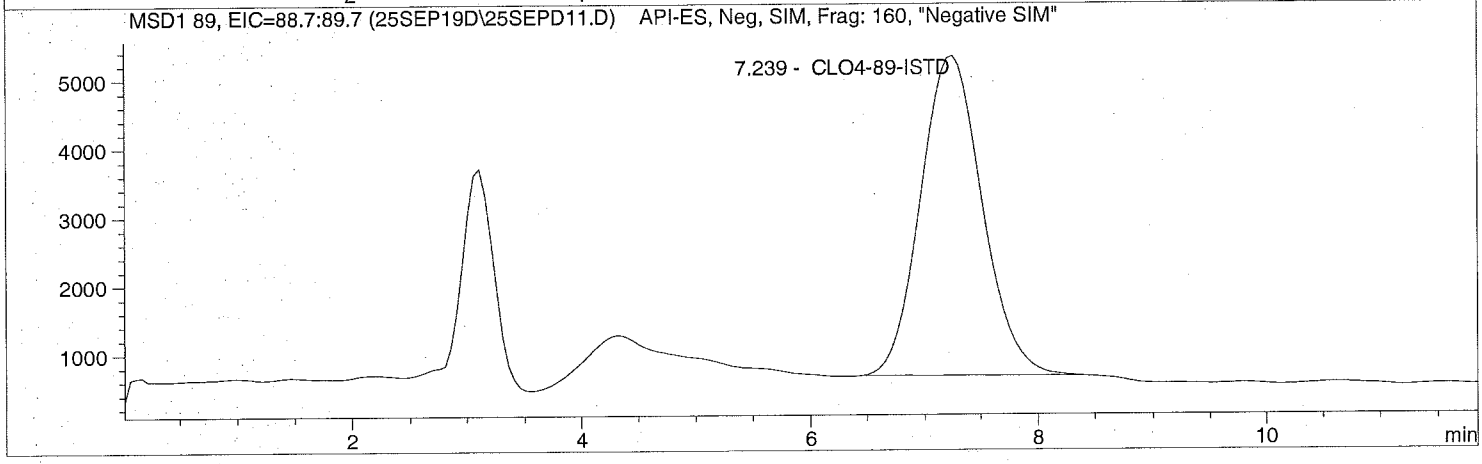
Injection Date:	9/25/2019 10:56:29	Seq Line:	11
Sample Name:	1927207004	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD11.D Sample Name: 1927207004

Injection Date:	9/25/2019 10:56:29	Seq Line:	11
Sample Name:	1927207004	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.239	PBA	177076.9	5.0000	CLO4-89-ISTD

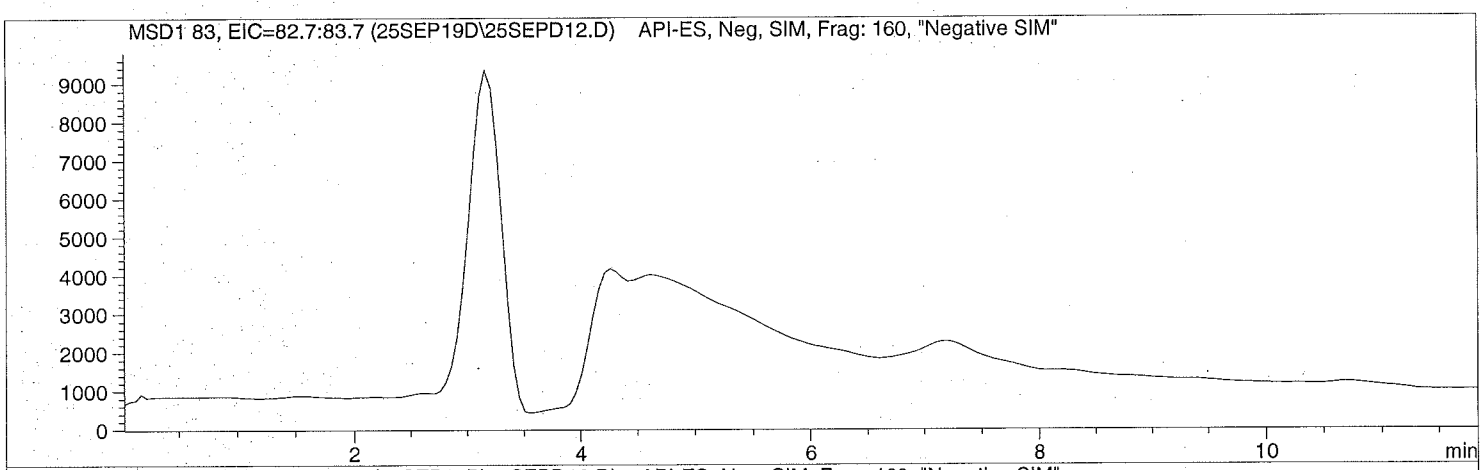
*** End of Report ***

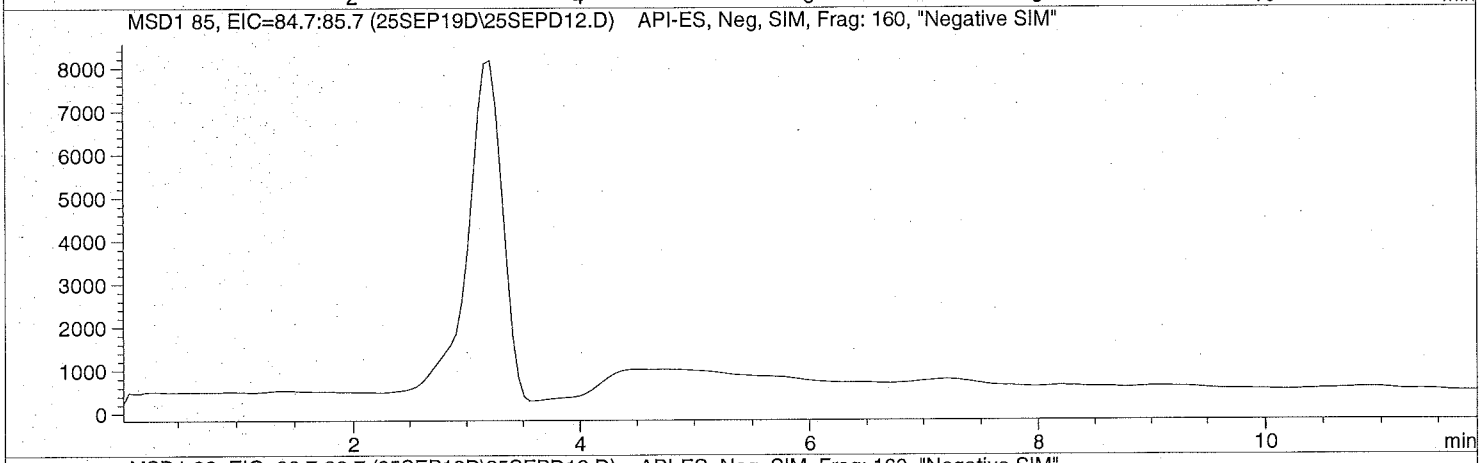
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD12.D Sample Name: 1927207005

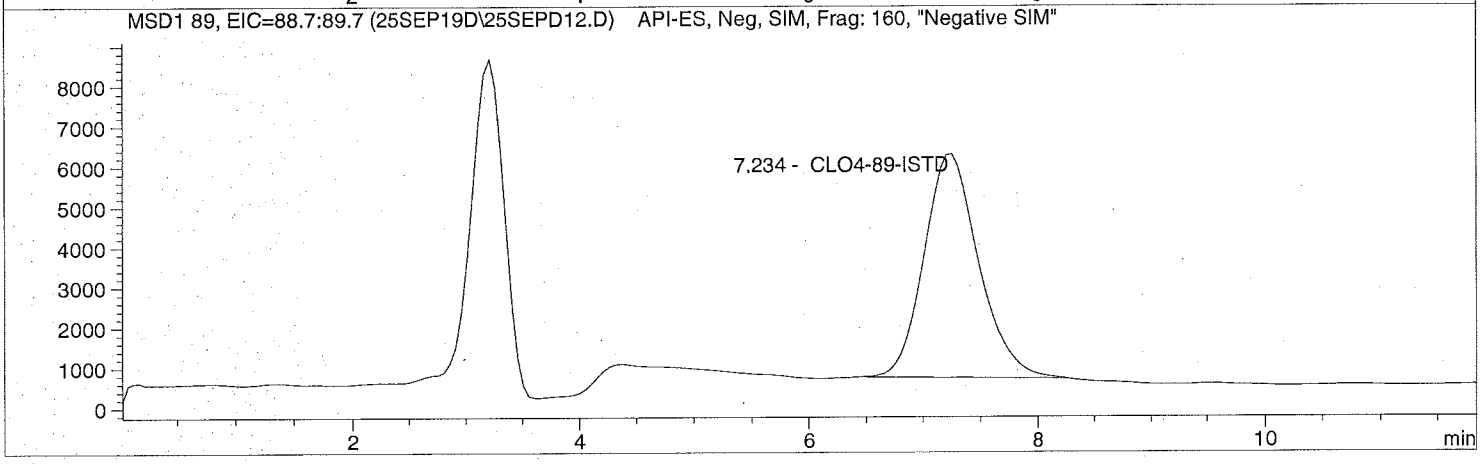
Injection Date:	9/25/2019 11:10:17	Seq Line:	12
Sample Name:	1927207005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD12.D Sample Name: 1927207005

Injection Date:	9/25/2019 11:10:17	Seq Line:	12
Sample Name:	1927207005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.234	BBA	182947.6	5.0000	CLO4-89-ISTD

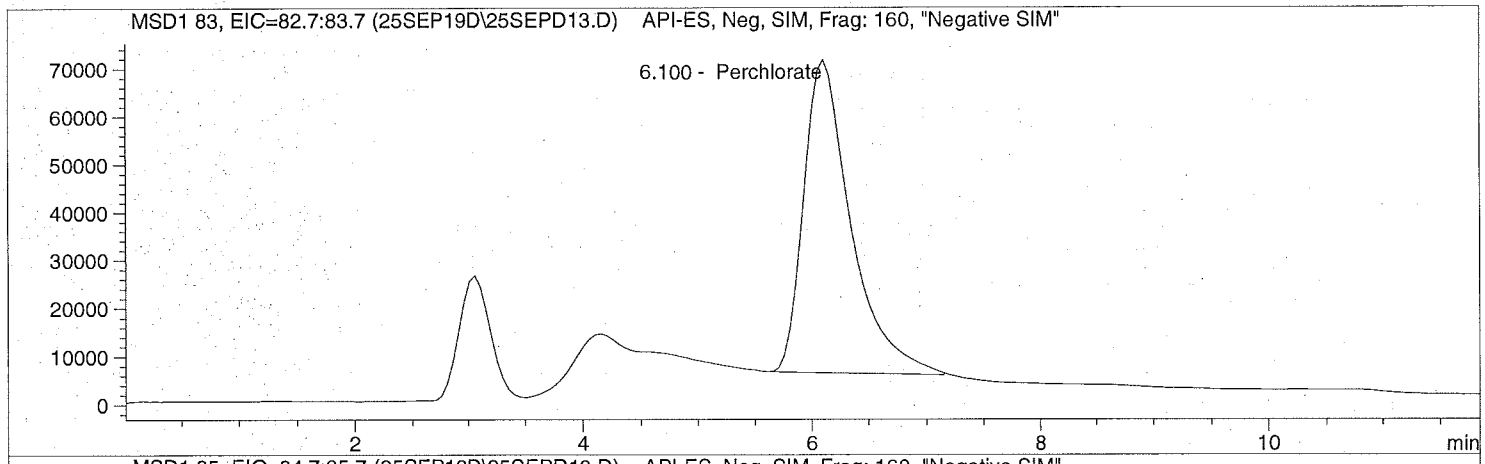
*** End of Report ***

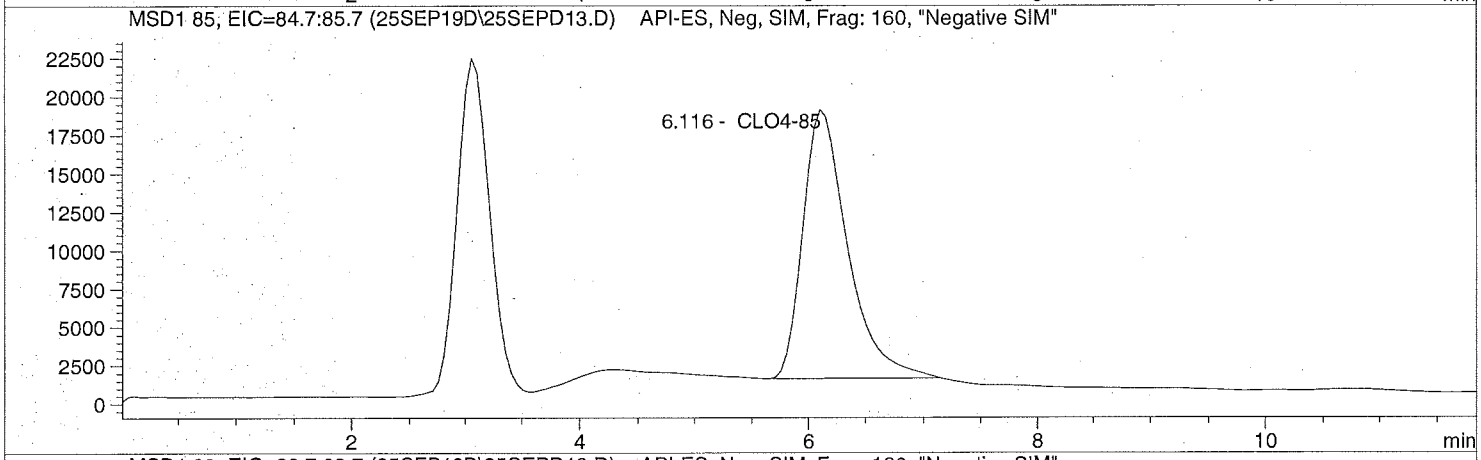
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD13.D Sample Name: 1927207006

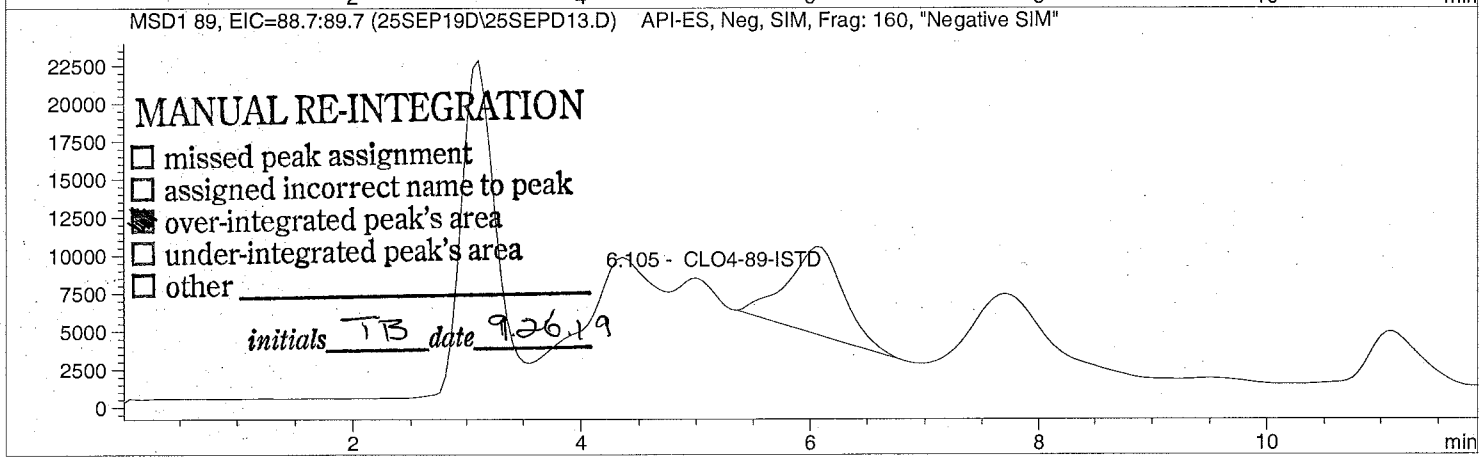
Injection Date:	9/25/2019 11:24:03	Seq Line:	13
Sample Name:	1927207006	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD13.D Sample Name: 1927207006

Injection Date:	9/25/2019 11:24:03	Seq Line:	13
Sample Name:	1927207006	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.100	BBA	1881866.3	31.0739	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.116	PBA	480234.9	26.5101	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.105	MM	201847.6	5.0000	CLO4-89-ISTD

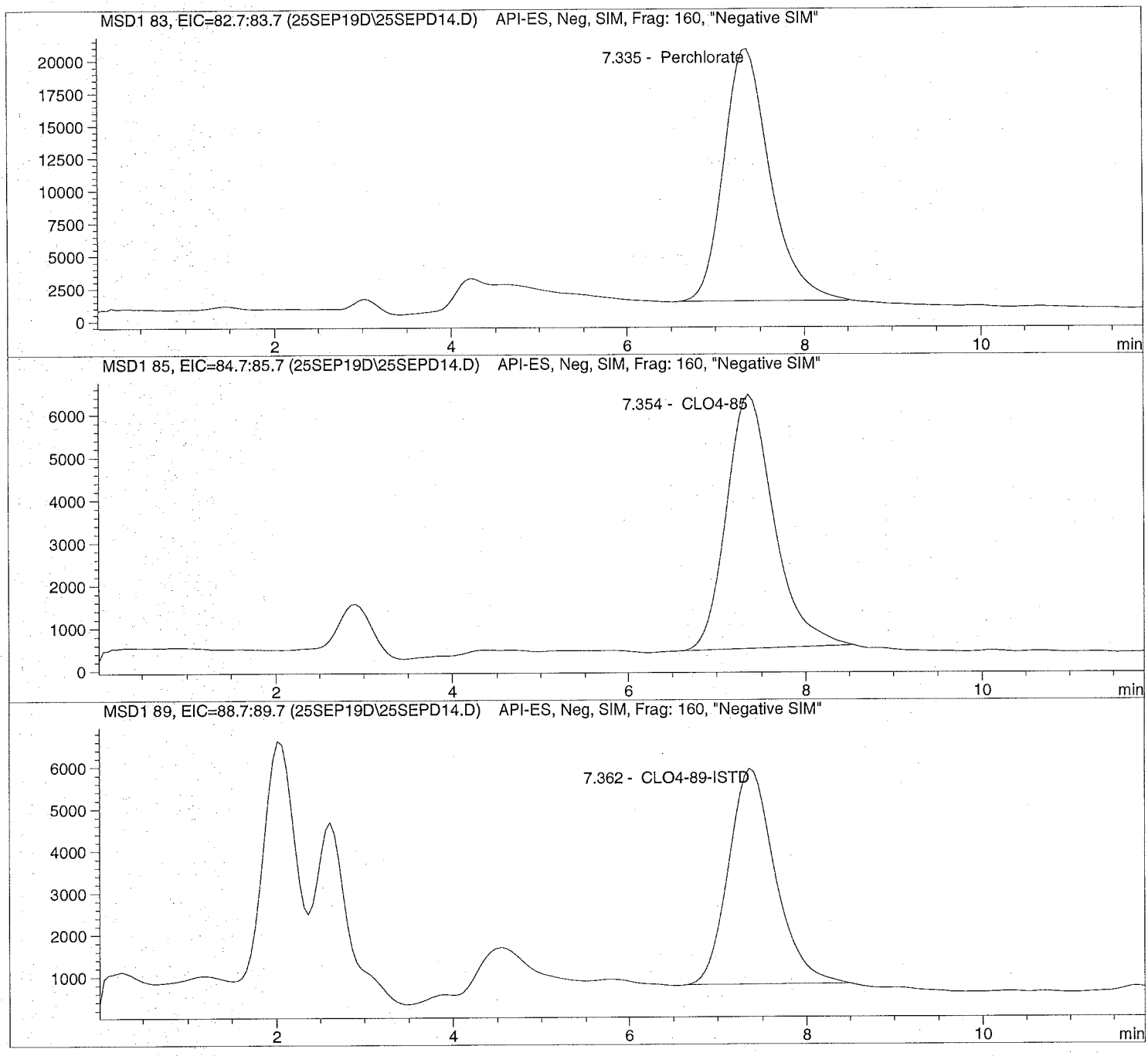
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD14.D Sample Name: 1927207007 10X

Injection Date:	9/25/2019 11:37:52	Seq Line:	14
Sample Name:	1927207007 10X	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD14.D Sample Name: 1927207007 10X

Injection Date:	9/25/2019 11:37:52	Seq Line:	14
Sample Name:	1927207007 10X	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.335	PBA	693116.9	133.8740	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.354	PBA	218925.9	137.6610	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.362	PBA	185567.6	50.0000	CLO4-89-ISTD

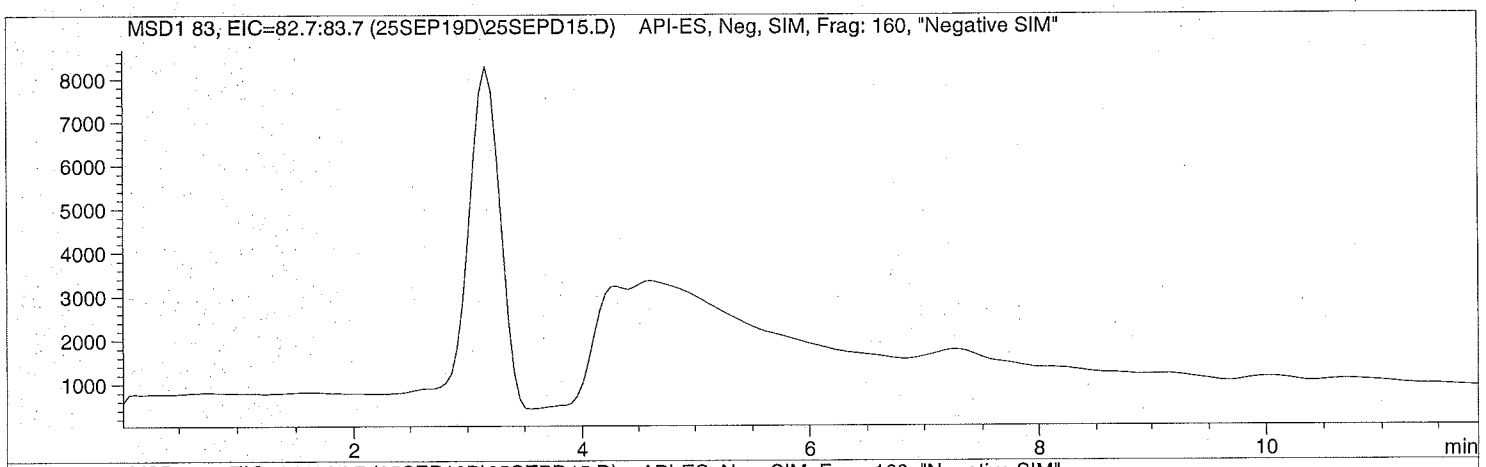
*** End of Report ***

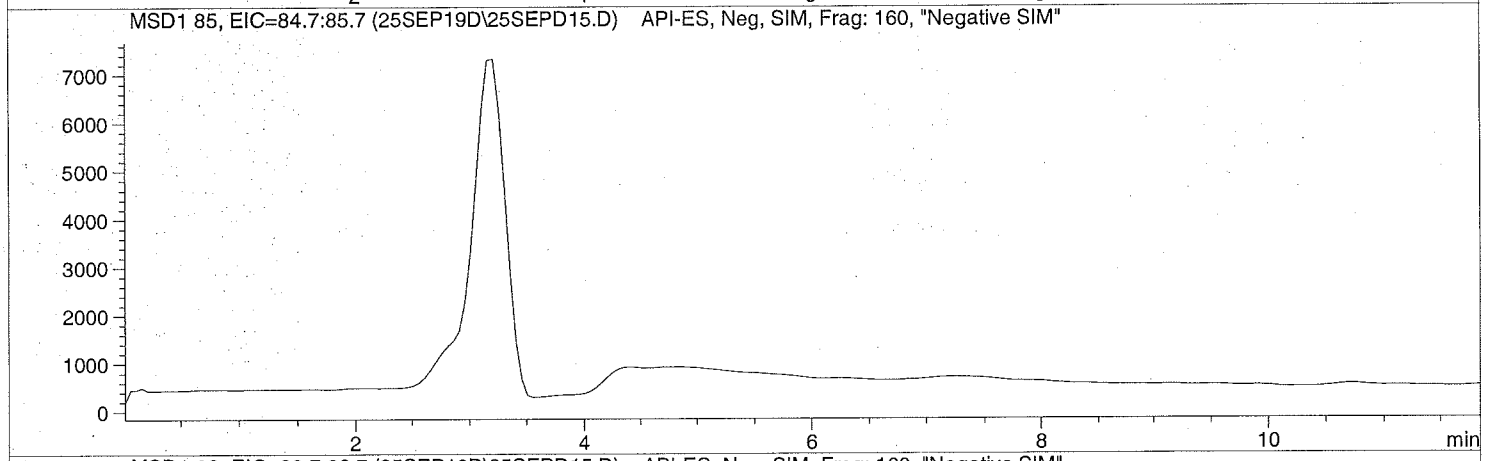
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD15.D Sample Name: 1927207008

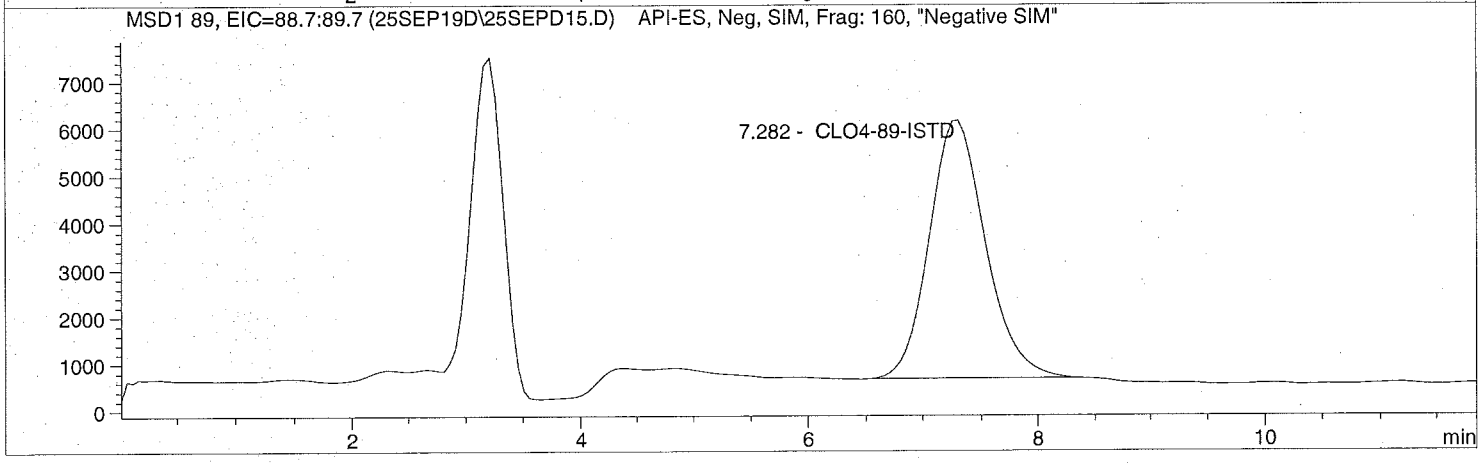
Injection Date:	9/25/2019 11:51:39	Seq Line:	15
Sample Name:	1927207008	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD15.D Sample Name: 1927207008

Injection Date:	9/25/2019 11:51:39	Seq Line:	15
Sample Name:	1927207008	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.282	PBA	184103.5	5.0000	CLO4-89-ISTD

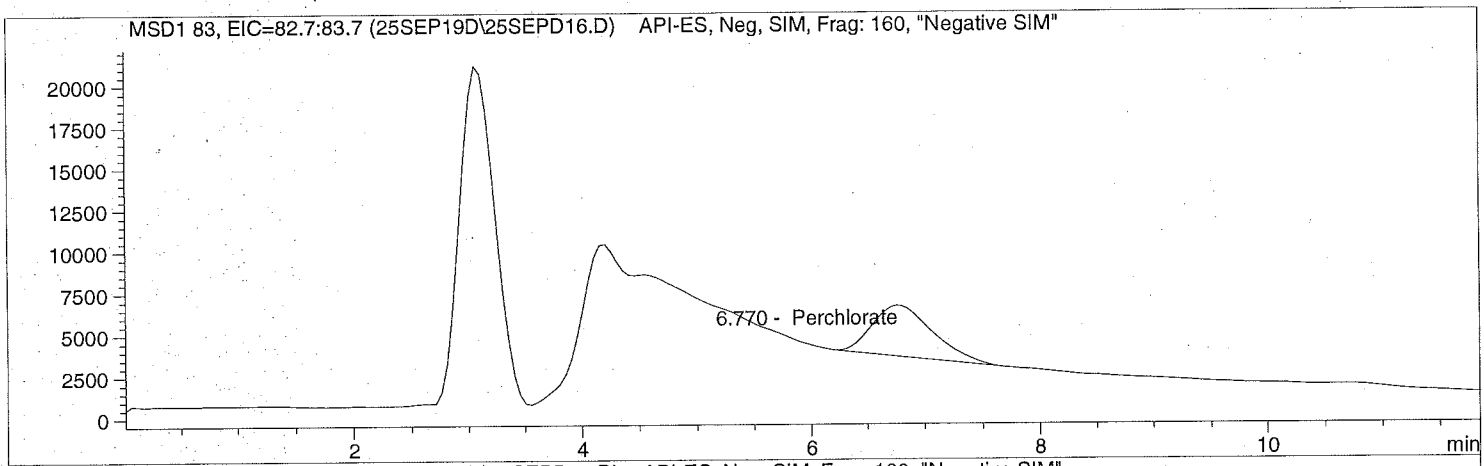
*** End of Report ***

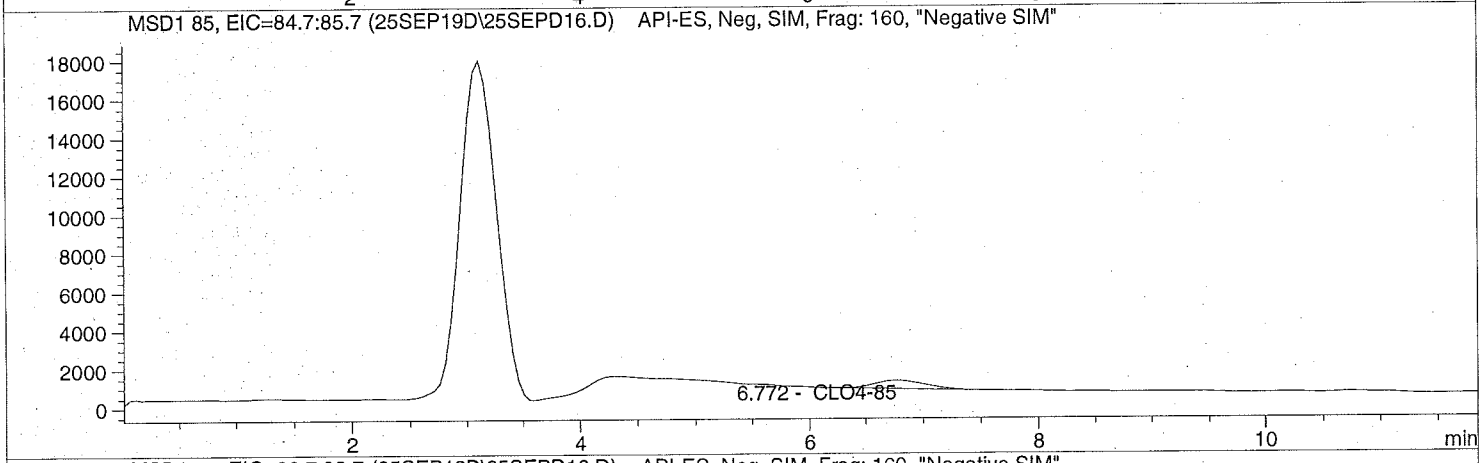
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD16.D Sample Name: 1927207009

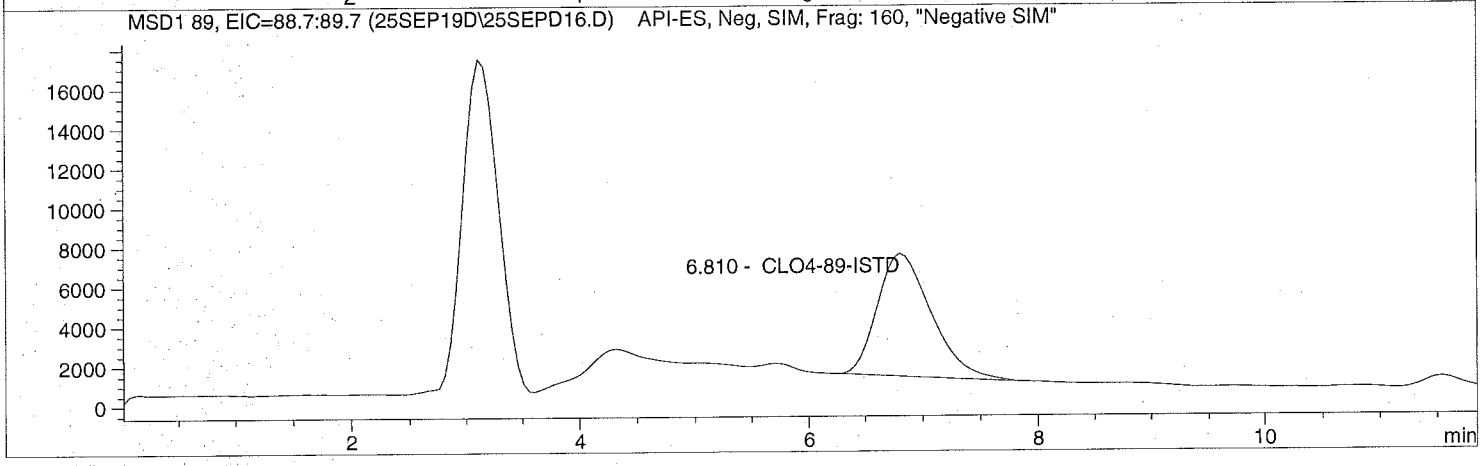
Injection Date:	9/25/2019 12:05:30	Seq Line:	16
Sample Name:	1927207009	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD16.D Sample Name: 1927207009

Injection Date:	9/25/2019 12:05:30	Seq Line:	16
Sample Name:	1927207009	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.770	BBA	111064.3	2.0258	Perchlorate

= NOT REPORTED / RATIO FAILS CRITERI (83/85)

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.772	PBA	13398.1	0.6696	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.810	PBA	200027.4	5.0000	CLO4-89-ISTD

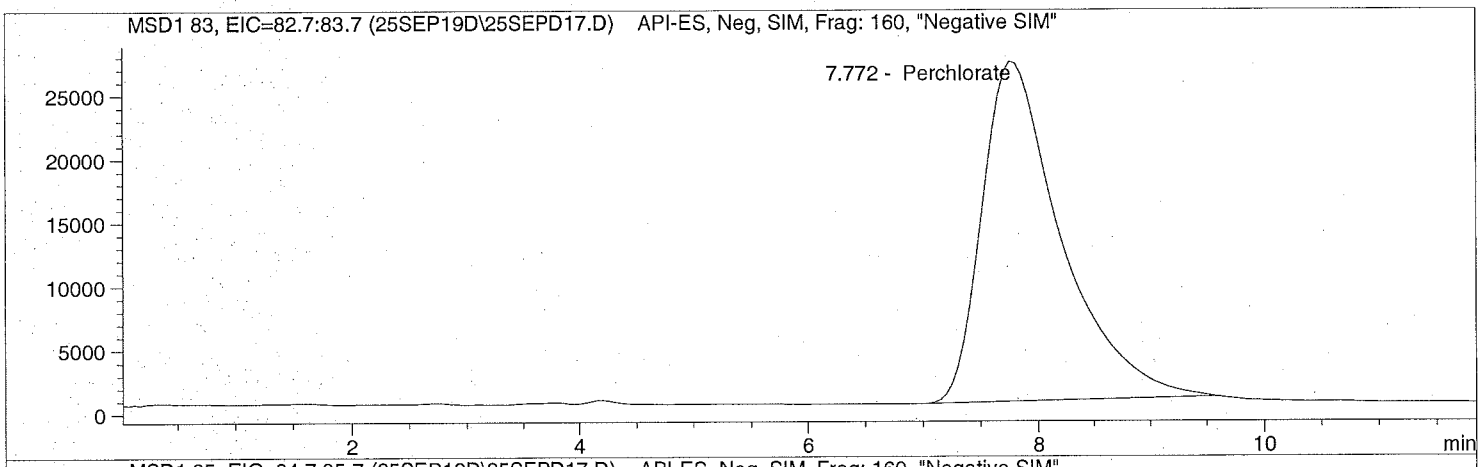
*** End of Report ***

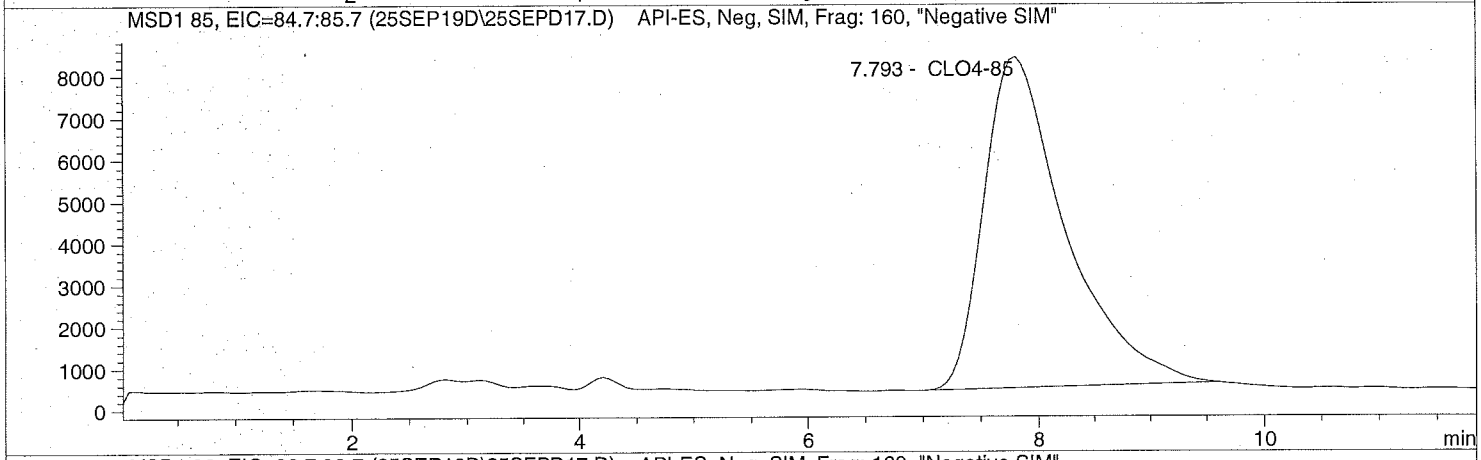
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD17.D Sample Name: 675452 CCV@25

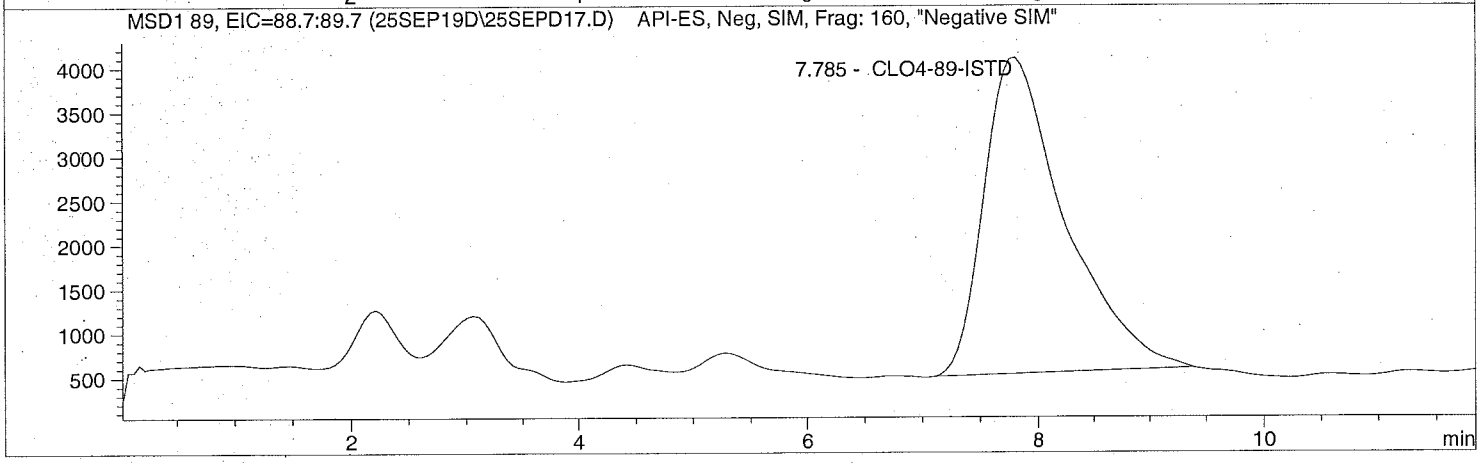
Injection Date:	9/25/2019 12:19:18	Seq Line:	17
Sample Name:	675452 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD17.D Sample Name: 675452 CCV@25

Injection Date:	9/25/2019 12:19:18	Seq Line:	17
Sample Name:	675452 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.772	PBA	1279619.1	24.9031	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	393112.7	25.0723	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	175644.5	5.0000	CLO4-89-ISTD

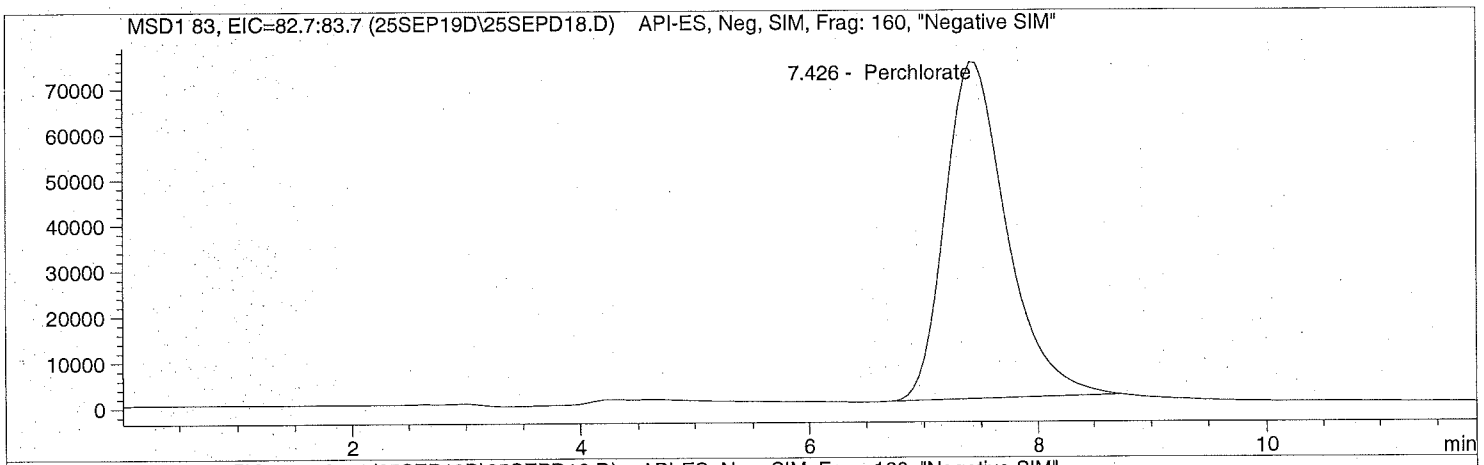
*** End of Report ***

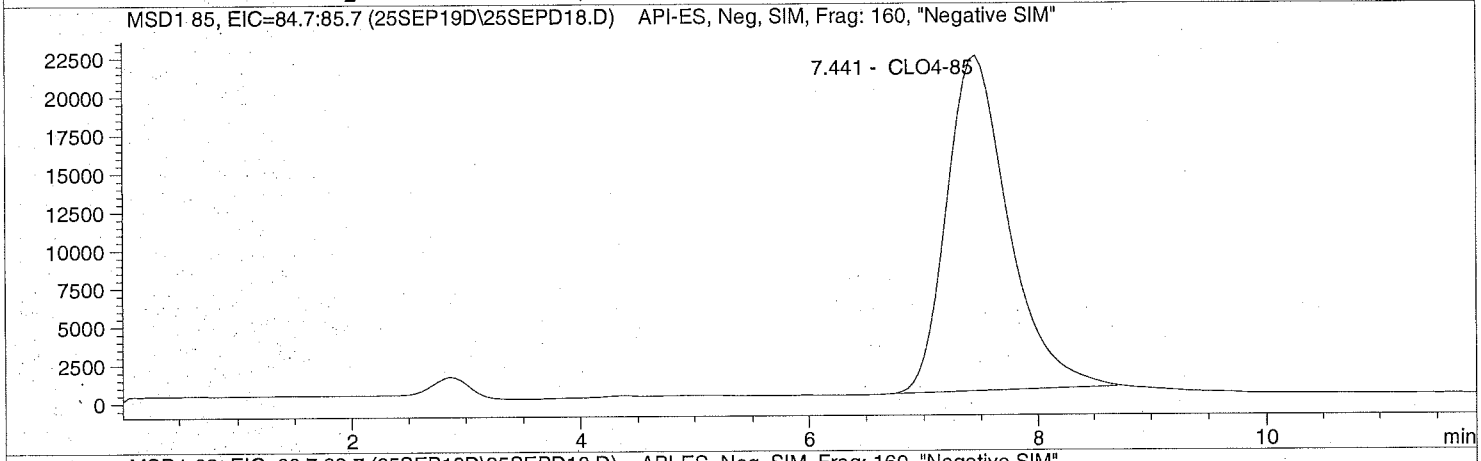
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD18.D Sample Name: 1927207010 10X

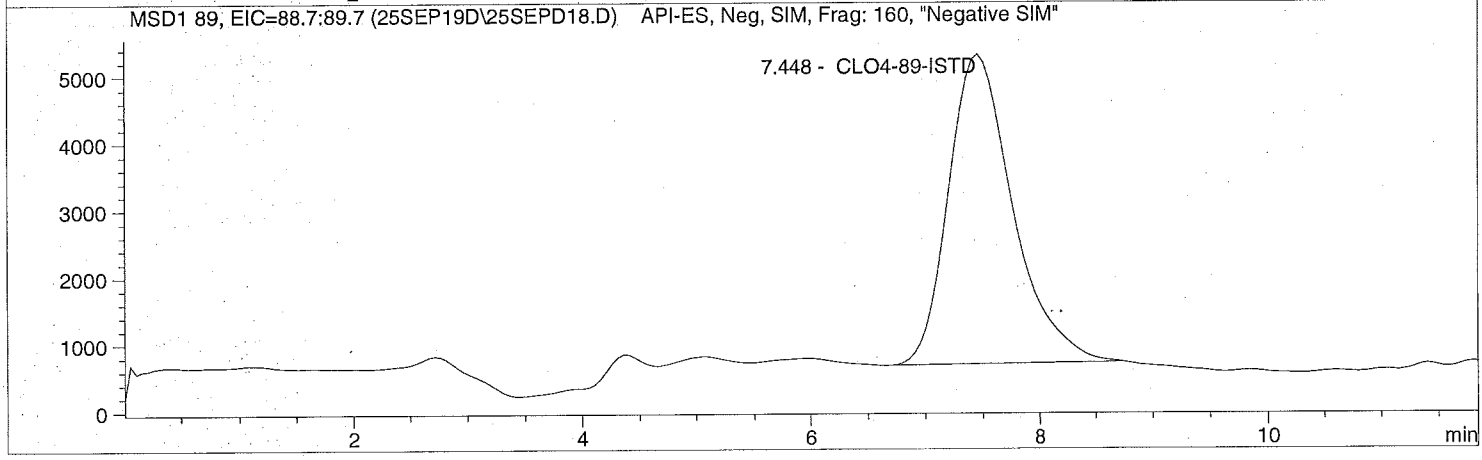
Injection Date:	9/25/2019 12:34:51	Seq Line:	18
Sample Name:	1927207010 10X	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD18.D Sample Name: 1927207010 10X

Injection Date:	9/25/2019 12:34:51	Seq Line:	18
Sample Name:	1927207010 10X	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.426	PBA	2749347.5	477.5033	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.441	PBA	819118.9	470.9470	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	179651.3	50.0000	CLO4-89-ISTD

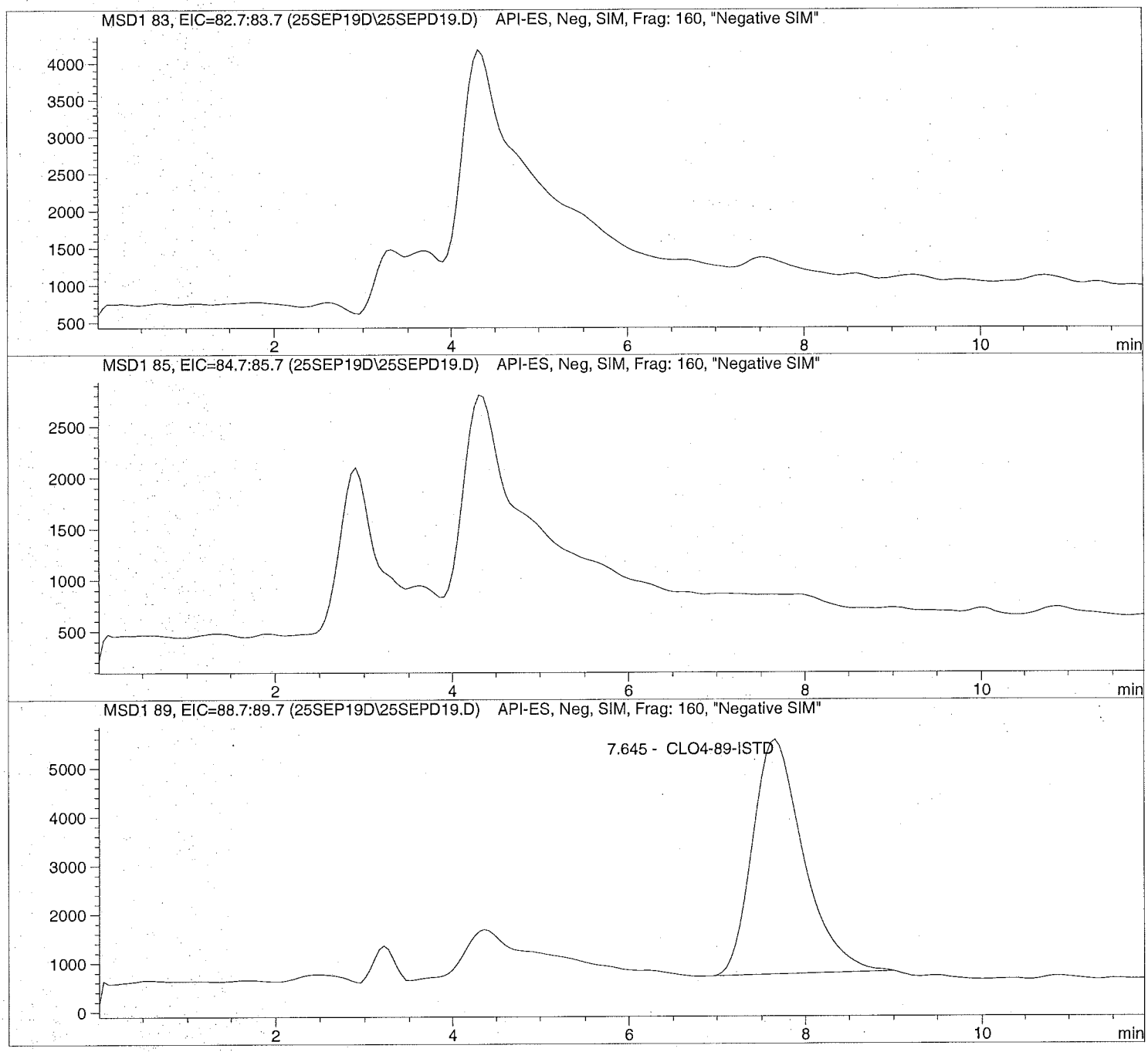
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD19.D Sample Name: 1927207011

Injection Date:	9/25/2019 12:48:38	Seq Line:	19
Sample Name:	1927207011	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD19.D Sample Name: 1927207011

Injection Date:	9/25/2019 12:48:38	Seq Line:	19
Sample Name:	1927207011	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.645	PBA	192431.6	5.0000	CLO4-89-ISTD

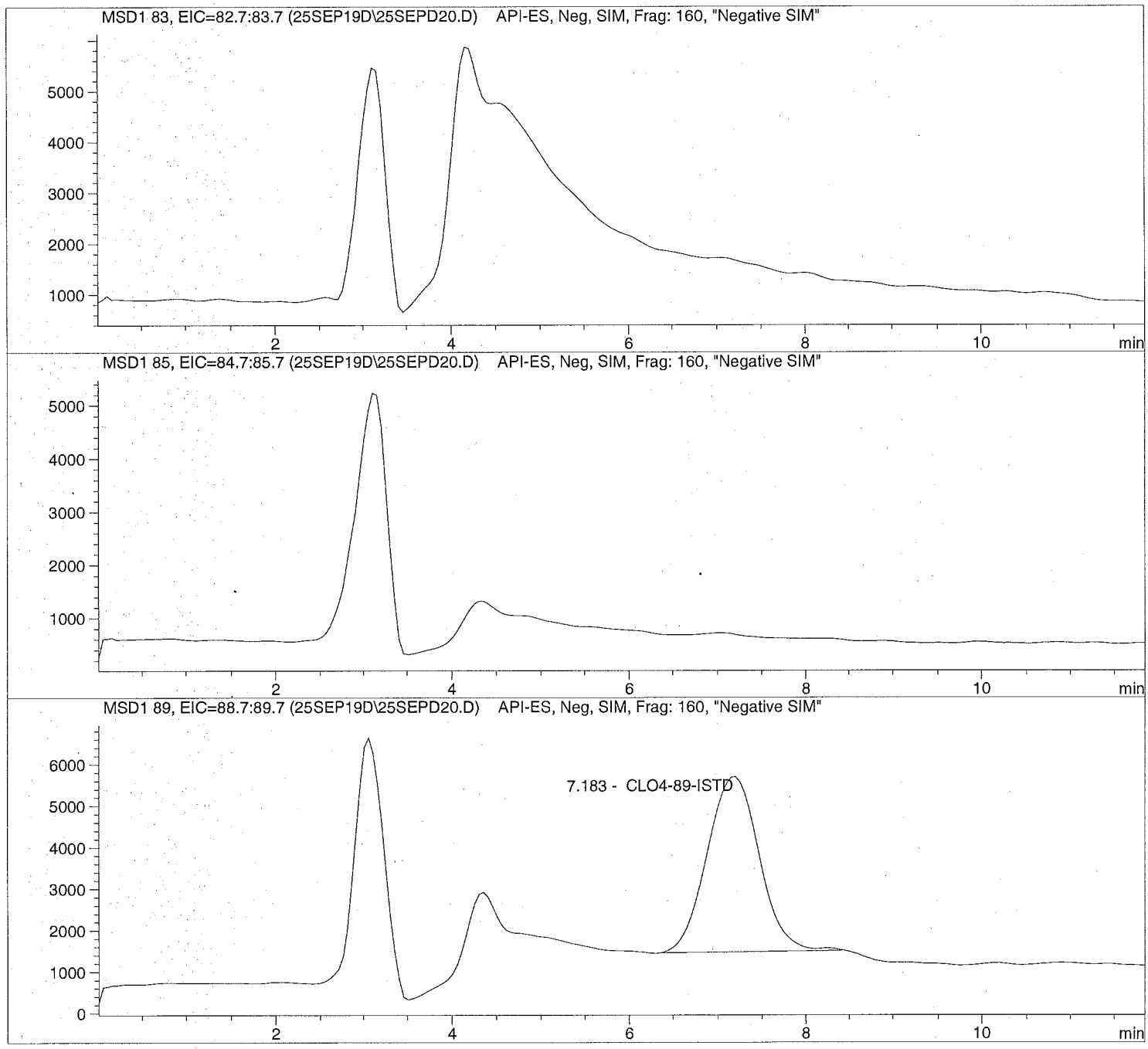
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD20.D Sample Name: 1927207012

Injection Date:	9/25/2019 13:02:29	Seq Line:	20
Sample Name:	1927207012	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD20.D Sample Name: 1927207012

Injection Date:	9/25/2019 13:02:29	Seq Line:	20
Sample Name:	1927207012	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.183	PBA	172716.4	5.0000	CLO4-89-ISTD

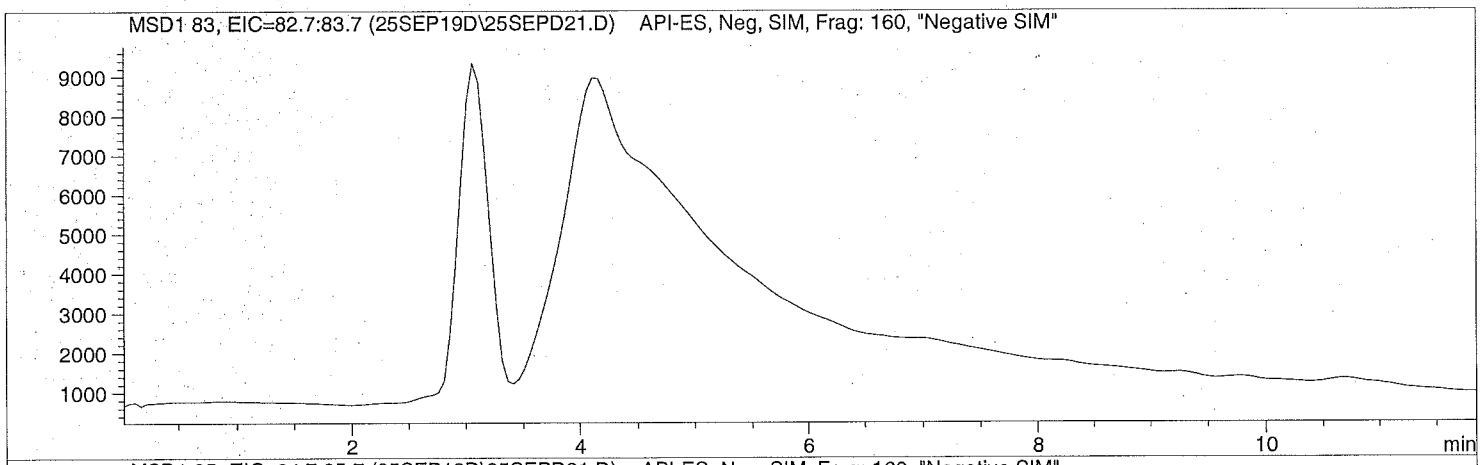
*** End of Report ***

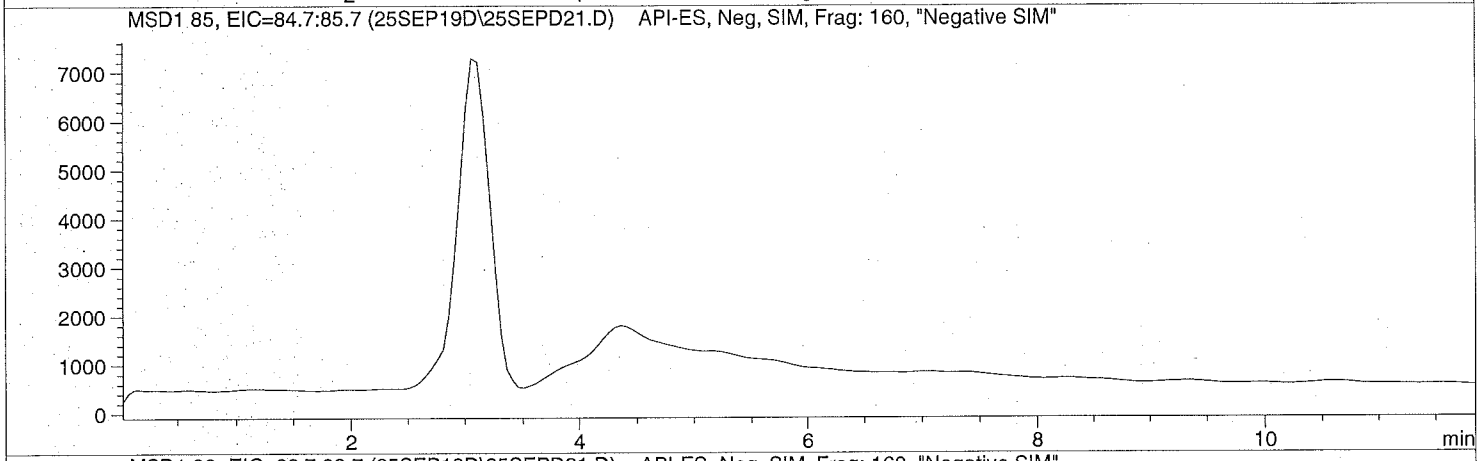
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD21.D Sample Name: 1927207013

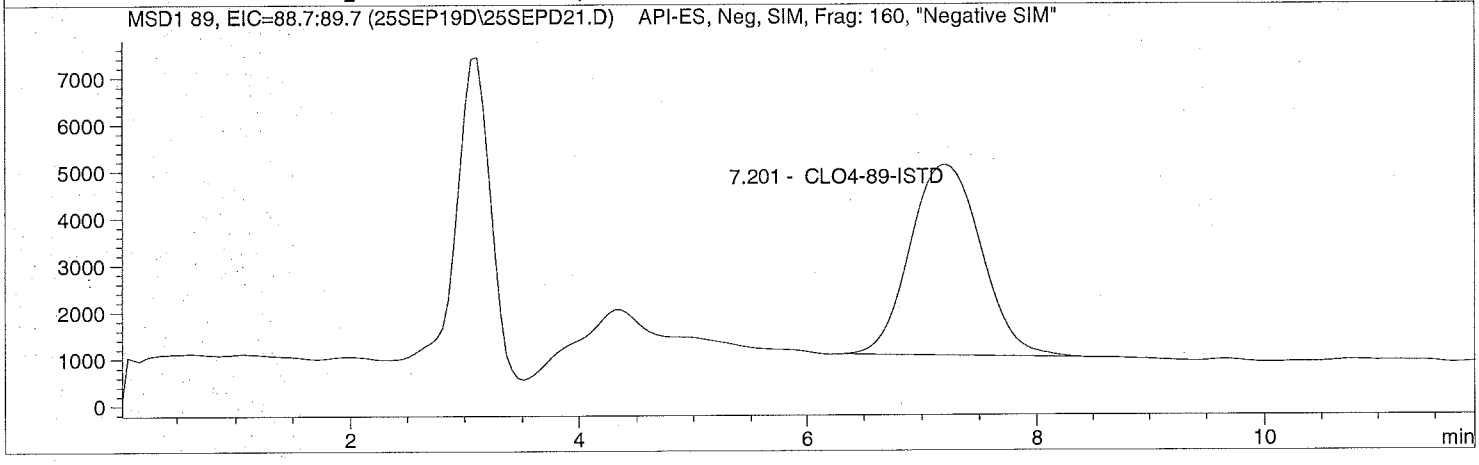
Injection Date:	9/25/2019 13:16:17	Seq Line:	21
Sample Name:	1927207013	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD21.D Sample Name: 1927207013

Injection Date:	9/25/2019 13:16:17	Seq Line:	21
Sample Name:	1927207013	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.201	PBA	174006.0	5.0000	CLO4-89-ISTD

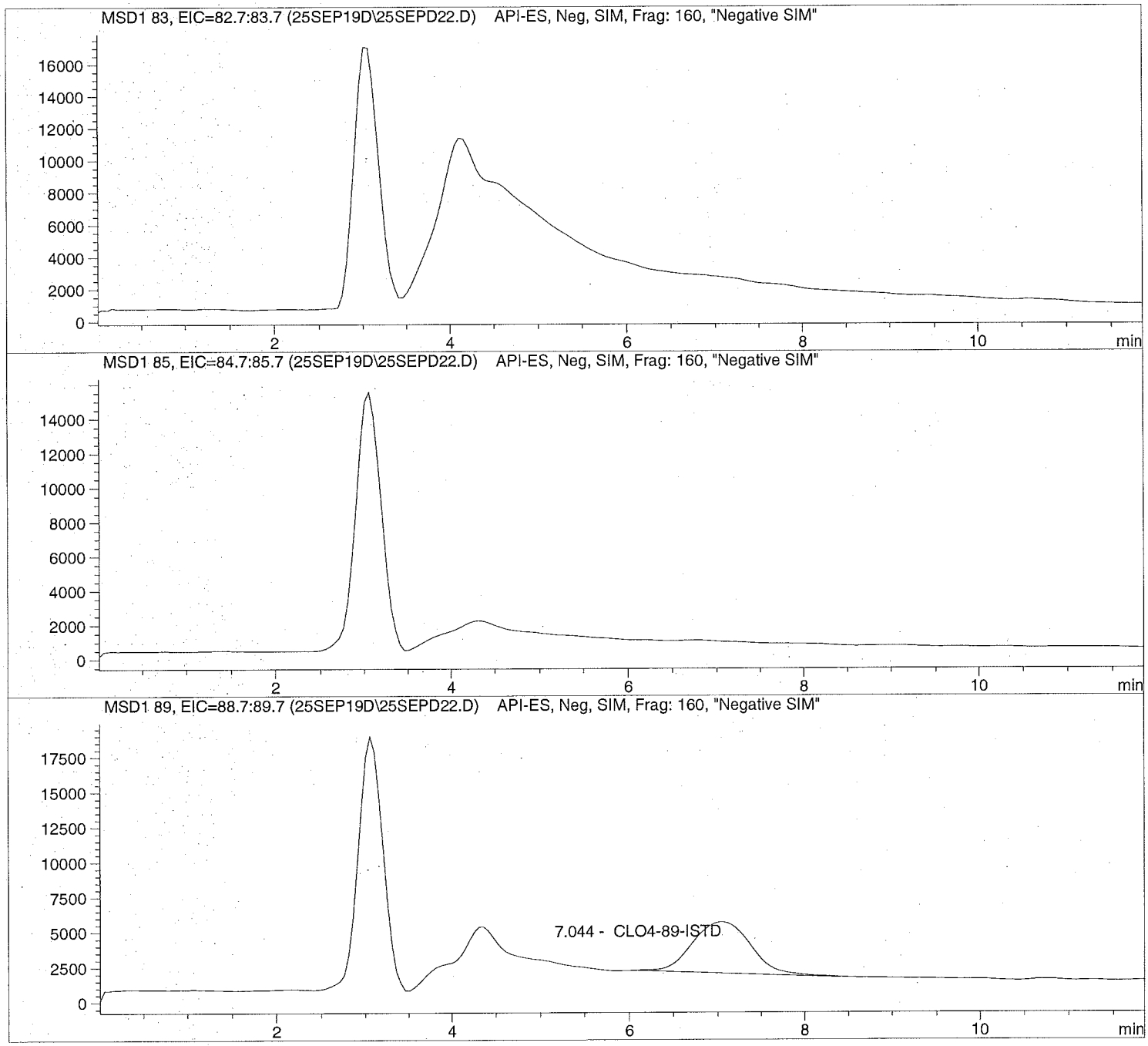
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD22.D Sample Name: 1927207014

Injection Date:	9/25/2019 13:30:08	Seq Line:	22
Sample Name:	1927207014	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD22.D Sample Name: 1927207014

Injection Date:	9/25/2019 13:30:08	Seq Line:	22
Sample Name:	1927207014	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.044	PBA	167770.5	5.0000	CLO4-89-ISTD

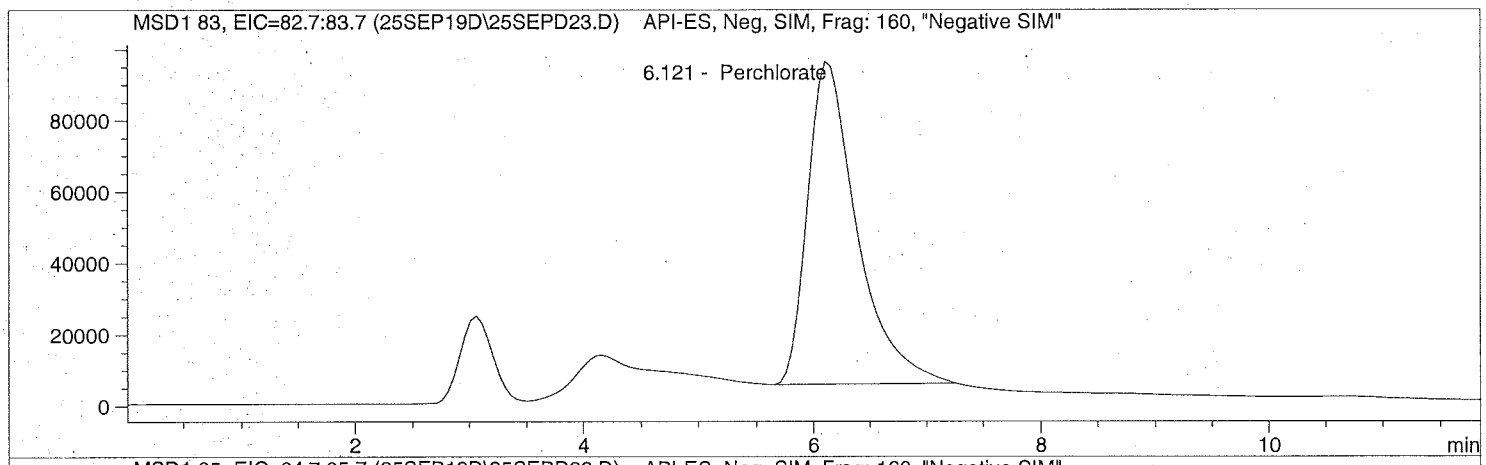
*** End of Report ***

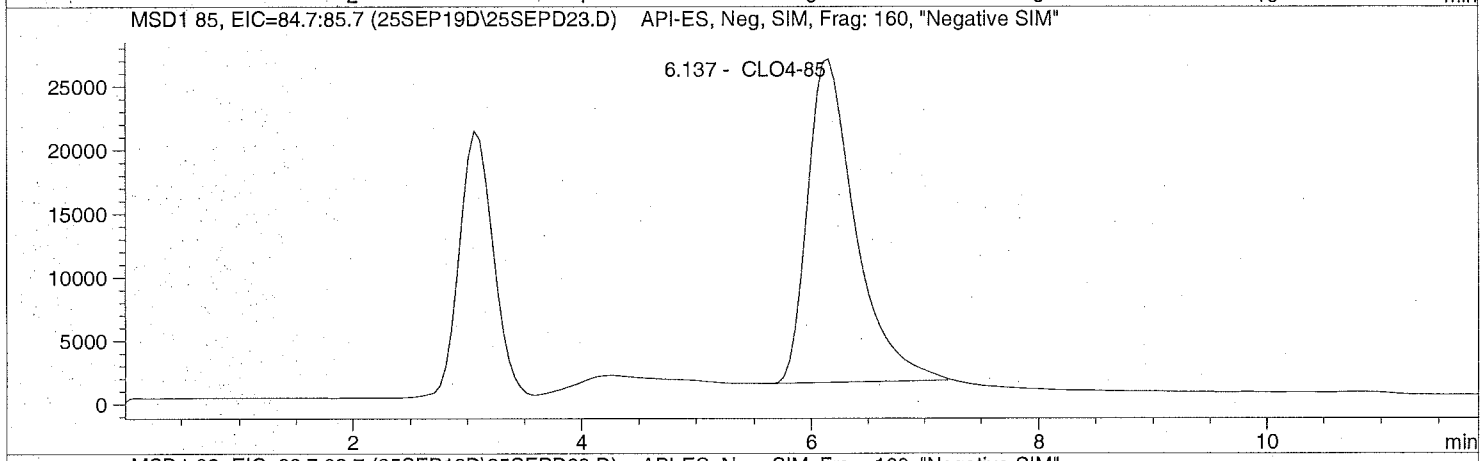
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD23.D Sample Name: 1927207006 MS-25

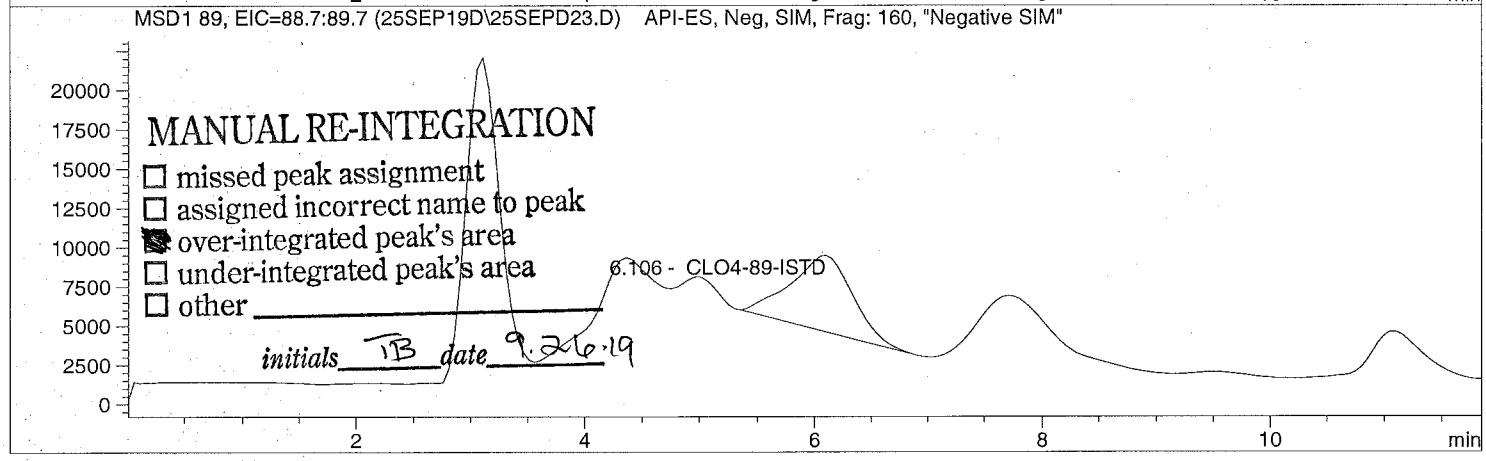
Injection Date:	9/25/2019 13:43:55	Seq Line:	23
Sample Name:	1927207006 MS-25	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD23.D Sample Name: 1927207006 MS-25

Injection Date:	9/25/2019 13:43:55	Seq Line:	23
Sample Name:	1927207006 MS-25	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.121	PBA	2732867.5	46.5539	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.137	PBA	747215.8	42.6266	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.106	MM	184009.8	5.0000	CLO4-89-ISTD

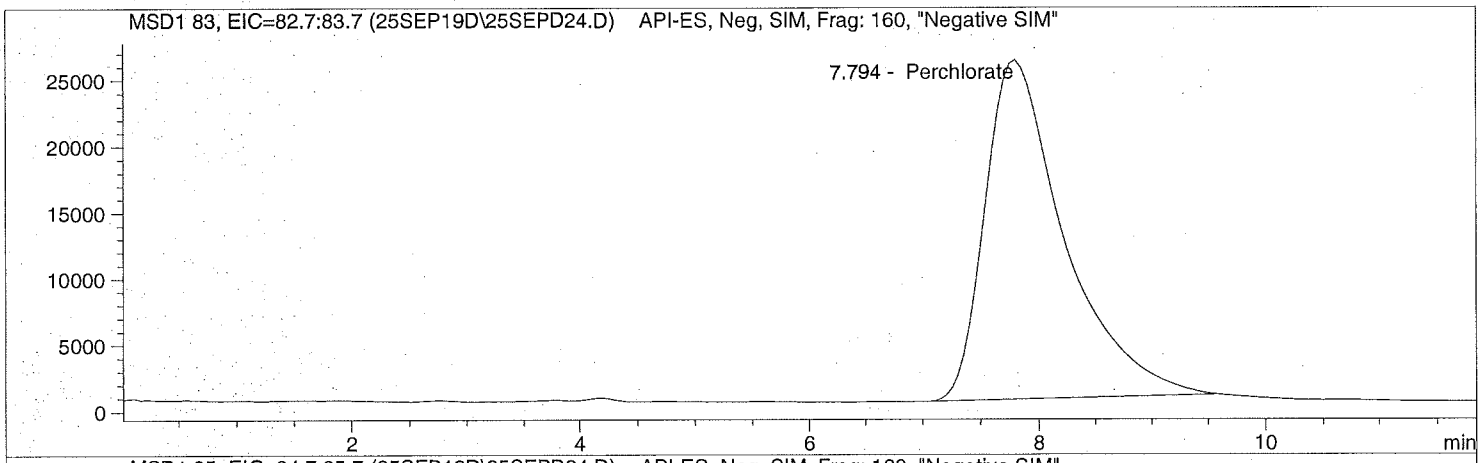
*** End of Report ***

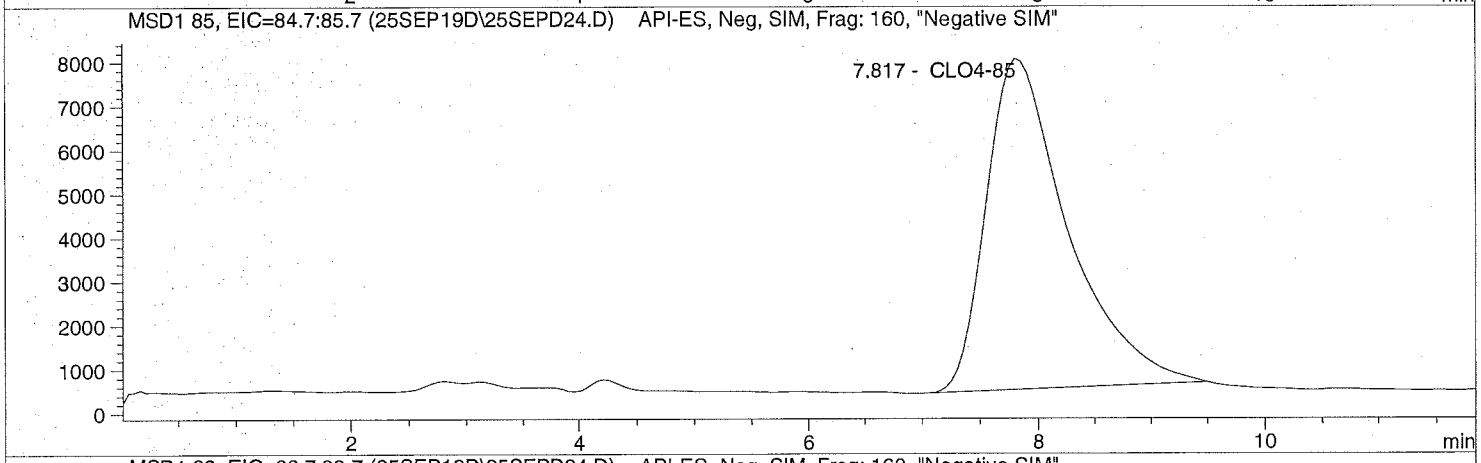
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD24.D Sample Name: 675453 CCV@25

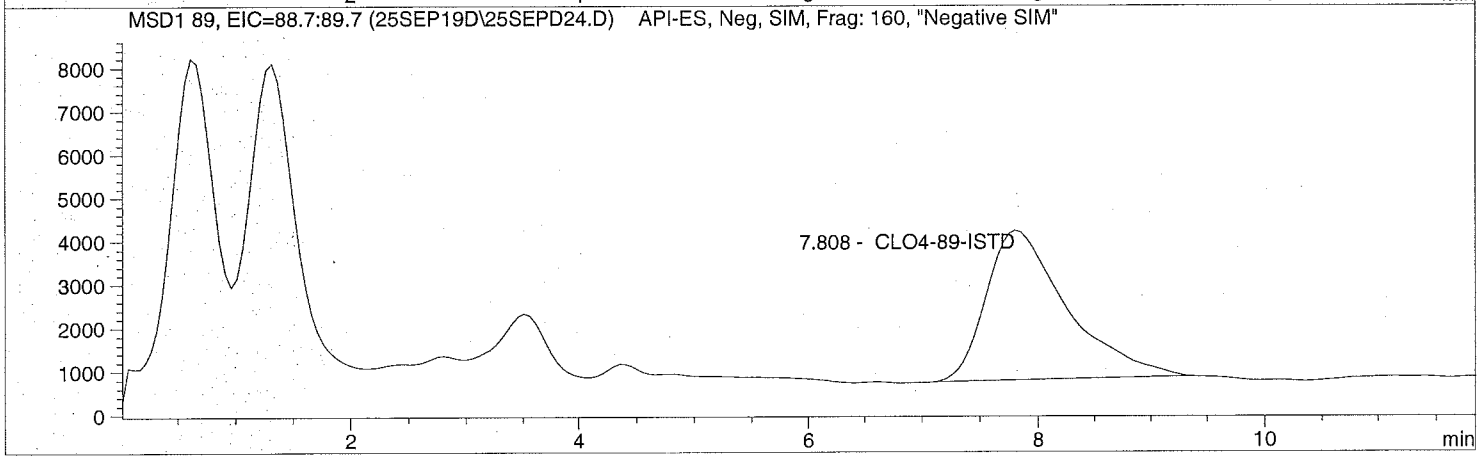
Injection Date:	9/25/2019 13:59:10	Seq Line:	24
Sample Name:	675453 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD24.D Sample Name: 675453 CCV@25

Injection Date:	9/25/2019 13:59:10	Seq Line:	24
Sample Name:	675453 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.794	PBA	1221554.3	25.0034	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.817	PBA	369755.7	24.8352	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.808	PBA	166932.8	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

Calibration Table

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
7.750	1	3	1.00000	5.39218e4	1.85454e-5	1		Perchlorate
		4	2.00000	1.32825e5	1.50574e-5			
		5	5.00000	2.76271e5	1.80982e-5			
		6	10.00000	5.61298e5	1.78159e-5			
		7	25.00000	1.51820e6	1.64669e-5			
		8	50.00000	3.31156e6	1.50986e-5			
		9	75.00000	5.23914e6	1.43153e-5			
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1		CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5			
		5	5.00000	2.13407e5	2.34294e-5			
		6	5.00000	2.09246e5	2.38953e-5			
		7	5.00000	2.07403e5	2.41077e-5			
		8	5.00000	2.02929e5	2.46391e-5			
		9	5.00000	1.97933e5	2.52611e-5			
7.778	2	3	1.00000	1.70436e4	5.86732e-5	1		CLO4-85
		4	2.00000	4.20754e4	4.75337e-5			
		5	5.00000	9.24707e4	5.40712e-5			
		6	10.00000	1.68622e5	5.93041e-5			
		7	25.00000	4.63724e5	5.39114e-5			
		8	50.00000	9.95933e5	5.02042e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
	9	75.00000	1.58066e6	4.74484e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 3.581 min To 11.899 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 0.5
  - Level 5 : 0.2
  - Level 6 : 0.1
  - Level 7 : 0.04
  - Level 8 : 0.02
  - Level 9 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

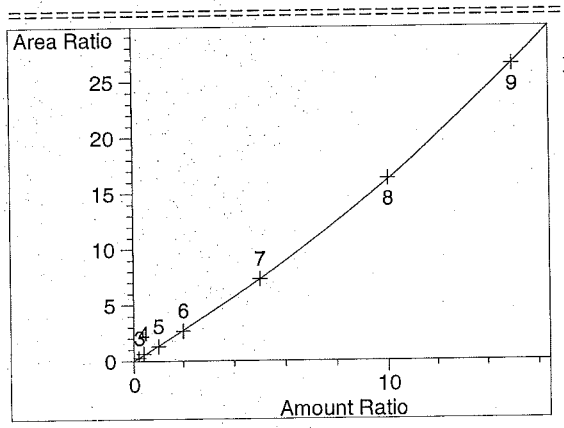
Compound: CLO4-85
- Time Window : From 3.601 min To 11.913 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 0.5
  - Level 5 : 0.2
  - Level 6 : 0.1
  - Level 7 : 0.04
  - Level 8 : 0.02
  - Level 9 : 0.013333

Peak Sum Table

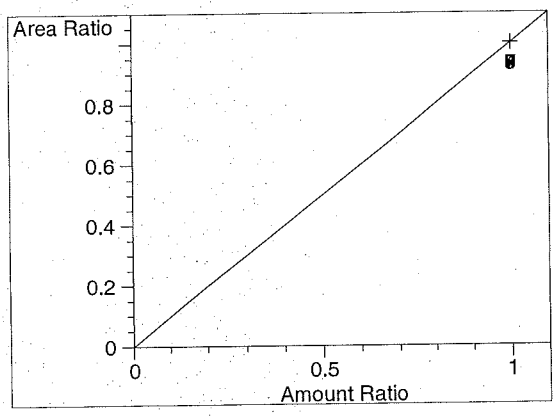
No Entries in table

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

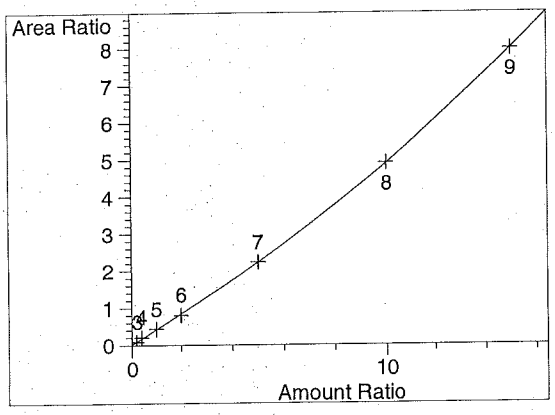
Calibration Curves



Perchlorate at exp. RT: 7.750
MSD1 83, EIC=82.7:83.7
Correlation: 0.99975
Residual Std. Dev.: 0.10284
Formula: $y = ax^2 + bx + c$
a: 3.10463e-2
b: 1.30369
c: 2.19496e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1
Level 8 : 1
Level 9 : 1



CLO4-85 at exp. RT: 7.778
MSD1 85, EIC=84.7:85.7
Correlation: 0.99969
Residual Std. Dev.: 0.02601
Formula: $y = ax^2 + bx + c$
a: 8.85207e-3
b: 3.99283e-1
c: 1.33505e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333

Batch Report: C:\HPCHEM\1\DATA\20SEP19I\20SEP19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\20SEP19I.S

Sequence Table:

Method and Injection Info Part:

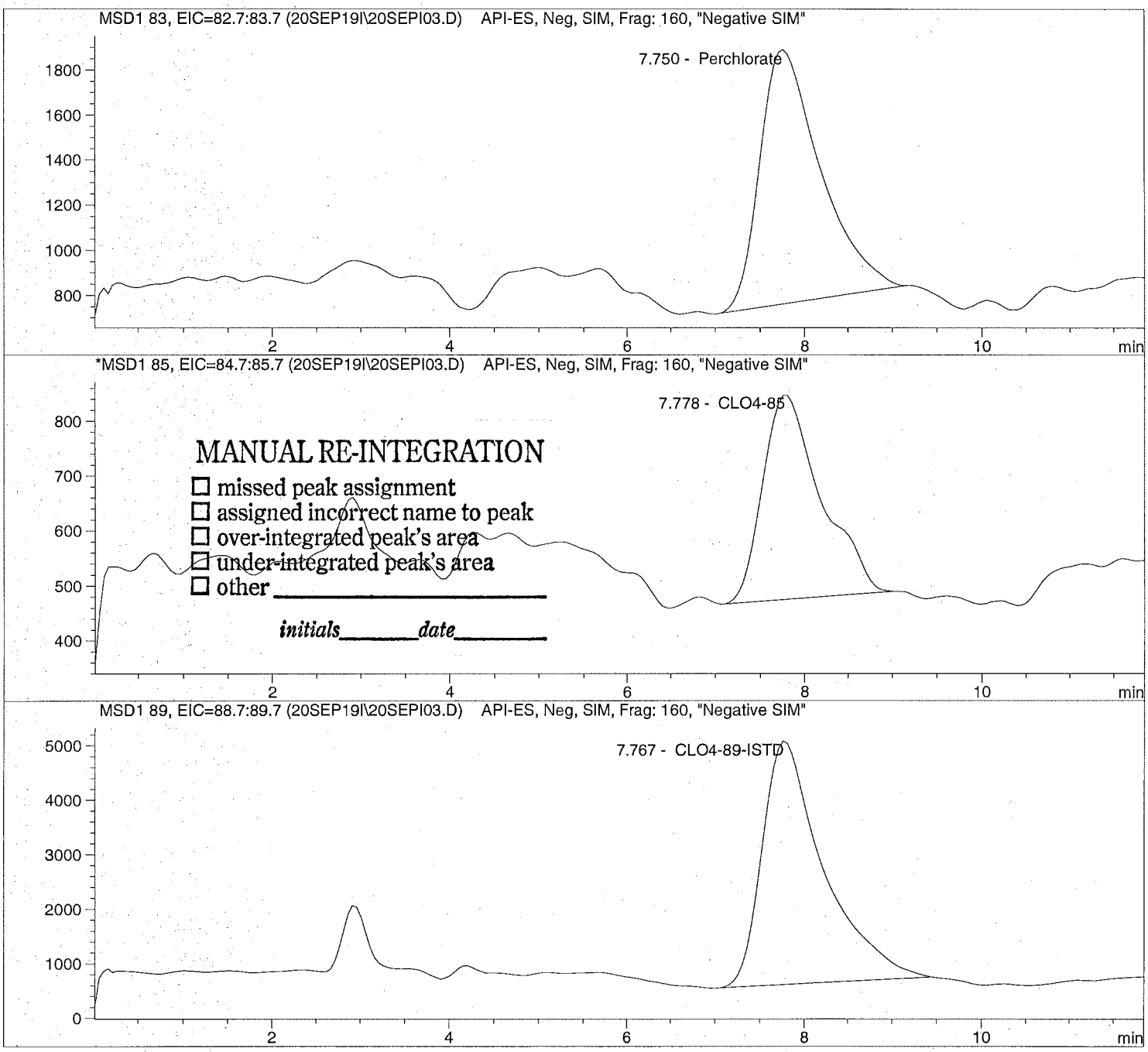
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

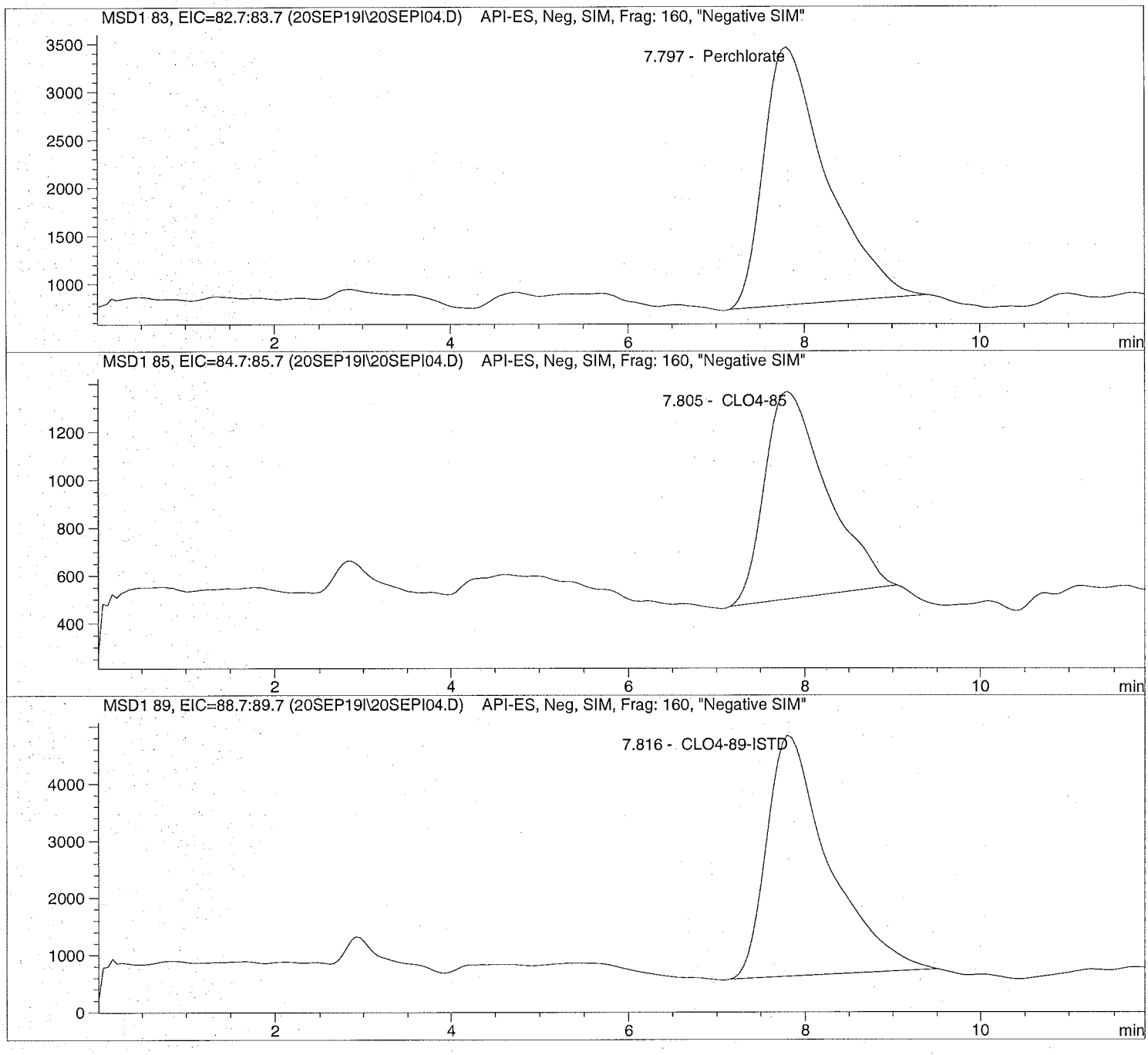
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

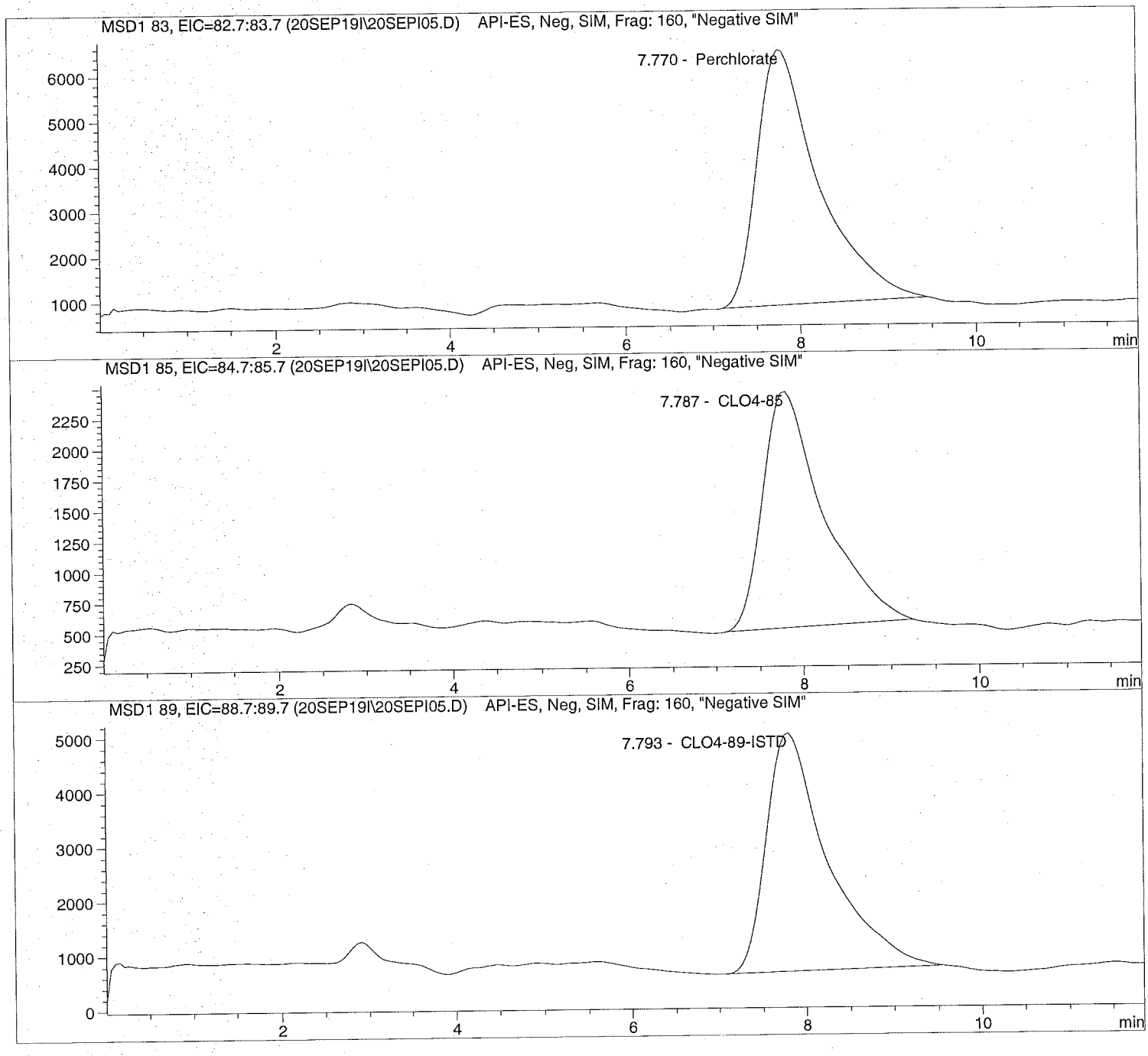
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	9/20/2019 09:51:49	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	9/20/2019 09:51:49	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

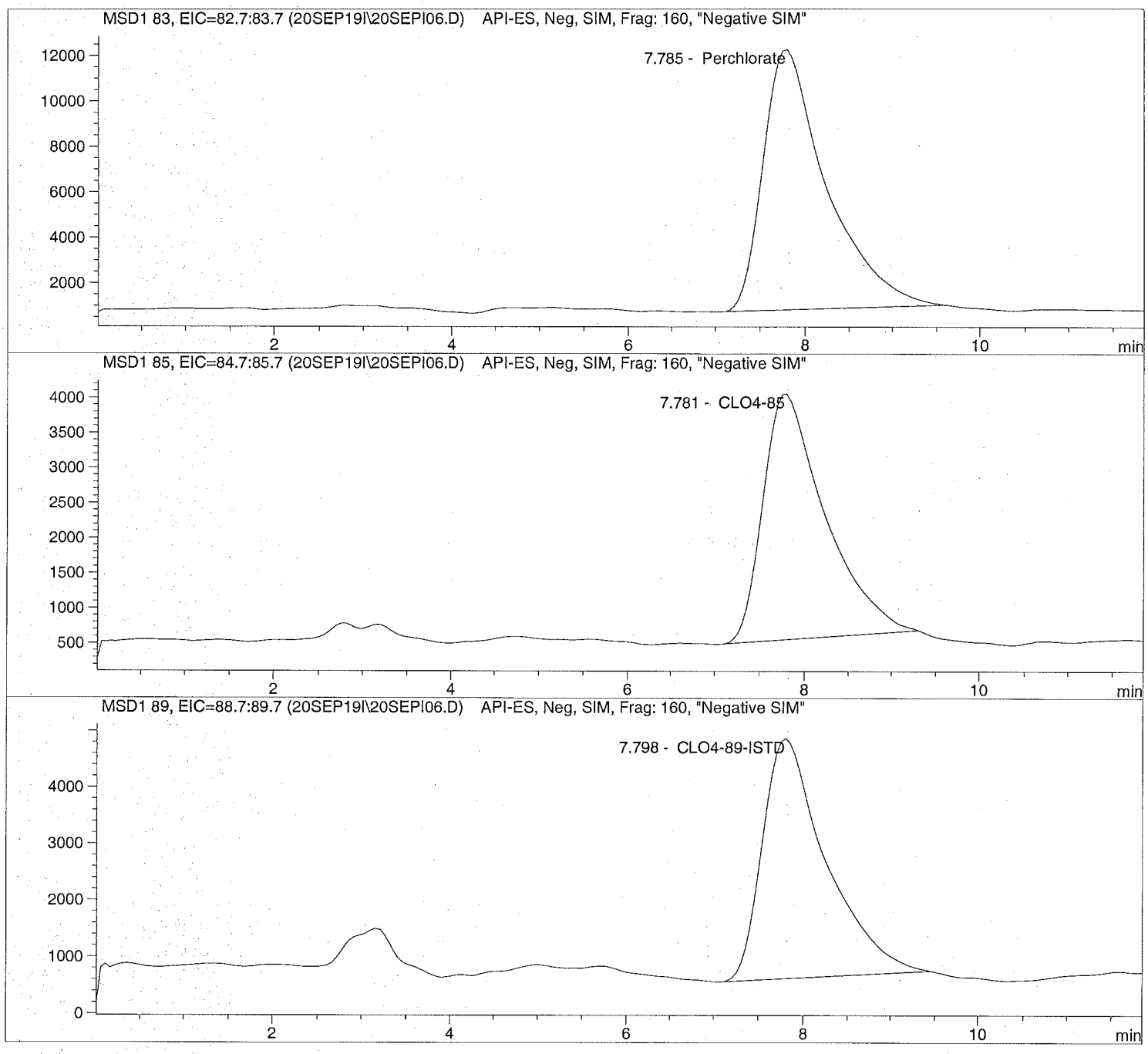
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

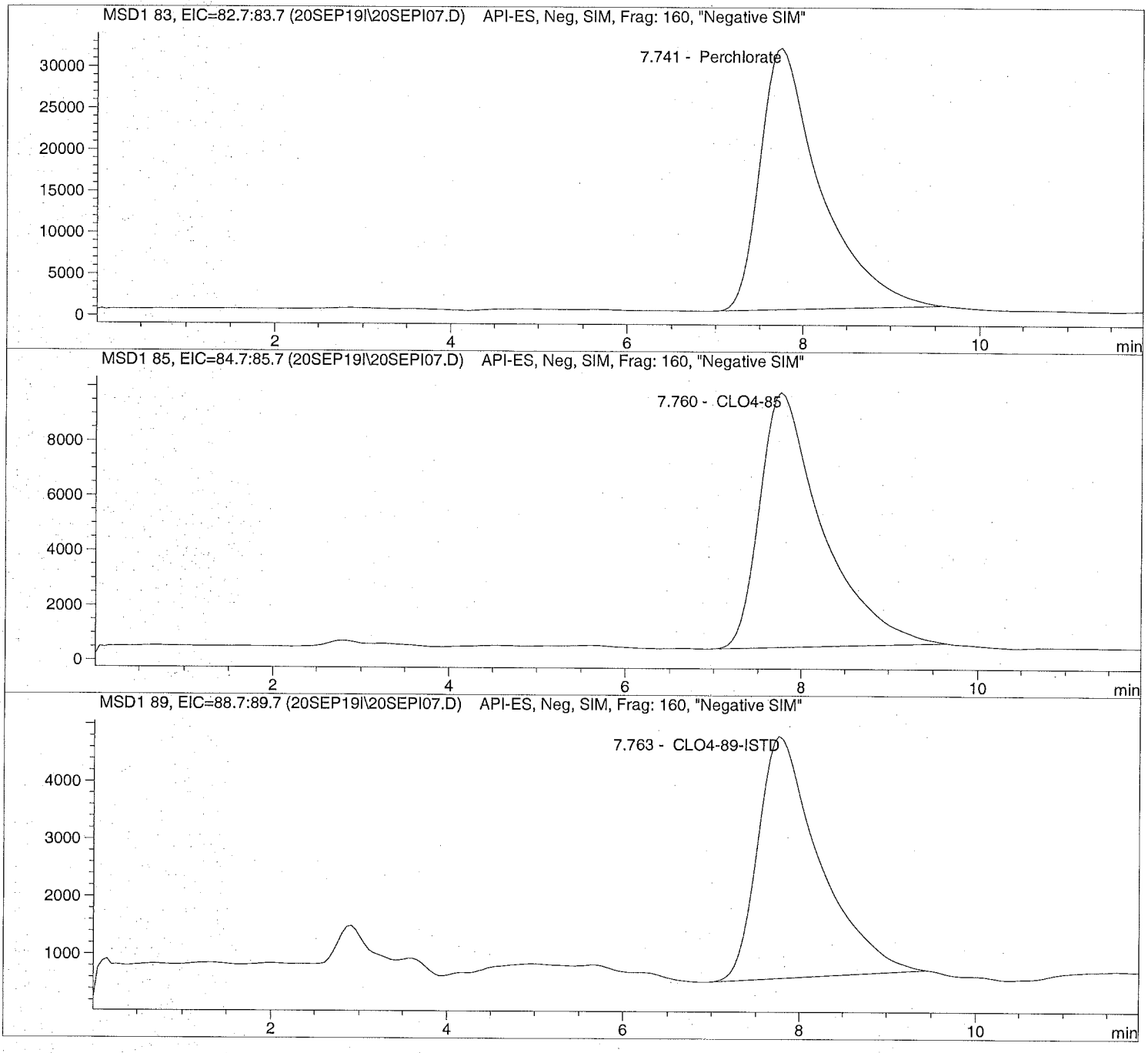
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	9/20/2019 10:19:23	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	9/20/2019 10:19:23	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

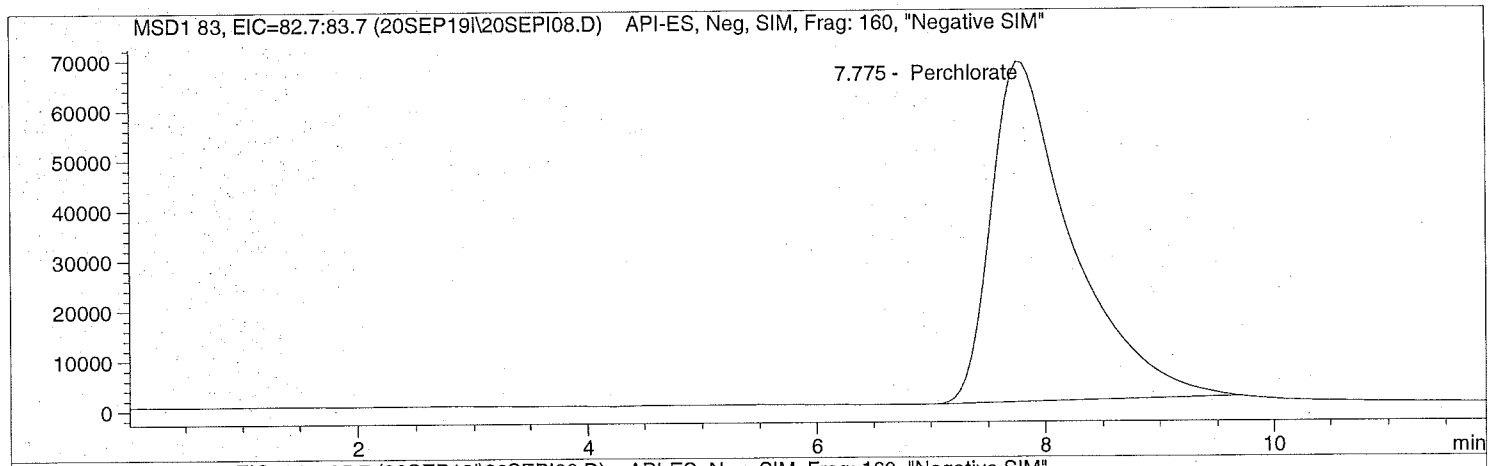
*** End of Report ***

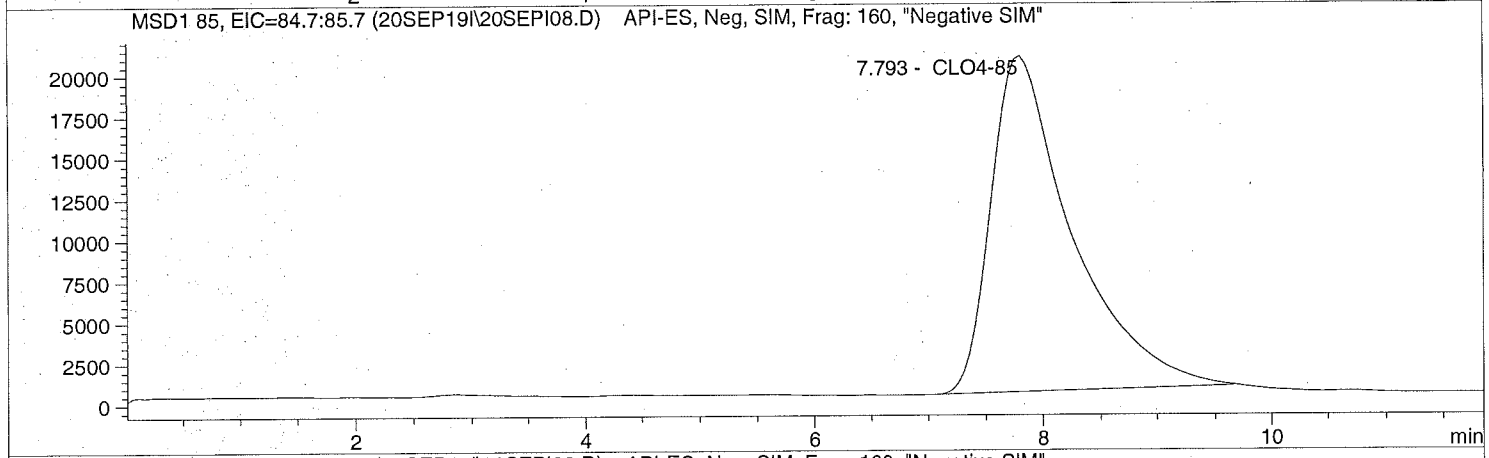
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

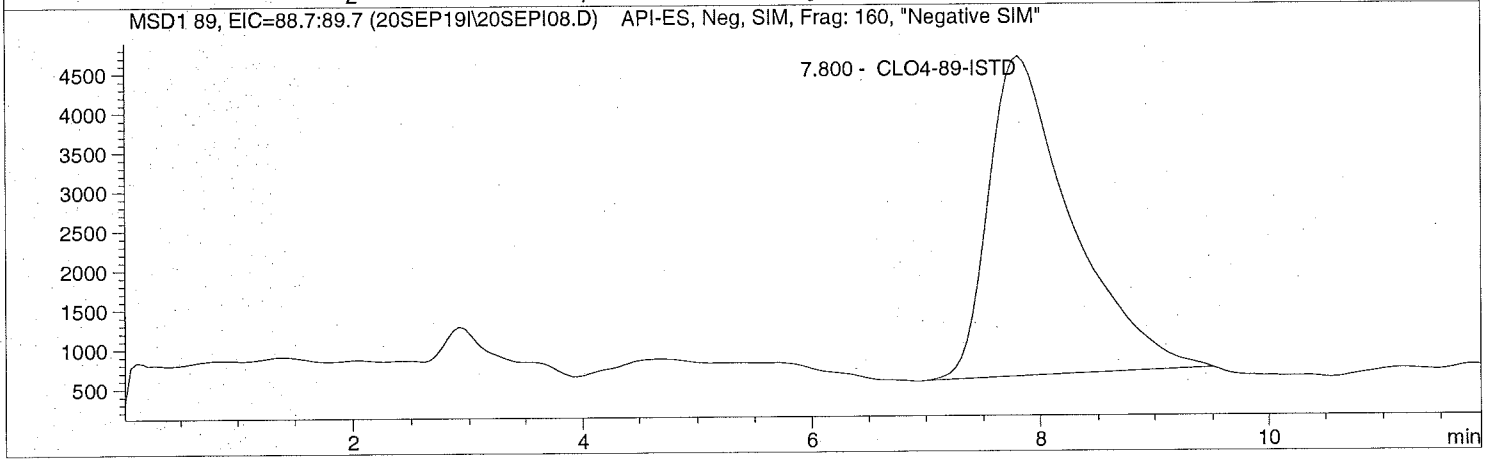
Injection Date:	9/20/2019 10:33:18	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis







145 of 379

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	9/20/2019 10:33:18	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

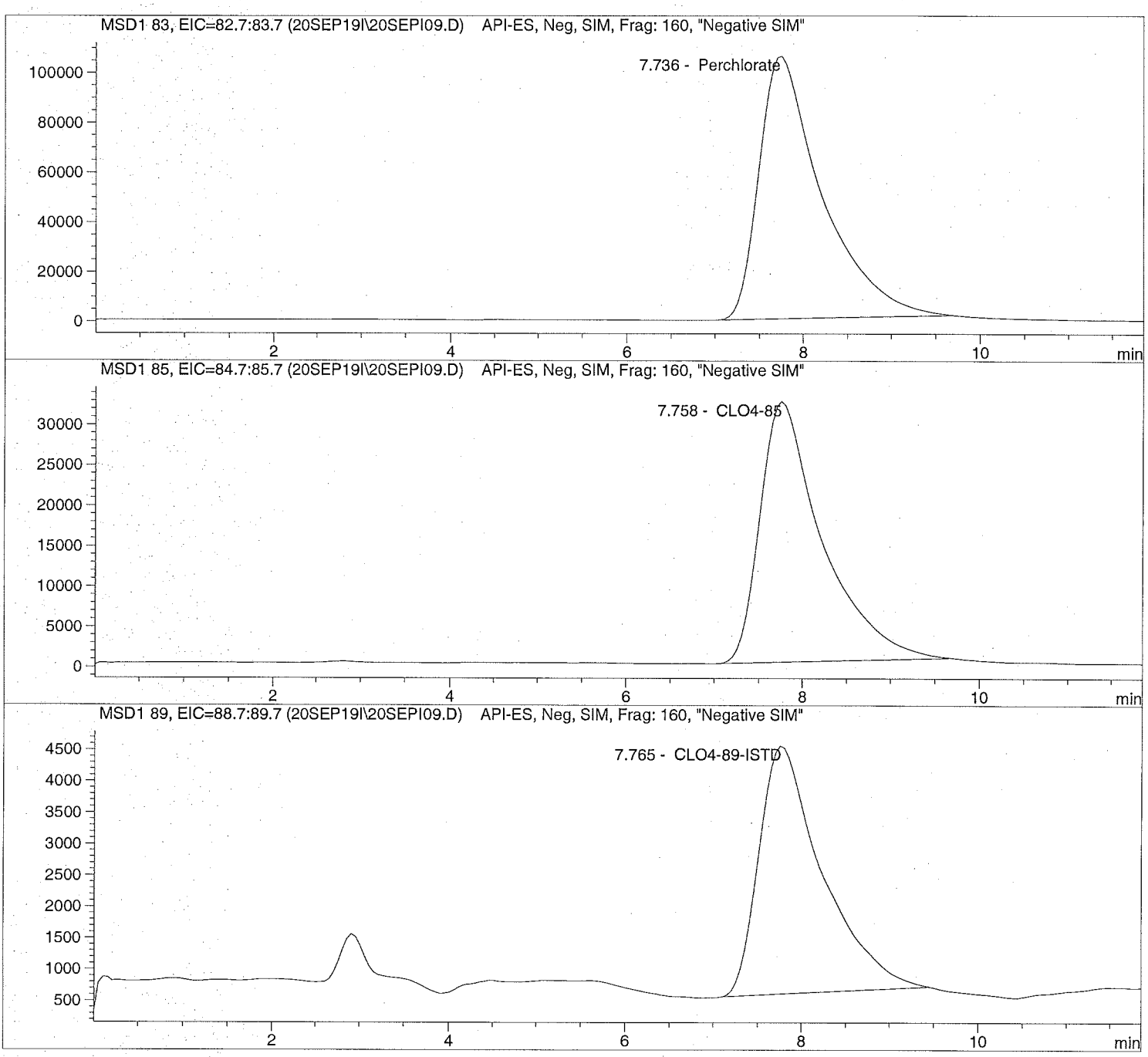
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	9/20/2019 10:47:05	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	9/20/2019 10:47:05	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

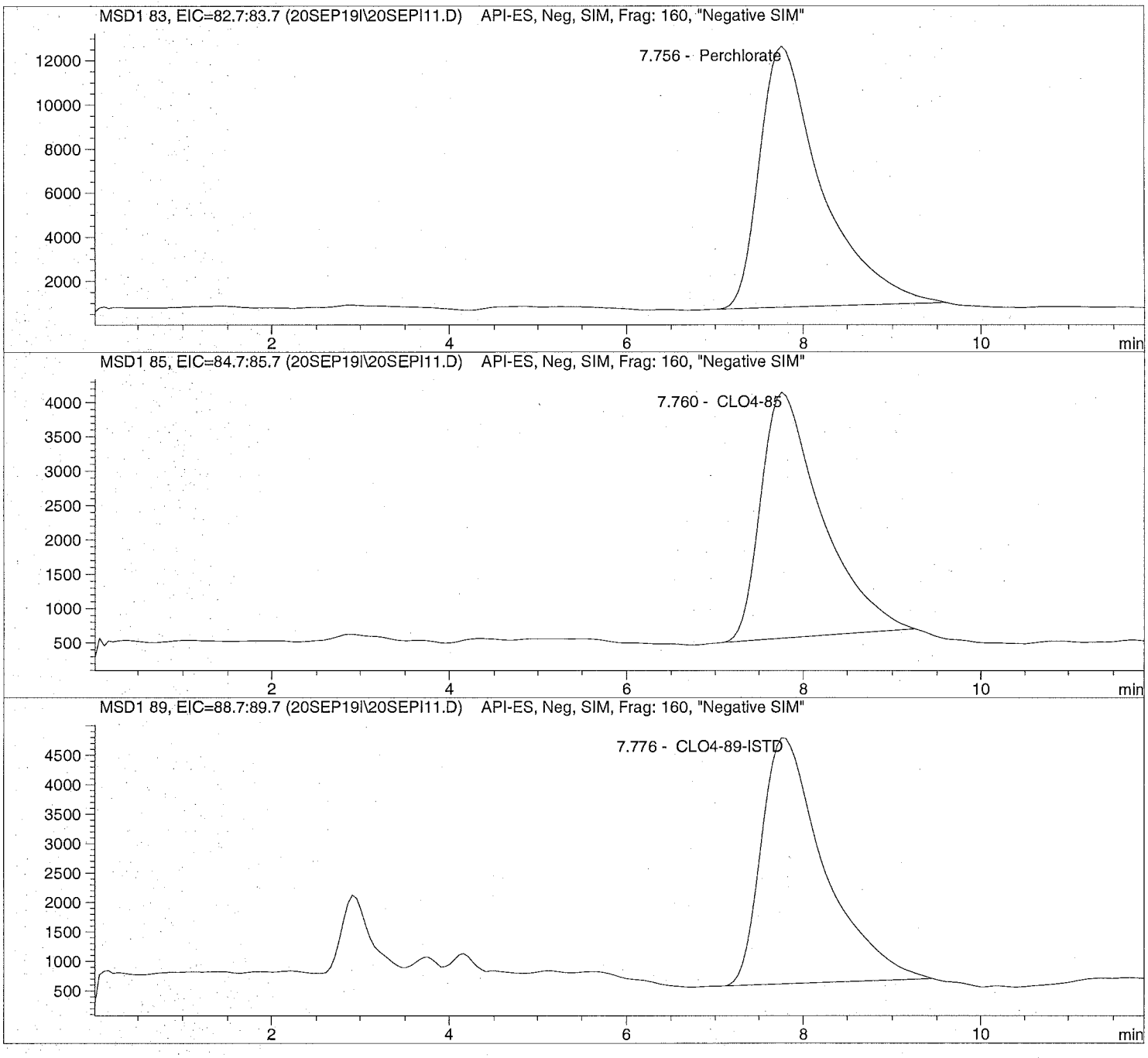
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

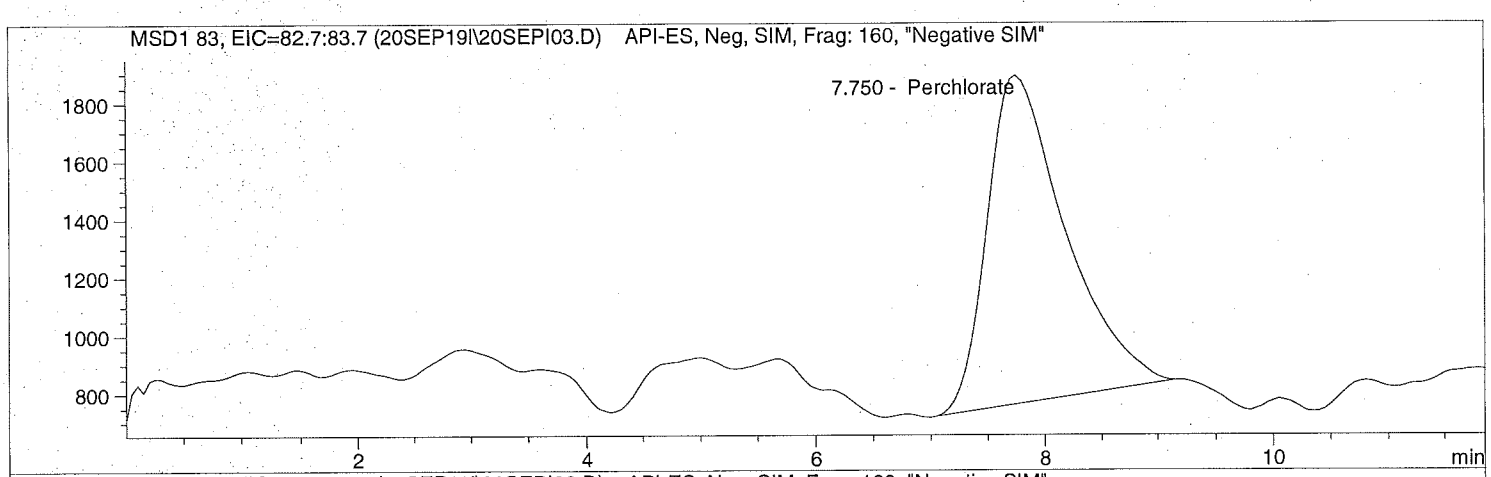
Unmodified

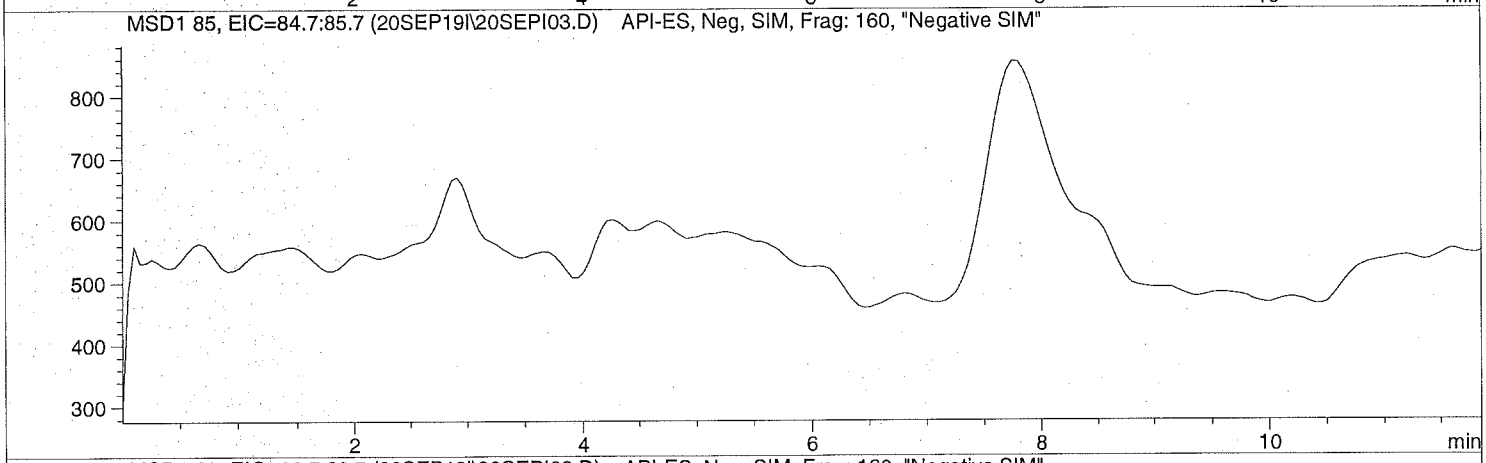
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

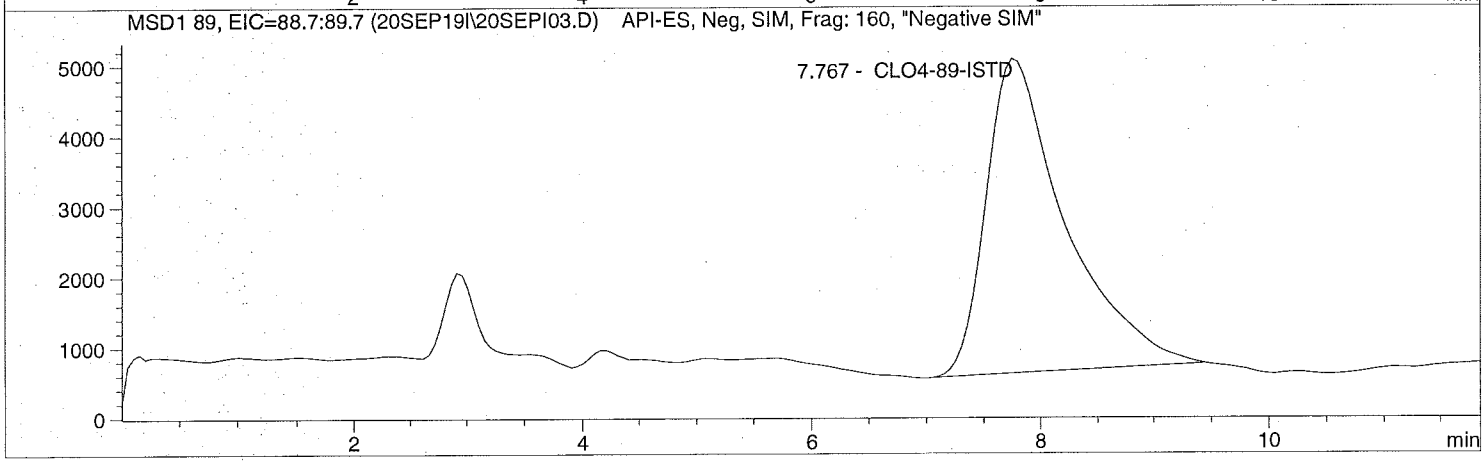
Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

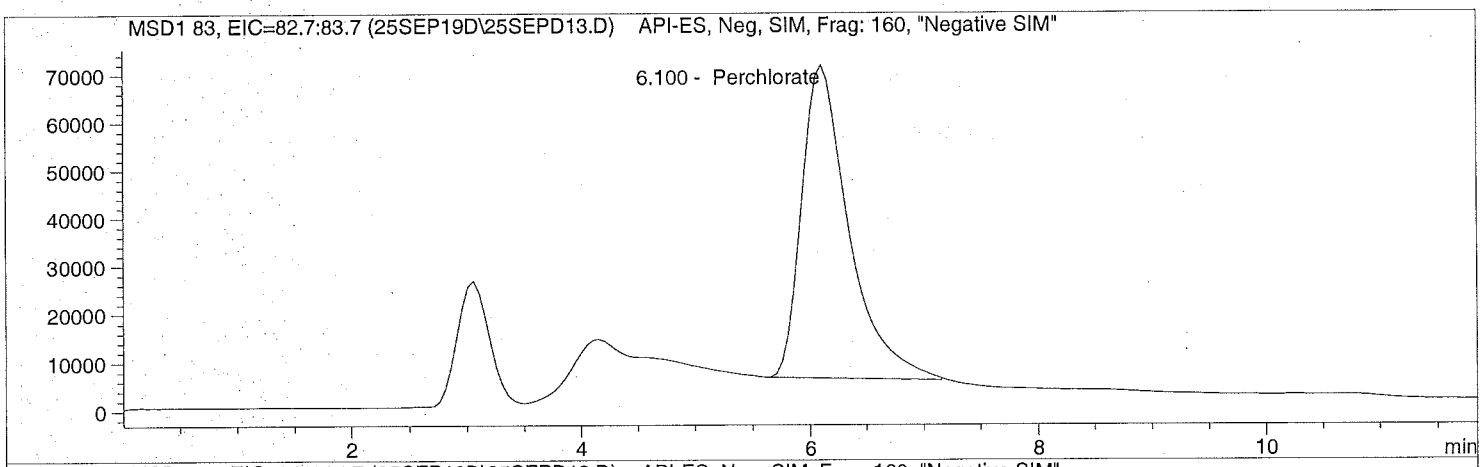
*** End of Report ***

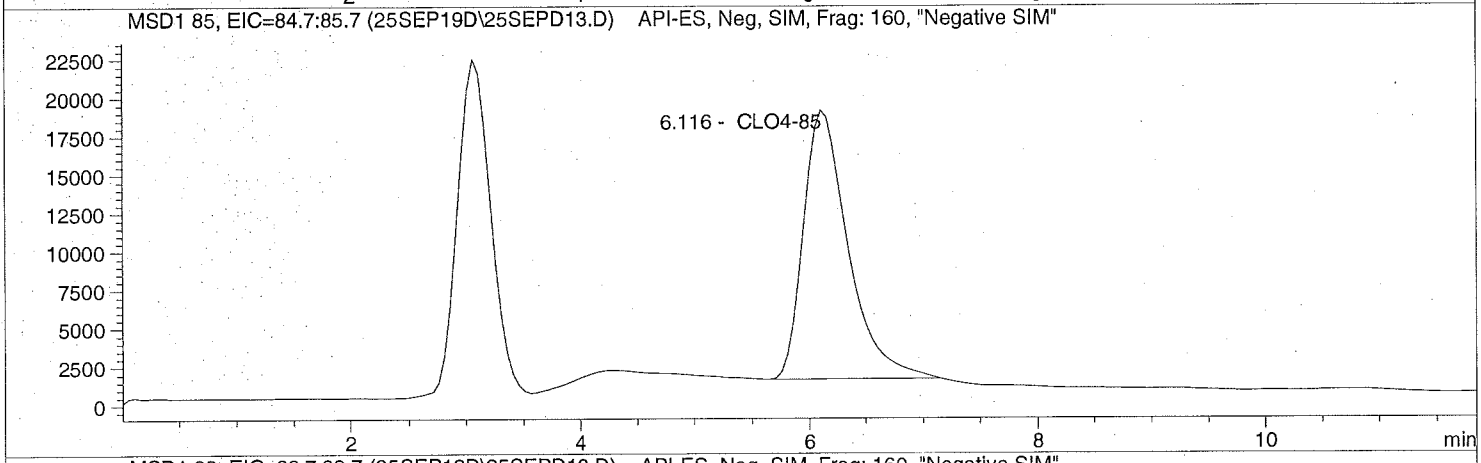
Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD13.D Sample Name: 1927207006

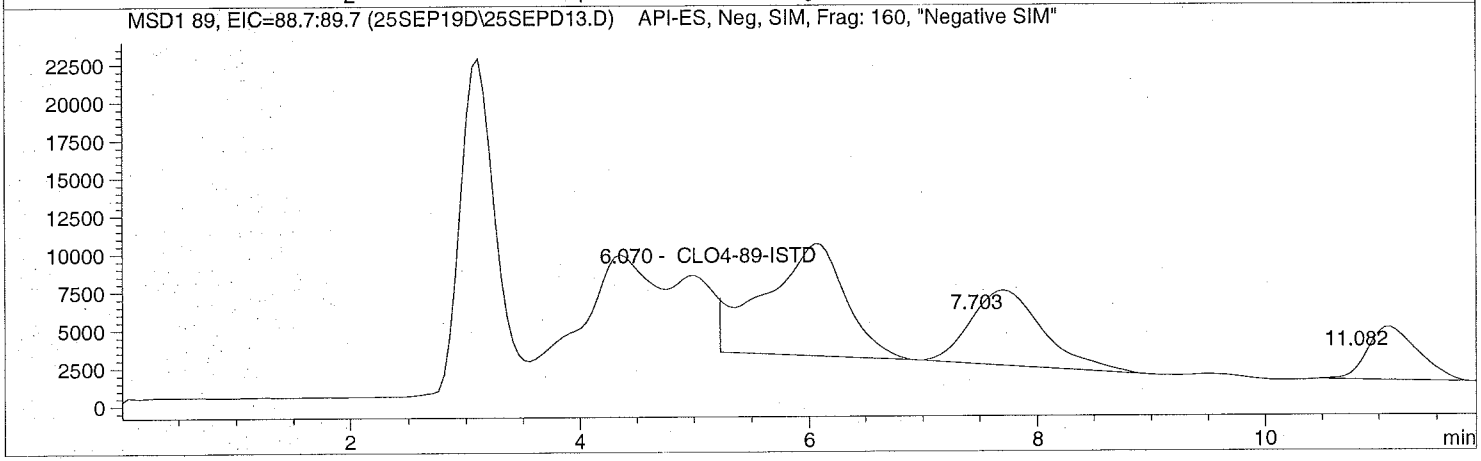
Injection Date:	9/25/2019 11:24:03	Seq Line:	13
Sample Name:	1927207006	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD13.D Sample Name: 1927207006

Injection Date:	9/25/2019 11:24:03	Seq Line:	13
Sample Name:	1927207006	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.100	BBA	1881866.3	18.2810	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.116	PBA	480234.9	15.4085	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.070	BB	361652.6	5.0000	CLO4-89-ISTD
7.703	VBA	216336.8	0.0000	
11.082	PPA	106442.1	0.0000	

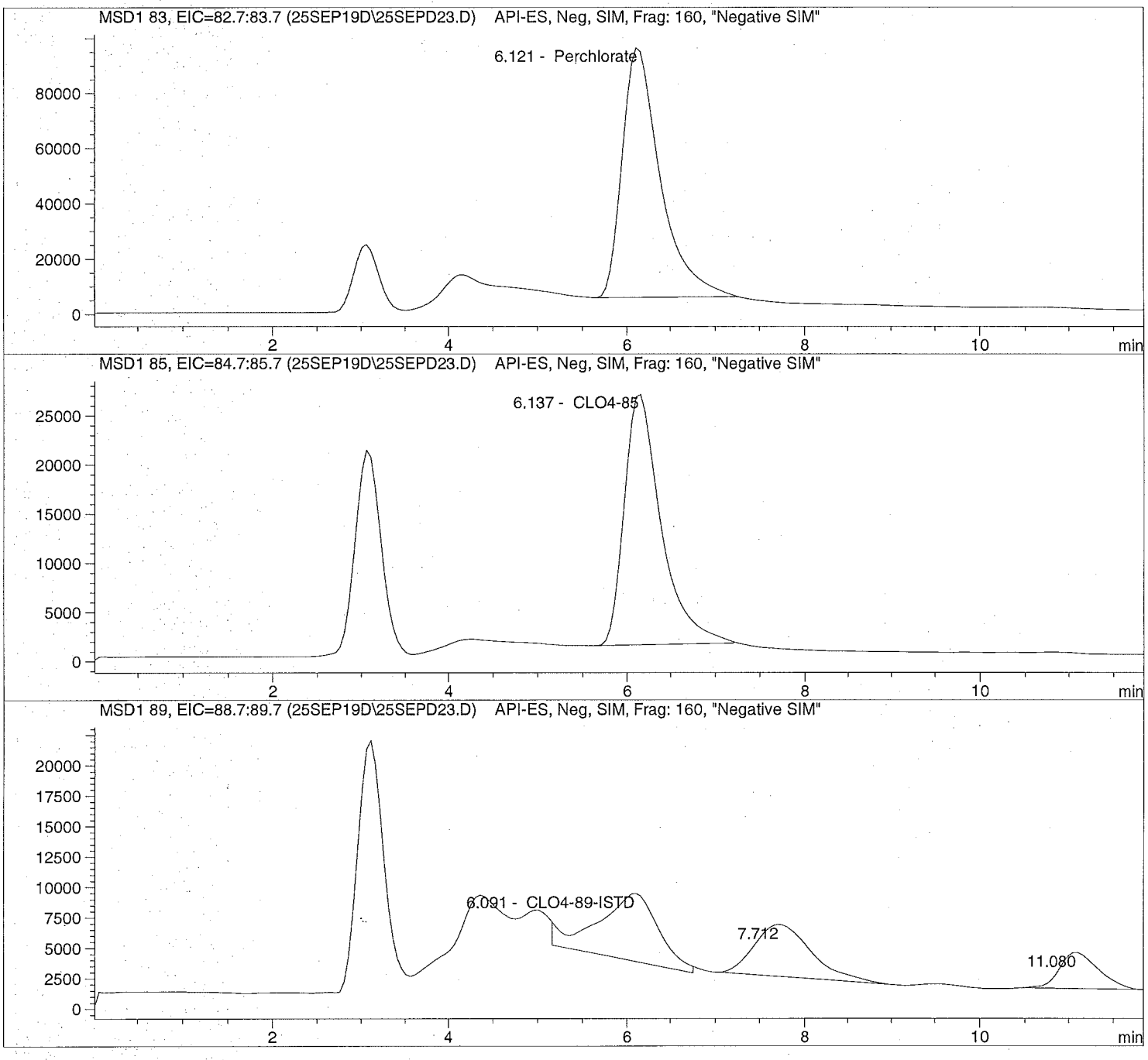
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD23.D Sample Name: 1927207006 MS-25

Injection Date:	9/25/2019 13:43:55	Seq Line:	23
Sample Name:	1927207006 MS-25	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD23.D Sample Name: 1927207006 MS-25

Injection Date:	9/25/2019 13:43:55	Seq Line:	23
Sample Name:	1927207006 MS-25	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.121	PBA	2732867.5	34.3055	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.137	PBA	747215.8	31.2167	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.091	BBA	262065.2	5.0000	CLO4-89-ISTD
7.712	PBA	189169.8	0.0000	
11.080	PBA	89782.7	0.0000	

*** End of Report ***

HS19090860 8260

ALS WO# HS19090860

MSVOA06 -Logbook

Batch: 37649 **Analyst:** Devak Giga

Date: 09-24-2019 **Reviewer:**

Method: 8260 ICAL **Laboratory:** Houston

Comments:

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	09-24-2019 10:48 am	1.00	0.00 mL	0.00 mL	X092401.D	Liquid	Y	NA
	Auto find/purged									
2	VSTD000.25	ICAL1	09-24-2019 11:12 am	1.00	5.00 mL	0.00 mL	X092402.D	Liquid	Y	NA
3	VSTD000.5	ICAL2	09-24-2019 11:36 am	1.00	5.00 mL	0.00 mL	X092403.D	Liquid	Y	NA
4	VSTD001	ICAL3	09-24-2019 12:23 pm	1.00	5.00 mL	0.00 mL	X092404.D	Liquid	Y	NA
5	VSTD002	ICAL4	09-24-2019 12:47 pm	1.00	5.00 mL	0.00 mL	X092405.D	Liquid	Y	NA
6	VSTD005	ICAL5	09-24-2019 01:11 pm	1.00	5.00 mL	0.00 mL	X092406.D	Liquid	Y	NA
7	VSTD020	ICAL6	09-24-2019 01:35 pm	1.00	5.00 mL	0.00 mL	X092407.D	Liquid	Y	NA
8	VSTD050	ICAL7	09-24-2019 01:59 pm	1.00	5.00 mL	0.00 mL	X092408.D	Liquid	Y	NA
9	VSTD100	ICAL8	09-24-2019 02:23 pm	1.00	5.00 mL	0.00 mL	X092409.D	Liquid	Y	NA
10	VSTD150	ICAL9	09-24-2019 02:47 pm	1.00	5.00 mL	0.00 mL	X092410.D	Liquid	Y	NA
11	VSTD200	ICAL	09-24-2019 03:11 pm	1.00	5.00 mL	0.00 mL	X092411.D	Liquid	Y	NA
12	BLANK	SAMP	09-24-2019 03:35 pm	1.00	5.00 mL	0.00 mL	X092412.D	Liquid	Y	NA
	Cleanup blk									
13	BLANK	SAMP	09-24-2019 03:59 pm	1.00	5.00 mL	0.00 mL	X092413.D	Liquid	Y	NA
	Cleanup blk									
14	ICV	ICV	09-24-2019 04:23 pm	1.00	5.00 mL	0.00 mL	X092414.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
15	BLANK	SAMP	09-24-2019 04:47 pm	1.00	5.00 mL	0.00 mL	X092415.D	Liquid	Y	NA
	Cleanup blk									
16	CCB	SAMP	09-24-2019 05:11 pm	1.00	5.00 mL	0.00 mL	X092416.D	Liquid	Y	NA
	CCB									
17	VLCSW-190924	LCS	09-24-2019 05:35 pm	1.00	5.00 mL	0.00 mL	X092417.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
18	BLK	SAMP	09-24-2019 05:59 pm	1.00	5.00 mL	0.00 mL	X092418.D	Liquid	Y	NA
	Cleanup blk									
19	VBLKW-190924	MBLK	09-24-2019 06:23 pm	1.00	5.00 mL	0.00 mL	X092419.D	Liquid	Y	NA
20	HS19090860-01	SAMP	09-24-2019 06:47 pm	1.00	5.00 mL	0.00 mL	X092420.D	Liquid	Y	<2
21	HS19090860-02	SAMP	09-24-2019 07:11 pm	25.00	5.00 mL	0.00 mL	X092421.D	Liquid	Y	<2
22	HS19090860-01MS	MS	09-24-2019 07:35 pm	1.00	5.00 mL	0.00 mL	X092422.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
23	HS19090860-01MSD	MSD	09-24-2019 07:59 pm	1.00	5.00 mL	0.00 mL	X092423.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
24	HS19090860-02	SAMP	09-24-2019 08:23 pm	250.0(	5.00 mL	0.00 mL	X092424.D	Liquid	Y	<2
25	HS19090860-05	SAMP	09-24-2019 08:47 pm	1.00	5.00 mL	0.00 mL	X092425.D	Liquid	Y	<2
26	HS19090860-08	SAMP	09-24-2019 09:11 pm	1.00	5.00 mL	0.00 mL	X092426.D	Liquid	Y	<2
~~27~~	~~HS19090860-11~~	~~SAMP~~	~~09-24-2019 09:36 pm~~	~~1.00~~	~~5.00 mL~~	~~0.00 mL~~	~~X092427.D~~	~~Liquid~~	~~Y~~	~~<2~~
28	HS19090860-12	SAMP	09-24-2019 10:00 pm	1.00	5.00 mL	0.00 mL	X092428.D	Liquid	Y	<2
29	CCV-END	CCV	09-24-2019 10:24 pm	1.00	5.00 mL	0.00 mL	X092429.D	Liquid	Y	NA
	~~*10 uL cal std/50 mL DI*~~									

Chemical	Value
SURR SPK ID	30502-94-03
IS ID	30502-94-04
ICV STD ID	30603-84-01
LCS/MS ID	30603-84-01
CAL STD ID	30502-94-01/02
BFB Ion 95 Response	
BFB ID	30502-94-03
pH Paper	634-64-11

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

	CLIENT SAMPLE NO.	SMC1 (TOL) #	SMC2 #	SMC3 (DCE) #	OTHER #	TOT OUT
01	VLCSW-190924	92	105	104	104	0
02	VBLKW-190924	98	104	91	94	0
03	HS19090860-0	98	103	91	94	0
04	HS19090860-0	97	104	91	94	0
05	HS19090860-0	100	102	92	96	0
06	HS19090860-0	98	104	91	95	0
07	HS19090860-0	101	104	92	94	0
08	HS19090860-0	99	106	91	94	0
09	HS19090860-0	98	106	92	95	0
10	HS19090860-1	99	103	91	94	0
11	HS19090860-1	98	104	91	94	0
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(70-130)
SMC2	= 4-Bromofluorobenzene	(70-130)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-130)
OTHER	= Dibromofluoromethane	(70-130)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
cis-1,2-Dichloroethene	50.00	45.36	91	80-120
1,2-Dichloroethane	50.00	46.75	94	80-120
Vinyl Chloride	50.00	45.29	90	80-120
1,1,2-Trichloroethane	50.00	50.91	102	80-120
Methylene Chloride	50.00	49.74	99	80-120
1,1-Dichloroethene	50.00	44.61	89	80-120
Trichloroethene	50.00	44.46	89	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS:

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

VBLKW-190924

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID: X092419 Lab Sample ID: VBLKW-190924

Date Analyzed: 09/24/19 Time Analyzed: 1823

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA6

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VLCSW-190924	VLCSW-190924	X092417	1735
02	HS19090860-0	HS19090860-01	X092420	1847
03	HS19090860-0	HS19090860-02	X092421	1911
04	HS19090860-0	HS19090860-01M	X092422	1935
05	HS19090860-0	HS19090860-01M	X092423	1959
06	HS19090860-0	HS19090860-02	X092424	2023
07	HS19090860-0	HS19090860-05	X092425	2047
08	HS19090860-0	HS19090860-08	X092426	2111
09	HS19090860-1	HS19090860-11	X092427	2136
10	HS19090860-1	HS19090860-12	X092428	2200
11				
12				
13				
14				
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28				
29				
30				

COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID: X092401 BFB Injection Date: 09/24/19

Instrument ID: VOA6 BFB Injection Time: 1048

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.0
75	30.0 - 60.0% of mass 95	49.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.4 (0.7)1
174	Greater than 50.0% of mass 95	61.6
175	5.0 - 9.0% of mass 174	5.0 (8.1)1
176	95.0 - 101.0% of mass 174	59.0 (95.7)1
177	5.0 - 9.0% of mass 176	4.5 (7.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD000.25	VSTD000.25	X092402	09/24/19	1112
02	VSTD000.5	VSTD000.5	X092403	09/24/19	1136
03	VSTD001	VSTD001	X092404	09/24/19	1223
04	VSTD002	VSTD002	X092405	09/24/19	1247
05	VSTD005	VSTD005	X092406	09/24/19	1311
06	VSTD020	VSTD020	X092407	09/24/19	1335
07	VSTD050	VSTD050	X092408	09/24/19	1359
08	VSTD100	VSTD100	X092409	09/24/19	1423
09	VSTD150	VSTD150	X092410	09/24/19	1447
10	VSTD200	VSTD200	X092411	09/24/19	1511
11	ICV	ICV	X092414	09/24/19	1623
12	VLCSW-190924	VLCSW-190924	X092417	09/24/19	1735
13	VBLKW-190924	VBLKW-190924	X092419	09/24/19	1823
14	HS19090860-0	HS19090860-01	X092420	09/24/19	1847
15	HS19090860-0	HS19090860-02	X092421	09/24/19	1911
16	HS19090860-0	HS19090860-01M	X092422	09/24/19	1935
17	HS19090860-0	HS19090860-01M	X092423	09/24/19	1959
18	HS19090860-0	HS19090860-02	X092424	09/24/19	2023
19	HS19090860-0	HS19090860-05	X092425	09/24/19	2047
20	HS19090860-0	HS19090860-08	X092426	09/24/19	2111
21	HS19090860-1	HS19090860-11	X092427	09/24/19	2136
22	HS19090860-1	HS19090860-12	X092428	09/24/19	2200

FORM V VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID: X092401 BFB Injection Date: 09/24/19

Instrument ID: VOA6 BFB Injection Time: 1048

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.0
75	30.0 - 60.0% of mass 95	49.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.4 (0.7)1
174	Greater than 50.0% of mass 95	61.6
175	5.0 - 9.0% of mass 174	5.0 (8.1)1
176	95.0 - 101.0% of mass 174	59.0 (95.7)1
177	5.0 - 9.0% of mass 176	4.5 (7.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CCV-END	CCV-END	X092429	09/24/19	2224
02					
03					
04					
05					
06					
07					
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21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Instrument ID: VOA6 Calibration Date(s): 09/24/19 09/24/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1112 1511

LAB FILE ID: RF0.25: X092402 RF0.5: X092403 RF1: X092404
RF2: X092405 RF5: X092406 RF20: X092407

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
1,2-Dichloroethane		0.572	0.460	0.492	0.471	0.444
Vinyl Chloride		0.765	0.626	0.626	0.599	0.559
1,1,2-Trichloroethane		2819	4547	7961	21561	72743
Methylene Chloride		7457	9629	14182	29957	97780
1,1-Dichloroethene		0.562	0.432	0.426	0.422	0.387
Trichloroethene		0.519	0.387	0.376	0.376	0.346
Toluene-d8		1.753	1.561	1.408	1.480	1.347
4-Bromofluorobenzene		5086	8451	14730	35795	123917
1,2-Dichloroethane-d4		4097	6313	11919	28682	103005
Dibromofluoromethane		2791	4969	8916	25838	89138

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1909086

Instrument ID: VOA6 Calibration Date(s): 09/24/19 09/24/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1112 1511

LAB FILE ID: RF50: X092408 RF100: X092409 RF150: X092410
RF200: X092411

COMPOUND	RF50	RF100	RF150	RF200
1,2-Dichloroethane	0.423	0.451	0.440	0.436
Vinyl Chloride	0.574	0.668	0.646	0.633
1,1,2-Trichloroethane	171839	329695	458033	587385
Methylene Chloride	225405	435117	608299	766926
1,1-Dichloroethene	0.391	0.444	0.424	0.408
Trichloroethene	0.338	0.371	0.371	0.365
Toluene-d8	1.247	1.313	1.288	1.247
4-Bromofluorobenzene	282942	545858	769184	968135
1,2-Dichloroethane-d4	234244	463426	649926	816407
Dibromofluoromethane	199887	396845	558432	703317

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1909086

Instrument ID: VOA6 Calibration Date(s): 09/24/19 09/24/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1112 1511

COMPOUND	CURVE	COEFFICENTS A0	COEFFICENTS A1	%RSD OR R^2	MAX %RSD OR R^2
1,2-Dichloroethane	AVRG		0.46555932	9.662	15.000
Vinyl Chloride	AVRG		0.63292194	9.516	15.000
1,1,2-Trichloroethane	LINR	-2.02e-002	3.55583352	0.9996535	0.9900000
Methylene Chloride	LINR	-3.42e-002	1.91912003	0.9984093	0.9900000
1,1-Dichloroethene	AVRG		0.43295766	11.982	15.000
Trichloroethene	AVRG		0.38326251	13.901	15.000
Toluene-d8	AVRG		1.40494138	11.984	15.000
4-Bromofluorobenzene	LINR	-2.4e-002	2.14609610	0.9994029	0.9900000
1,2-Dichloroethane-d4	LINR	-1.96e-002	1.79297194	0.9981784	0.9900000
Dibromofluoromethane	LINR	-1.71e-002	2.08368074	0.9983472	0.9900000

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Instrument ID: VOA6 Calibration Date: 09/24/19 Time: 2224

Lab File ID: X092429 Init. Calib. Date(s): 09/24/19 09/24/19

Init. Calib. Times: 1112 1511

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dichloroethane	0.4650000	0.4228890	0.4228890	0.1	9.06	50.00	AVRG
Vinyl Chloride	0.6330000	0.5743295	0.5743295	0.1	9.27	50.00	AVRG
1,1,2-Trichloroethane	48.556755	50.000000	0.2922154	0.1	2.89	50.00	LINR
Methylene Chloride	49.079378	50.000000	0.5281255	0.1	1.84	50.00	LINR
1,1-Dichloroethene	0.4330000	0.3906683	0.3906683	0.1	9.78	50.00	AVRG
Trichloroethene	0.3830000	0.3377915	0.3377915	0.2	11.80	50.00	AVRG
Toluene-d8	1.4050000	1.2468812	1.2468812	0.1	11.25	50.00	AVRG
4-Bromofluorobenzene	51.323111	50.000000	0.4811481	0.1	-2.65	50.00	LINR
1,2-Dichloroethane-d4	49.407629	50.000000	0.5488353	0.1	1.18	50.00	LINR
Dibromofluoromethane	50.138913	50.000000	0.4683366	0.1	-0.28	50.00	LINR

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID (Standard): X092408 Date Analyzed: 09/24/19

Instrument ID: VOA6 Time Analyzed: 1359

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(CBZ) AREA #	RT #	IS2(DCB) AREA #	RT #	IS3(DFB) AREA #	RT #
	12 HOUR STD	588056	7.67	304949	9.67	654978	4.97
	UPPER LIMIT	1176112	8.17	609898	10.17	1309956	5.47
	LOWER LIMIT	294028	7.17	152475	9.17	327489	4.47
	CLIENT SAMPLE NO.						
01	VLCSW-190924	571149	7.67	300403	9.67	631257	4.97
02	VBLKW-190924	696007	7.67	355530	9.67	807277	4.97
03	HS19090860-0	703085	7.67	361280	9.67	809316	4.97
04	HS19090860-0	674697	7.67	349383	9.67	805917	4.97
05	HS19090860-0	629450	7.67	310727	9.67	755092	4.97
06	HS19090860-0	653144	7.67	336239	9.67	753609	4.97
07	HS19090860-0	644878	7.67	324028	9.67	769906	4.97
08	HS19090860-0	680289	7.67	353833	9.67	797051	4.97
09	HS19090860-0	686270	7.67	359783	9.67	809207	4.97
10	HS19090860-1	684132	7.67	350093	9.67	804775	4.97
11	HS19090860-1	684013	7.67	337681	9.67	806567	4.97
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (CBZ) = Chlorobenzene-d5
IS2 (DCB) = 1,4-Dichlorobenzene-d4
IS3 (DFB) = 1,4-Difluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID (Standard): X092408 Date Analyzed: 09/24/19

Instrument ID: VOA6 Time Analyzed: 1359

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	426802	4.18				
	UPPER LIMIT	853604	4.68				
	LOWER LIMIT	213401	3.68				
	CLIENT SAMPLE NO.						
01	VLCSW-190924	403171	4.19				
02	VBLKW-190924	547665	4.19				
03	HS19090860-0	549501	4.18				
04	HS19090860-0	543009	4.18				
05	HS19090860-0	506995	4.18				
06	HS19090860-0	512173	4.18				
07	HS19090860-0	522663	4.18				
08	HS19090860-0	539189	4.18				
09	HS19090860-0	545164	4.18				
10	HS19090860-1	547780	4.18				
11	HS19090860-1	547325	4.18				
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS4 = Pentafluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092401.D

Date : 24-SEP-2019 10:48

Client ID: BFB

Instrument: voa6.i

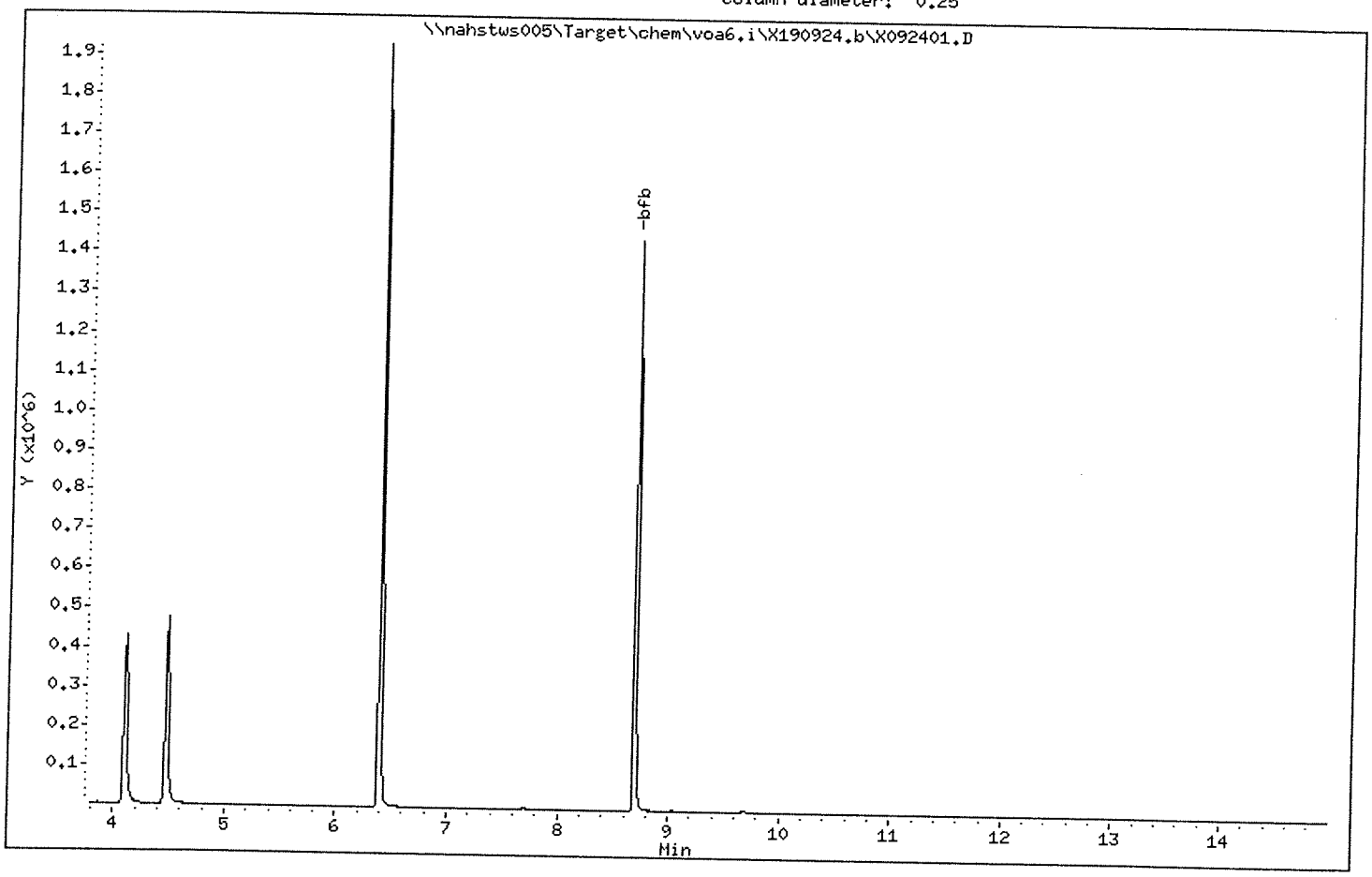
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092401.D

Date : 24-SEP-2019 10:48

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

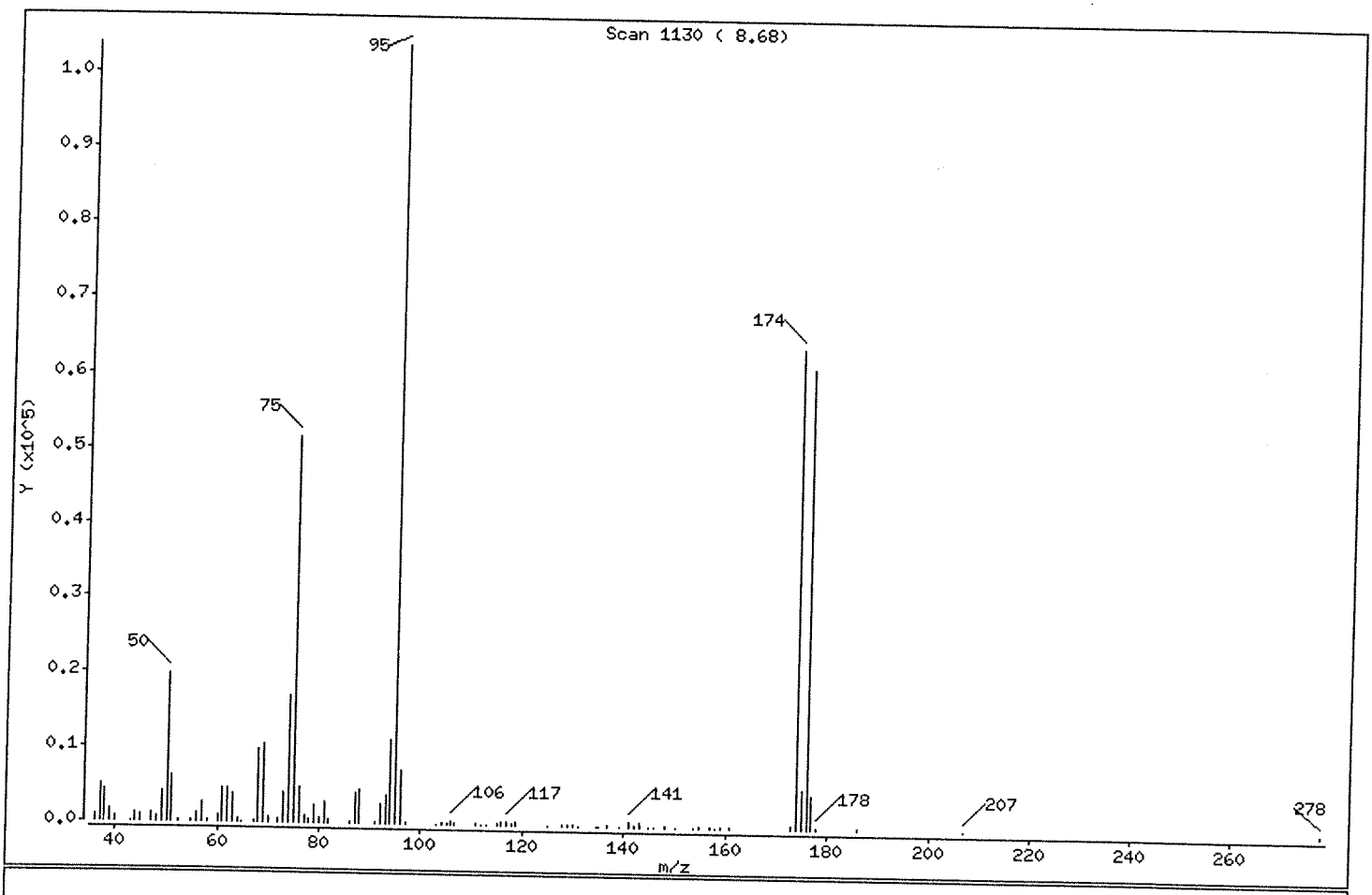
Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	19.04
75	30.00 - 60.00% of mass 95	49.67
96	5.00 - 9.00% of mass 95	7.01
173	Less than 2.00% of mass 174	0.42 (0.68)
174	Greater than 50.00% of mass 95	61.62
175	5.00 - 9.00% of mass 174	4.99 (8.09)
176	95.00 - 101.00% of mass 174	58.98 (95.71)
177	5.00 - 9.00% of mass 176	4.47 (7.57)

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092401.D

Date : 24-SEP-2019 10:48

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: X092401.D
Spectrum: Scan 1130 (8.68)
Location of Maximum: 95.00
Number of points: 94

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	989	67.10	304	96.90	170	142.00	192
37.00	5113	68.00	9770	103.00	61	143.00	737
38.00	4311	69.00	10453	104.00	357	144.80	84
39.00	1618	70.00	832	105.00	167	145.80	90
40.00	621	72.00	449	105.90	436	147.90	159
43.20	101	73.00	4041	106.70	126	150.10	50
44.00	1149	74.00	16944	110.90	124	153.70	56
45.10	905	75.00	51600	111.80	71	153.90	58
47.00	1223	76.00	4754	112.80	112	154.90	148
48.10	603	77.00	837	115.00	143	156.90	218
49.00	4091	78.00	586	115.80	392	157.90	54
50.10	19776	78.90	2439	116.90	453	158.90	134
51.00	6091	79.90	609	117.90	301	160.90	140
52.20	258	80.90	2777	118.80	416	173.00	436
55.00	271	81.90	480	125.00	60	173.90	64016
56.00	1308	86.00	135	127.90	307	174.90	5179
57.00	2534	87.00	4120	128.90	182	175.90	61272
58.10	144	87.90	4495	129.90	216	176.90	4641
60.00	966	91.00	273	131.00	116	177.90	190
61.00	4455	92.00	2550	134.70	102	185.90	149
62.00	4473	93.00	3732	135.10	90	207.00	70
63.00	3751	94.00	11115	136.80	192	278.20	203
64.00	450	95.00	103888	139.10	59		
64.90	78	96.00	7279	141.00	765		

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092402.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 24-SEP-2019 11:12
Operator : PC Inst ID: voa6.i
Smp Info : VSTD000.25;VSTD000.25;1;1;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 11:12 Cal File: X092402.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	1403	0.25000	(a)
11	1,1-Dichloroethene	96	1.912	1.911	(0.457)	1257	0.25000	0.29(aM)
33	1,2-Dichloroethane	62	4.569	4.562	(0.919)	2408	0.25000	0.33(a)
27	cis-1,2-Dichloroethene	96	3.538	3.530	(0.846)	1911	0.25000	0.31(a)
17	Methylene Chloride	84	2.306	2.305	(0.551)	5284	0.25000	(aM)
38	Trichloroethene	130	5.221	5.214	(1.050)	1927	0.25000	0.33(a)
5	Vinyl Chloride	62	1.138	1.138	(0.272)	1777	0.25000	0.28(aM)
$ 35	1,2-Dichloroethane-d4	65	4.483	4.476	(1.072)	1873	0.25000	(Ta)
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	3915	0.25000	(a)
$ 30	Dibromofluoromethane	113	4.111	4.103	(0.983)	1509	0.25000	(a)
$ 48	Toluene-d8	98	6.396	6.388	(0.834)	6823	0.25000	0.35(aM)
* 1	Pentafluorobenzene	168	4.182	4.189	(1.000)	492249	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	760854	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.678	(1.000)	675193	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	352735	50.0000	

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092402.D

Date : 24-SEP-2019 11:12

Client ID: VSTD000.25

Sample Info: VSTD000.25;VSTD000.25;1;1;

Purge Volume: 5.0

Column phase: DB624

Instrument: voa6.i

Operator: PC

Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092403.D
Lab Smp Id: VSTD000.5 Client Smp ID: VSTD000.5
Inj Date : 24-SEP-2019 11:36
Operator : PC Inst ID: voa6.i
Smp Info : VSTD000.5;VSTD000.5;1;2;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 11:36 Cal File: X092403A.D
Als bottle: 3 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	2819	0.50000	(a)
11 1,1-Dichloroethene	96	1.911	1.911	(0.456)	2583	0.50000	0.64(aM)
33 1,2-Dichloroethane	62	4.569	4.562	(0.919)	4143	0.50000	0.61(aM)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	3607	0.50000	0.63(aM)
17 Methylene Chloride	84	2.305	2.305	(0.550)	7457	0.50000	(a)
38 Trichloroethene	130	5.214	5.214	(1.049)	3759	0.50000	0.67(a)
5 Vinyl Chloride	62	1.138	1.138	(0.272)	3517	0.50000	0.60(aM)
$ 35 1,2-Dichloroethane-d4	65	4.483	4.476	(1.070)	4097	0.50000	(a)
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	5086	0.50000	(a)
$ 30 Dibromofluoromethane	113	4.118	4.103	(0.983)	2791	0.50000	(a)
$ 48 Toluene-d8	98	6.395	6.388	(0.834)	11368	0.50000	0.62(a)
* 1 Pentafluorobenzene	168	4.189	4.189	(1.000)	459462	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	723680	50.0000	
* 47 Chlorobenzene-d5	117	7.670	7.678	(1.000)	648488	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	339469	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092403.D

Date : 24-SEP-2019 11:36

Client ID: VSTD000.5

Sample Info: VSTD000.5;VSTD000.5;1;2;

Purge Volume: 5.0

Column phase: DB624

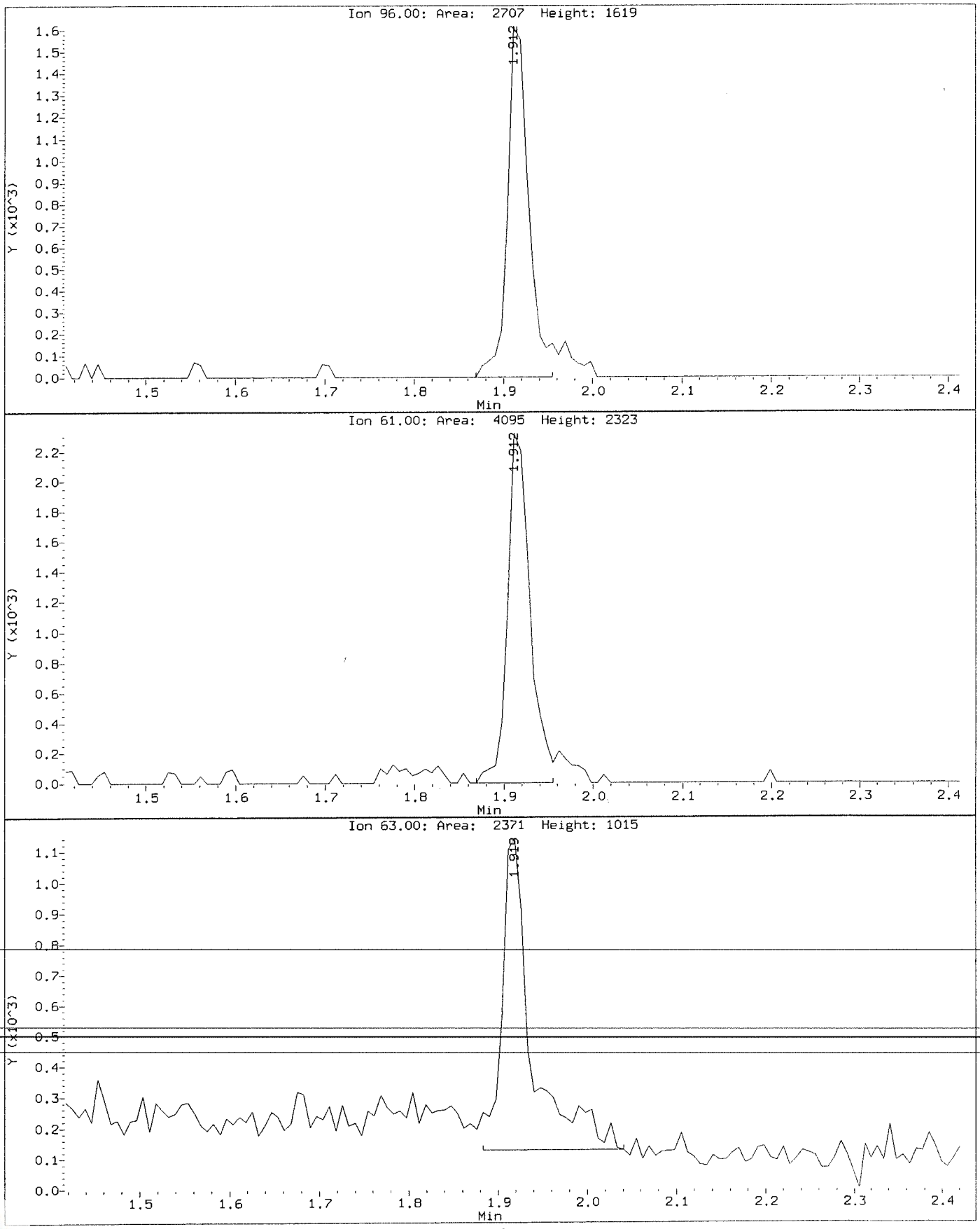
Instrument: voa6.i

Operator: PC

Column diameter: 0.18

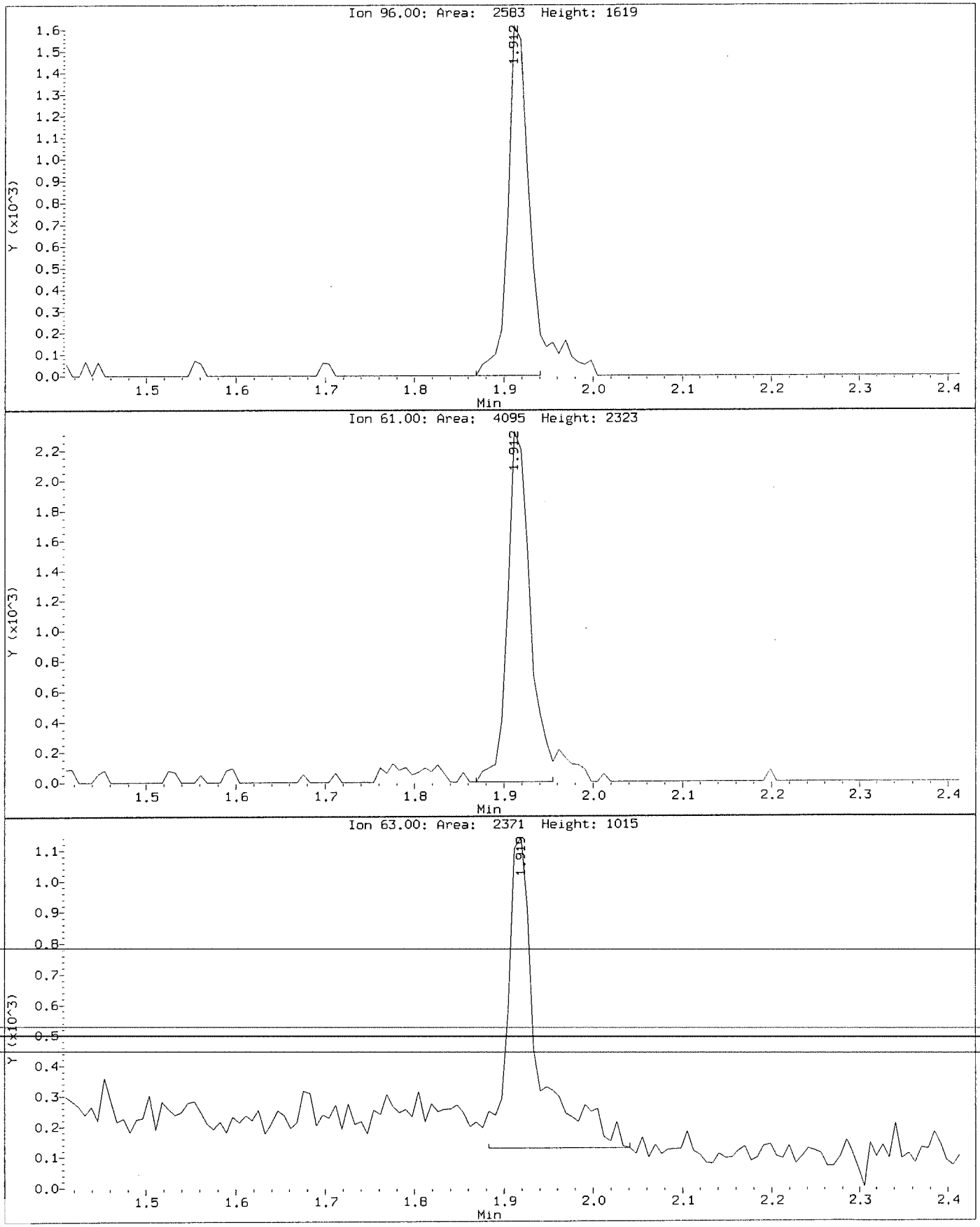
Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\BEFORE2\X092403.D
Injection Date: 24-SEP-2019 11:36
Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4



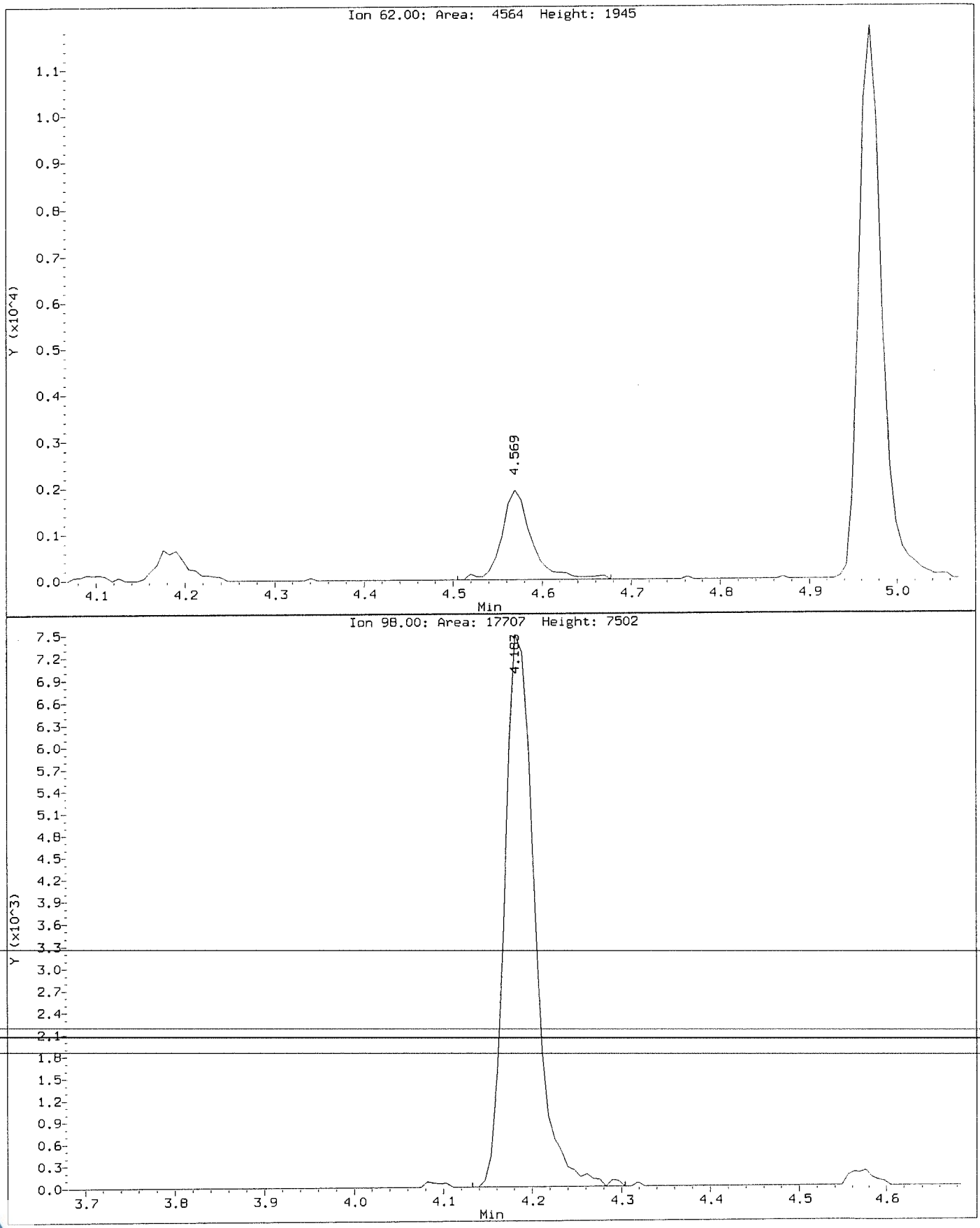
Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092403.D
Injection Date: 24-SEP-2019 11:36
Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4



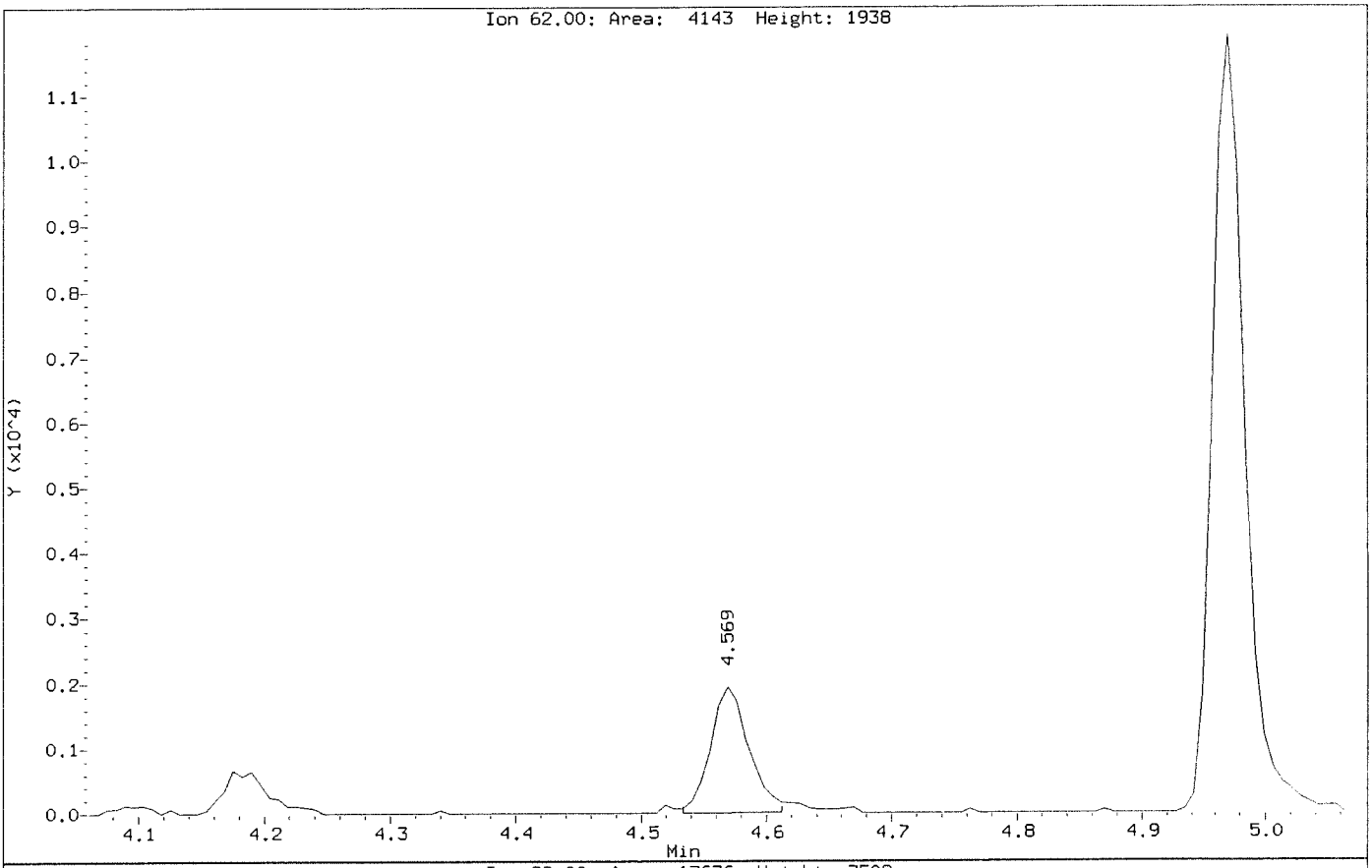
Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\BEFORE2\X092403.D
Injection Date: 24-SEP-2019 11:36
Instrument: voa6.i
Client Sample ID: VSTD000.5

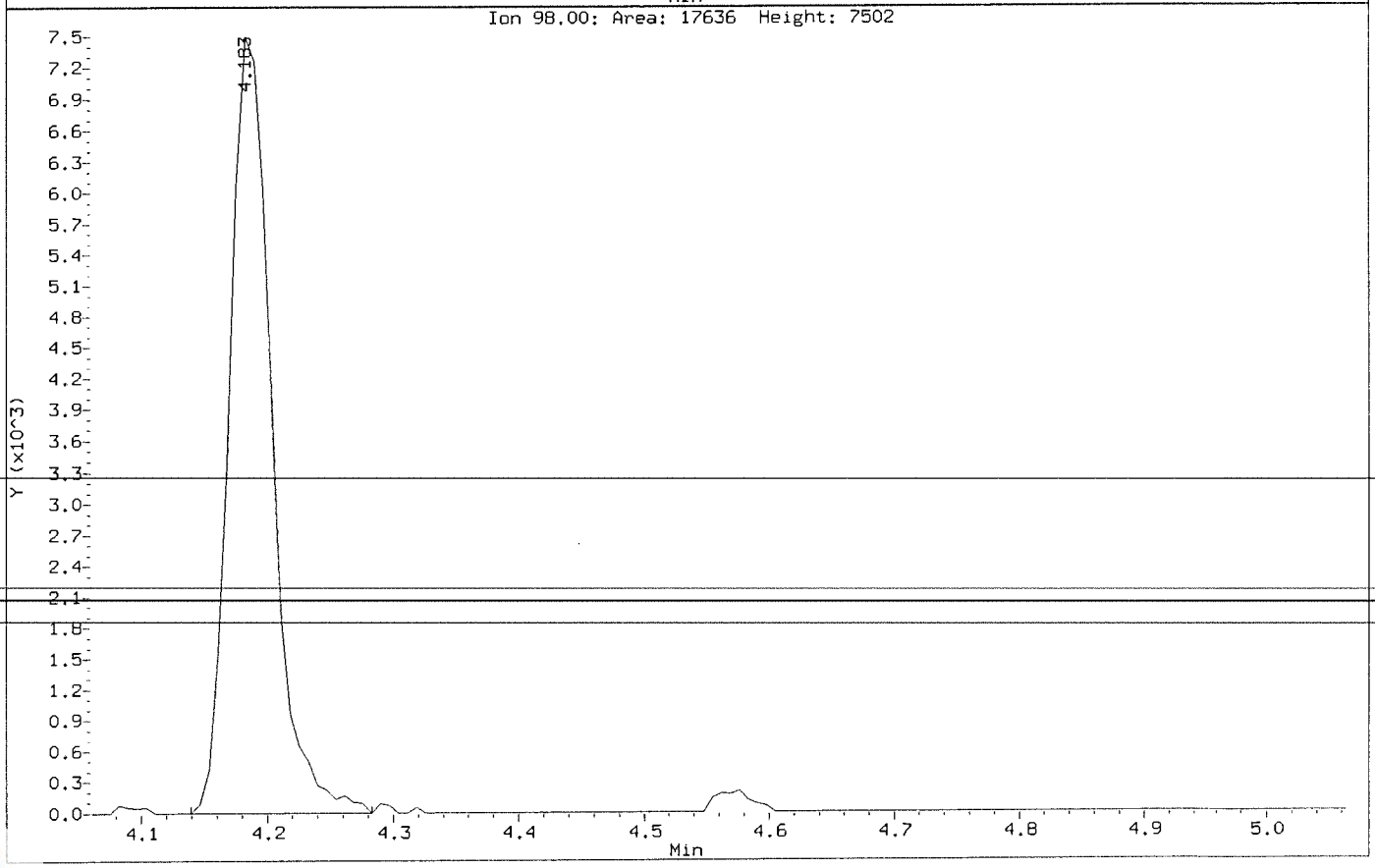
Compound: 1,2-Dichloroethane
CAS Number: 107-06-2



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092403.D
Injection Date: 24-SEP-2019 11:36
Instrument: voa6.i
Client Sample ID: VSTD000.5

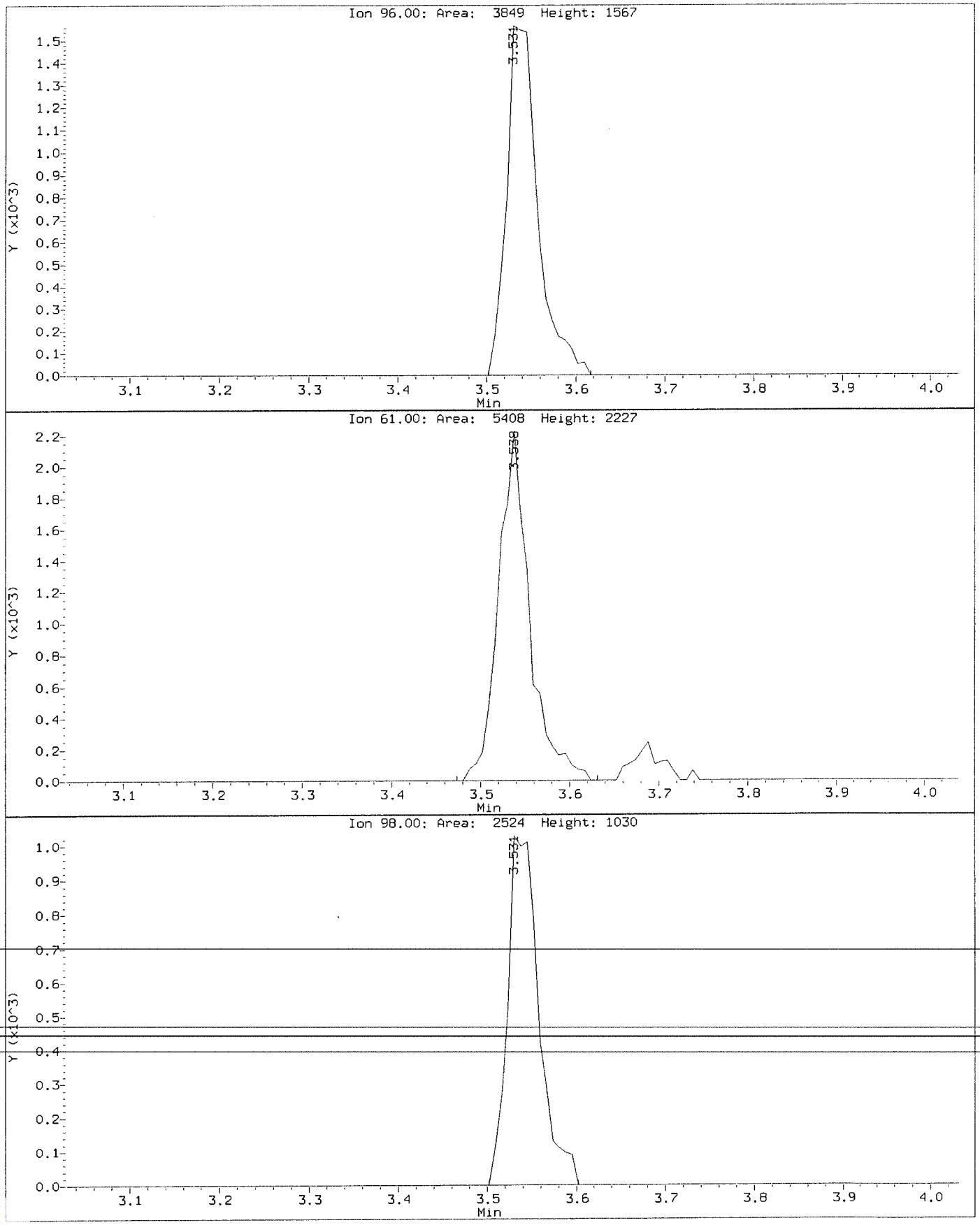
Compound: 1,2-Dichloroethane
CAS Number: 107-06-2





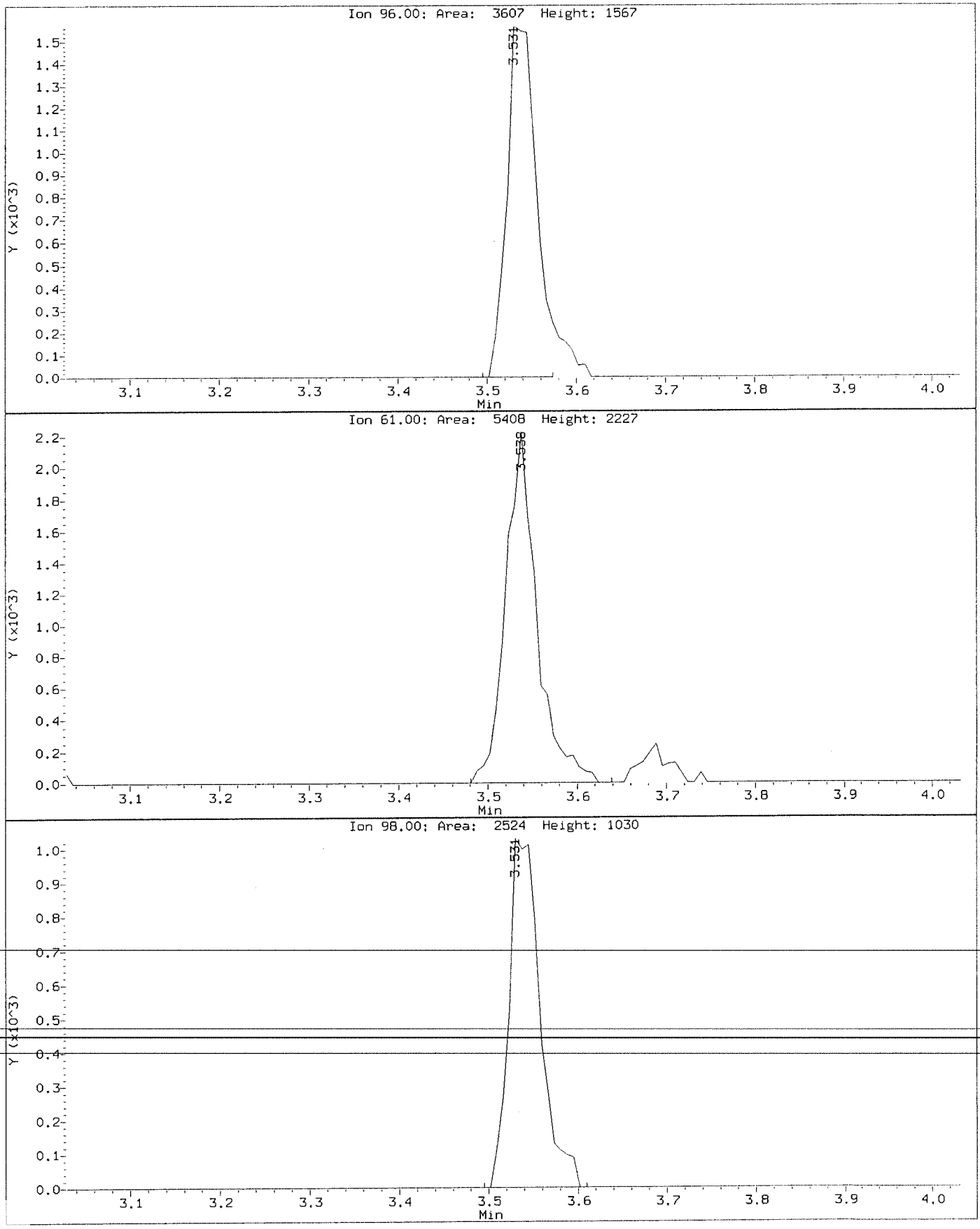
Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\BEFORE2\X092403.D
Injection Date: 24-SEP-2019 11:36
Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: cis-1,2-Dichloroethene
CAS Number: 156-59-2



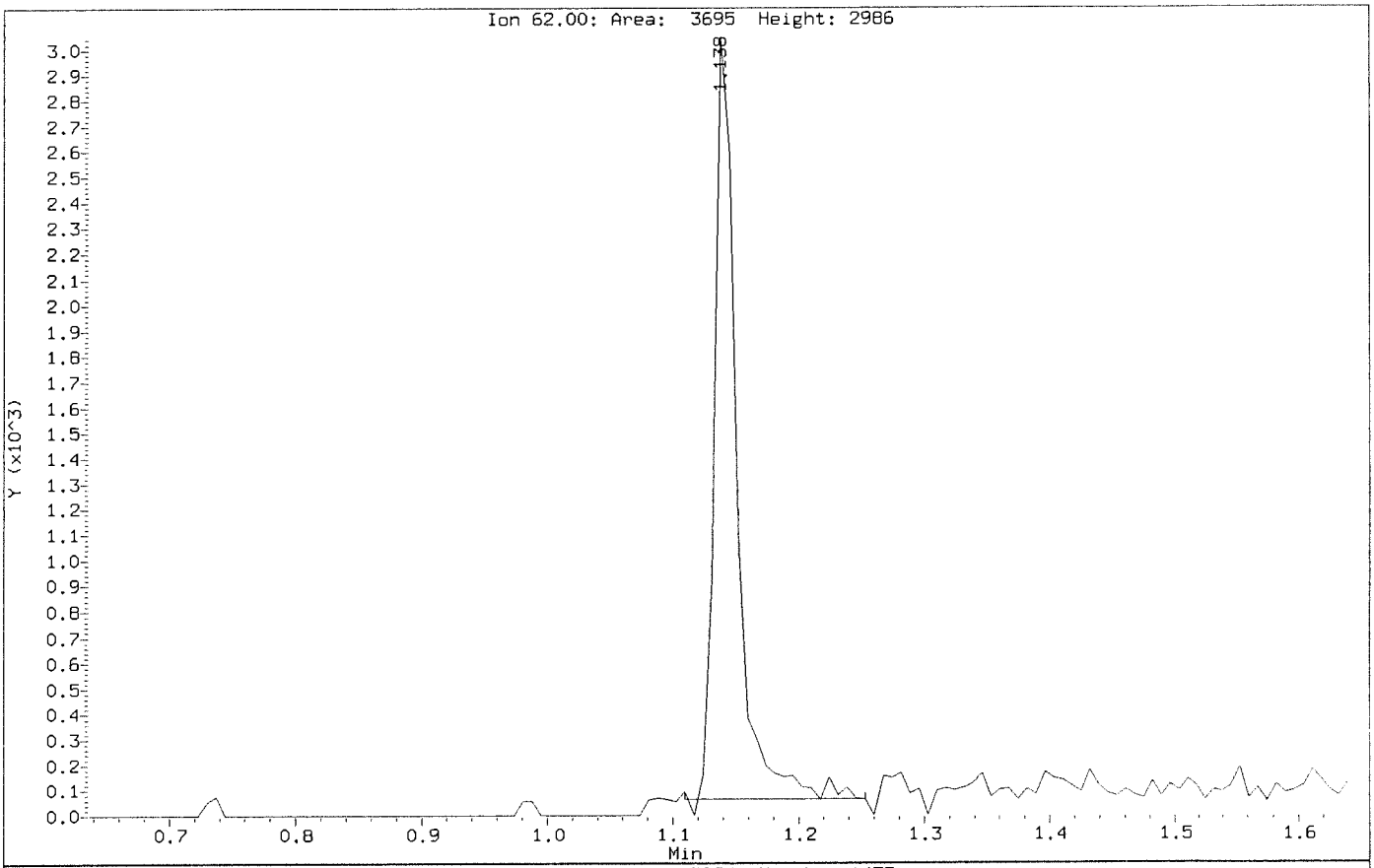
Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092403.D
Injection Date: 24-SEP-2019 11:36
Instrument: voa6.i
Client Sample ID: VSTD000.5

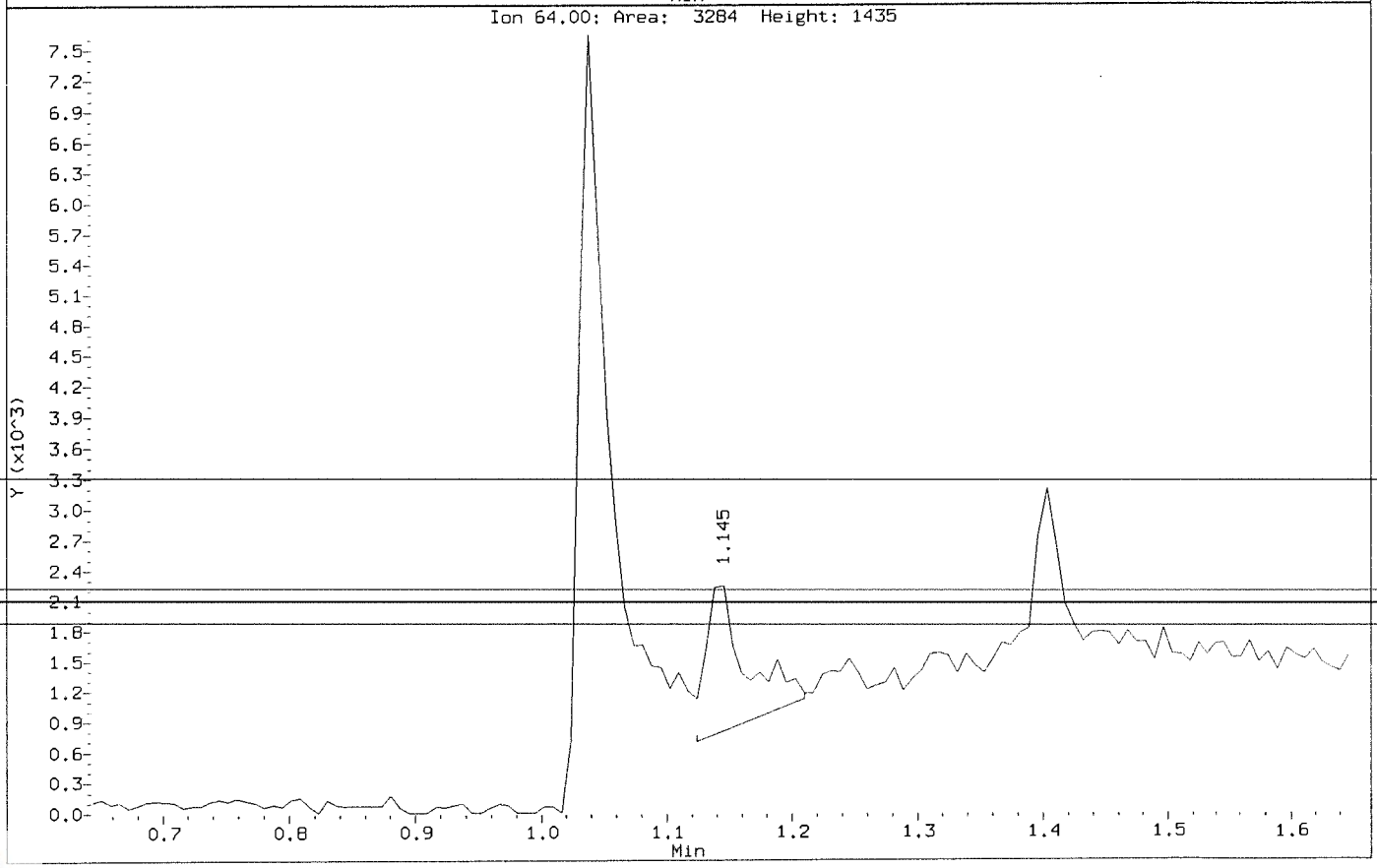
Compound: cis-1,2-Dichloroethene
CAS Number: 156-59-2



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\BEFORE2\X092403.D
Injection Date: 24-SEP-2019 11:36
Instrument: voa6.i
Client Sample ID: VSTD000.5

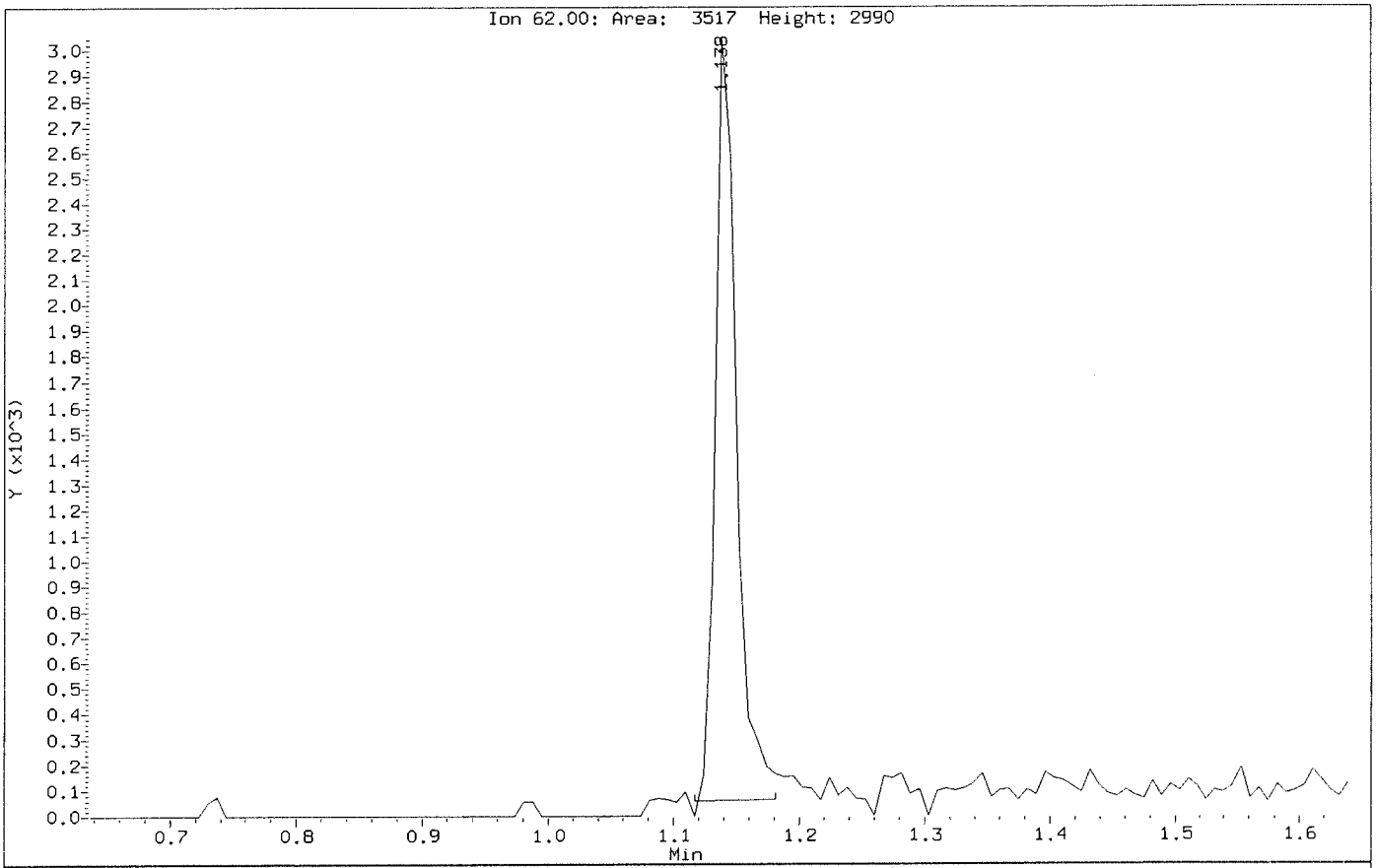
Compound: Vinyl Chloride
CAS Number: 75-01-4

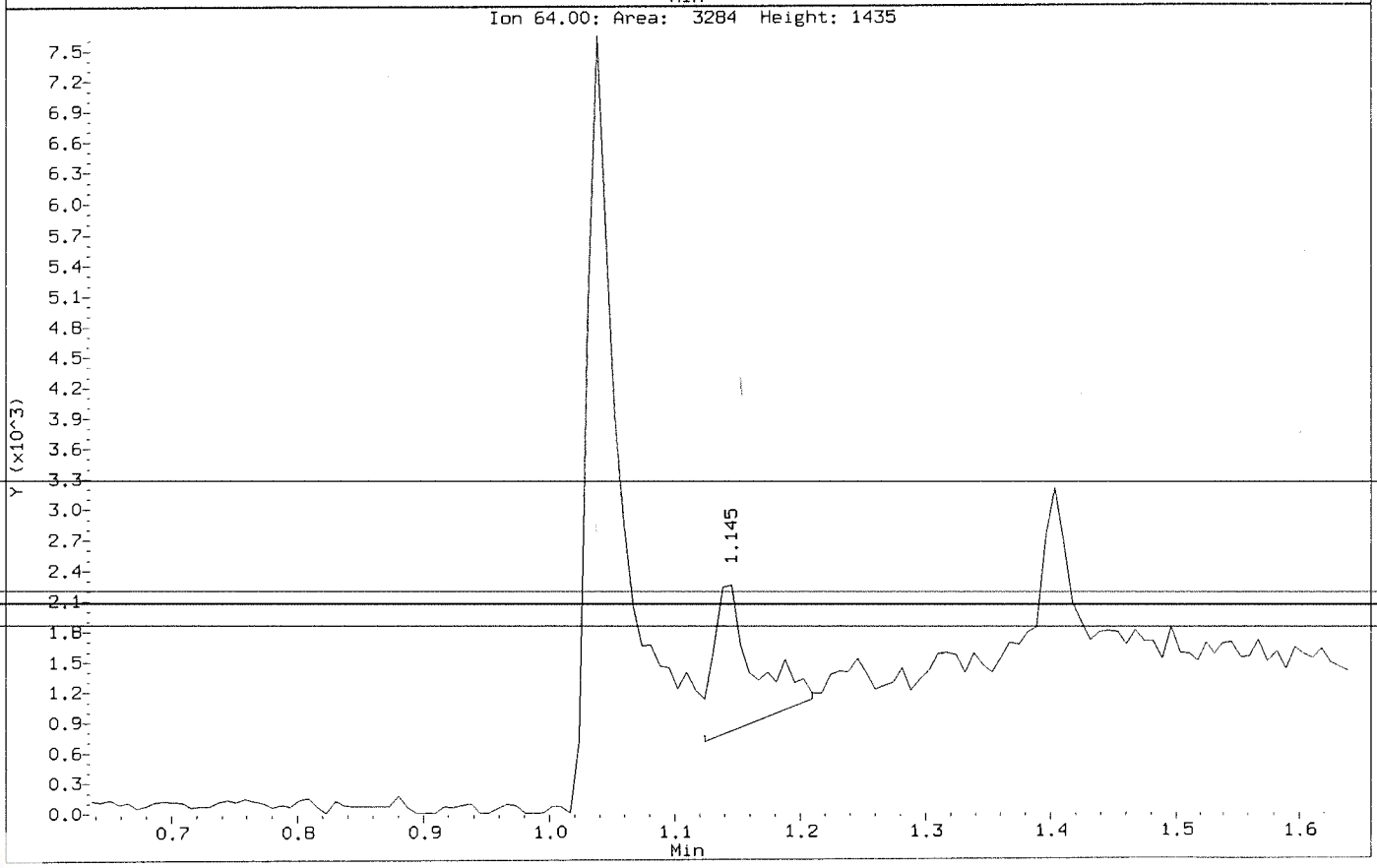




Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092403.D
Injection Date: 24-SEP-2019 11:36
Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: Vinyl Chloride
CAS Number: 75-01-4





ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092404.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 24-SEP-2019 12:23
Operator : PC Inst ID: voa6.i
Smp Info : VSTD001;VSTD001;1;3;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 12:23 Cal File: X092404.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	4547	1.00000	0.26(a)
11 1,1-Dichloroethene	96	1.919	1.911	(0.458)	3910	1.00000	0.99(a)
33 1,2-Dichloroethane	62	4.569	4.562	(0.919)	6568	1.00000	0.98(a)
27 cis-1,2-Dichloroethene	96	3.537	3.530	(0.844)	6052	1.00000	1.08(a)
17 Methylene Chloride	84	2.305	2.305	(0.550)	9629	1.00000	0.33(a)
38 Trichloroethene	130	5.214	5.214	(1.049)	5524	1.00000	1.00(a)
5 Vinyl Chloride	62	1.138	1.138	(0.272)	5660	1.00000	0.98(a)
$ 35 1,2-Dichloroethane-d4	65	4.483	4.476	(1.070)	6313	1.00000	0.27(a)
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	8451	1.00000	0.23(a)
$ 30 Dibromofluoromethane	113	4.110	4.103	(0.981)	4969	1.00000	0.28(a)
$ 48 Toluene-d8	98	6.395	6.388	(0.834)	19808	1.00000	1.11(a)
* 1 Pentafluorobenzene	168	4.189	4.189	(1.000)	452353	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	713817	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	634278	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	332471	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092404.D
Date : 24-SEP-2019 12:23
Client ID: VSTD001
Sample Info: VSTD001;VSTD001;1;3;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092405.D
Lab Smp Id: VSTD002 Client Smp ID: VSTD002
Inj Date : 24-SEP-2019 12:47
Operator : PC Inst ID: voa6.i
Smp Info : VSTD002;VSTD002;1;4;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 12:47 Cal File: X092405.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	7961	2.00000	1.18(a)
11 1,1-Dichloroethene	96	1.912	1.911	(0.456)	7818	2.00000	1.97(a)
33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	14205	2.00000	2.11(a)
27 cis-1,2-Dichloroethene	96	3.538	3.530	(0.844)	11063	2.00000	1.95(a)
17 Methylene Chloride	84	2.305	2.305	(0.550)	14182	2.00000	1.25(a)
38 Trichloroethene	130	5.214	5.214	(1.049)	10851	2.00000	1.96(a)
5 Vinyl Chloride	62	1.138	1.138	(0.272)	11471	2.00000	1.97(a)
$ 35 1,2-Dichloroethane-d4	65	4.483	4.476	(1.070)	11919	2.00000	1.35(a)
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	14730	2.00000	1.25(a)
$ 30 Dibromofluoromethane	113	4.111	4.103	(0.981)	8916	2.00000	1.17(a)
$ 48 Toluene-d8	98	6.396	6.388	(0.834)	36351	2.00000	2.00(a)
* 1 Pentafluorobenzene	168	4.189	4.189	(1.000)	458186	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	722014	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	645290	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	337724	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092405.D
Date : 24-SEP-2019 12:47
Client ID: VSTD002
Sample Info: VSTD002;VSTD002;1;4;
Purge Volume: 5.0
Column phase: DB624
Instrument: voa6.i
Operator: PC
Column diameter: 0.18
Y (x10^6)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
1.3
1.4
Min
2
3
4
5
6
7
8
9
10
11
12
13
14
-Bromomethane
-Chloroethane+
-Trichlorofluoromethane+
-Diethyl ether+
-Acrolein+
Iodomethane+
-Acetonitrile+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-n-Hexane+
-1,1-Dichloroethane+
-tert-Butyl ethyl ether
-2-Butanone+
-Propionitrile+
-Chloroform+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-Isobutyl Alcohol+
-1,4-Difluorobenzene
-Trichloroethene+
-Methylcyclohexane+
-Methyl Methacrylate+
-Bromodichloromethane
-2-Chloroethylvinyl ether+
-cis-1,3-Dichloropropene+
-4-Methyl-2-Pentanone
-Toluene-d8+
-Ethyl Methacrylate+
-1,1,2-Trichloroethane+
-2-Hexanone+
-1,2-Dibromoethane+
Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes
-o-Xylene+
-Bromoform+
-Isopropylbenzene
-4-Bromofluorobenzene+
-1,1,2,2-Tetrachloroethane+
-n-Propylbenzene+
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene+
-sec-Butylbenzene
-Benzyl Chloride+
1,4-Dichlorobenzene-d4+
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene+
-1,2,3-Trichlorobenzene
-2-Methylnaphthalene
-1-Methylnaphthalene
\\nahstws005\Target\chem\voa6.i\X190924.b\X092405.D

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092406.D
Lab Smp Id: VSTD005 Client Smp ID: VSTD005
Inj Date : 24-SEP-2019 13:11
Operator : PC Inst ID: voa6.i
Smp Info : VSTD005;VSTD005;1;5;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 13:11 Cal File: X092406.D
Als bottle: 7 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

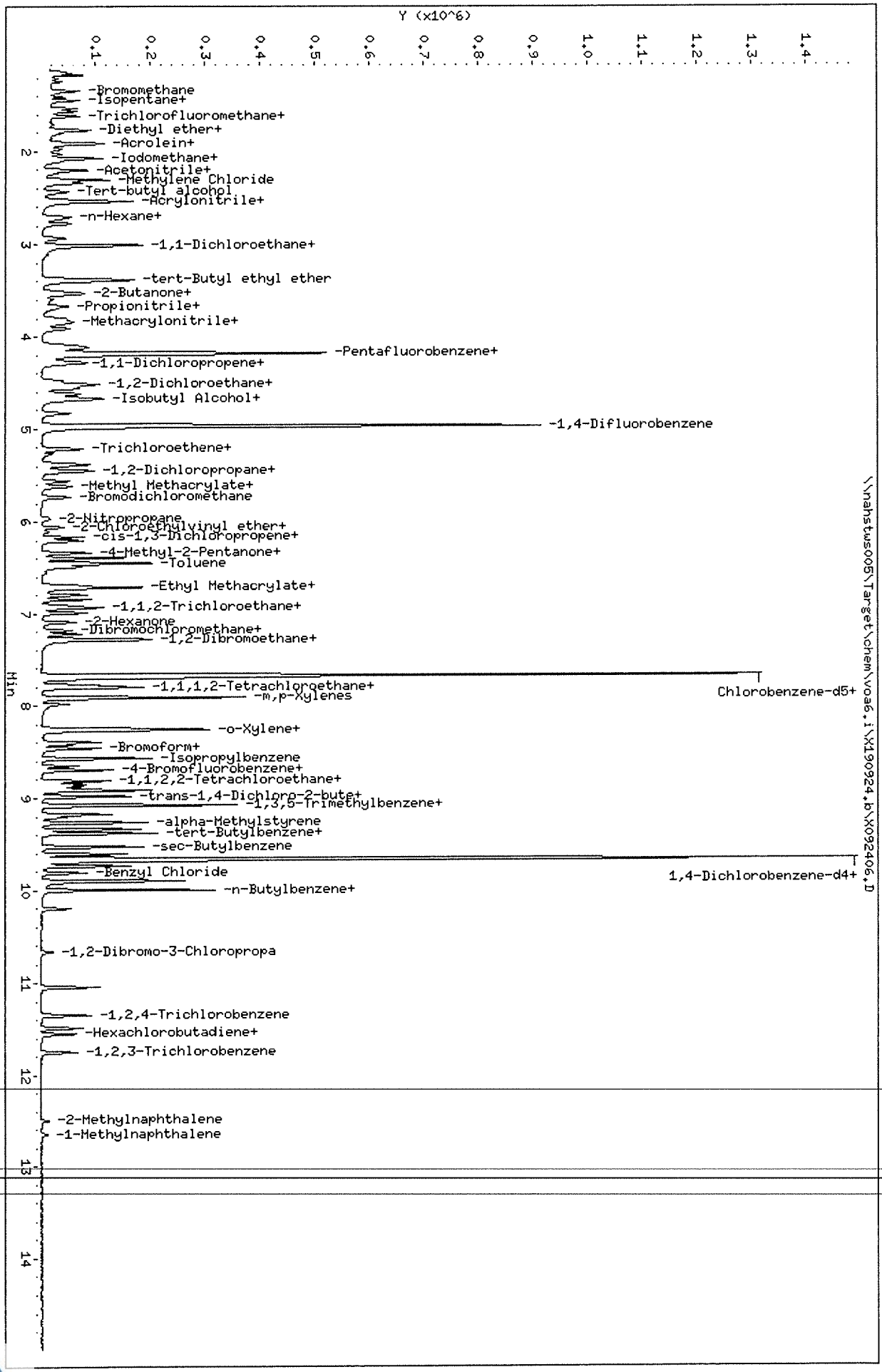
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	21561	5.00000	4.97(a)
11	1,1-Dichloroethene	96	1.919	1.911	(0.458)	18685	5.00000	4.87(a)
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	33666	5.00000	5.05
27	cis-1,2-Dichloroethene	96	3.537	3.530	(0.844)	28266	5.00000	5.17
17	Methylene Chloride	84	2.305	2.305	(0.550)	29957	5.00000	4.78(a)
38	Trichloroethene	130	5.214	5.214	(1.049)	26842	5.00000	4.90(a)
5	Vinyl Chloride	62	1.138	1.138	(0.272)	26531	5.00000	4.73(a)
$ 35	1,2-Dichloroethane-d4	65	4.483	4.476	(1.070)	28682	5.00000	4.82(a)
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	35795	5.00000	4.79(a)
$ 30	Dibromofluoromethane	113	4.110	4.103	(0.981)	25838	5.00000	5.22
$ 48	Toluene-d8	98	6.388	6.388	(0.833)	94779	5.00000	5.26
* 1	Pentafluorobenzene	168	4.189	4.189	(1.000)	442787	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	714623	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.678	(1.000)	640341	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	335748	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092406.D
Date : 24-SEP-2019 13:11
Client ID: VSTD005
Sample Info: VSTD005;VSTD005;1;5;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092407.D
Lab Smp Id: VSTD020 Client Smp ID: VSTD020
Inj Date : 24-SEP-2019 13:35
Operator : PC Inst ID: voa6.i
Smp Info : VSTD020;VSTD020;1;6;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 13:35 Cal File: X092407.D
Als bottle: 8 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	72743	20.0000	20.14
11	1,1-Dichloroethene	96	1.911	1.911	(0.456)	67984	20.0000	17.89
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	120625	20.0000	19.09
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	100416	20.0000	18.53
17	Methylene Chloride	84	2.305	2.305	(0.550)	97780	20.0000	19.67
38	Trichloroethene	130	5.214	5.214	(1.049)	94083	20.0000	18.08
5	Vinyl Chloride	62	1.138	1.138	(0.272)	98170	20.0000	17.67
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	103005	20.0000	20.06
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	123917	20.0000	20.55
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.979)	89138	20.0000	20.30
$ 48	Toluene-d8	98	6.388	6.388	(0.833)	329347	20.0000	19.17
* 1	Pentafluorobenzene	168	4.189	4.189	(1.000)	438777	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	678616	50.0000	
* 47	Chlorobenzene-d5	117	7.670	7.678	(1.000)	611359	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	317541	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092407.D
Date : 24-SEP-2019 13:35
Client ID: VSTD020
Sample Info: VSTD020;VSTD020;1;6;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092408.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 24-SEP-2019 13:59
Operator : PC Inst ID: voa6.i
Smp Info : VSTD050;VSTD050;1;7;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 9 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	171839	50.0000	50.94
11	1,1-Dichloroethene	96	1.911	1.911	(0.457)	166738	50.0000	45.11
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	276983	50.0000	45.41
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	238099	50.0000	45.18
17	Methylene Chloride	84	2.305	2.305	(0.551)	225405	50.0000	48.96
38	Trichloroethene	130	5.214	5.214	(1.049)	221246	50.0000	44.06
5	Vinyl Chloride	62	1.138	1.138	(0.272)	245125	50.0000	45.37
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	234244	50.0000	48.22
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	282942	50.0000	50.43
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.981)	199887	50.0000	47.93
$ 48	Toluene-d8	98	6.388	6.388	(0.833)	733236	50.0000	44.37
* 1	Pentafluorobenzene	168	4.182	4.189	(1.000)	426802	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	654978	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.678	(1.000)	588056	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	304949	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092408.D
Date : 24-SEP-2019 13:59
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;1;7;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

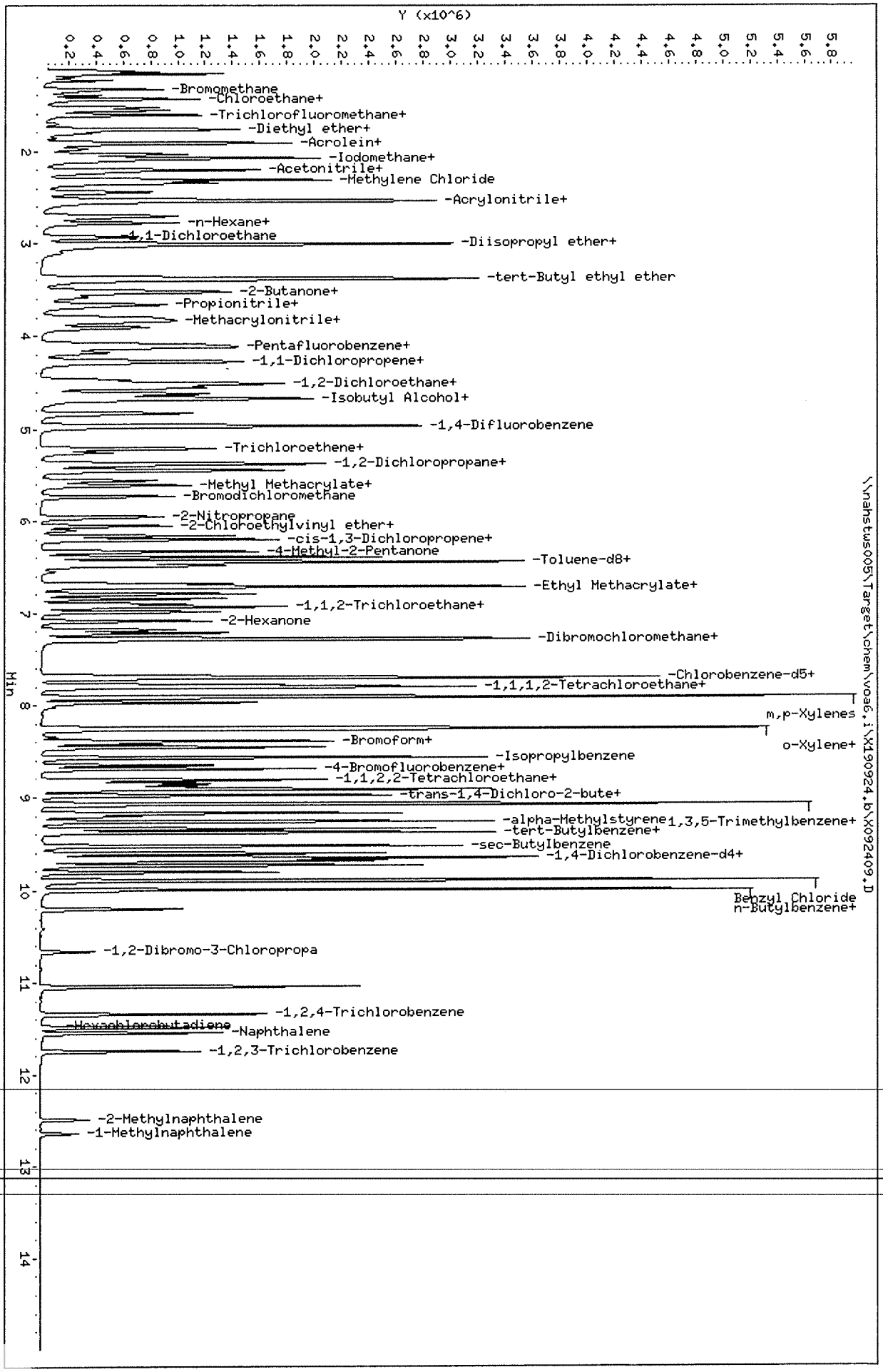
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092409.D
Lab Smp Id: VSTD100 Client Smp ID: VSTD100
Inj Date : 24-SEP-2019 14:23
Operator : PC Inst ID: voa6.i
Smp Info : VSTD100;VSTD100;1;8;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 14:23 Cal File: X092409.D
Als bottle: 10 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	329695	100.000	102.75
11	1,1-Dichloroethene	96	1.912	1.911	(0.457)	343210	100.000	102.44
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	547609	100.000	96.93
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	462898	100.000	96.91
17	Methylene Chloride	84	2.306	2.305	(0.551)	435117	100.000	106.20
38	Trichloroethene	130	5.214	5.214	(1.049)	450504	100.000	96.87
5	Vinyl Chloride	62	1.138	1.138	(0.272)	516628	100.000	105.48
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	463426	100.000	106.39
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	545858	100.000	102.48
$ 30	Dibromofluoromethane	113	4.104	4.103	(0.981)	396845	100.000	106.00
$ 48	Toluene-d8	98	6.389	6.388	(0.833)	1483903	100.000	93.48
* 1	Pentafluorobenzene	168	4.182	4.189	(1.000)	386906	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	606689	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.678	(1.000)	564926	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	281162	50.0000	



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092409.D
Date : 24-SEP-2019 14:23
Client ID: VSTD100
Sample Info: VSTD100;VSTD100;1;8;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092410.D
Lab Smp Id: VSTD150 Client Smp ID: VSTD150
Inj Date : 24-SEP-2019 14:47
Operator : PC Inst ID: voa6.i
Smp Info : VSTD150;VSTD150;1;9;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 14:47 Cal File: X092410.D
Als bottle: 11 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.892)	458033	150.000	150.64
11	1,1-Dichloroethene	96	1.911	1.911	(0.456)	481682	150.000	146.81
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	759060	150.000	141.64
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	653149	150.000	139.63
17	Methylene Chloride	84	2.305	2.305	(0.550)	608299	150.000	152.34
38	Trichloroethene	130	5.214	5.214	(1.049)	640511	150.000	145.18
5	Vinyl Chloride	62	1.138	1.138	(0.272)	733937	150.000	153.02
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	649926	150.000	152.79
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.132)	769184	150.000	152.51
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.979)	558432	150.000	152.69
$ 48	Toluene-d8	98	6.388	6.388	(0.832)	2074299	150.000	137.48
* 1	Pentafluorobenzene	168	4.189	4.189	(1.000)	378896	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	575537	50.0000	
* 47	Chlorobenzene-d5	117	7.678	7.678	(1.000)	536954	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	270032	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092410.D
Date : 24-SEP-2019 14:47
Client ID: VSTD150
Sample Info: VSTD150;VSTD150;1;9;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092411.D
Lab Smp Id: VSTD200 Client Smp ID: VSTD200
Inj Date : 24-SEP-2019 15:11
Operator : PC Inst ID: voa6.i
Smp Info : VSTD200;VSTD200;1;10;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 15:11 Cal File: X092411.D
Als bottle: 12 Calibration Sample, Level: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.892)	587385	200.000	197.82
11	1,1-Dichloroethene	96	1.911	1.911	(0.456)	610818	200.000	188.64
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	966214	200.000	187.44
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	832429	200.000	180.32
17	Methylene Chloride	84	2.305	2.305	(0.550)	766926	200.000	195.09
38	Trichloroethene	130	5.214	5.214	(1.049)	808345	200.000	190.48
5	Vinyl Chloride	62	1.138	1.138	(0.272)	947002	200.000	200.07(A)
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	816407	200.000	194.75
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.132)	968135	200.000	196.59
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.979)	703317	200.000	195.10
$ 48	Toluene-d8	98	6.388	6.388	(0.832)	2619468	200.000	177.49
* 1	Pentafluorobenzene	168	4.189	4.189	(1.000)	373921	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	553609	50.0000	
* 47	Chlorobenzene-d5	117	7.678	7.678	(1.000)	525222	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	260171	50.0000	

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092411.D
Date : 24-SEP-2019 15:11
Client ID: VSTD200
Sample Info: VSTD200;VSTD200;1;10;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

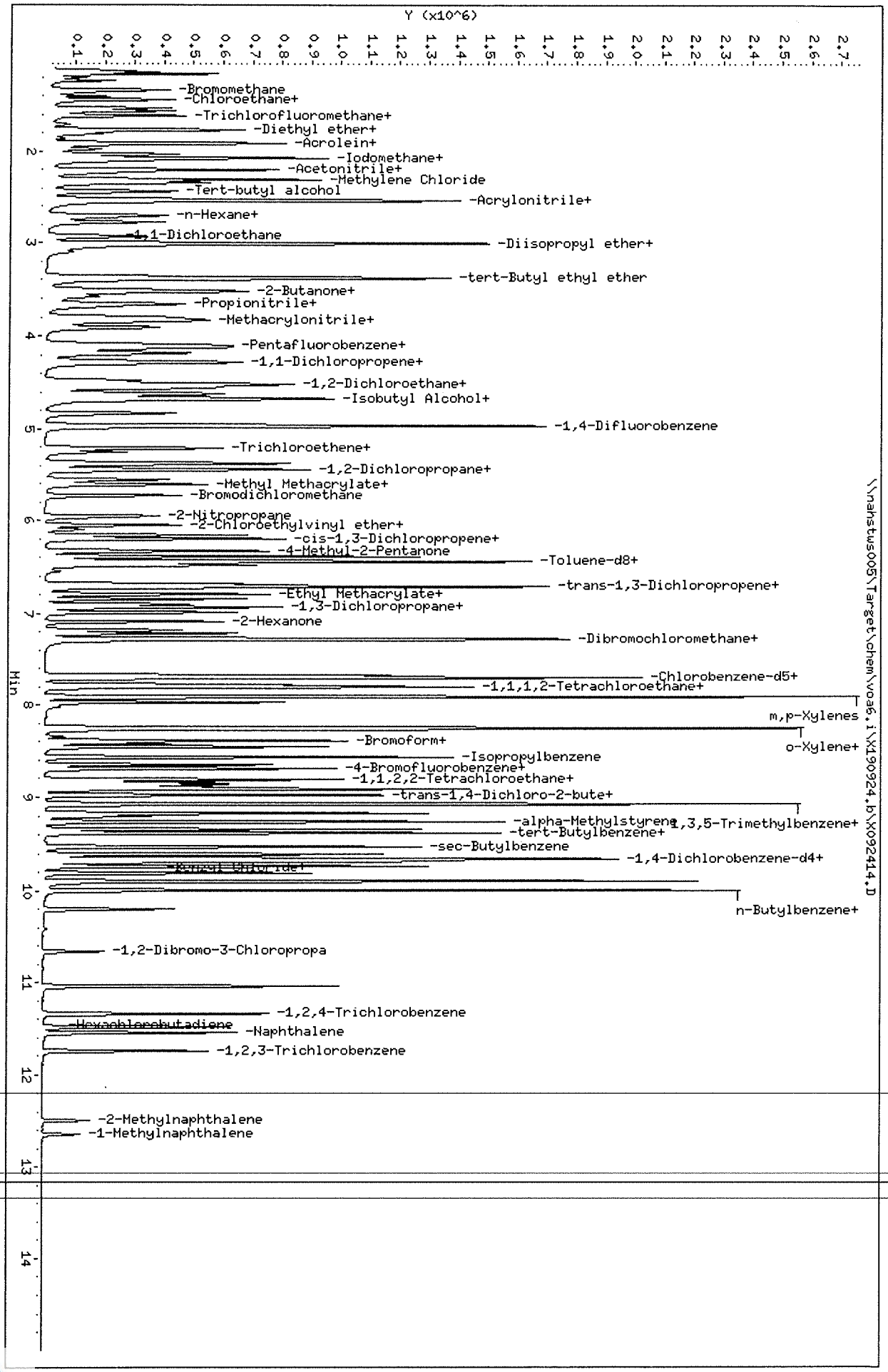
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092414.D
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 24-SEP-2019 16:23
Operator : PC Inst ID: voa6.i
Smp Info : CCV;CCV;2;;ICV
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:26 voa6.i Quant Type: ISTD
Cal Date : 24-SEP-2019 12:23 Cal File: X092404.D
Als bottle: 15 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	163018	50.9184	50.91
11	1,1-Dichloroethene	96	1.912	1.911	(0.456)	156238	44.6179	44.61
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	266861	46.7548	46.75
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	226474	45.3645	45.36
17	Methylene Chloride	84	2.306	2.305	(0.550)	216855	49.7456	49.74
38	Trichloroethene	130	5.214	5.214	(1.049)	208914	44.4618	44.46
5	Vinyl Chloride	62	1.138	1.138	(0.272)	231875	45.2972	45.29
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	232871	50.6437	50.64
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	278585	52.3606	52.36
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.979)	201029	50.9341	50.93
$ 48	Toluene-d8	98	6.389	6.388	(0.833)	746125	47.5753	47.57
* 1	Pentafluorobenzene	168	4.189	4.189	(1.000)	404392	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	612991	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.678	(1.000)	558138	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	293307	50.0000	



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092414.D
Date : 24-SEP-2019 16:23
Client ID: ICV
Sample Info: CCV;CCV;2;;ICV
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092417.D
Lab Smp Id: VLCSW-190924 Client Smp ID: VLCSW-190924
Inj Date : 24-SEP-2019 17:35
Operator : PC Inst ID: voa6.i
Smp Info : VLCSW-190924;VLCSW-190924;3;;LCS
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 18 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	68942	20.4508	20.45
11	1,1-Dichloroethene	96	1.919	1.911	(0.458)	65908	18.8788	18.87
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	114935	19.5542	19.55
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	95821	19.2518	19.25
17	Methylene Chloride	84	2.306	2.305	(0.550)	92643	20.3386	20.33
38	Trichloroethene	130	5.214	5.214	(1.049)	87919	18.1698	18.16
5	Vinyl Chloride	62	1.138	1.138	(0.272)	94001	18.4189	18.41
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	238522	52.0566	52.05
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	286700	52.6651	52.66
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.979)	204828	52.0726	52.07
$ 48	Toluene-d8	98	6.388	6.388	(0.833)	742552	46.2689	46.26
* 1	Pentafluorobenzene	168	4.189	4.189	(1.000)	403171	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	631257	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.678	(1.000)	571149	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	300403	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092417.D
Date : 24-SEP-2019 17:35
Client ID: VLCSW-190924
Sample Info: VLCSW-190924;VLCSW-190924;3;;LCS
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092419.D
Lab Smp Id: VBLKW-190924 Client Smp ID: VBLKW-190924
Inj Date : 24-SEP-2019 18:23
Operator : PC Inst ID: voa6.i
Smp Info : VBLKW-190924;VBLKW-190924;3;;BLANK
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 20 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

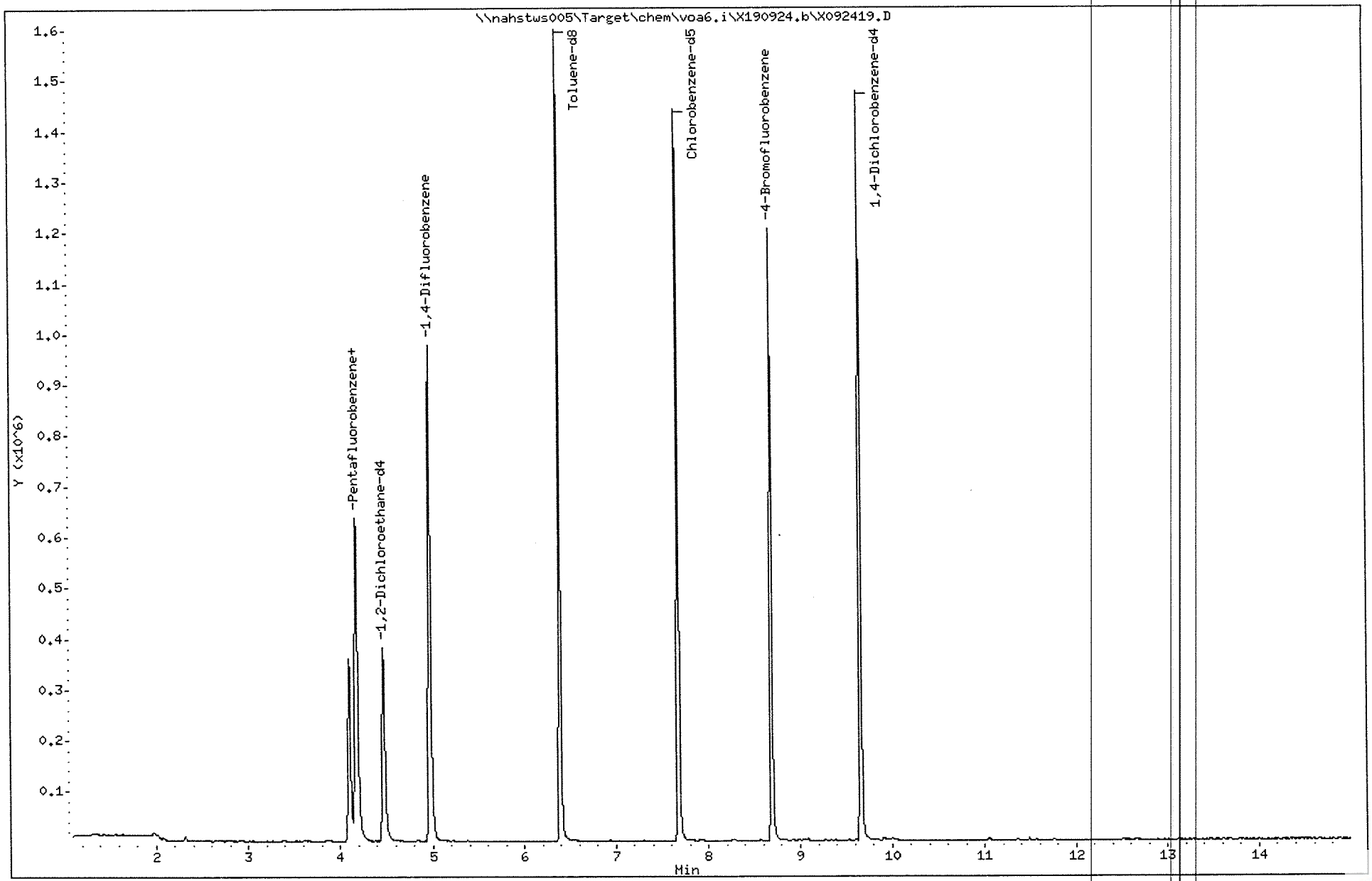
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	284109	45.5256	45.52
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	346953	52.2917	52.29
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.979)	252204	47.1203	47.12
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	955959	48.8807	48.88
* 1 Pentafluorobenzene	168	4.189	4.189	(1.000)	547665	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	807277	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	696007	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	355530	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092419.D
Date : 24-SEP-2019 18:23
Client ID: VBLKW-190924
Sample Info: VBLKW-190924;VBLKW-190924;3;;BLANK
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092420.D
Lab Smp Id: HS19090860-01 Client Smp ID: HS19090860-01
Inj Date : 24-SEP-2019 18:47
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-01;HS19090860-01;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 21
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

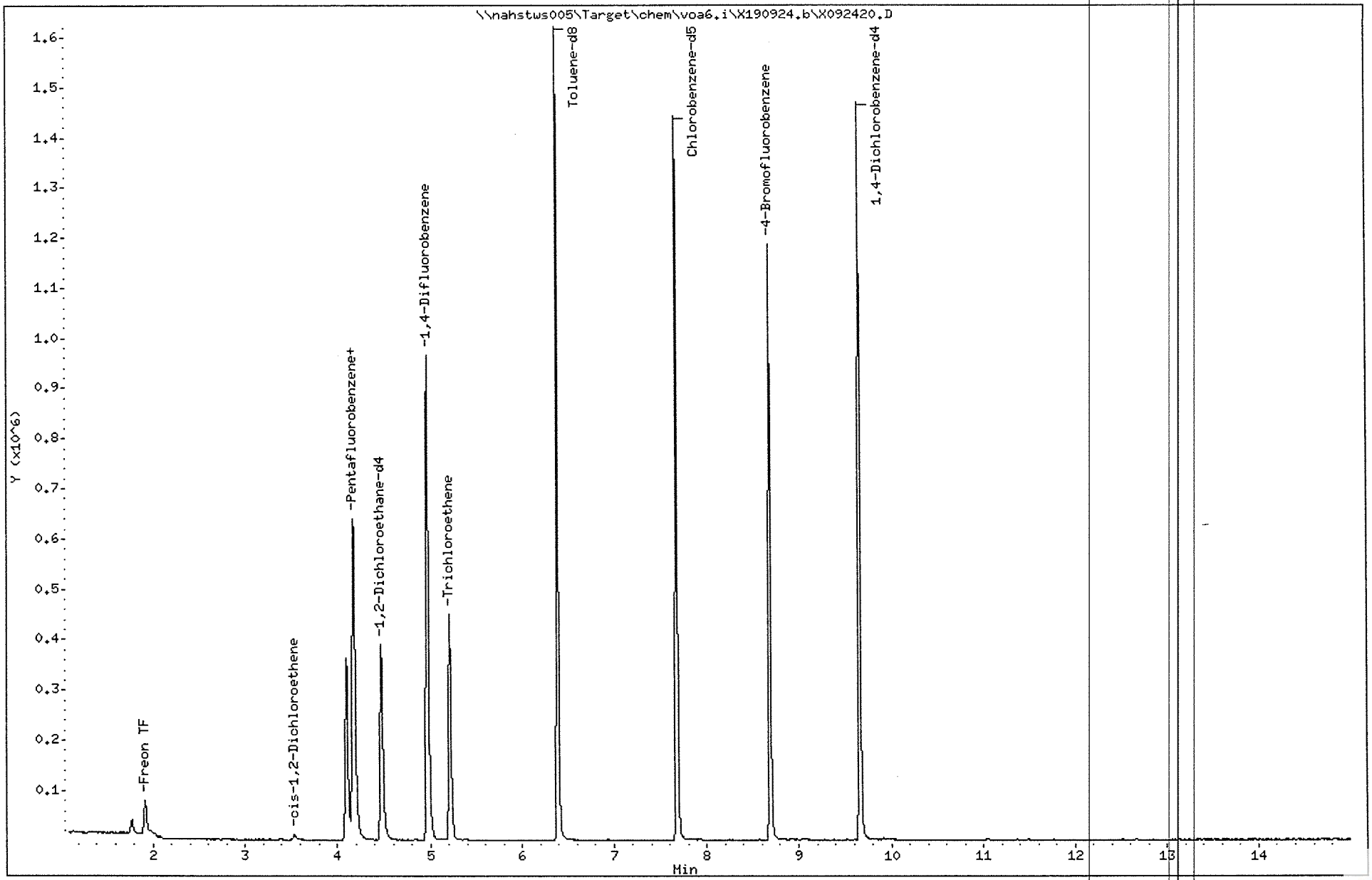
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
27 cis-1,2-Dichloroethene	96	3.537	3.530	(0.846)	5354	0.78924	0.78(a)
38 Trichloroethene	130	5.214	5.214	(1.049)	156710	25.2611	25.26
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	285497	45.5967	45.59
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	345717	51.5646	51.56
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	253441	47.1945	47.19
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	964764	48.8343	48.83
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	549501	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	809316	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	703085	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	361280	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092420.D
Date : 24-SEP-2019 18:47
Client ID: HS19090860-01
Sample Info: HS19090860-01;HS19090860-01;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092420.D

Date : 24-SEP-2019 18:47

Client ID: HS19090860-01

Instrument: voa6.i

Sample Info: HS19090860-01;HS19090860-01;;;

Purge Volume: 5.0

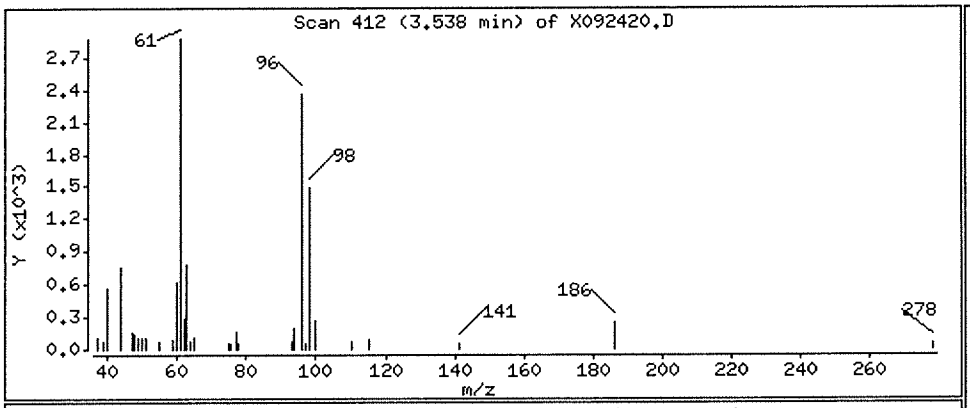
Operator: PC

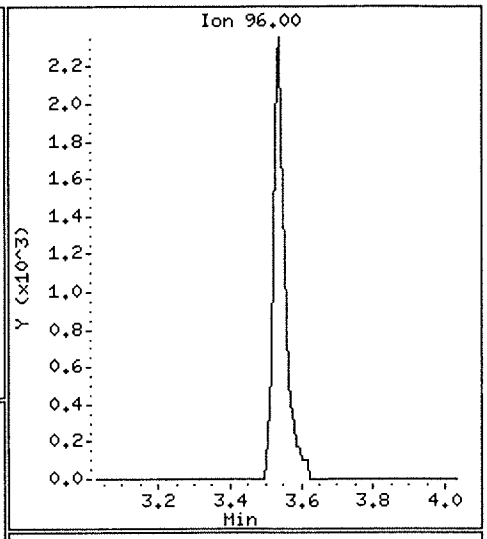
Column phase: DB624

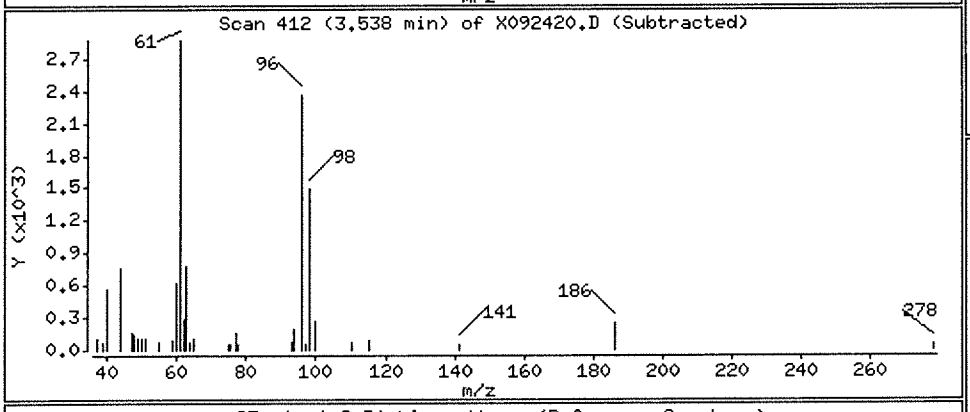
Column diameter: 0.18

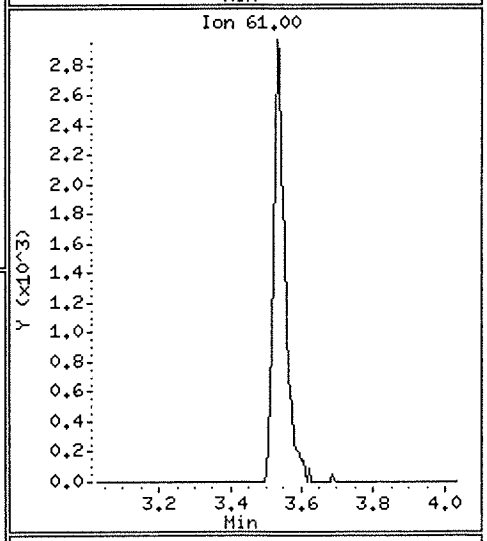
27 cis-1,2-Dichloroethene

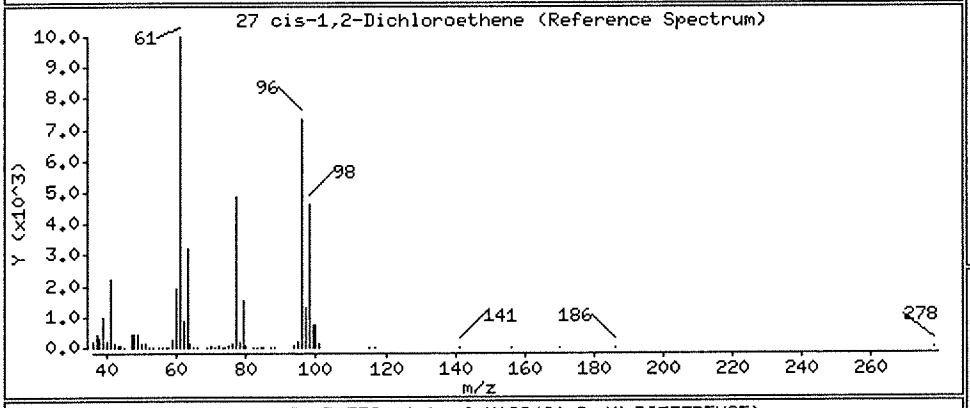
Concentration: 0.78 ug/l

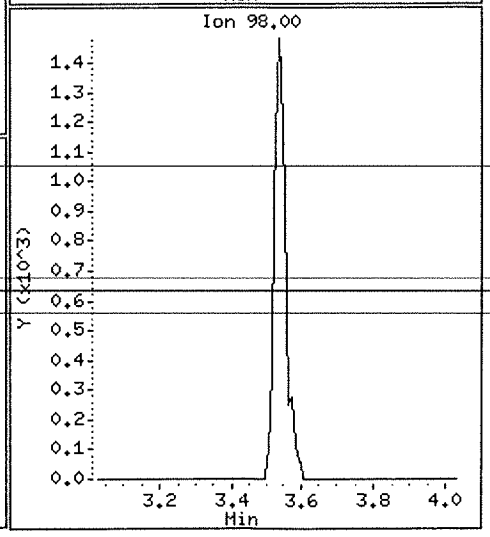


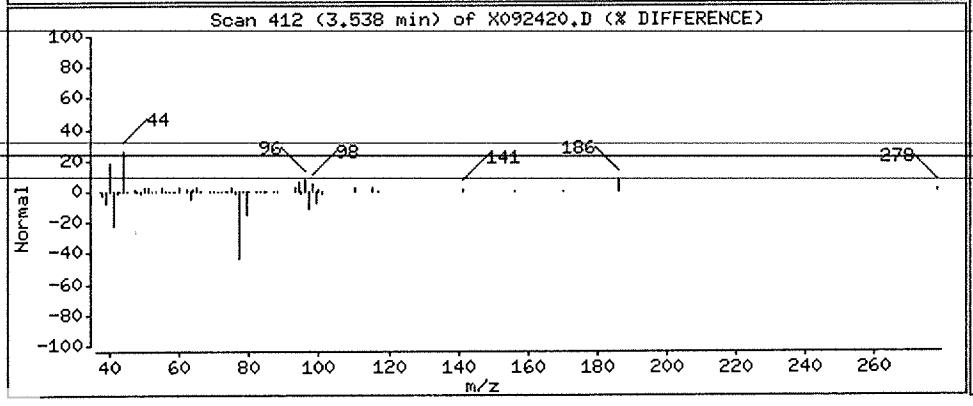












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092420.D

Date : 24-SEP-2019 18:47

Client ID: HS19090860-01

Instrument: voa6.i

Sample Info: HS19090860-01;HS19090860-01;;;

Purge Volume: 5.0

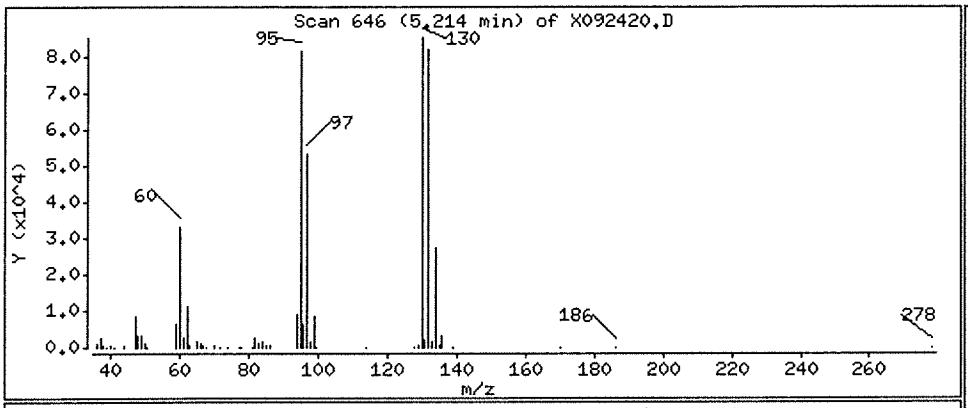
Operator: PC

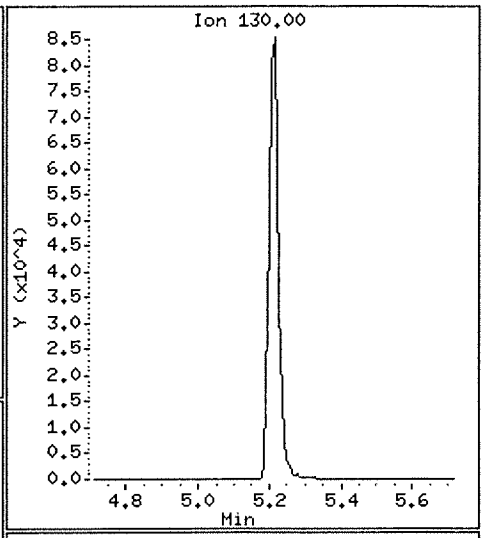
Column phase: DB624

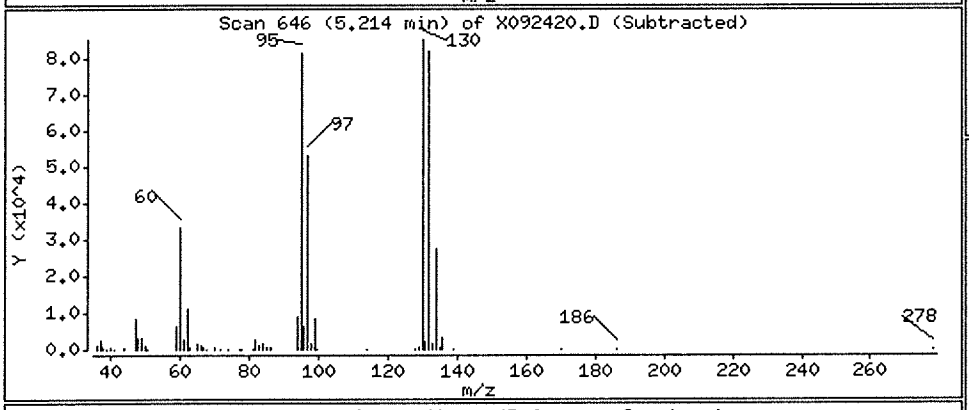
Column diameter: 0.18

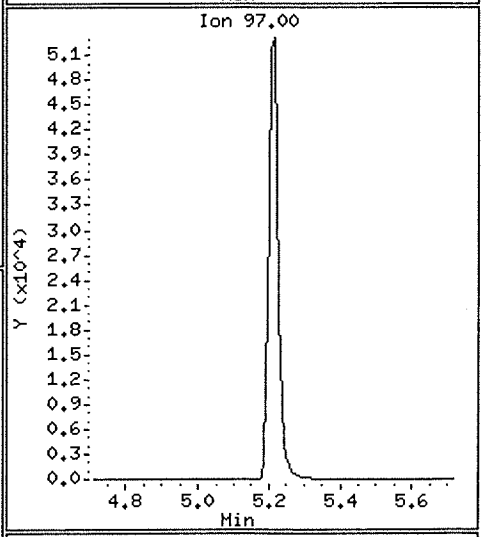
38 Trichloroethene

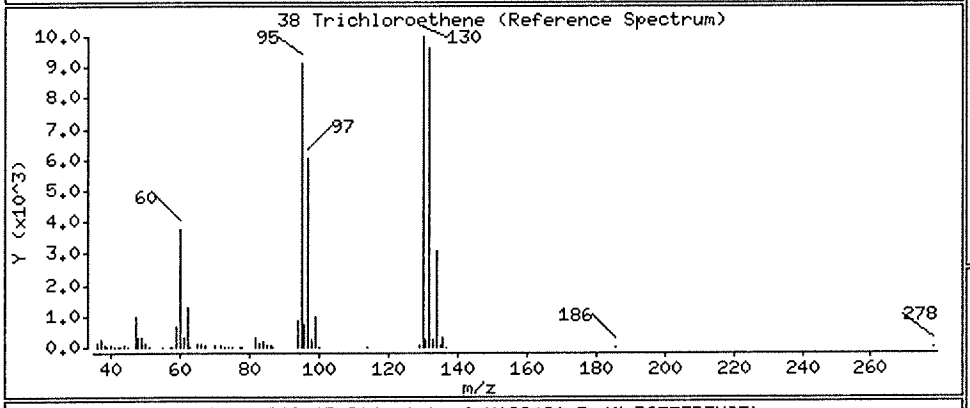
Concentration: 25.26 ug/l

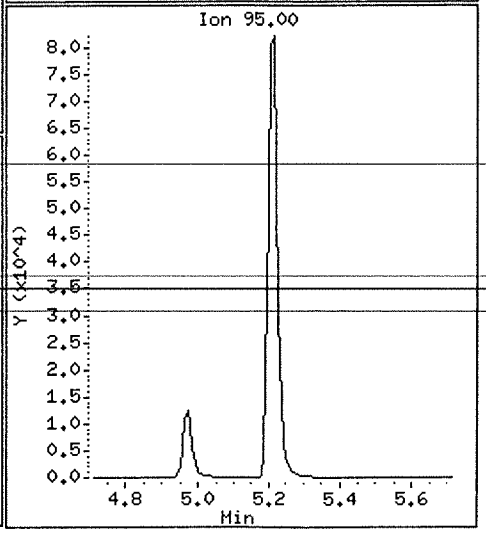


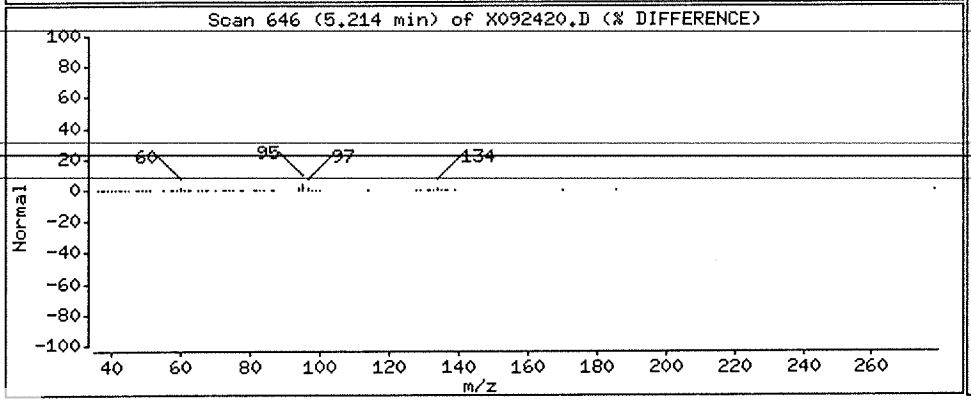












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092421.D
Lab Smp Id: HS19090860-02 Client Smp ID: HS19090860-02
Inj Date : 24-SEP-2019 19:11
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-02;HS19090860-02;;;
Misc Info : HS18090001;WATER;0;25;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 22
Dil Factor: 25.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	25.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

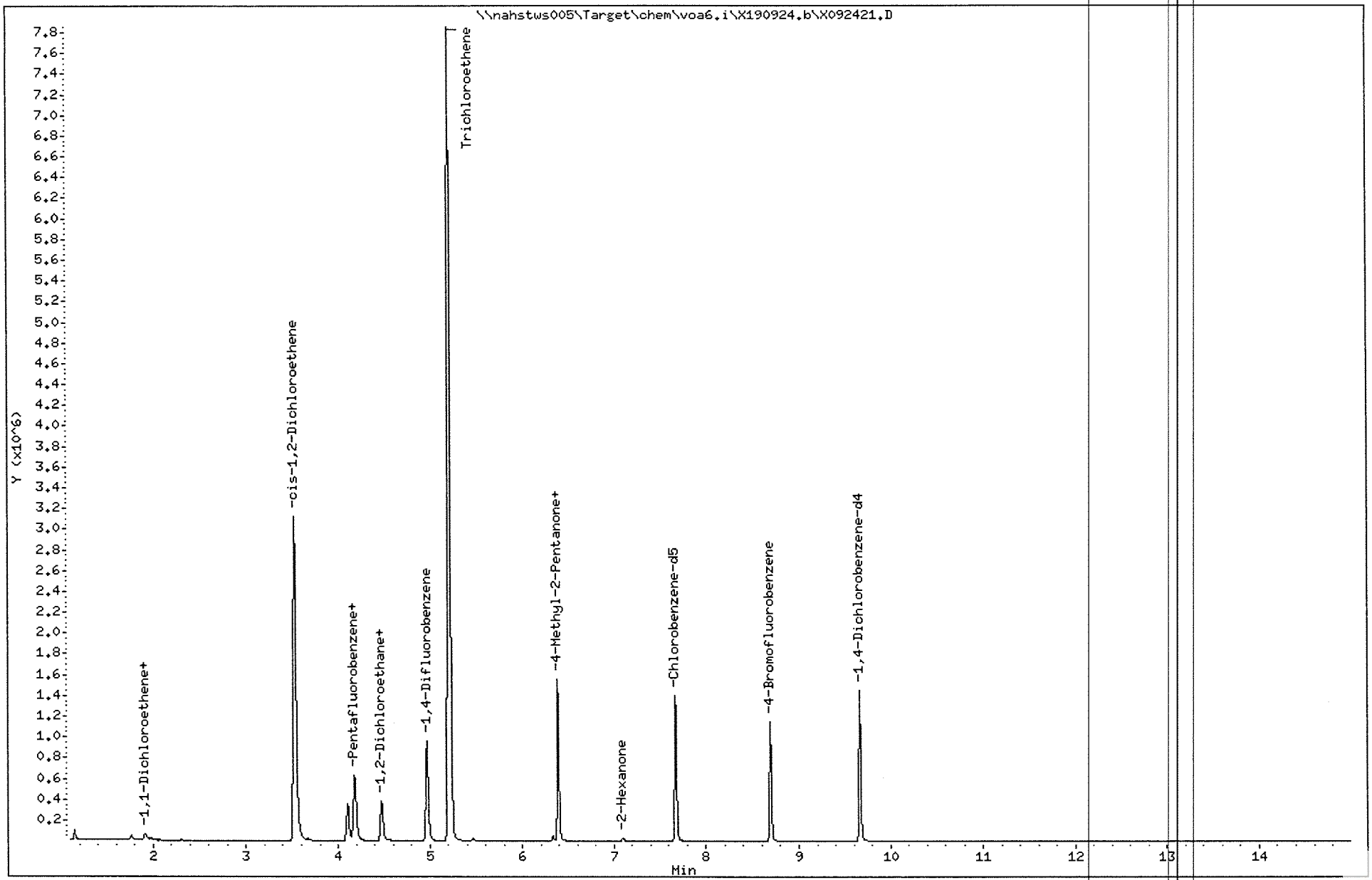
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
11	1,1-Dichloroethene	96	1.919	1.911	(0.459)	4687	0.99681	24.92(a)
33	1,2-Dichloroethane	62	4.569	4.562	(0.919)	5590	0.74493	18.62(a)
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	1617533	241.294	6032.34(AM)
38	Trichloroethene	130	5.214	5.214	(1.049)	2806452	454.298	11357.45(A)
5	Vinyl Chloride	62	1.138	1.138	(0.272)	59946	8.72114	218.02
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	283014	45.7436	45.74
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	335608	52.1769	52.17
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.981)	248466	46.8145	46.81
$ 48	Toluene-d8	98	6.388	6.388	(0.833)	923267	48.7002	48.70
* 1	Pentafluorobenzene	168	4.182	4.189	(1.000)	543009	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	805917	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.678	(1.000)	674697	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	349383	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092421.D
Date : 24-SEP-2019 19:11
Client ID: HS19090860-02
Sample Info: HS19090860-02;HS19090860-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092421.D

Date : 24-SEP-2019 19:11

Client ID: HS19090860-02

Instrument: voa6.i

Sample Info: HS19090860-02;HS19090860-02;;;

Purge Volume: 5.0

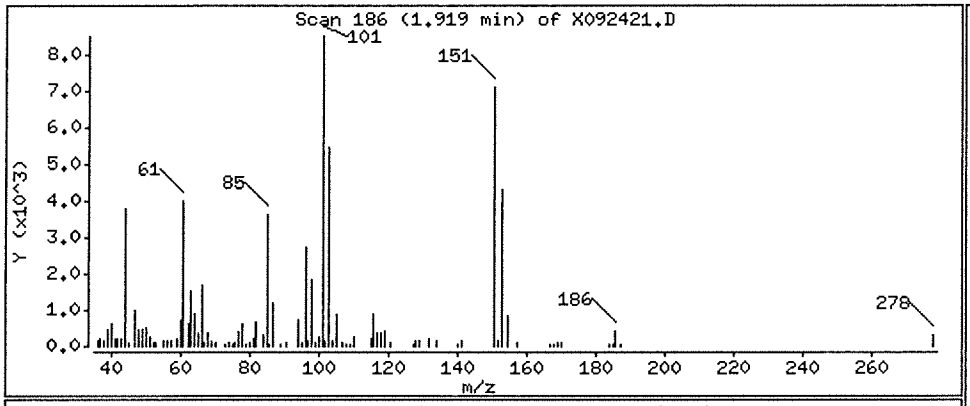
Operator: PC

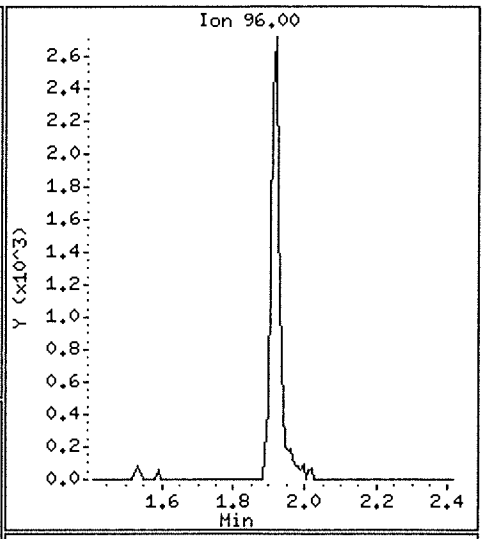
Column phase: DB624

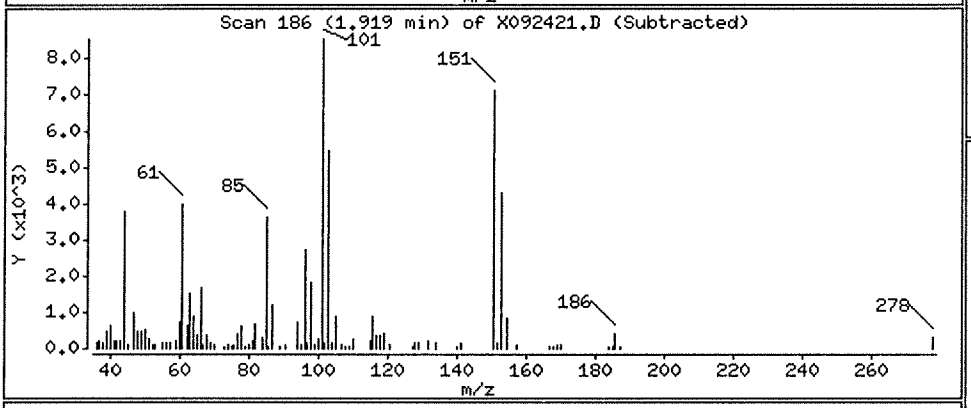
Column diameter: 0.18

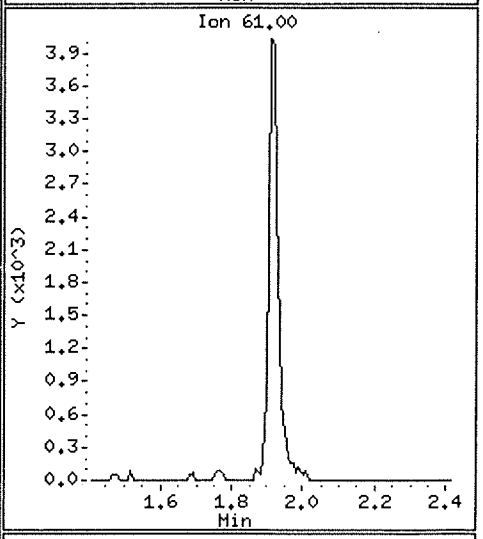
11 1,1-Dichloroethene

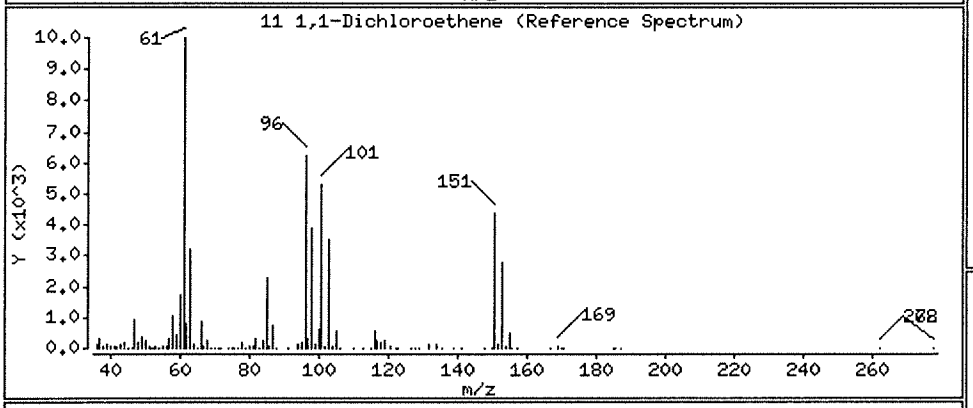
Concentration: 24.92 ug/l

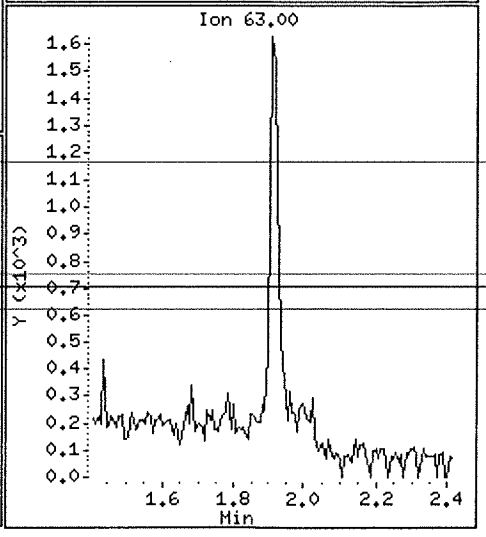


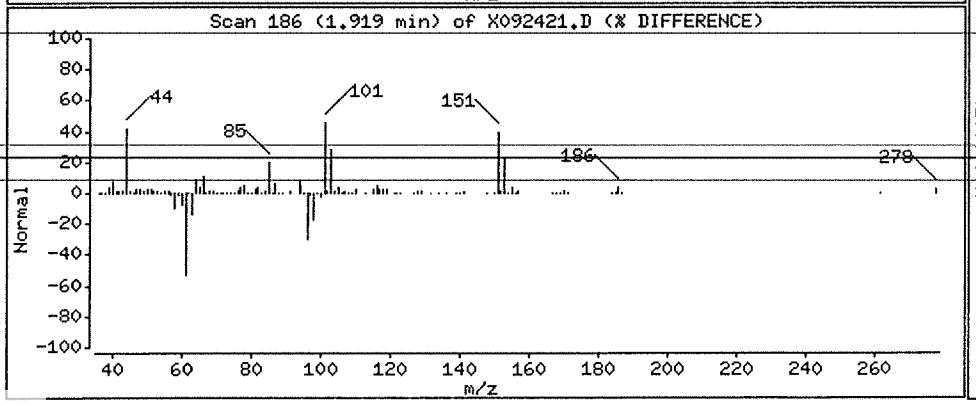












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092421.D

Date : 24-SEP-2019 19:11

Client ID: HS19090860-02

Instrument: voa6.i

Sample Info: HS19090860-02;HS19090860-02;;;

Purge Volume: 5.0

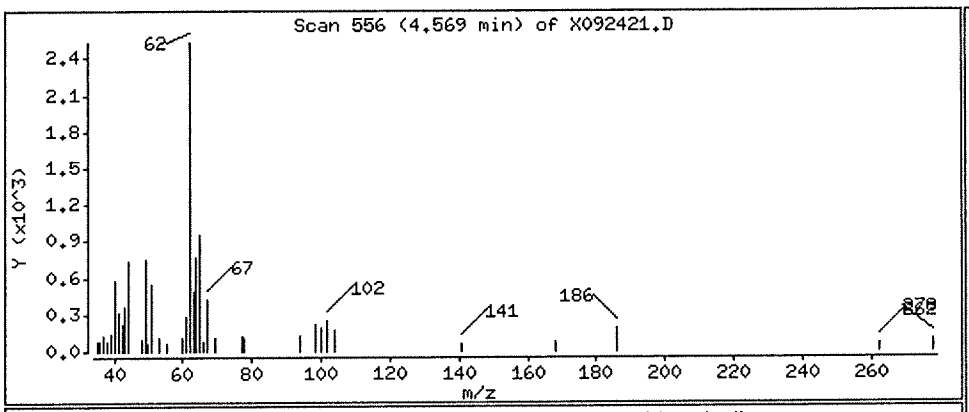
Operator: PC

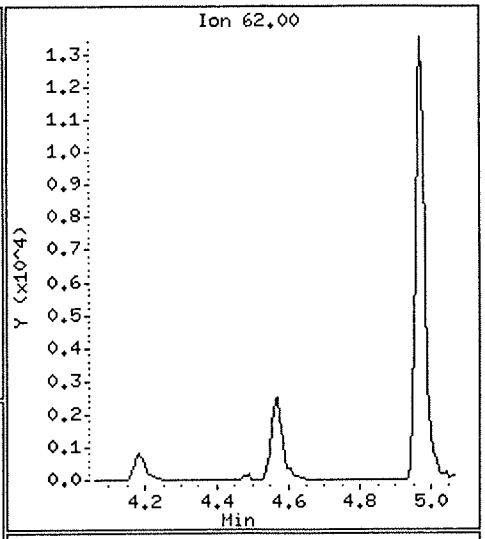
Column phase: DB624

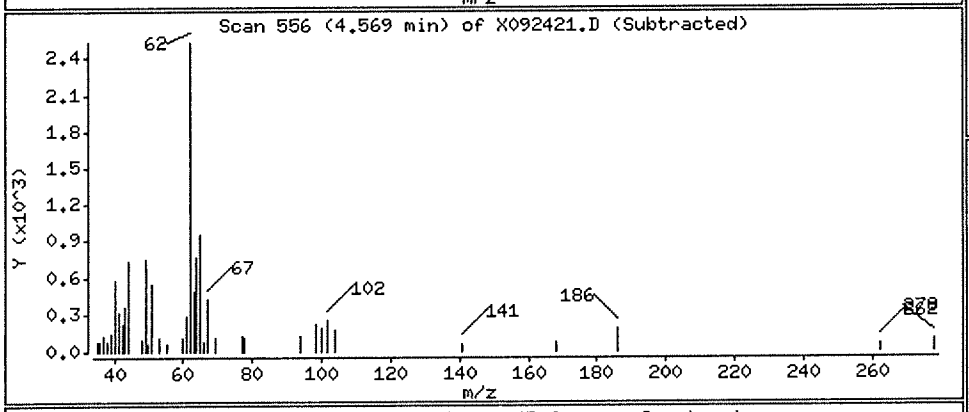
Column diameter: 0.18

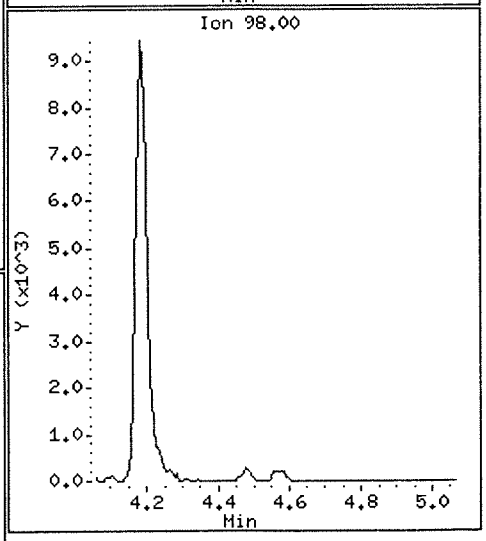
33 1,2-Dichloroethane

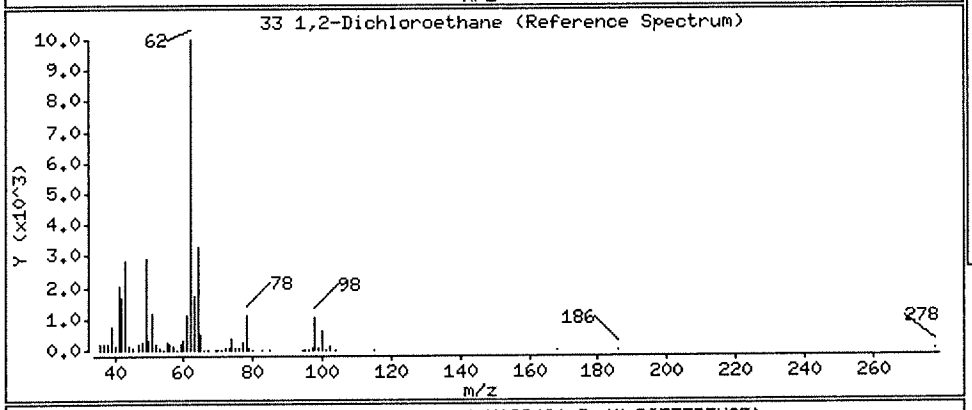
Concentration: 18.62 ug/l

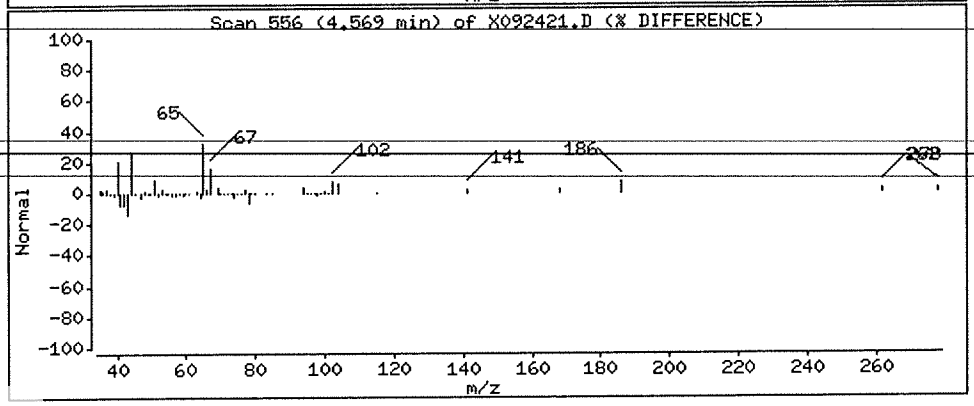












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092421.D

Date : 24-SEP-2019 19:11

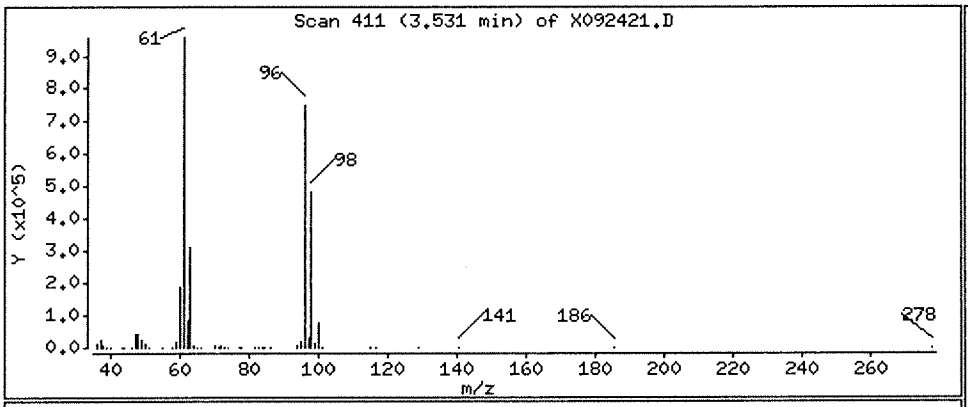
Client ID: HS19090860-02 Instrument: voa6.i

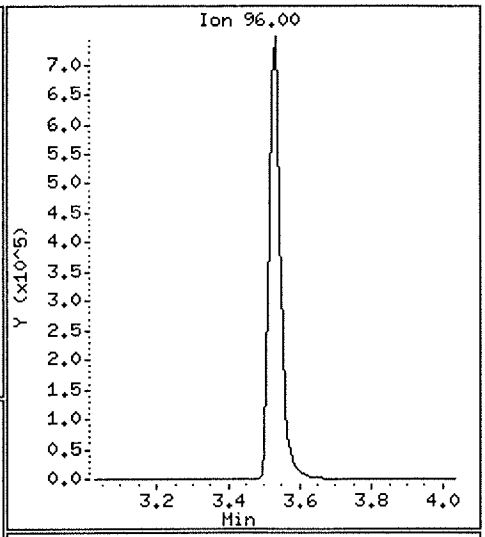
Sample Info: HS19090860-02;HS19090860-02;;;

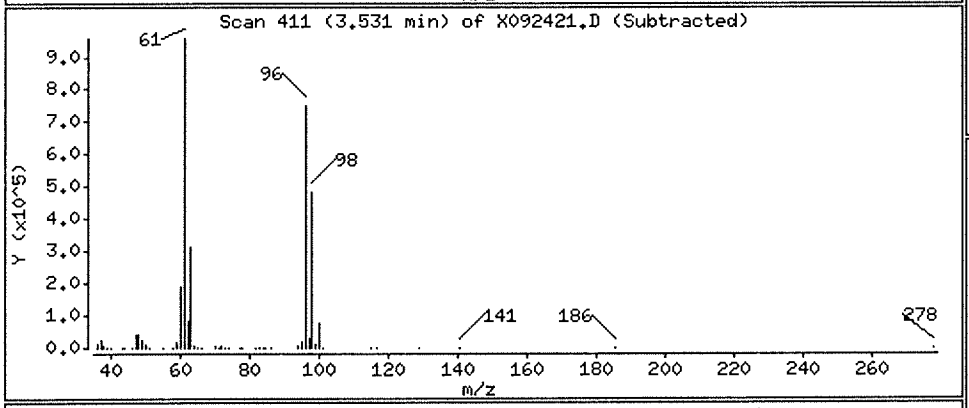
Purge Volume: 5.0 Operator: PC

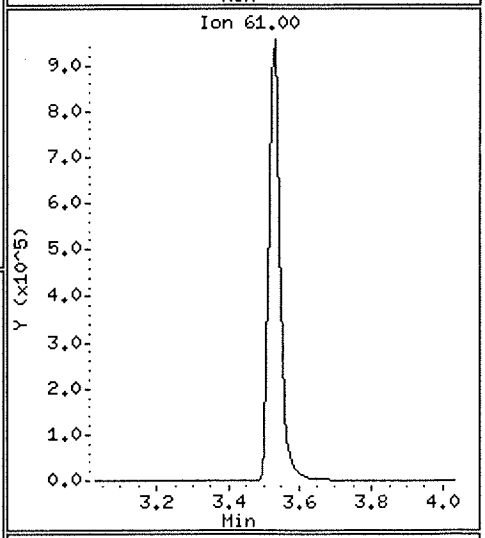
Column phase: DB624 Column diameter: 0.18

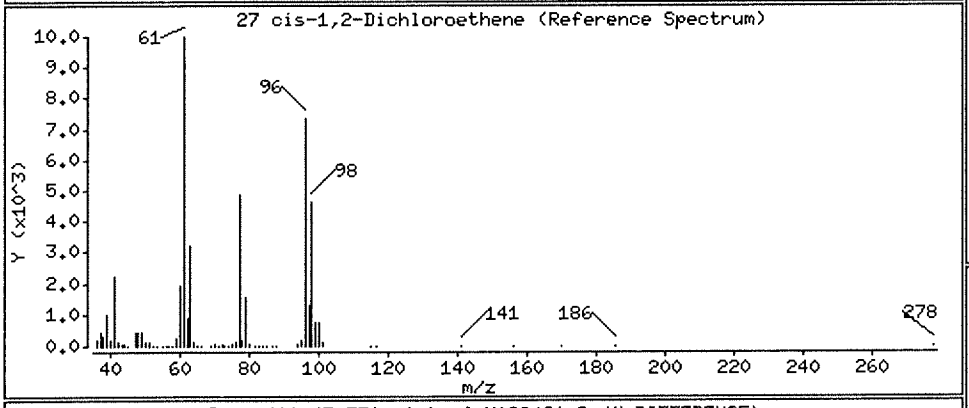
27 cis-1,2-Dichloroethene Concentration: 6032.34 ug/l

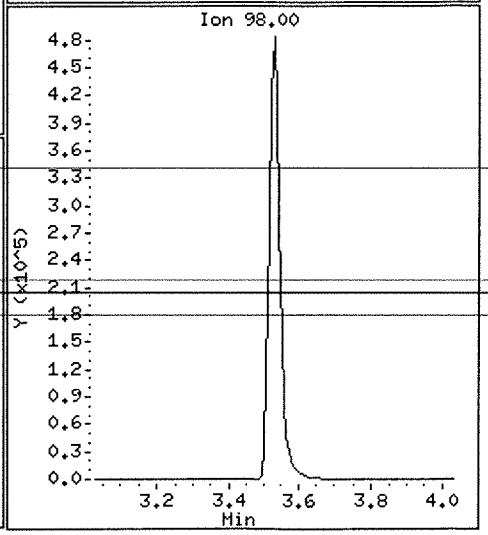


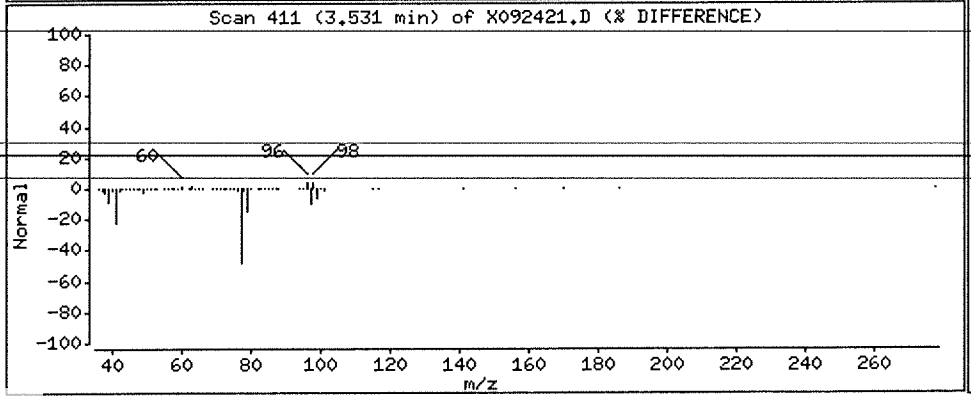












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092421.D

Date : 24-SEP-2019 19:11

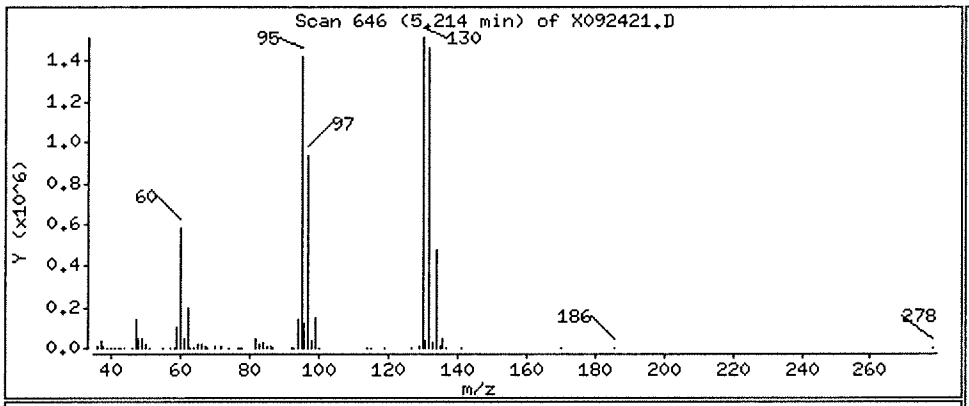
Client ID: HS19090860-02 Instrument: voa6.i

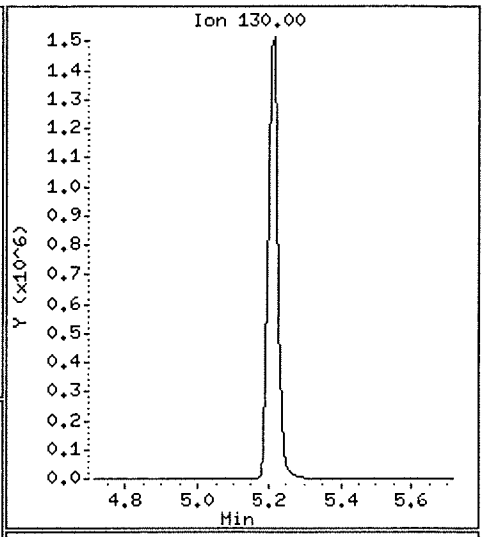
Sample Info: HS19090860-02;HS19090860-02;;;

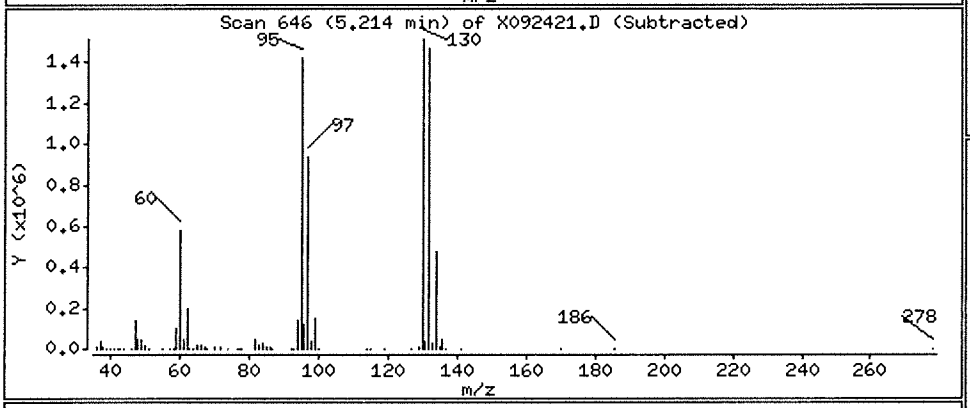
Purge Volume: 5.0 Operator: PC

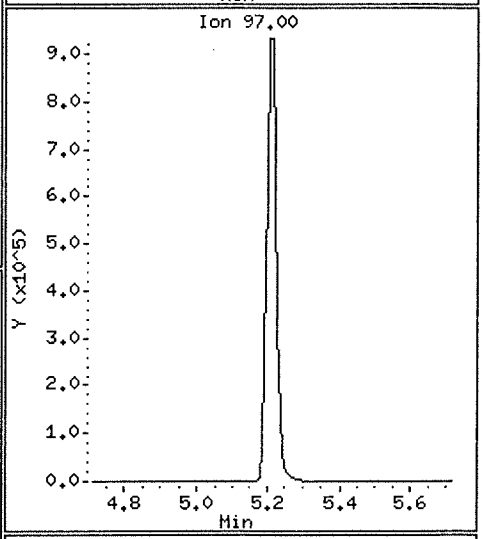
Column phase: DB624 Column diameter: 0.18

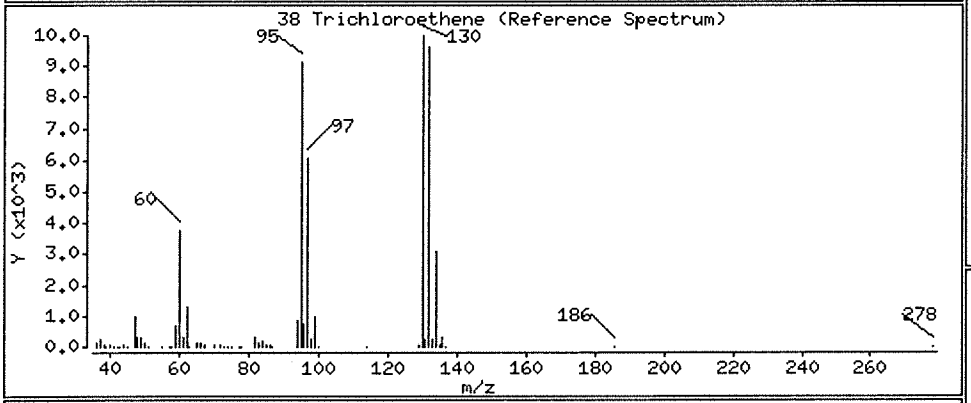
38 Trichloroethene Concentration: 11357.45 ug/l

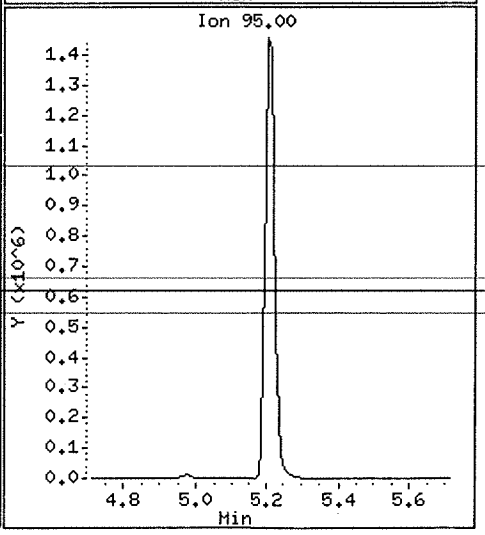


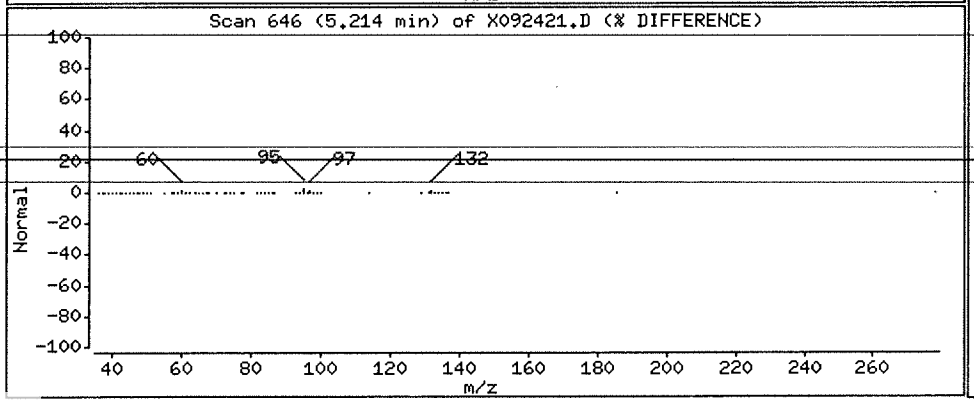












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092421.D

Date : 24-SEP-2019 19:11

Client ID: HS19090860-02

Instrument: voa6.i

Sample Info: HS19090860-02;HS19090860-02;;;

Purge Volume: 5.0

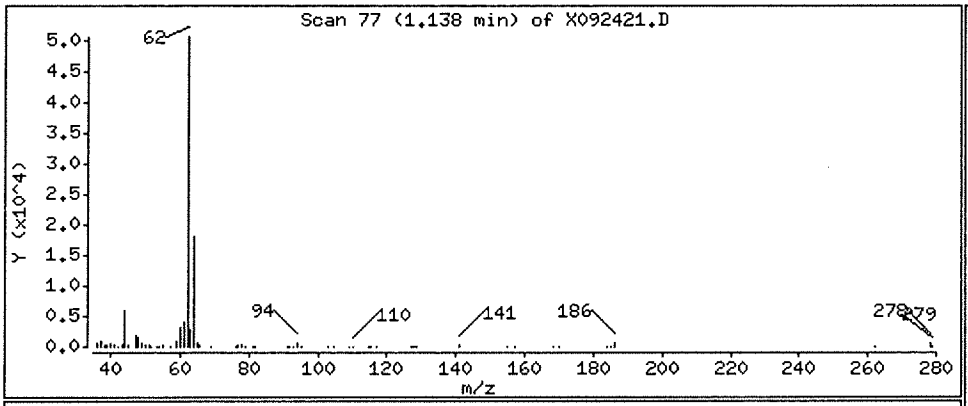
Operator: PC

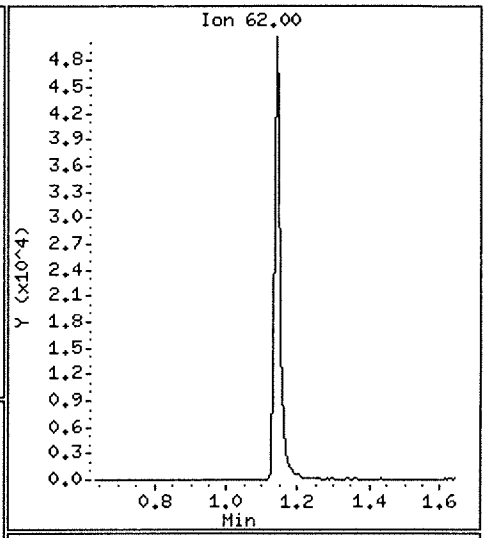
Column phase: DB624

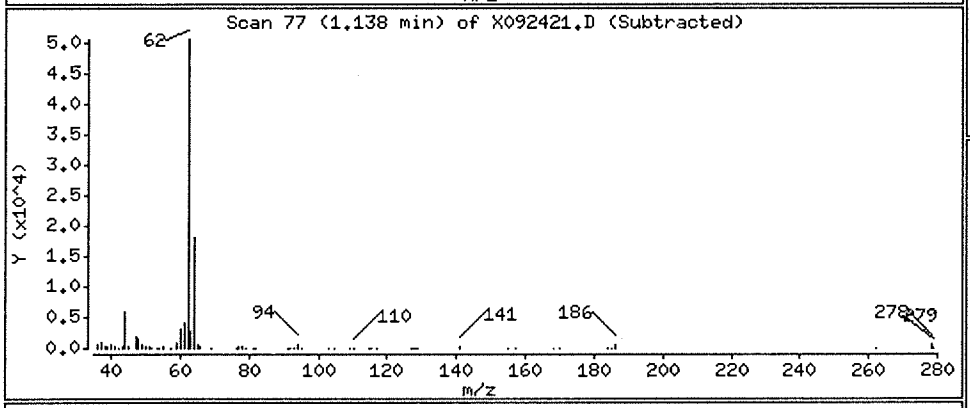
Column diameter: 0.18

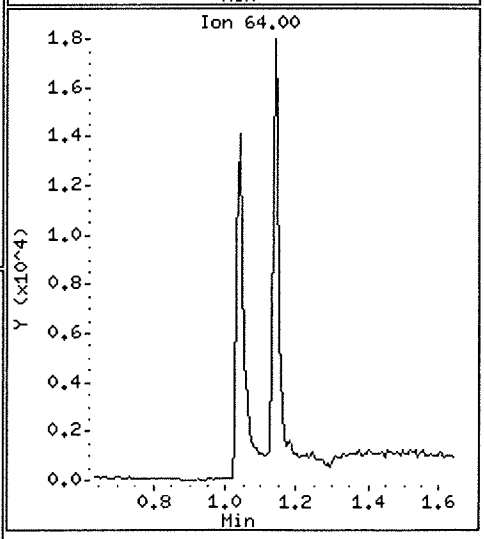
5 Vinyl Chloride

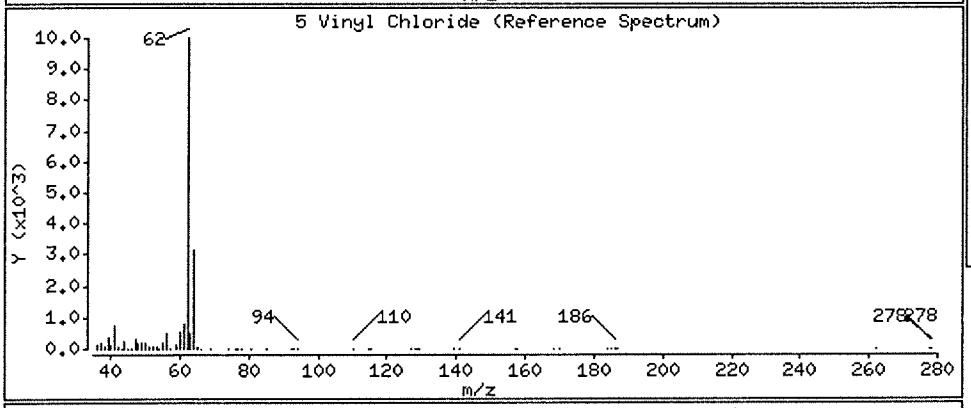
Concentration: 218.02 ug/l

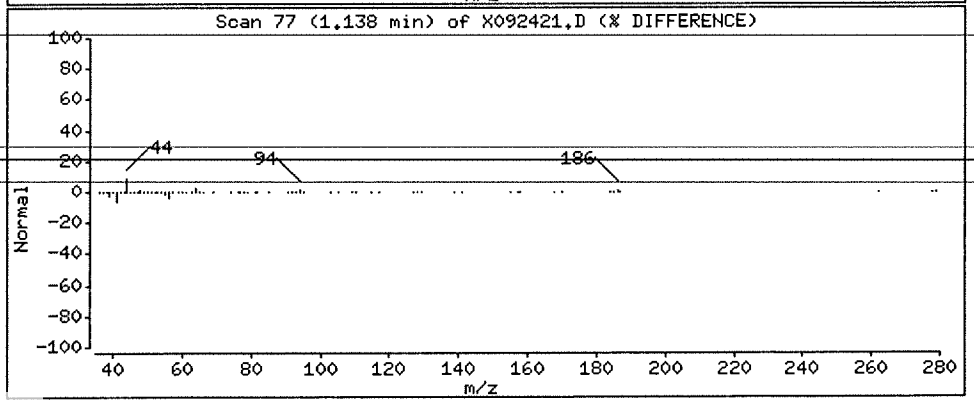






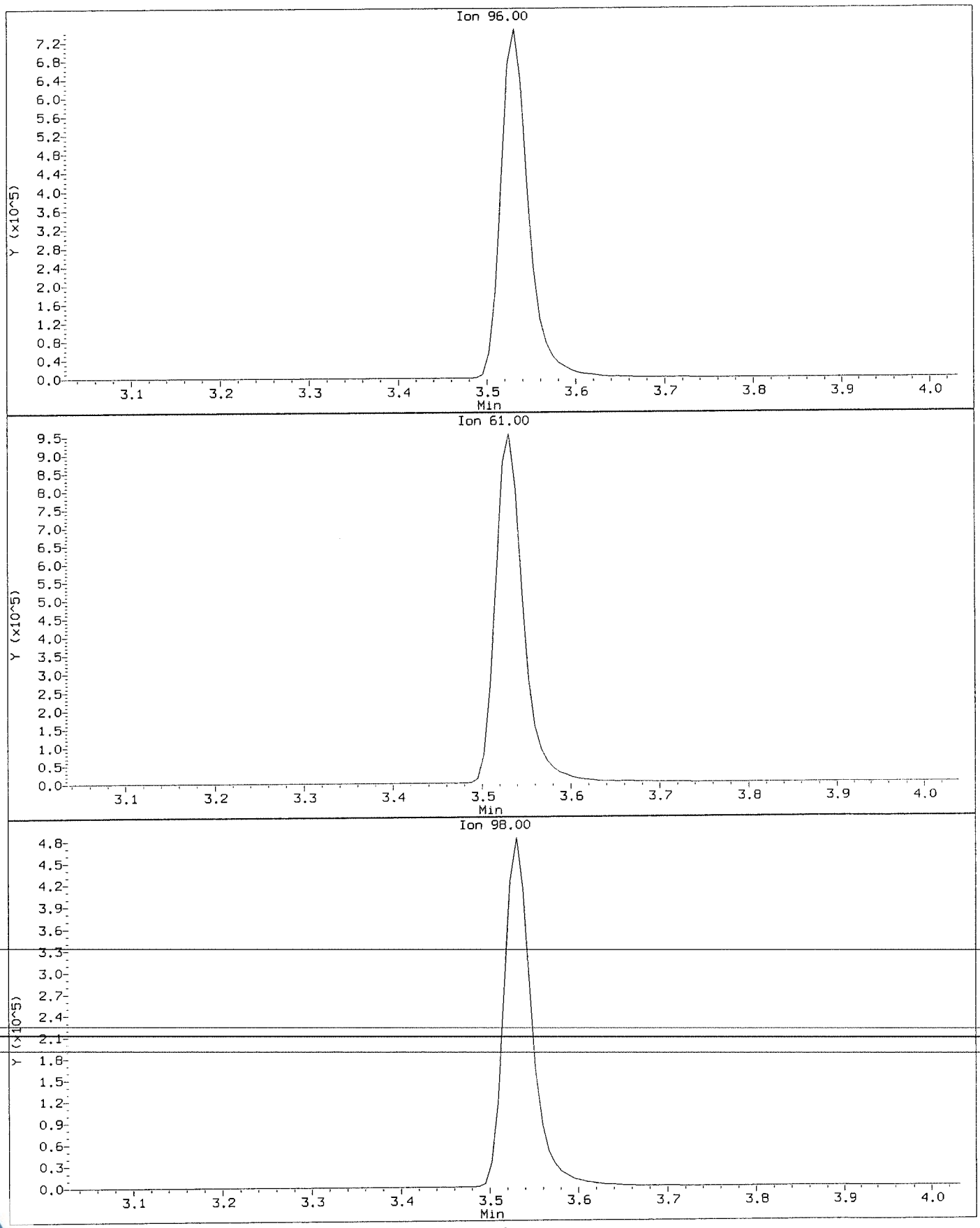






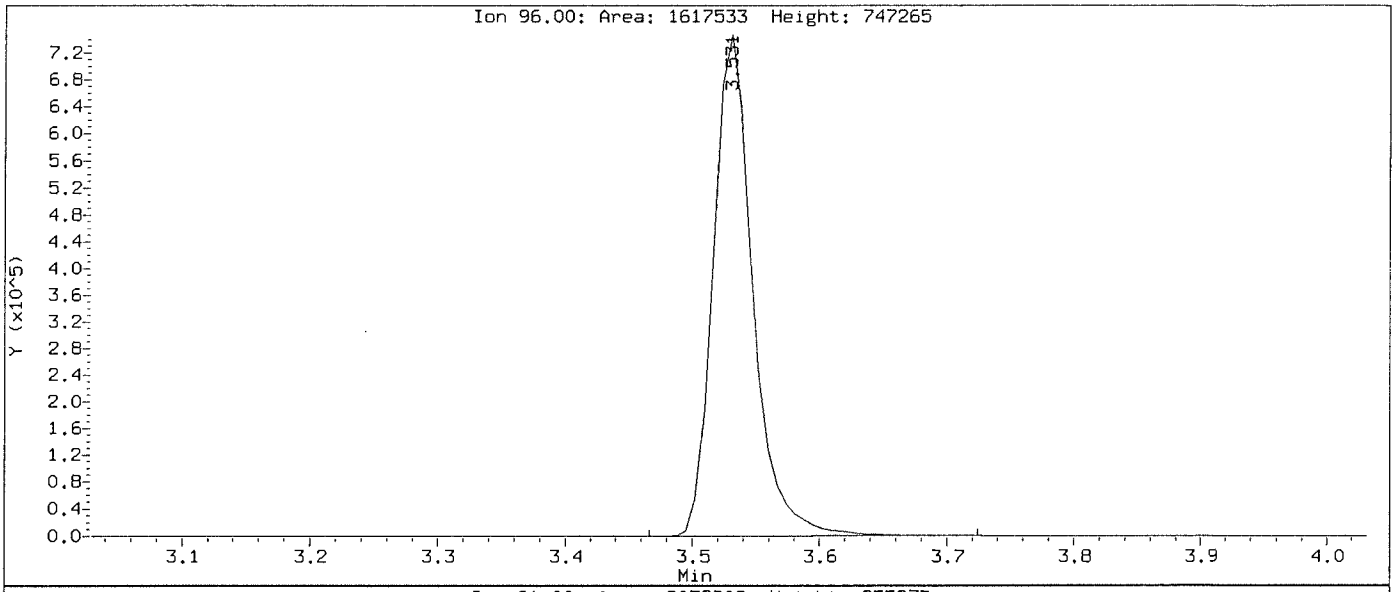
Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\BEFORE2\X092421.D
Injection Date: 24-SEP-2019 19:11
Instrument: voa6.i
Client Sample ID: HS19090860-02

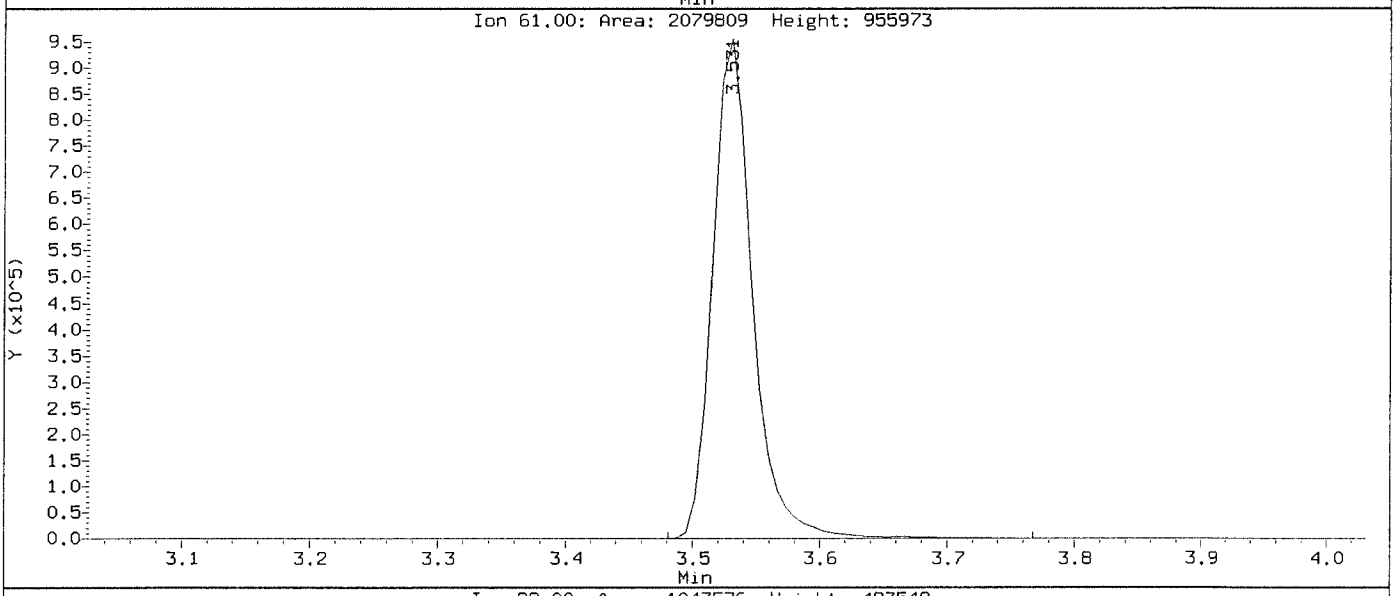
Compound: cis-1,2-Dichloroethene
CAS Number: 156-59-2

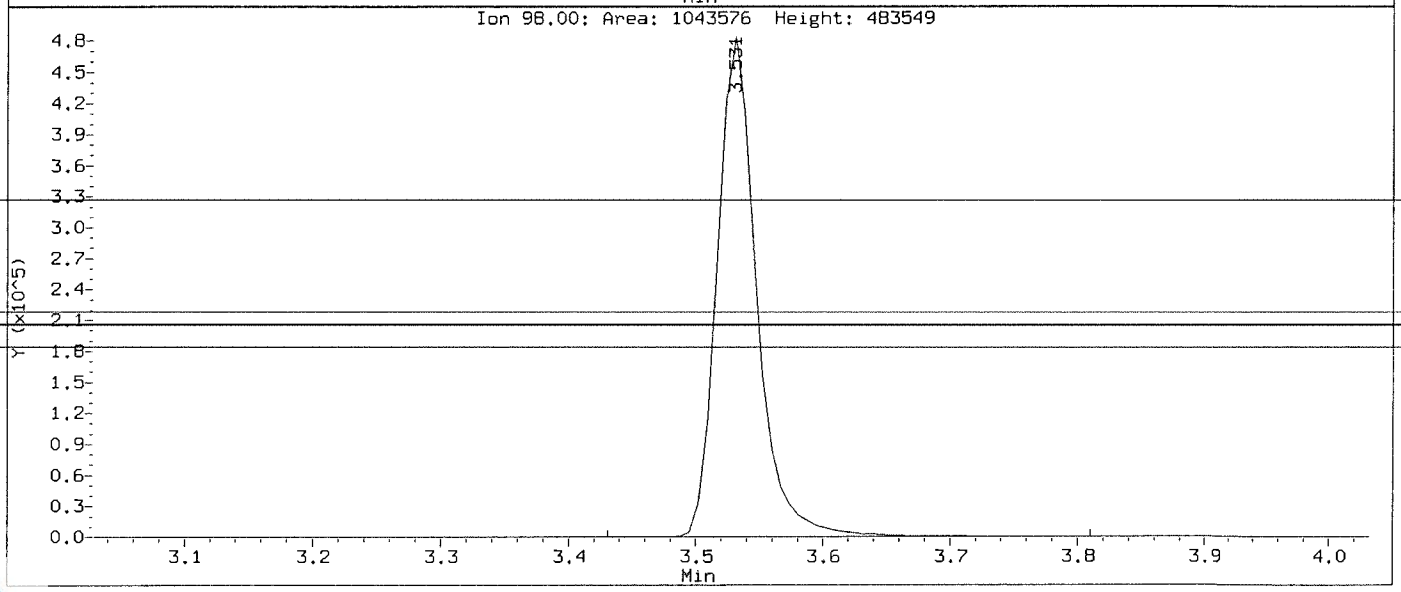


Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092421.D
Injection Date: 24-SEP-2019 19:11
Instrument: voa6.i
Client Sample ID: HS19090860-02

Compound: cis-1,2-Dichloroethene
CAS Number: 156-59-2







ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092422.D
Lab Smp Id: HS19090860-01MS Client Smp ID: HS19090860-01MS
Inj Date : 24-SEP-2019 19:35
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-01MS;HS19090860-01MS;3;;MS
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 23 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

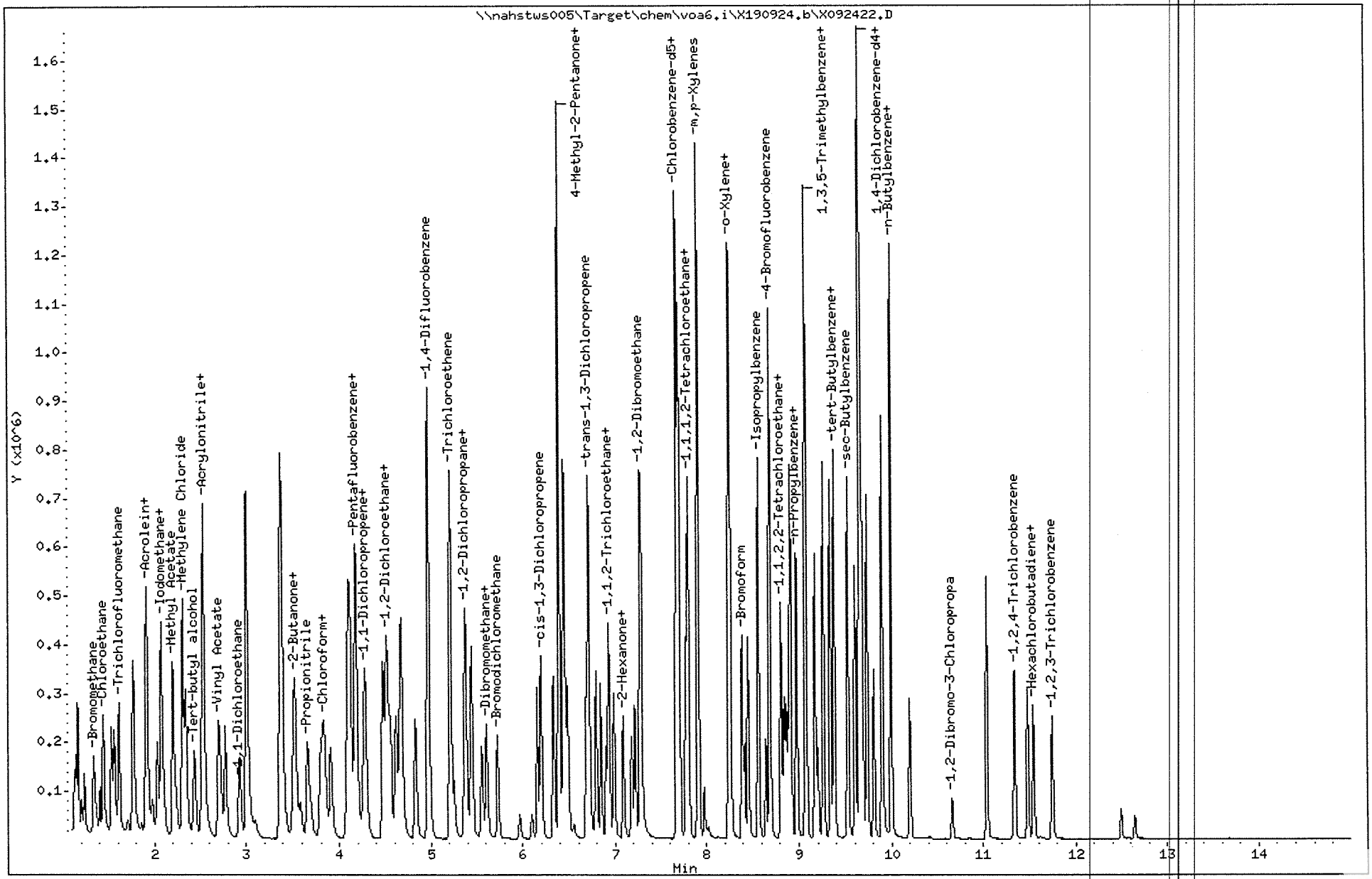
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	74475	20.0258	20.02
	11 1,1-Dichloroethene	96	1.912	1.911	(0.457)	79965	18.2147	18.21
	33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	125586	17.8623	17.86
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	114641	18.3162	18.31
	17 Methylene Chloride	84	2.306	2.305	(0.551)	98358	16.9049	16.90
	38 Trichloroethene	130	5.214	5.214	(1.049)	263512	45.5275	45.52
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	97833	15.2441	15.24
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	265557	45.9759	45.97
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	306142	50.9905	50.99
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	236565	47.7552	47.75
$	48 Toluene-d8	98	6.388	6.388	(0.833)	887247	50.1643	50.16
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	506995	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	755092	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	629450	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	310727	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092422.D
Date : 24-SEP-2019 19:35
Client ID: HS19090860-01MS
Sample Info: HS19090860-01MS;HS19090860-01MS;3;;MS
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092423.D
Lab Smp Id: HS19090860-01MSD Client Smp ID: HS19090860-01MSD
Inj Date : 24-SEP-2019 19:59
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-01MSD;HS19090860-01MSD;3;;MSD
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 23 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

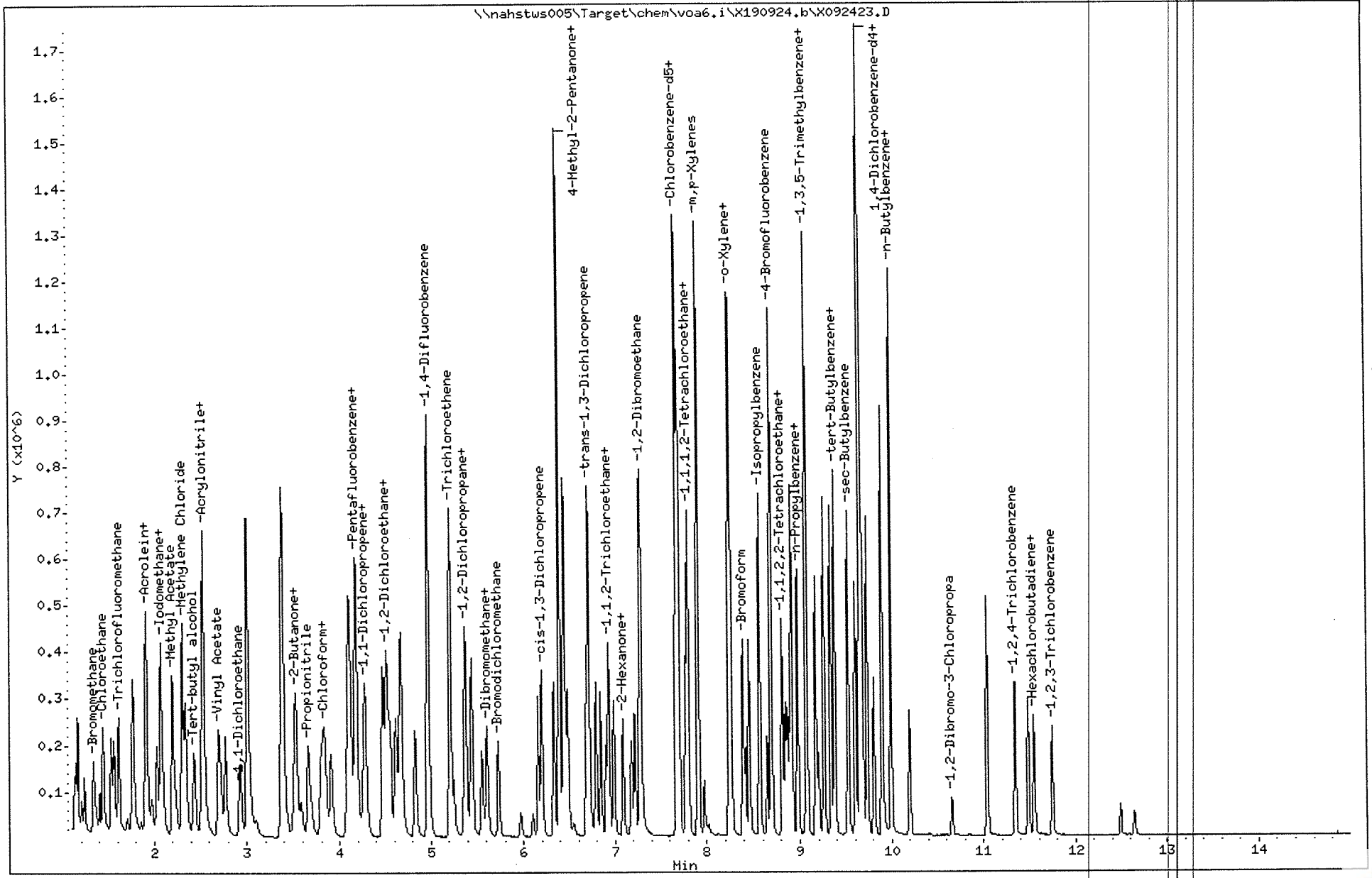
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	73988	19.1302	19.13
11	1,1-Dichloroethene	96	1.912	1.911	(0.457)	74659	16.8341	16.83
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	121334	17.2915	17.29
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	108666	17.1861	17.18
17	Methylene Chloride	84	2.305	2.305	(0.551)	93849	15.8719	15.87
38	Trichloroethene	130	5.214	5.214	(1.049)	249342	43.1641	43.16
5	Vinyl Chloride	62	1.138	1.138	(0.272)	91802	14.1597	14.15
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	265771	45.5386	45.53
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	323446	51.9401	51.94
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.981)	238037	47.5632	47.56
$ 48	Toluene-d8	98	6.388	6.388	(0.833)	902967	49.2011	49.20
* 1	Pentafluorobenzene	168	4.182	4.189	(1.000)	512173	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	753609	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.678	(1.000)	653144	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	336239	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092423.D
Date : 24-SEP-2019 19:59
Client ID: HS19090860-01MSD
Sample Info: HS19090860-01MSD;HS19090860-01MSD;3;;MSD
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092424.D
Lab Smp Id: HS19090860-02 Client Smp ID: HS19090860-02
Inj Date : 24-SEP-2019 20:23
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-02;HS19090860-02;;;
Misc Info : HS18090001;WATER;0;250;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 24
Dil Factor: 250.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	250.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

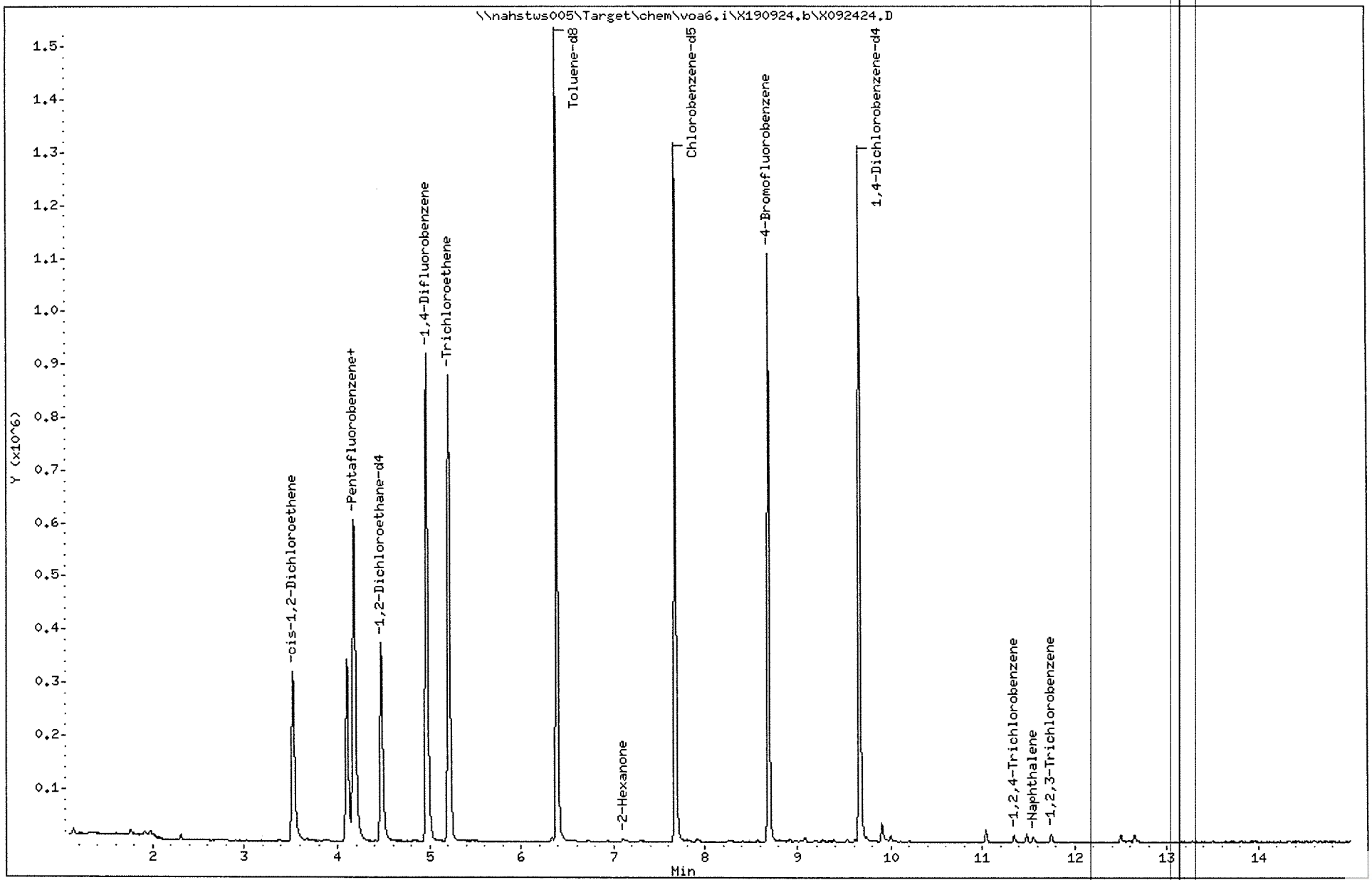
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	169177	26.2192	6554.80
38 Trichloroethene	130	5.214	5.214	(1.049)	312796	53.0026	13250.64
5 Vinyl Chloride	62	1.138	1.138	(0.272)	6290	0.95071	237.67(a)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	273834	45.9879	45.98
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	321395	52.2800	52.27
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	240715	47.1252	47.12
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	913296	50.4018	50.40
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	522663	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	769906	50.0000	
* 47 Chlorobenzene-d5	117	7.670	7.678	(1.000)	644878	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	324028	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092424.D
Date : 24-SEP-2019 20:23
Client ID: HS19090860-02
Sample Info: HS19090860-02;HS19090860-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092424.D

Date : 24-SEP-2019 20:23

Client ID: HS19090860-02

Instrument: voa6.i

Sample Info: HS19090860-02;HS19090860-02;;;

Purge Volume: 5.0

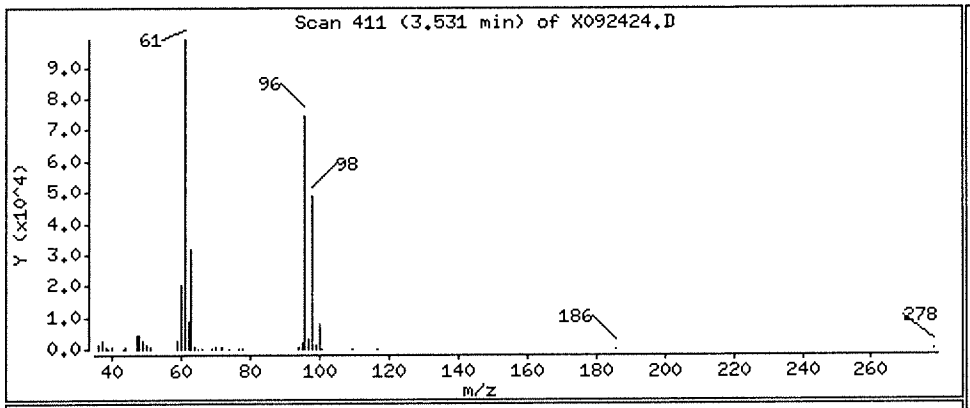
Operator: PC

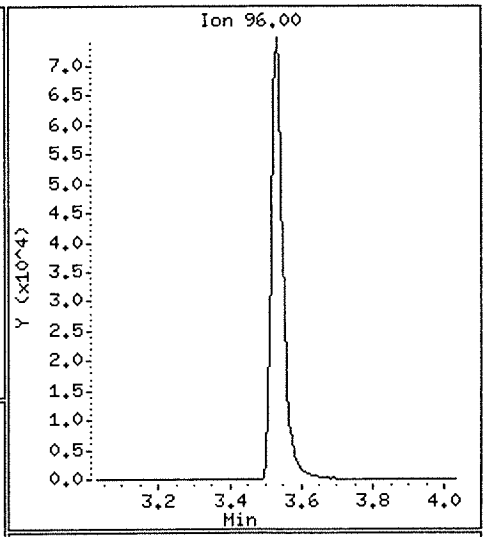
Column phase: DB624

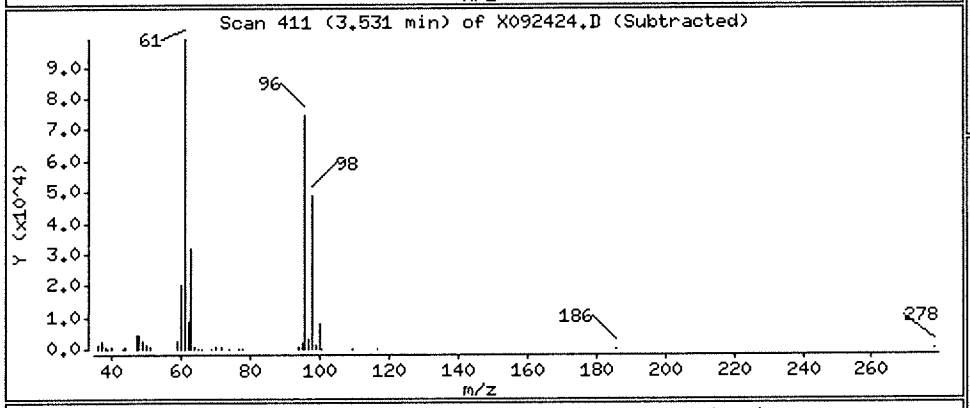
Column diameter: 0.18

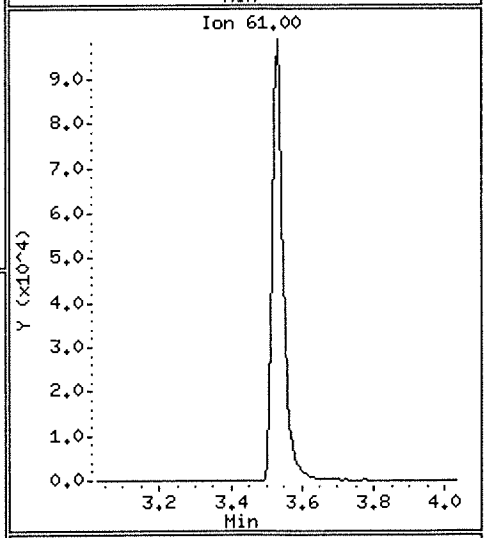
27 cis-1,2-Dichloroethene

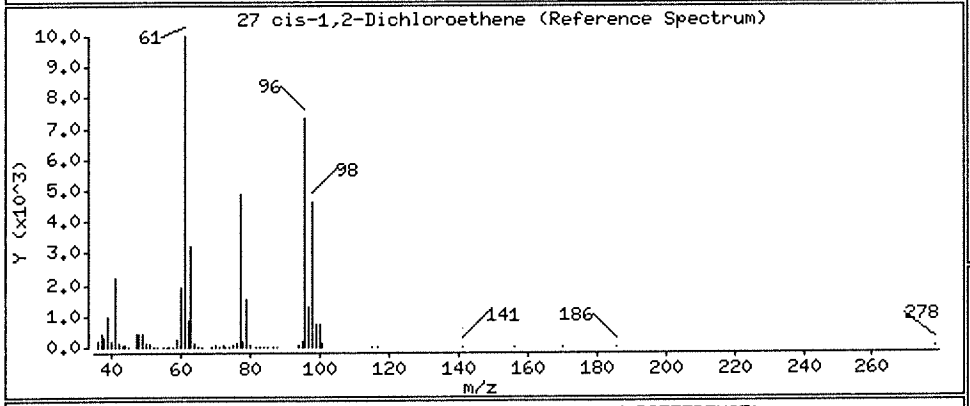
Concentration: 6554.80 ug/l

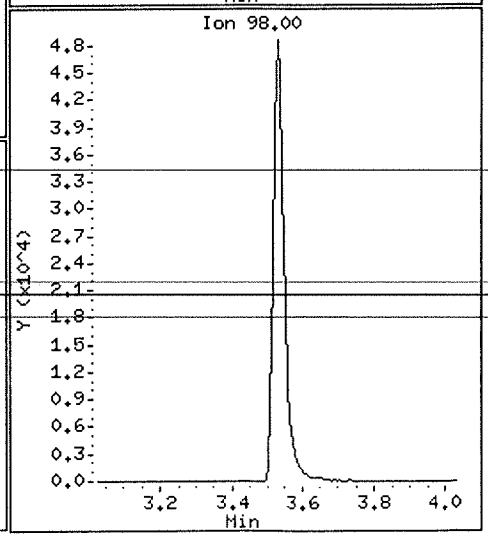


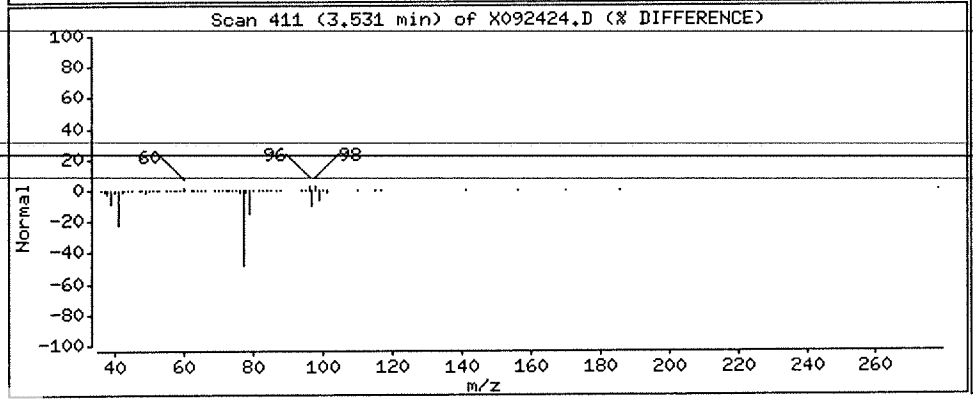












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092424.D

Date : 24-SEP-2019 20:23

Client ID: HS19090860-02

Instrument: voa6.i

Sample Info: HS19090860-02;HS19090860-02;;;

Purge Volume: 5.0

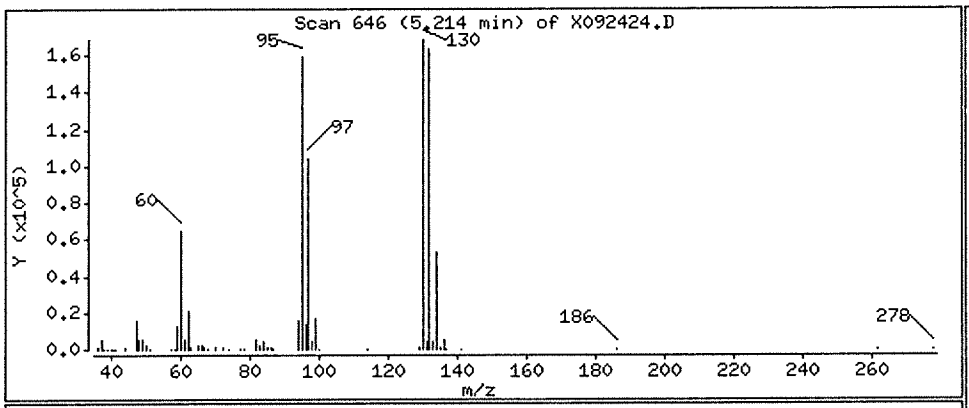
Operator: PC

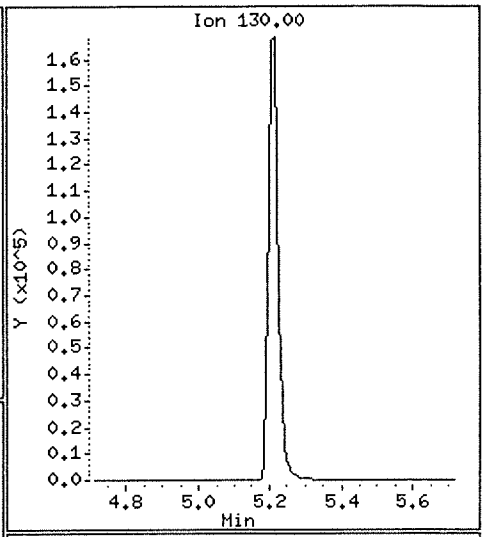
Column phase: DB624

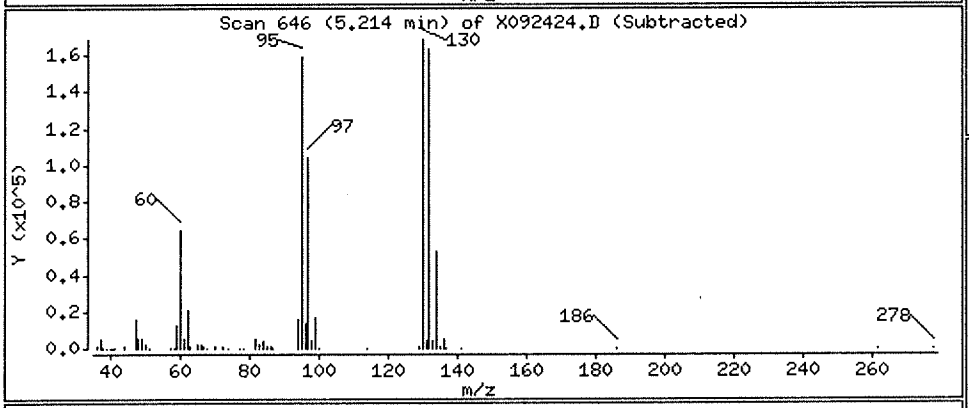
Column diameter: 0.18

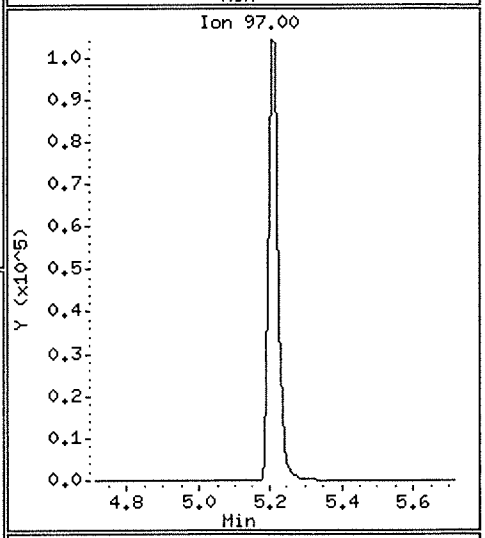
38 Trichloroethene

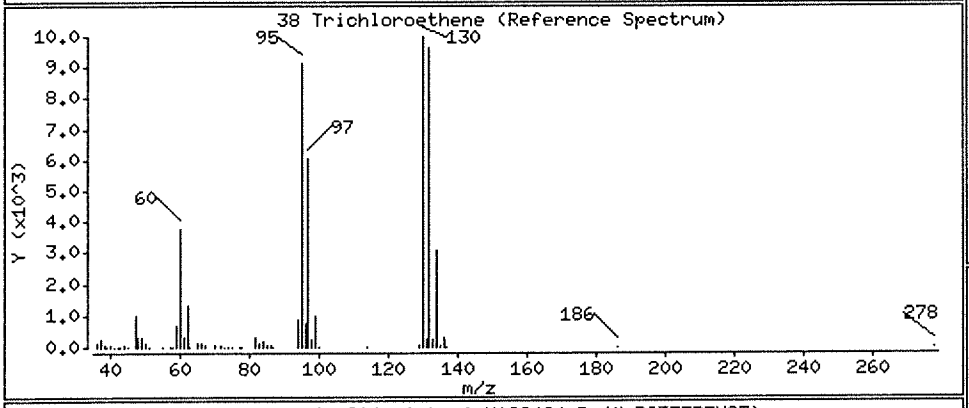
Concentration: 13250.64 ug/l

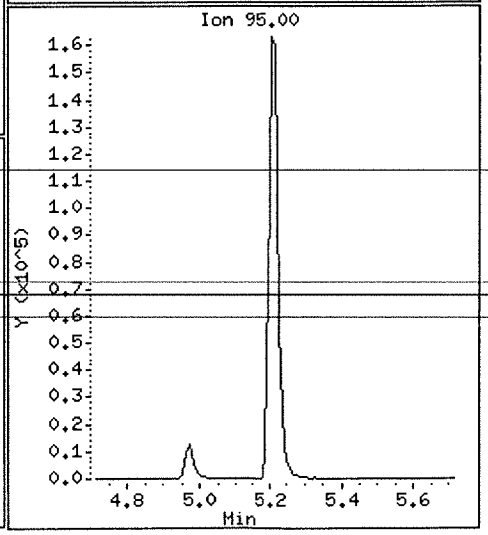


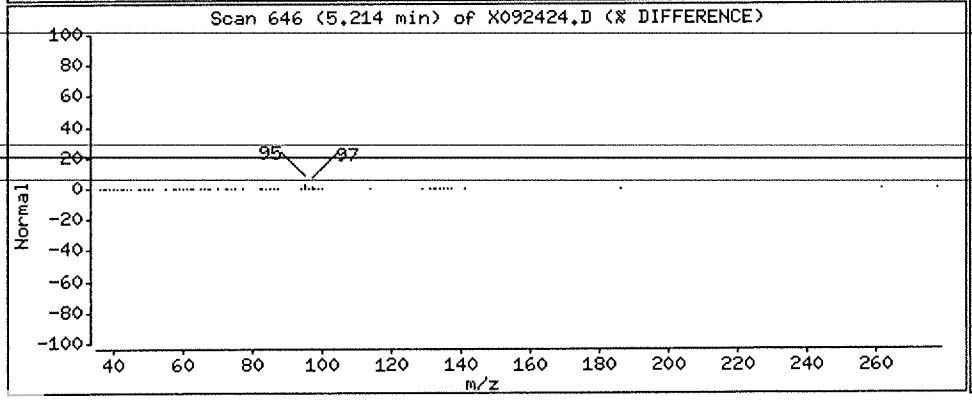












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092424.D

Date : 24-SEP-2019 20:23

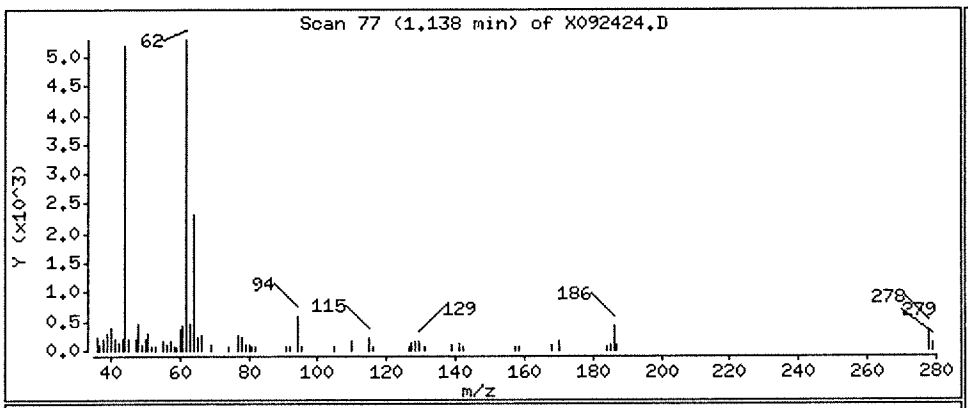
Client ID: HS19090860-02 Instrument: voa6.i

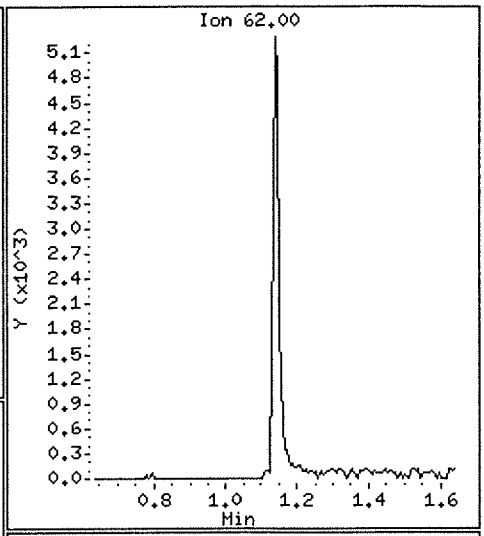
Sample Info: HS19090860-02;HS19090860-02;;;

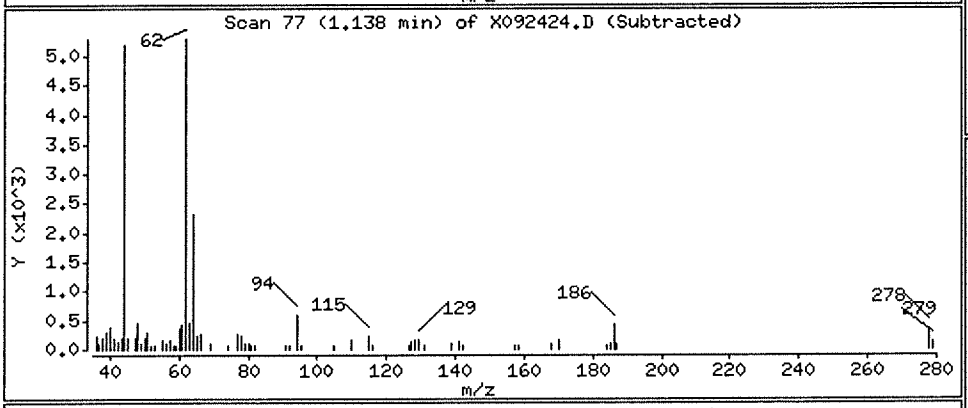
Purge Volume: 5.0 Operator: PC

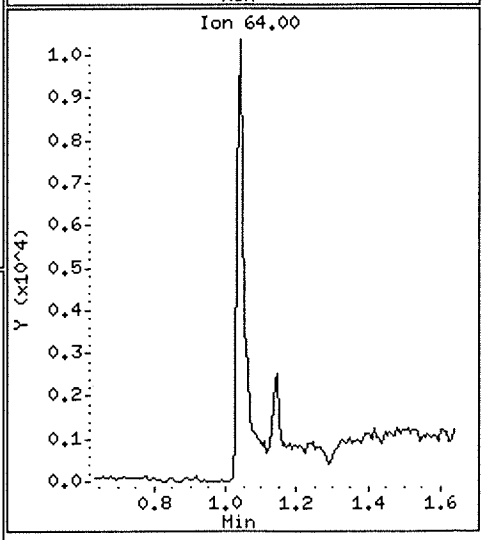
Column phase: DB624 Column diameter: 0.18

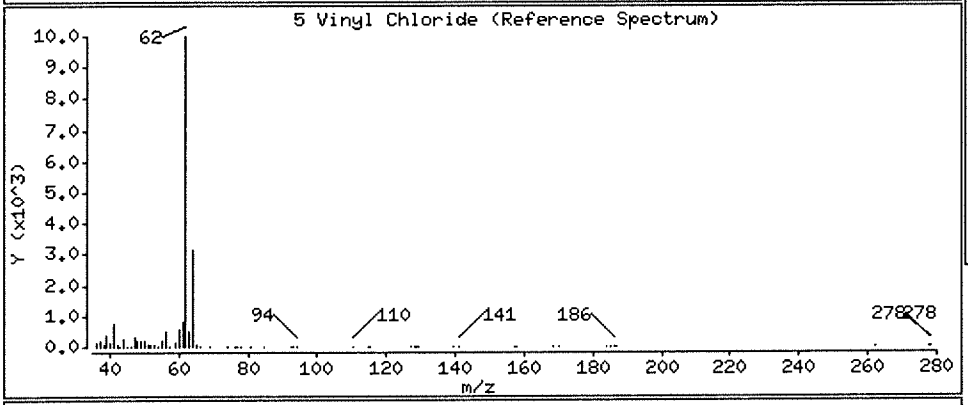
5 Vinyl Chloride Concentration: 237.67 ug/l

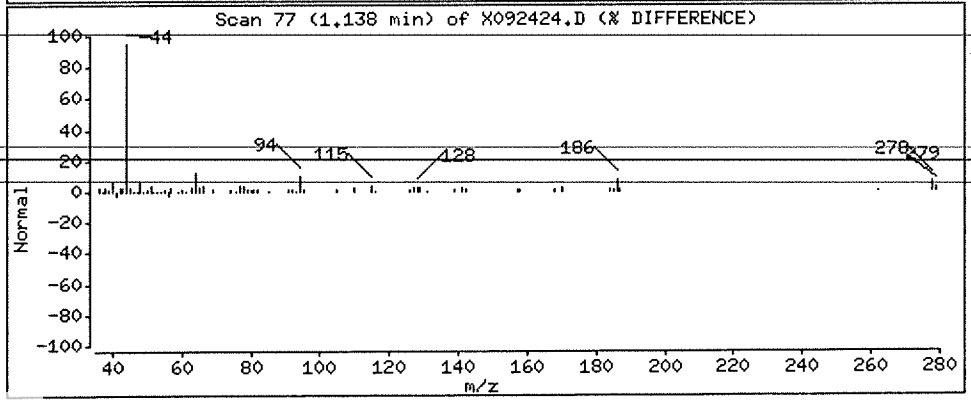












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092425.D
Lab Smp Id: HS19090860-05 Client Smp ID: HS19090860-05
Inj Date : 24-SEP-2019 20:47
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-05;HS19090860-05;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 25
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

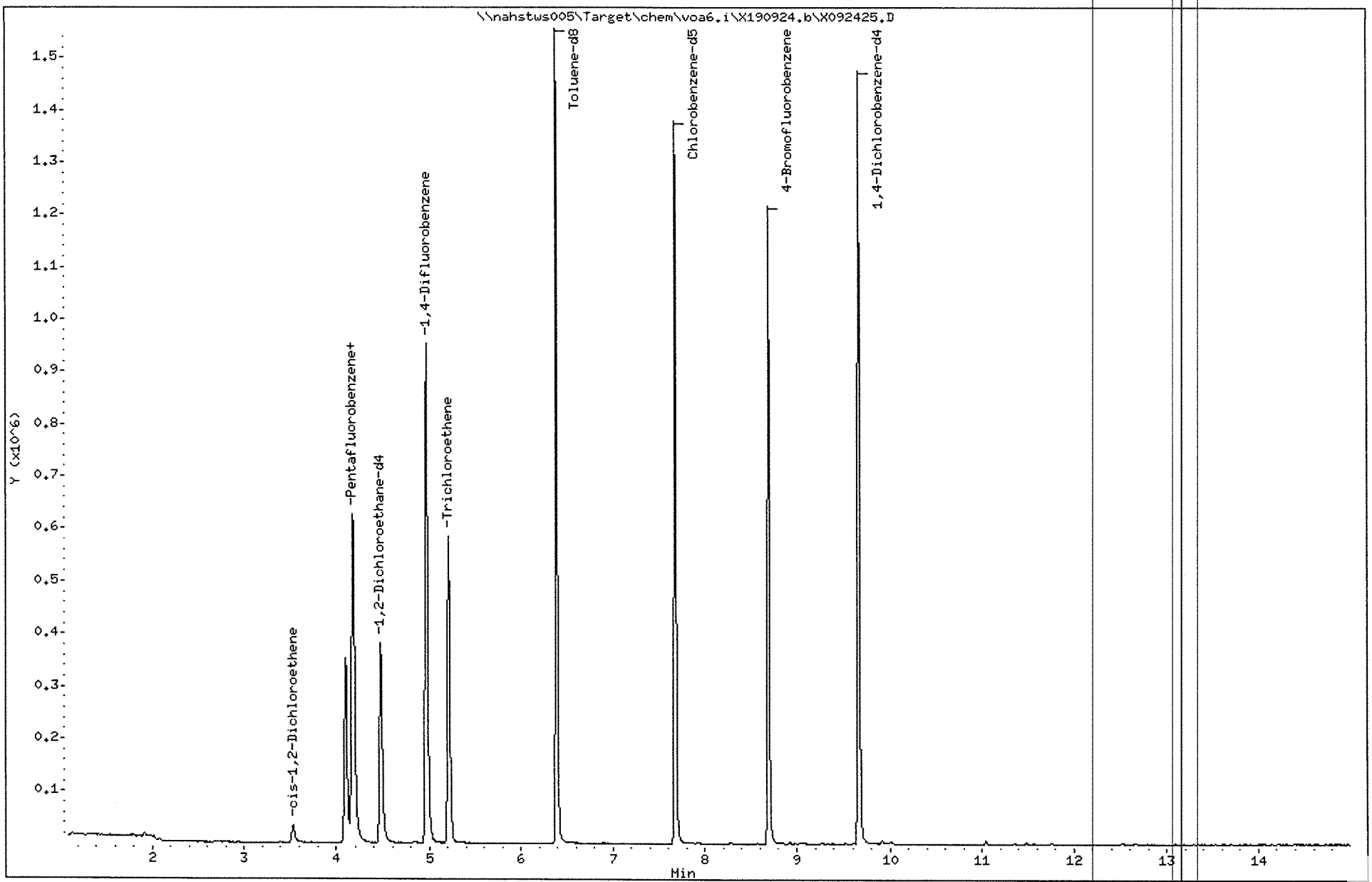
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	27 cis-1,2-Dichloroethene	96	3.537	3.530	(0.846)	17643	2.65052	2.65(a)
	38 Trichloroethene	130	5.214	5.214	(1.049)	209202	34.2415	34.24
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	2989	0.43793	0.43(a)
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	280804	45.7072	45.70
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	343661	53.0084	53.00
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	247786	47.0208	47.02
$	48 Toluene-d8	98	6.388	6.388	(0.833)	943987	49.3838	49.38
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	539189	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	797051	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	680289	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	353833	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092425.D
Date : 24-SEP-2019 20:47
Client ID: HS19090860-05
Sample Info: HS19090860-05;HS19090860-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092425.D

Date : 24-SEP-2019 20:47

Client ID: HS19090860-05

Instrument: voa6.i

Sample Info: HS19090860-05;HS19090860-05;;;

Purge Volume: 5.0

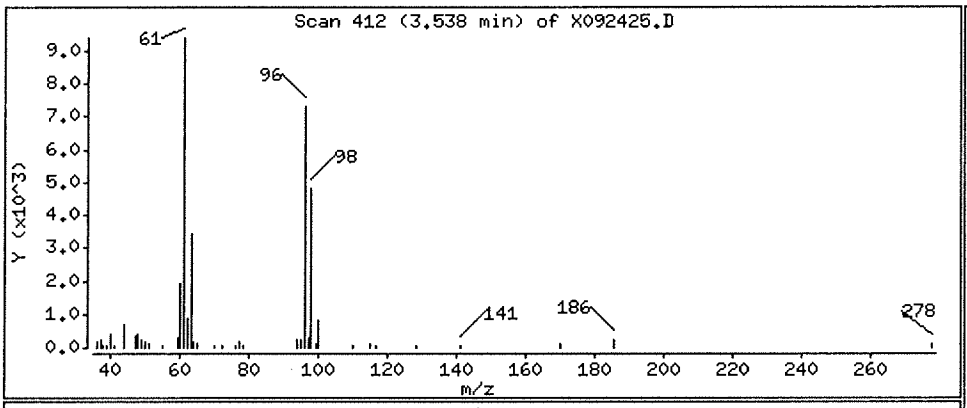
Operator: PC

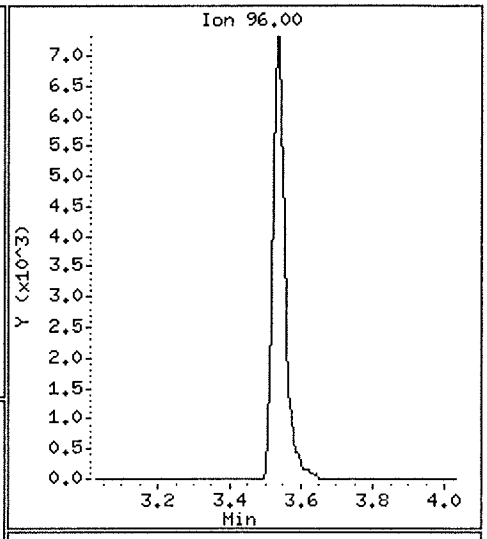
Column phase: DB624

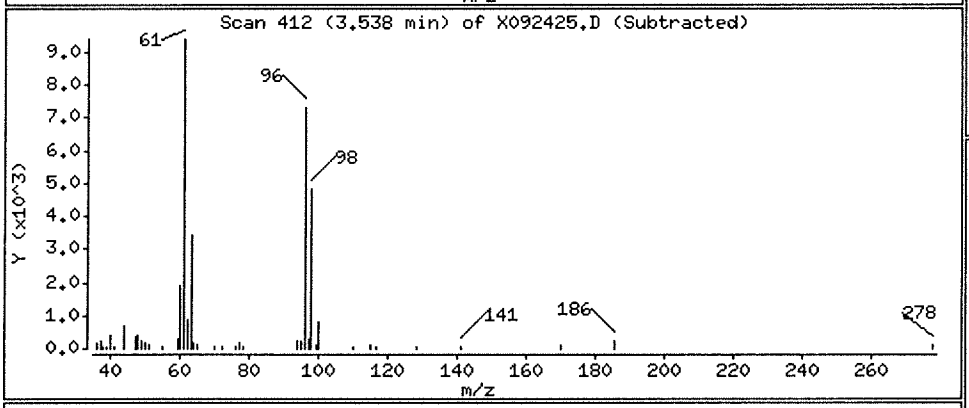
Column diameter: 0.18

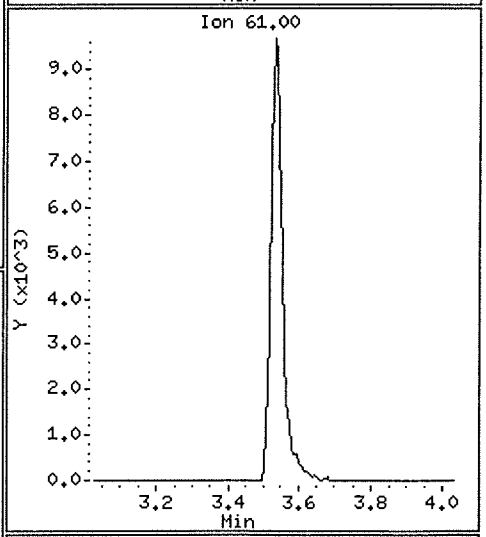
27 cis-1,2-Dichloroethene

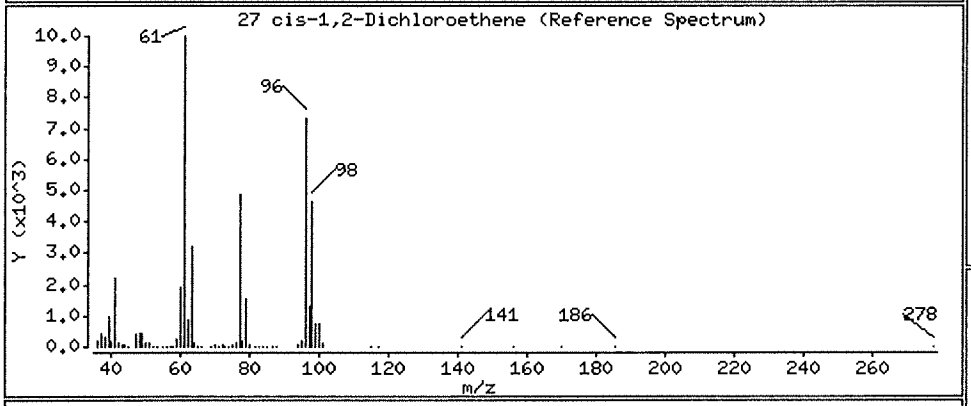
Concentration: 2.65 ug/l

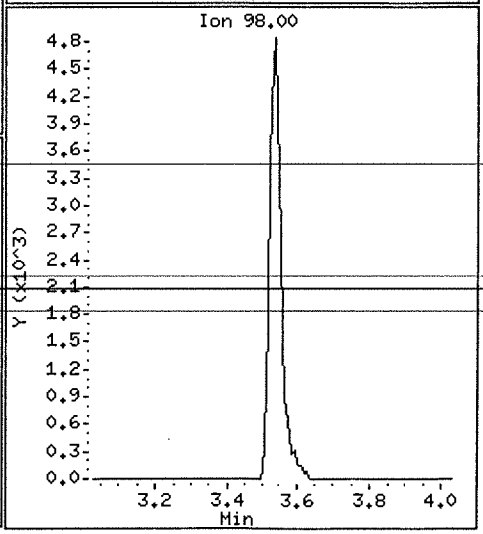


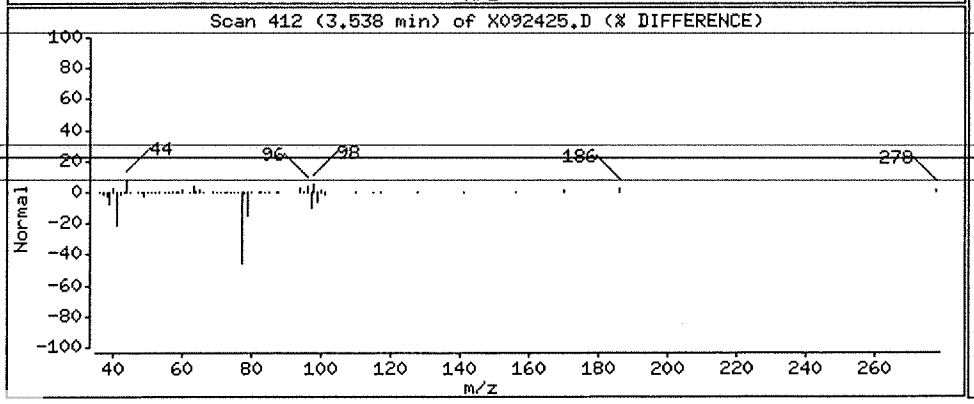












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092425.D

Date : 24-SEP-2019 20:47

Client ID: HS19090860-05

Instrument: voa6.i

Sample Info: HS19090860-05;HS19090860-05;;;

Purge Volume: 5.0

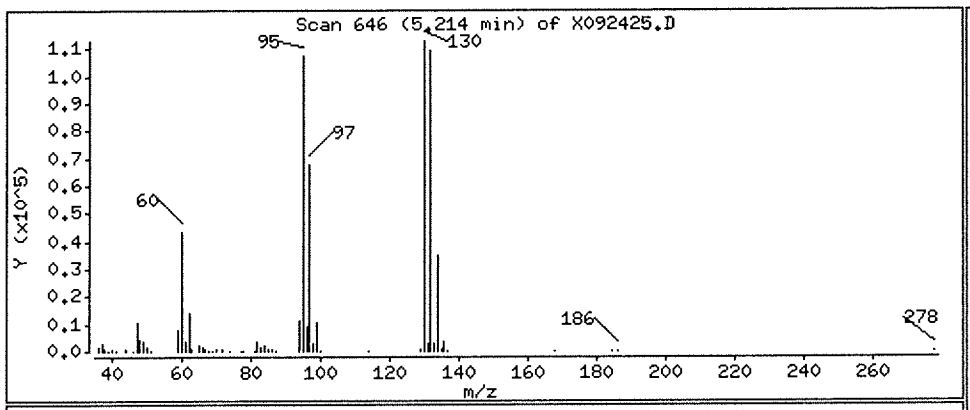
Operator: PC

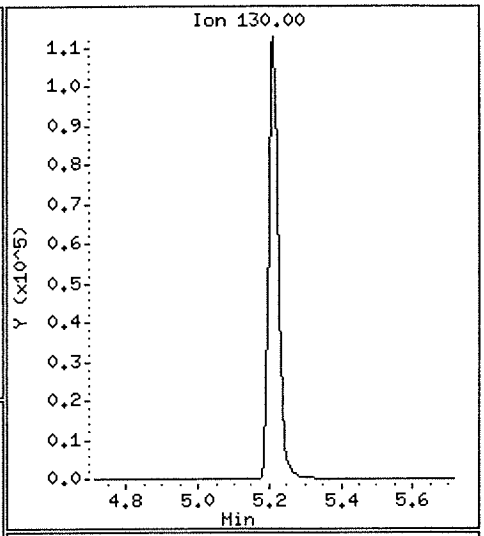
Column phase: DB624

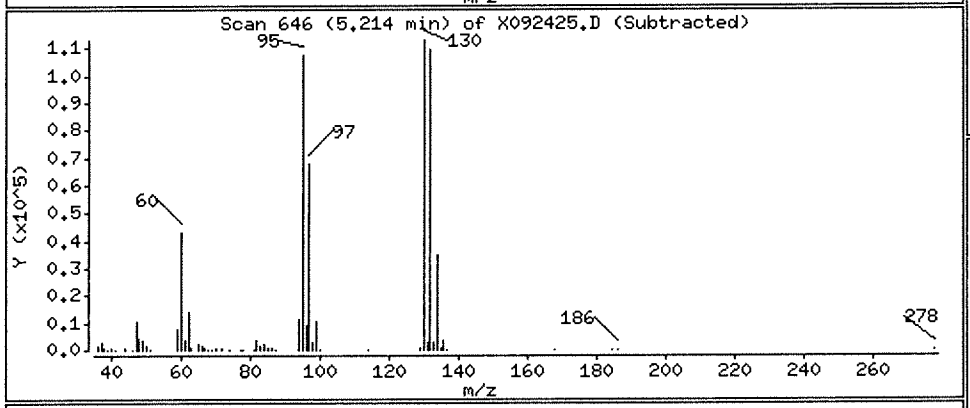
Column diameter: 0.18

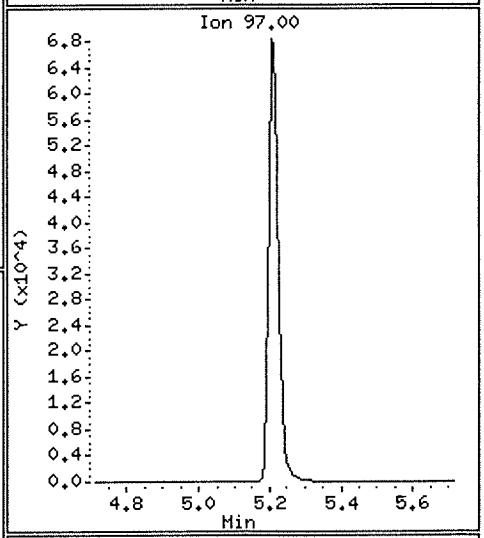
38 Trichloroethene

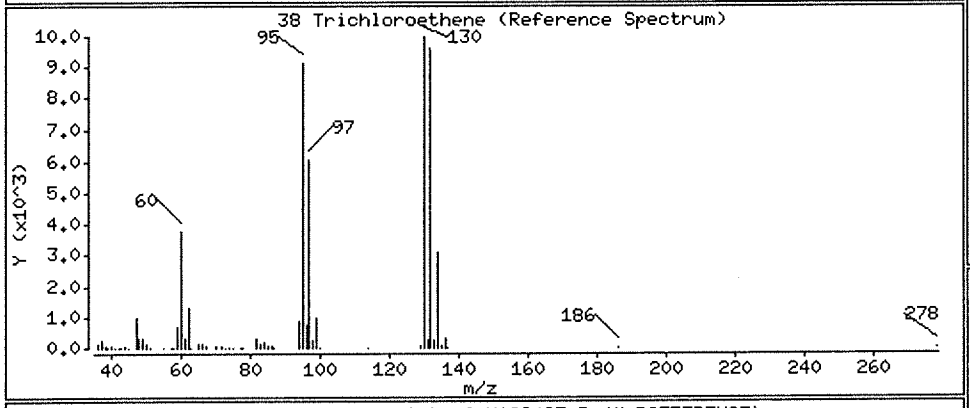
Concentration: 34.24 ug/l

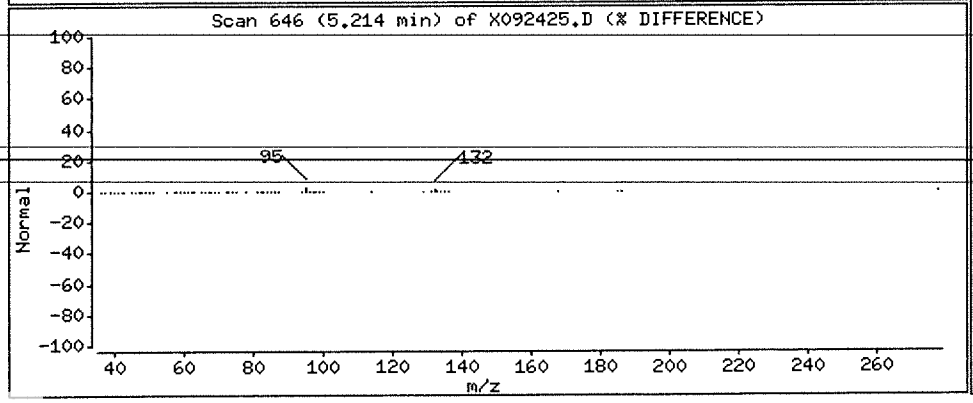


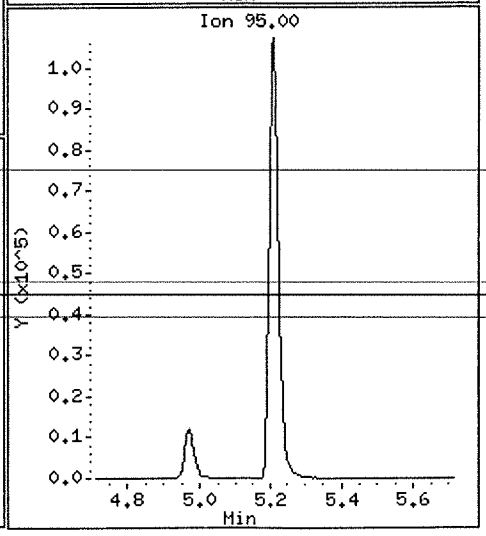












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092425.D

Date : 24-SEP-2019 20:47

Client ID: HS19090860-05

Instrument: voa6.i

Sample Info: HS19090860-05;HS19090860-05;;;

Purge Volume: 5.0

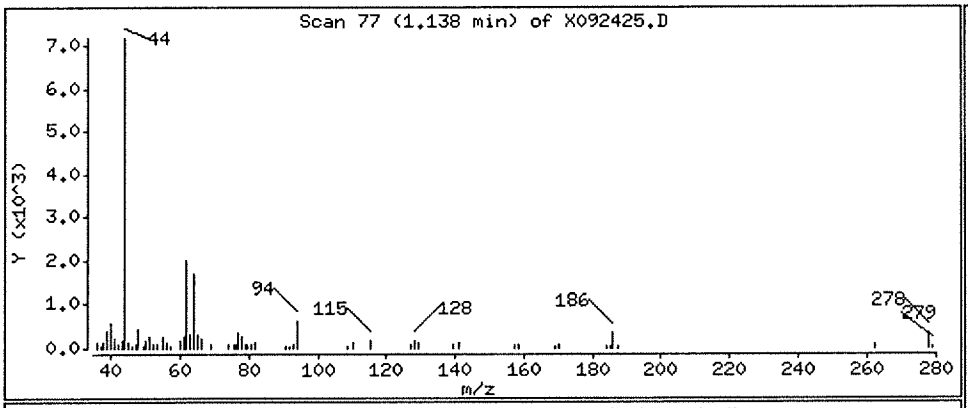
Operator: PC

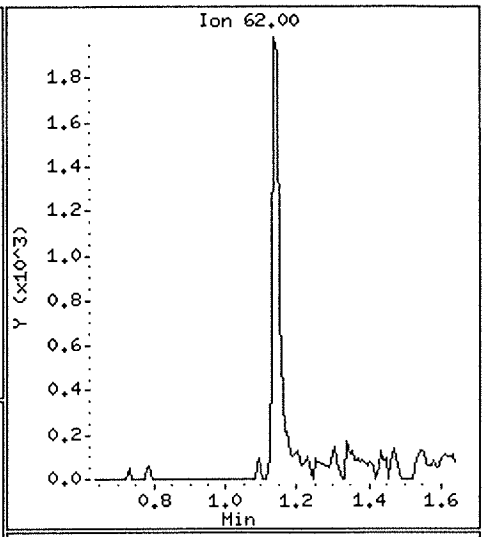
Column phase: DB624

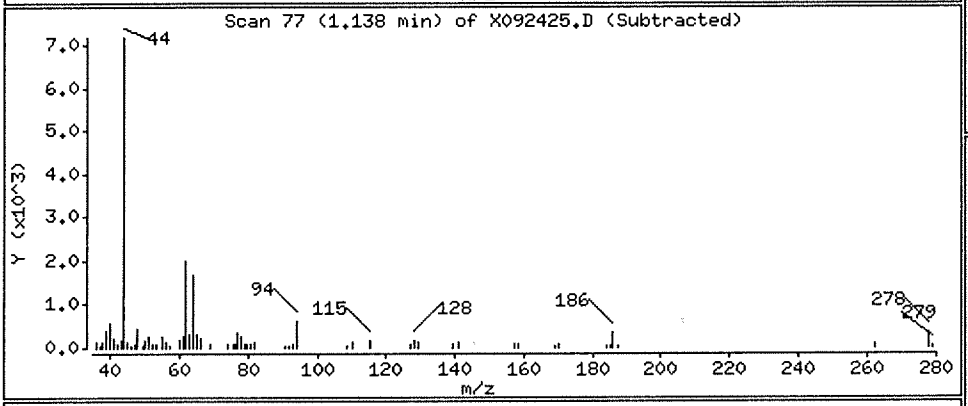
Column diameter: 0.18

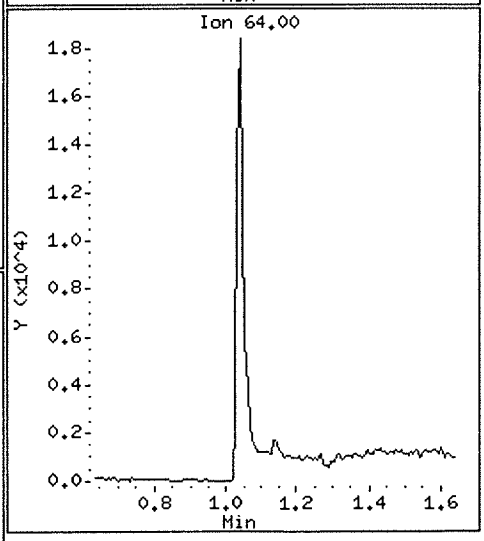
5 Vinyl Chloride

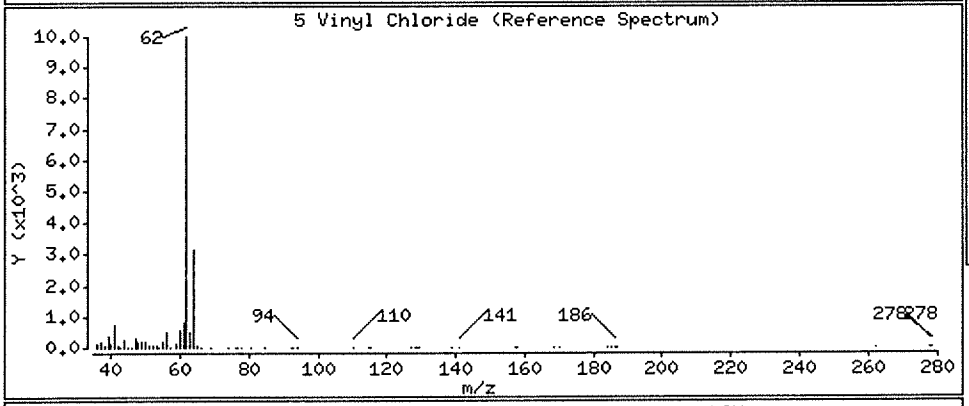
Concentration: 0.43 ug/l

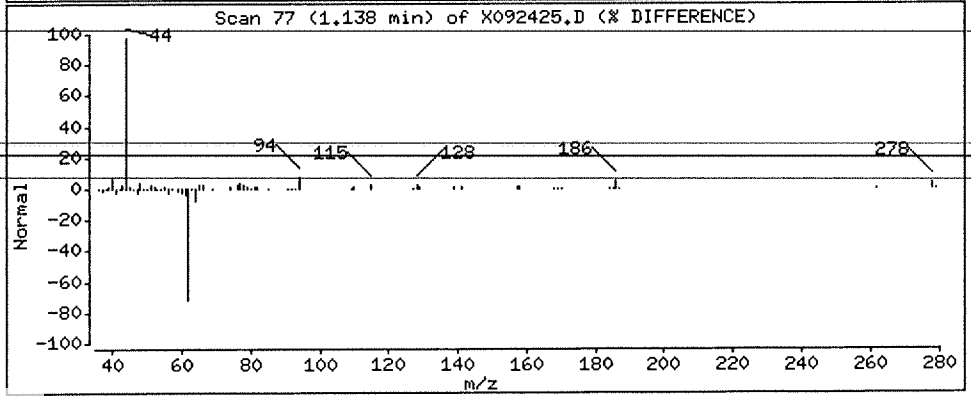












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092426.D
Lab Smp Id: HS19090860-08 Client Smp ID: HS19090860-08
Inj Date : 24-SEP-2019 21:11
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-08;HS19090860-08;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 26
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

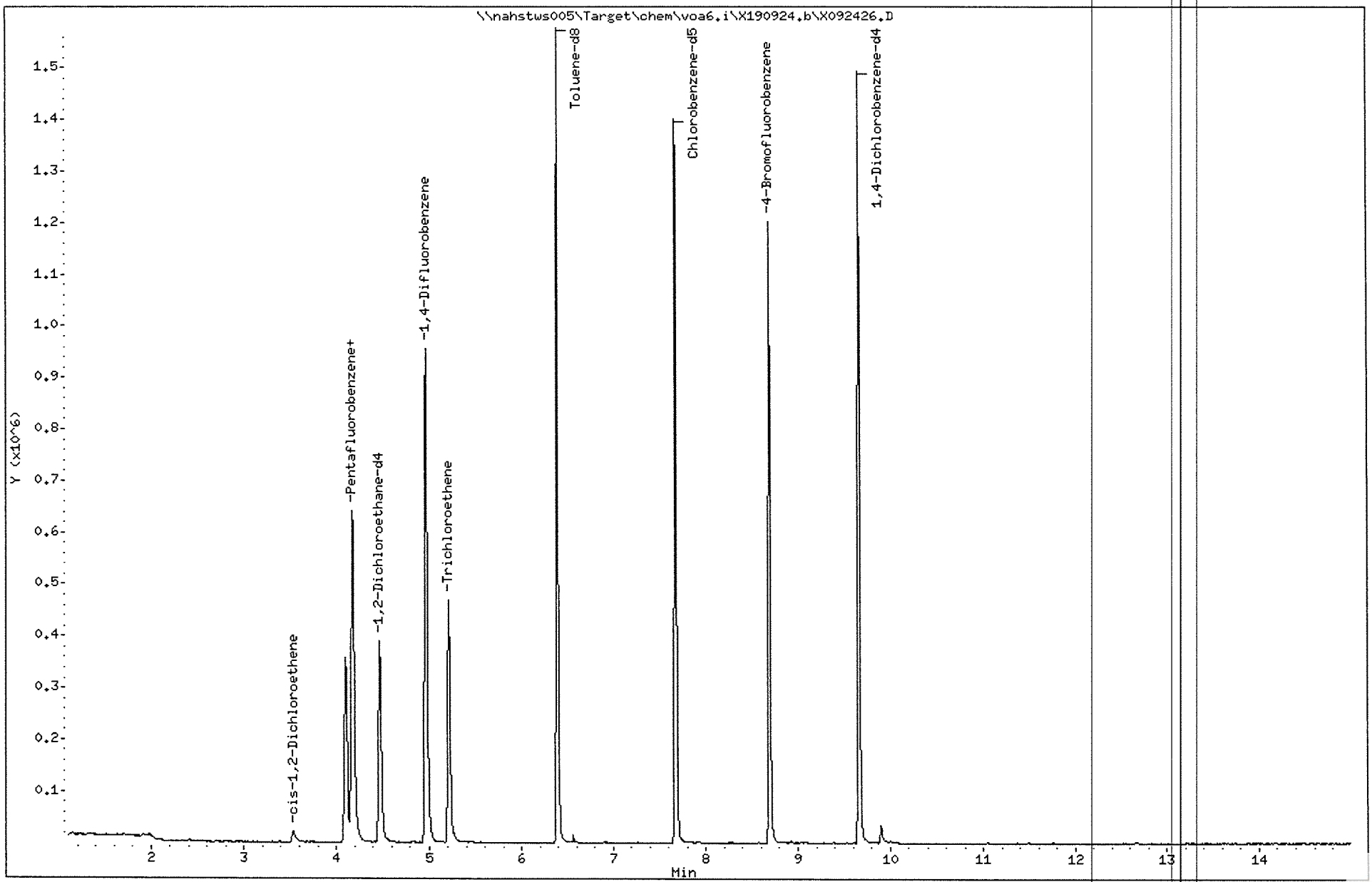
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
27 cis-1,2-Dichloroethene	96	3.538	3.530	(0.846)	11559	1.71749	1.71(a)
38 Trichloroethene	130	5.214	5.214	(1.049)	167005	26.9242	26.92
5 Vinyl Chloride	62	1.138	1.138	(0.272)	2799	0.40560	0.40(a)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	286140	46.0730	46.07
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	346948	53.0499	53.04
$ 30 Dibromofluoromethane	113	4.104	4.103	(0.981)	253183	47.5275	47.52
$ 48 Toluene-d8	98	6.389	6.388	(0.833)	949188	49.2231	49.22
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	545164	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	809207	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	686270	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	359783	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092426.D
Date : 24-SEP-2019 21:11
Client ID: HS19090860-08
Sample Info: HS19090860-08;HS19090860-08;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092426.D

Date : 24-SEP-2019 21:11

Client ID: HS19090860-08

Instrument: voa6.i

Sample Info: HS19090860-08;HS19090860-08;;;

Purge Volume: 5.0

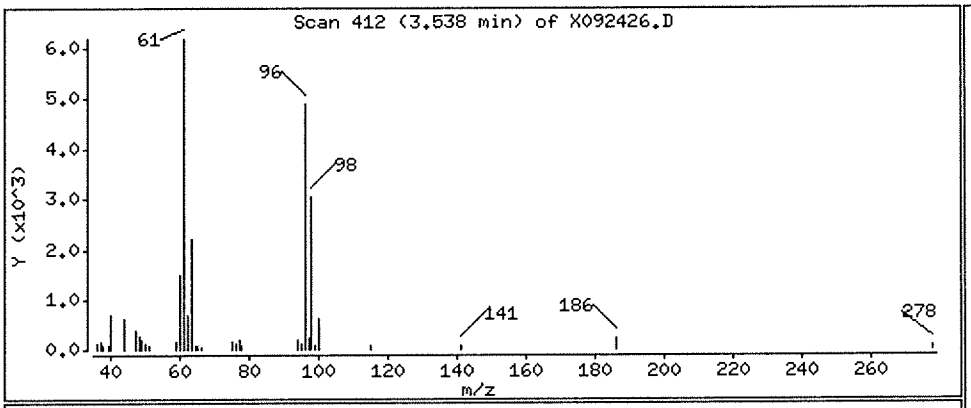
Operator: PC

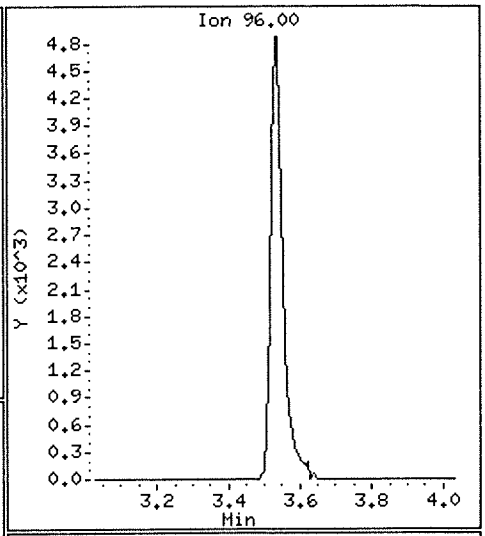
Column phase: DB624

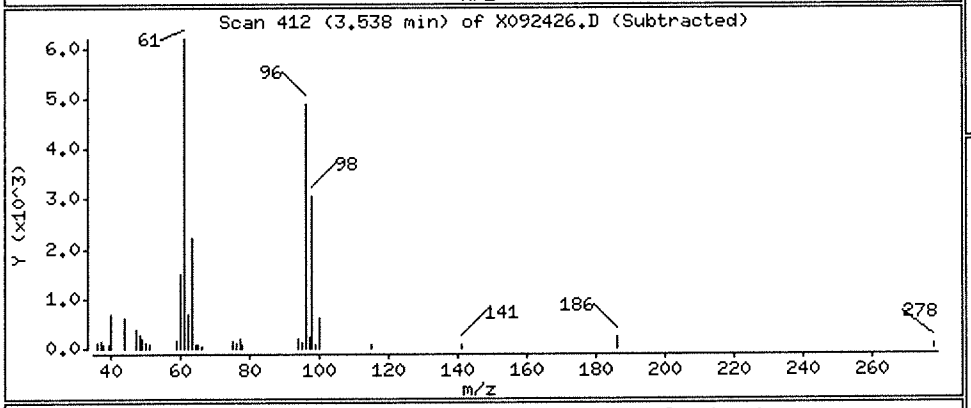
Column diameter: 0.18

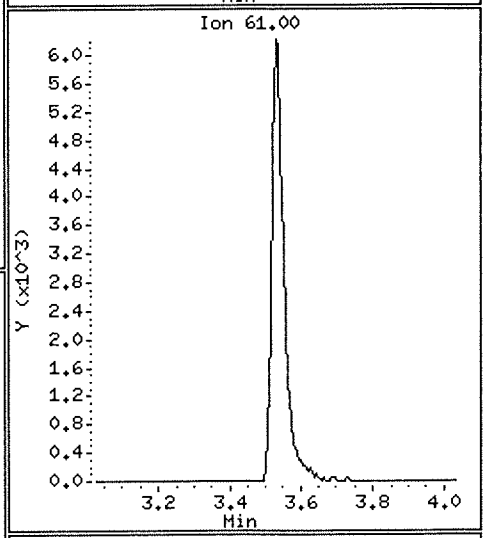
27 cis-1,2-Dichloroethene

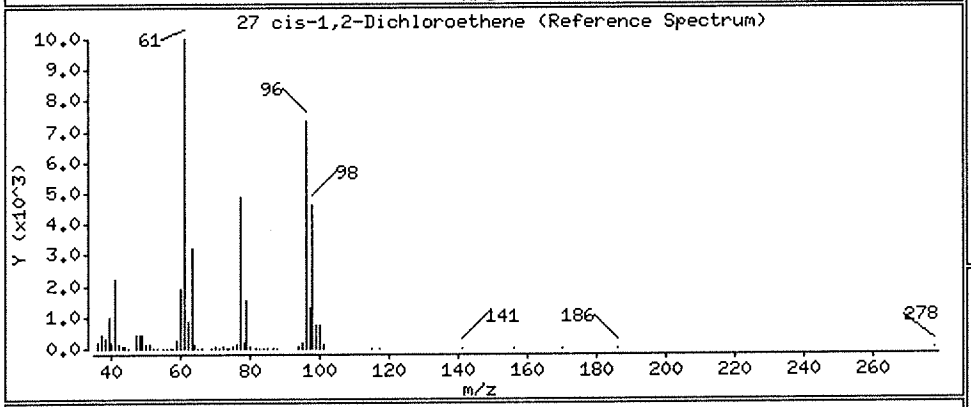
Concentration: 1.71 ug/l

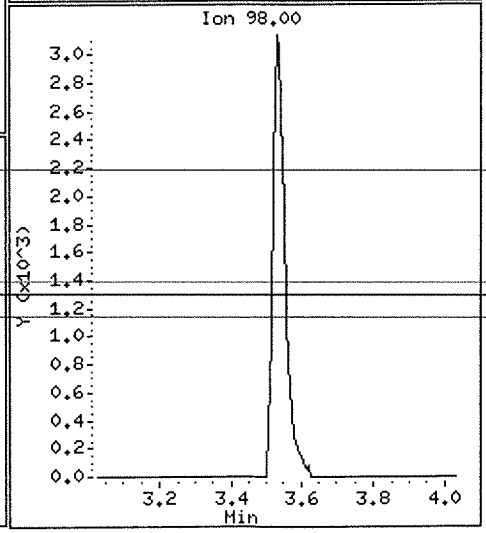


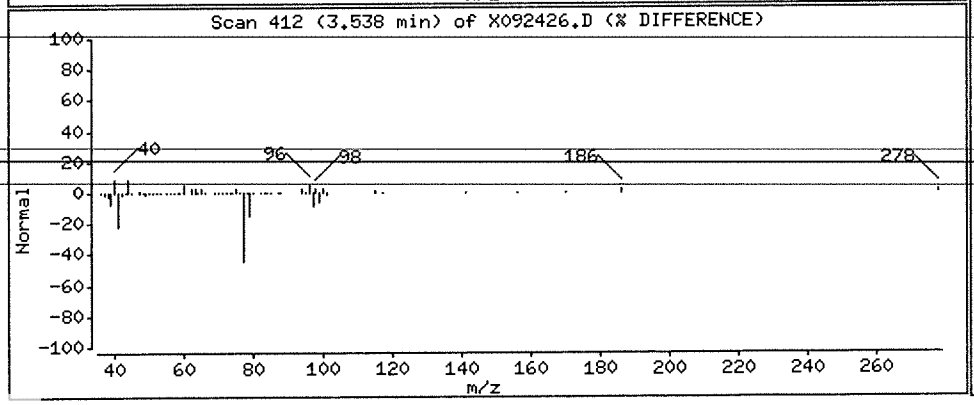












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092426.D

Date : 24-SEP-2019 21:11

Client ID: HS19090860-08

Instrument: voa6.i

Sample Info: HS19090860-08;HS19090860-08;;;

Purge Volume: 5.0

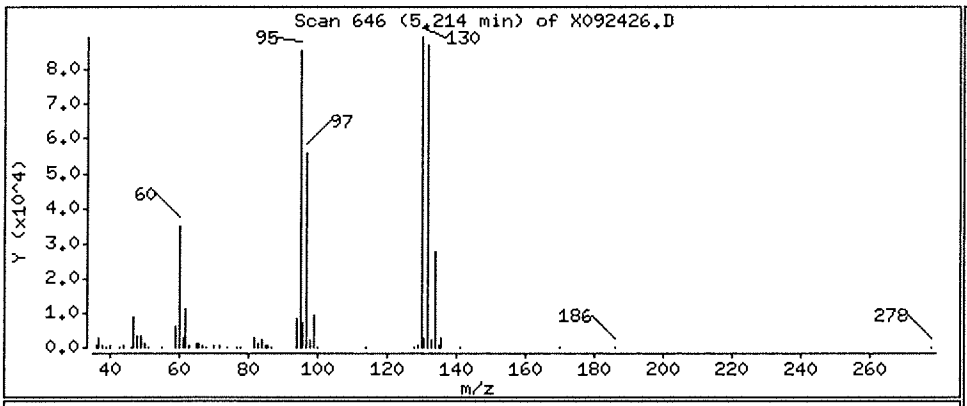
Operator: PC

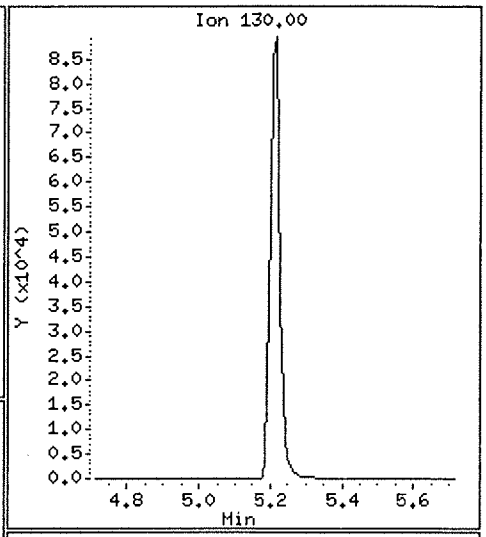
Column phase: DB624

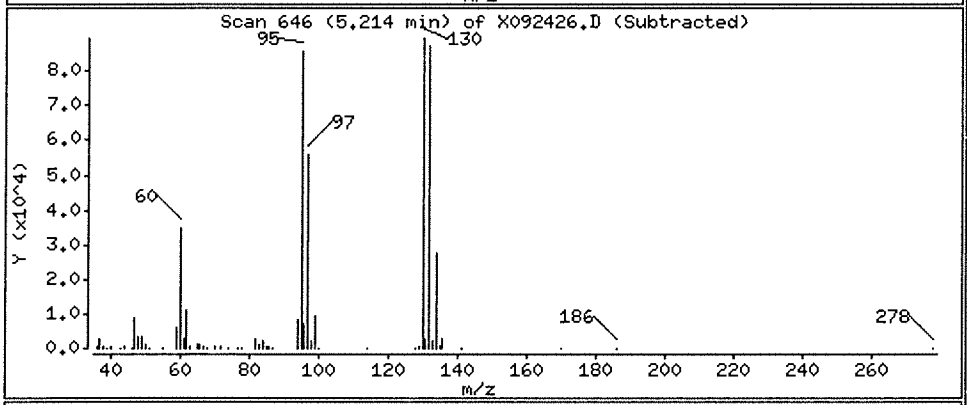
Column diameter: 0.18

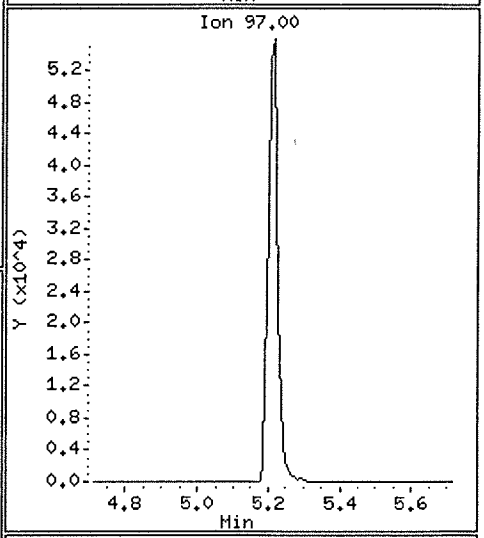
38 Trichloroethene

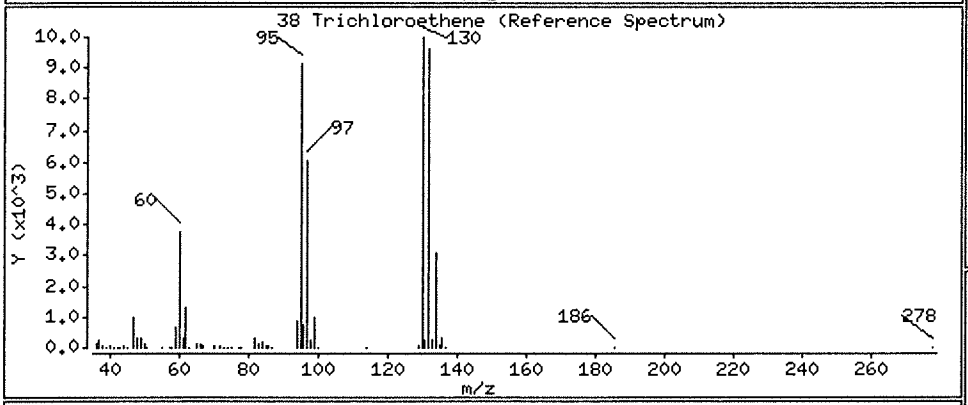
Concentration: 26.92 ug/l

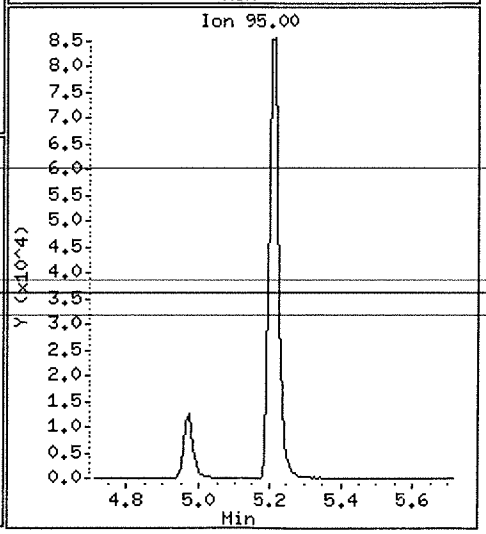


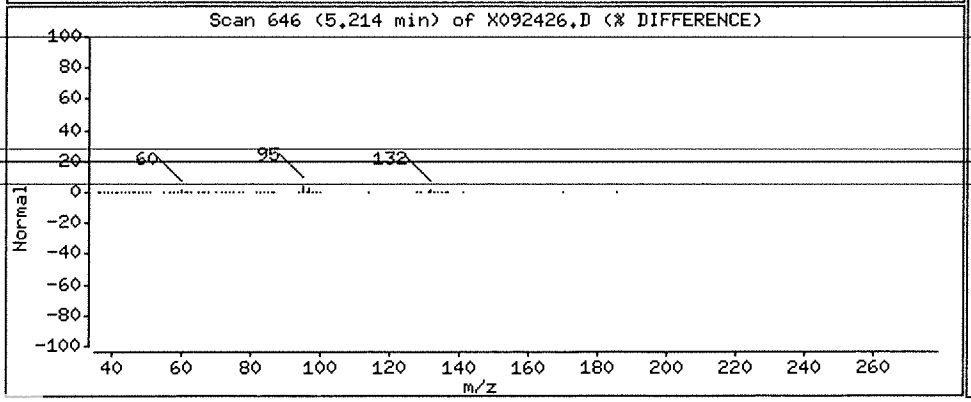












Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092426.D

Date : 24-SEP-2019 21:11

Client ID: HS19090860-08

Instrument: voa6.i

Sample Info: HS19090860-08;HS19090860-08;;;

Purge Volume: 5.0

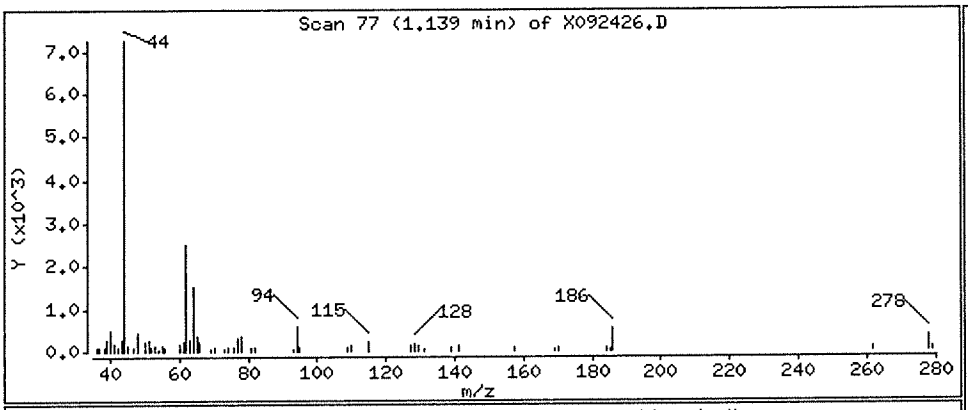
Operator: PC

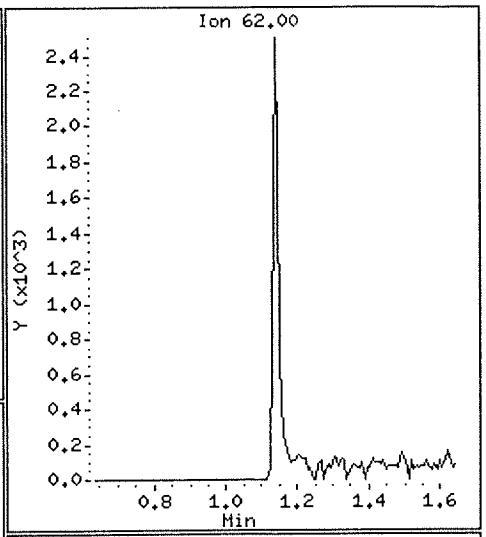
Column phase: DB624

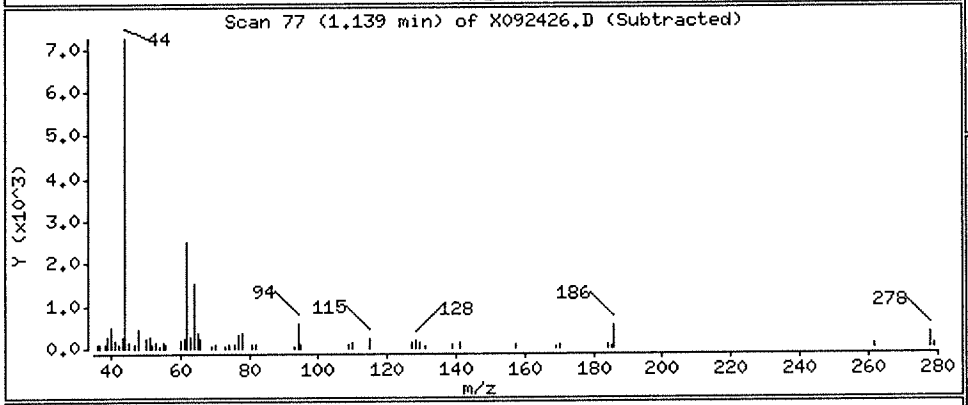
Column diameter: 0.18

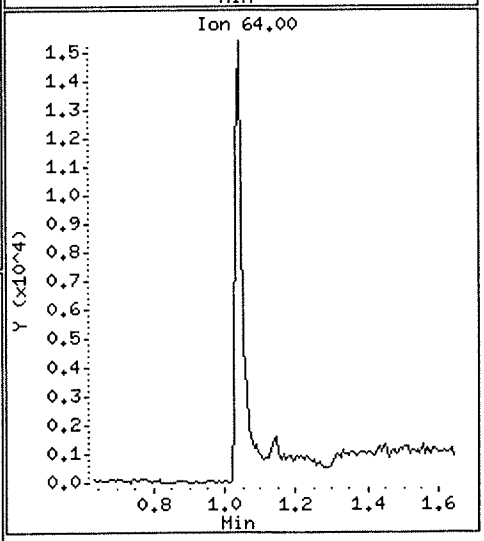
5 Vinyl Chloride

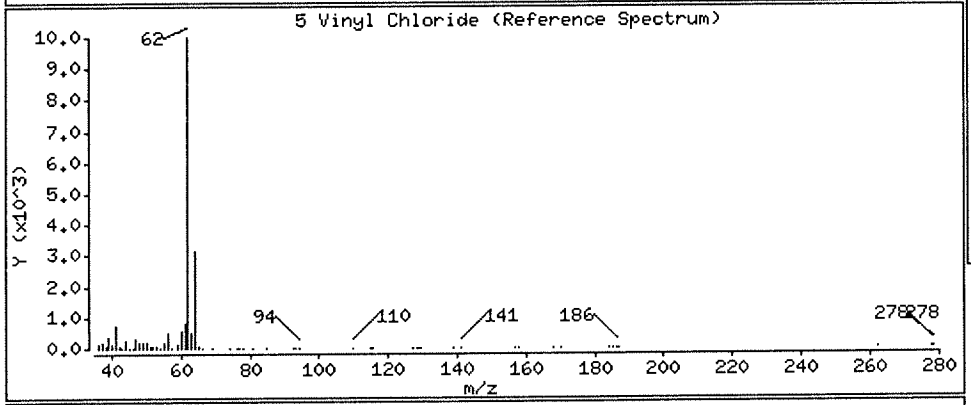
Concentration: 0.40 ug/l

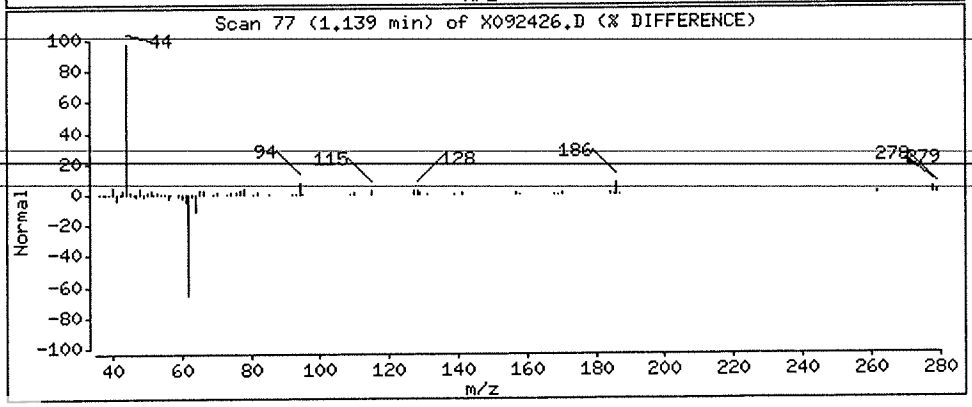












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092427.D
Lab Smp Id: HS19090860-11 Client Smp ID: HS19090860-11
Inj Date : 24-SEP-2019 21:36
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-11;HS19090860-11;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 27
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

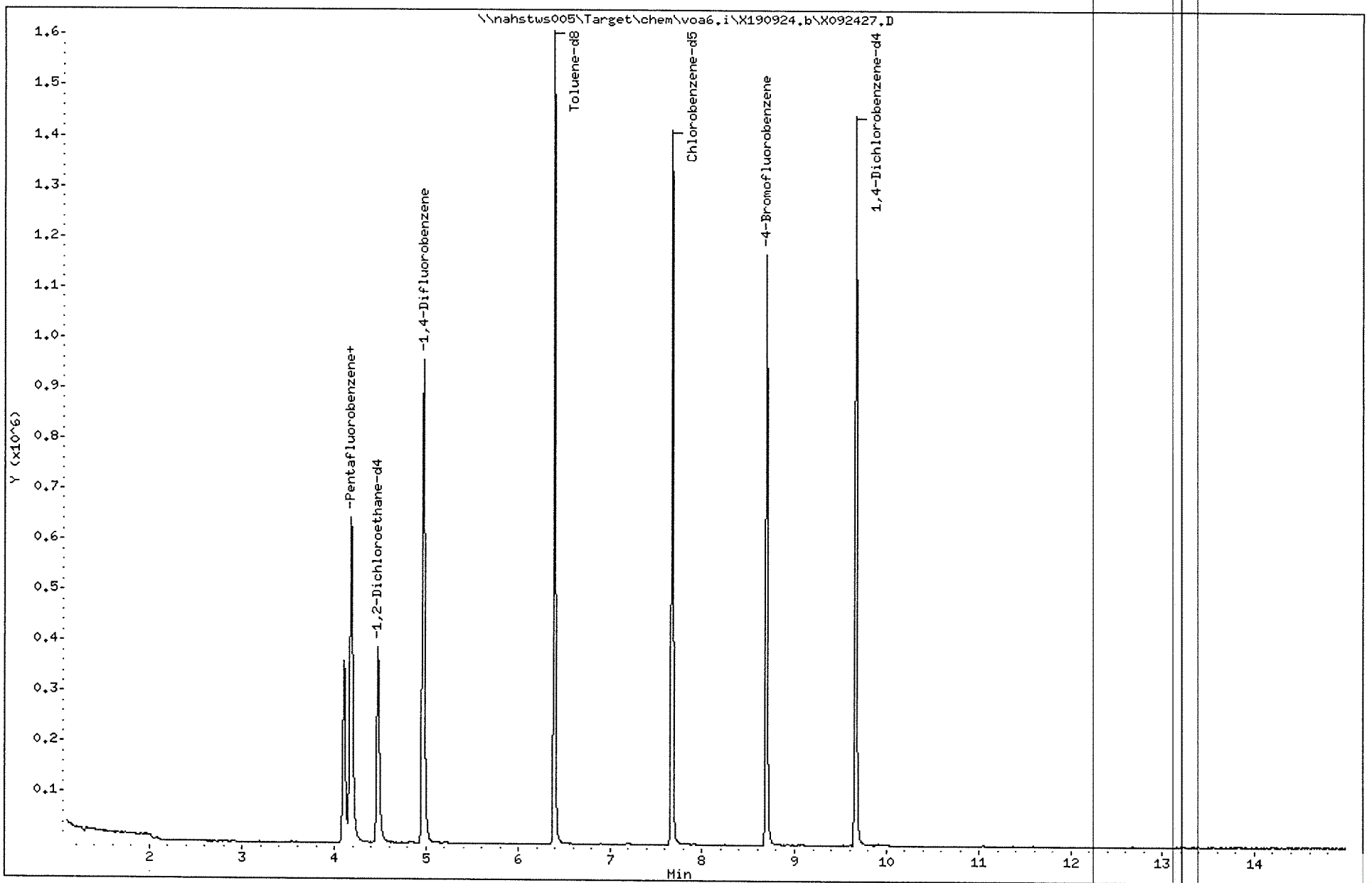
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	284525	45.5840	45.58
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	336784	51.6252	51.62
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	252495	47.1655	47.16
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	954238	49.6396	49.63
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	547780	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	804775	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	684132	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	350093	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092427.D
Date : 24-SEP-2019 21:36
Client ID: HS19090860-11
Sample Info: HS19090860-11;HS19090860-11;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i

Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092428.D
Lab Smp Id: HS19090860-12 Client Smp ID: HS19090860-12
Inj Date : 24-SEP-2019 22:00
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-12;HS19090860-12;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 28
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

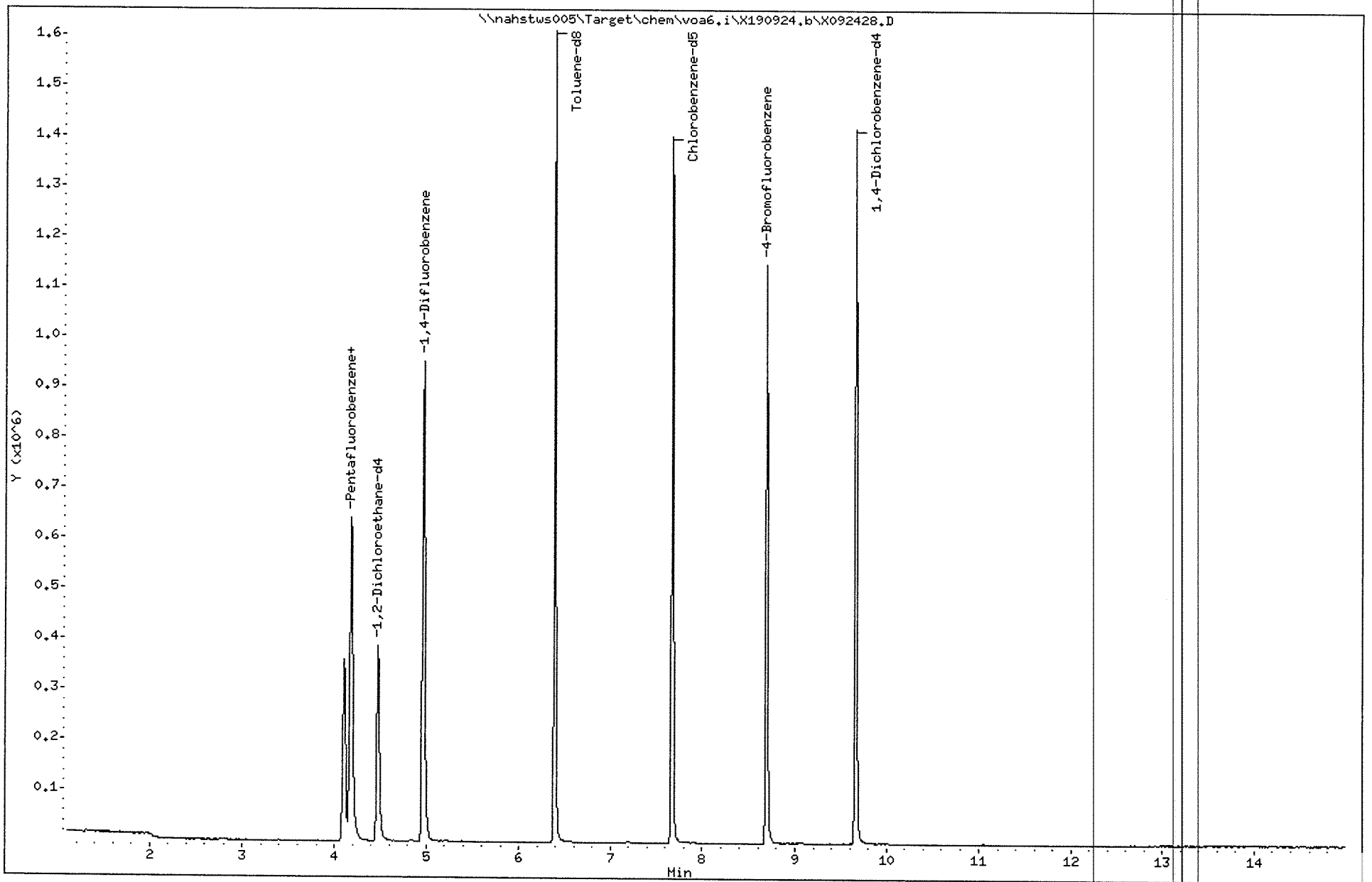
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	285194	45.7322	45.73
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	338153	51.8492	51.84
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	252570	47.2197	47.21
$ 48 Toluene-d8	98	6.389	6.388	(0.833)	944809	49.1577	49.15
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	547325	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	806567	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	684013	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	337681	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092428.D
Date : 24-SEP-2019 22:00
Client ID: HS19090860-12
Sample Info: HS19090860-12;HS19090860-12;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i

Operator: PC
Column diameter: 0.18



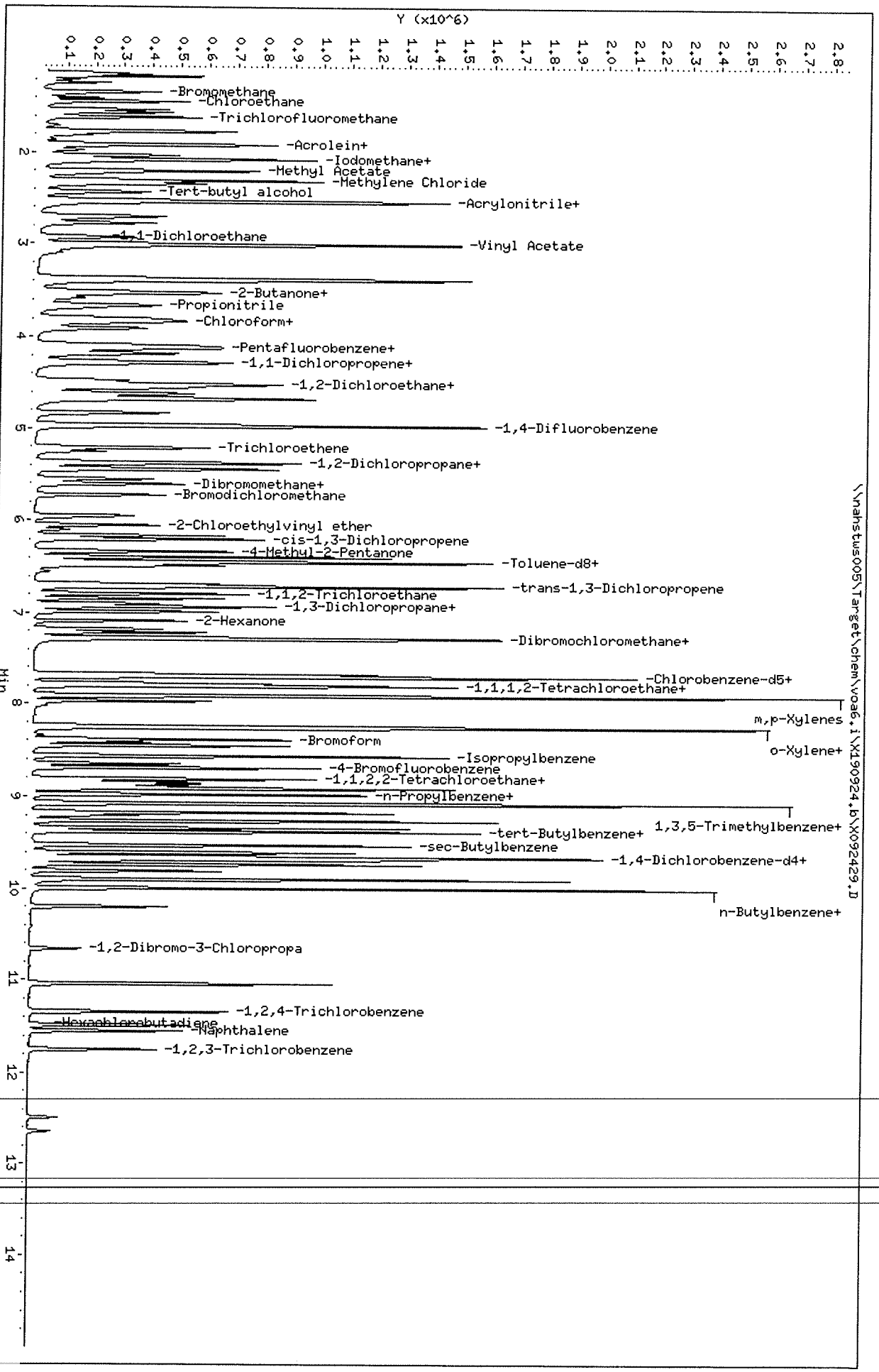
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190924.b\X092429.D
Lab Smp Id: CCV-END Client Smp ID: CCV-END
Inj Date : 24-SEP-2019 22:24
Operator : PC Inst ID: voa6.i
Smp Info : CCV-END;CCV-END;2;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190924.b\8260W.m
Meth Date : 09-Oct-2019 18:43 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 29 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	159358	50.0000	48.55
	11 1,1-Dichloroethene	96	1.919	1.911	(0.459)	163138	50.0000	46.02
	33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	261958	50.0000	44.83
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	225657	50.0000	44.65
	17 Methylene Chloride	84	2.306	2.305	(0.551)	216668	50.0000	49.07
	38 Trichloroethene	130	5.214	5.214	(1.049)	211978	50.0000	44.07
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	240687	50.0000	46.44
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	230078	50.0000	49.40
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	279779	50.0000	51.32
$	30 Dibromofluoromethane	113	4.104	4.103	(0.981)	200366	50.0000	50.13
$	48 Toluene-d8	98	6.389	6.388	(0.833)	736791	50.0000	45.87
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	409343	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	627425	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.678	(1.000)	571603	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	291842	50.0000	



Data File: \\nahstws005\Target\chem\voa6.i\X190924.b\X092429.D
Date : 24-SEP-2019 22:24
Client ID: CCV-END
Sample Info: CCV-END;CCV-END;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

MSVOA06 -Logbook

Batch: 37648 **Analyst:** Devak Giga

Date: 09-25-2019 **Reviewer:**

Method: 8260 **Laboratory:** Houston

Comments:

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	09-25-2019 10:13 am	1.00	0.00 mL	0.00 mL	X092501.D	Liquid	Y	NA
	Auto find/purged									
2	CCV	CCV	09-25-2019 10:37 am	1.00	5.00 mL	0.00 mL	X092502.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
3	CCV	CCV	09-25-2019 11:01 am	1.00	5.00 mL	0.00 mL	X092503.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
4	CCB	SAMP	09-25-2019 11:25 am	1.00	5.00 mL	0.00 mL	X092504.D	Liquid	Y	NA
	CCB									
5	VLCSW-190925	LCS	09-25-2019 11:49 am	1.00	5.00 mL	0.00 mL	X092505.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
6	BLK	SAMP	09-25-2019 12:13 pm	1.00	5.00 mL	0.00 mL	X092506.D	Liquid	Y	NA
	Cleanup blk									
7	VBLKW-190925	MBLK	09-25-2019 12:37 pm	1.00	5.00 mL	0.00 mL	X092507.D	Liquid	Y	NA
8	HS19090847-02	SAMP	09-25-2019 01:01 pm	1.00	5.00 mL	0.00 mL	X092508.D	Liquid	Y	<2
9	HS19090847-01	SAMP	09-25-2019 01:25 pm	1.00	5.00 mL	0.00 mL	X092509.D	Liquid	Y	<2
10	HS19090860-15	SAMP	09-25-2019 01:49 pm	1.00	5.00 mL	0.00 mL	X092510.D	Liquid	Y	<2
11	HS19090860-16	SAMP	09-25-2019 02:13 pm	1.00	5.00 mL	0.00 mL	X092511.D	Liquid	Y	<2
12	HS19090860-04	SAMP	09-25-2019 02:37 pm	1.00	5.00 mL	0.00 mL	X092512.D	Liquid	Y	<2
13	HS19090860-03	SAMP	09-25-2019 03:02 pm	25.00	5.00 mL	0.00 mL	X092513.D	Liquid	Y	<2
14	HS19090847-01MS	MS	09-25-2019 03:26 pm	1.00	5.00 mL	0.00 mL	X092514.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
15	HS19090847-01MSD	MSD	09-25-2019 03:50 pm	1.00	5.00 mL	0.00 mL	X092515.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
16	HS19090860-03	SAMP	09-25-2019 04:14 pm	250.0(	5.00 mL	0.00 mL	X092516.D	Liquid	Y	<2
17	HS19090860-04	SAMP	09-25-2019 04:38 pm	5.00	5.00 mL	0.00 mL	X092517.D	Liquid	Y	<2
18	HS19090860-13	SAMP	09-25-2019 05:02 pm	1.00	5.00 mL	0.00 mL	X092518.D	Liquid	Y	<2
19	HS19090860-14	SAMP	09-25-2019 05:26 pm	1.00	5.00 mL	0.00 mL	X092519.D	Liquid	Y	<2
20	HS19090962-01	SAMP	09-25-2019 05:50 pm	1.00	5.00 mL	0.00 mL	X092520.D	Liquid	Y	<2
21	HS19091157-07	SAMP	09-25-2019 06:14 pm	1.00	5.00 mL	0.00 mL	X092521.D	Liquid	Y	<2
22	HS19090860-09	SAMP	09-25-2019 06:38 pm	5.00	5.00 mL	0.00 mL	X092522.D	Liquid	Y	<2
23	HS19090860-09	SAMP	09-25-2019 07:02 pm	25.00	5.00 mL	0.00 mL	X092523.D	Liquid	Y	<2
24	HS19090860-06	SAMP	09-25-2019 07:26 pm	10.00	5.00 mL	0.00 mL	X092524.D	Liquid	Y	<2
25	HS19090860-06	SAMP	09-25-2019 07:50 pm	100.0(	5.00 mL	0.00 mL	X092525.D	Liquid	Y	<2
26	HS19090860-07	SAMP	09-25-2019 08:14 pm	10.00	5.00 mL	0.00 mL	X092526.D	Liquid	Y	<2
27	HS19090860-07	SAMP	09-25-2019 08:38 pm	100.0(	5.00 mL	0.00 mL	X092527.D	Liquid	Y	<2
28	HS19090860-10	SAMP	09-25-2019 09:02 pm	10.00	5.00 mL	0.00 mL	X092528.D	Liquid	Y	<2
29	HS19090860-10	SAMP	09-25-2019 09:26 pm	100.0(	5.00 mL	0.00 mL	X092529.D	Liquid	Y	<2
30	CCV-END	CCV	09-25-2019 09:50 pm	1.00	5.00 mL	0.00 mL	X092530.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									

Chemical	Value
SURR SPK ID	30502-94-03
IS ID	30502-94-04
ICV STD ID	30603-84-01
LCS/MS ID	30603-84-01
CAL STD ID	30502-94-01/02
BFB ID	30502-94-03
pH Paper	634-64-11

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

	CLIENT SAMPLE NO.	SMC1 (TOL) #	SMC2 #	SMC3 (DCE) #	OTHER #	TOT OUT
01	VLCSW-190925	95	107	103	104	0
02	VBLKW-190925	101	103	89	93	0
03	HS19090860-1	100	104	92	95	0
04	HS19090860-1	99	104	90	93	0
05	HS19090860-0	99	105	91	94	0
06	HS19090860-0	97	106	92	94	0
07	HS19090847-0	98	101	91	94	0
08	HS19090847-0	98	104	90	94	0
09	HS19090860-0	99	104	91	94	0
10	HS19090860-0	98	108	91	94	0
11	HS19090860-1	99	102	91	93	0
12	HS19090860-1	100	105	91	93	0
13	HS19090860-0	99	104	90	93	0
14	HS19090860-0	98	104	89	93	0
15	HS19090860-0	99	105	90	93	0
16	HS19090860-0	98	105	90	94	0
17	HS19090860-0	99	102	89	92	0
18	HS19090860-0	97	107	89	93	0
19	HS19090860-1	100	104	90	93	0
20	HS19090860-1	98	104	89	93	0
21						
22						
23						
24						
25						
26						
27						
28						

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(70-130)
SMC2	= 4-Bromofluorobenzene	(70-130)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-130)
OTHER	= Dibromofluoromethane	(70-130)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

VBLKW-190925

Lab Name:

Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID: X092507

Lab Sample ID: VBLKW-190925

Date Analyzed: 09/25/19

Time Analyzed: 1237

GC Column: DB624 ID: 0.18 (mm)

Heated Purge: (Y/N) N

Instrument ID: VOA6

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VLCSW-190925	VLCSW-190925	X092505	1149
02	HS19090860-1	HS19090860-15	X092510	1349
03	HS19090860-1	HS19090860-16	X092511	1413
04	HS19090860-0	HS19090860-04	X092512	1437
05	HS19090860-0	HS19090860-03	X092513	1502
06	HS19090847-0	HS19090847-01M	X092514	1526
07	HS19090847-0	HS19090847-01M	X092515	1550
08	HS19090860-0	HS19090860-03	X092516	1614
09	HS19090860-0	HS19090860-04	X092517	1638
10	HS19090860-1	HS19090860-13	X092518	1702
11	HS19090860-1	HS19090860-14	X092519	1726
12	HS19090860-0	HS19090860-09	X092522	1838
13	HS19090860-0	HS19090860-09	X092523	1902
14	HS19090860-0	HS19090860-06	X092524	1926
15	HS19090860-0	HS19090860-06	X092525	1950
16	HS19090860-0	HS19090860-07	X092526	2014
17	HS19090860-0	HS19090860-07	X092527	2038
18	HS19090860-1	HS19090860-10	X092528	2102
19	HS19090860-1	HS19090860-10	X092529	2126
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID: X092501 BFB Injection Date: 09/25/19

Instrument ID: VOA6 BFB Injection Time: 1013

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.9
75	30.0 - 60.0% of mass 95	47.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.6 (0.8)1
174	Greater than 50.0% of mass 95	76.7
175	5.0 - 9.0% of mass 174	5.8 (7.6)1
176	95.0 - 101.0% of mass 174	73.6 (96.0)1
177	5.0 - 9.0% of mass 176	5.0 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CCV	CCV	X092503	09/25/19	1101
02	VLCSW-190925	VLCSW-190925	X092505	09/25/19	1149
03	VBLKW-190925	VBLKW-190925	X092507	09/25/19	1237
04	HS19090860-1	HS19090860-15	X092510	09/25/19	1349
05	HS19090860-1	HS19090860-16	X092511	09/25/19	1413
06	HS19090860-0	HS19090860-04	X092512	09/25/19	1437
07	HS19090860-0	HS19090860-03	X092513	09/25/19	1502
08	HS19090847-0	HS19090847-01M	X092514	09/25/19	1526
09	HS19090847-0	HS19090847-01M	X092515	09/25/19	1550
10	HS19090860-0	HS19090860-03	X092516	09/25/19	1614
11	HS19090860-0	HS19090860-04	X092517	09/25/19	1638
12	HS19090860-1	HS19090860-13	X092518	09/25/19	1702
13	HS19090860-1	HS19090860-14	X092519	09/25/19	1726
14	HS19090860-0	HS19090860-09	X092522	09/25/19	1838
15	HS19090860-0	HS19090860-09	X092523	09/25/19	1902
16	HS19090860-0	HS19090860-06	X092524	09/25/19	1926
17	HS19090860-0	HS19090860-06	X092525	09/25/19	1950
18	HS19090860-0	HS19090860-07	X092526	09/25/19	2014
19	HS19090860-0	HS19090860-07	X092527	09/25/19	2038
20	HS19090860-1	HS19090860-10	X092528	09/25/19	2102
21	HS19090860-1	HS19090860-10	X092529	09/25/19	2126
22	CCV-END	CCV-END	X092530	09/25/19	2150

FORM V VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Instrument ID: VOA6 Calibration Date: 09/25/19 Time: 1101

Lab File ID: X092503 Init. Calib. Date(s): 09/24/19 09/24/19

Init. Calib. Times: 1112 1511

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dichloroethane	0.4650000	0.4160431	0.4160431	0.1	10.53	20.00	AVRG
Vinyl Chloride	0.6330000	0.6100188	0.6100188	0.1	3.63	20.00	AVRG
1,1,2-Trichloroethane	49.835434	50.000000	0.2892675	0.1	0.33	20.00	LINR
Methylene Chloride	47.625148	50.000000	0.5453657	0.1	4.75	20.00	LINR
1,1-Dichloroethene	0.4330000	0.4146009	0.4146009	0.1	4.25	20.00	AVRG
Trichloroethene	0.3830000	0.3509932	0.3509932	0.2	8.36	20.00	AVRG
Toluene-d8	1.4050000	1.3165704	1.3165704	0.1	6.29	20.00	AVRG
4-Bromofluorobenzene	51.945333	50.000000	0.4970046	0.1	-3.89	20.00	LINR
1,2-Dichloroethane-d4	49.361831	50.000000	0.5747734	0.1	1.28	20.00	LINR
Dibromofluoromethane	50.218986	50.000000	0.5009222	0.1	-0.44	20.00	LINR

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Instrument ID: VOA6 Calibration Date: 09/25/19 Time: 2150

Lab File ID: X092530 Init. Calib. Date(s): 09/24/19 09/24/19

Init. Calib. Times: 1112 1511

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dichloroethane	0.4650000	0.4160431	0.4160431	0.1	10.53	50.00	AVRG
Vinyl Chloride	0.6330000	0.6100188	0.6100188	0.1	3.63	50.00	AVRG
1,1,2-Trichloroethane	50.419315	50.000000	0.2892675	0.1	-0.84	50.00	LINR
Methylene Chloride	50.620337	50.000000	0.5453657	0.1	-1.24	50.00	LINR
1,1-Dichloroethene	0.4330000	0.4146009	0.4146009	0.1	4.25	50.00	AVRG
Trichloroethene	0.3830000	0.3509932	0.3509932	0.2	8.36	50.00	AVRG
Toluene-d8	1.4050000	1.3165704	1.3165704	0.1	6.29	50.00	AVRG
4-Bromofluorobenzene	52.132273	50.000000	0.4970046	0.1	-4.26	50.00	LINR
1,2-Dichloroethane-d4	50.546779	50.000000	0.5747734	0.1	-1.09	50.00	LINR
Dibromofluoromethane	51.330803	50.000000	0.5009222	0.1	-2.66	50.00	LINR

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID (Standard): X092503 Date Analyzed: 09/25/19

Instrument ID: VOA6 Time Analyzed: 1101

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(CBZ) AREA #	RT #	IS2(DCB) AREA #	RT #	IS3(DFB) AREA #	RT #
	12 HOUR STD	554193	7.67	288562	9.67	610397	4.97
	UPPER LIMIT	1108386	8.17	577124	10.17	1220794	5.47
	LOWER LIMIT	277097	7.17	144281	9.17	305199	4.47
	CLIENT SAMPLE NO.						
01	VLCSW-190925	567818	7.67	299106	9.67	628097	4.97
02	VBLKW-190925	661823	7.67	316092	9.67	789626	4.97
03	HS19090860-1	669745	7.67	343923	9.67	793526	4.97
04	HS19090860-1	694295	7.67	355507	9.67	811724	4.97
05	HS19090860-0	681722	7.67	350631	9.67	797235	4.97
06	HS19090860-0	664988	7.67	357165	9.67	778122	4.97
07	HS19090847-0	647416	7.67	322512	9.67	750742	4.97
08	HS19090847-0	655178	7.67	341655	9.67	750600	4.97
09	HS19090860-0	662410	7.67	325205	9.67	777250	4.97
10	HS19090860-0	693315	7.67	372297	9.67	803475	4.97
11	HS19090860-1	672511	7.67	344841	9.67	790174	4.97
12	HS19090860-1	682297	7.67	357046	9.67	810611	4.97
13	HS19090860-0	678467	7.67	347817	9.67	805973	4.97
14	HS19090860-0	721303	7.67	371703	9.67	843447	4.97
15	HS19090860-0	660519	7.67	351326	9.67	794182	4.97
16	HS19090860-0	683725	7.67	349817	9.67	797379	4.97
17	HS19090860-0	653886	7.67	309548	9.67	791287	4.97
18	HS19090860-0	702270	7.67	379587	9.67	809871	4.97
19	HS19090860-1	642749	7.67	323340	9.67	777814	4.97
20	HS19090860-1	680120	7.67	355062	9.67	795632	4.97

IS1 (CBZ) = Chlorobenzene-d5
IS2 (DCB) = 1,4-Dichlorobenzene-d4
IS3 (DFB) = 1,4-Difluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name:

Contract:

Lab Code:

Case No.:

SAS No.:

SDG No.: HS19090860

Lab File ID (Standard): X092503

Date Analyzed: 09/25/19

Instrument ID: VOA6

Time Analyzed: 1101

GC Column: DB624 ID: 0.18 (mm)

Heated Purge: (Y/N) N

	CLIENT SAMPLE NO.	IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	404585	4.18				
	UPPER LIMIT	809170	4.68				
	LOWER LIMIT	202293	3.68				
01	VLCSW-190925	408763	4.19				
02	VBLKW-190925	535673	4.18				
03	HS19090860-1	537387	4.19				
04	HS19090860-1	553472	4.18				
05	HS19090860-0	537656	4.19				
06	HS19090860-0	518098	4.19				
07	HS19090847-0	512863	4.18				
08	HS19090847-0	509006	4.18				
09	HS19090860-0	526245	4.18				
10	HS19090860-0	541943	4.18				
11	HS19090860-1	540449	4.19				
12	HS19090860-1	549831	4.18				
13	HS19090860-0	549505	4.18				
14	HS19090860-0	579346	4.18				
15	HS19090860-0	539384	4.18				
16	HS19090860-0	541423	4.18				
17	HS19090860-0	539995	4.18				
18	HS19090860-0	546818	4.19				
19	HS19090860-1	533258	4.19				
20	HS19090860-1	545462	4.18				

IS4 = Pentafluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

ata File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092501.D

Date : 25-SEP-2019 10:13

Client ID: BFB

Instrument: voa6.i

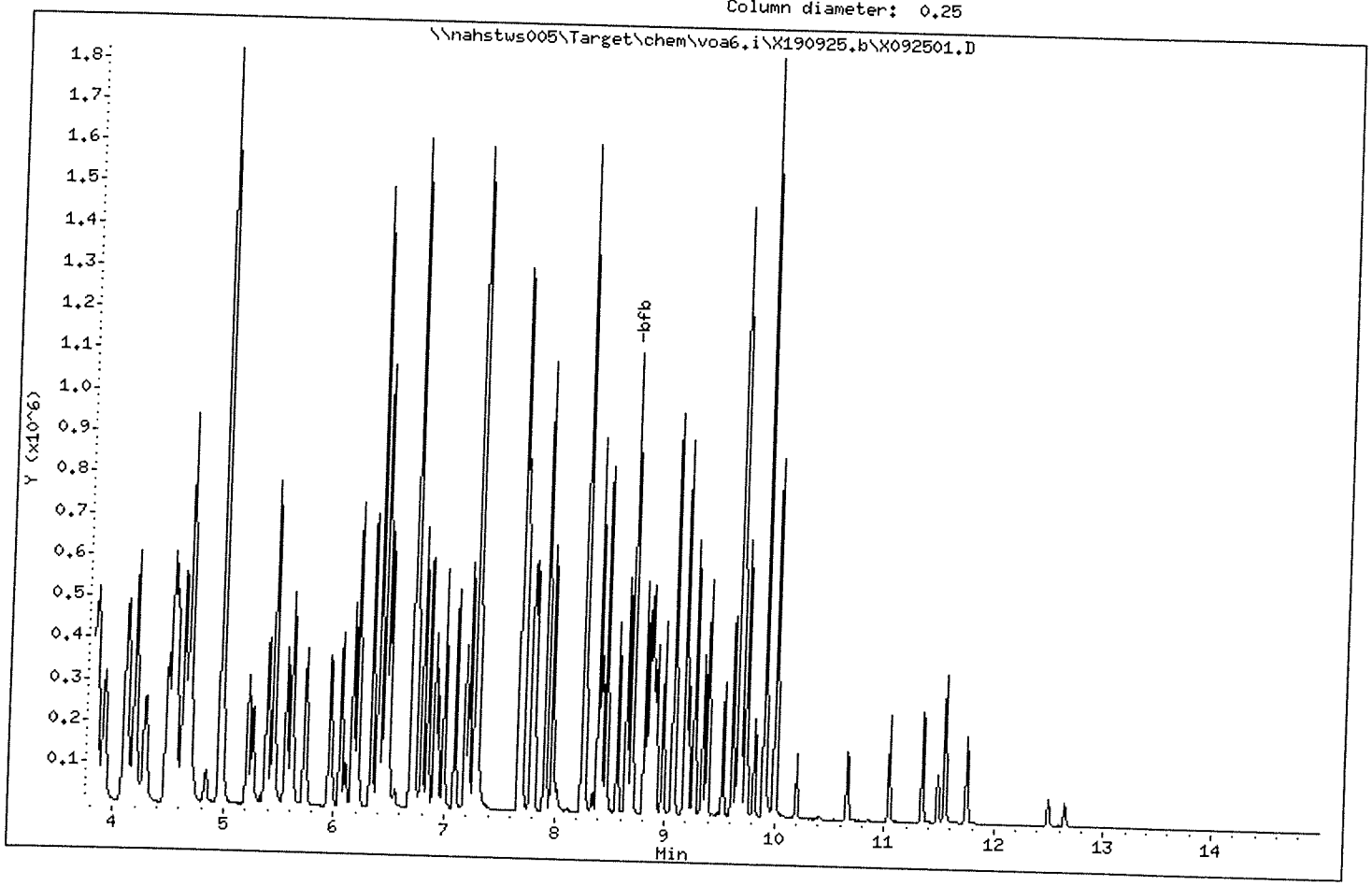
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092501.D

Date : 25-SEP-2019 10:13

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

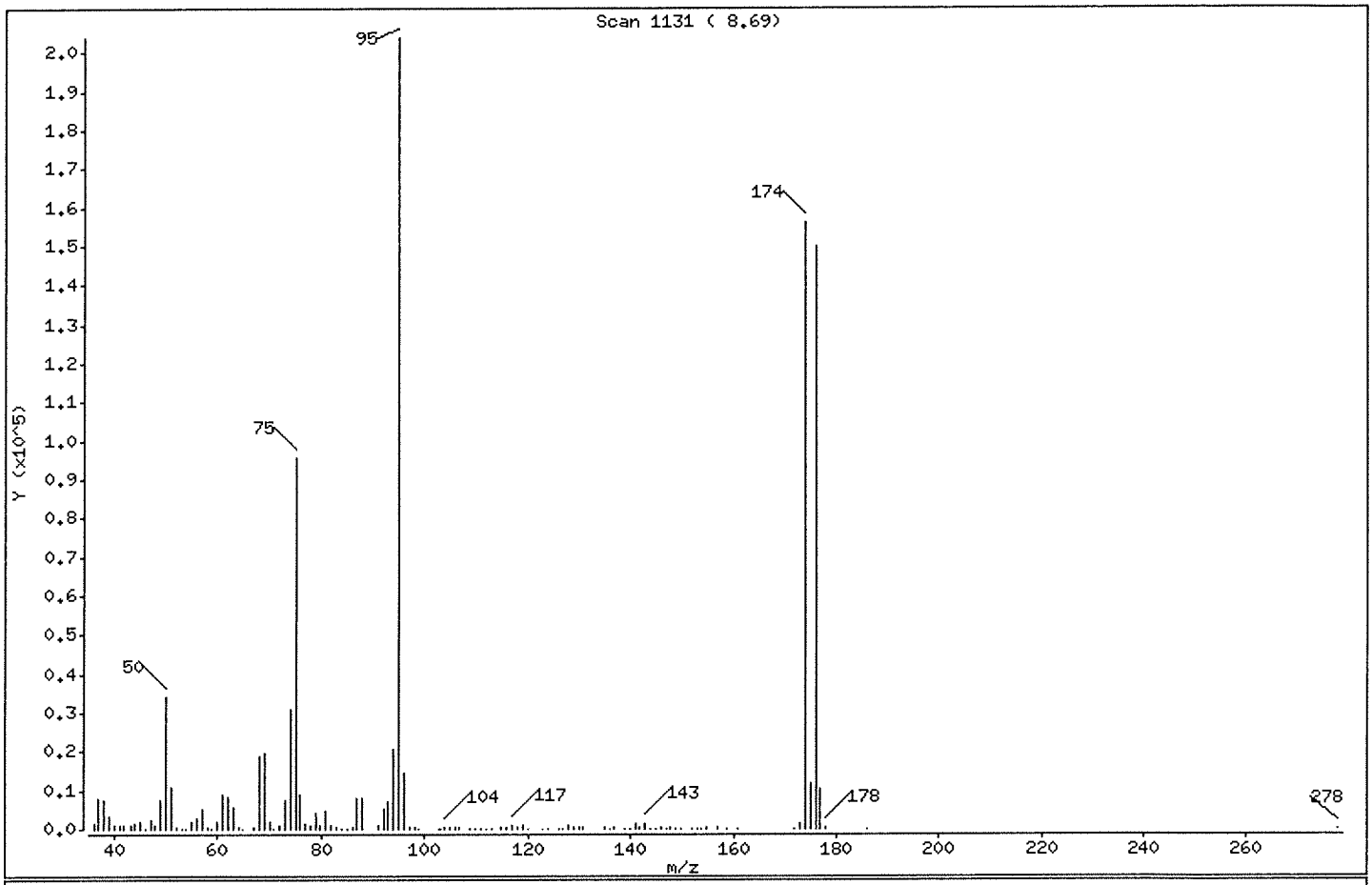
Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	16.88
75	30.00 - 60.00% of mass 95	46.95
96	5.00 - 9.00% of mass 95	7.07
173	Less than 2.00% of mass 174	0.59 (0.77)
174	Greater than 50.00% of mass 95	76.66
175	5.00 - 9.00% of mass 174	5.79 (7.56)
176	95.00 - 101.00% of mass 174	73.61 (96.03)
177	5.00 - 9.00% of mass 176	4.99 (6.77)

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092501.D

Date : 25-SEP-2019 10:13

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: X092501.D
Spectrum: Scan 1131 (8.69)
Location of Maximum: 95.00
Number of points: 117

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	1466	67.00	556	98.90	53	139.80	101
37.00	8013	68.00	18800	102.70	68	140.90	1378
38.10	7482	69.00	19744	103.10	67	141.80	324
39.10	3351	70.10	1706	103.90	650	142.90	1501
40.10	731	70.90	184	104.90	299	144.00	77
41.10	1059	72.00	986	105.80	645	144.90	147
42.00	949	73.00	7623	106.80	270	145.90	246
43.10	1080	74.00	30832	108.80	109	146.90	145
44.00	1496	75.00	95768	109.80	134	147.80	411
45.00	1781	76.00	8759	110.90	101	148.80	114
46.20	200	77.00	1502	111.90	111	149.90	217
47.00	2367	78.10	974	112.90	136	151.90	65
48.00	944	78.90	4325	114.80	308	152.90	160
49.00	7391	79.90	1143	115.90	569	153.80	100
50.00	34432	80.90	4500	116.90	1105	155.00	472
51.00	10698	82.00	1017	118.00	548	156.90	394
52.10	489	83.00	242	118.90	795	158.80	187
53.10	135	84.10	137	120.00	82	160.70	186
53.90	121	85.10	79	122.80	80	172.00	162
55.00	2020	86.00	265	123.90	115	173.00	1204
56.00	3004	87.00	7962	126.00	67	173.90	156352
57.00	5088	88.00	7948	126.80	200	175.00	11813
58.00	365	91.00	773	127.90	864	176.00	150144
58.90	164	92.00	5066	128.90	319	176.90	10169
60.00	1975	93.00	7161	130.00	556	177.90	305
61.00	8798	94.00	20624	130.70	277	185.90	172
62.00	8438	95.00	203968	134.90	258	278.20	108
63.00	5521	96.00	14427	136.00	67		
64.00	599	97.10	390	136.80	262		
65.00	107	98.00	516	138.80	55		

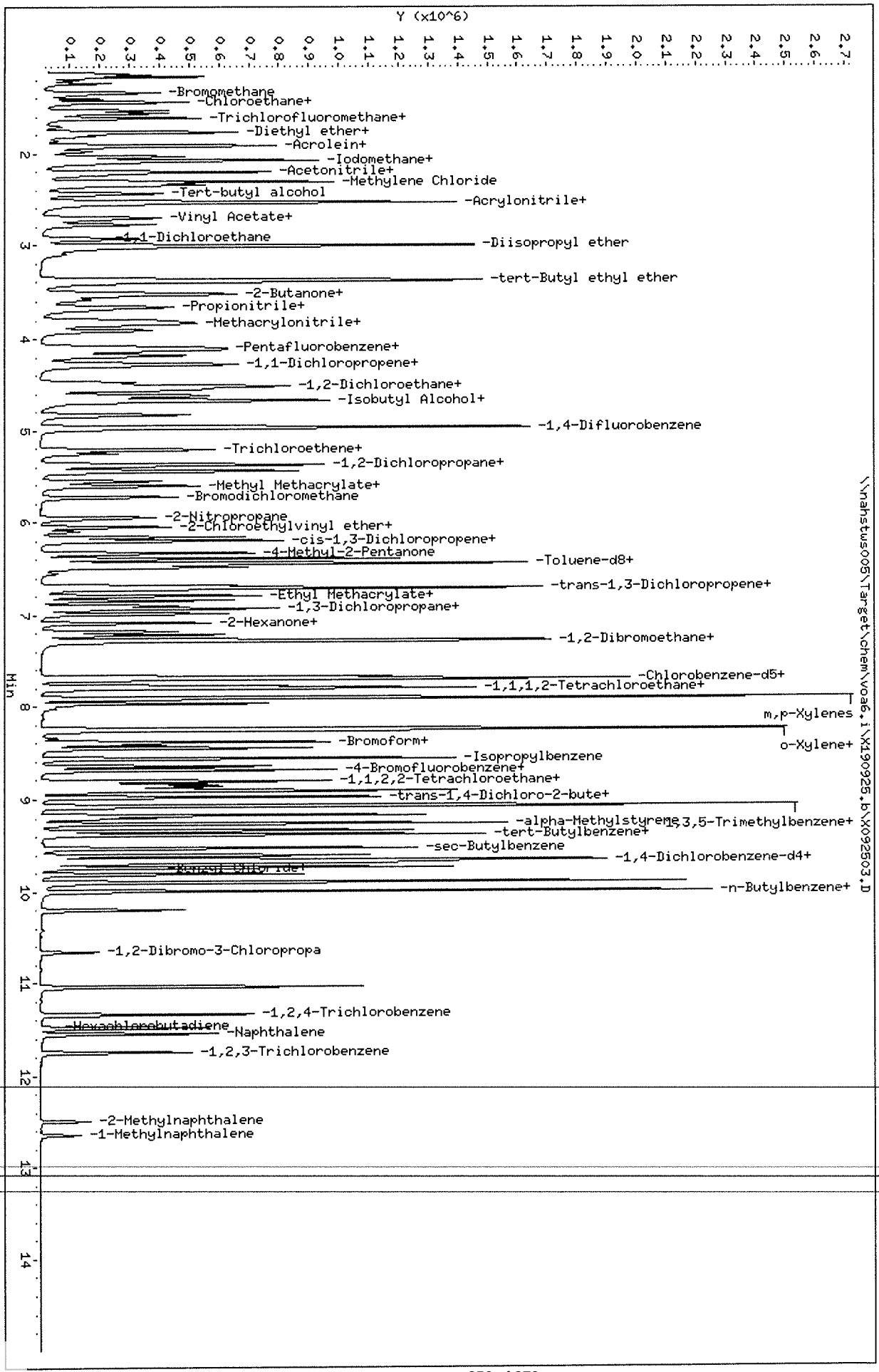
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092503.D
Lab Smp Id: CCV Client Smp ID: CCV
Inj Date : 25-SEP-2019 11:01
Operator : PC Inst ID: voa6.i
Smp Info : CCV;CCV;2;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 3 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
	53 1,1,2-Trichloroethane	83	6.840	6.847	(0.892)	158490	50.0000	49.83
	11 1,1-Dichloroethene	96	1.919	1.912	(0.459)	152831	50.0000	43.62
	33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	256804	50.0000	45.18
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	216435	50.0000	43.33
	17 Methylene Chloride	84	2.306	2.306	(0.551)	208018	50.0000	47.62
	38 Trichloroethene	130	5.214	5.214	(1.049)	207737	50.0000	44.39
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	224064	50.0000	43.75
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	227197	50.0000	49.36
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	274471	50.0000	51.94
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	198348	50.0000	50.21
$	48 Toluene-d8	98	6.388	6.388	(0.833)	728581	50.0000	46.78
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	404585	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	610397	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	554193	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	288562	50.0000	



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092503.D
Date : 25-SEP-2019 11:01
Client ID: CCV
Sample Info: CCV;CCV;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

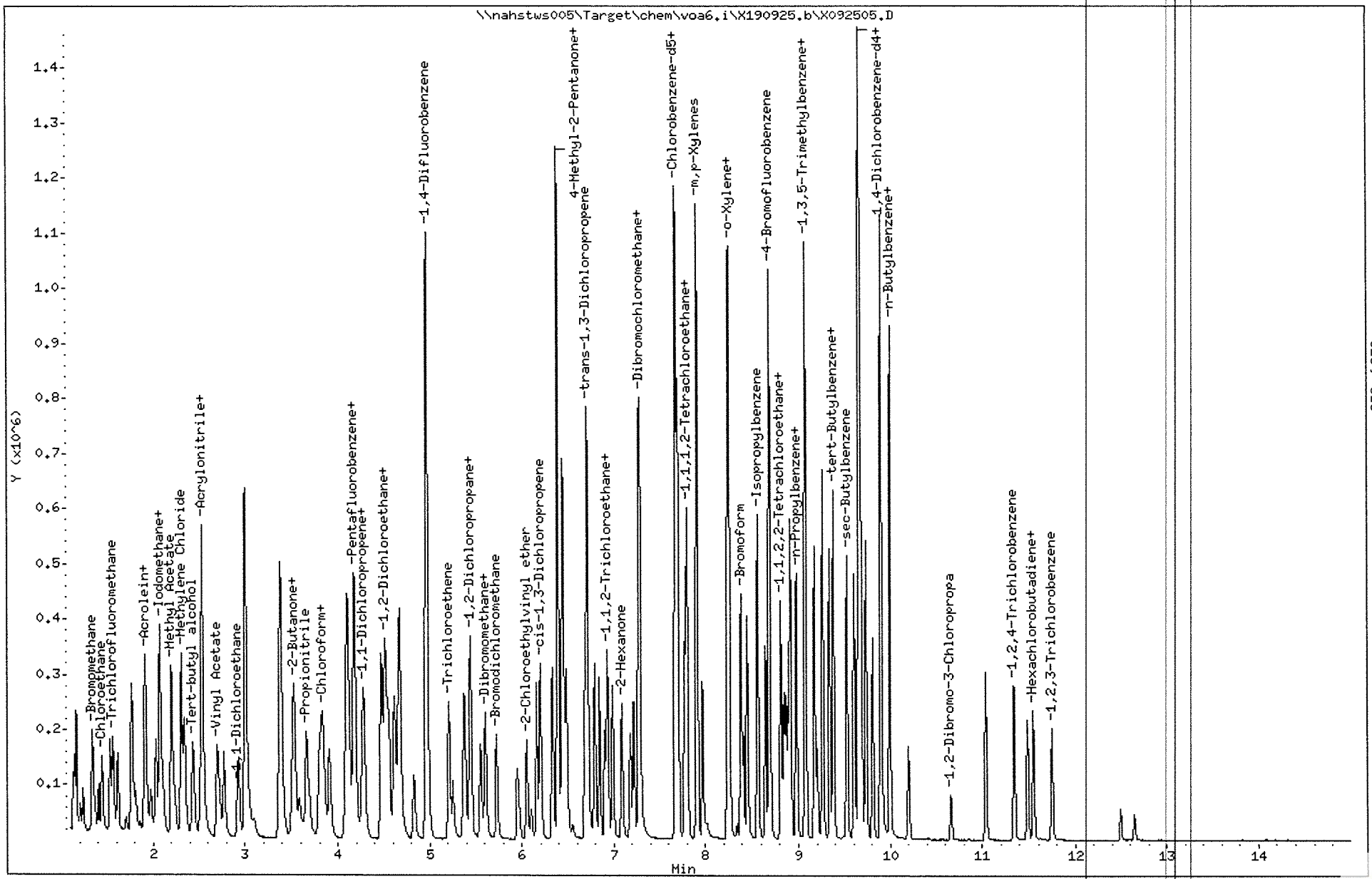
Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092505.D
Lab Smp Id: VLCSW-190925 Client Smp ID: VLCSW-190925
Inj Date : 25-SEP-2019 11:49
Operator : PC Inst ID: voa6.i
Smp Info : VLCSW-190925;VLCSW-190925;3;;LCS
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 5 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	68691	20.4981	20.49
	11 1,1-Dichloroethene	96	1.919	1.912	(0.458)	64786	18.3035	18.30
	33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	112288	19.2000	19.20
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	95018	18.8293	18.82
	17 Methylene Chloride	84	2.305	2.306	(0.550)	92598	20.0264	20.02
	38 Trichloroethene	130	5.214	5.214	(1.049)	86532	17.9731	17.97
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	92102	17.7999	17.79
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	239641	51.5765	51.57
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	289677	53.5437	53.54
$	30 Dibromofluoromethane	113	4.103	4.103	(0.979)	208081	52.1776	52.17
$	48 Toluene-d8	98	6.388	6.388	(0.833)	761215	47.7101	47.71
*	1 Pentafluorobenzene	168	4.189	4.189	(1.000)	408763	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	628097	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	567818	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	299106	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092505.D
Date : 25-SEP-2019 11:49
Client ID: VLCSW-190925
Instrument: voa6.i
Sample Info: VLCSW-190925;VLCSW-190925;3;;LCS
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092507.D
Lab Smp Id: VBLKW-190925 Client Smp ID: VBLKW-190925
Inj Date : 25-SEP-2019 12:37
Operator : PC Inst ID: voa6.i
Smp Info : VBLKW-190925;VBLKW-190925;3;;BLANK
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

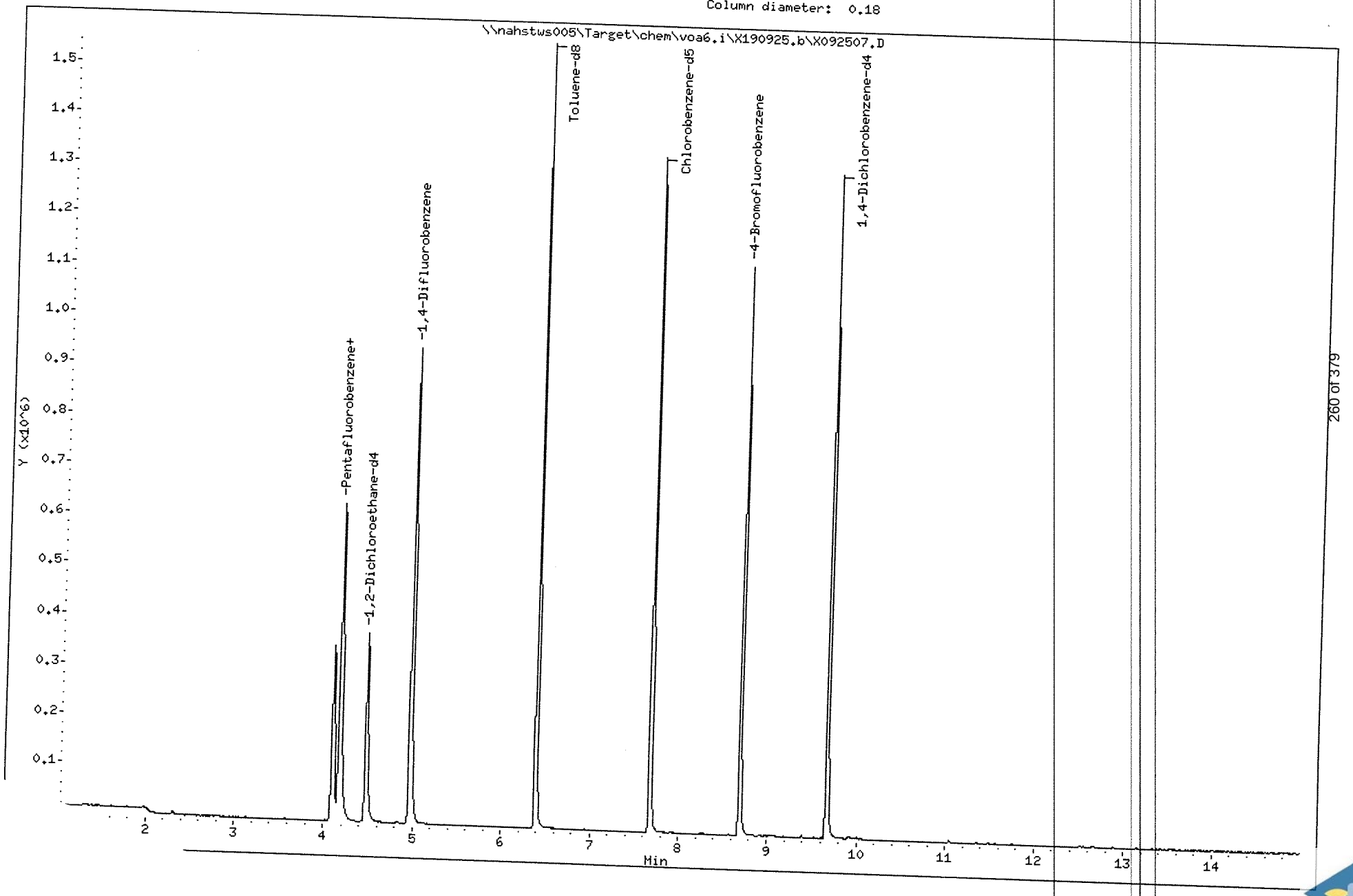
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	273241	44.7479	44.74
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	324690	51.4450	51.44
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	243664	46.5334	46.53
$ 48 Toluene-d8	98	6.389	6.388	(0.833)	938071	50.4436	50.44
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	535673	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	789626	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	661823	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	316092	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092507.D
Date : 25-SEP-2019 12:37
Client ID: VBLKW-190925
Sample Info: VBLKW-190925;VBLKW-190925;3;;BLANK
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i

Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092510.D
Lab Smp Id: HS19090860-15 Client Smp ID: HS19090860-15
Inj Date : 25-SEP-2019 13:49
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-15;HS19090860-15;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 10
Dil Factor: 1.00000
Integrator: HP RTE
Target Version: 4.14 Compound Sublist: CBI-HOU.sub

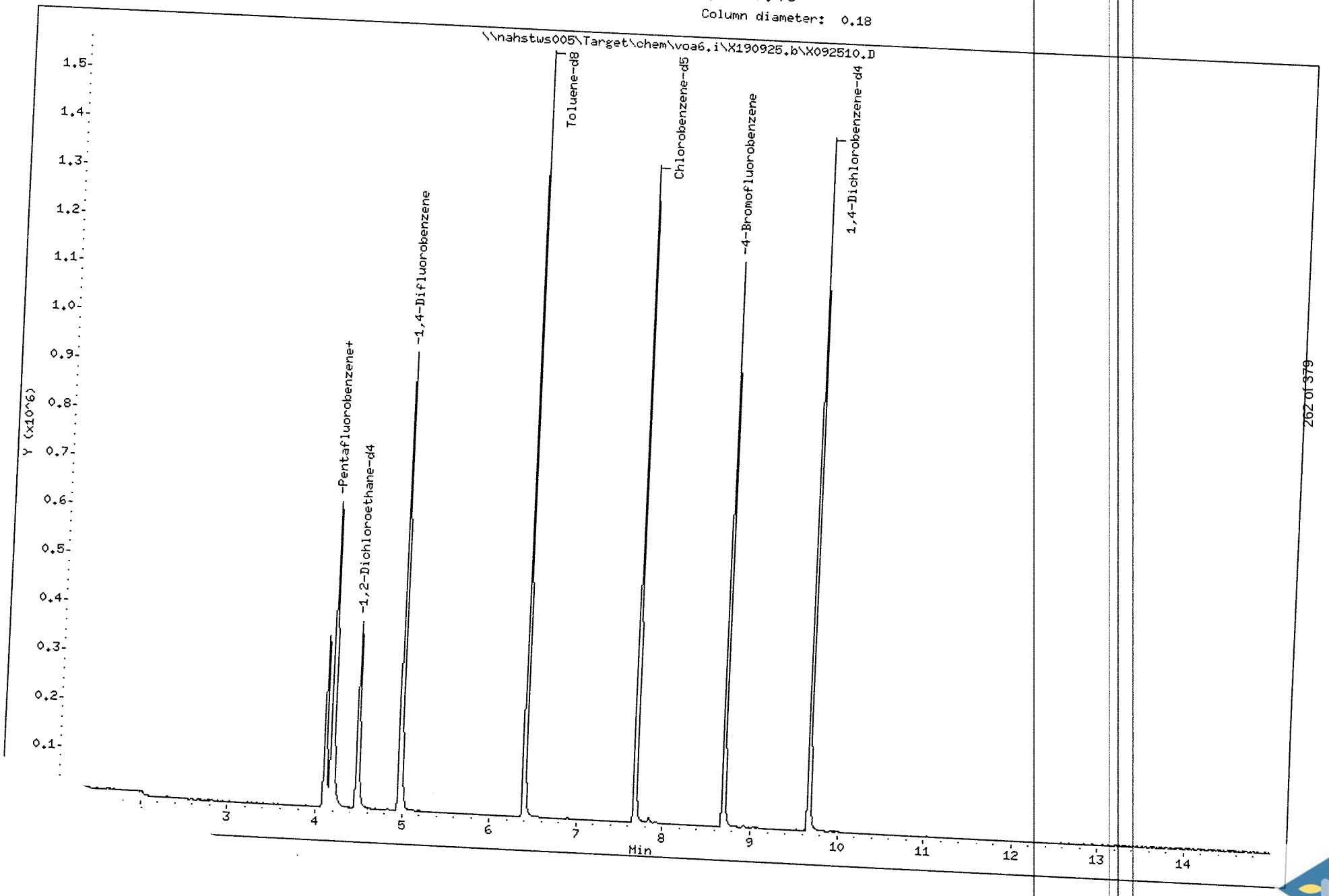
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	282958	46.2231	46.22
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	333443	52.2247	52.22
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.979)	248474	47.3147	47.31
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	943162	50.1174	50.11
* 1 Pentafluorobenzene	168	4.189	4.189	(1.000)	537387	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	793526	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	669745	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	343923	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092510.D
Date : 25-SEP-2019 13:49
Client ID: HS19090860-15
Sample Info: HS19090860-15;HS19090860-15;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092511.D
Lab Smp Id: HS19090860-16 Client Smp ID: HS19090860-16
Inj Date : 25-SEP-2019 14:13
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-16;HS19090860-16;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE
Target Version: 4.14 Compound Sublist: CBI-HOU.sub

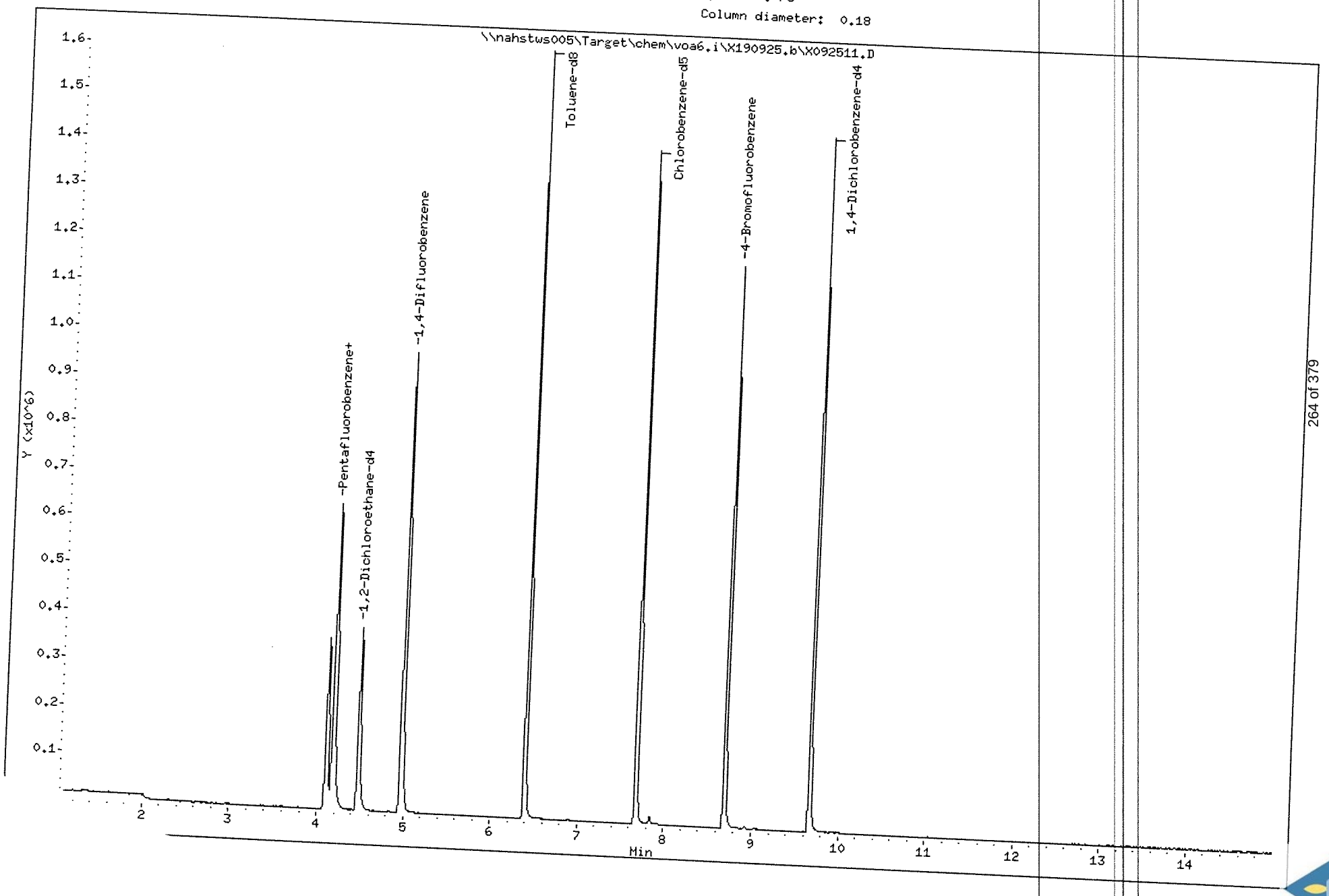
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	282593	44.7921	44.79
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	345188	52.1508	52.15
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	251929	46.5651	46.56
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	963318	49.3784	49.37
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	553472	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	811724	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	694295	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	355507	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092511.D
Date : 25-SEP-2019 14:13
Client ID: HS19090860-16
Sample Info: HS19090860-16;HS19090860-16;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092512.D
Lab Smp Id: HS19090860-04 Client Smp ID: HS19090860-04
Inj Date : 25-SEP-2019 14:37
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-04;HS19090860-04;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 12
Dil Factor: 1.00000
Integrator: HP RTE
Target Version: 4.14 Compound Sublist: CBI-HOU.sub

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

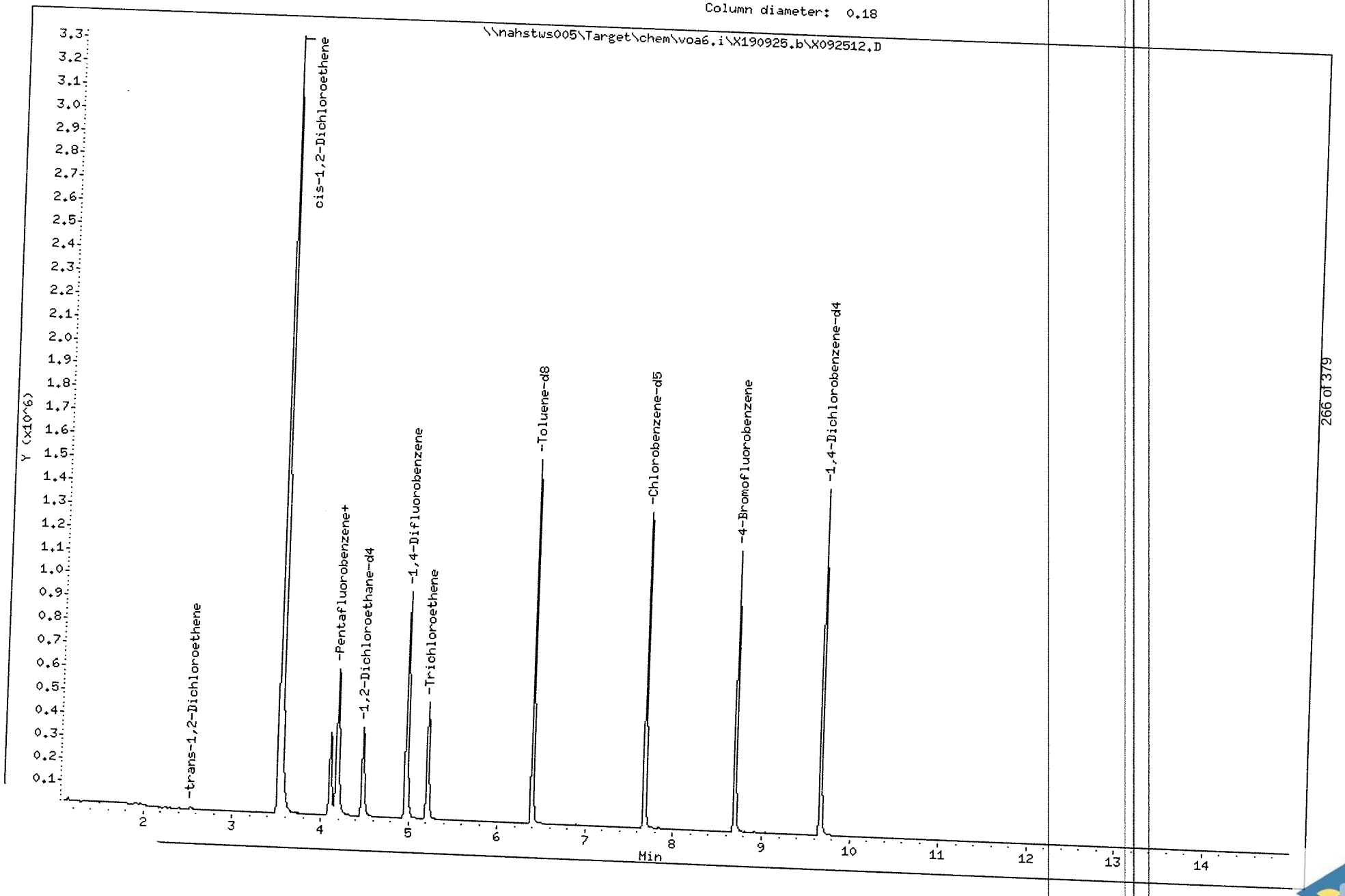
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	1724907	259.873	259.87(A)
38 Trichloroethene	130	5.214	5.214	(1.049)	176747	28.9227	28.92
5 Vinyl Chloride	62	1.138	1.138	(0.272)	7227	1.06188	1.06(a)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	279386	45.6039	45.60
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	340861	52.4537	52.45
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.979)	247419	47.0862	47.08
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	947587	49.4679	49.46
* 1 Pentafluorobenzene	168	4.189	4.189	(1.000)	537656	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	797235	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	681722	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	350631	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092512.D
Date : 25-SEP-2019 14:37
Client ID: HS19090860-04
Sample Info: HS19090860-04;HS19090860-04;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



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Date : 25-SEP-2019 14:37

Client ID: HS19090860-04

Instrument: voa6.i

Sample Info: HS19090860-04;HS19090860-04;;;

Purge Volume: 5.0

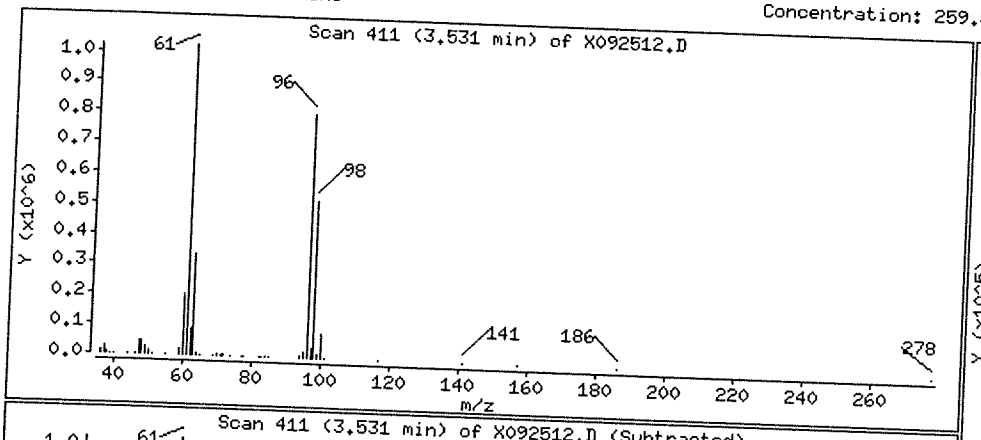
Operator: PC

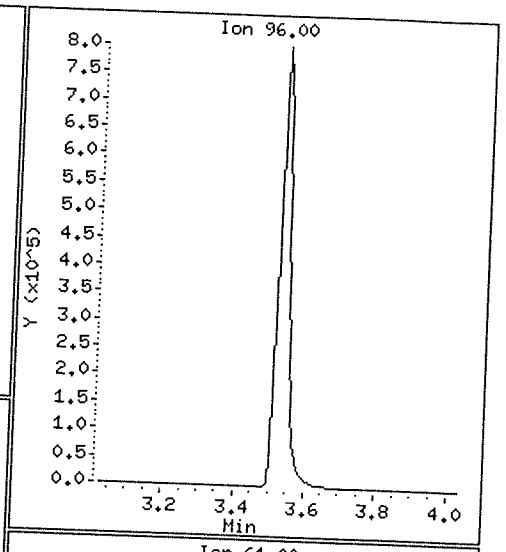
Column phase: DB624

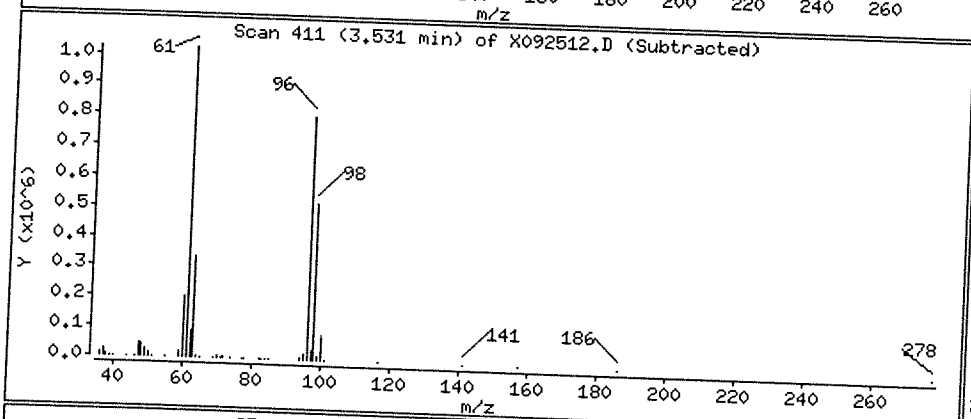
Column diameter: 0.18

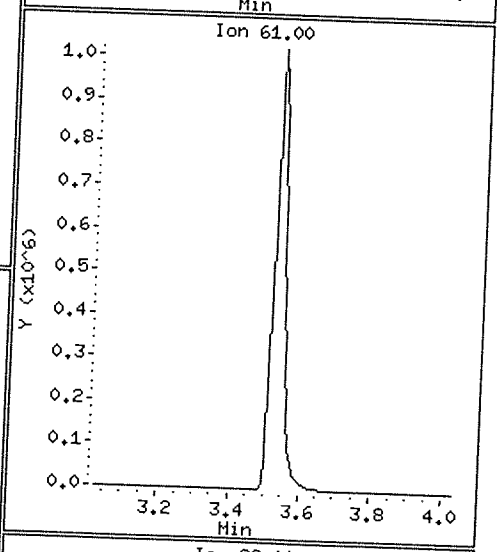
27 cis-1,2-Dichloroethene

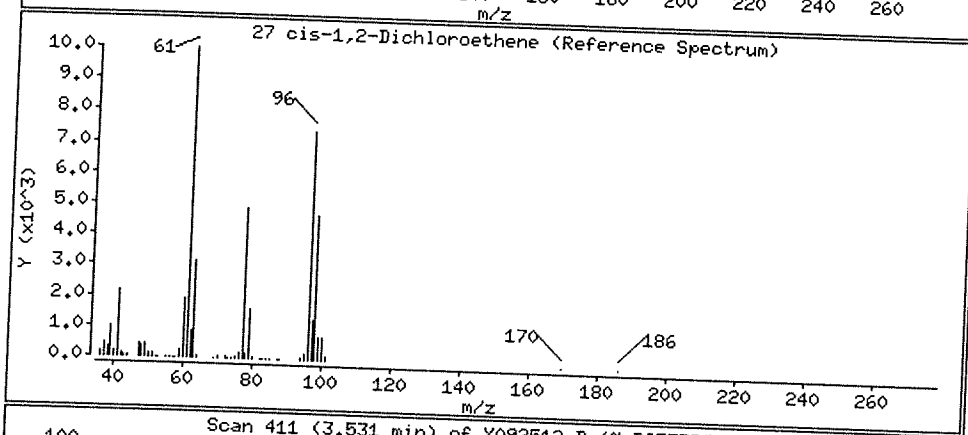
Concentration: 259.87 ug/l

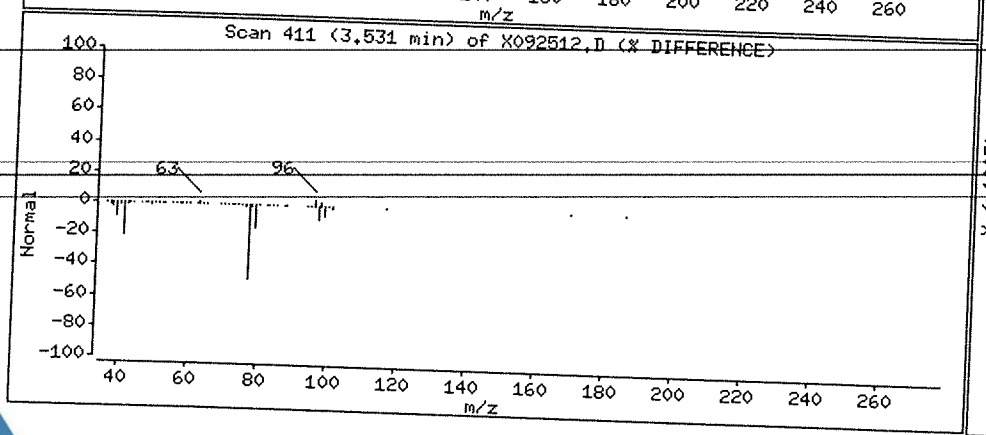


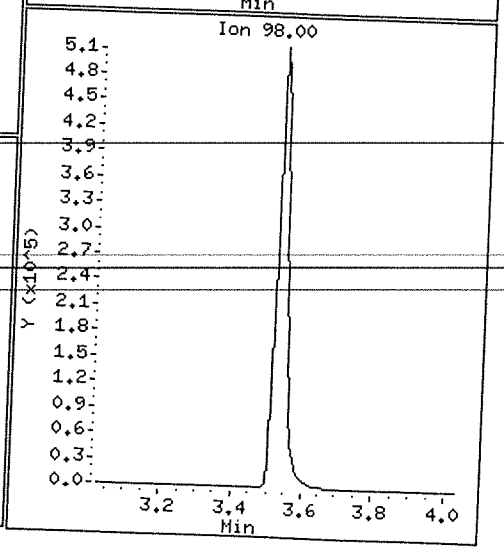












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092512.D

Date : 25-SEP-2019 14:37

Client ID: HS19090860-04

Instrument: voa6.i

Sample Info: HS19090860-04;HS19090860-04;;;

Purge Volume: 5.0

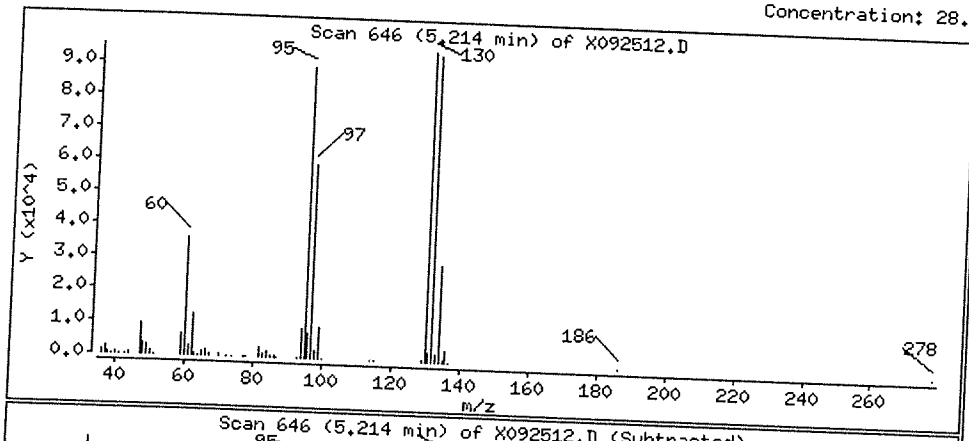
Operator: PC

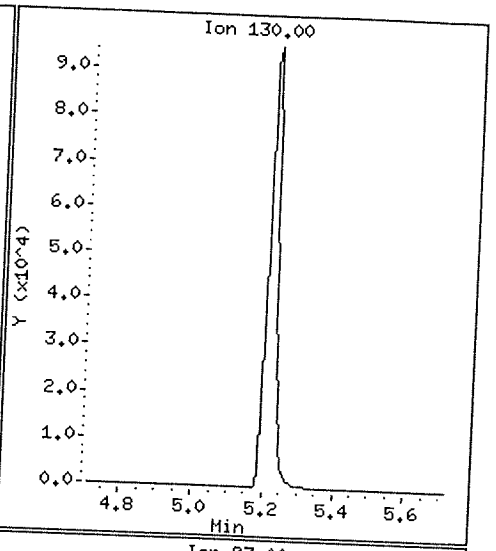
Column phase: DB624

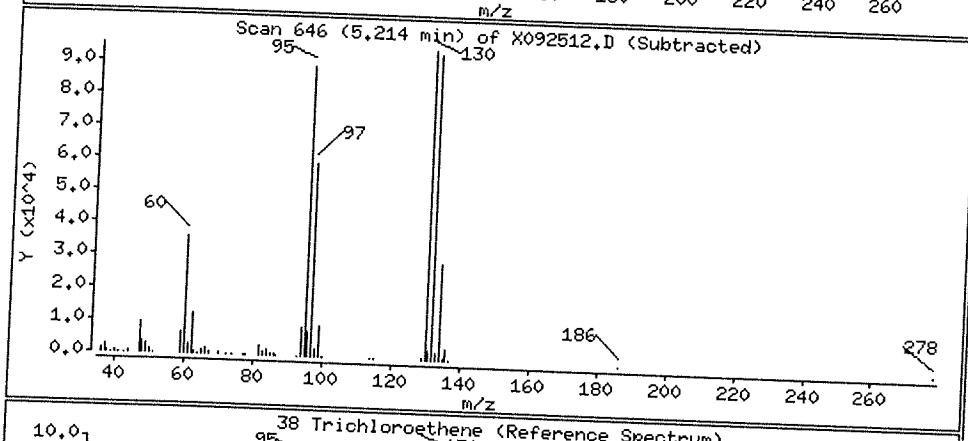
Column diameter: 0.18

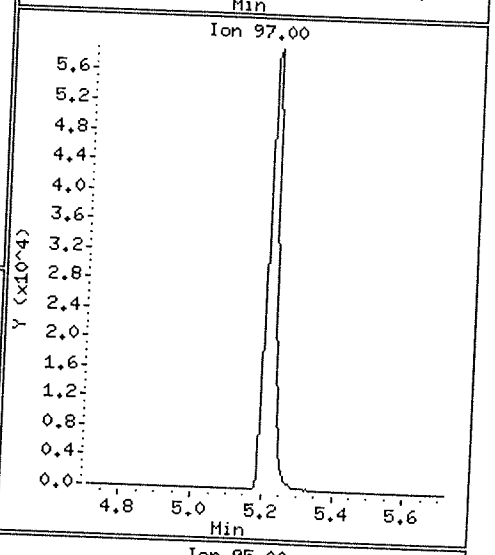
38 Trichloroethene

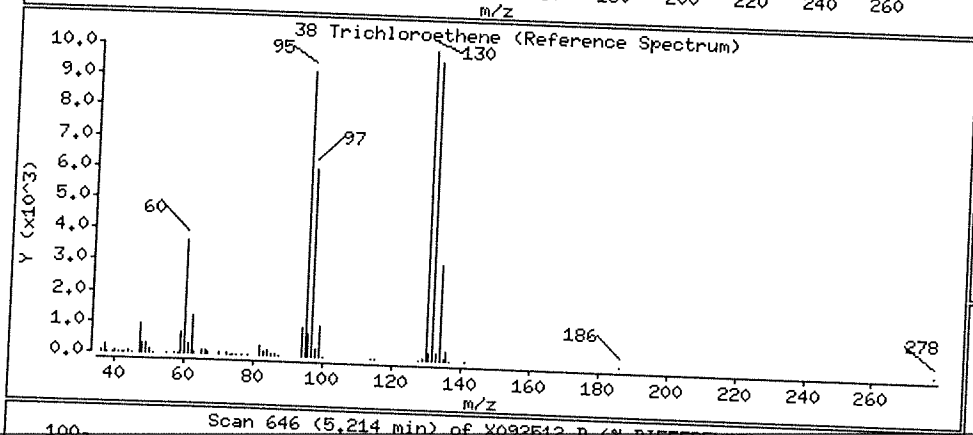
Concentration: 28.92 ug/l

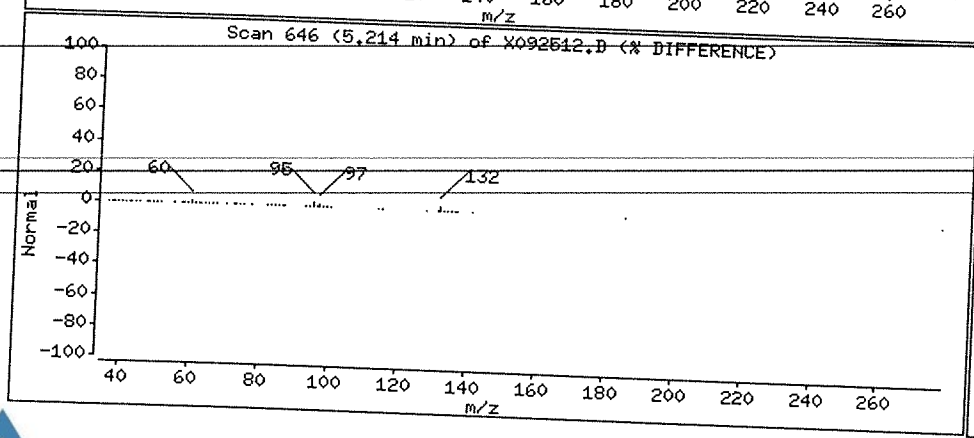


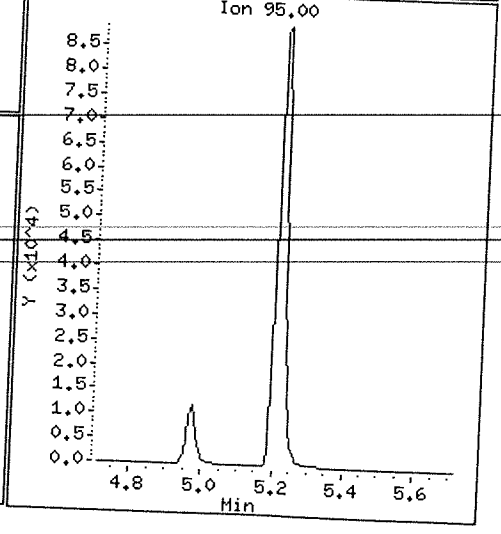












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092512.D

Date : 25-SEP-2019 14:37

Client ID: HS19090860-04

Sample Info: HS19090860-04;HS19090860-04;;;

Purge Volume: 5.0

Column phase: DB624

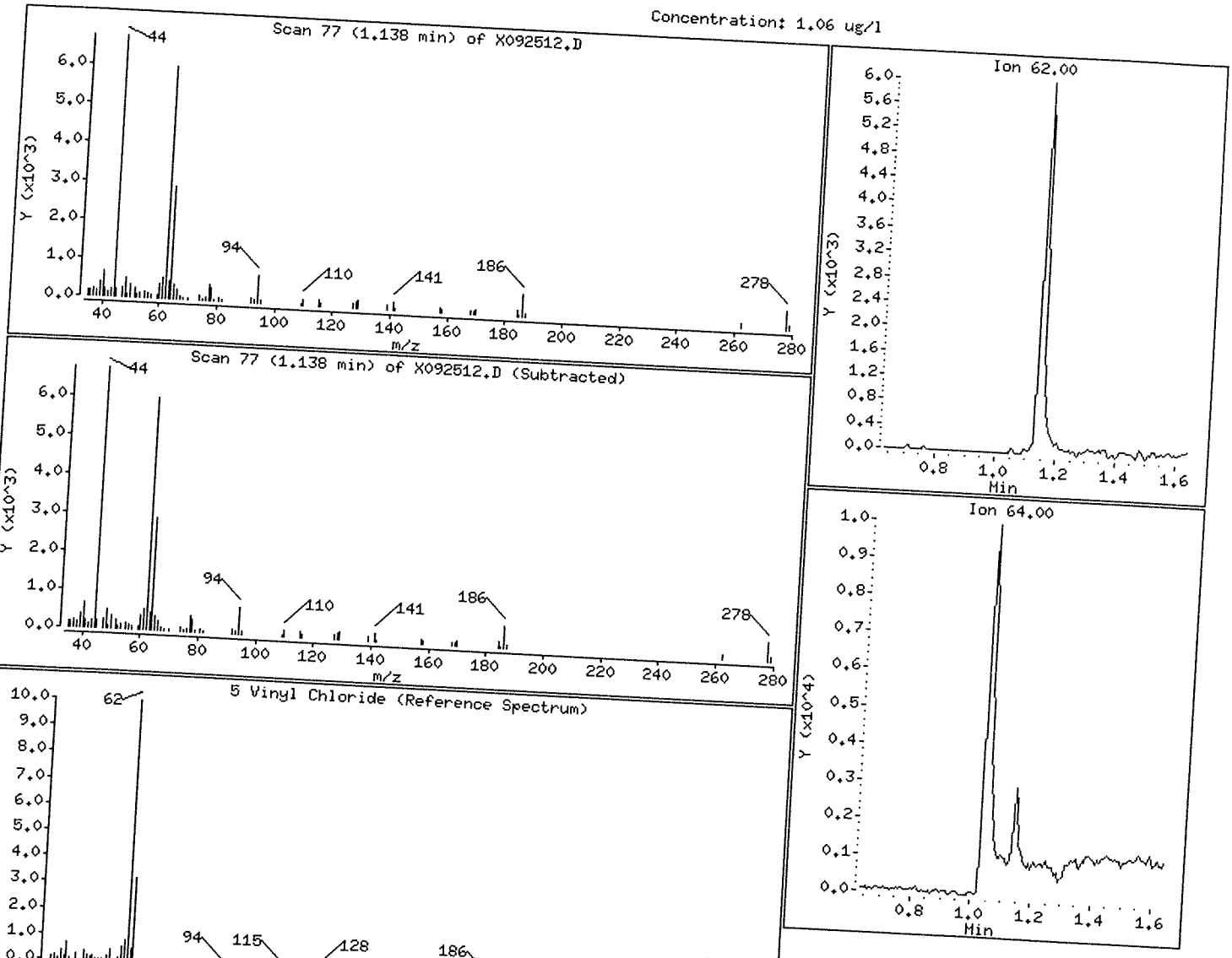
Instrument: voa6.i

Operator: PC

Column diameter: 0.18

5 Vinyl Chloride

Concentration: 1.06 ug/l



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092513.D
Lab Smp Id: HS19090860-03 Client Smp ID: HS19090860-03
Inj Date : 25-SEP-2019 15:02
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-03;HS19090860-03;;;
Misc Info : HS18090001;WATER;0;25;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 13
Dil Factor: 25.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	25.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

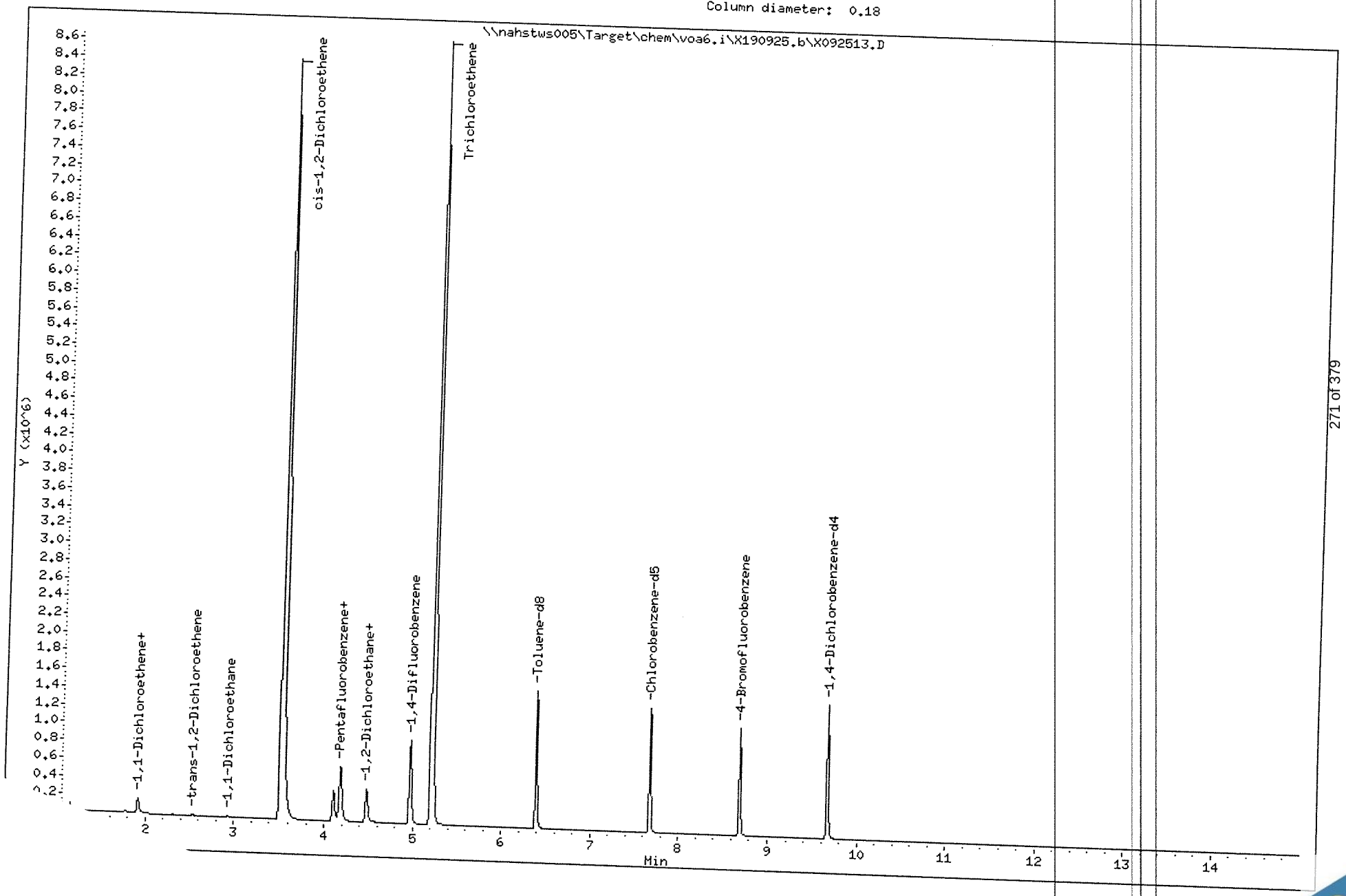
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
11 1,1-Dichloroethene	96	1.911	1.912	(0.456)	34598	7.71194	192.79
33 1,2-Dichloroethane	62	4.569	4.562	(0.919)	3906	0.53911	13.47(a)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	4470506	698.948	17473.70(A)
38 Trichloroethene	130	5.214	5.214	(1.049)	3089716	518.018	12950.44(A)
5 Vinyl Chloride	62	1.138	1.138	(0.272)	61417	9.36476	234.11
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	271158	45.9387	45.93
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	336260	53.0614	53.06
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.979)	238583	47.1192	47.11
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	902833	48.3176	48.31
* 1 Pentafluorobenzene	168	4.189	4.189	(1.000)	518098	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	778122	50.0000	
* 47 Chlorobenzene-d5	117	7.670	7.671	(1.000)	664988	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	357165	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092513.D
Date : 25-SEP-2019 15:02
Client ID: HS19090860-03
Sample Info: HS19090860-03;HS19090860-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092513.D

Date : 25-SEP-2019 15:02

Client ID: HS19090860-03

Instrument: voa6.i

Sample Info: HS19090860-03;HS19090860-03;;;

Purge Volume: 5.0

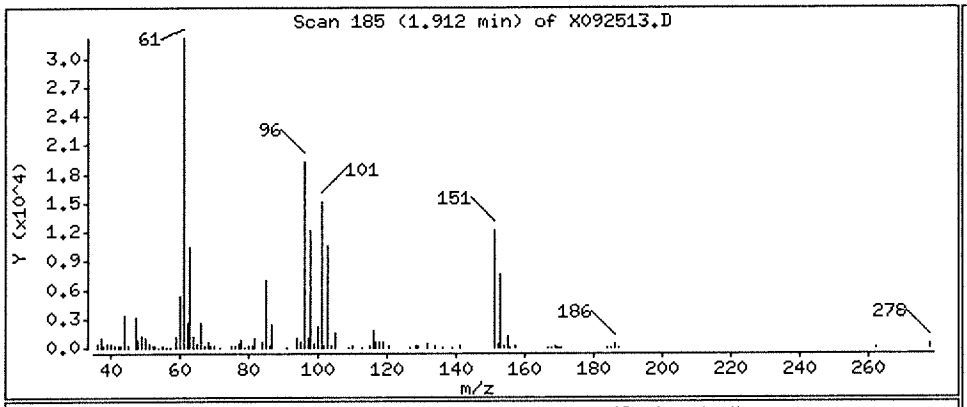
Operator: PC

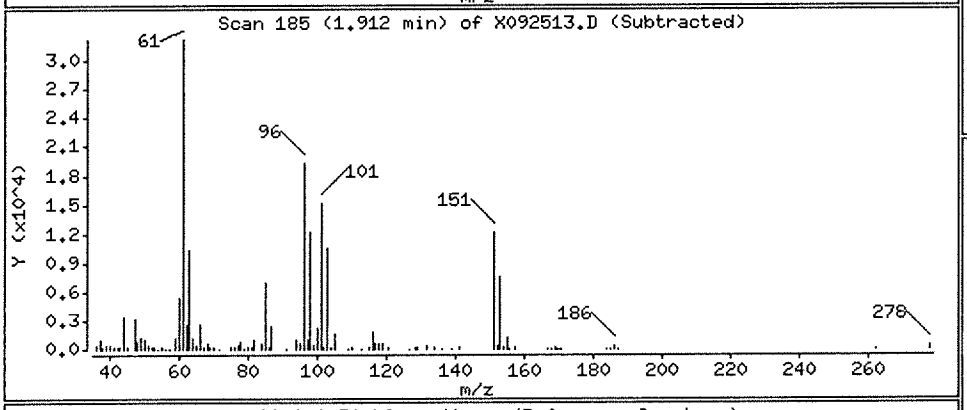
Column phase: DB624

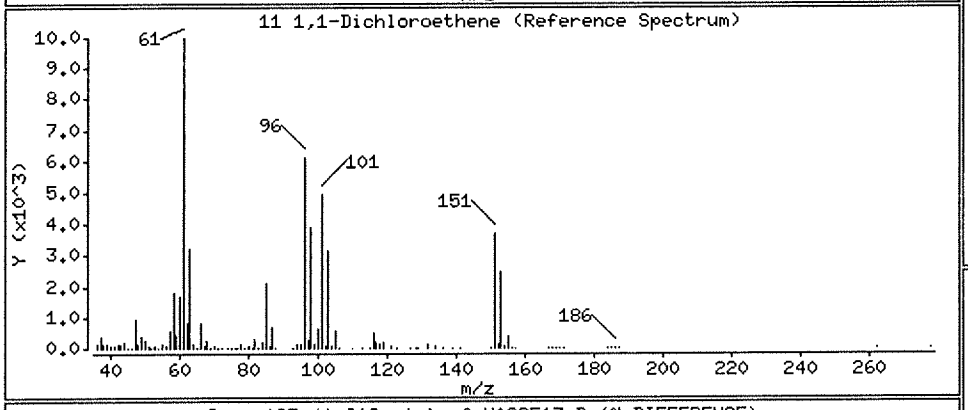
Column diameter: 0.18

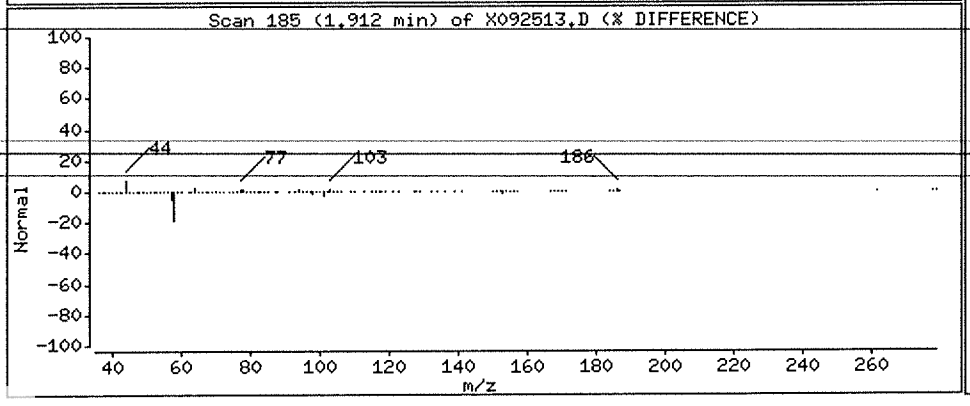
11 1,1-Dichloroethene

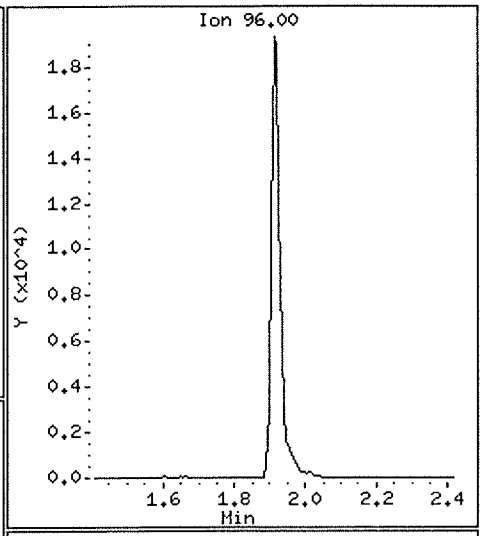
Concentration: 192.79 ug/l

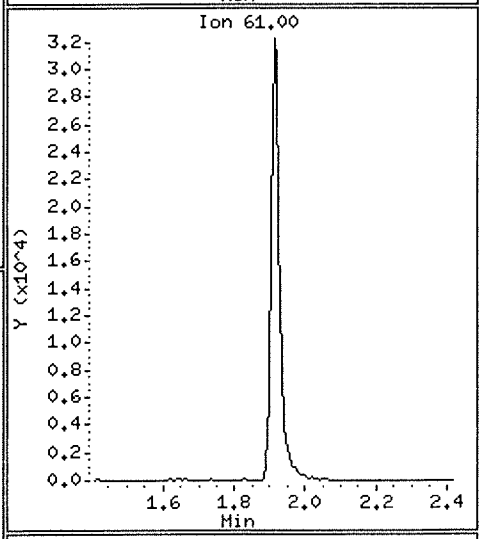


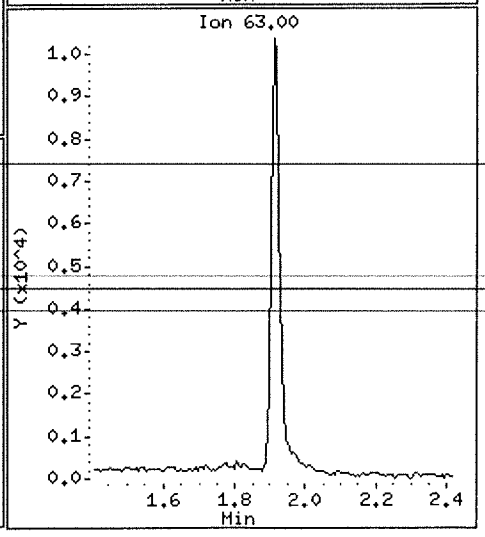












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092513.D

Date : 25-SEP-2019 15:02

Client ID: HS19090860-03

Instrument: voa6.i

Sample Info: HS19090860-03;HS19090860-03;;;

Purge Volume: 5.0

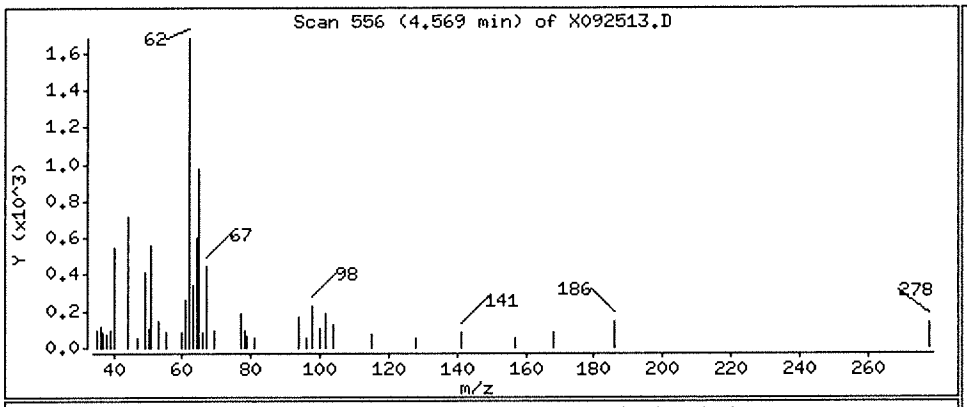
Operator: PC

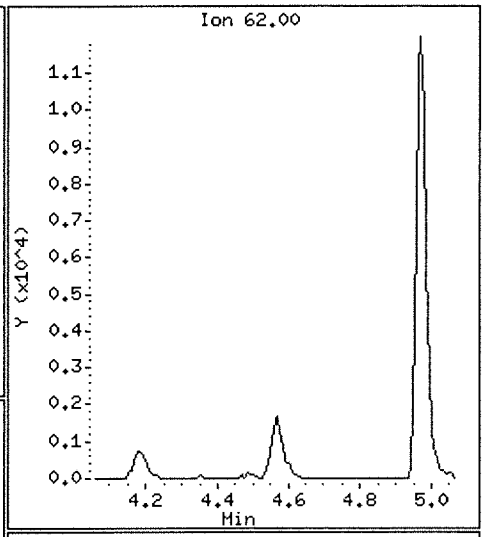
Column phase: DB624

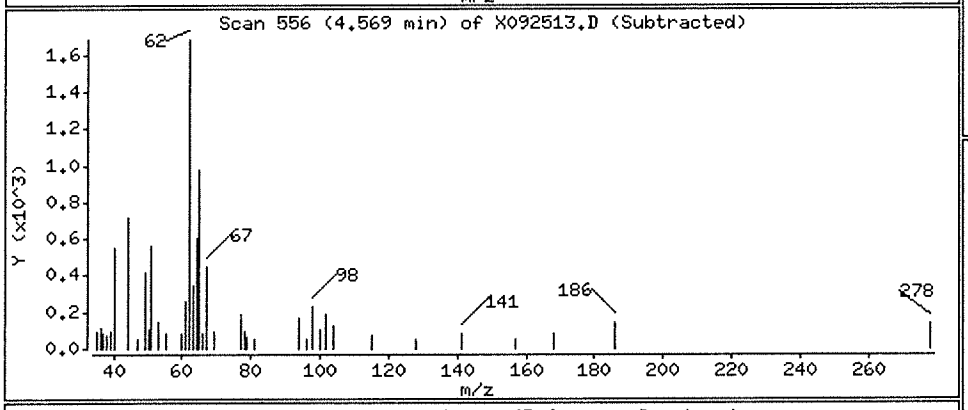
Column diameter: 0.18

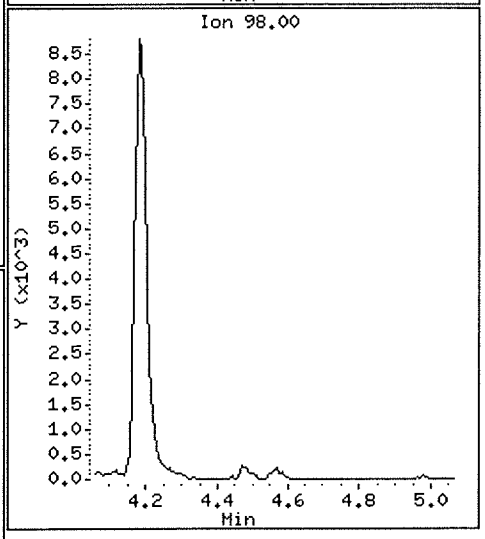
33 1,2-Dichloroethane

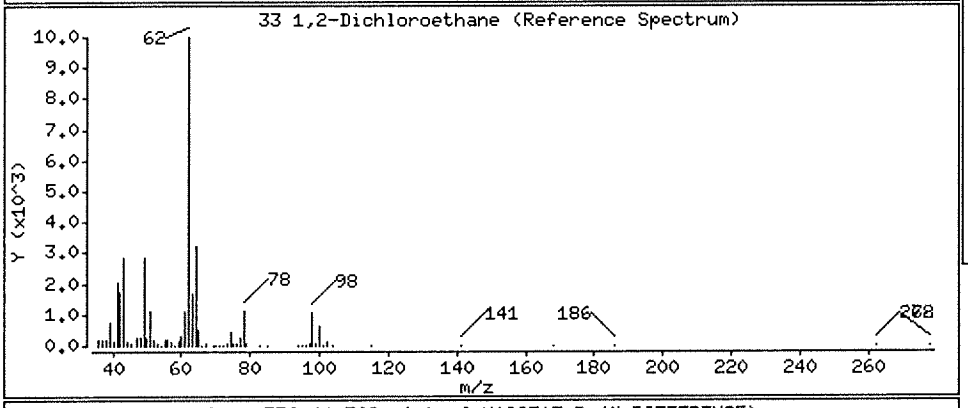
Concentration: 13.47 ug/l

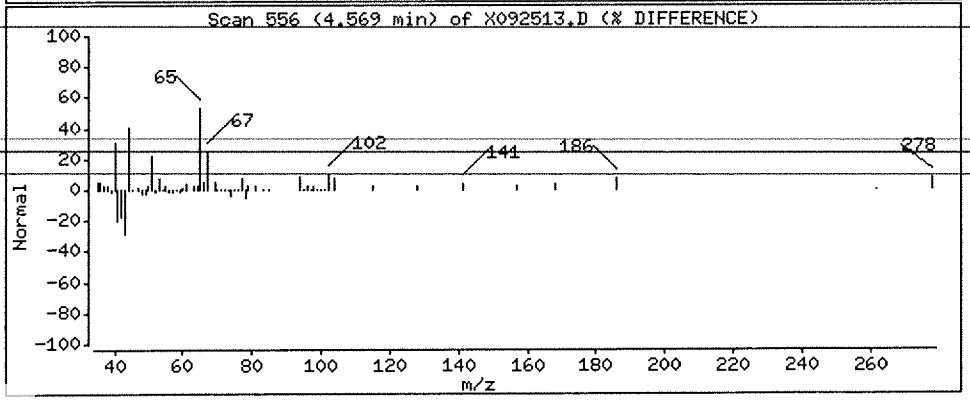












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092513.D

Date : 25-SEP-2019 15:02

Client ID: HS19090860-03

Instrument: voa6.i

Sample Info: HS19090860-03;HS19090860-03;;;

Purge Volume: 5.0

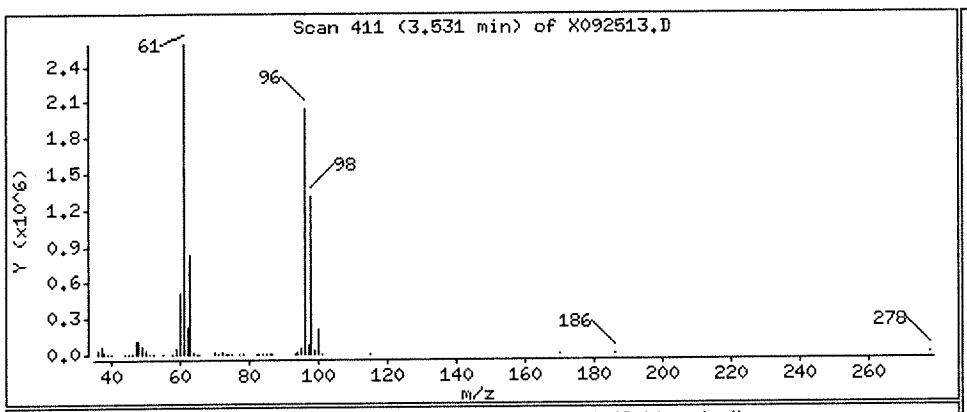
Operator: PC

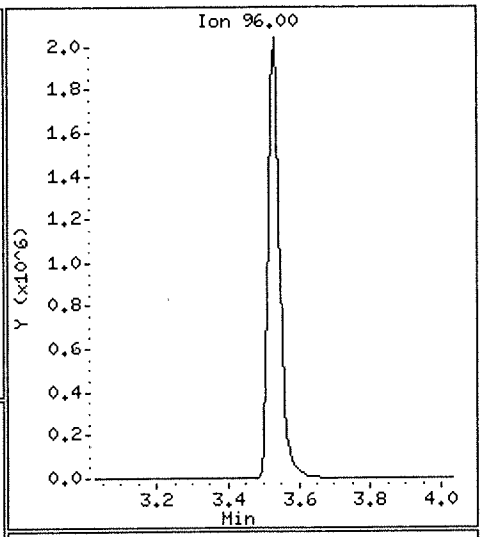
Column phase: DB624

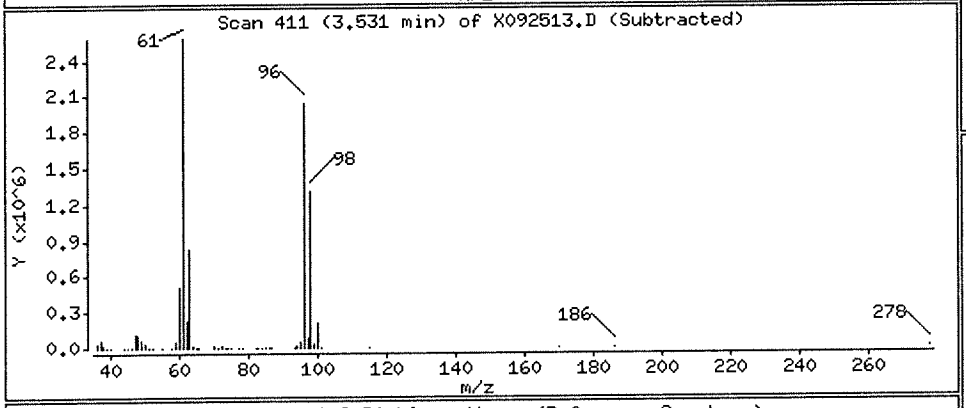
Column diameter: 0.18

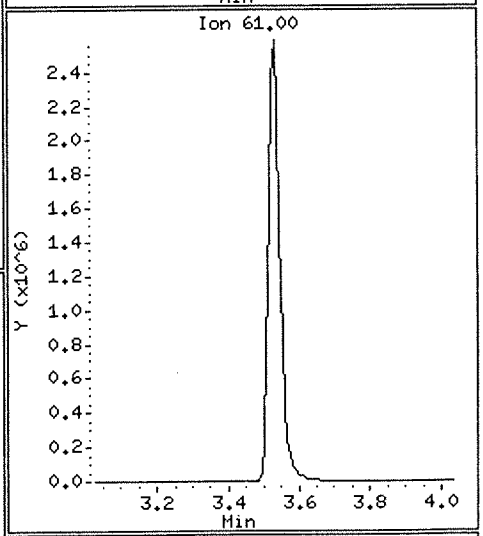
27 cis-1,2-Dichloroethene

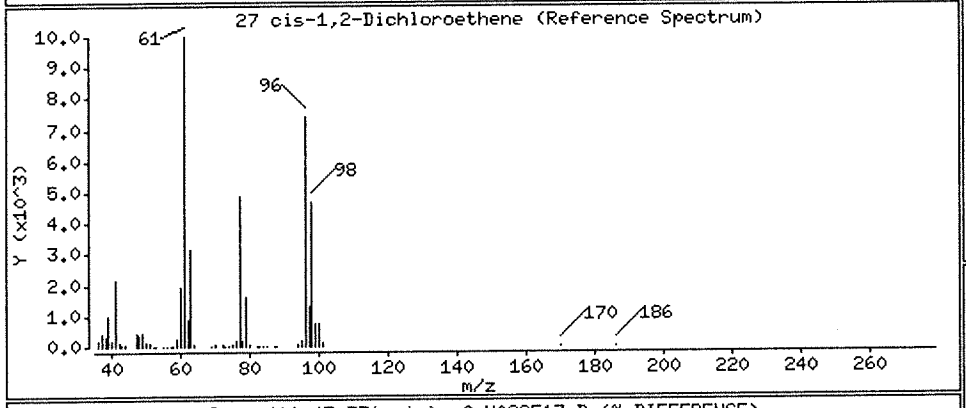
Concentration: 17473.70 ug/l

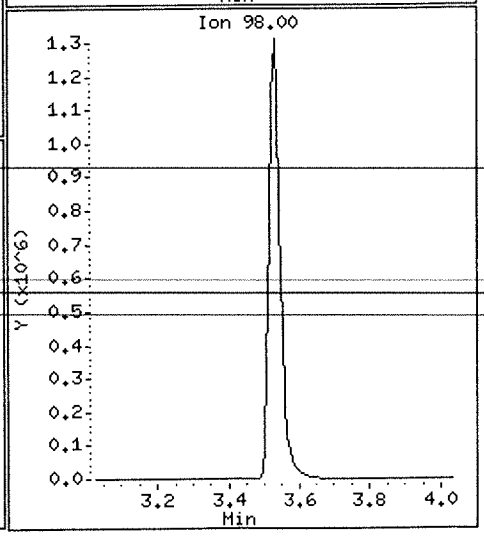


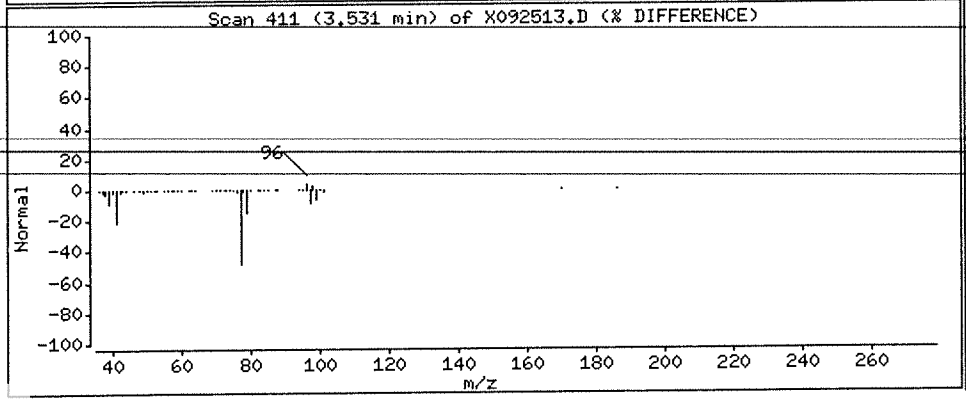






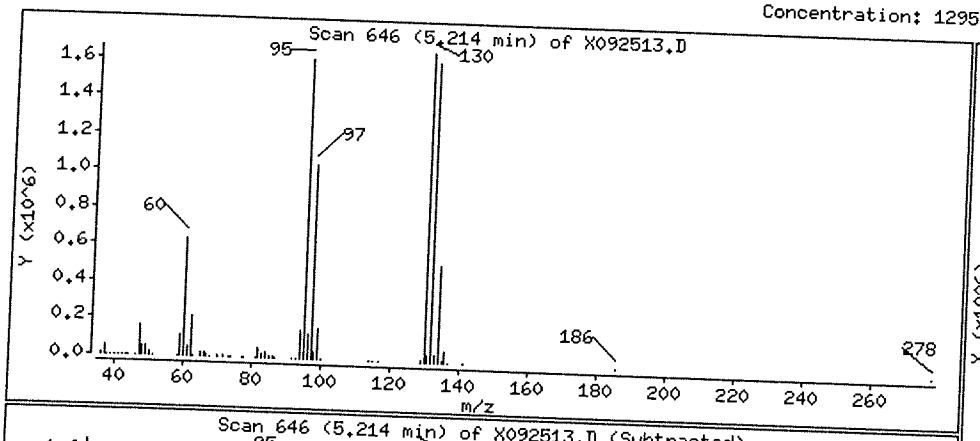


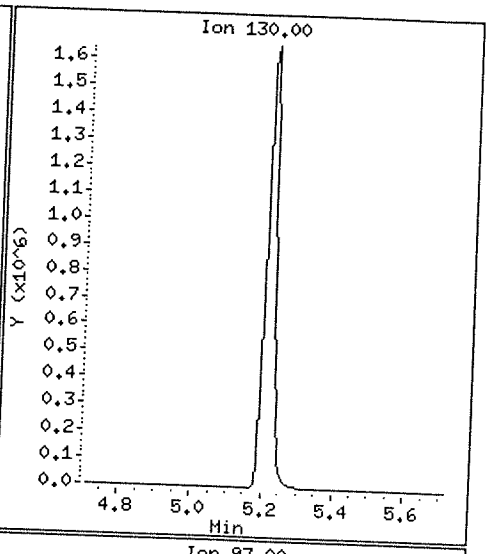


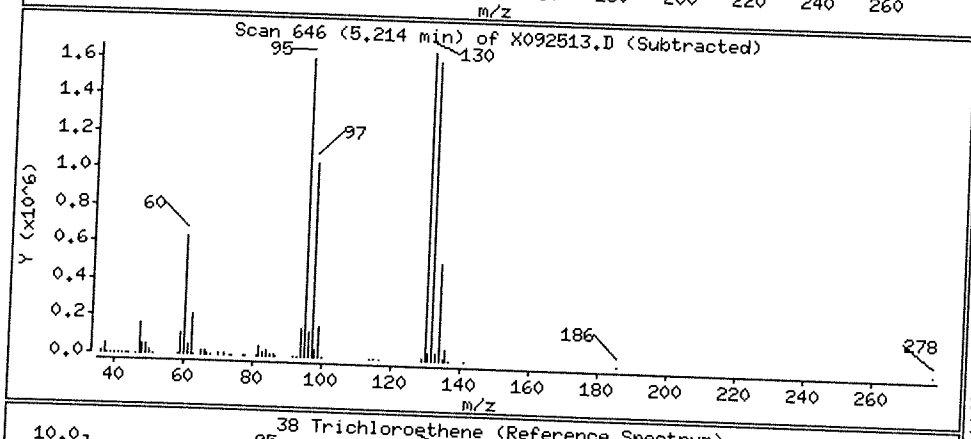


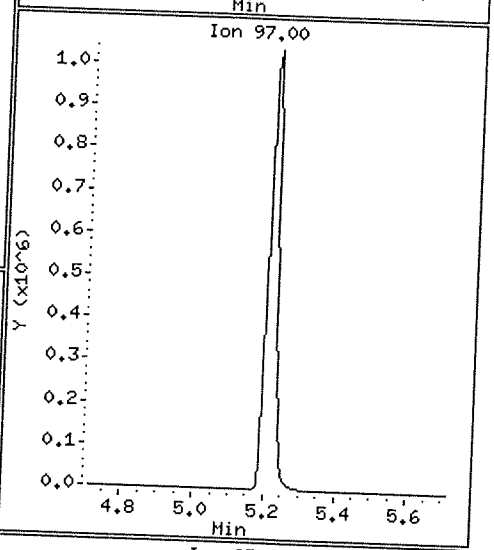
38 Trichloroethene

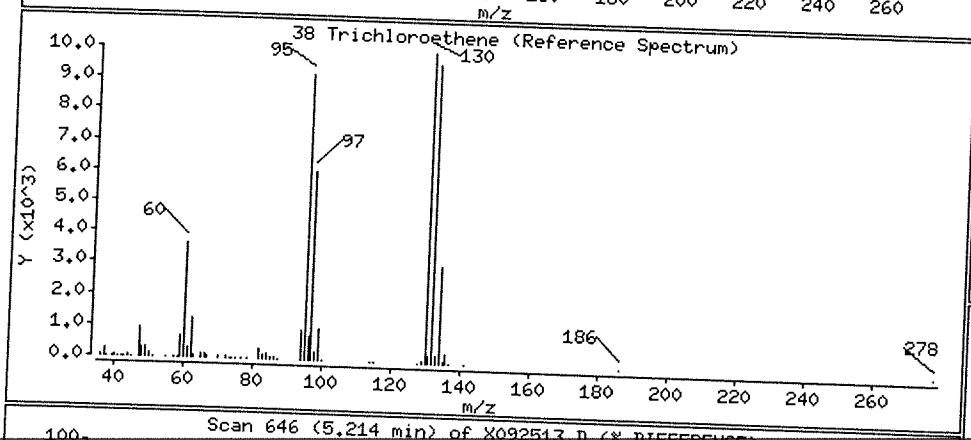
Concentration: 12950.44 ug/l

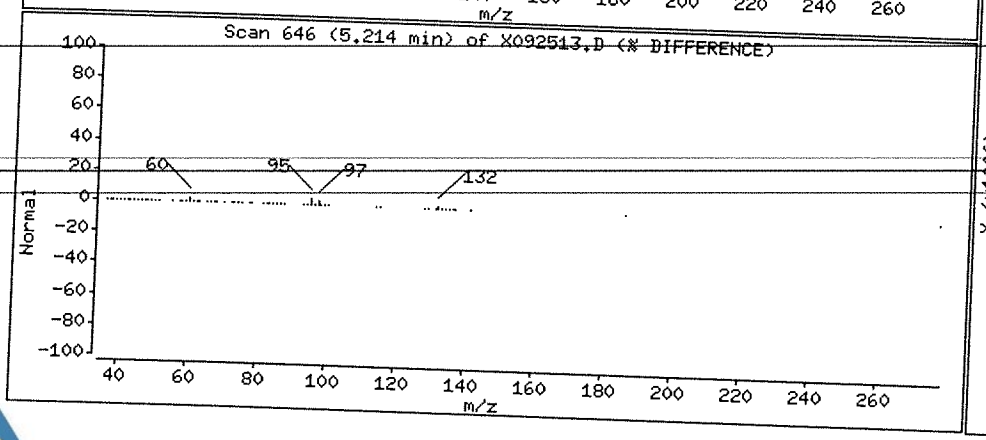


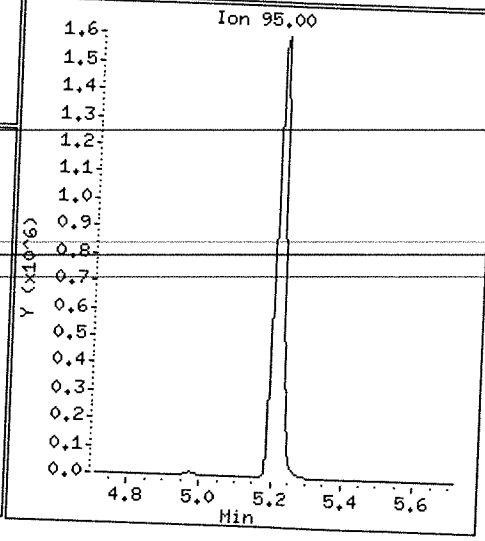












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092513.D

Date : 25-SEP-2019 15:02

Client ID: HS19090860-03

Instrument: voa6.i

Sample Info: HS19090860-03;HS19090860-03;;;

Purge Volume: 5.0

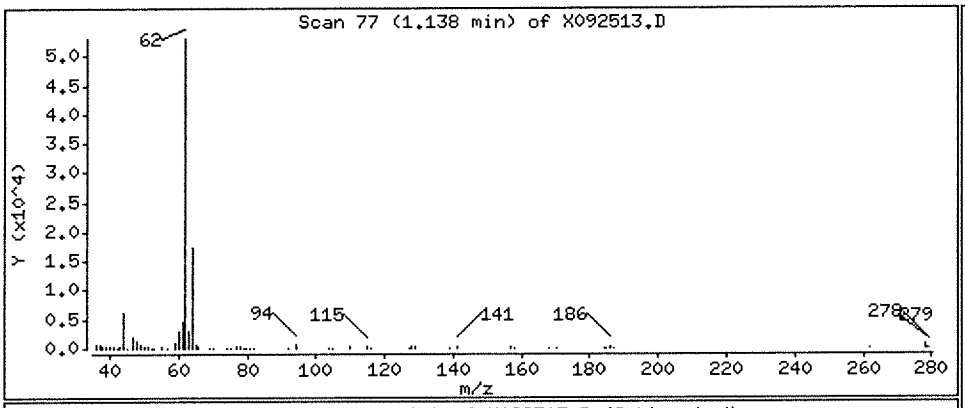
Operator: PC

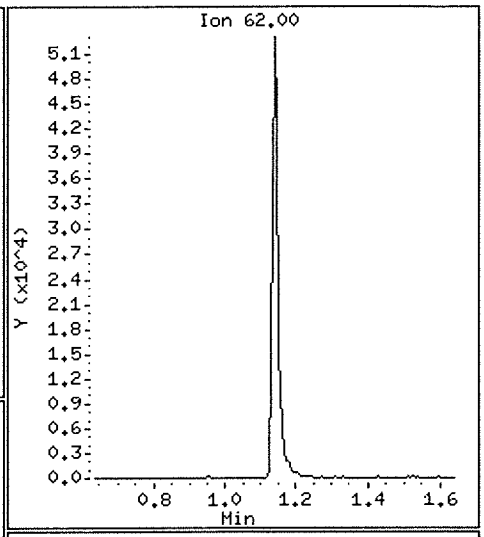
Column phase: DB624

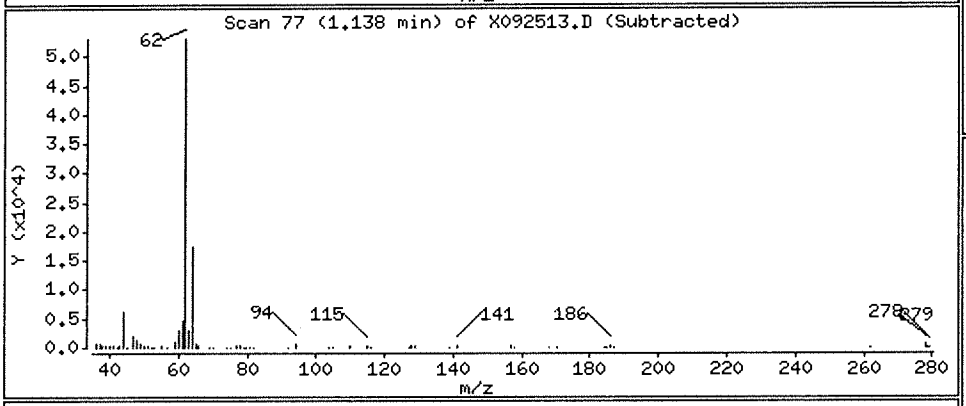
Column diameter: 0.18

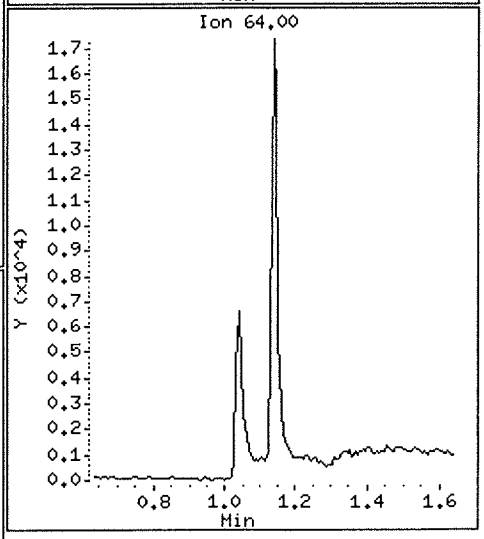
5 Vinyl Chloride

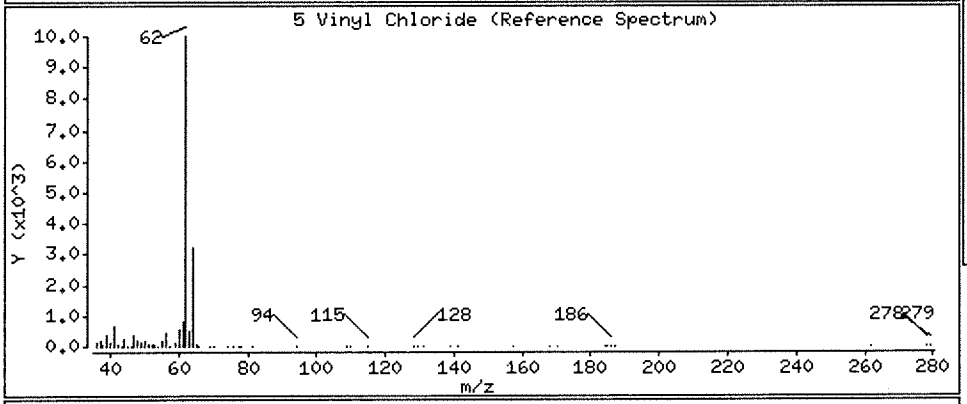
Concentration: 234.11 ug/l

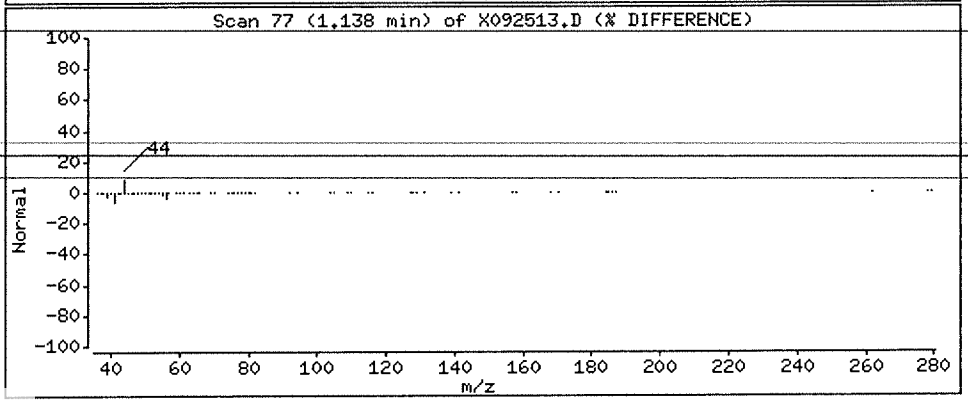












ALS Laboratory Group

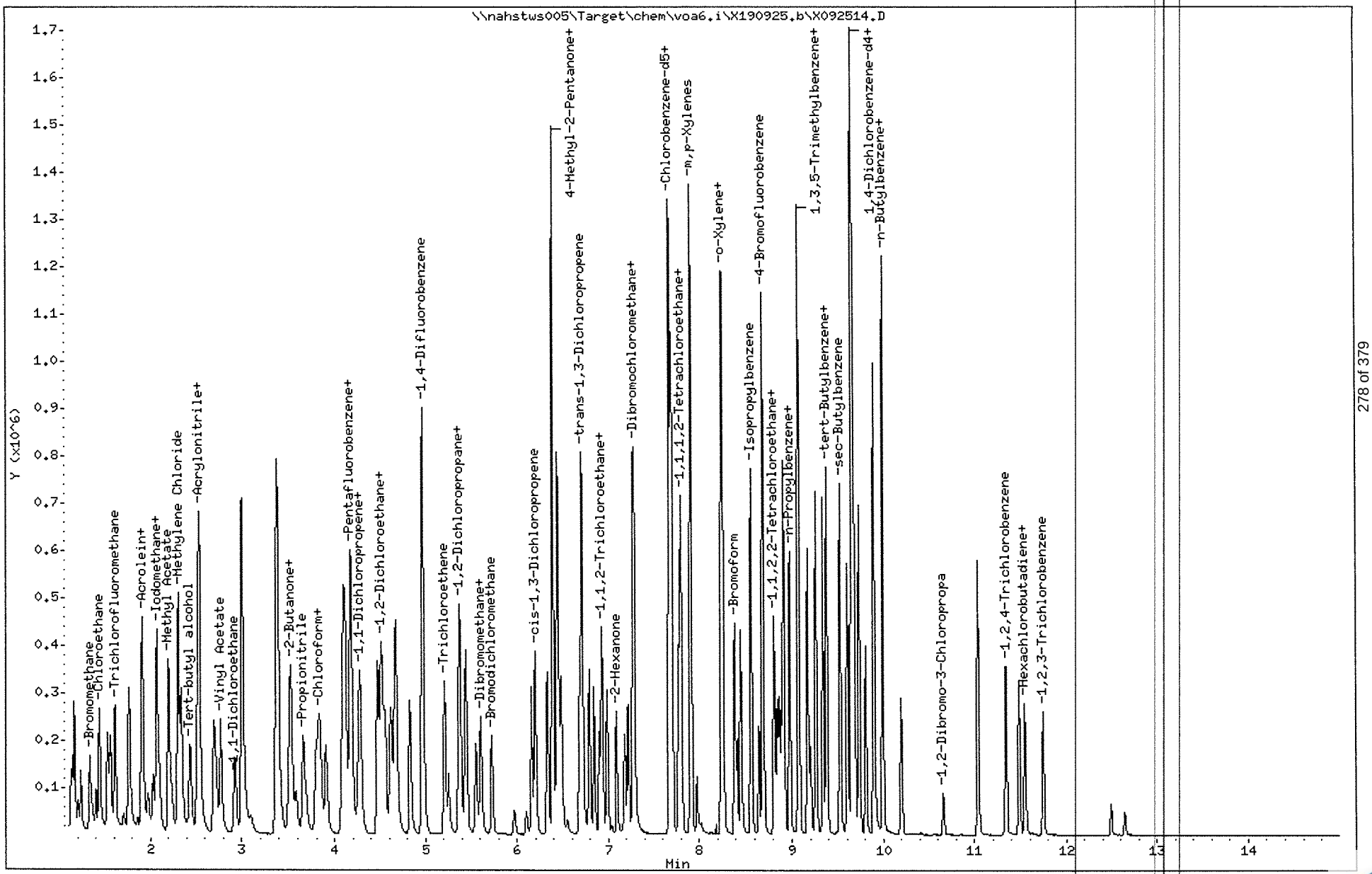
Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092514.D
Lab Smp Id: HS19090847-01MS Client Smp ID: HS19090847-01MS
Inj Date : 25-SEP-2019 15:26
Operator : PC Inst ID: voa6.i
Smp Info : HS19090847-01MS;HS19090847-01MS;3;;MS
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 14 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	74617	19.4811	19.48
	11 1,1-Dichloroethene	96	1.912	1.912	(0.457)	76473	17.2199	17.21
	33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	124141	17.7590	17.75
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	125980	19.8976	19.89
	17 Methylene Chloride	84	2.306	2.306	(0.551)	98959	16.8043	16.80
	38 Trichloroethene	130	5.214	5.214	(1.049)	114074	19.8230	19.82
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	93138	14.3465	14.34
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	265738	45.4702	45.47
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	312198	50.5460	50.54
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	235285	46.9390	46.93
$	48 Toluene-d8	98	6.389	6.388	(0.833)	896148	49.2616	49.26
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	512863	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	750742	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	647416	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	322512	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092514.D
Date : 25-SEP-2019 15:26
Client ID: HS19090847-01MS
Instrument: voa6.i
Sample Info: HS19090847-01MS;HS19090847-01MS;3;;MS
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



ALS Laboratory Group

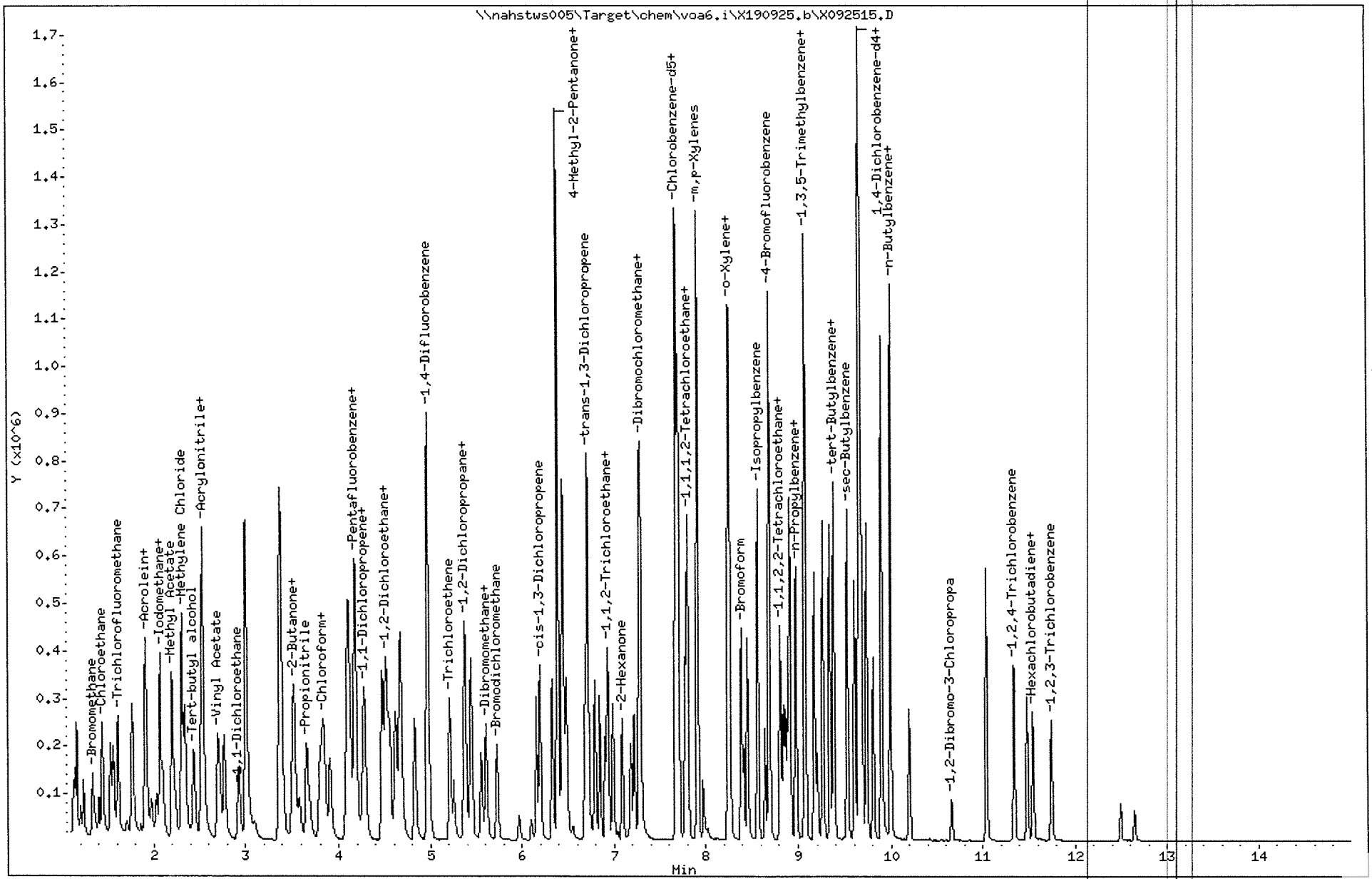
Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092515.D
Lab Smp Id: HS19090847-01MSD Client Smp ID: HS19090847-01MSD
Inj Date : 25-SEP-2019 15:50
Operator : PC Inst ID: voa6.i
Smp Info : HS19090847-01MSD;HS19090847-01MSD;3;;MSD
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 14 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	72430	18.6449	18.64
	11 1,1-Dichloroethene	96	1.911	1.912	(0.457)	70353	15.9619	15.96
	33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	119242	17.0614	17.06
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	115251	18.3410	18.34
	17 Methylene Chloride	84	2.305	2.306	(0.551)	94587	16.1204	16.12
	38 Trichloroethene	130	5.214	5.214	(1.049)	105219	18.2877	18.28
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	86586	13.4383	13.43
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	261228	45.0279	45.02
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	326152	52.2183	52.21
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	234731	47.1878	47.18
$	48 Toluene-d8	98	6.388	6.388	(0.833)	897824	48.7690	48.76
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	509006	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	750600	50.0000	
*	47 Chlorobenzene-d5	117	7.670	7.671	(1.000)	655178	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	341655	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092515.D
Date : 25-SEP-2019 15:50
Client ID: HS19090847-01MSD
Instrument: voa6.i
Sample Info: HS19090847-01MSD;HS19090847-01MSD;3;;MSD
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092516.D
Lab Smp Id: HS19090860-03 Client Smp ID: HS19090860-03
Inj Date : 25-SEP-2019 16:14
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-03;HS19090860-03;;;
Misc Info : HS18090001;WATER;0;250;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 15
Dil Factor: 250.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	250.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

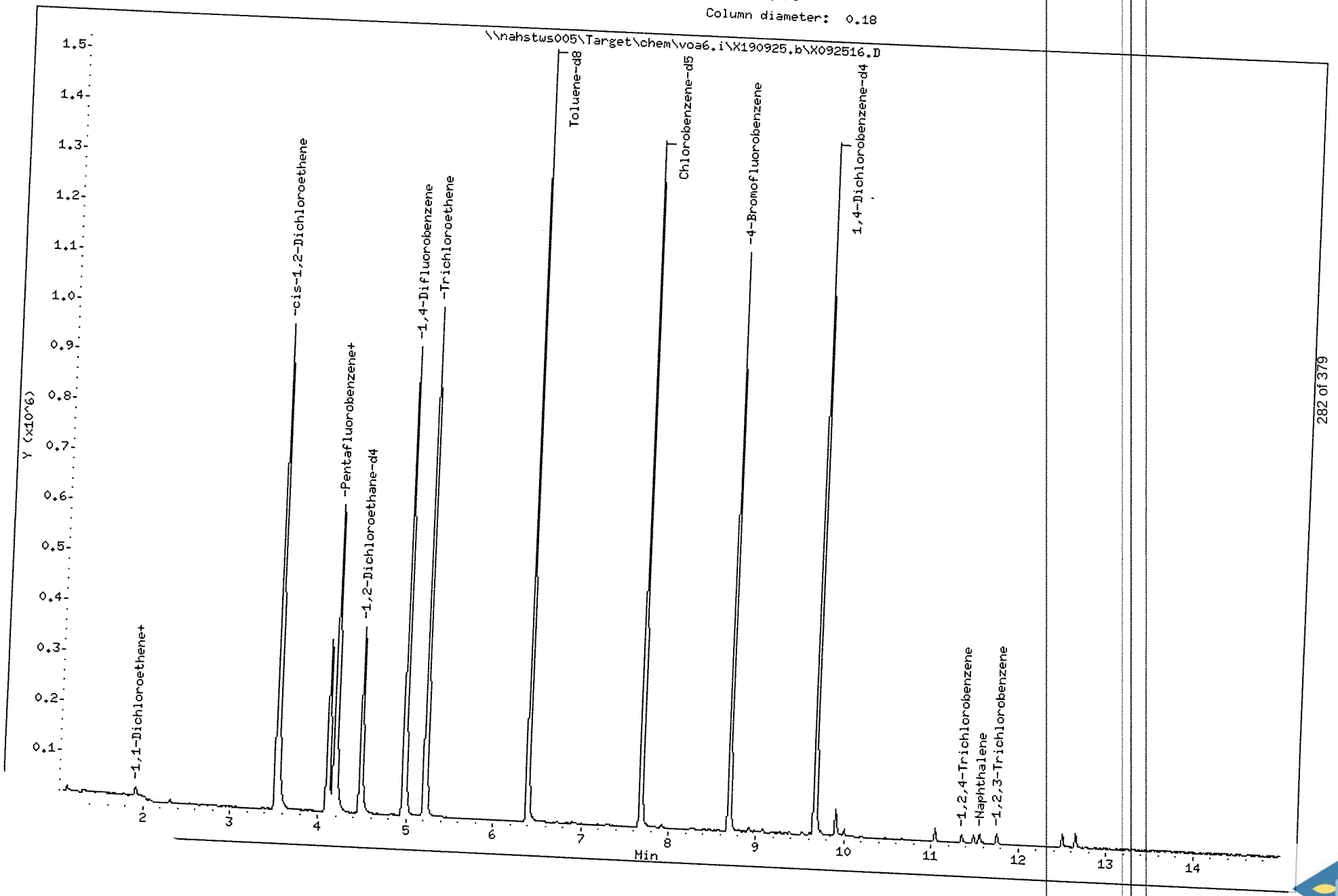
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
11 1,1-Dichloroethene	96	1.912	1.912	(0.457)	3856	0.84620	211.55(a)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	496229	76.3826	19095.64
38 Trichloroethene	130	5.214	5.214	(1.049)	362007	60.7617	15190.42
5 Vinyl Chloride	62	1.138	1.138	(0.272)	7059	1.05968	264.92(a)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	272710	45.4767	45.47
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	328337	51.9891	51.98
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	241114	46.8776	46.87
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	920669	49.4639	49.46
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	526245	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	777250	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	662410	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	325205	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092516.D
Date : 25-SEP-2019 16:14
Client ID: HS19090860-03
Sample Info: HS19090860-03;HS19090860-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



ıta File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092516.D

Date : 25-SEP-2019 16:14

Client ID: HS19090860-03

Instrument: voa6.i

Sample Info: HS19090860-03;HS19090860-03;;;

Purge Volume: 5.0

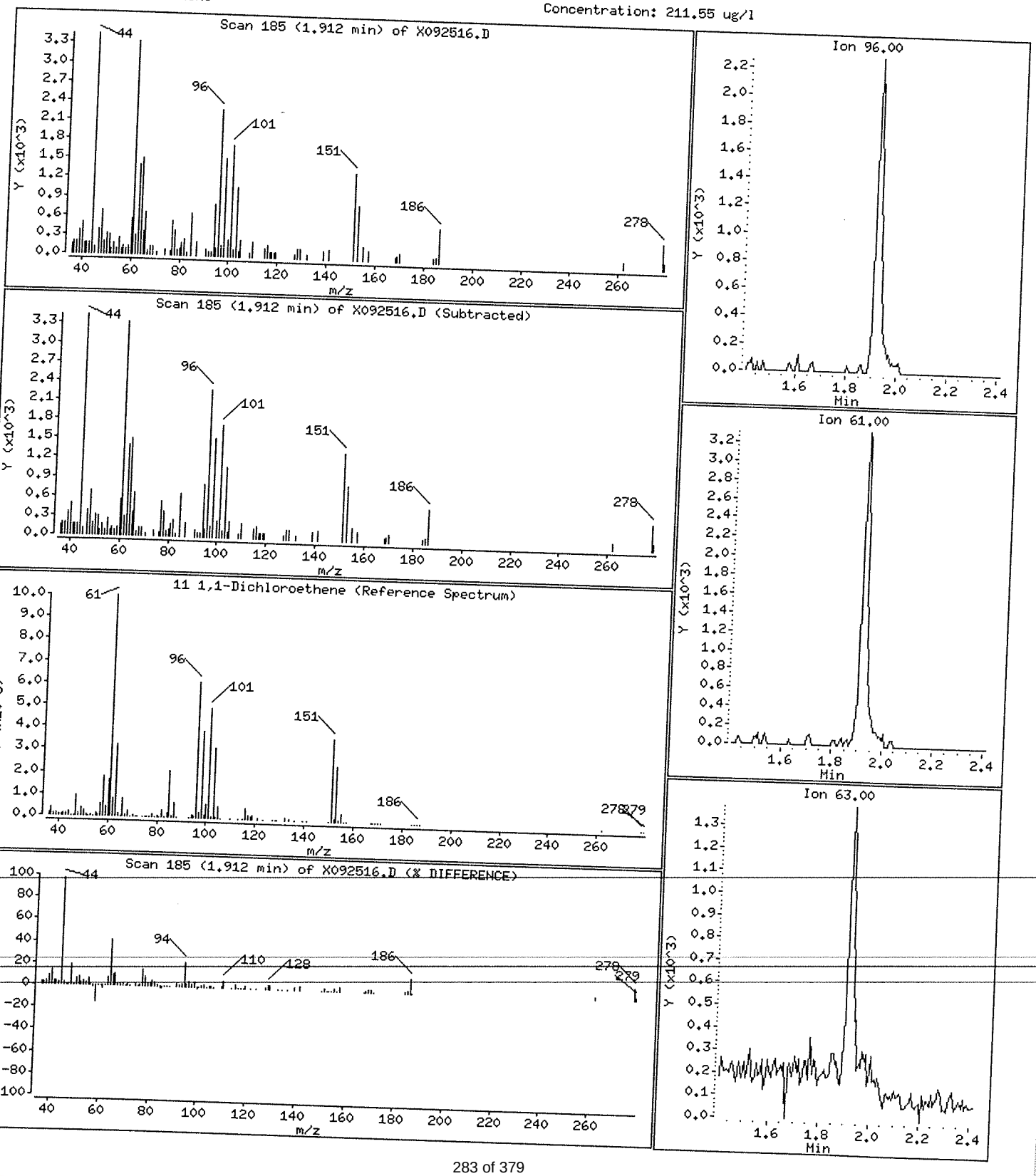
Operator: PC

Column phase: DB624

Column diameter: 0.18

11 1,1-Dichloroethene

Concentration: 211.55 ug/l



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092516.D

Date : 25-SEP-2019 16:14

Client ID: HS19090860-03

Instrument: voa6.i

Sample Info: HS19090860-03;HS19090860-03;;;

Purge Volume: 5.0

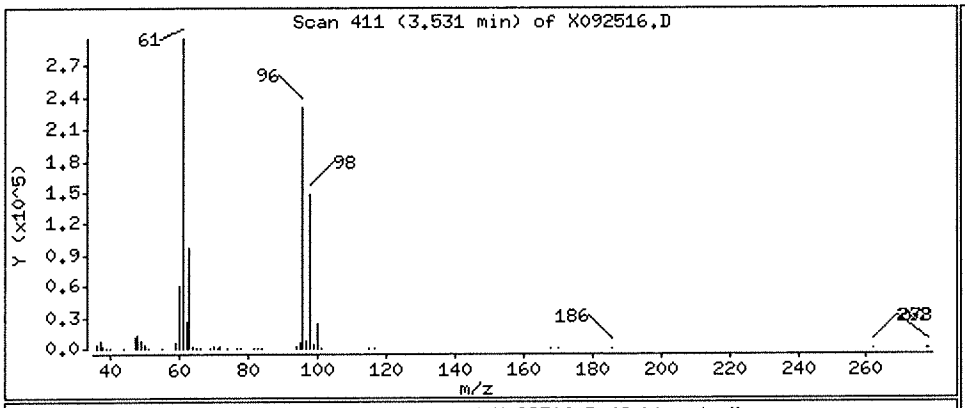
Operator: PC

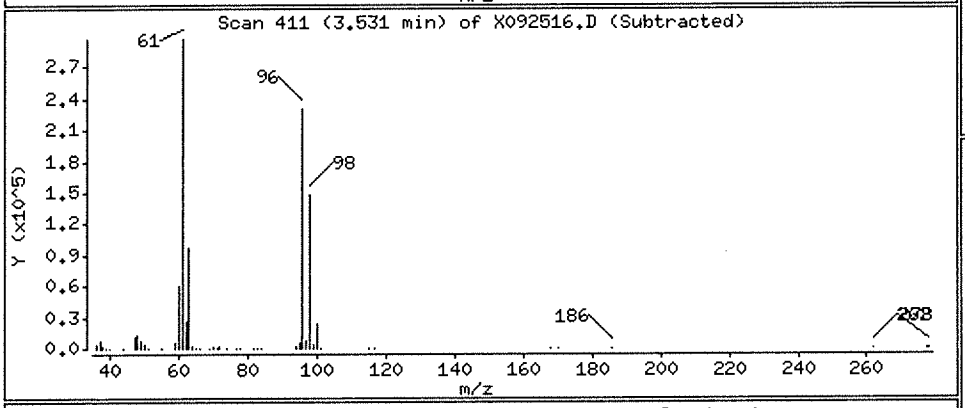
Column phase: DB624

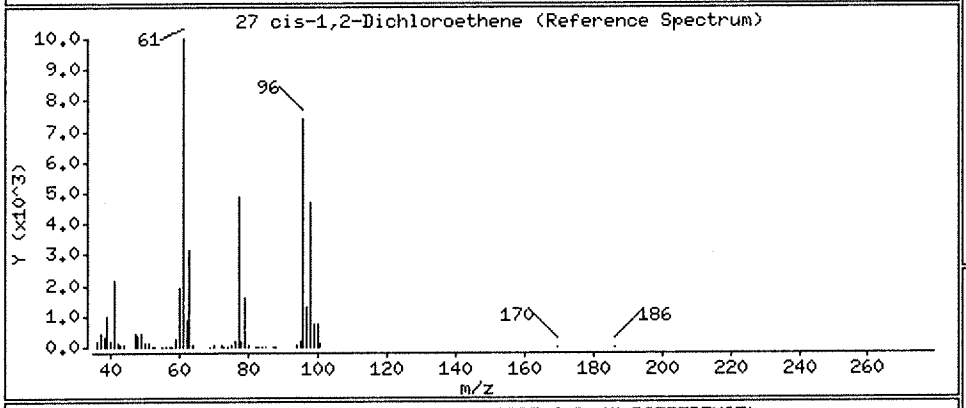
Column diameter: 0.18

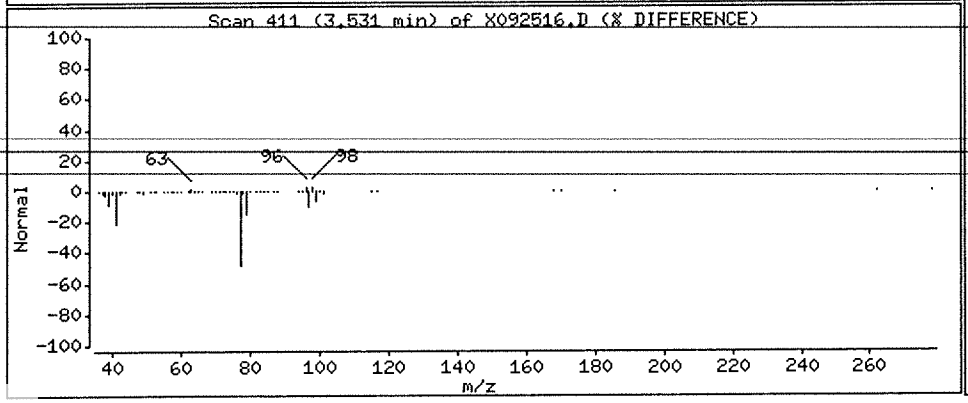
27 cis-1,2-Dichloroethene

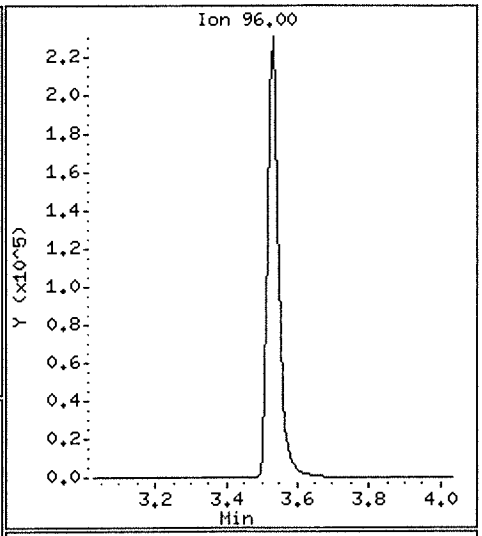
Concentration: 19095.64 ug/l

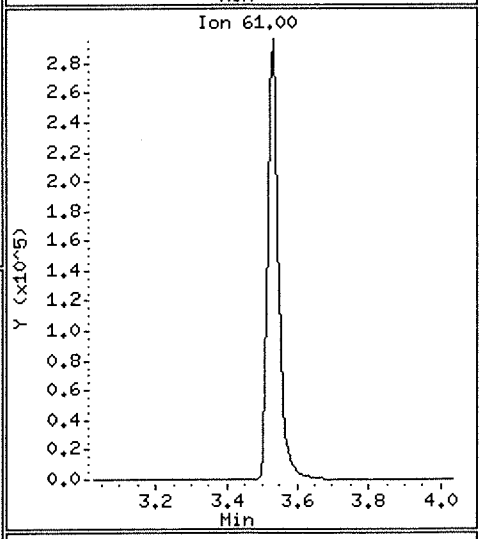


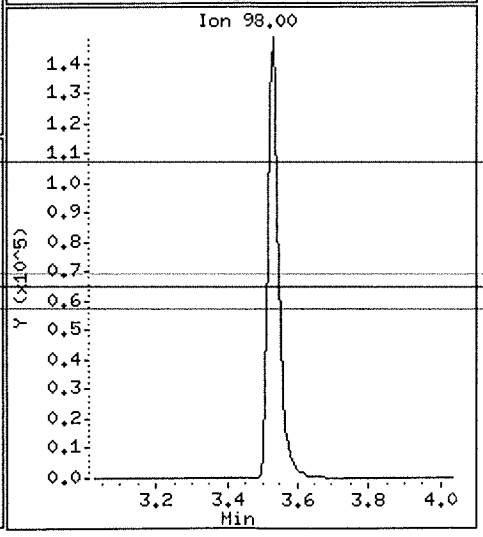












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092516.D

Date : 25-SEP-2019 16:14

Client ID: HS19090860-03

Sample Info: HS19090860-03;HS19090860-03;;;

Purge Volume: 5.0

Column phase: DB624

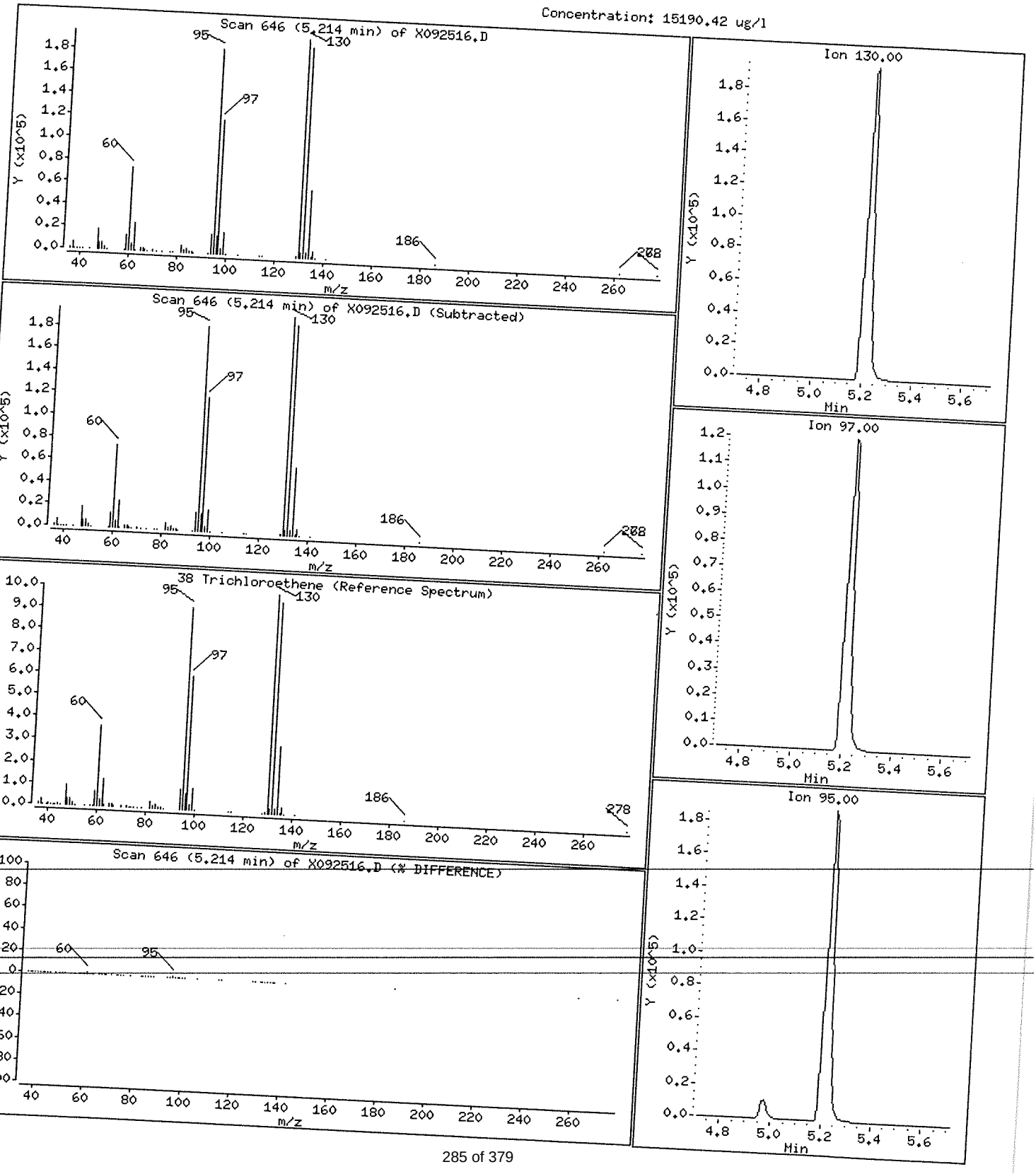
Instrument: voa6.i

Operator: PC

Column diameter: 0.18

38 Trichloroethene

Concentration: 15190.42 ug/l



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092516.D

Date : 25-SEP-2019 16:14

Client ID: HS19090860-03

Instrument: voa6.i

Sample Info: HS19090860-03;HS19090860-03;;;

Purge Volume: 5.0

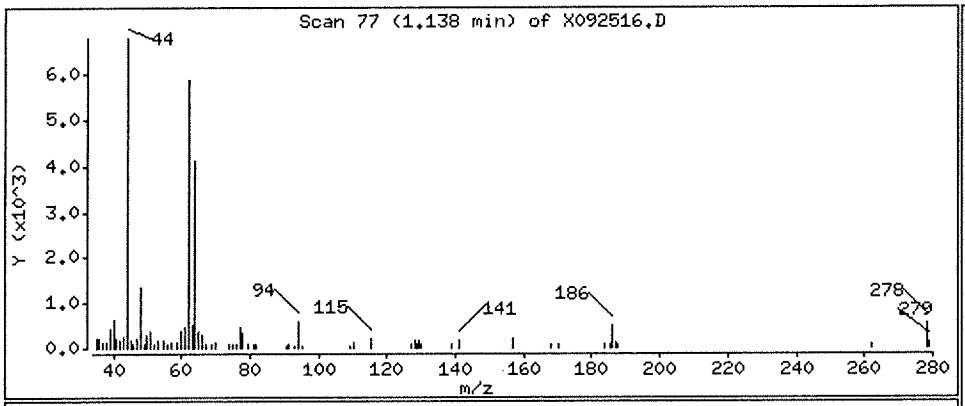
Operator: PC

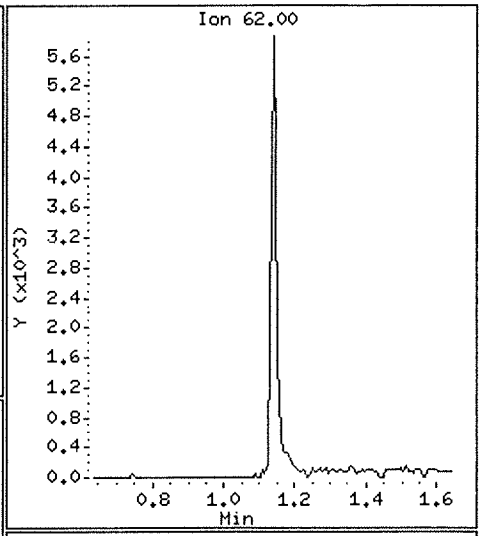
Column phase: DB624

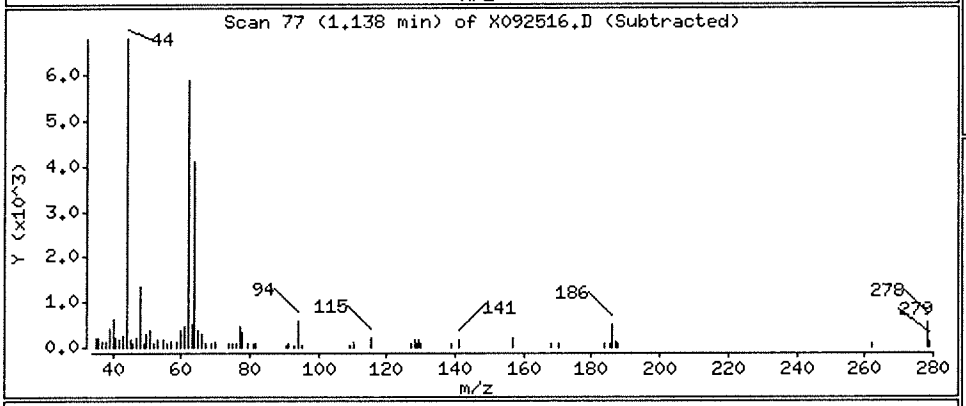
Column diameter: 0.18

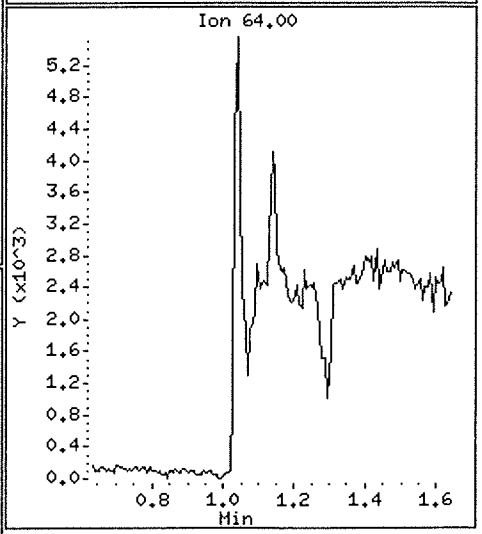
5 Vinyl Chloride

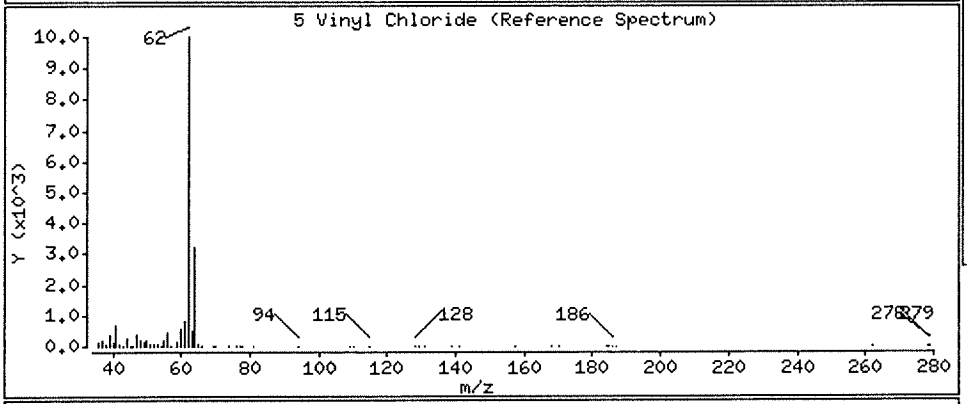
Concentration: 264.92 ug/l

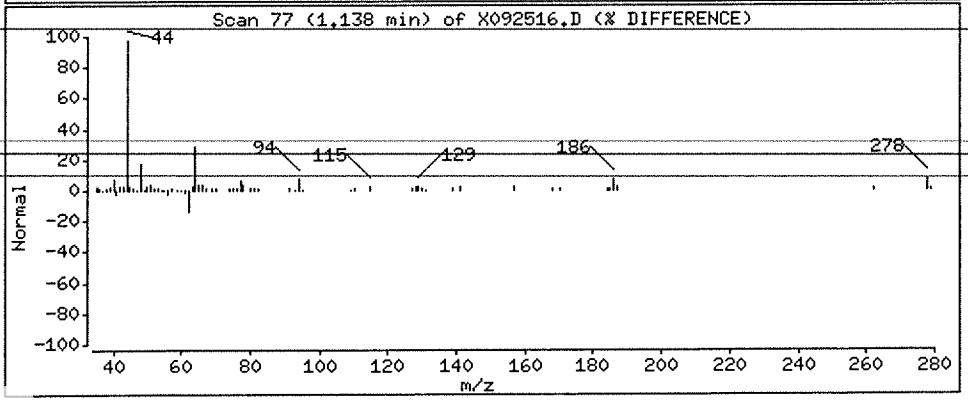












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092517.D
Lab Smp Id: HS19090860-04 Client Smp ID: HS19090860-04
Inj Date : 25-SEP-2019 16:38
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-04;HS19090860-04;;;
Misc Info : HS18090001;WATER;0;5;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 16
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

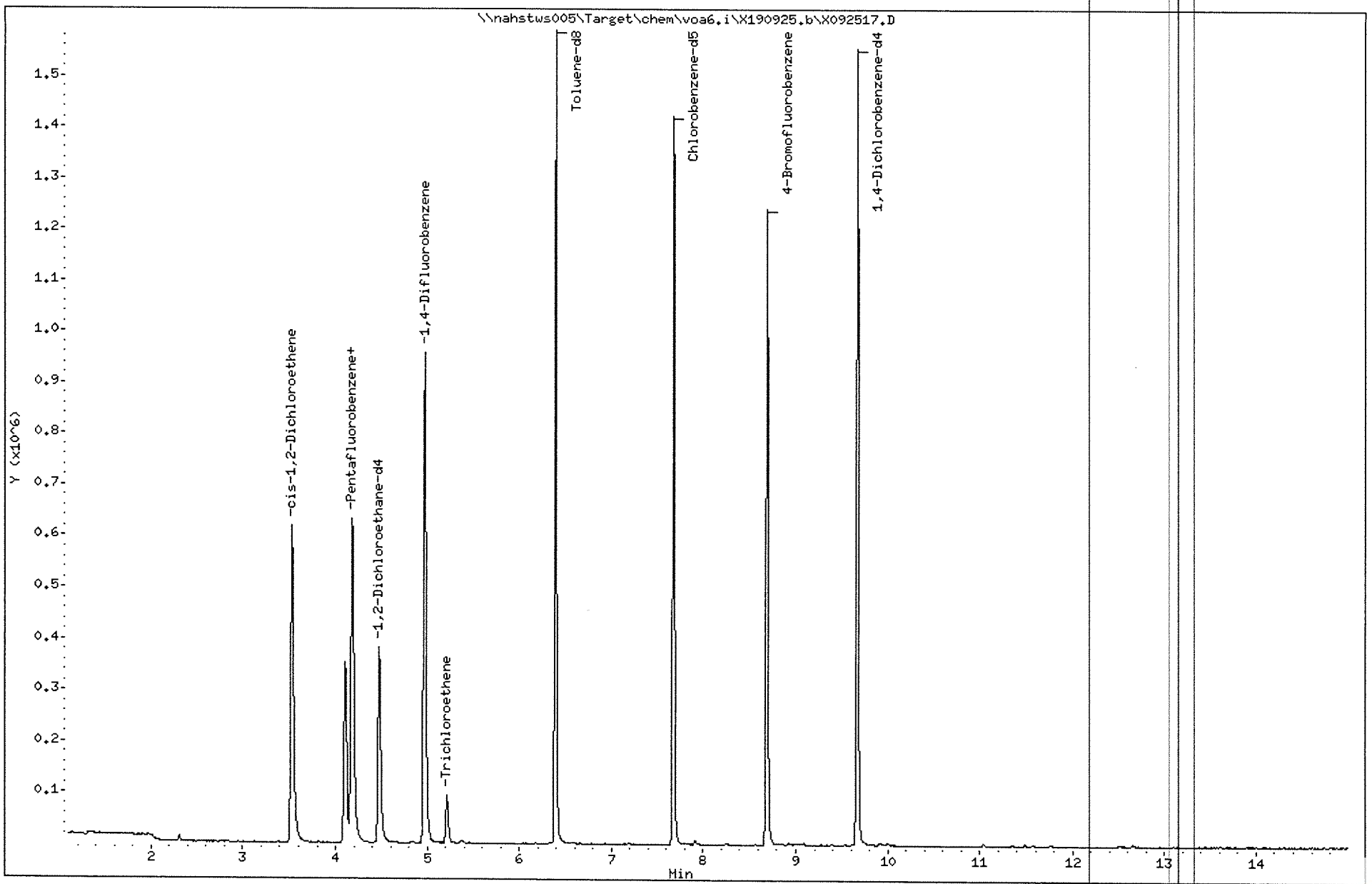
Name	Value	Description
DF	5.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	320503	47.9048	239.52
38 Trichloroethene	130	5.214	5.214	(1.049)	32832	5.33088	26.65
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	279845	45.3113	45.31
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	355399	53.8066	53.80
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	248425	46.9004	46.90
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	950318	48.7809	48.78
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	541943	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	803475	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	693315	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	372297	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092517.D
Date : 25-SEP-2019 16:38
Client ID: HS19090860-04
Sample Info: HS19090860-04;HS19090860-04;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i

Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092517.D

Date : 25-SEP-2019 16:38

Client ID: HS19090860-04

Instrument: voa6.i

Sample Info: HS19090860-04;HS19090860-04;;;

Purge Volume: 5.0

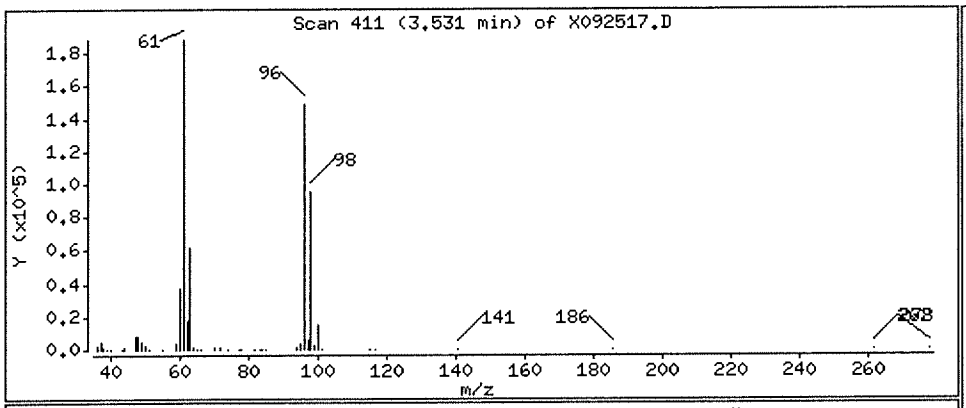
Operator: PC

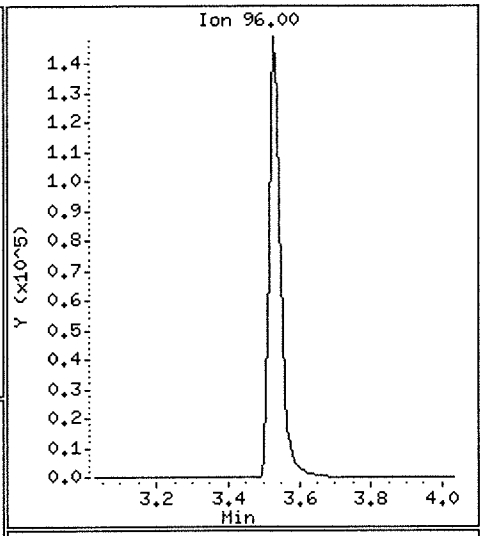
Column phase: DB624

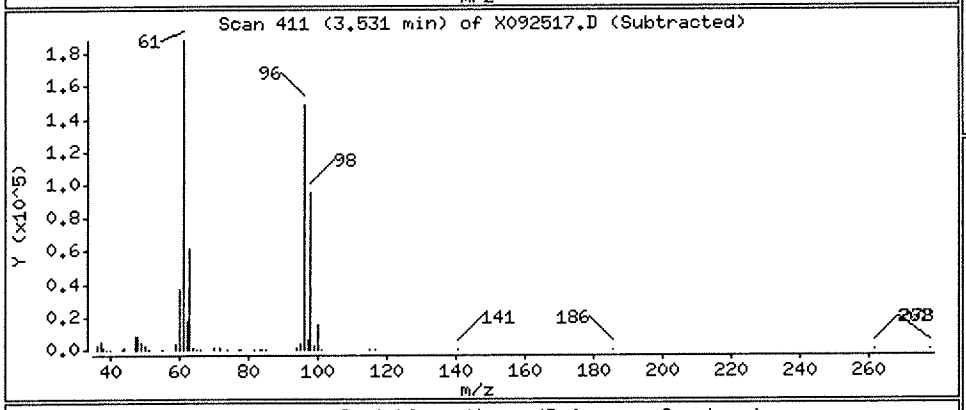
Column diameter: 0.18

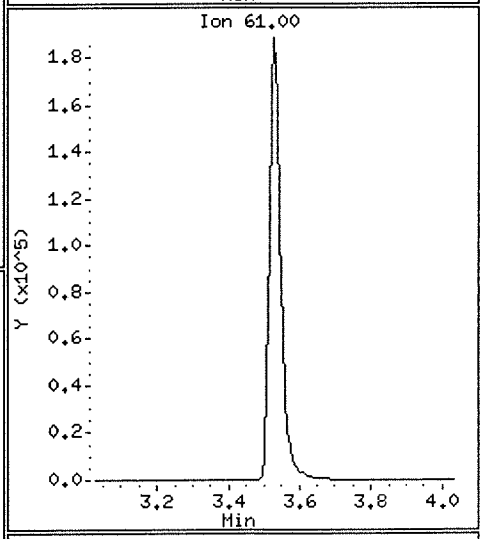
27 cis-1,2-Dichloroethene

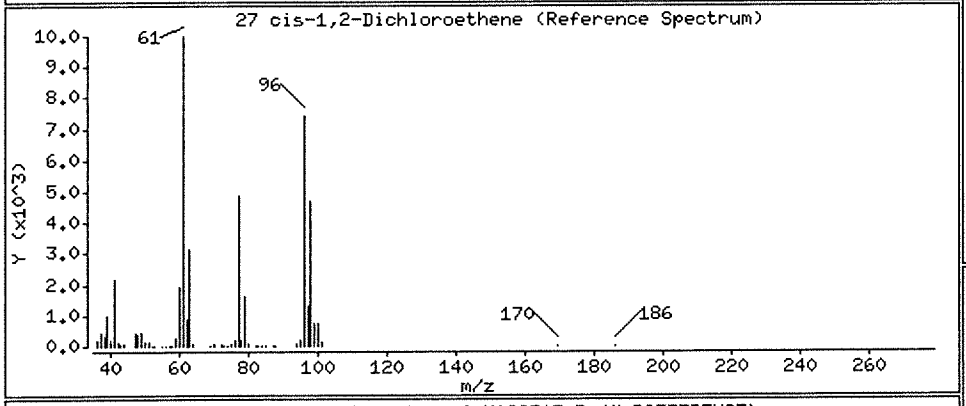
Concentration: 239.52 ug/l

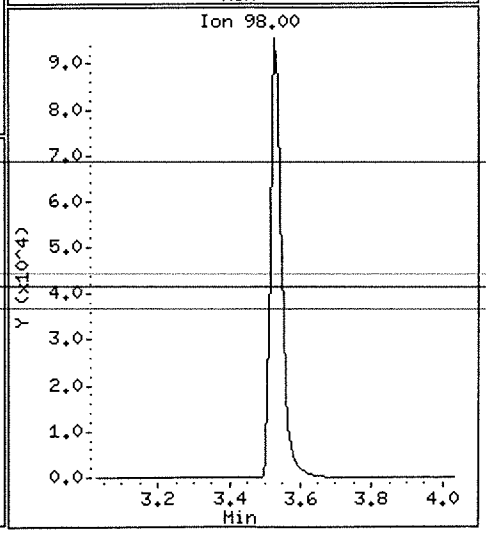


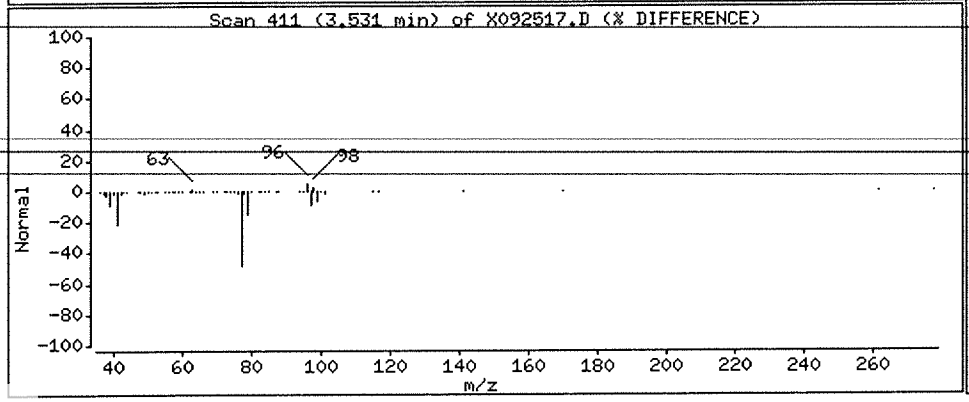












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092517.D

Date : 25-SEP-2019 16:38

Client ID: HS19090860-04

Instrument: voa6.i

Sample Info: HS19090860-04;HS19090860-04;;;

Purge Volume: 5.0

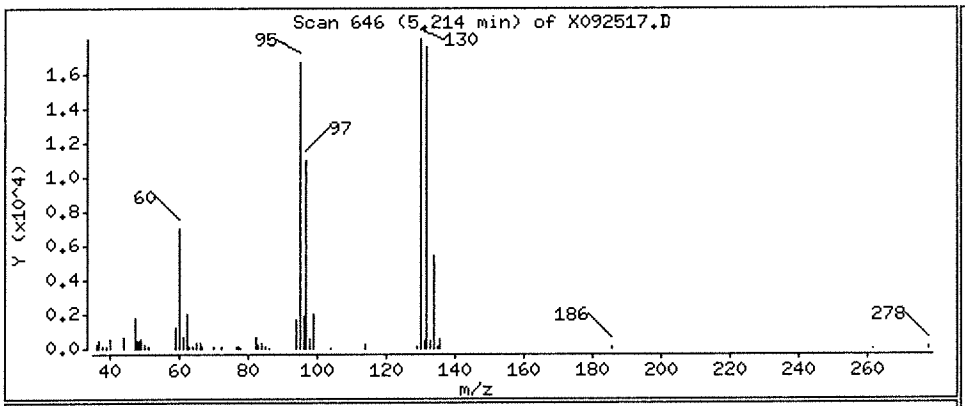
Operator: PC

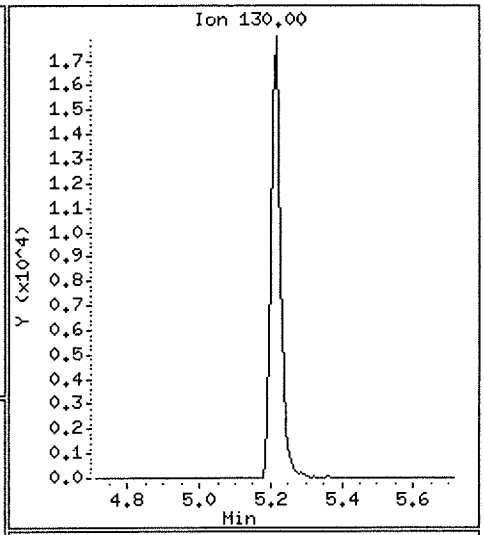
Column phase: DB624

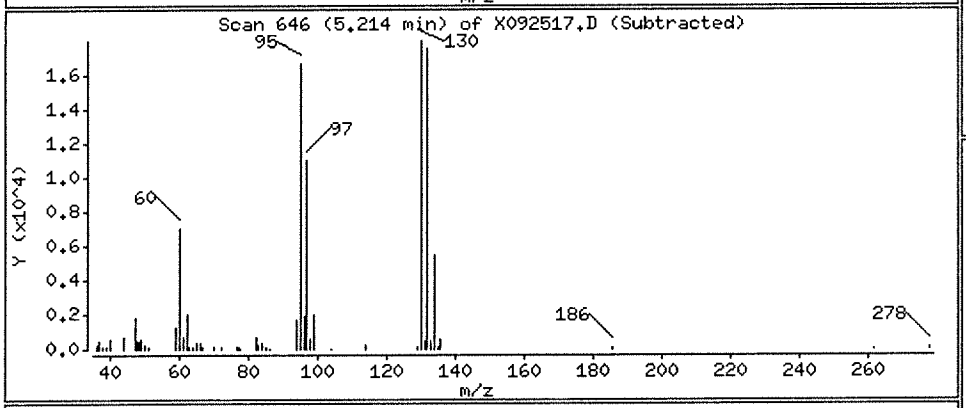
Column diameter: 0.18

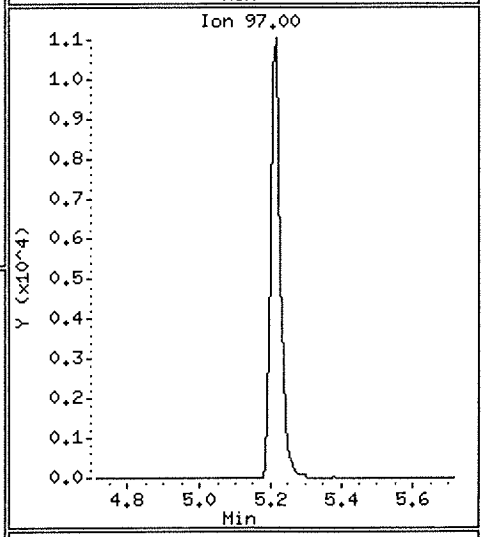
38 Trichloroethene

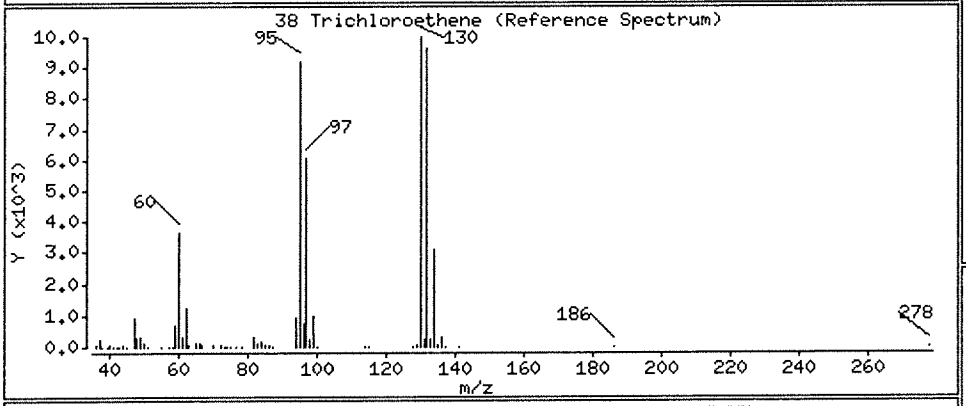
Concentration: 26.65 ug/l

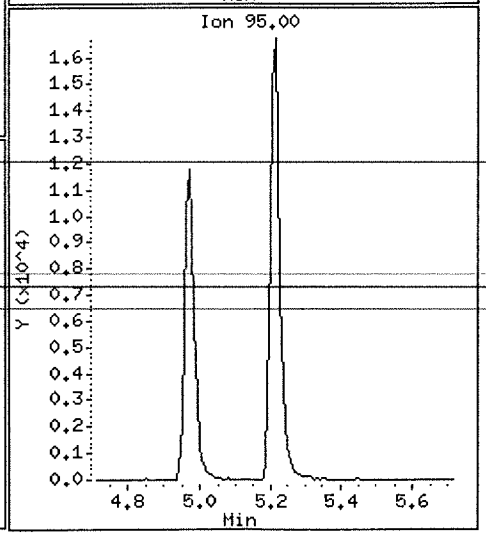


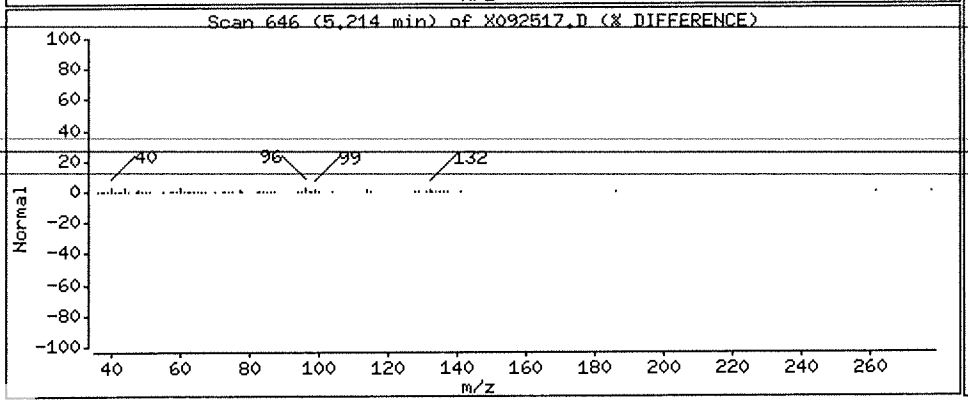












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092518.D
Lab Smp Id: HS19090860-13 Client Smp ID: HS19090860-13
Inj Date : 25-SEP-2019 17:02
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-13;HS19090860-13;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 17
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

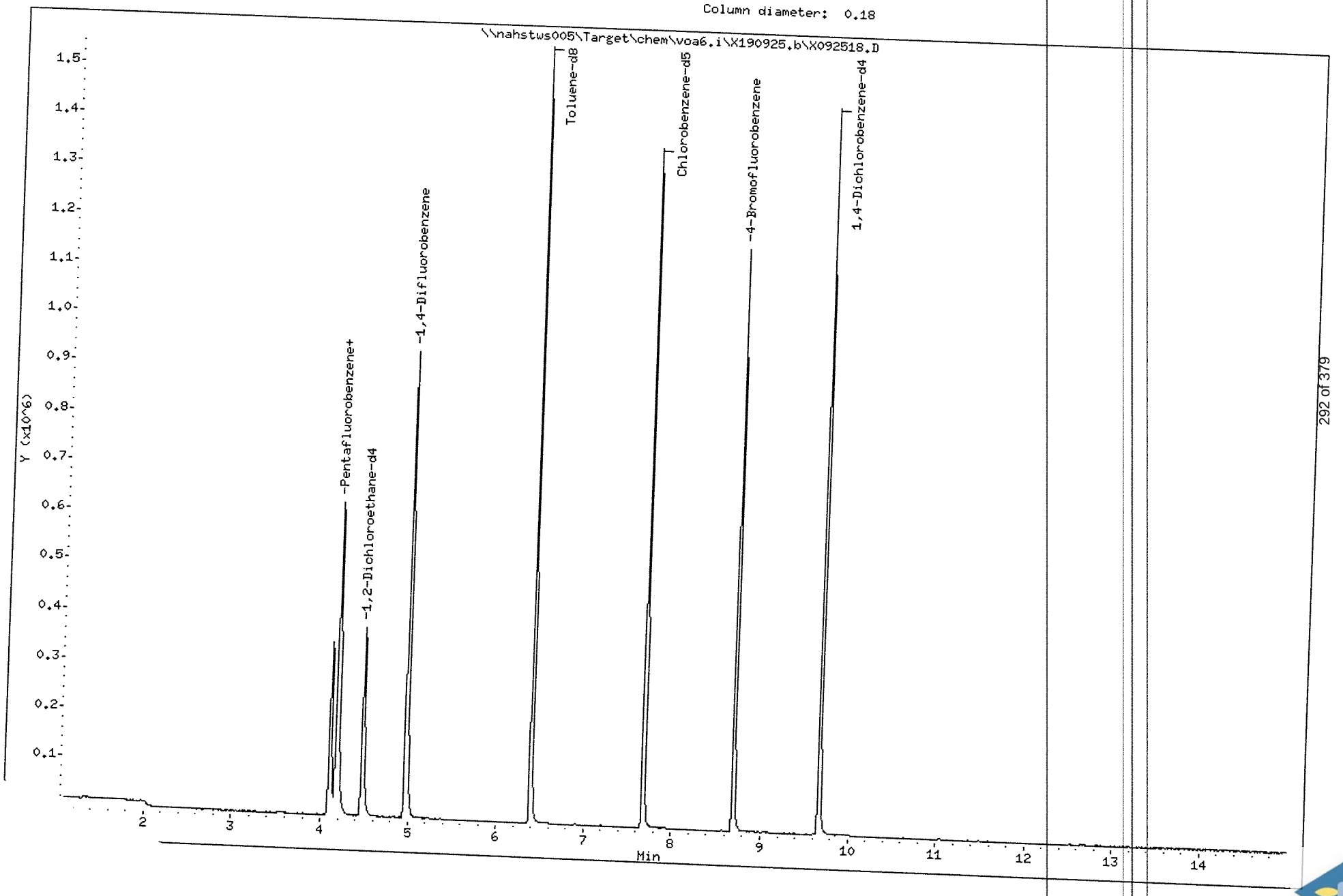
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	279429	45.3703	45.37
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	327649	51.0805	51.08
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.979)	245708	46.5086	46.50
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	939702	49.7282	49.72
* 1 Pentafluorobenzene	168	4.189	4.189	(1.000)	540449	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	790174	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	672511	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	344841	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092518.D
Date : 25-SEP-2019 17:02
Client ID: HS19090860-13
Sample Info: HS19090860-13;HS19090860-13;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i

Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092519.D
Lab Smp Id: HS19090860-14 Client Smp ID: HS19090860-14
Inj Date : 25-SEP-2019 17:26
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-14;HS19090860-14;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 18
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

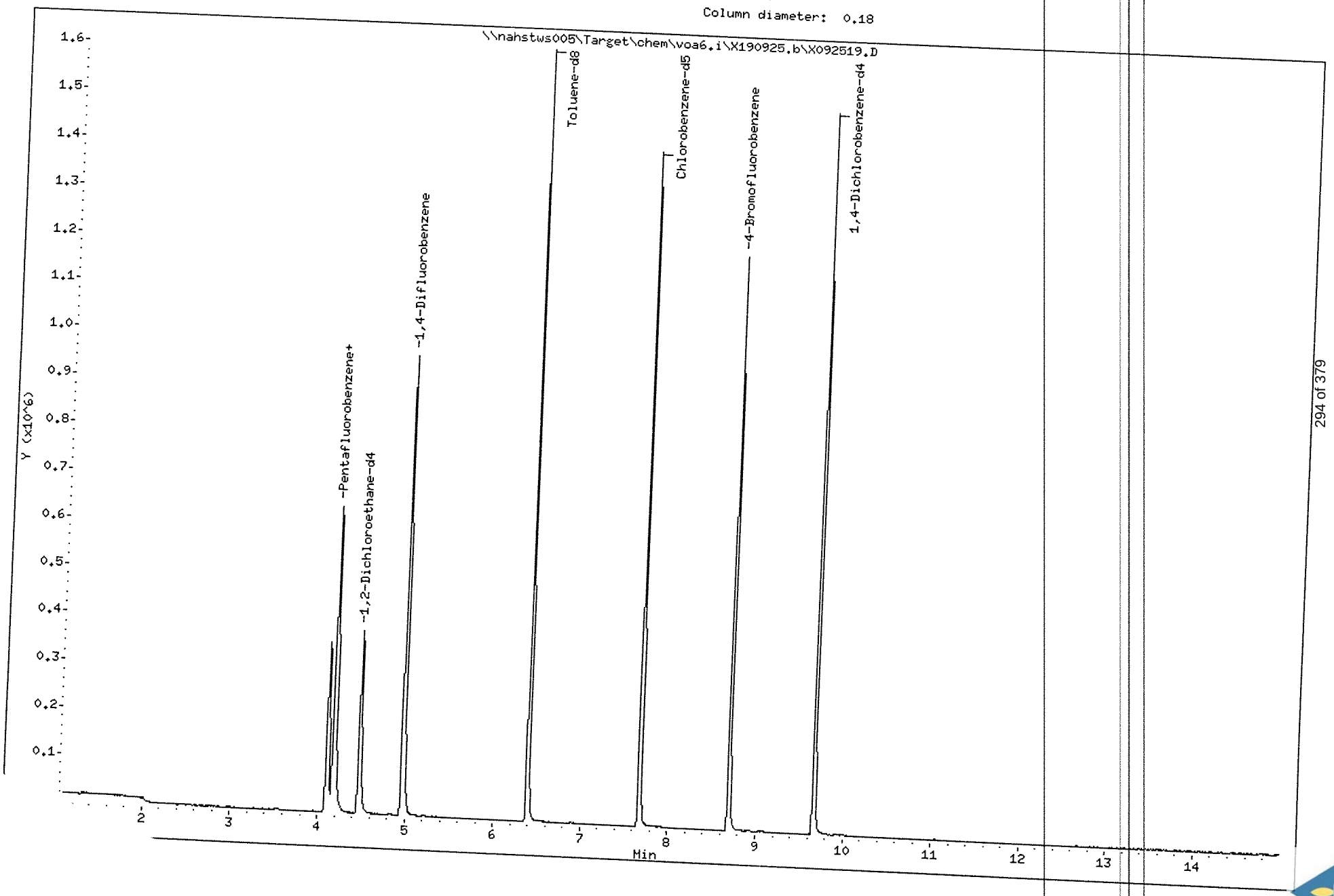
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	283901	45.3085	45.30
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	341337	52.4833	52.48
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	249785	46.4729	46.47
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	956491	49.8907	49.89
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	549831	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	810611	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	682297	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	357046	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092519.D
Date : 25-SEP-2019 17:26
Client ID: HS19090860-14
Sample Info: HS19090860-14;HS19090860-14;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092522.D
Lab Smp Id: HS19090860-09 Client Smp ID: HS19090860-09
Inj Date : 25-SEP-2019 18:38
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-09;HS19090860-09;;;
Misc Info : HS18090001;WATER;0;5;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 21
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

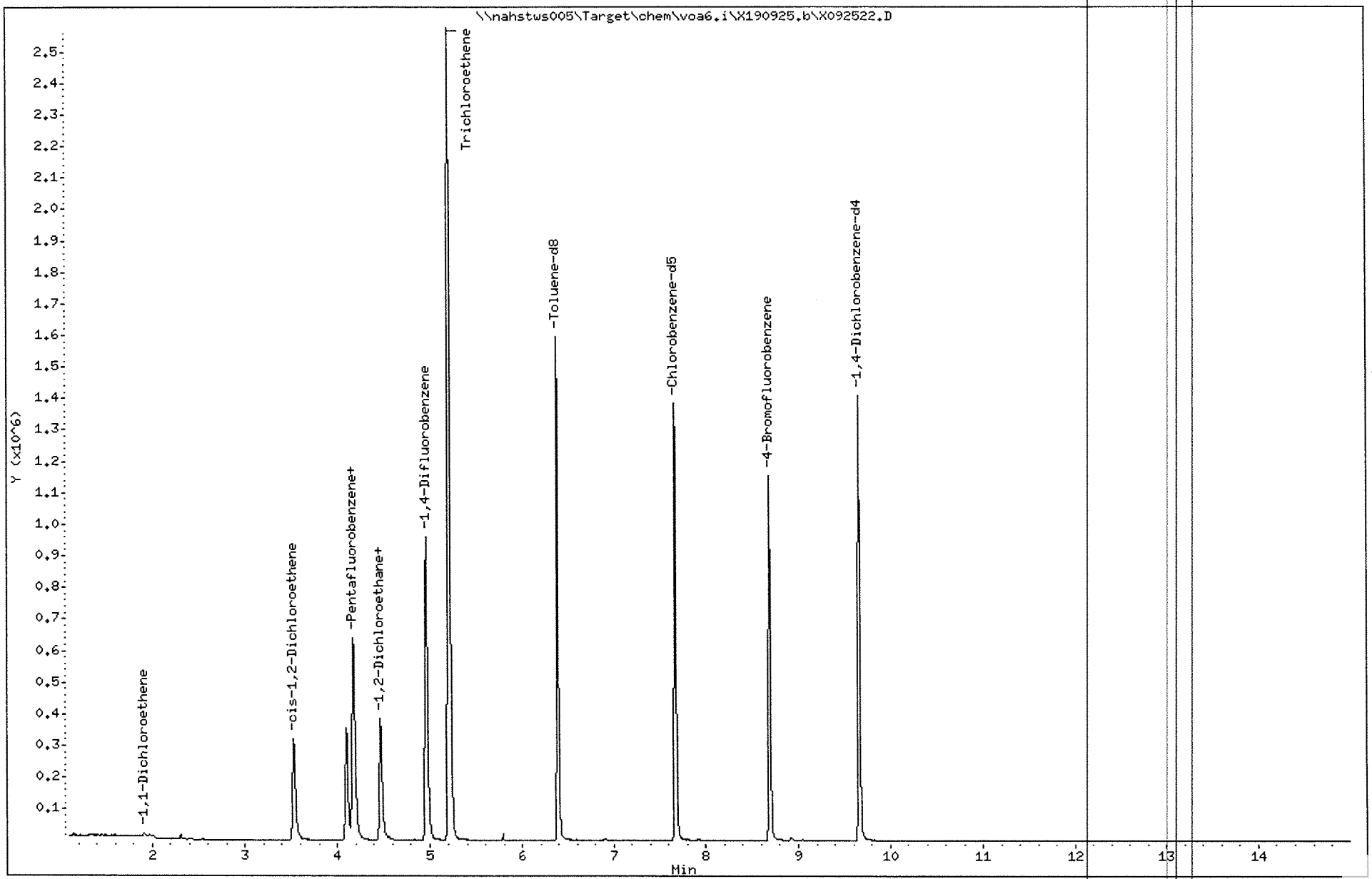
Name	Value	Description
DF	5.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	11 1,1-Dichloroethene	96	1.911	1.912	(0.457)	2768	0.58173	2.90(a)
	33 1,2-Dichloroethane	62	4.569	4.562	(0.919)	6358	0.84722	4.23(a)
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	169381	24.9685	124.84
	38 Trichloroethene	130	5.214	5.214	(1.049)	915769	148.231	741.15
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	3801	0.54644	2.73(a)
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	282911	45.1745	45.17
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	335998	51.9420	51.94
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	248985	46.3493	46.34
$	48 Toluene-d8	98	6.388	6.388	(0.833)	941797	49.4015	49.40
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	549505	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	805973	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	678467	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	347817	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092522.D
Date : 25-SEP-2019 18:38
Client ID: HS19090860-09
Instrument: voa6.i
Sample Info: HS19090860-09;HS19090860-09;;;
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092522.D

Date : 25-SEP-2019 18:38

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

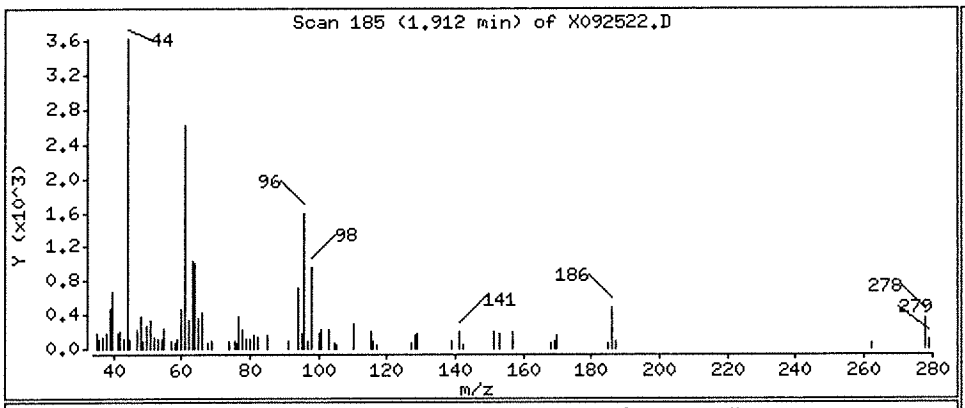
Operator: PC

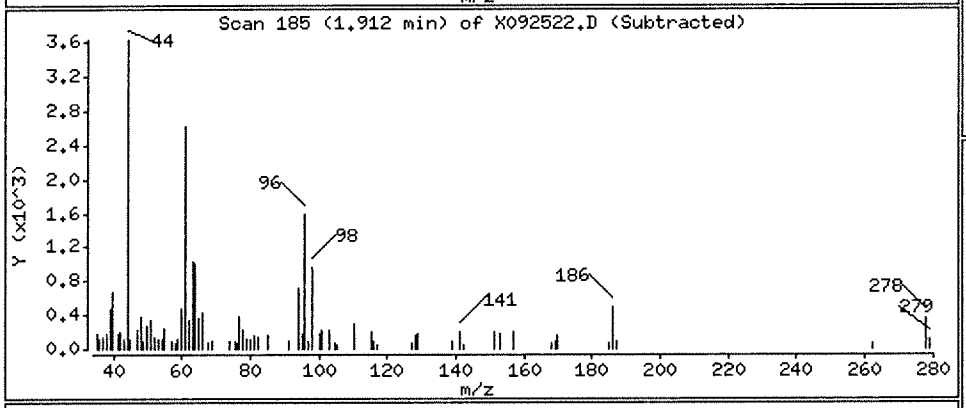
Column phase: DB624

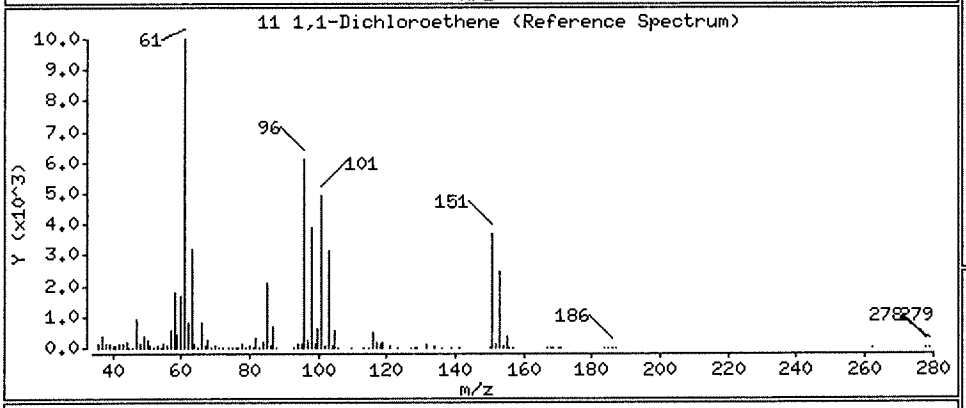
Column diameter: 0.18

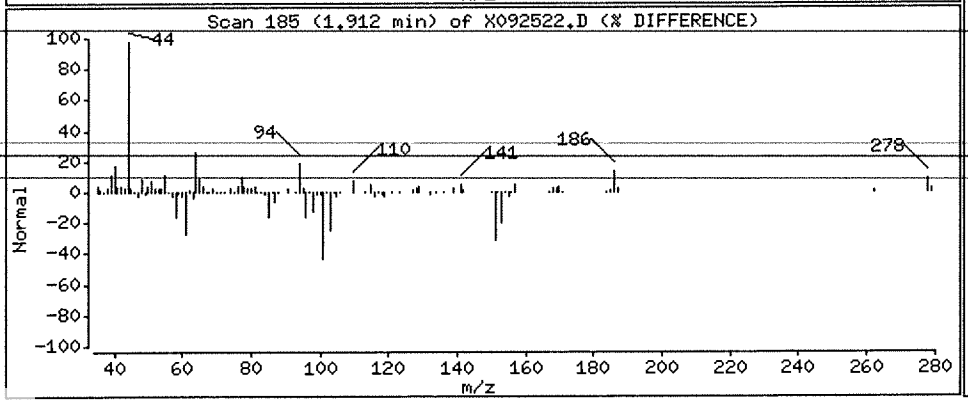
11 1,1-Dichloroethene

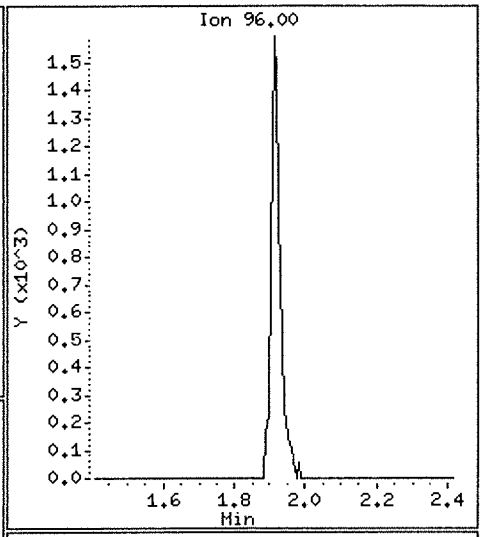
Concentration: 2.90 ug/l

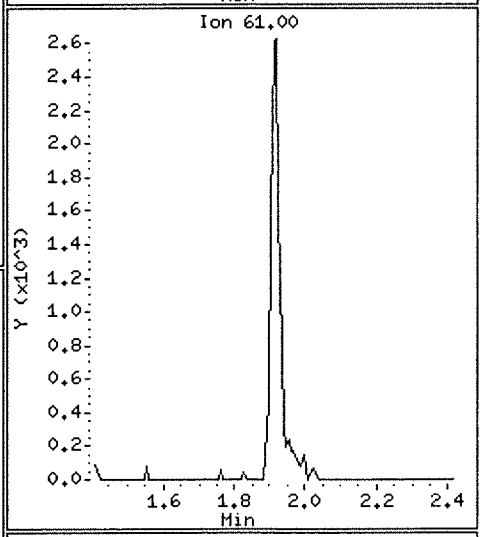


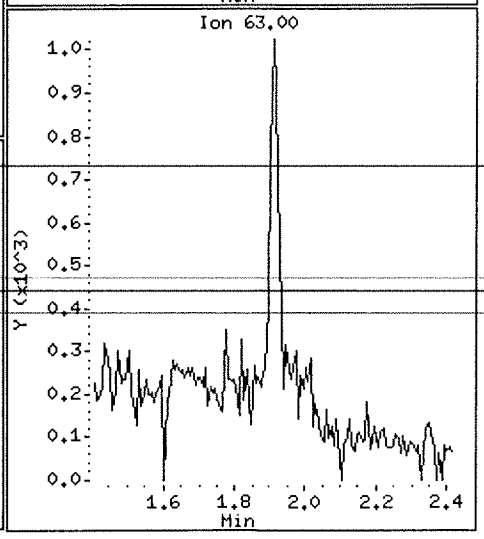












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092522.D

Date : 25-SEP-2019 18:38

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

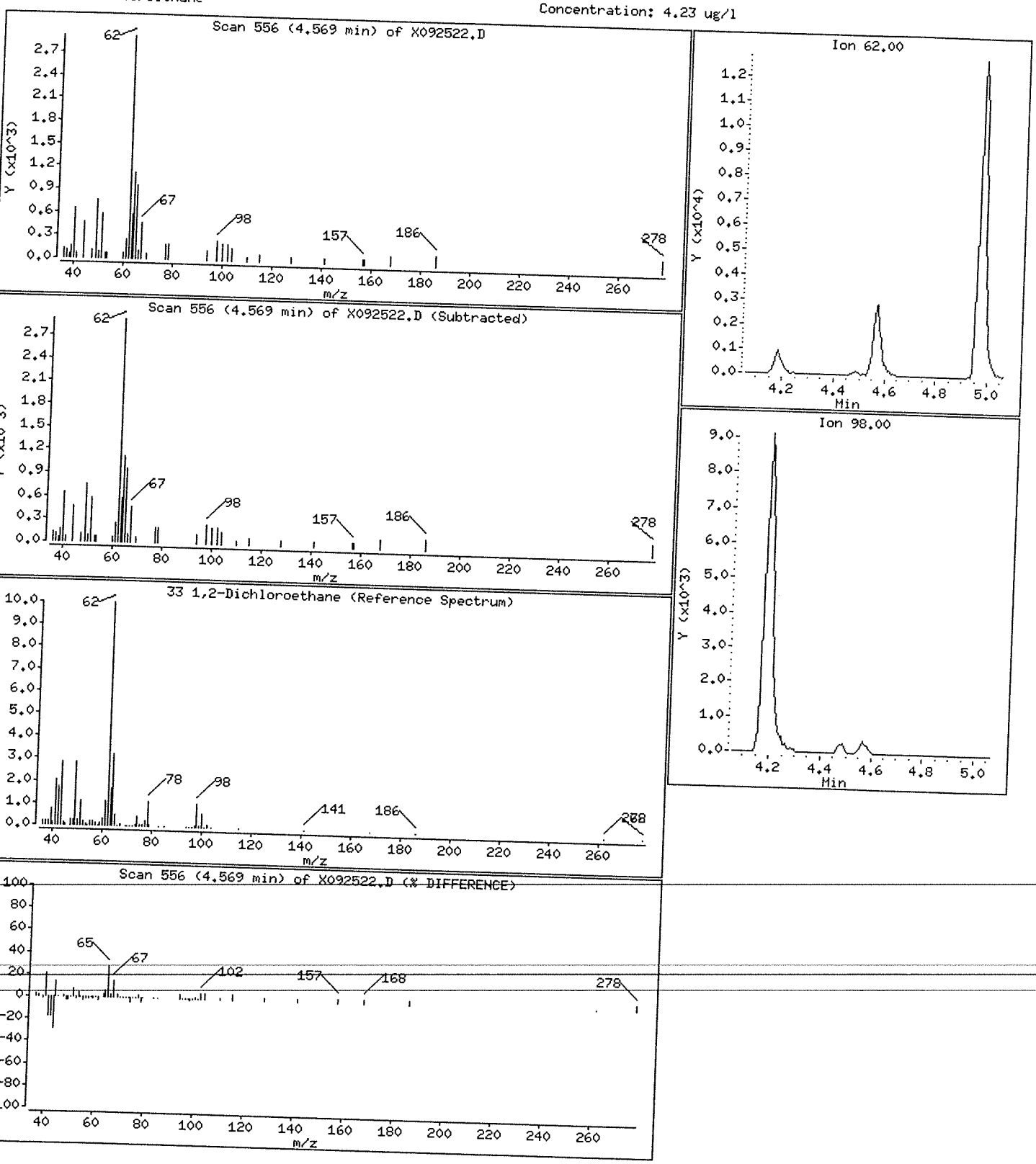
Operator: PC

Column phase: DB624

Column diameter: 0.18

33 1,2-Dichloroethane

Concentration: 4.23 ug/l



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Date : 25-SEP-2019 18:38

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

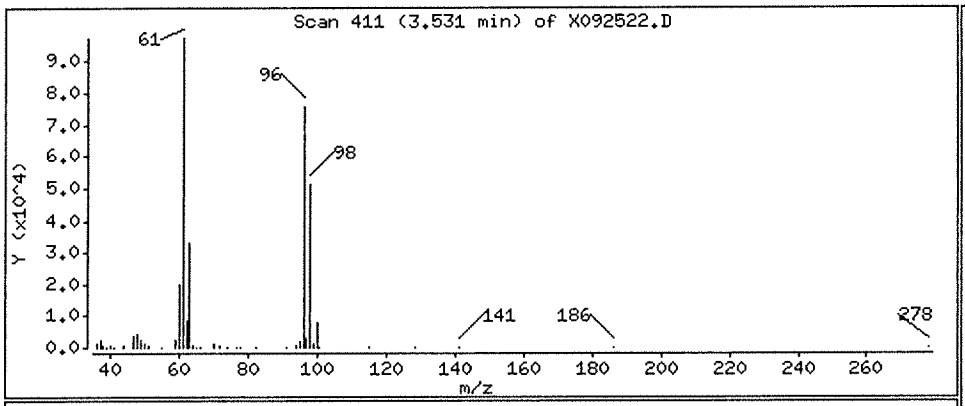
Operator: PC

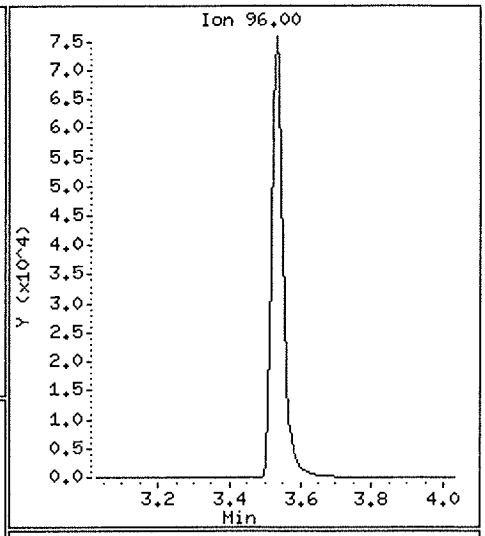
Column phase: DB624

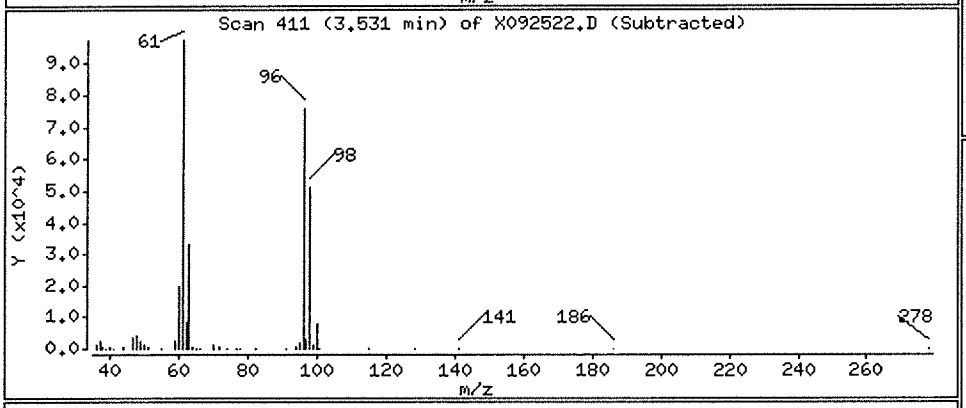
Column diameter: 0.18

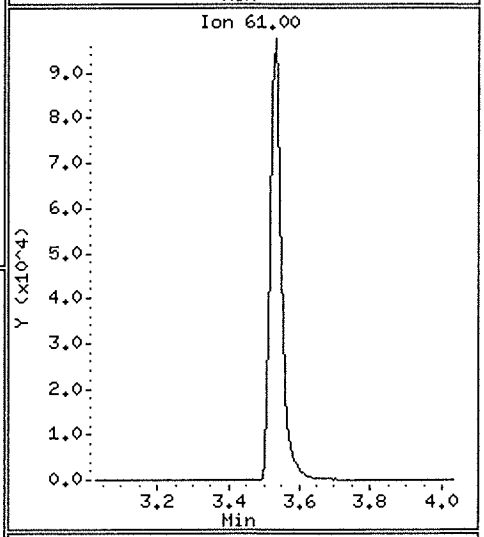
27 cis-1,2-Dichloroethene

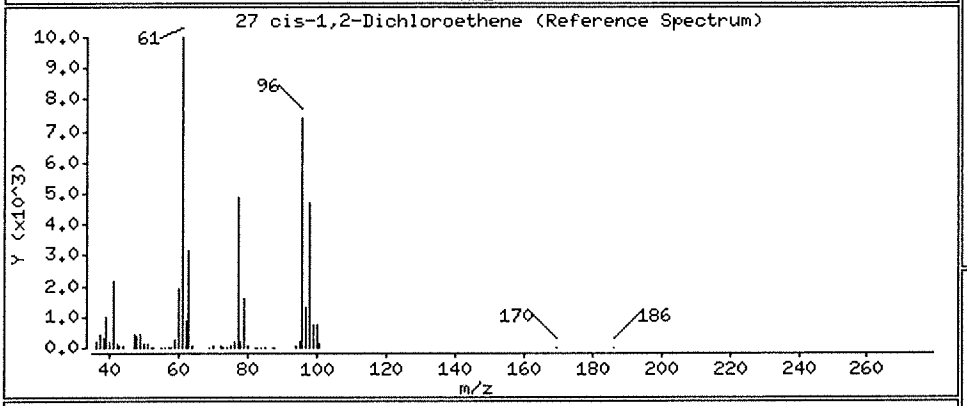
Concentration: 124.84 ug/l

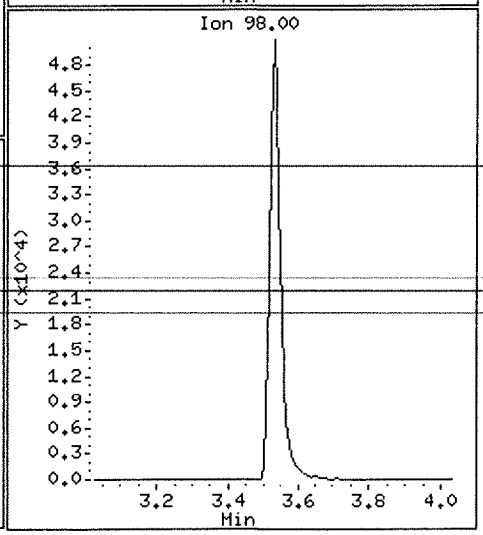


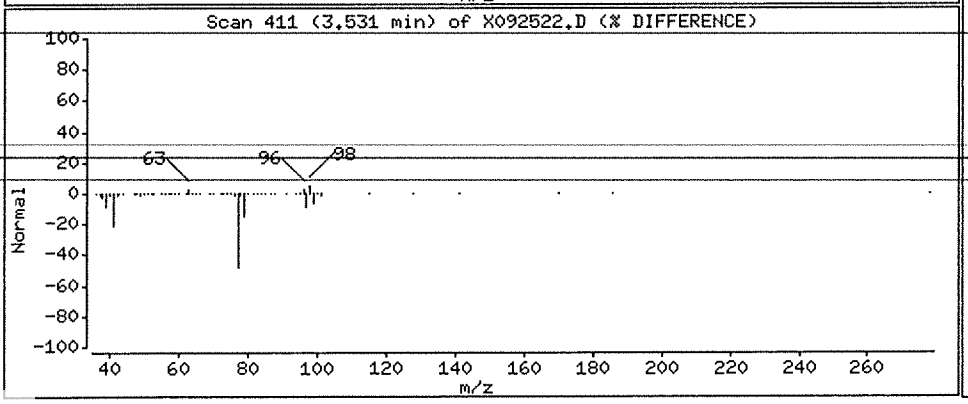












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092522.D

Date : 25-SEP-2019 18:38

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

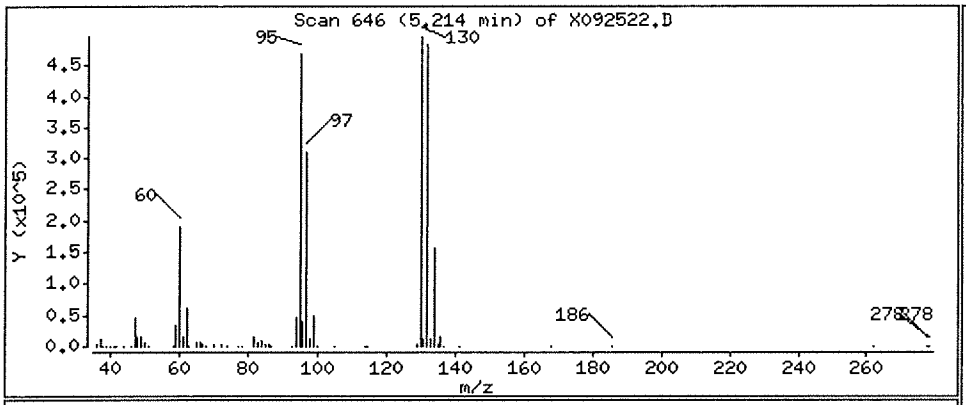
Operator: PC

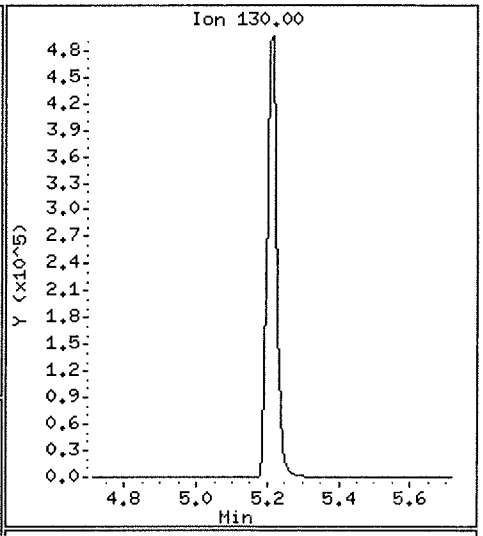
Column phase: DB624

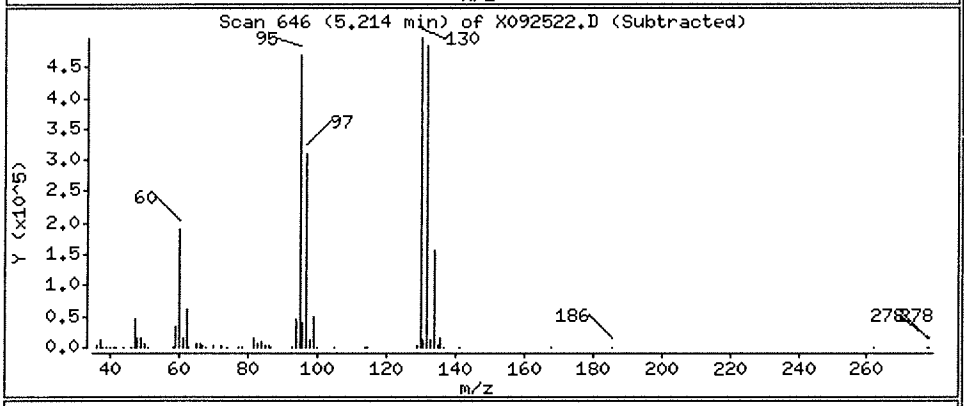
Column diameter: 0.18

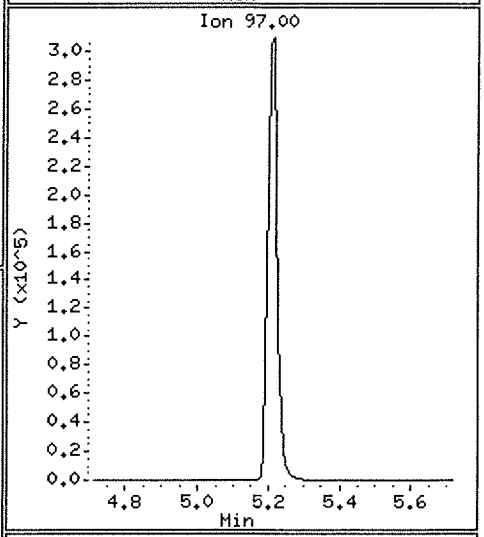
38 Trichloroethene

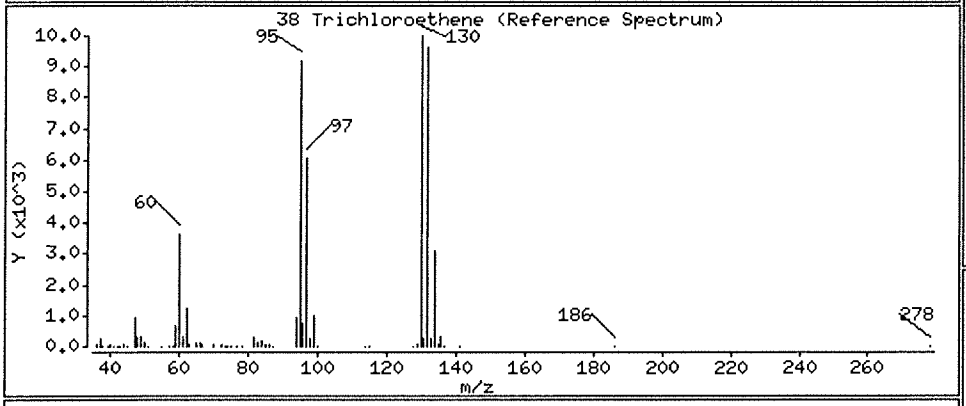
Concentration: 741.15 ug/l

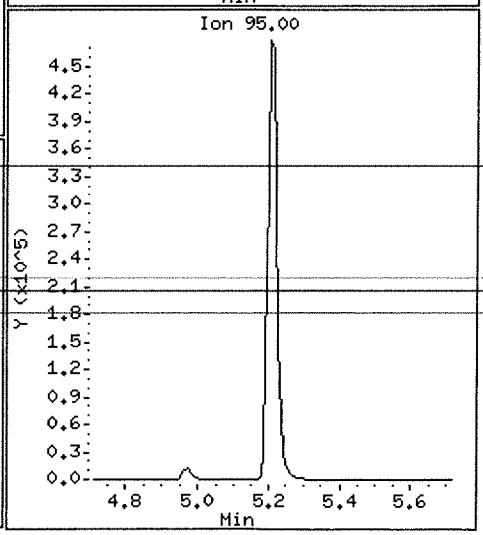


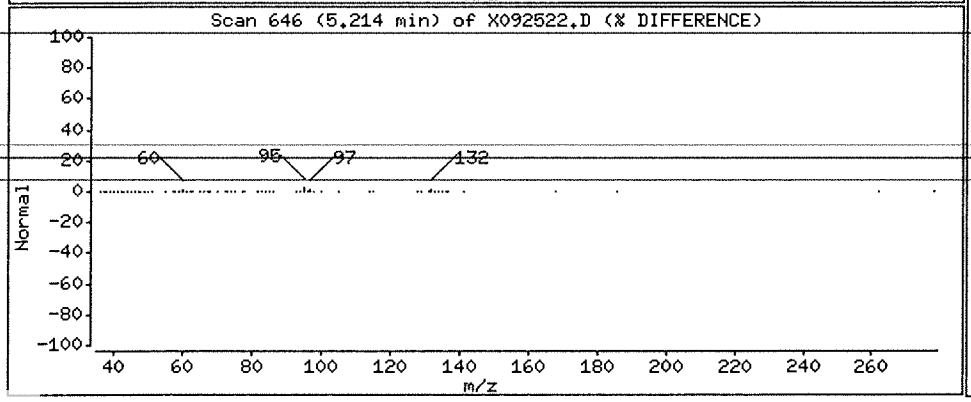












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092522.D

Date : 25-SEP-2019 18:38

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

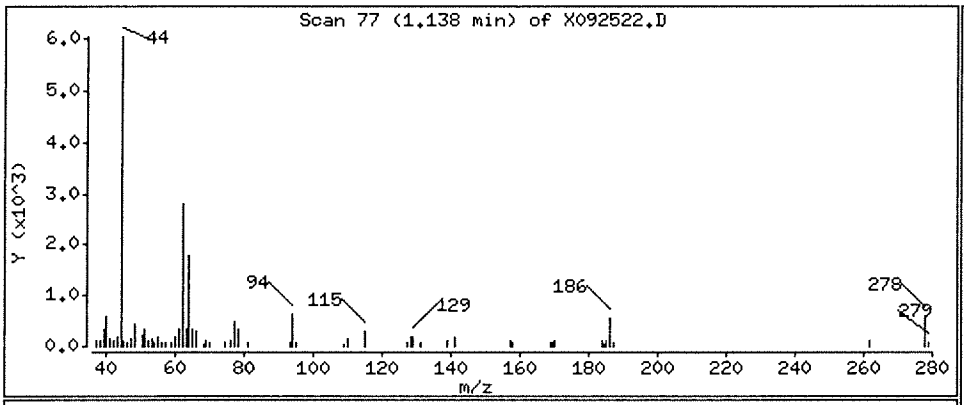
Operator: PC

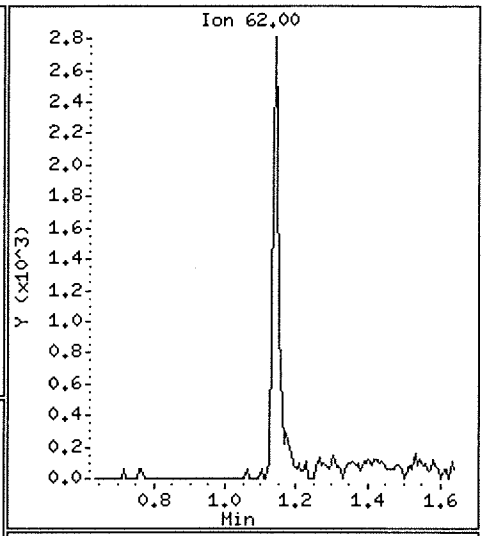
Column phase: DB624

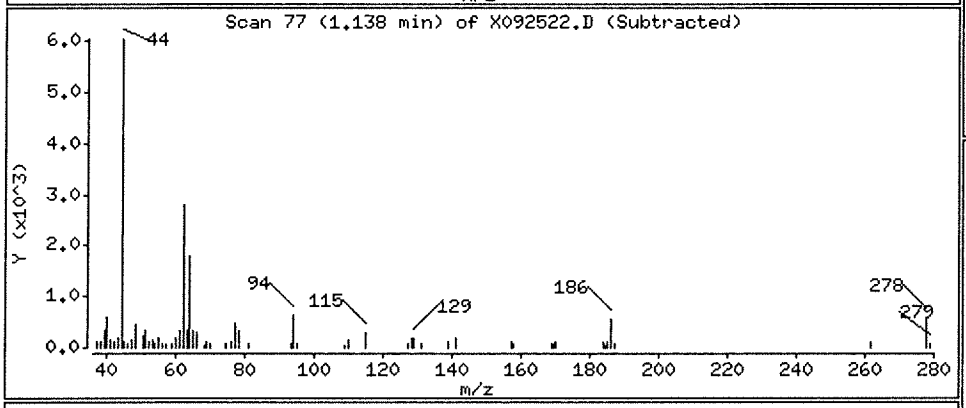
Column diameter: 0.18

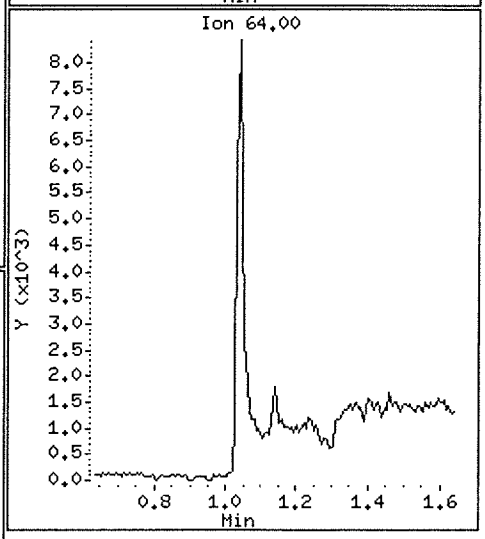
5 Vinyl Chloride

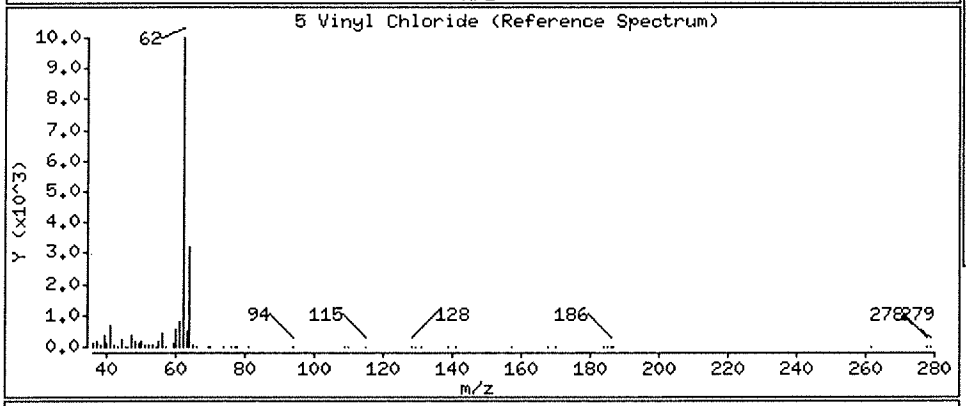
Concentration: 2.73 ug/l

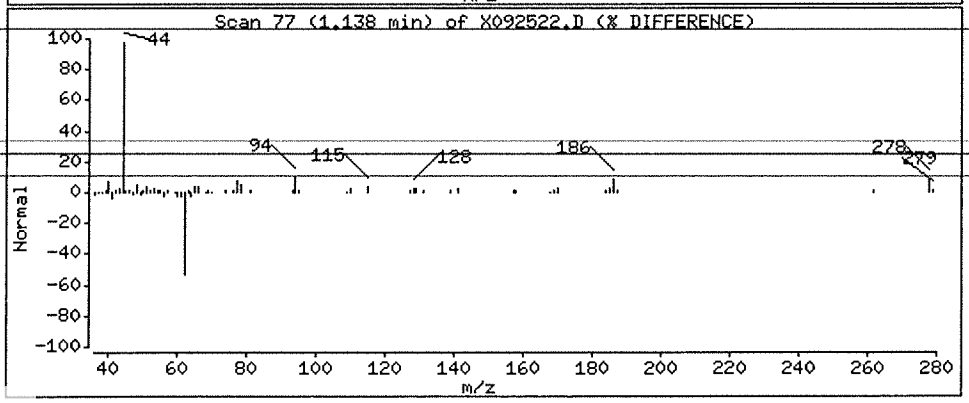












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092523.D
Lab Smp Id: HS19090860-09 Client Smp ID: HS19090860-09
Inj Date : 25-SEP-2019 19:02
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-09;HS19090860-09;;;
Misc Info : HS18090001;WATER;0;25;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 22
Dil Factor: 25.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

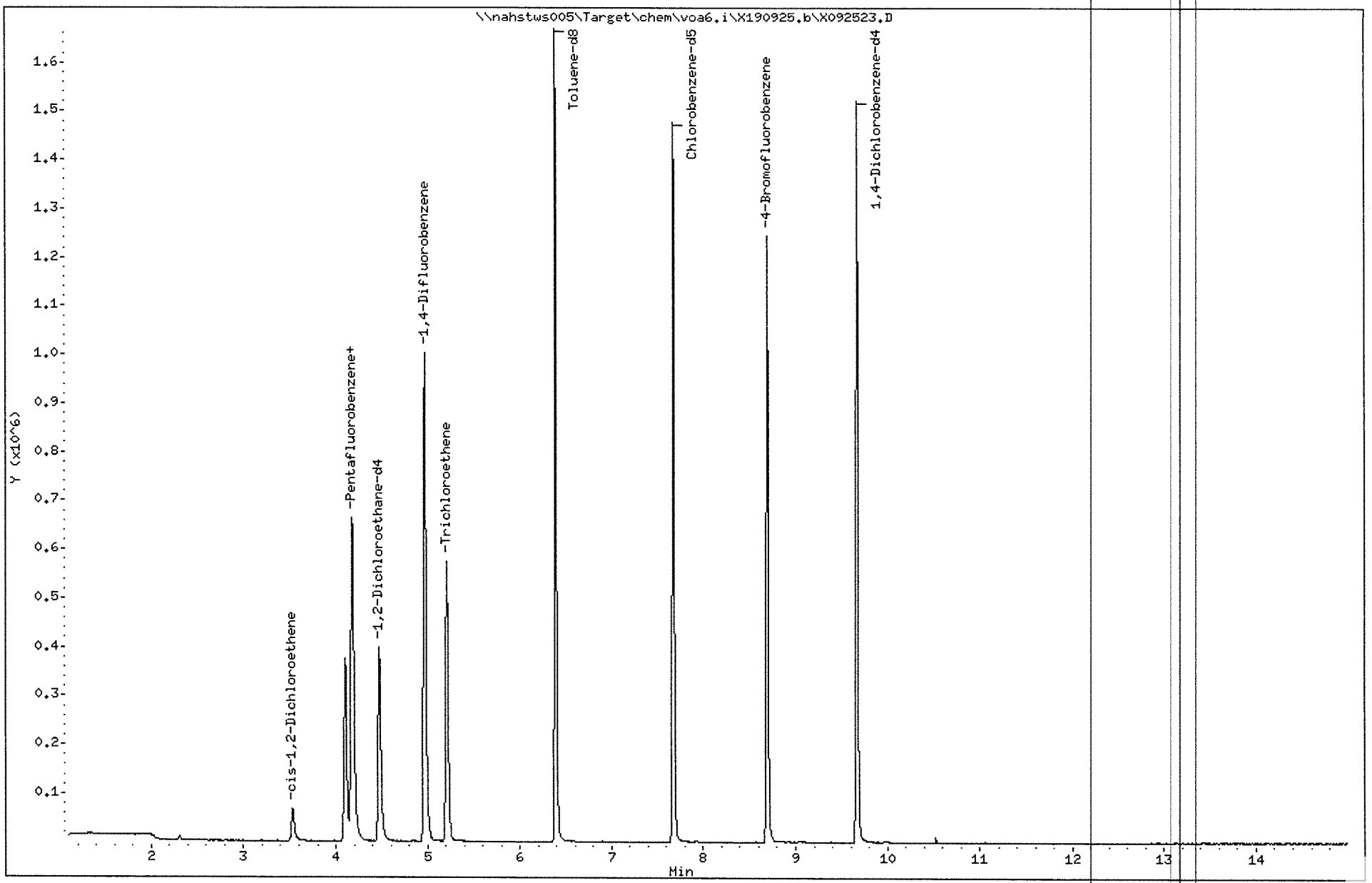
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	25.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	36487	5.10153	127.53
38 Trichloroethene	130	5.214	5.214	(1.049)	205249	31.7466	793.66
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	294768	44.6319	44.63
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	358133	52.0790	52.07
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	263470	46.5226	46.52
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	996508	49.1671	49.16
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	579346	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	843447	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	721303	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	371703	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092523.D
Date : 25-SEP-2019 19:02
Client ID: HS19090860-09
Sample Info: HS19090860-09;HS19090860-09;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092523.D

Date : 25-SEP-2019 19:02

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

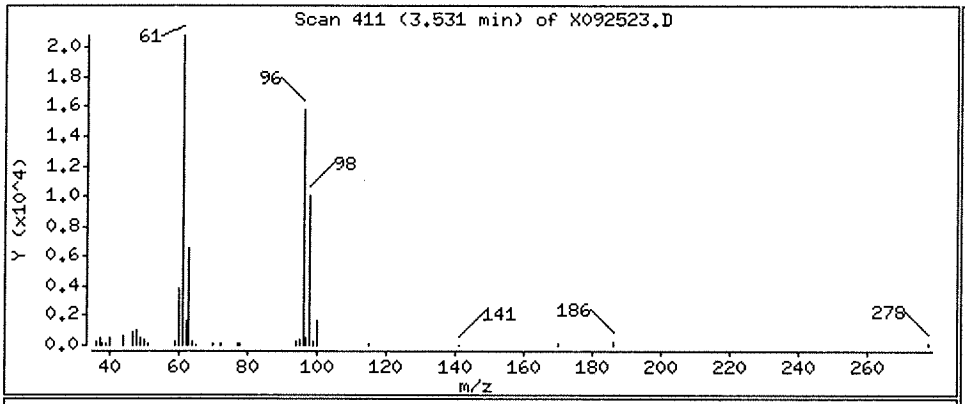
Operator: PC

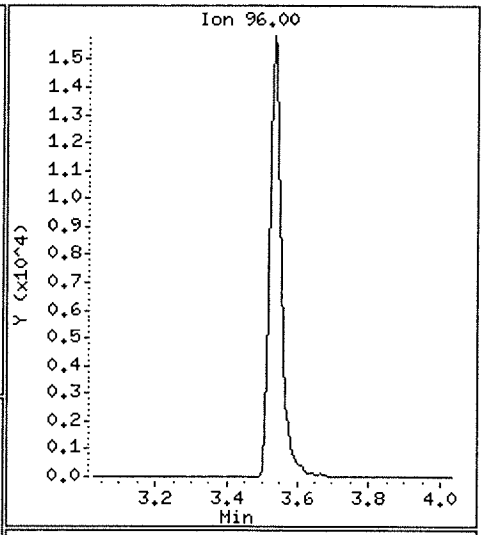
Column phase: DB624

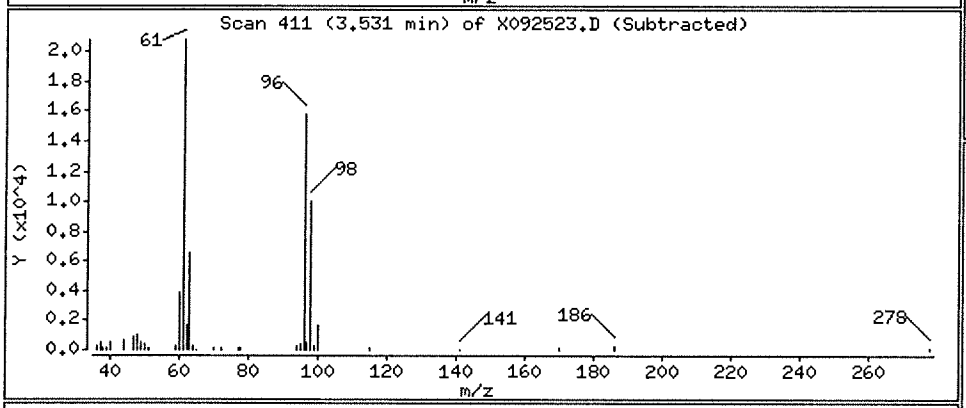
Column diameter: 0.18

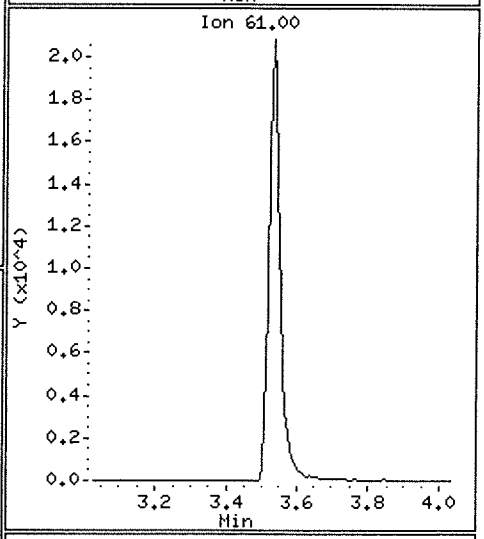
27 cis-1,2-Dichloroethene

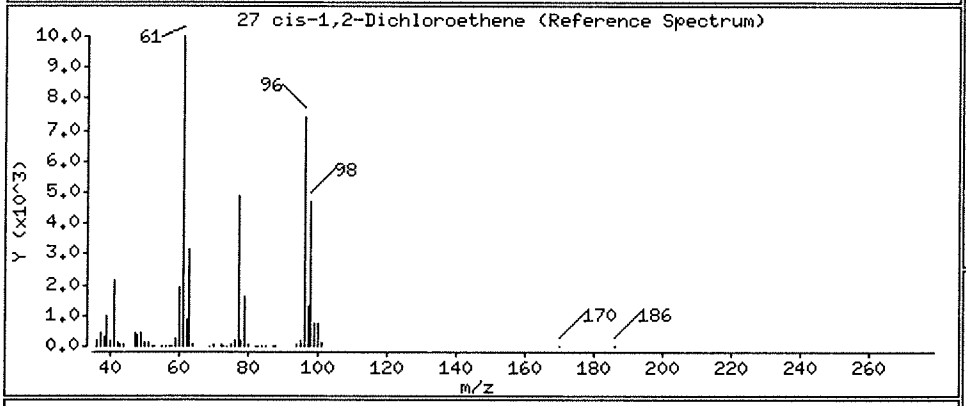
Concentration: 127.53 ug/l

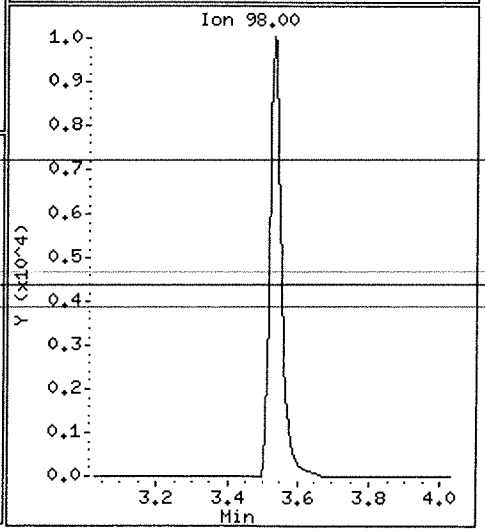


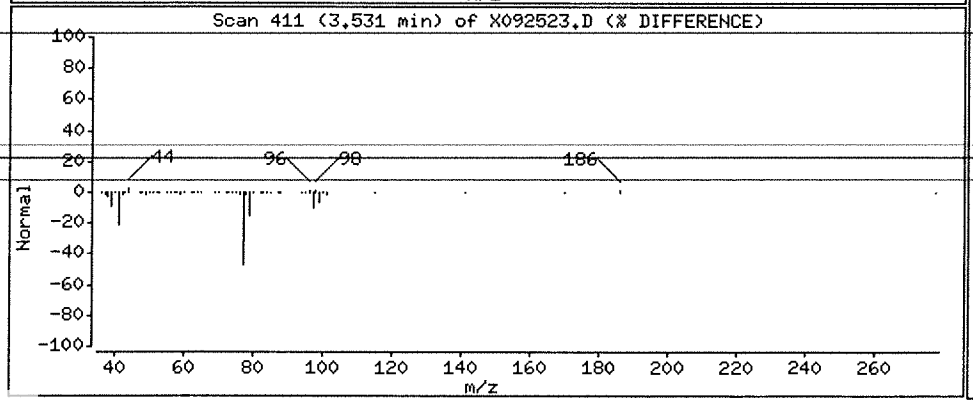












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092523.D

Date : 25-SEP-2019 19:02

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

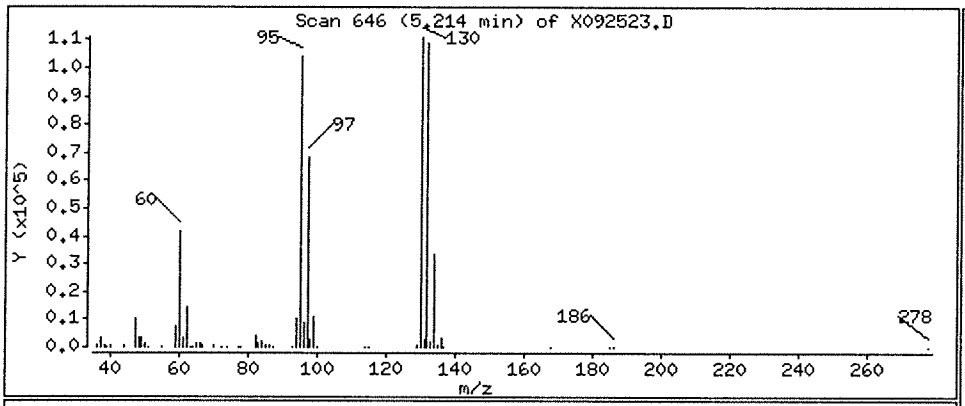
Operator: PC

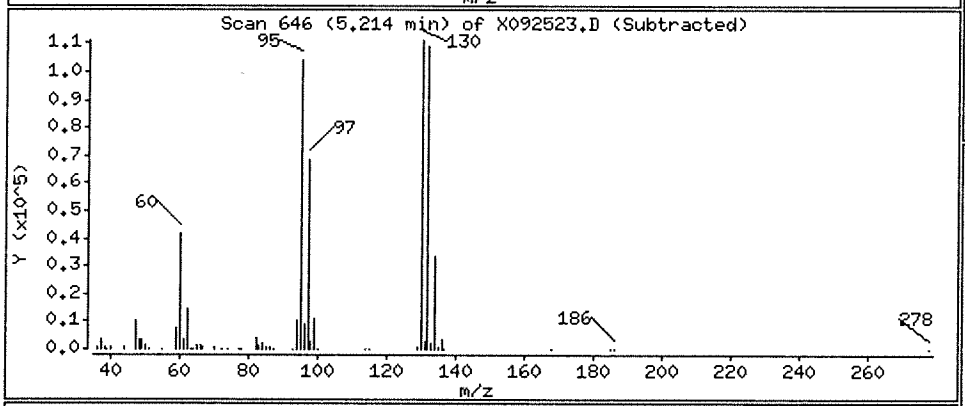
Column phase: DB624

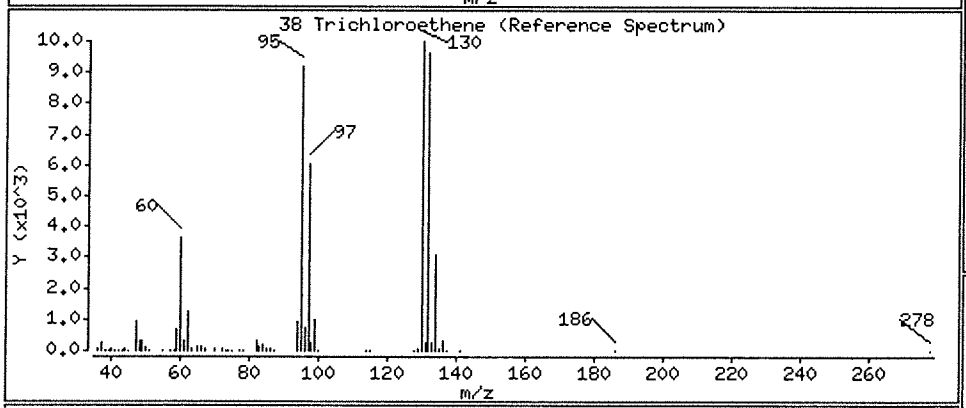
Column diameter: 0.18

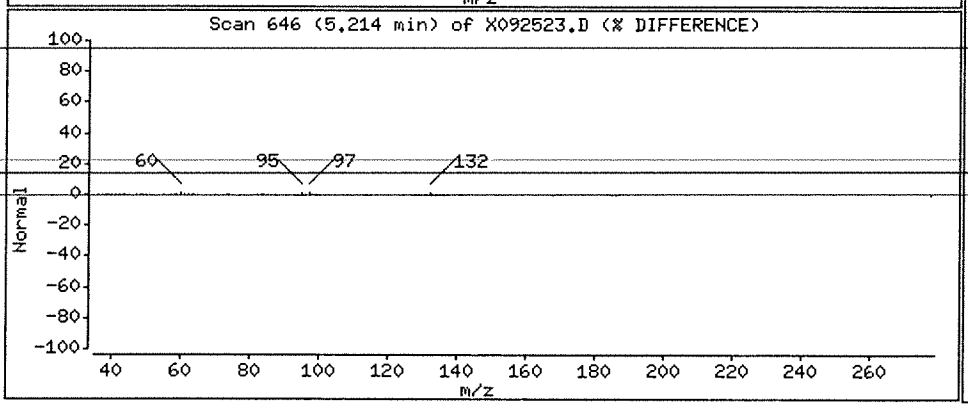
38 Trichloroethene

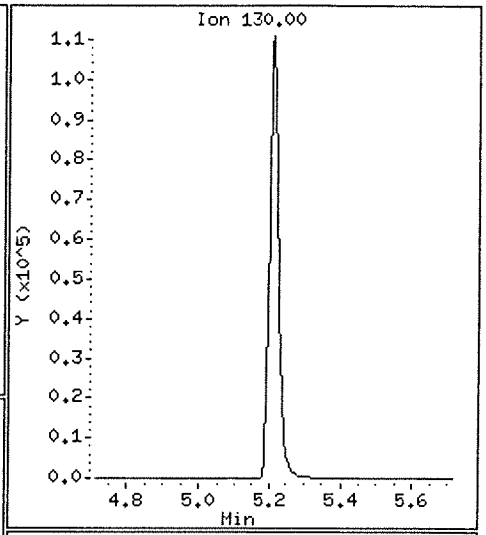
Concentration: 793.66 ug/l

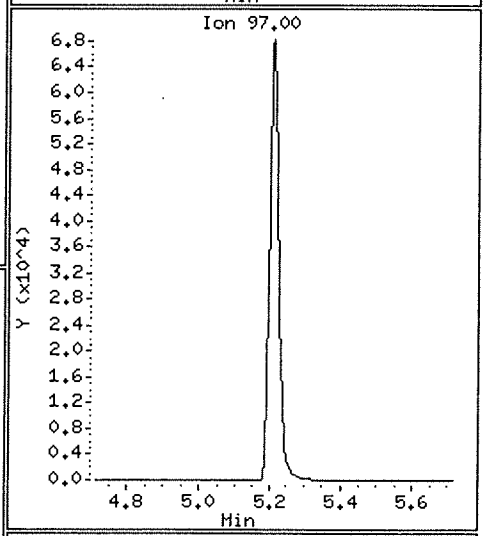


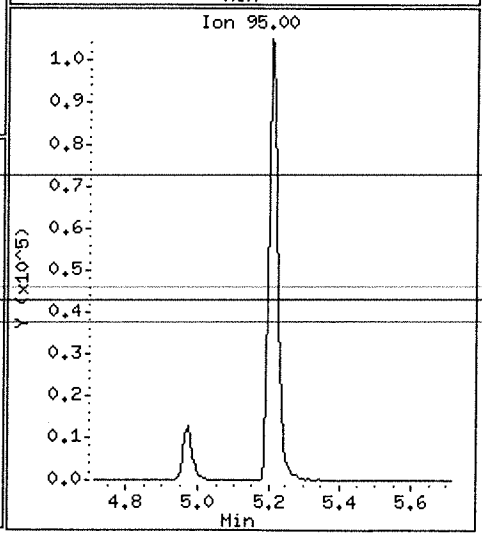












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092524.D
Lab Smp Id: HS19090860-06 Client Smp ID: HS19090860-06
Inj Date : 25-SEP-2019 19:26
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-06;HS19090860-06;;;
Misc Info : HS18090001;WATER;0;10;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 23
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

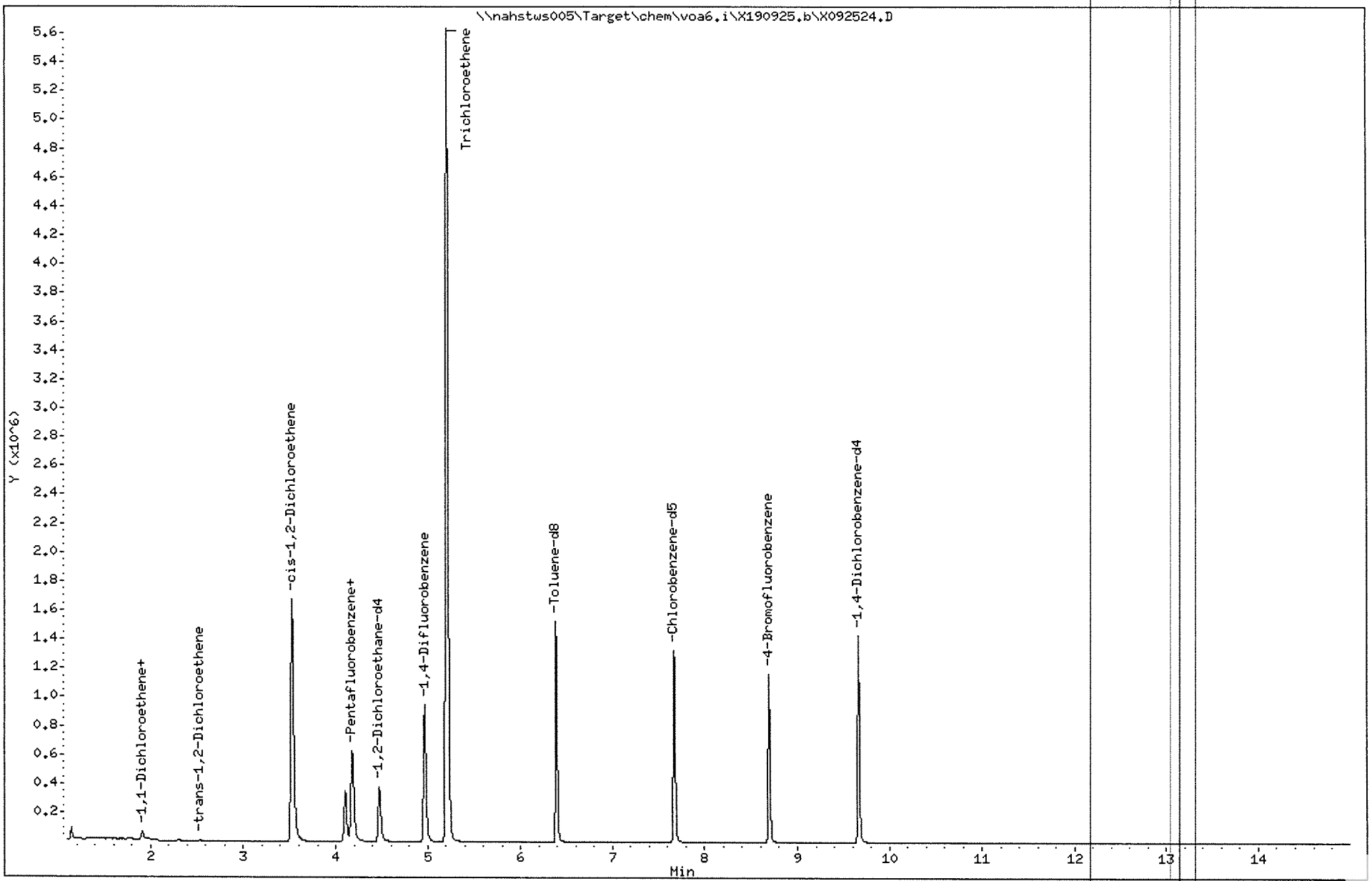
Name	Value	Description
DF	10.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	11 1,1-Dichloroethene	96	1.919	1.912	(0.459)	5125	1.09729	10.97(a)
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	867433	130.268	1302.68
	38 Trichloroethene	130	5.214	5.214	(1.049)	2021602	332.085	3320.85(A)
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	54914	8.04276	80.42
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	275354	44.7845	44.78
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	330789	52.5397	52.53
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	245999	46.6583	46.65
$	48 Toluene-d8	98	6.388	6.388	(0.833)	915696	49.3376	49.33
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	539384	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	794182	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	660519	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	351326	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092524.D
Date : 25-SEP-2019 19:26
Client ID: HS19090860-06
Instrument: voa6.i
Sample Info: HS19090860-06;HS19090860-06;;;
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092524.D

Date : 25-SEP-2019 19:26

Client ID: HS19090860-06

Instrument: voa6.i

Sample Info: HS19090860-06;HS19090860-06;;;

Purge Volume: 5.0

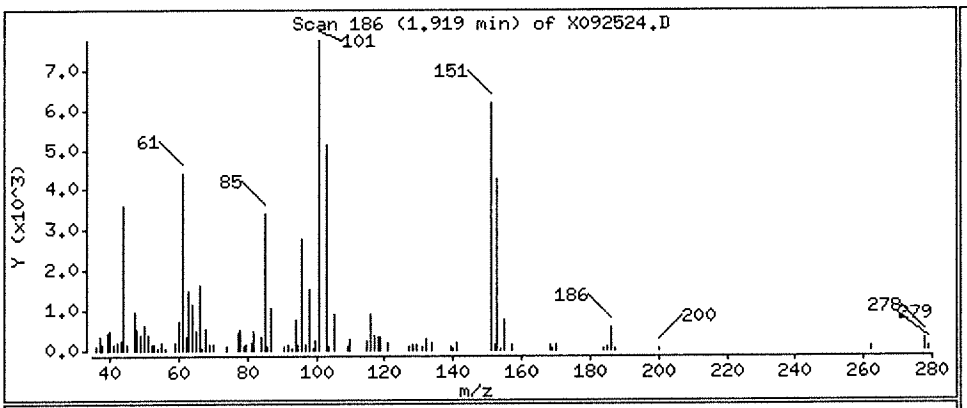
Operator: PC

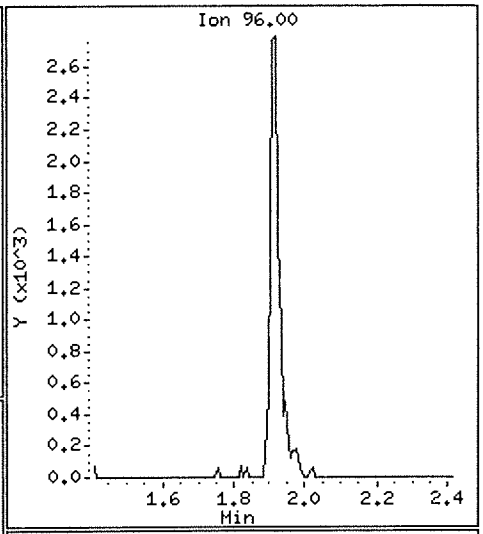
Column phase: DB624

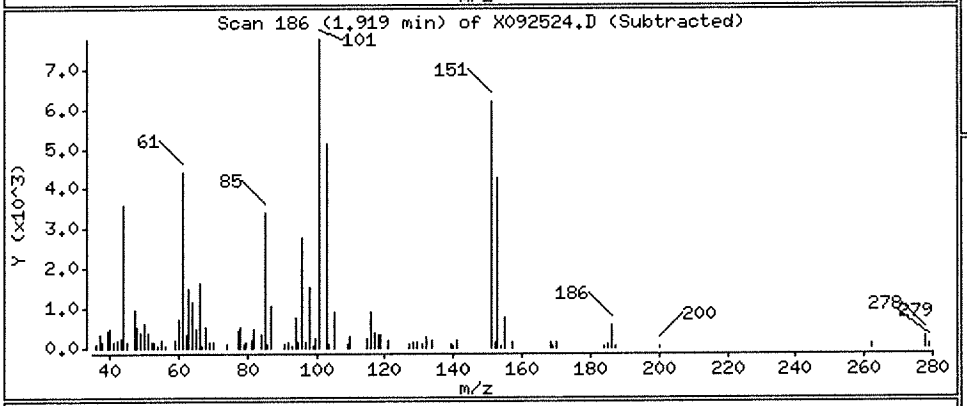
Column diameter: 0.18

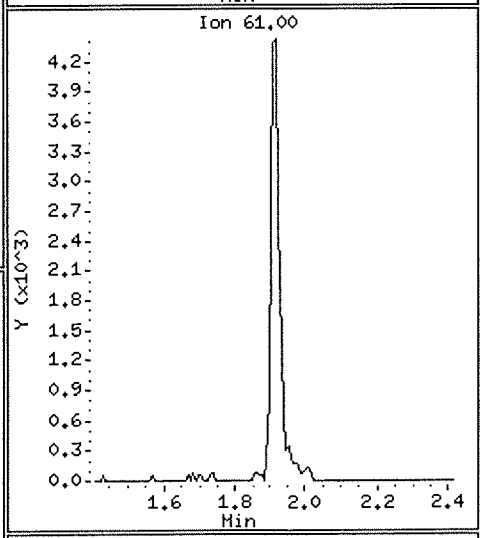
11 1,1-Dichloroethene

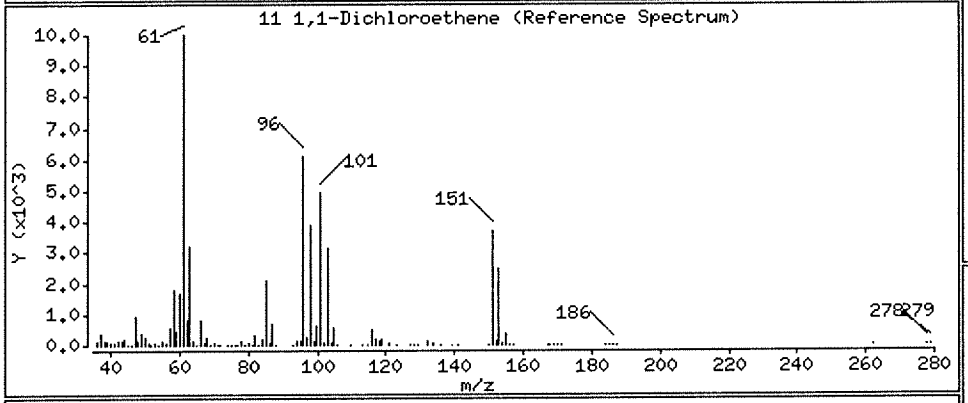
Concentration: 10.97 ug/l

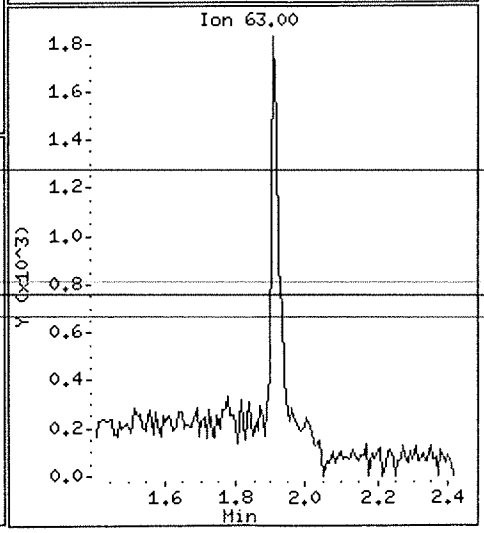


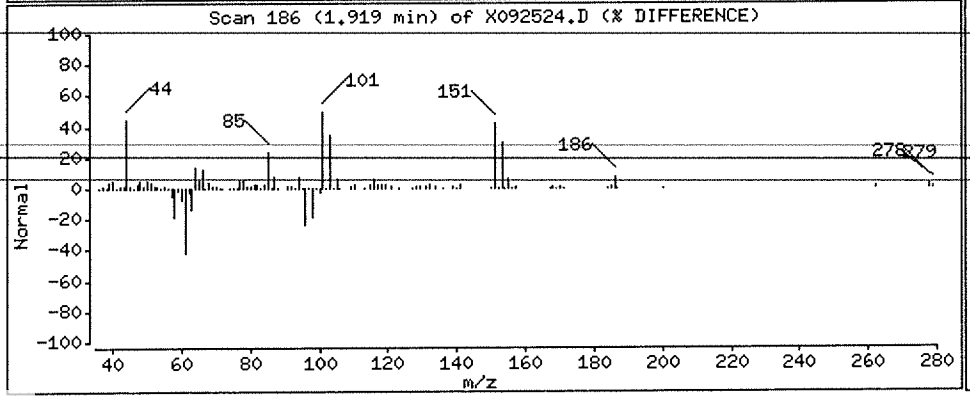












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092524.D

Date : 25-SEP-2019 19:26

Client ID: HS19090860-06

Instrument: voa6.i

Sample Info: HS19090860-06;HS19090860-06;;;

Purge Volume: 5.0

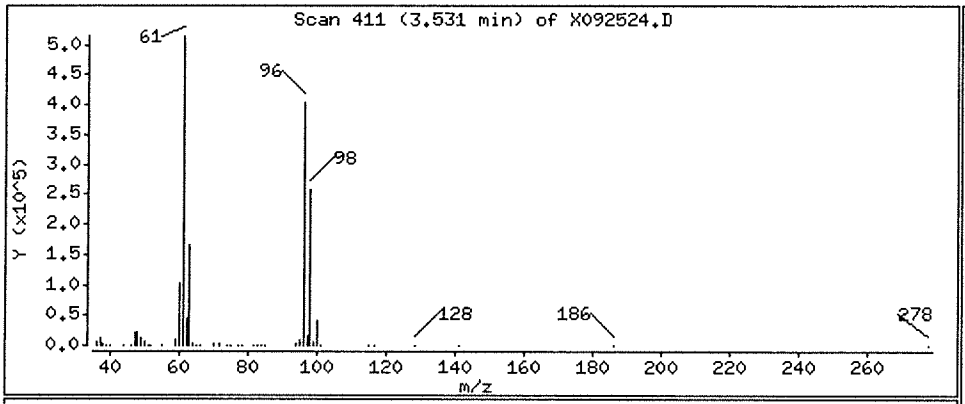
Operator: PC

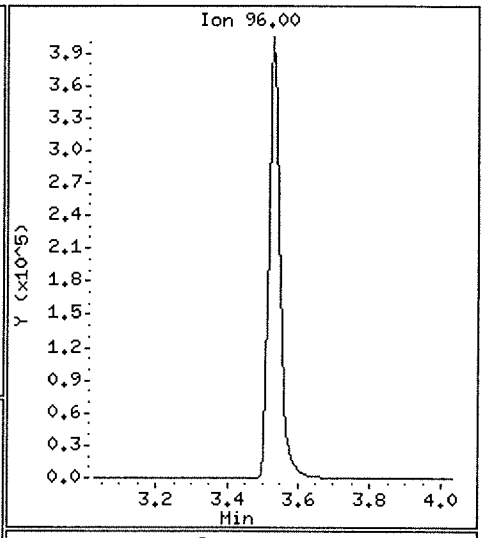
Column phase: DB624

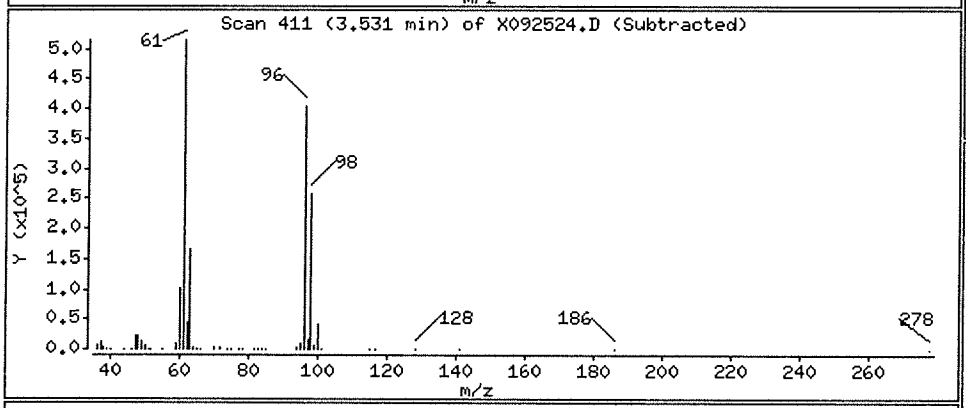
Column diameter: 0.18

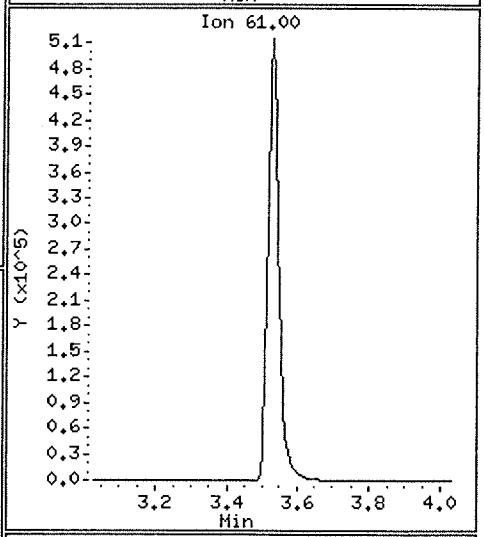
27 cis-1,2-Dichloroethene

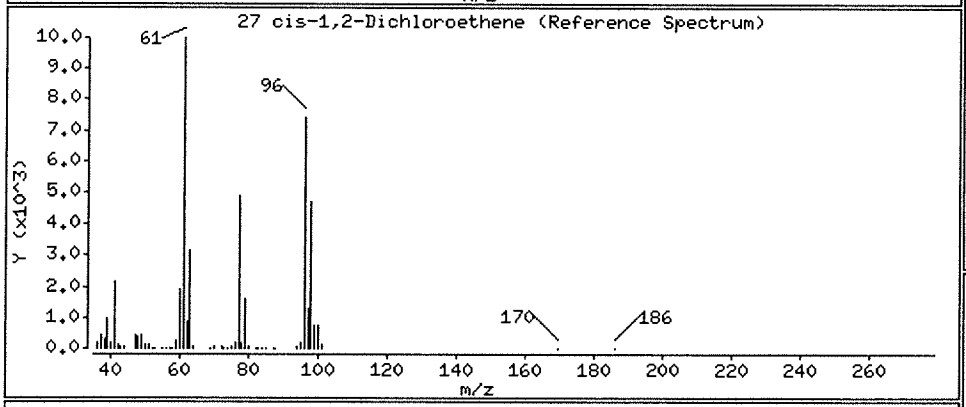
Concentration: 1302.68 ug/l

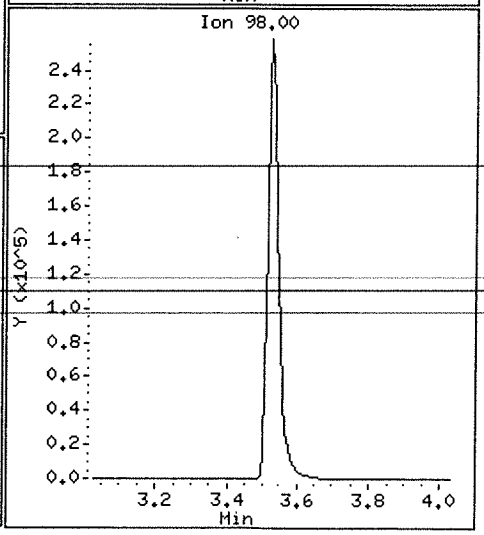


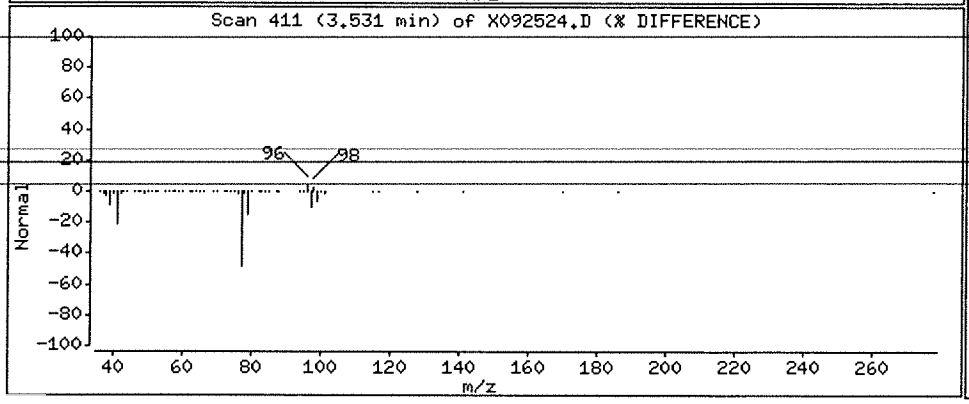












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092524.D

Date : 25-SEP-2019 19:26

Client ID: HS19090860-06

Instrument: voa6.i

Sample Info: HS19090860-06;HS19090860-06;;;

Purge Volume: 5.0

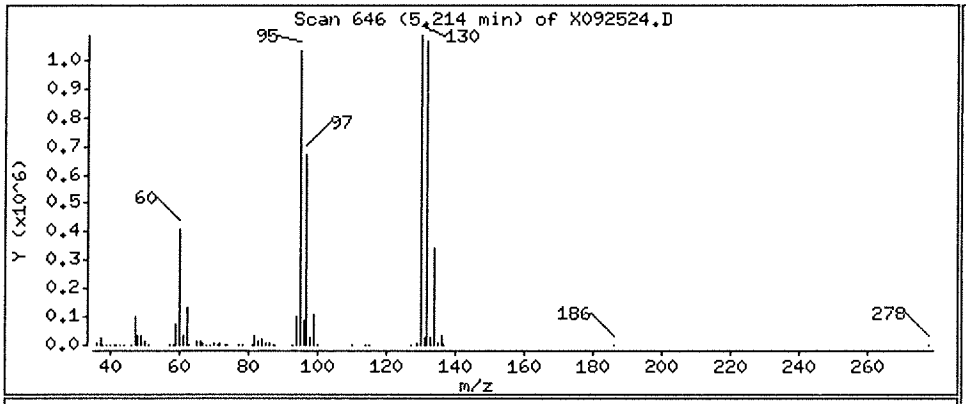
Operator: PC

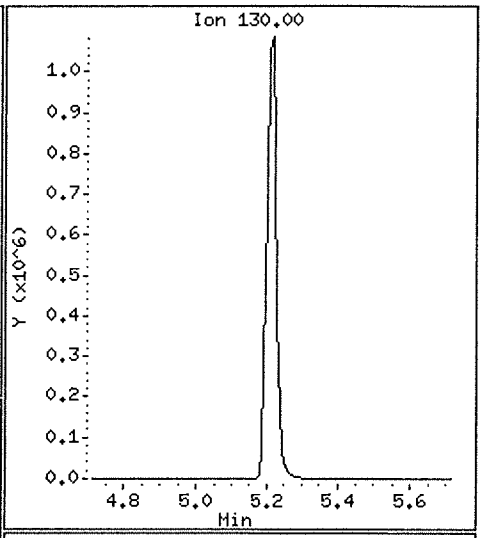
Column phase: DB624

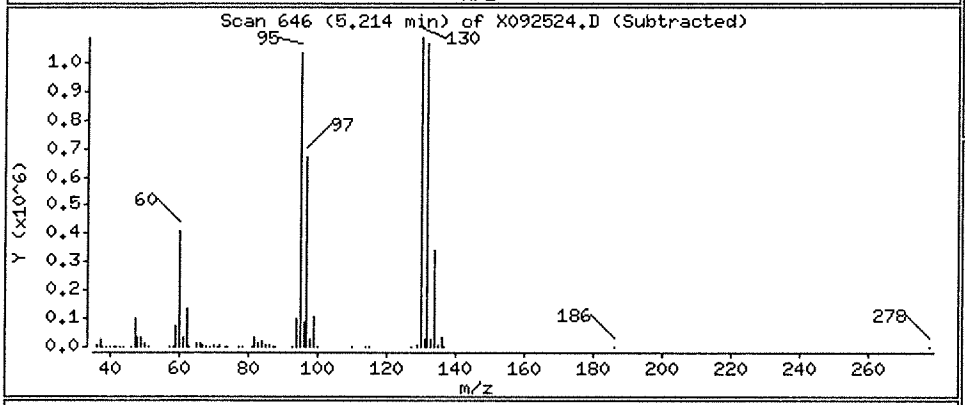
Column diameter: 0.18

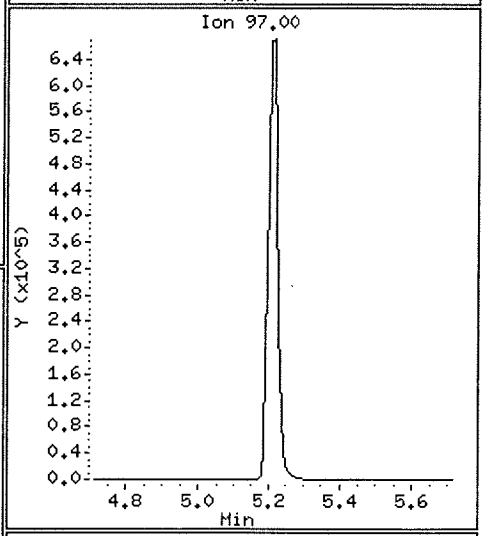
38 Trichloroethene

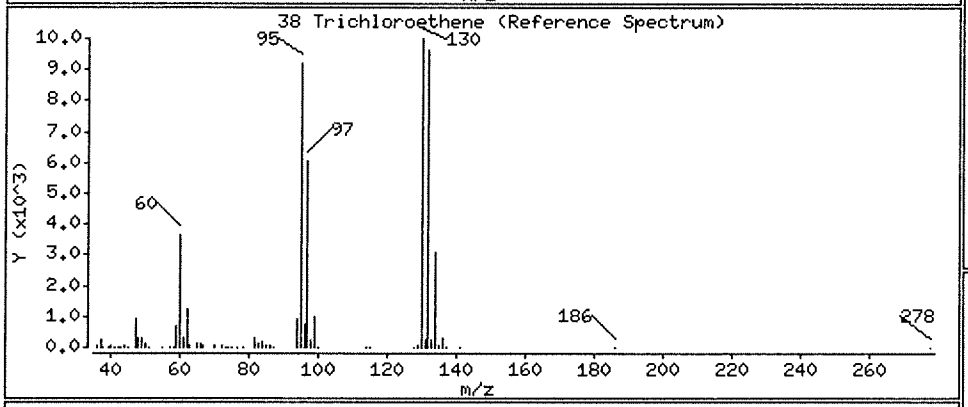
Concentration: 3320.85 ug/l

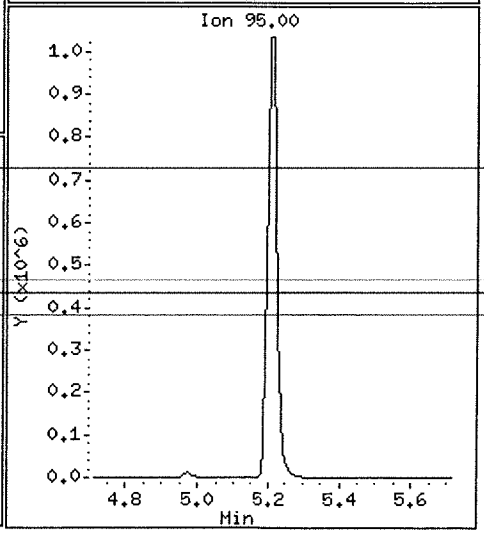


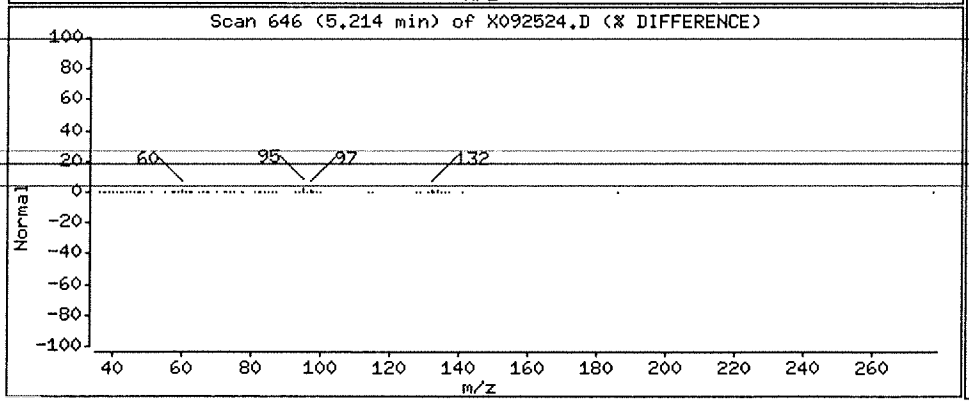












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092524.D

Date : 25-SEP-2019 19:26

Client ID: HS19090860-06

Instrument: voa6.i

Sample Info: HS19090860-06;HS19090860-06;;;

Purge Volume: 5.0

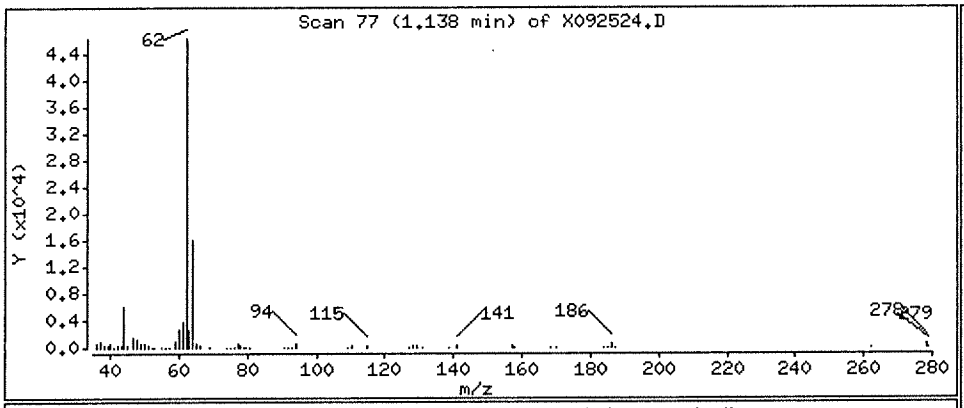
Operator: PC

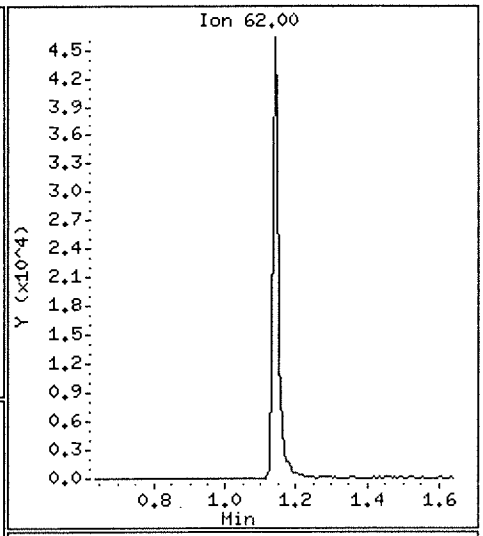
Column phase: DB624

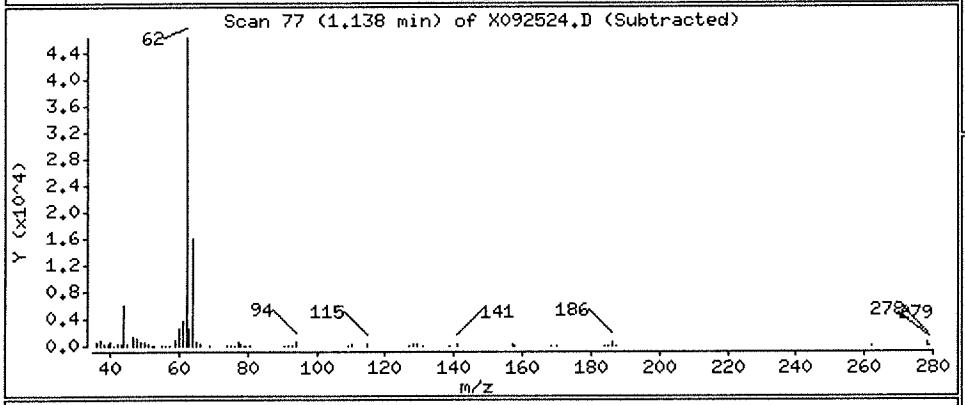
Column diameter: 0.18

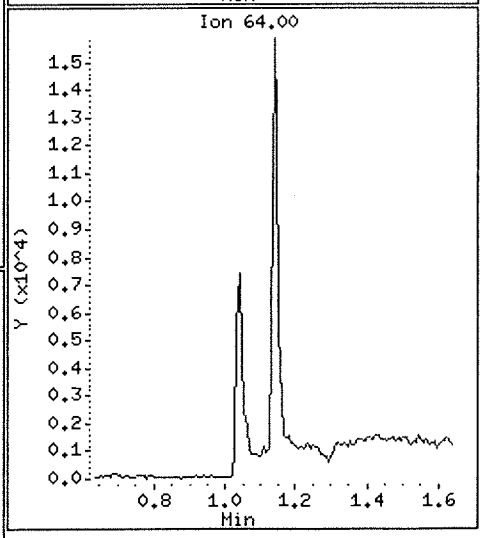
5 Vinyl Chloride

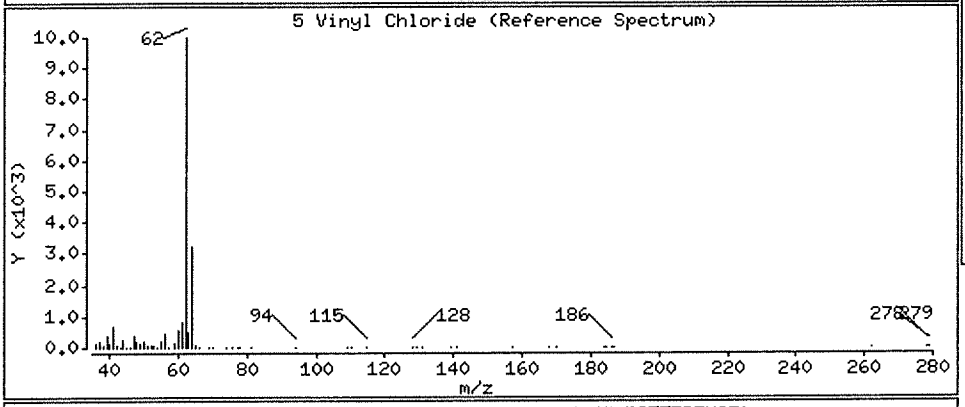
Concentration: 80.42 ug/l

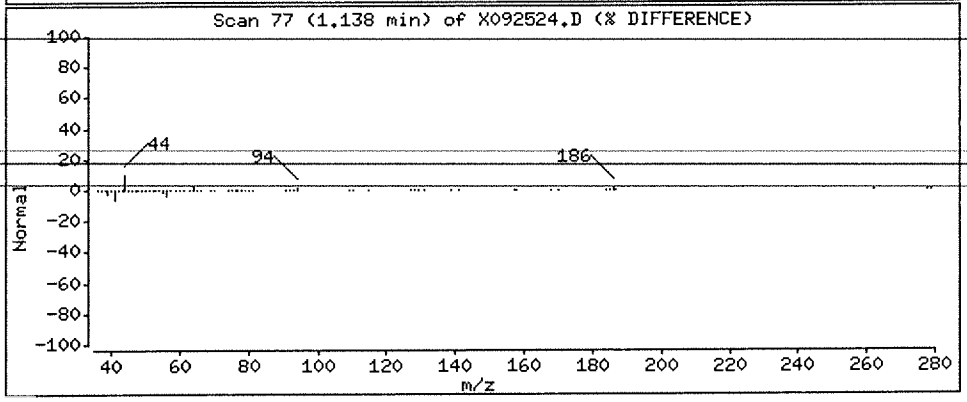












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092525.D
Lab Smp Id: HS19090860-06 Client Smp ID: HS19090860-06
Inj Date : 25-SEP-2019 19:50
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-06;HS19090860-06;;;
Misc Info : HS18090001;WATER;0;100;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 24
Dil Factor: 100.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	100.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	95051	14.2207	1422.06
	38 Trichloroethene	130	5.214	5.214	(1.049)	237243	38.8152	3881.52
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	6193	0.90362	90.36(a)
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	278001	45.0504	45.05
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	342115	52.4933	52.49
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	248797	47.0178	47.01
$	48 Toluene-d8	98	6.388	6.388	(0.833)	943141	49.0916	49.09
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	541423	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	797379	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	683725	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	349817	50.0000	

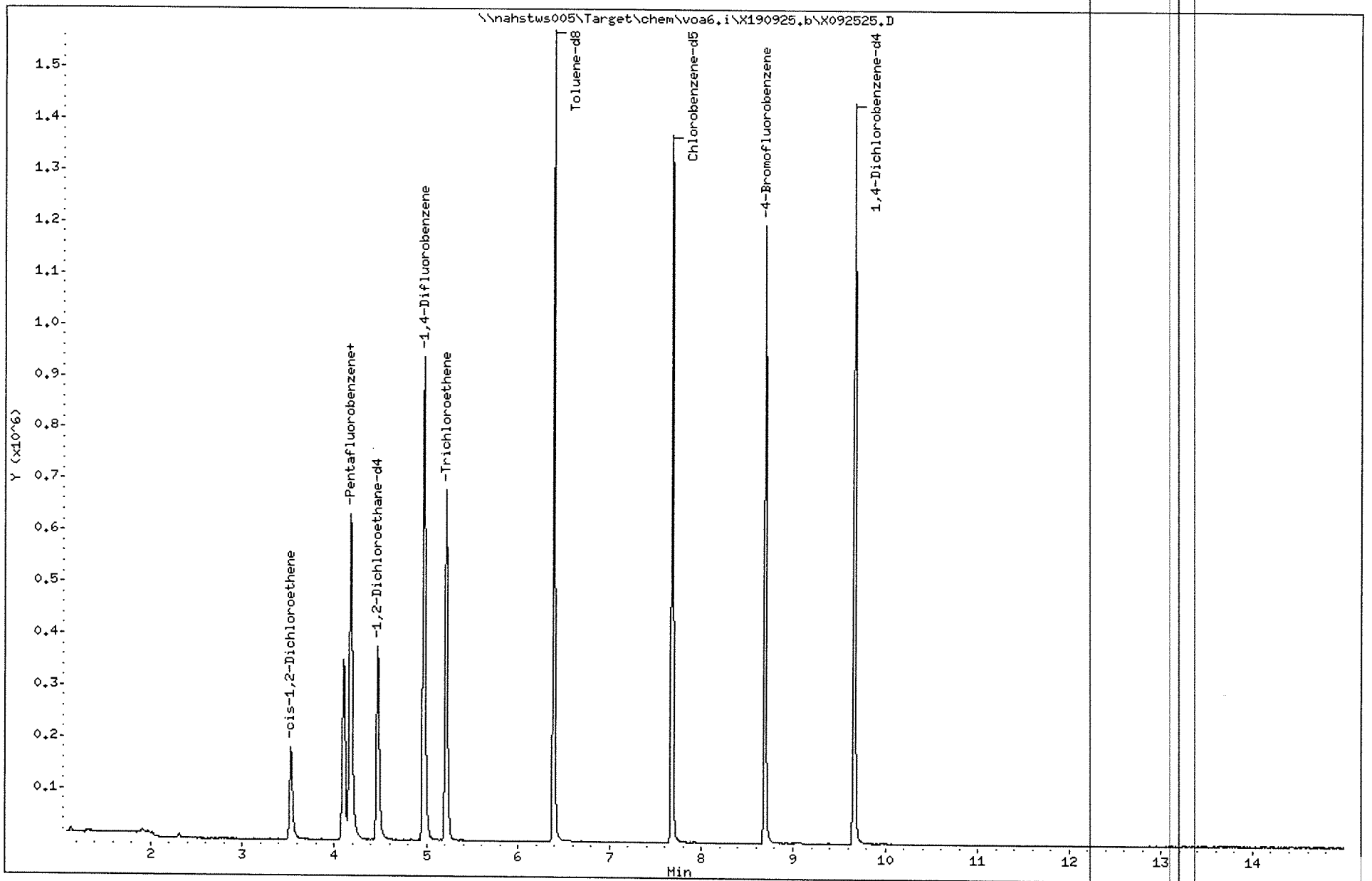
QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092525.D
Date : 25-SEP-2019 19:50
Client ID: HS19090860-06
Sample Info: HS19090860-06;HS19090860-06;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i

Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092525.D

Date : 25-SEP-2019 19:50

Client ID: HS19090860-06

Instrument: voa6.i

Sample Info: HS19090860-06;HS19090860-06;;;

Purge Volume: 5.0

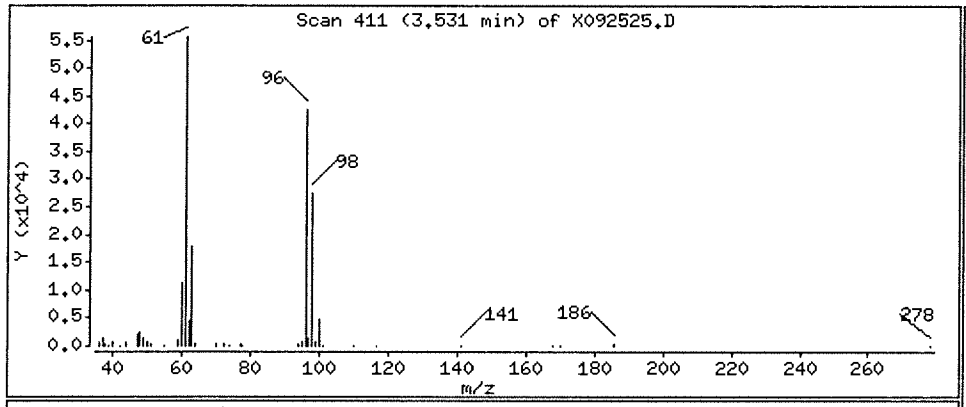
Operator: PC

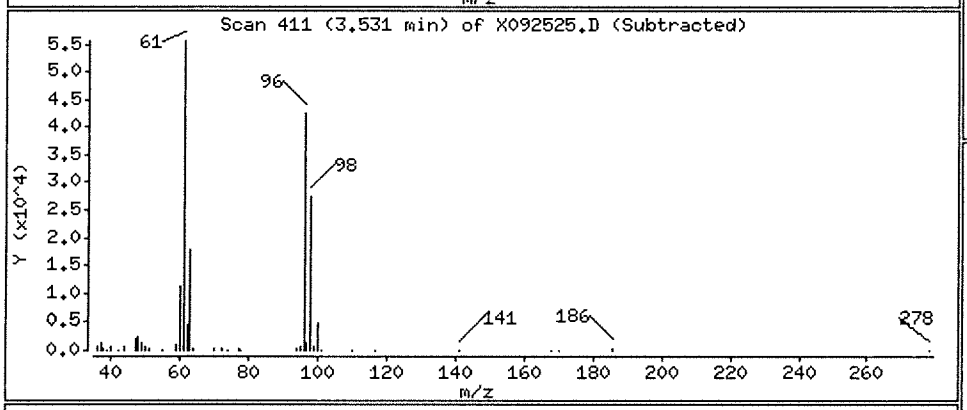
Column phase: DB624

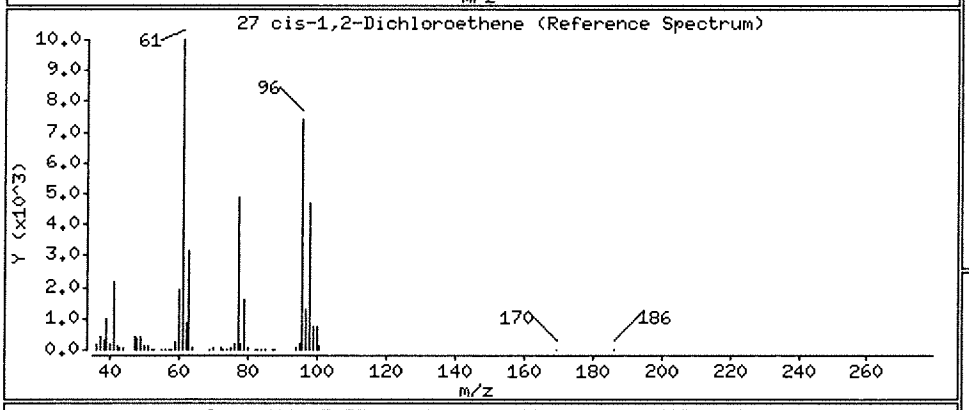
Column diameter: 0.18

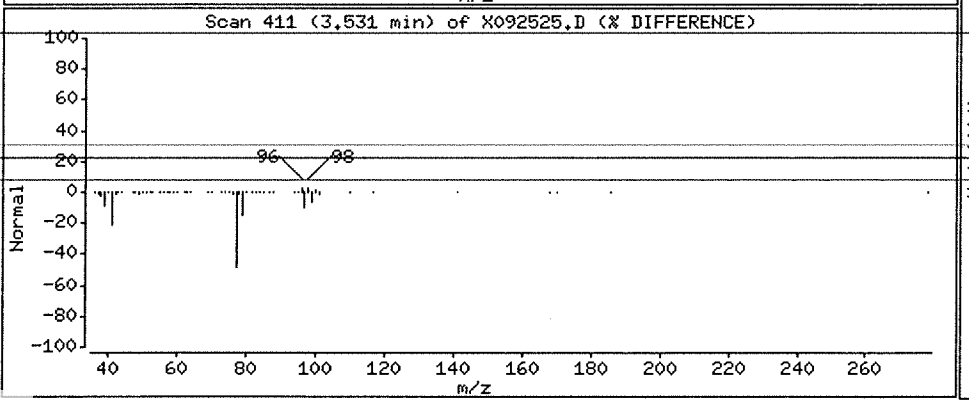
27 cis-1,2-Dichloroethene

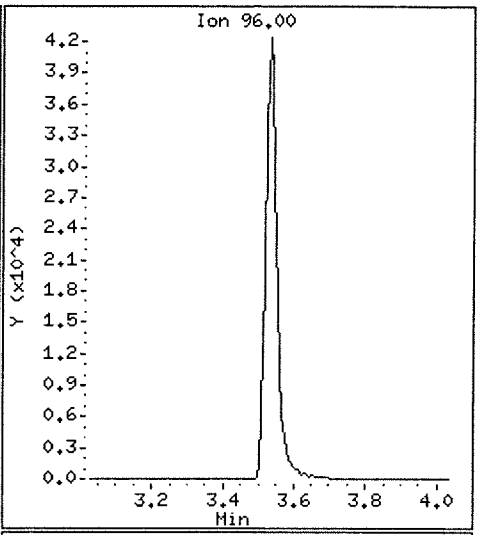
Concentration: 1422.06 ug/l

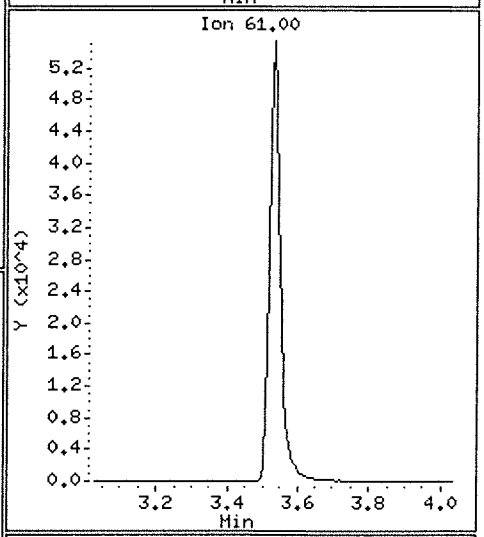


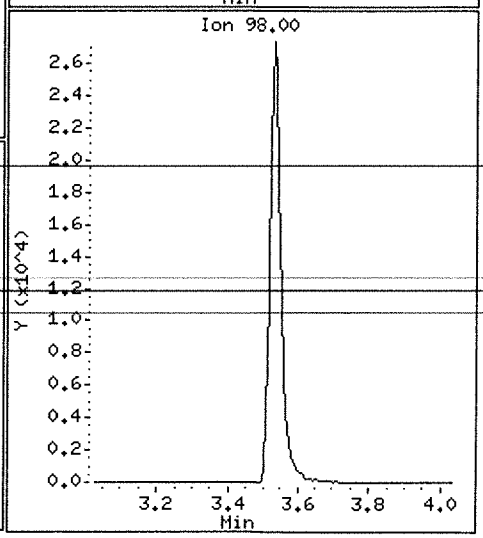












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092525.D

Date : 25-SEP-2019 19:50

Client ID: HS19090860-06

Instrument: voa6.i

Sample Info: HS19090860-06;HS19090860-06;;;

Purge Volume: 5.0

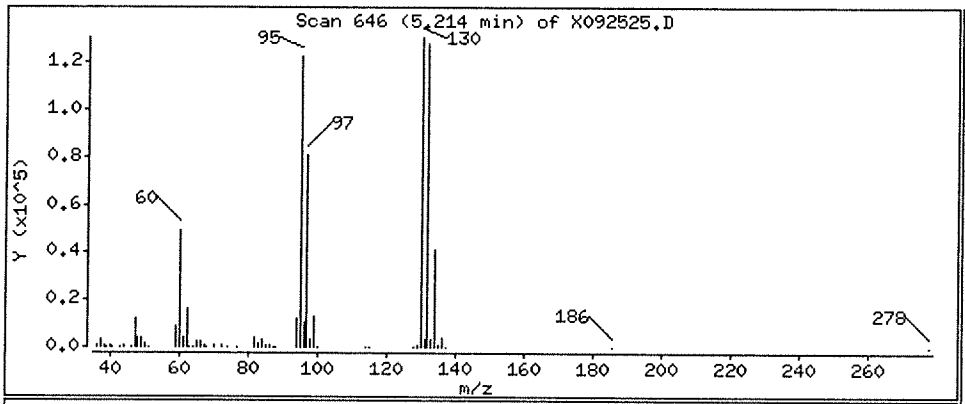
Operator: PC

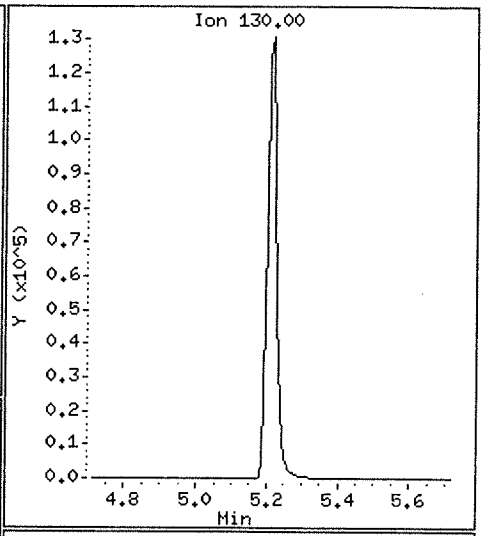
Column phase: DB624

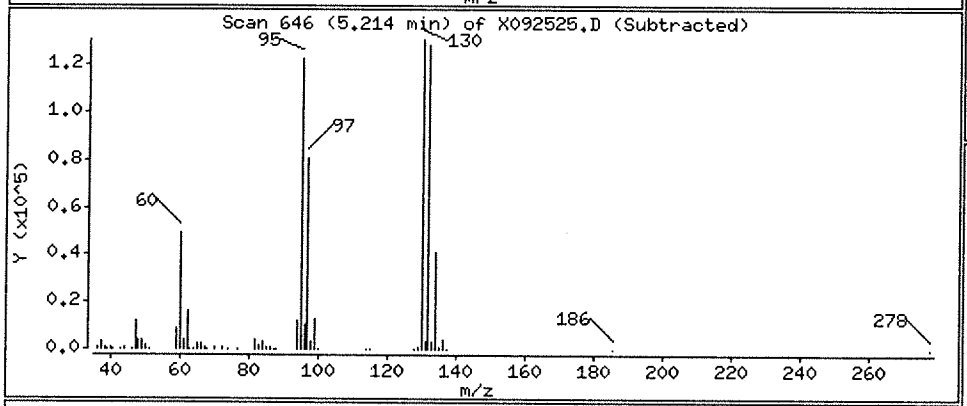
Column diameter: 0.18

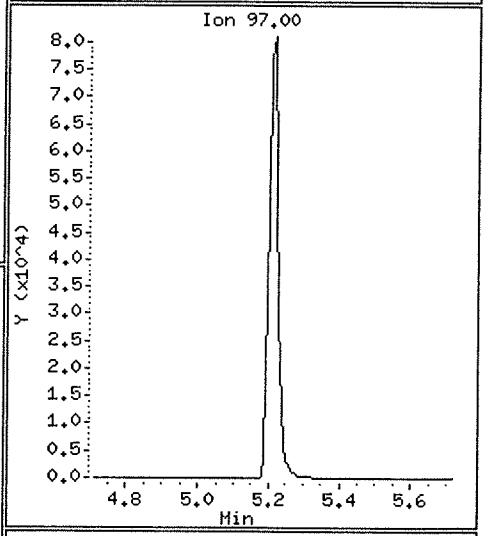
38 Trichloroethene

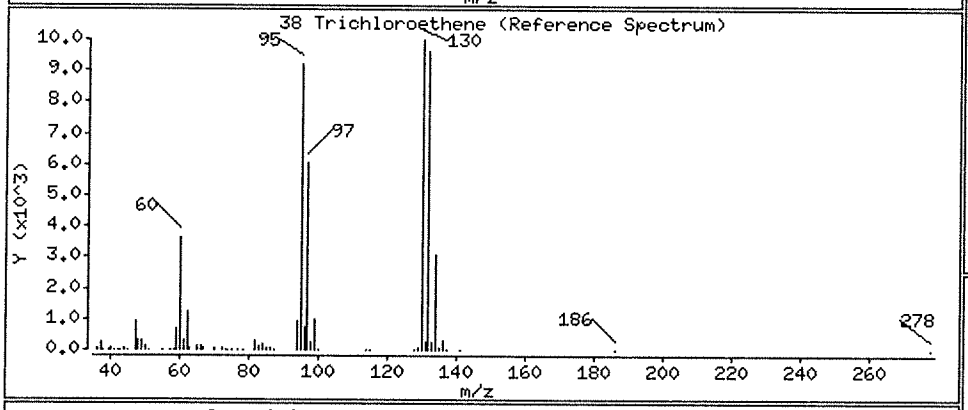
Concentration: 3881.52 ug/l

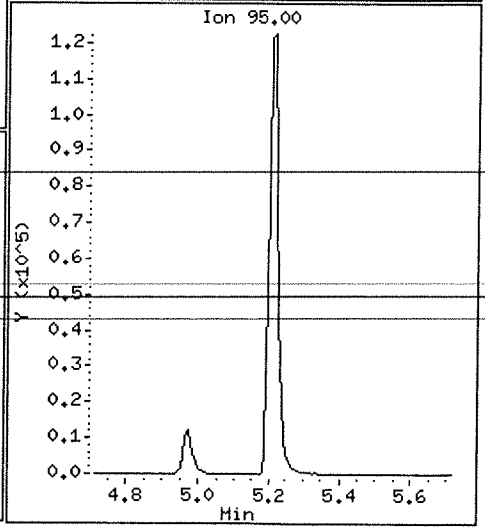


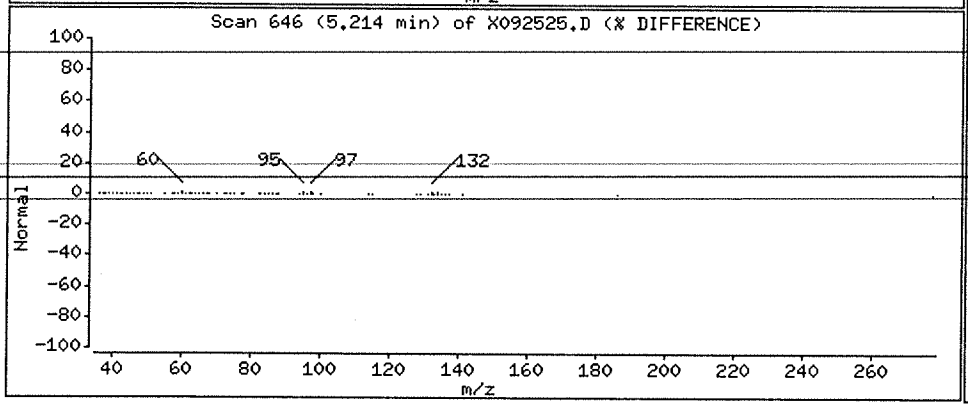












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092525.D

Date : 25-SEP-2019 19:50

Client ID: HS19090860-06

Instrument: voa6.i

Sample Info: HS19090860-06;HS19090860-06;;;

Purge Volume: 5.0

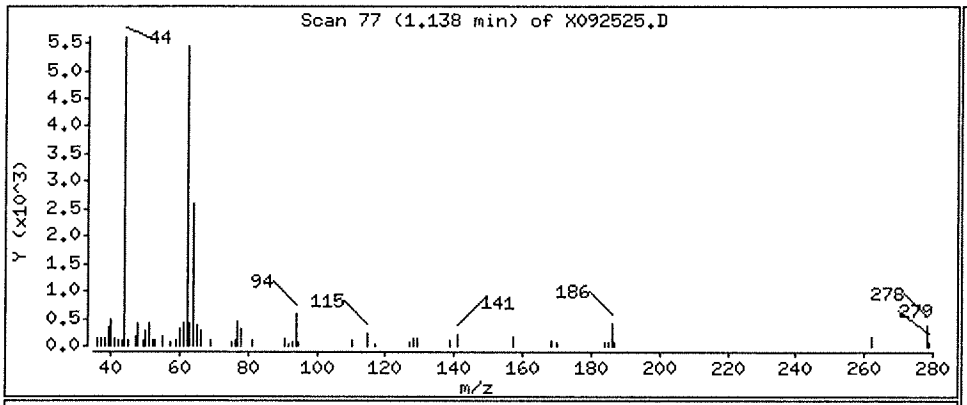
Operator: PC

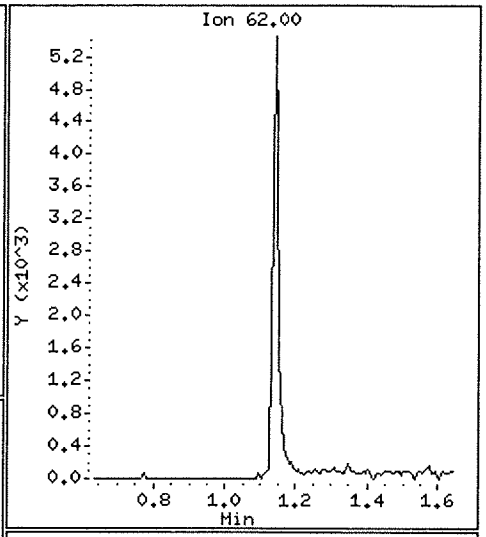
Column phase: DB624

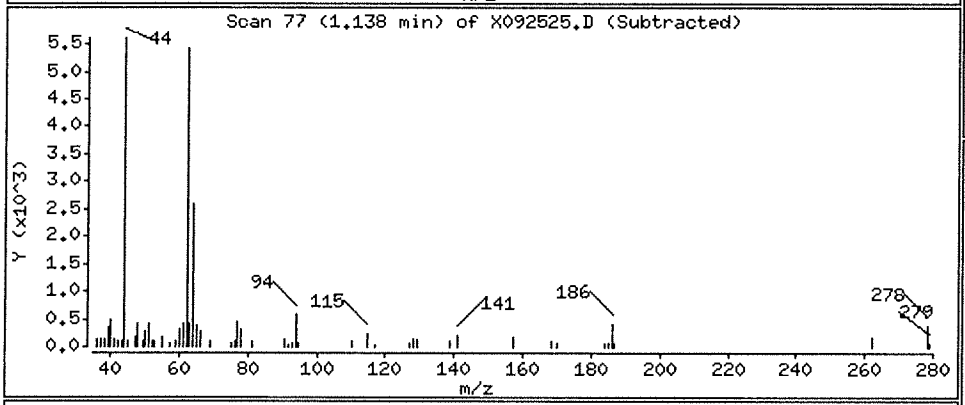
Column diameter: 0.18

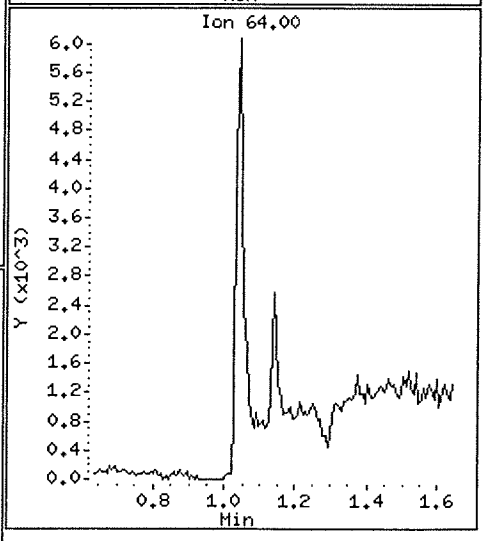
5 Vinyl Chloride

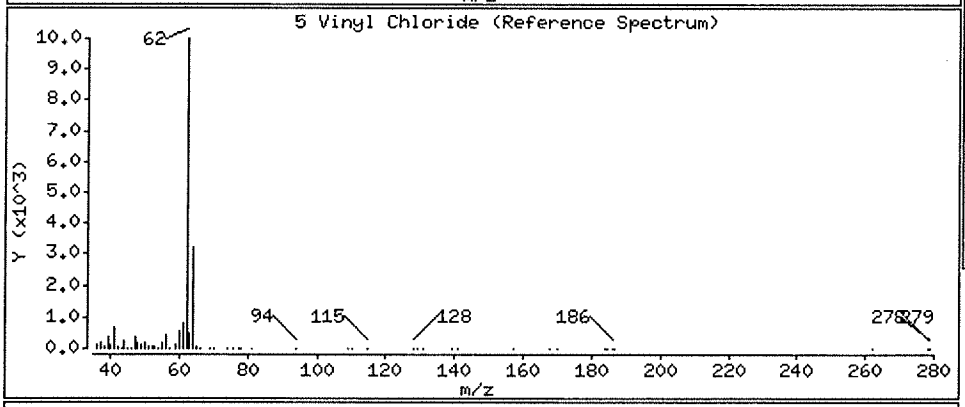
Concentration: 90.36 ug/l

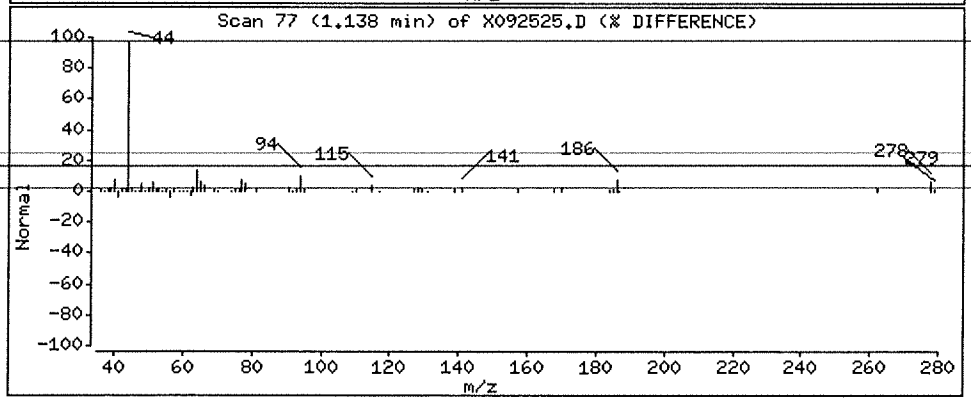












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092526.D
Lab Smp Id: HS19090860-07 Client Smp ID: HS19090860-07
Inj Date : 25-SEP-2019 20:14
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-07;HS19090860-07;;;
Misc Info : HS18090001;WATER;0;10;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 25
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	10.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

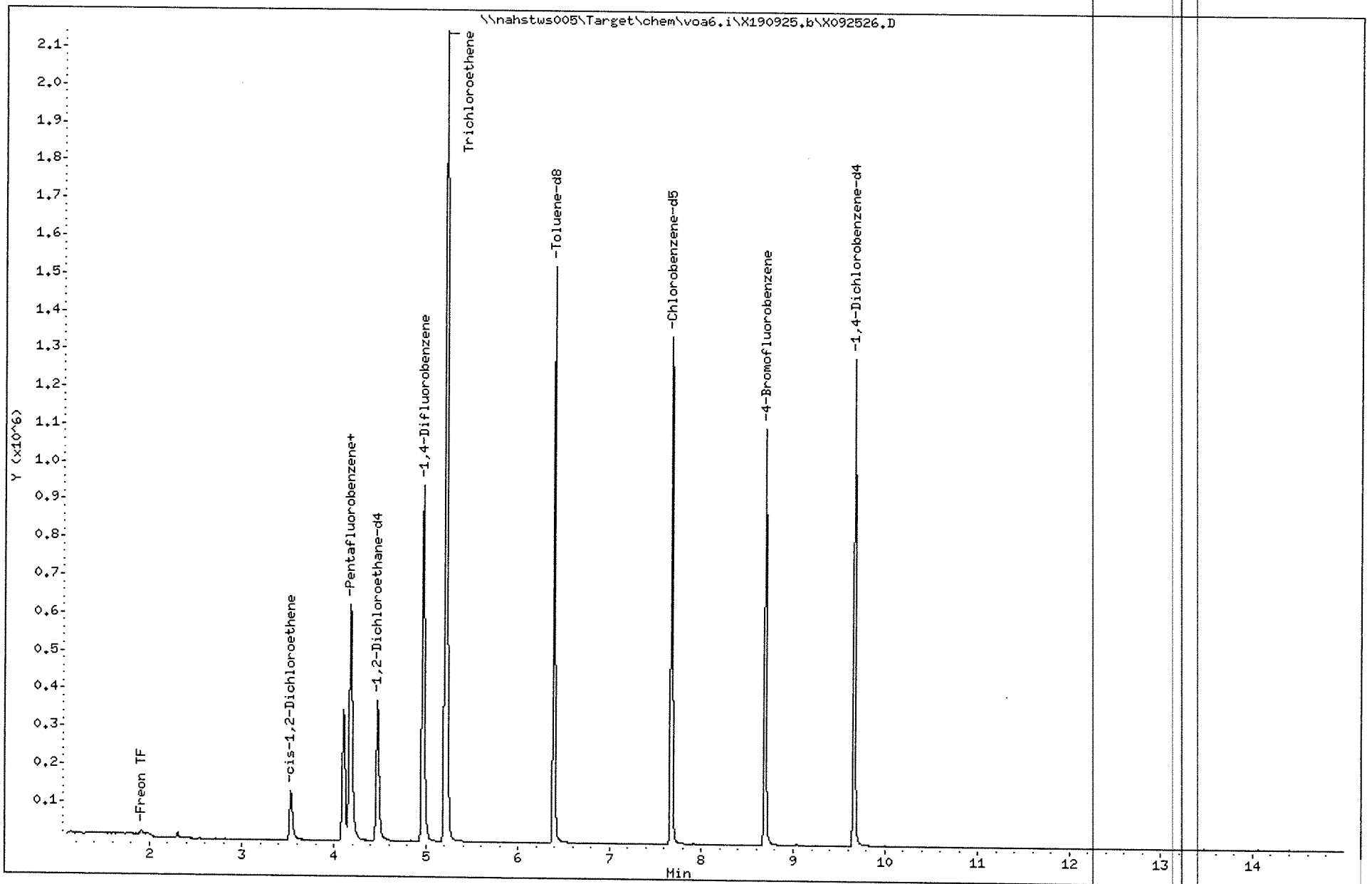
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	69549	10.4328	104.32
38 Trichloroethene	130	5.207	5.214	(1.048)	757159	124.832	1248.32
5 Vinyl Chloride	62	1.138	1.138	(0.272)	4254	0.62234	6.22(a)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	275167	44.7017	44.70
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	318895	51.1330	51.13
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	242101	45.8525	45.85
$ 48 Toluene-d8	98	6.389	6.388	(0.833)	914020	49.7468	49.74
* 1 Pentafluorobenzene	168	4.182	4.189	(1.000)	539995	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	791287	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	653886	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	309548	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092526.D
Date : 25-SEP-2019 20:14
Client ID: HS19090860-07
Sample Info: HS19090860-07;HS19090860-07;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092526.D

Date : 25-SEP-2019 20:14

Client ID: HS19090860-07

Instrument: voa6.i

Sample Info: HS19090860-07;HS19090860-07;;;

Purge Volume: 5.0

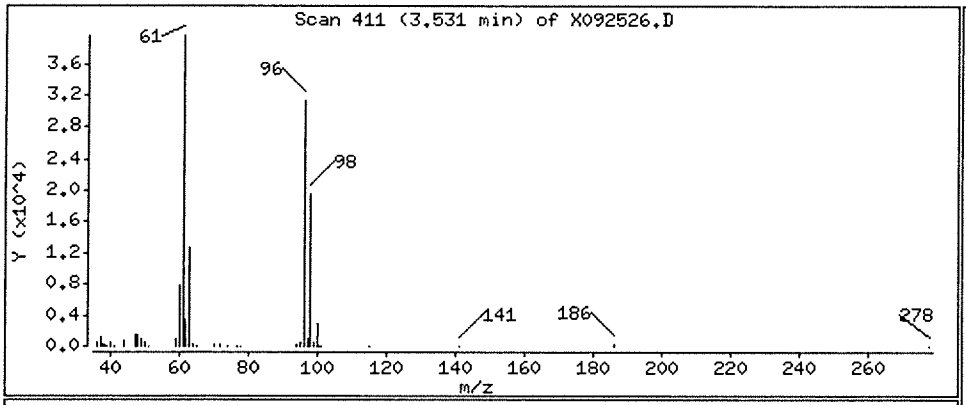
Operator: PC

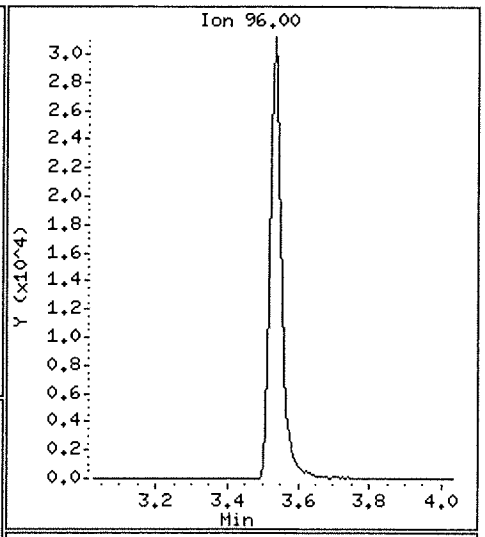
Column phase: DB624

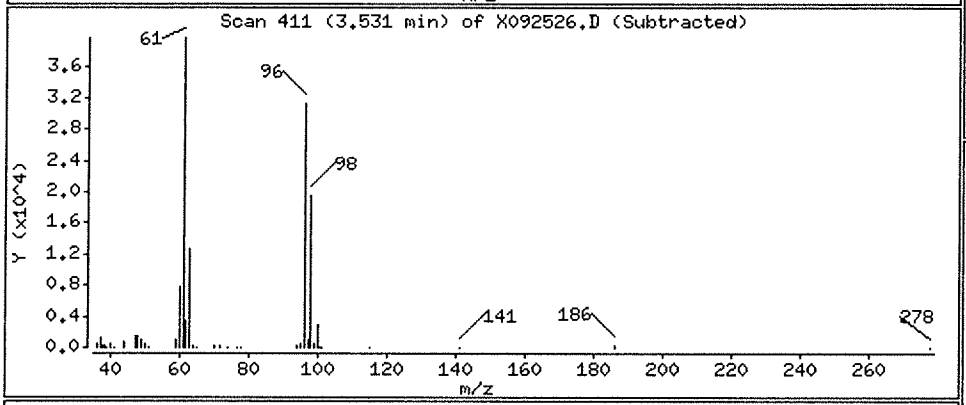
Column diameter: 0.18

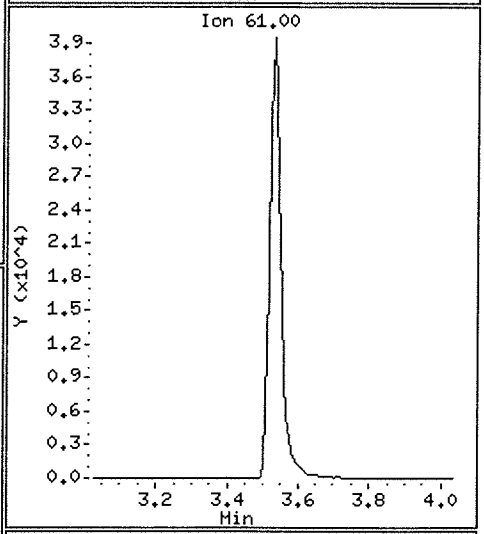
27 cis-1,2-Dichloroethene

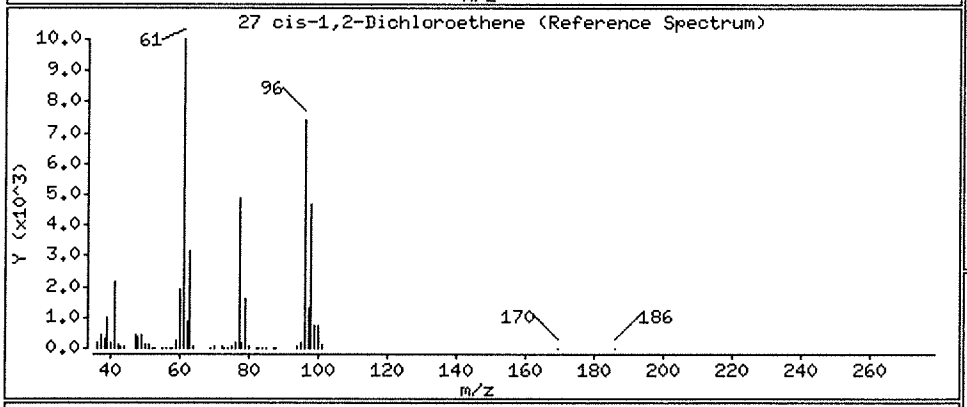
Concentration: 104.32 ug/l

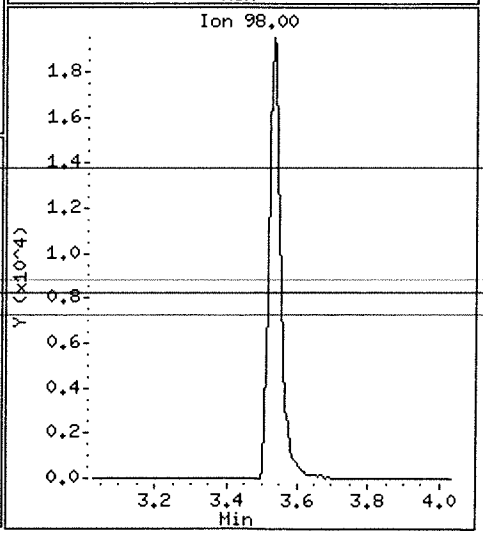


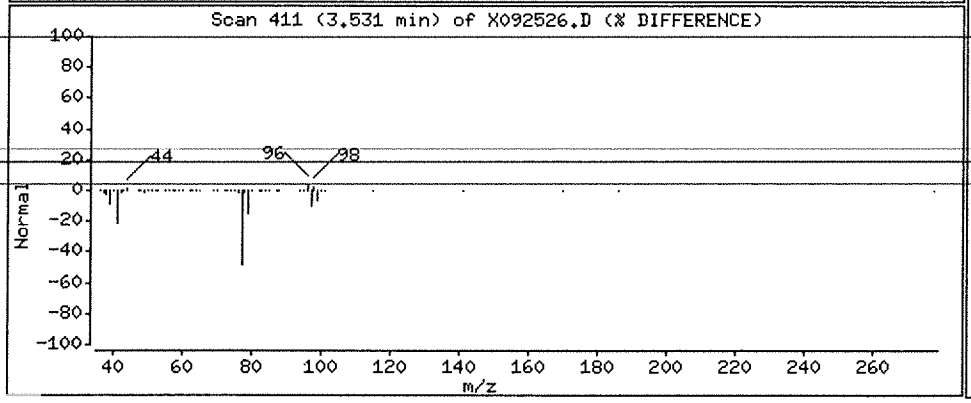












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092526.D

Date : 25-SEP-2019 20:14

Client ID: HS19090860-07

Instrument: voa6.i

Sample Info: HS19090860-07;HS19090860-07;;;

Purge Volume: 5.0

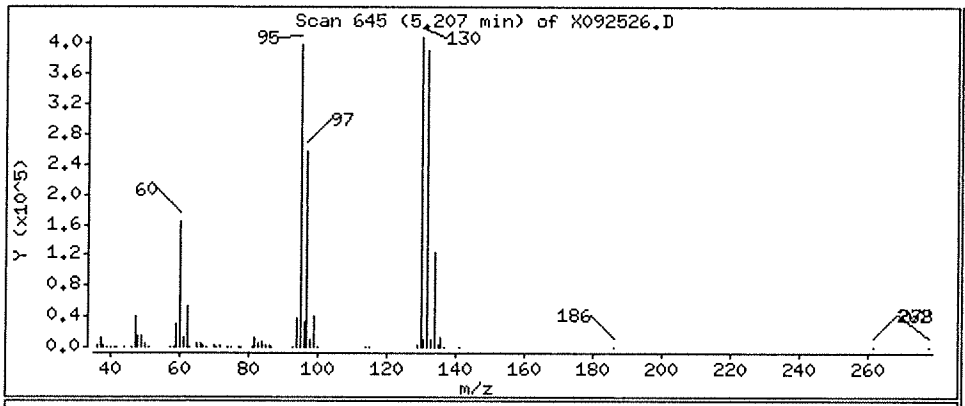
Operator: PC

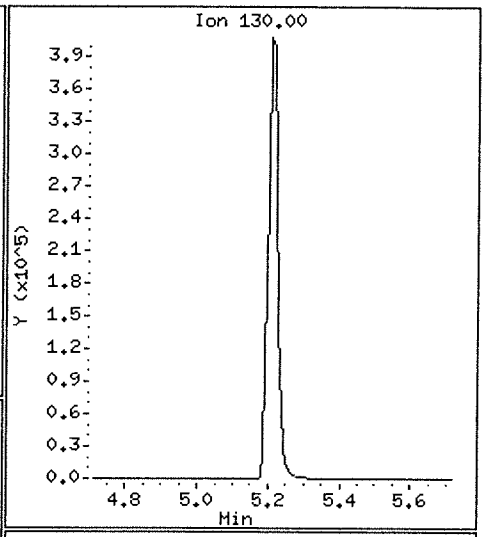
Column phase: DB624

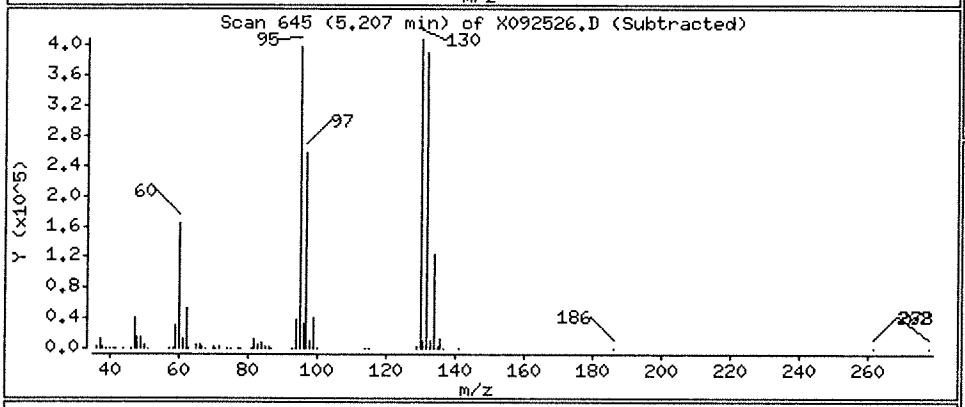
Column diameter: 0.18

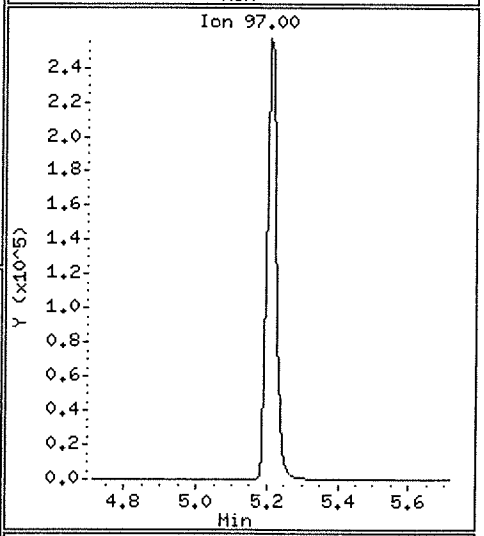
38 Trichloroethene

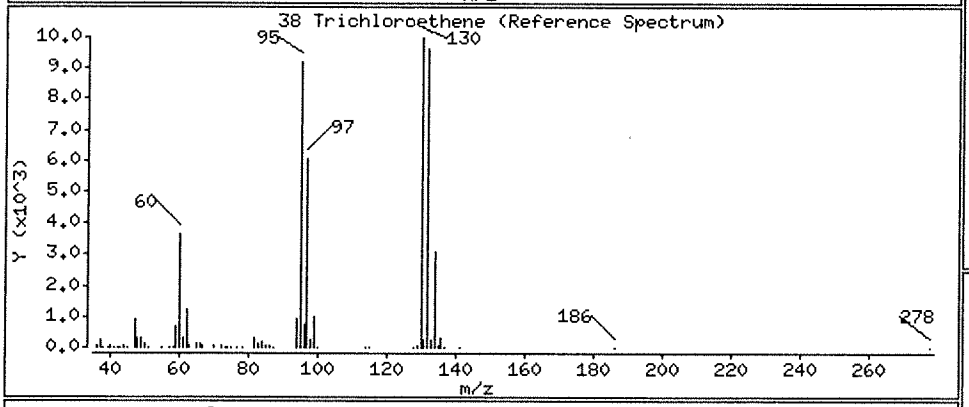
Concentration: 1248.32 ug/l

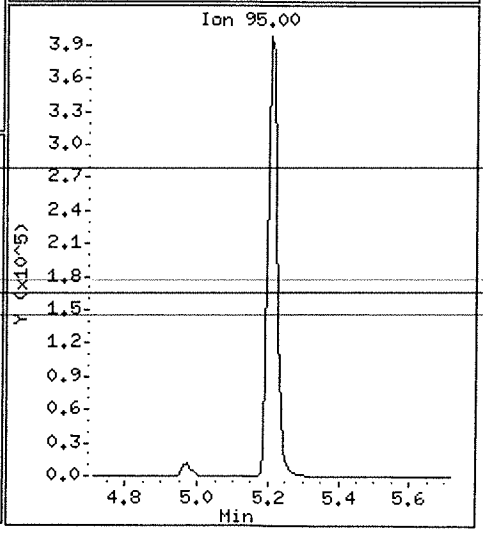


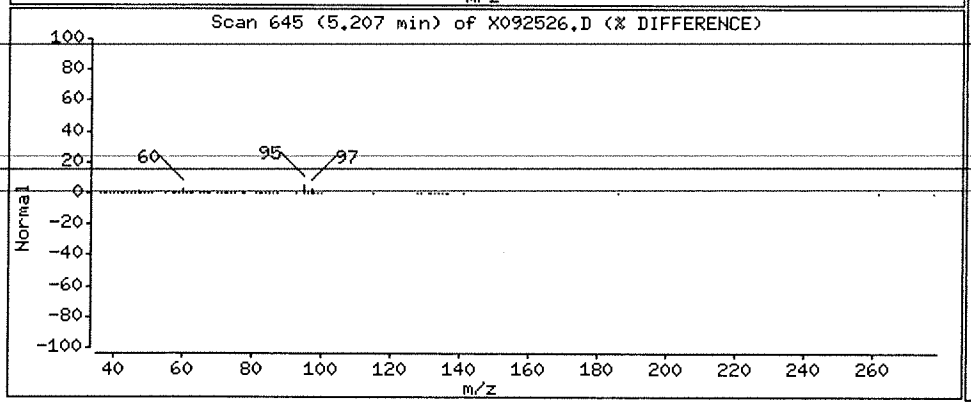












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092526.D

Date : 25-SEP-2019 20:14

Client ID: HS19090860-07

Instrument: voa6.i

Sample Info: HS19090860-07;HS19090860-07;;;

Purge Volume: 5.0

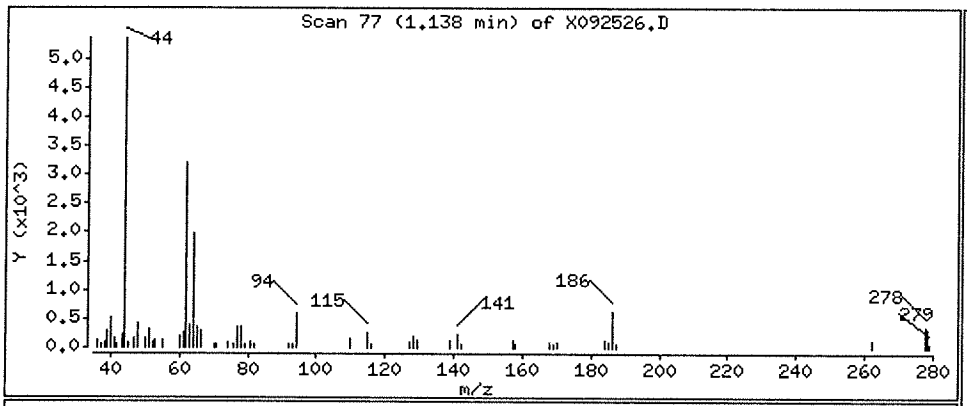
Operator: PC

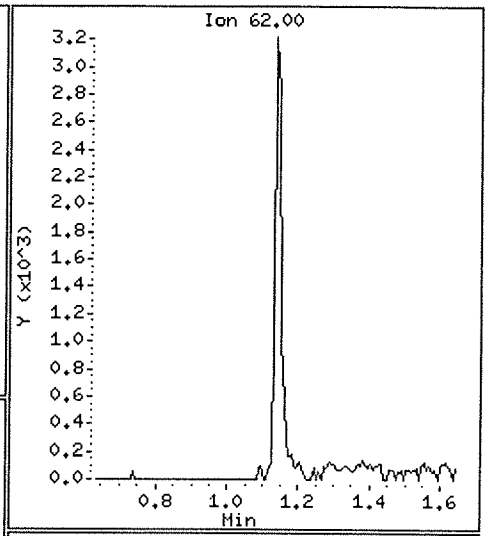
Column phase: DB624

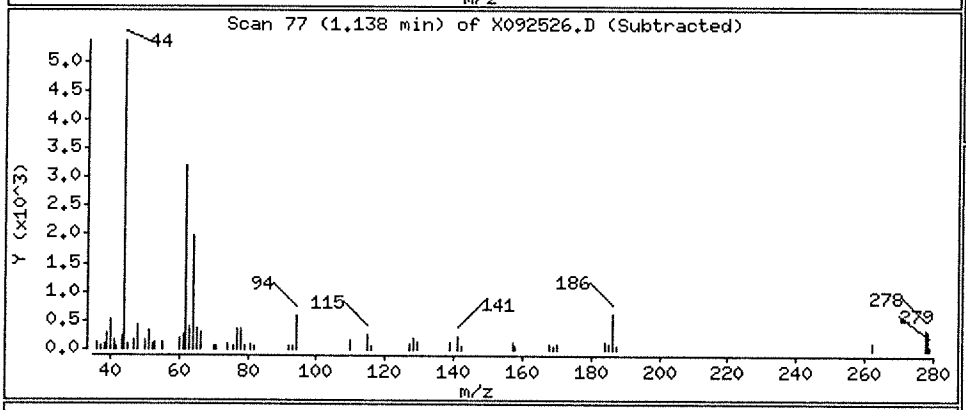
Column diameter: 0.18

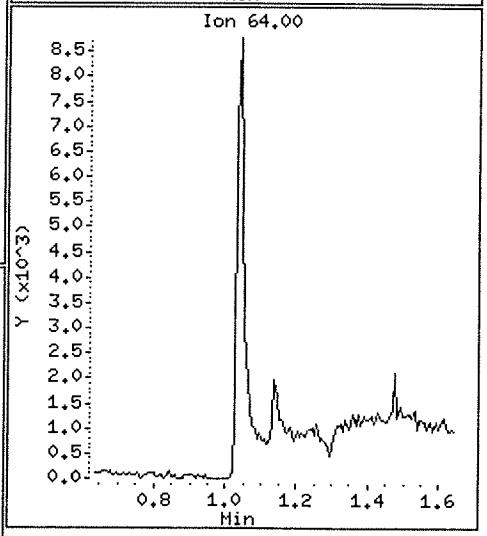
5 Vinyl Chloride

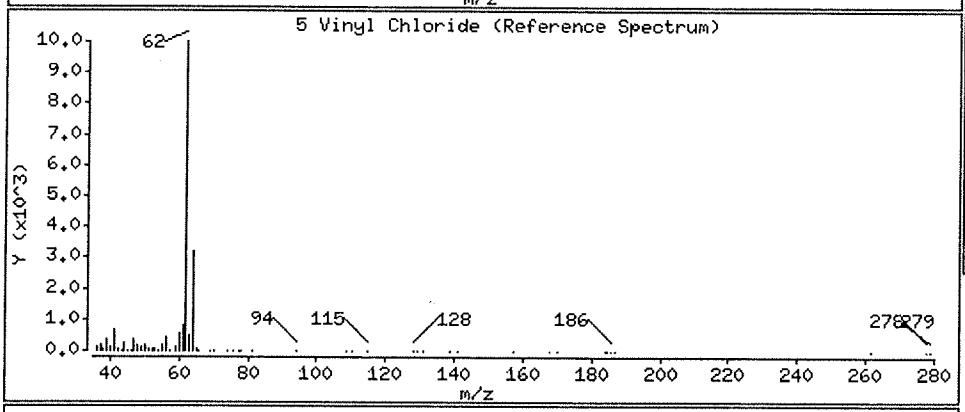
Concentration: 6.22 ug/l

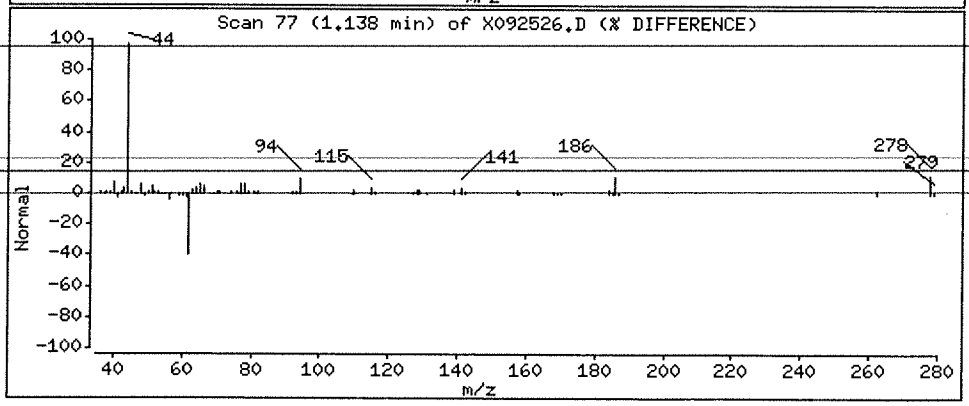












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092527.D
Lab Smp Id: HS19090860-07 Client Smp ID: HS19090860-07
Inj Date : 25-SEP-2019 20:38
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-07;HS19090860-07;;;
Misc Info : HS18090001;WATER;0;100;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 26
Dil Factor: 100.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	100.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
27 cis-1,2-Dichloroethene	96	3.537	3.530	(0.844)	7426	1.10005	110.00(a)
38 Trichloroethene	130	5.214	5.214	(1.049)	84840	13.6665	1366.65
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	278633	44.6999	44.69
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	358564	53.5888	53.58
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.979)	247734	46.3429	46.34
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	955706	48.4320	48.43
* 1 Pentafluorobenzene	168	4.189	4.189	(1.000)	546818	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	809871	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	702270	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	379587	50.0000	

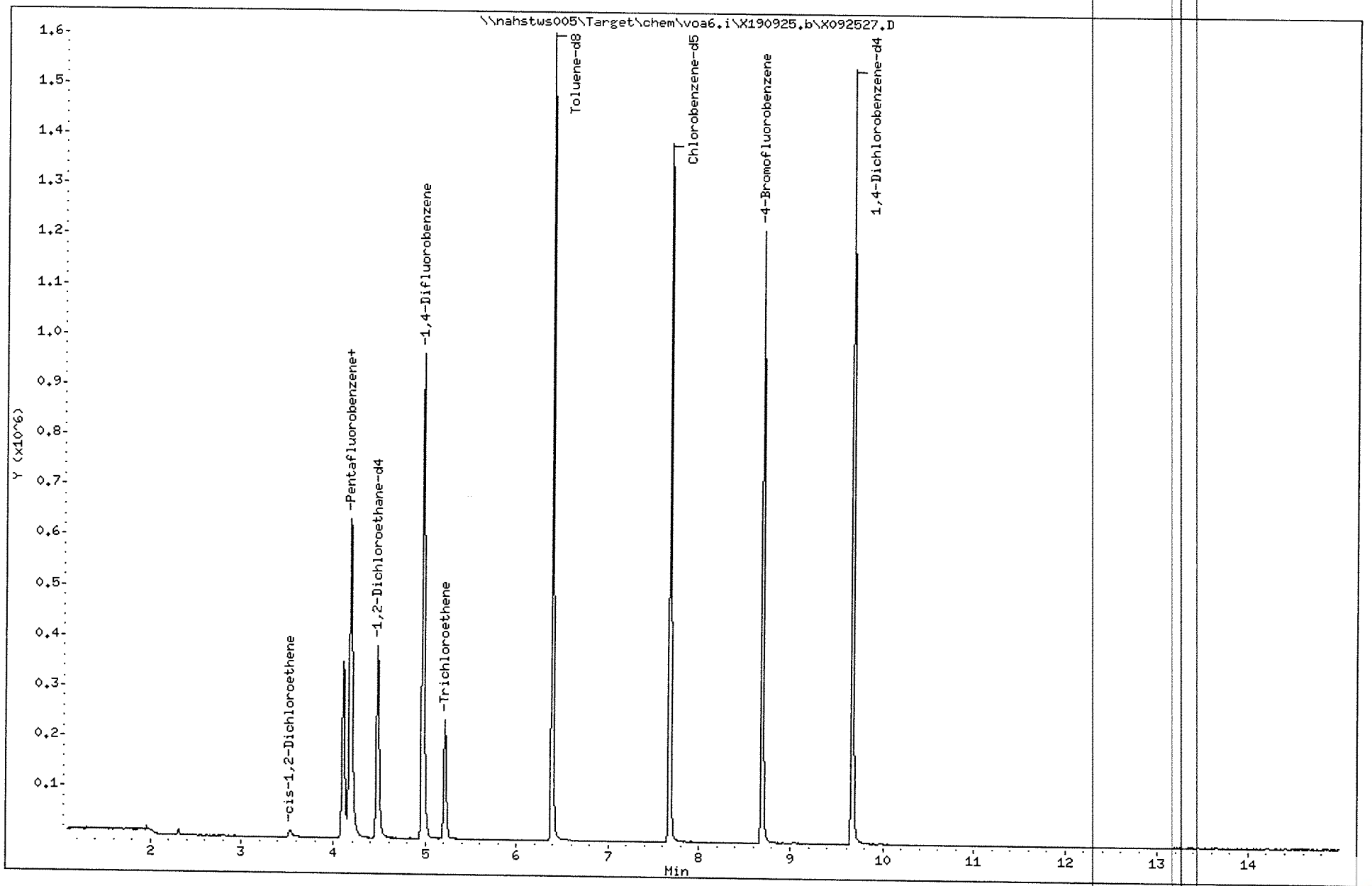
QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092527.D
Date : 25-SEP-2019 20:38
Client ID: HS19090860-07
Sample Info: HS19090860-07;HS19090860-07;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i

Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092527.D

Date : 25-SEP-2019 20:38

Client ID: HS19090860-07

Instrument: voa6.i

Sample Info: HS19090860-07;HS19090860-07;;;

Purge Volume: 5.0

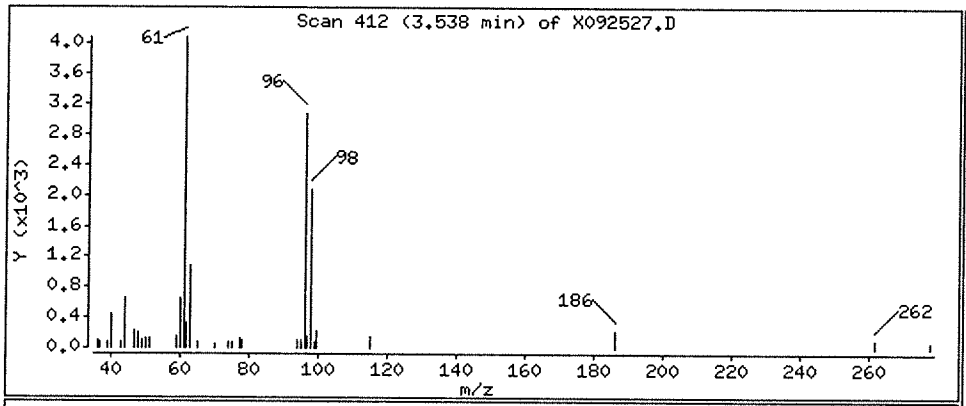
Operator: PC

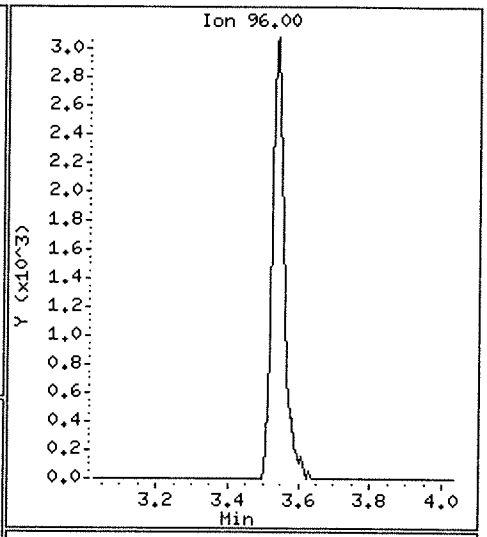
Column phase: DB624

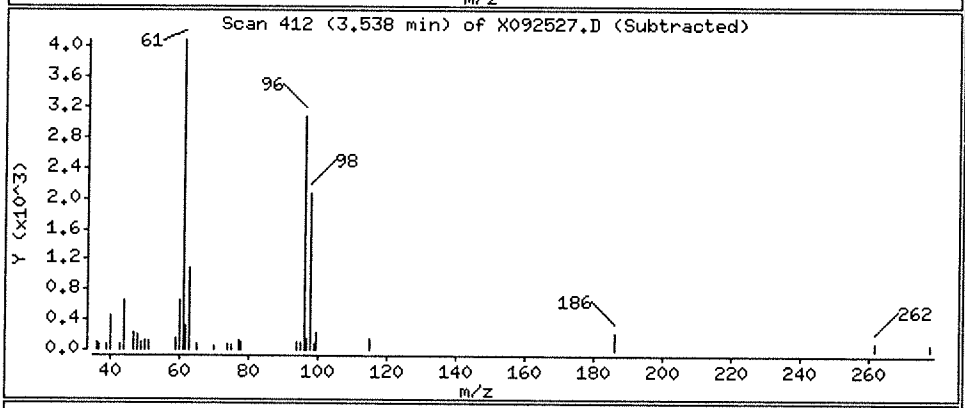
Column diameter: 0.18

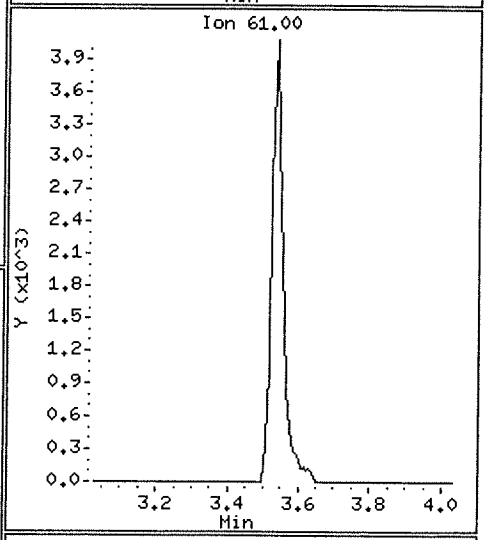
27 cis-1,2-Dichloroethene

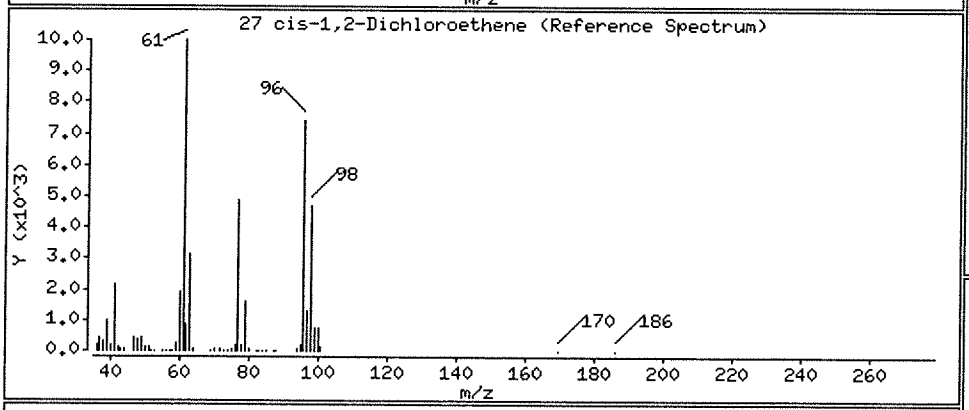
Concentration: 110.00 ug/l

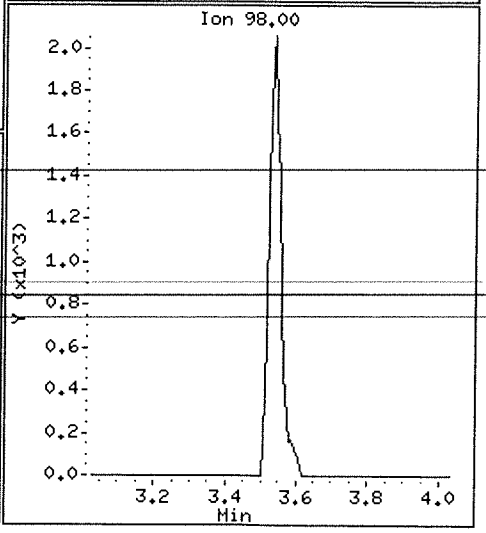


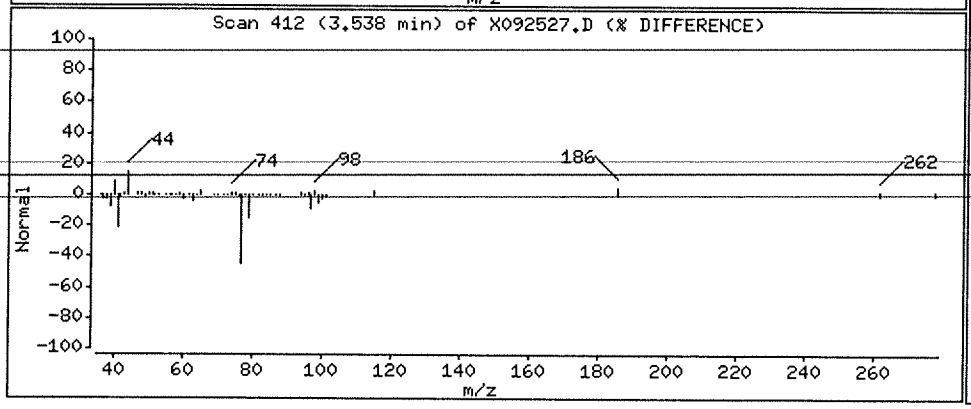












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092527.D

Date : 25-SEP-2019 20:38

Client ID: HS19090860-07

Instrument: voa6.i

Sample Info: HS19090860-07;HS19090860-07;;;

Purge Volume: 5.0

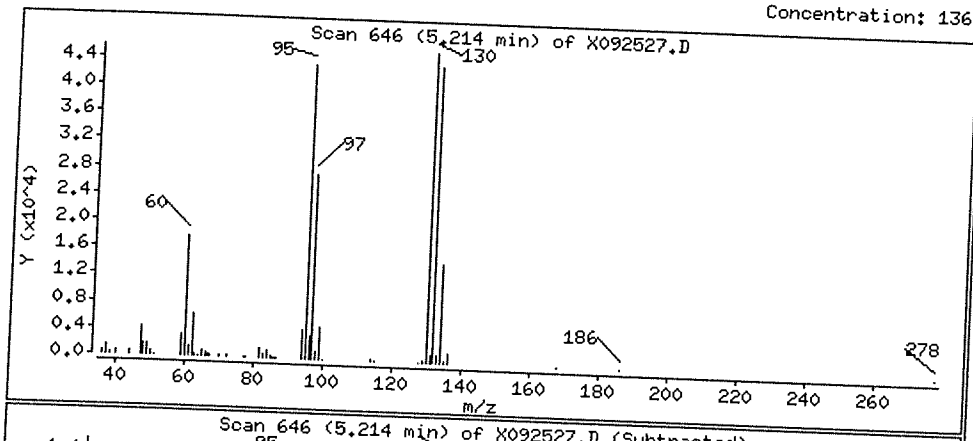
Operator: PC

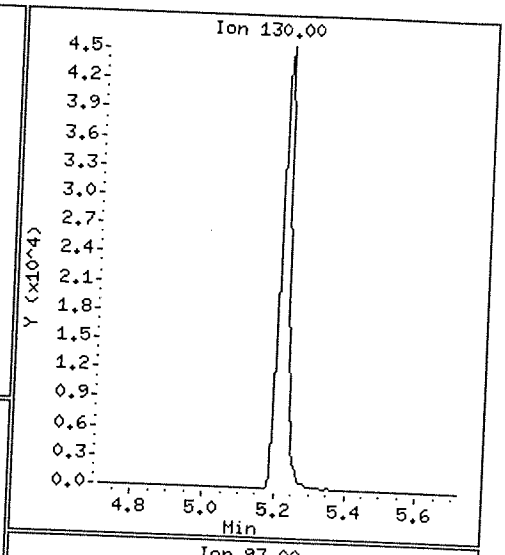
Column phase: DB624

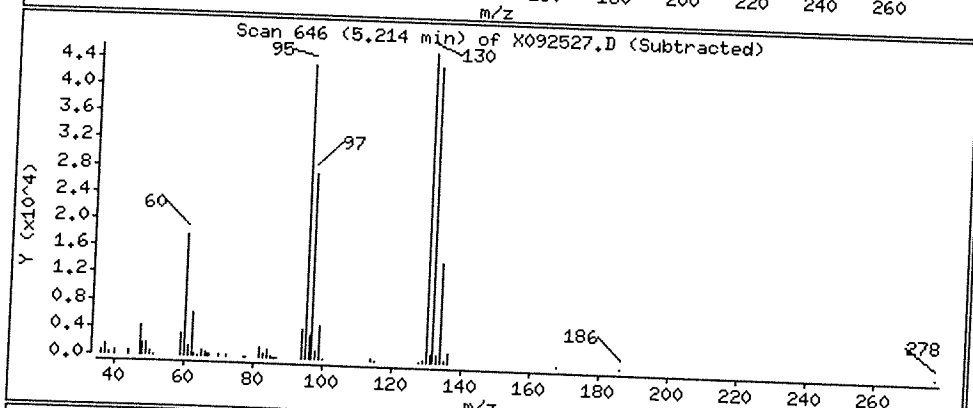
Column diameter: 0.18

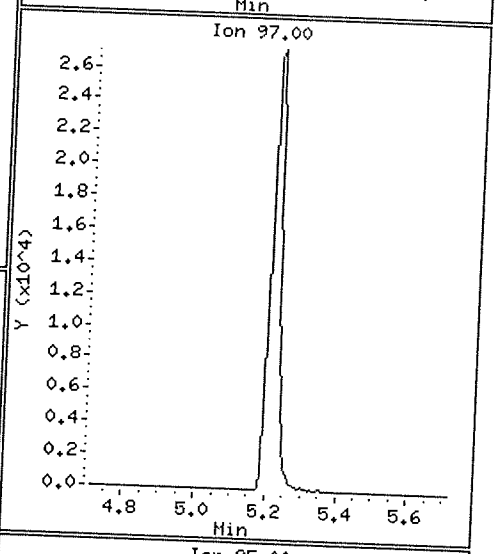
38 Trichloroethene

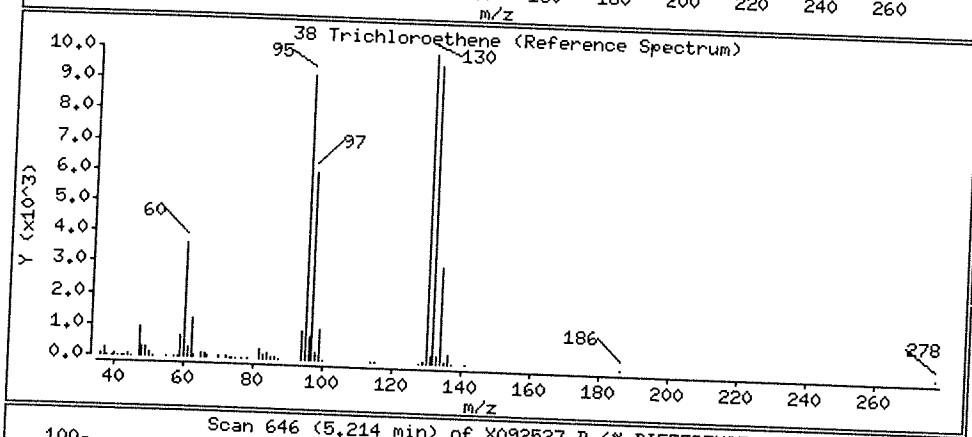
Concentration: 1366.65 ug/l

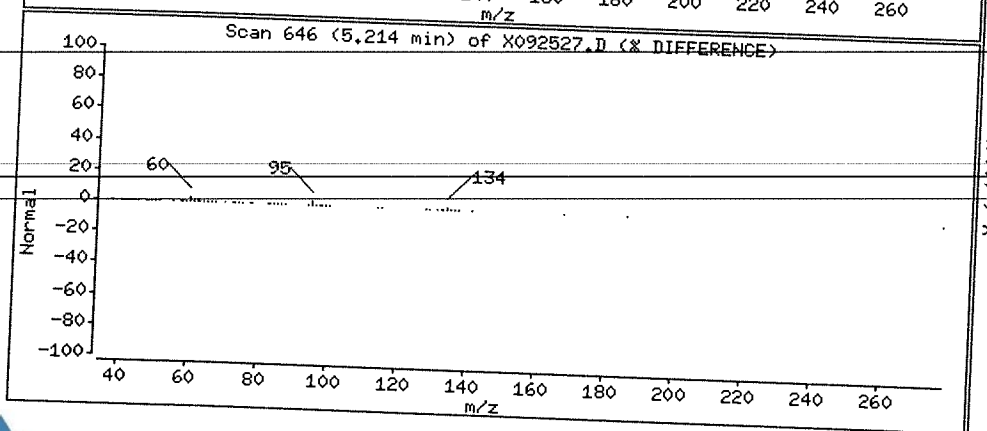


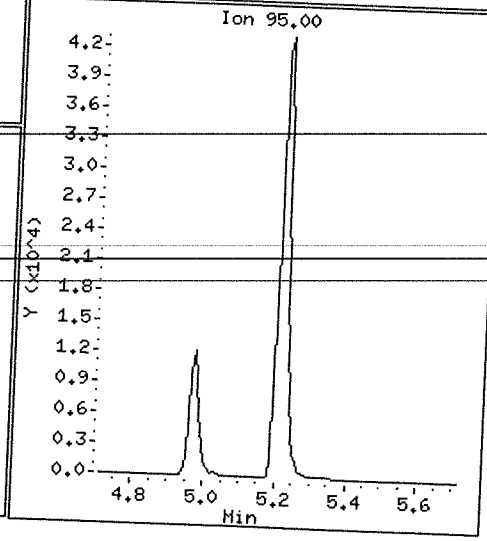












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092528.D
Lab Smp Id: HS19090860-10 Client Smp ID: HS19090860-10
Inj Date : 25-SEP-2019 21:02
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-10;HS19090860-10;;;
Misc Info : HS18090001;WATER;0;10;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 27
Dil Factor: 10.00000
Integrator: HP RTE
Target Version: 4.14 Compound Sublist: CBI-HOU.sub

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

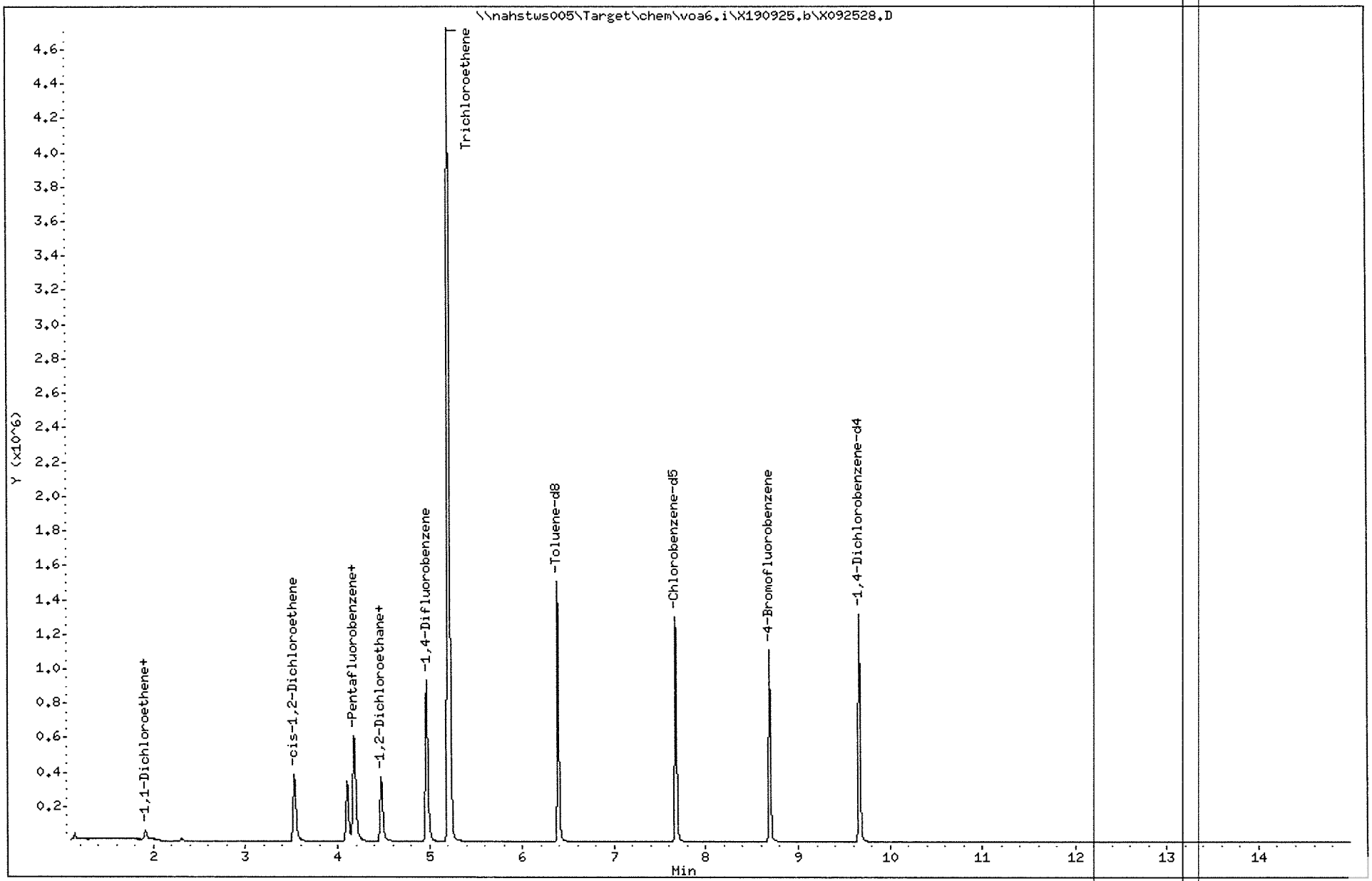
Name	Value	Description
DF	10.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	11 1,1-Dichloroethene	96	1.919	1.912	(0.458)	4203	0.91022	9.10(a)
	33 1,2-Dichloroethane	62	4.569	4.562	(0.919)	3844	0.53077	5.30(a)
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	202541	30.7663	307.66
	38 Trichloroethene	130	5.214	5.214	(1.049)	1700449	285.208	2852.07(A)
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	25270	3.74359	37.43(a)
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	273587	45.0132	45.01
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	319384	52.1214	52.12
$	30 Dibromofluoromethane	113	4.103	4.103	(0.979)	243615	46.7384	46.73
$	48 Toluene-d8	98	6.388	6.388	(0.833)	901906	49.9381	49.93
*	1 Pentafluorobenzene	168	4.189	4.189	(1.000)	533258	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	777814	50.0000	
*	47 Chlorobenzene-d5	117	7.670	7.671	(1.000)	642749	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	323340	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092528.D
Date : 25-SEP-2019 21:02
Client ID: HS19090860-10
Instrument: voa6.i
Sample Info: HS19090860-10;HS19090860-10;;;
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092528.D

Date : 25-SEP-2019 21:02

Client ID: HS19090860-10

Instrument: voa6.i

Sample Info: HS19090860-10;HS19090860-10;;;

Purge Volume: 5.0

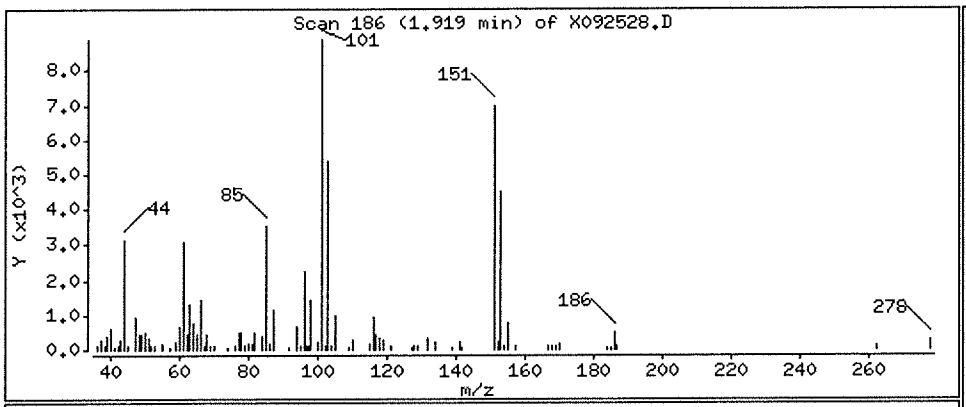
Operator: PC

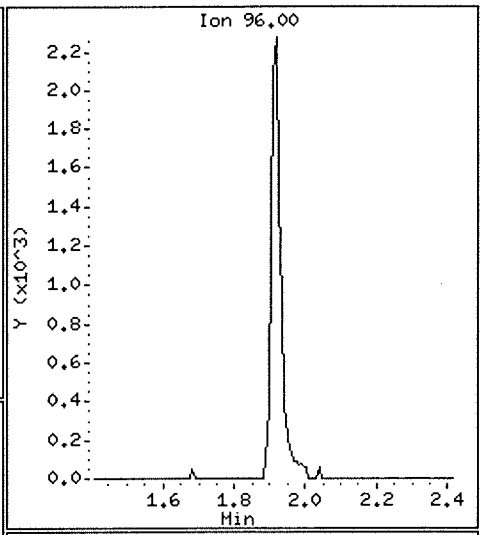
Column phase: DB624

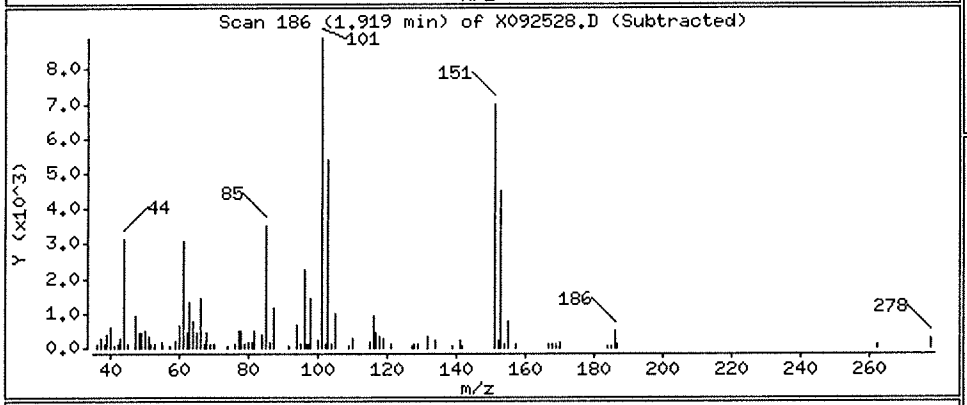
Column diameter: 0.18

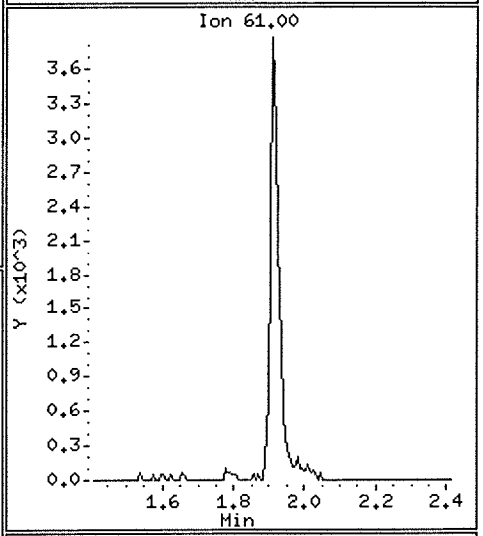
11 1,1-Dichloroethene

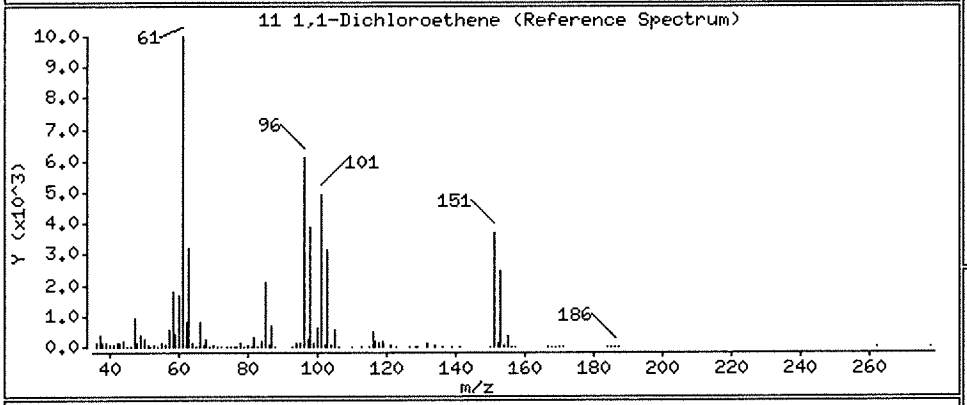
Concentration: 9.10 ug/l

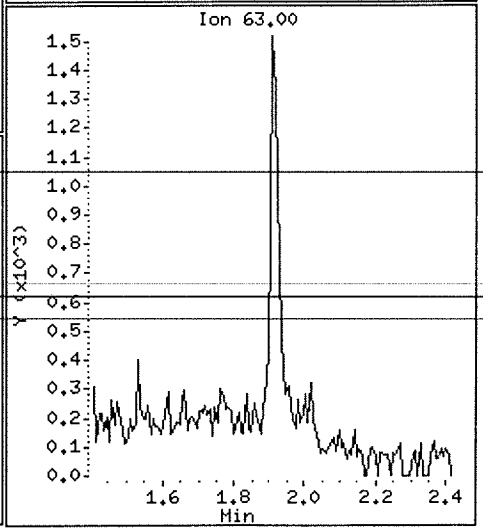


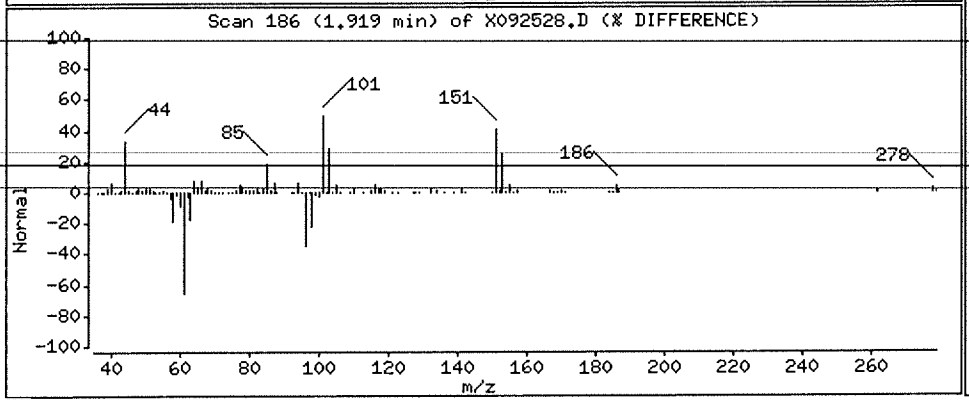












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092528.D

Date : 25-SEP-2019 21:02

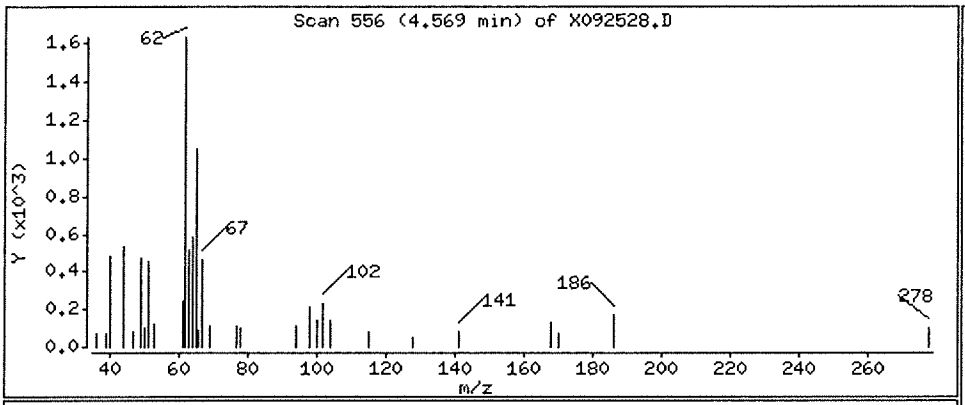
Client ID: HS19090860-10 Instrument: voa6.i

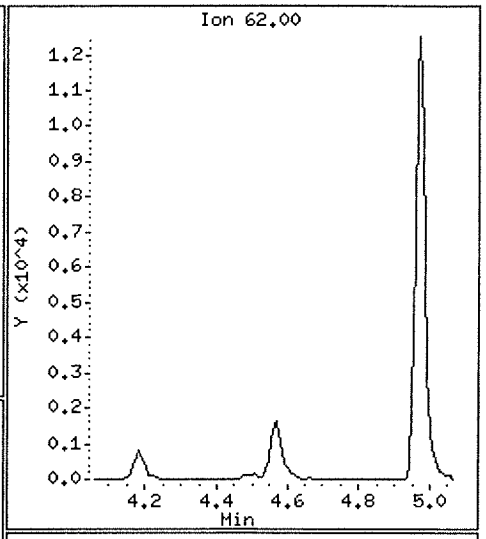
Sample Info: HS19090860-10;HS19090860-10;;;

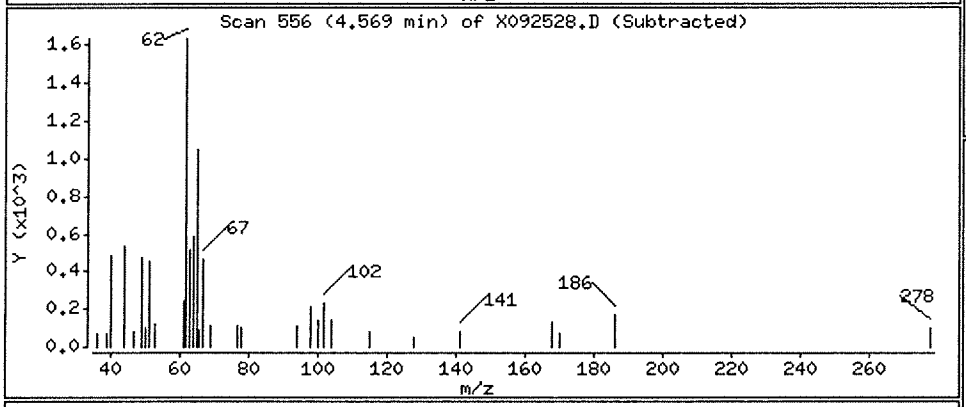
Purge Volume: 5.0 Operator: PC

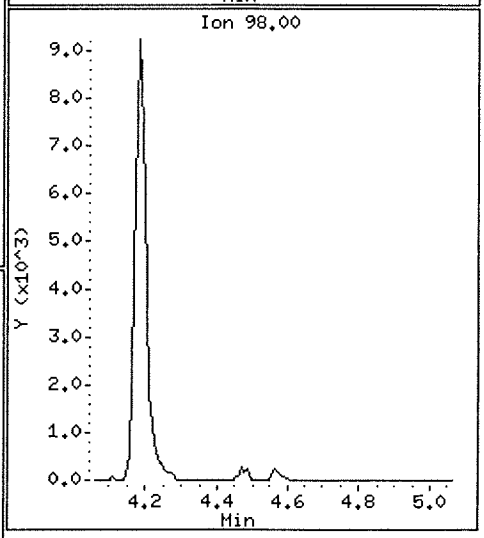
Column phase: DB624 Column diameter: 0.18

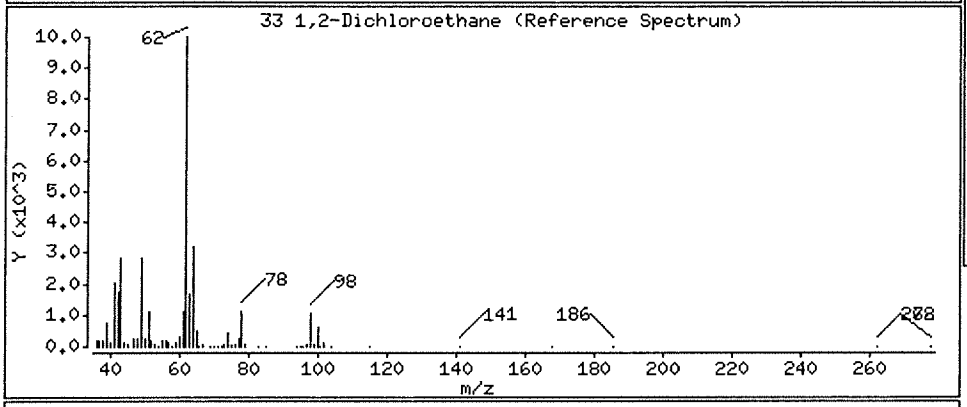
33 1,2-Dichloroethane Concentration: 5.30 ug/l

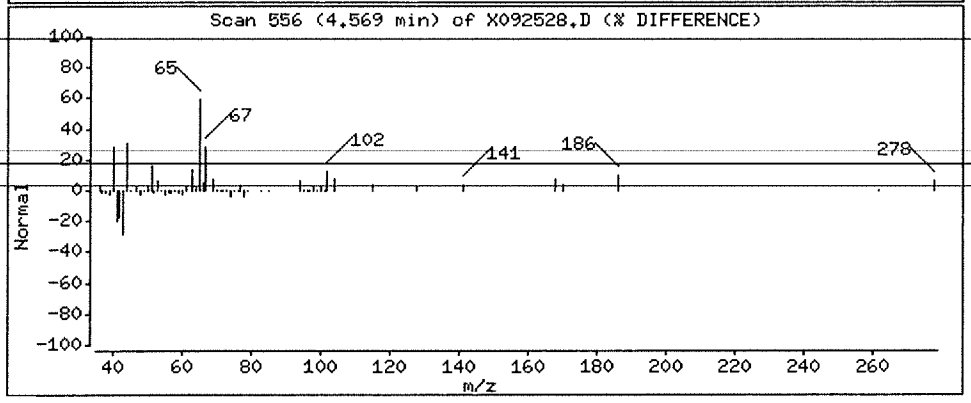












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092528.D

Date : 25-SEP-2019 21:02

Client ID: HS19090860-10

Instrument: voa6.i

Sample Info: HS19090860-10;HS19090860-10;;;

Purge Volume: 5.0

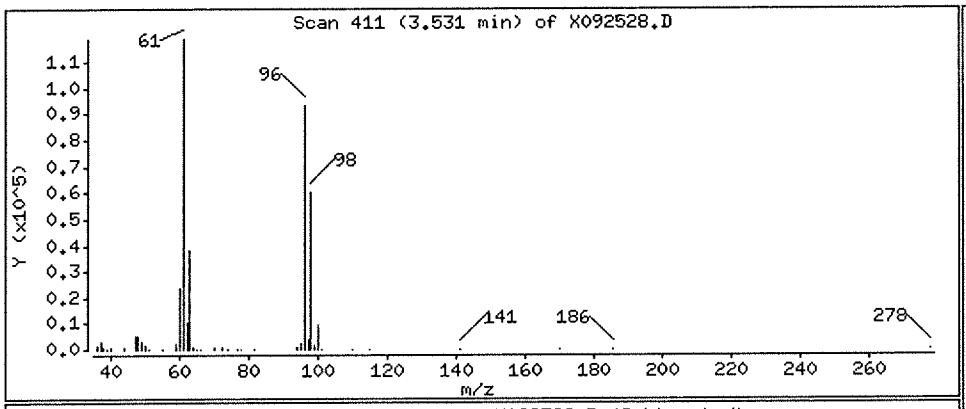
Operator: PC

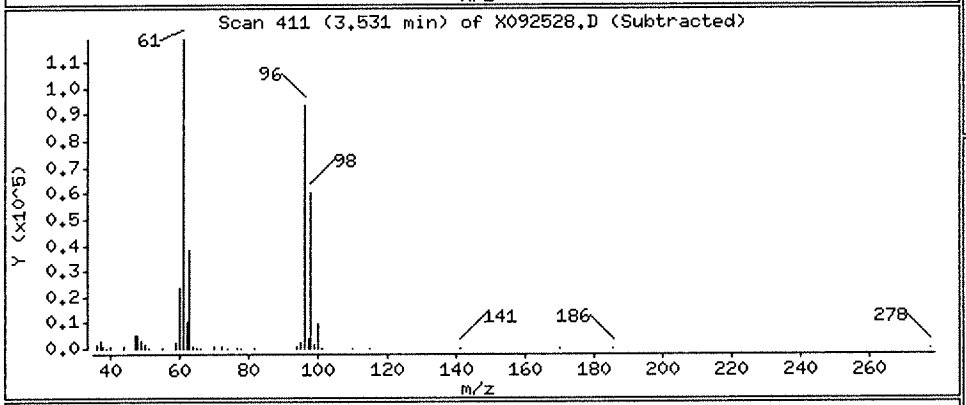
Column phase: DB624

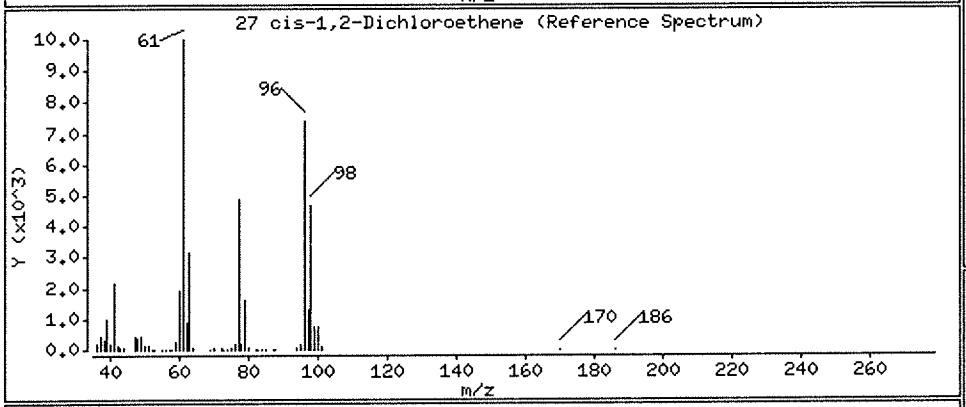
Column diameter: 0.18

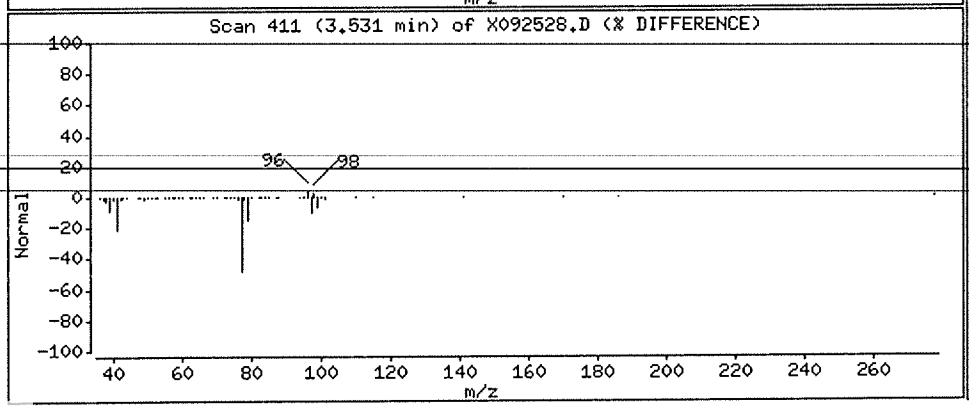
27 cis-1,2-Dichloroethene

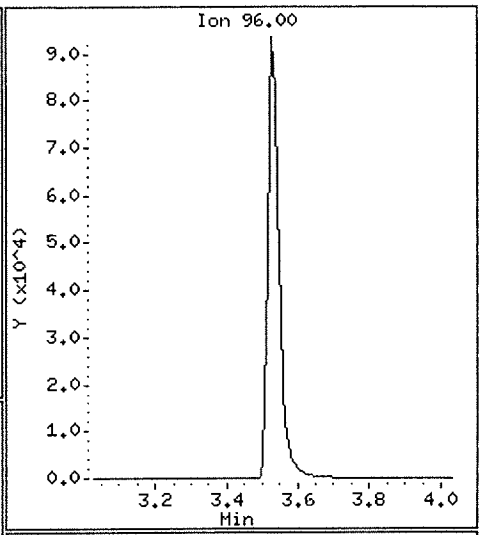
Concentration: 307.66 ug/l

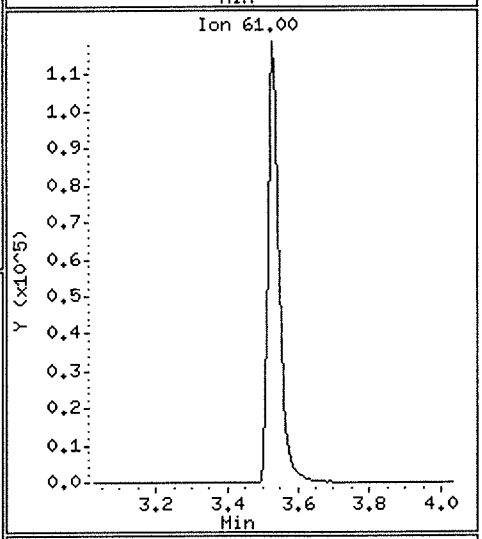


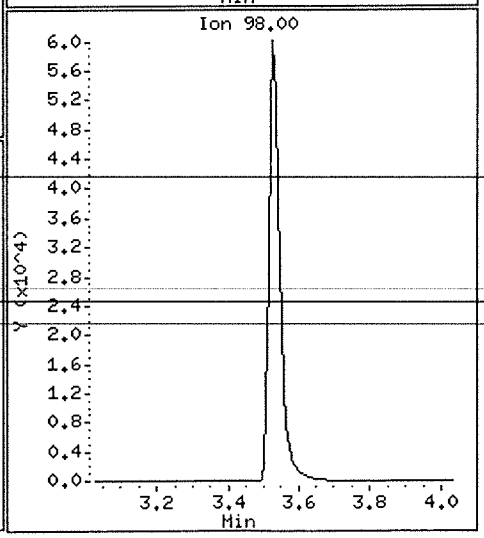












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092528.D

Date : 25-SEP-2019 21:02

Client ID: HS19090860-10

Instrument: voa6.i

Sample Info: HS19090860-10;HS19090860-10;;;

Purge Volume: 5.0

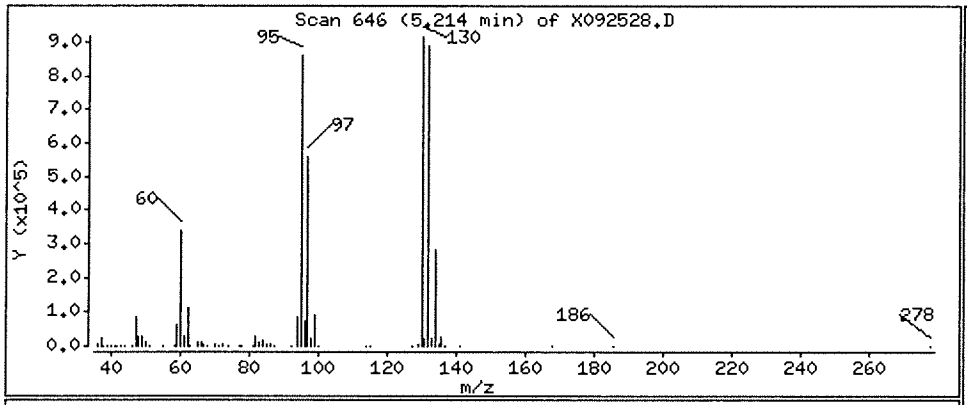
Operator: PC

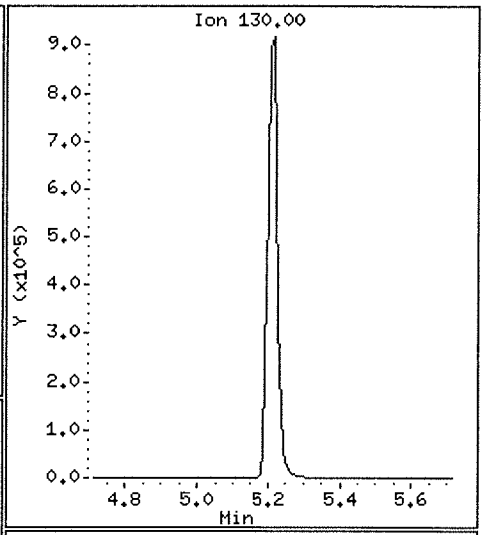
Column phase: DB624

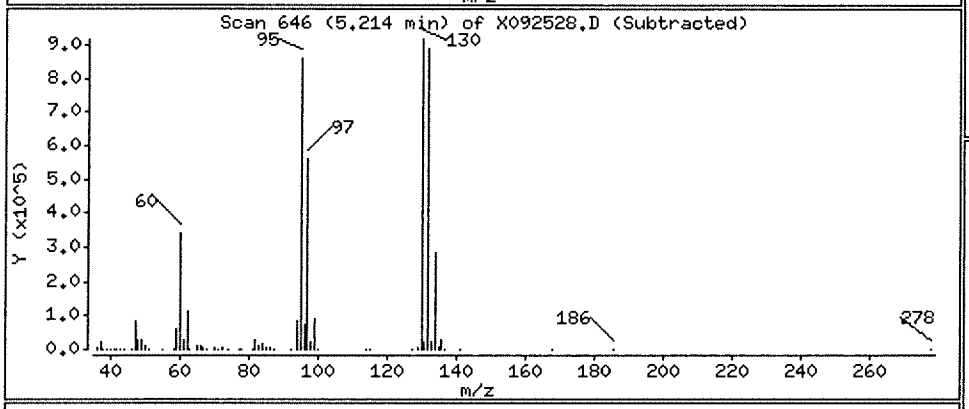
Column diameter: 0.18

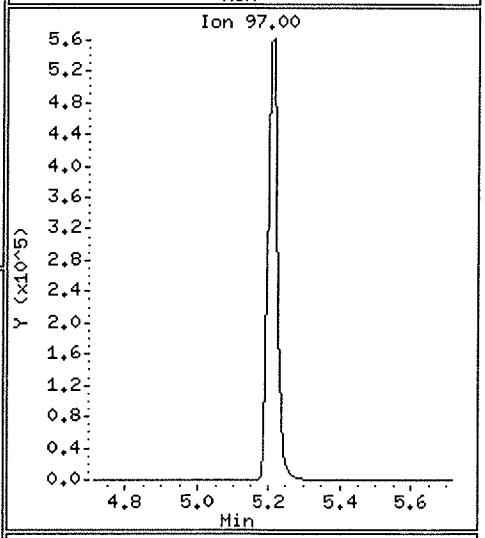
38 Trichloroethene

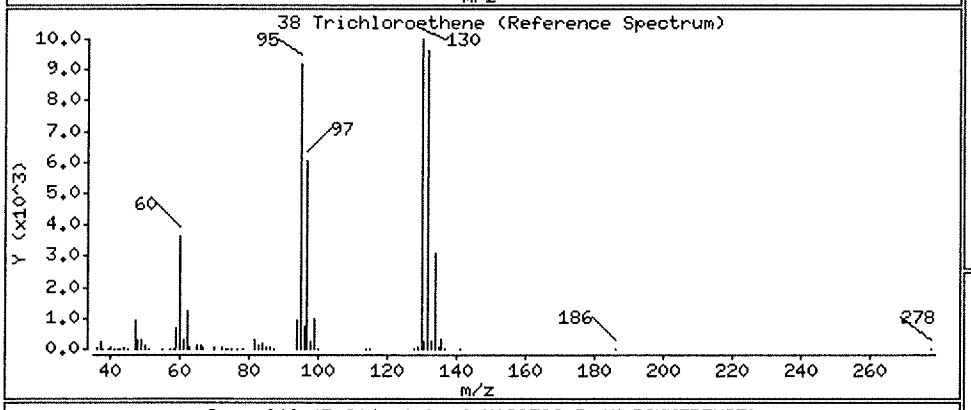
Concentration: 2852.07 ug/l

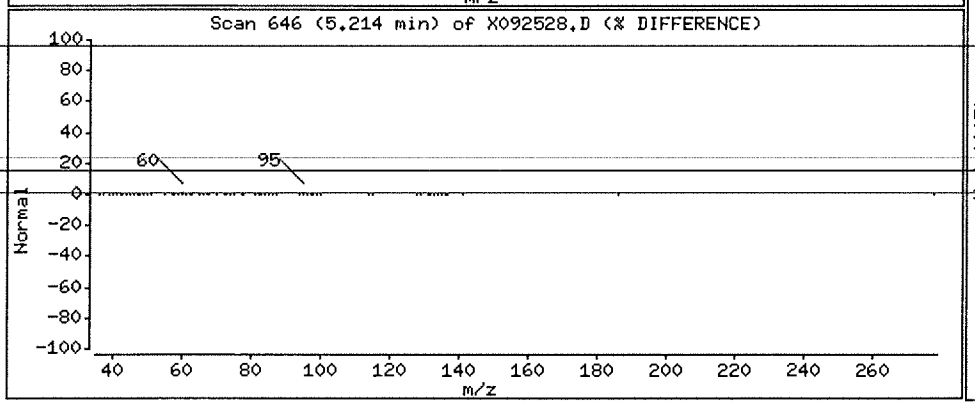


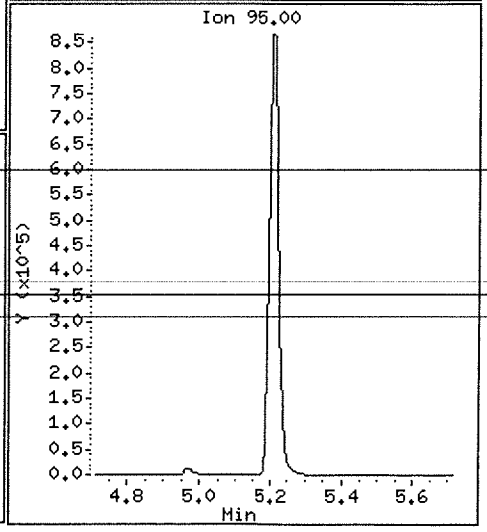












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092528.D

Date : 25-SEP-2019 21:02

Client ID: HS19090860-10

Instrument: voa6.i

Sample Info: HS19090860-10;HS19090860-10;;;

Purge Volume: 5.0

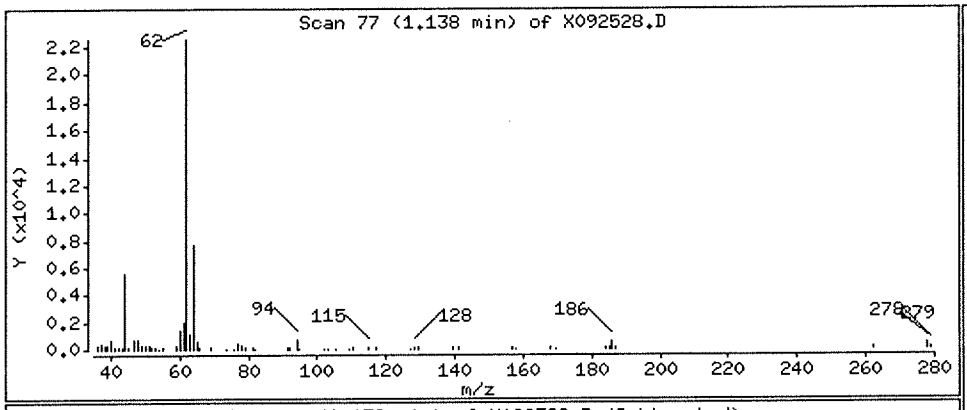
Operator: PC

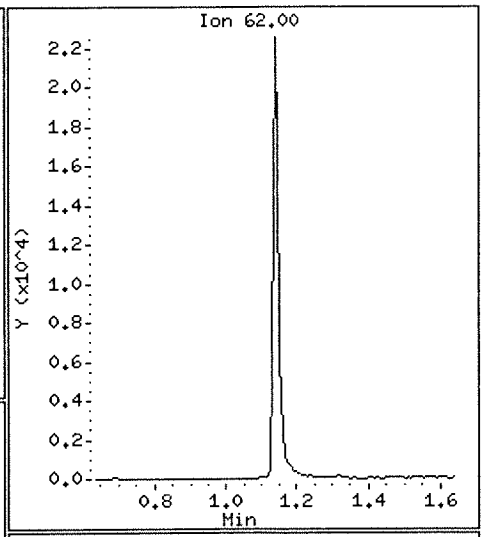
Column phase: DB624

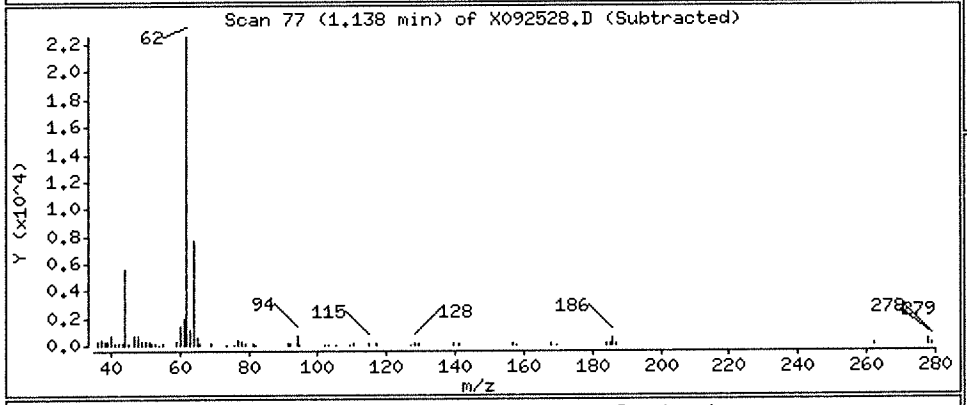
Column diameter: 0.18

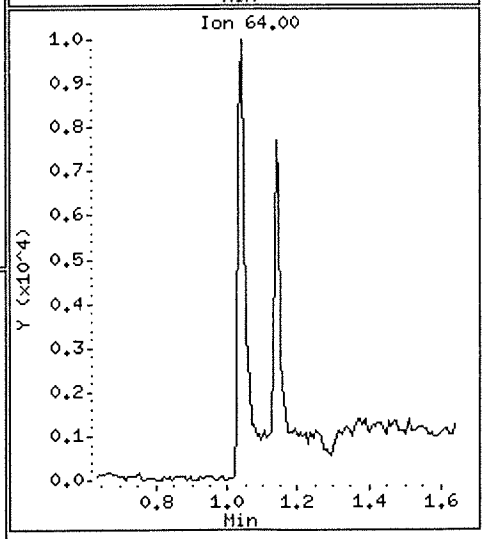
5 Vinyl Chloride

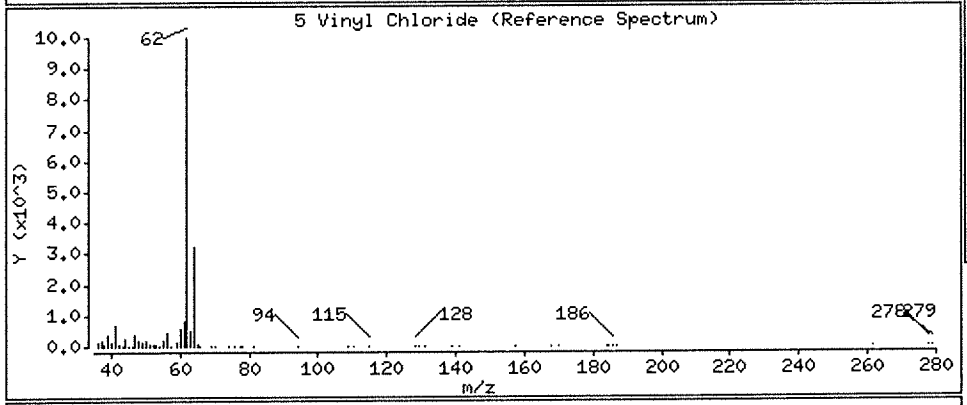
Concentration: 37.43 ug/l

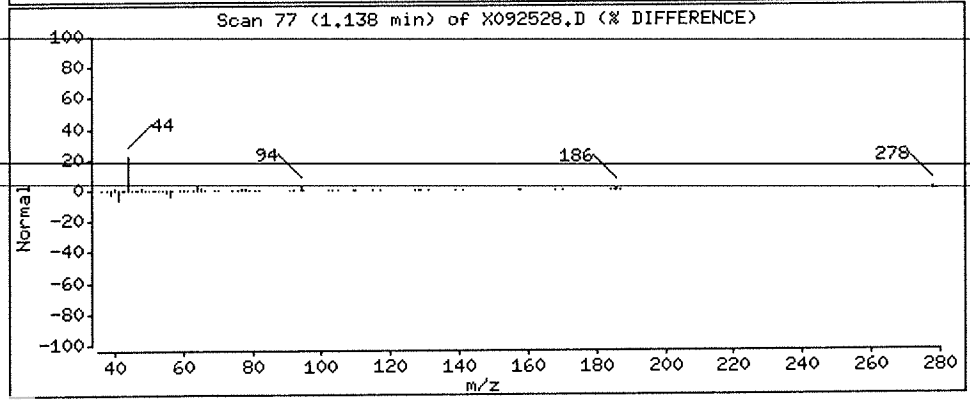












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092529.D
Lab Smp Id: HS19090860-10 Client Smp ID: HS19090860-10
Inj Date : 25-SEP-2019 21:26
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-10;HS19090860-10;;;
Misc Info : HS18090001;WATER;0;100;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 28
Dil Factor: 100.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

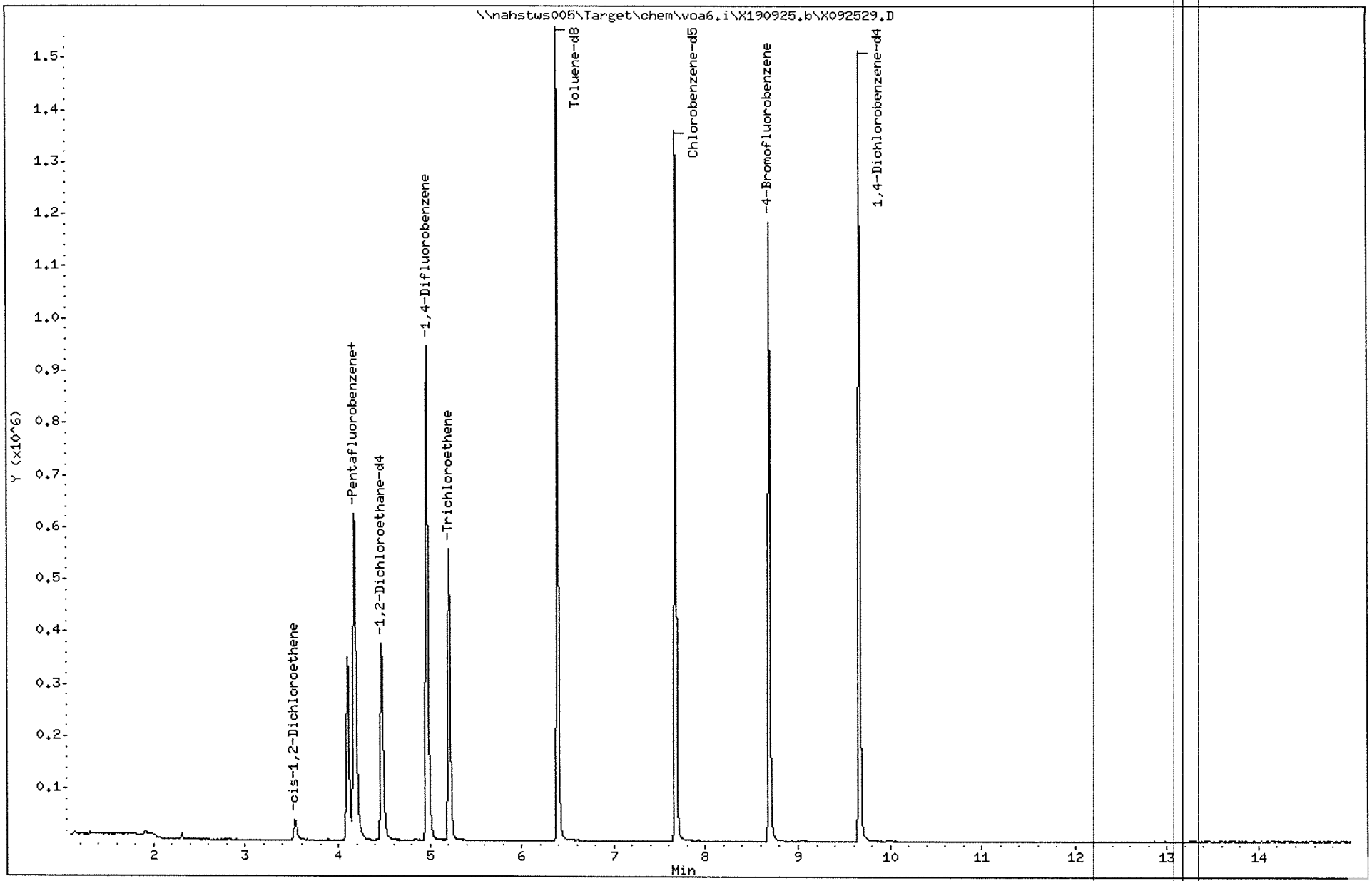
Name	Value	Description
DF	100.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	27 cis-1,2-Dichloroethene	96	3.537	3.530	(0.846)	21244	3.15480	315.48(a)
	38 Trichloroethene	130	5.214	5.214	(1.049)	197020	32.3051	3230.51
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	3424	0.49589	49.58(a)
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	276584	44.4767	44.47
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	336333	51.8657	51.86
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	248844	46.6723	46.67
$	48 Toluene-d8	98	6.388	6.388	(0.833)	940456	49.2113	49.21
*	1 Pentafluorobenzene	168	4.182	4.189	(1.000)	545462	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	795632	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	680120	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	355062	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092529.D
Date : 25-SEP-2019 21:26
Client ID: HS19090860-10
Instrument: voa6.i
Sample Info: HS19090860-10;HS19090860-10;;;
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092529.D

Date : 25-SEP-2019 21:26

Client ID: HS19090860-10

Instrument: voa6.i

Sample Info: HS19090860-10;HS19090860-10;;;

Purge Volume: 5.0

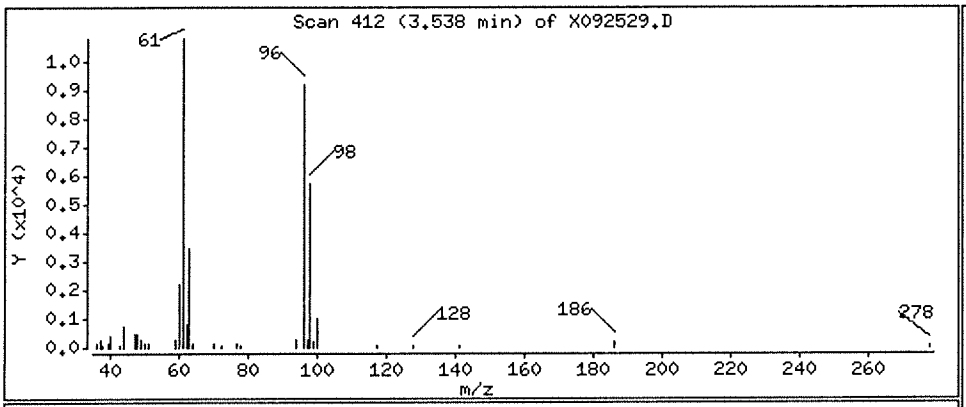
Operator: PC

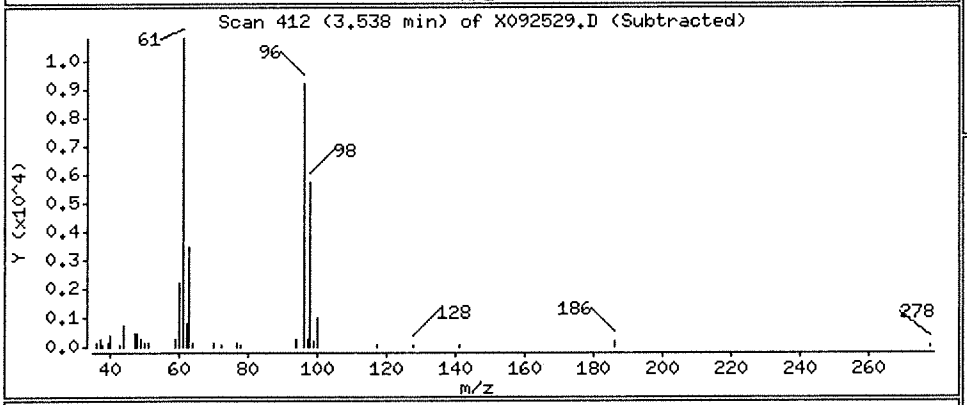
Column phase: DB624

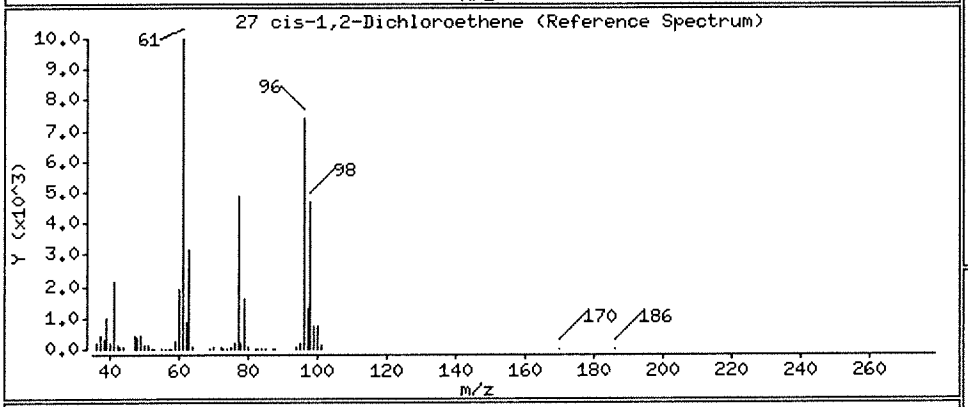
Column diameter: 0.18

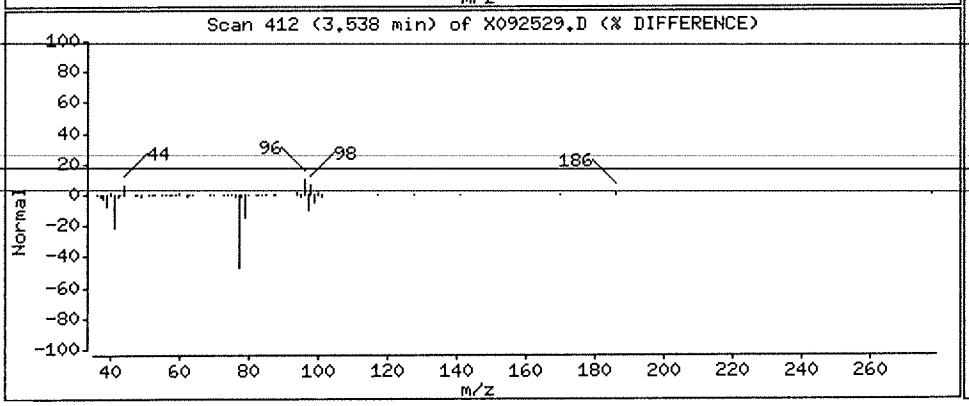
27 cis-1,2-Dichloroethene

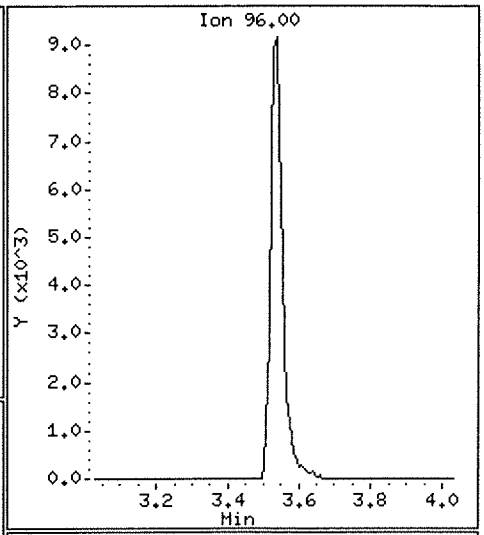
Concentration: 315.48 ug/l

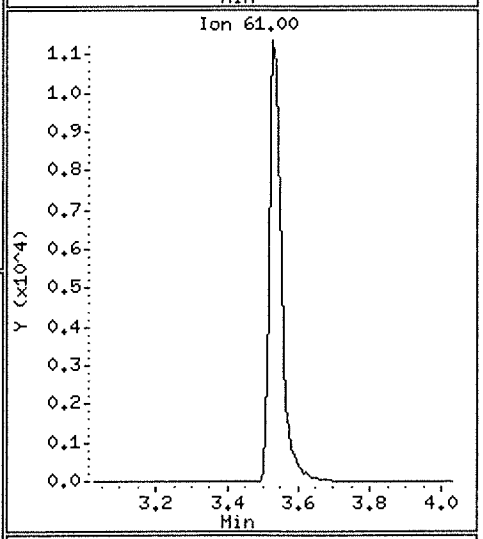


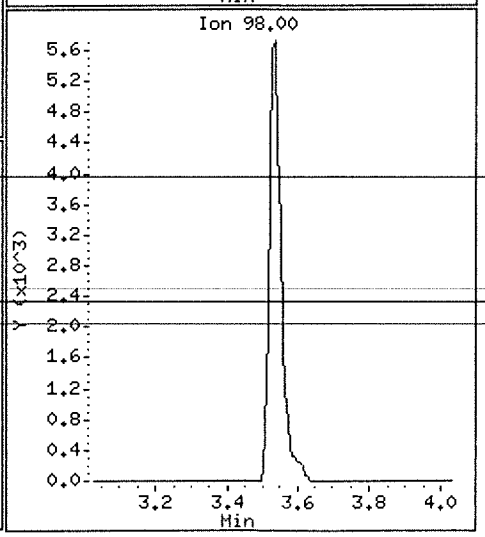












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092529.D

Date : 25-SEP-2019 21:26

Client ID: HS19090860-10

Instrument: voa6.i

Sample Info: HS19090860-10;HS19090860-10;;;

Purge Volume: 5.0

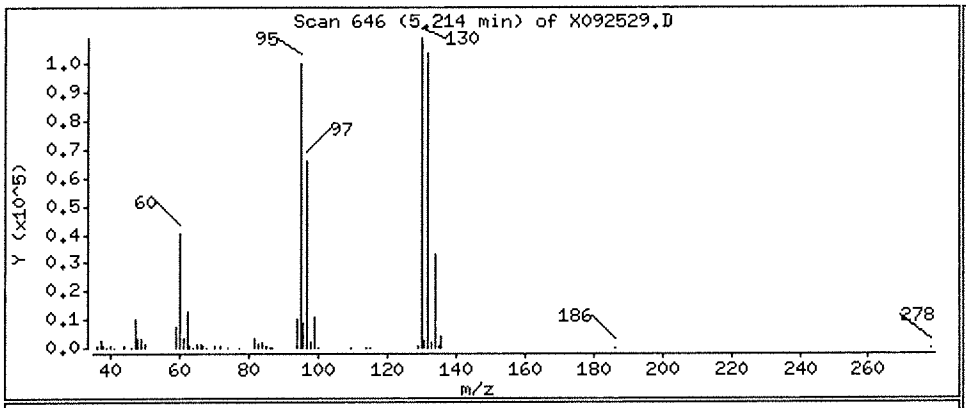
Operator: PC

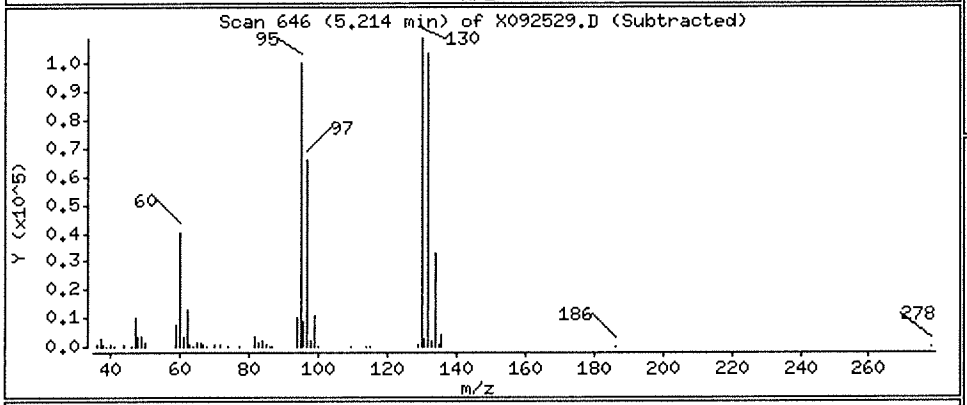
Column phase: DB624

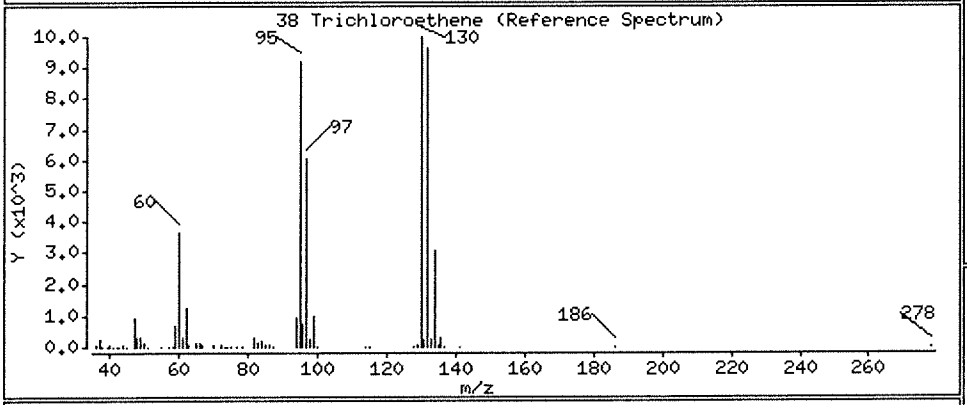
Column diameter: 0.18

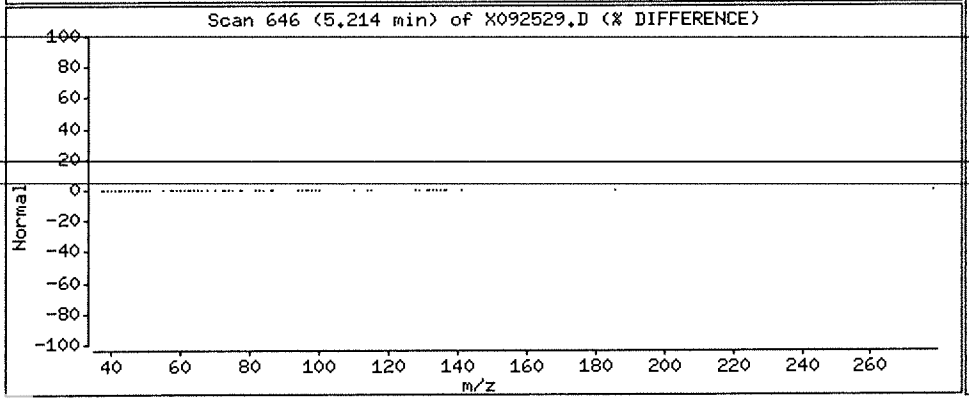
38 Trichloroethene

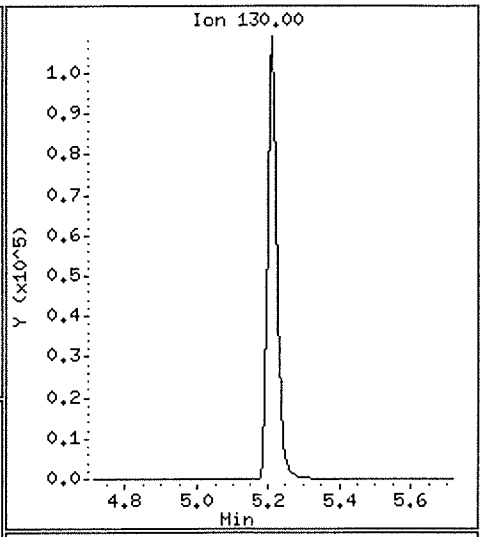
Concentration: 3230.51 ug/l

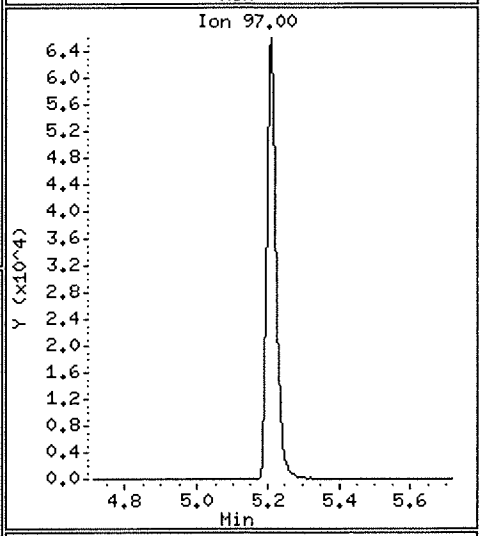


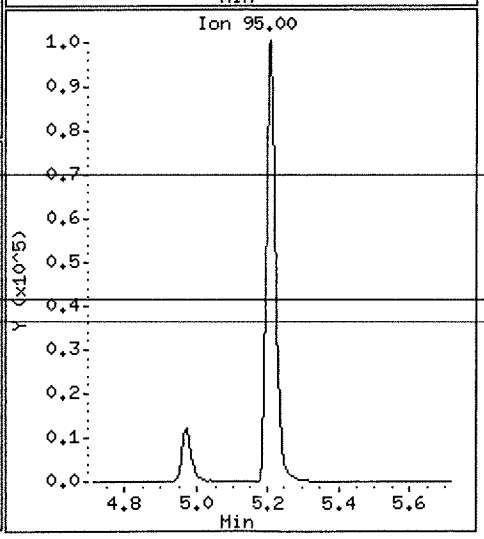












Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092529.D

Date : 25-SEP-2019 21:26

Client ID: HS19090860-10

Instrument: voa6.i

Sample Info: HS19090860-10;HS19090860-10;;;

Purge Volume: 5.0

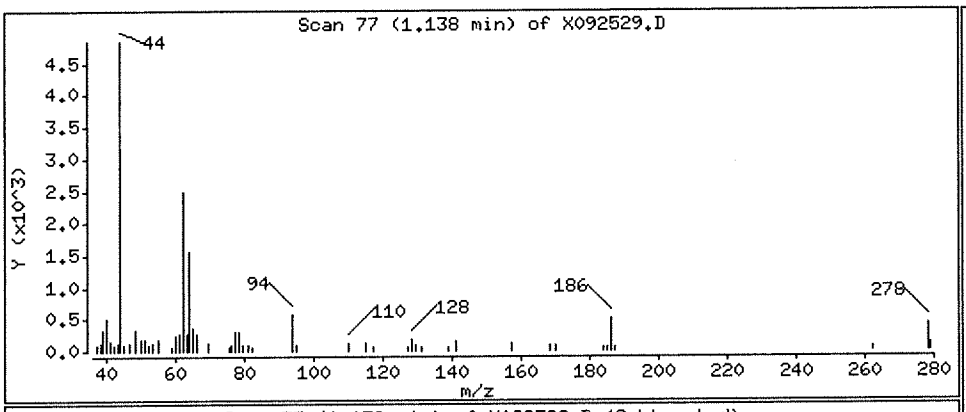
Operator: PC

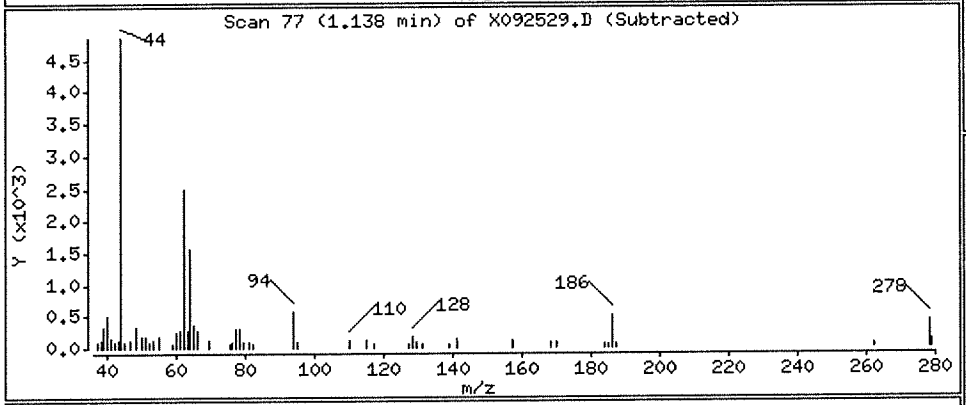
Column phase: DB624

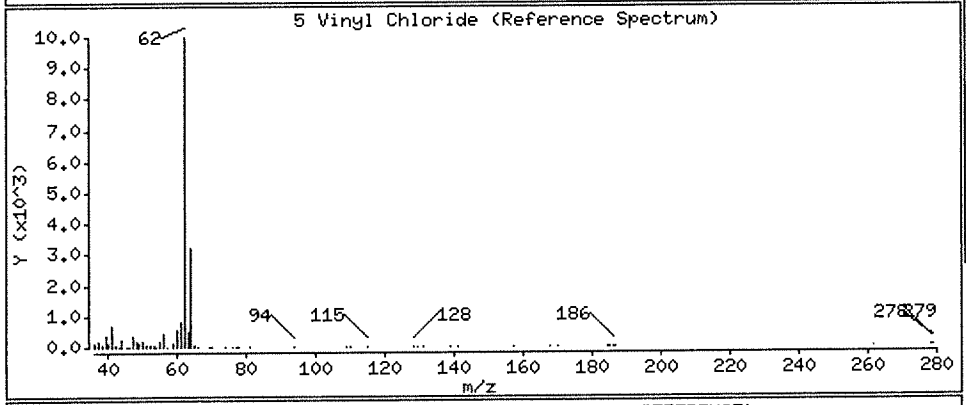
Column diameter: 0.18

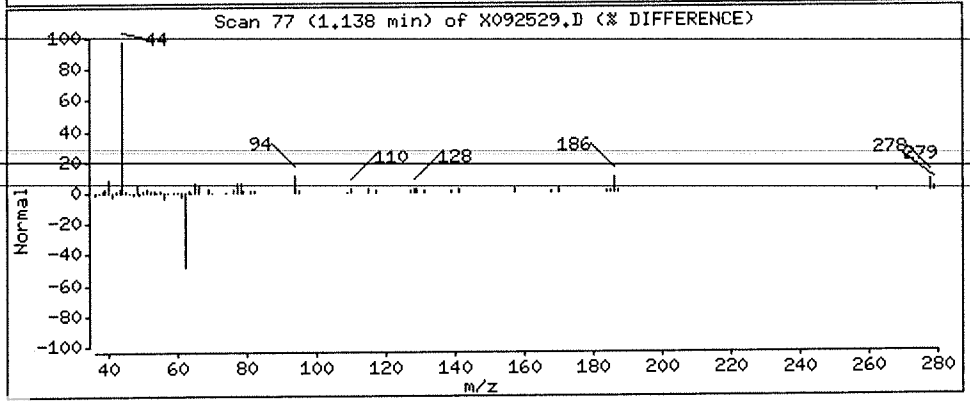
5 Vinyl Chloride

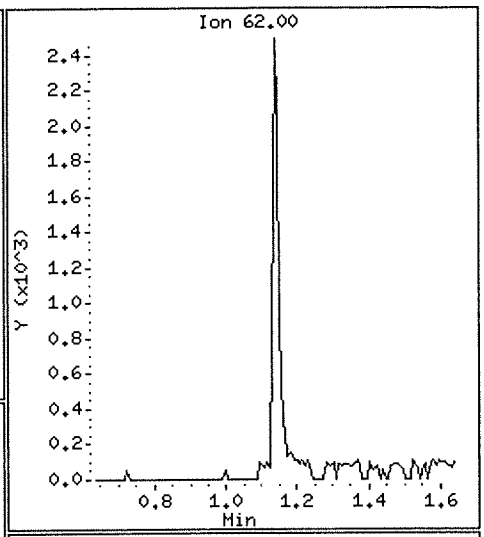
Concentration: 49.58 ug/l

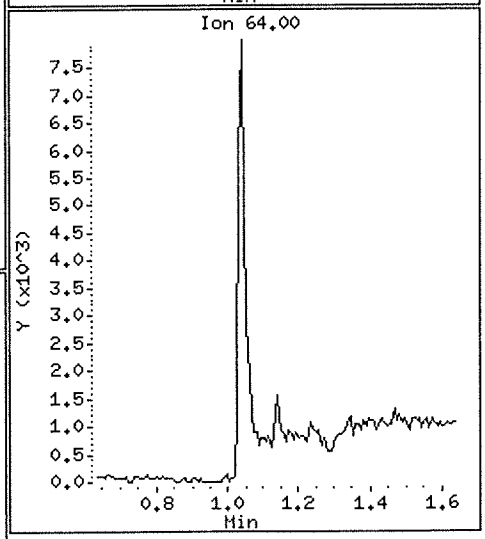












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190925.b\X092530.D
Lab Smp Id: CCV-END Client Smp ID: CCV-END
Inj Date : 25-SEP-2019 21:50
Operator : PC Inst ID: voa6.i
Smp Info : CCV-END;CCV-END;2;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190925.b\8260W.m
Meth Date : 11-Oct-2019 07:59 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 29 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	153645	50.0000	50.41
11	1,1-Dichloroethene	96	1.912	1.912	(0.456)	159157	50.0000	47.88
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	244350	50.0000	44.68
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	219479	50.0000	46.31
17	Methylene Chloride	84	2.306	2.306	(0.550)	209355	50.0000	50.62
38	Trichloroethene	130	5.214	5.214	(1.049)	206145	50.0000	45.79
5	Vinyl Chloride	62	1.138	1.138	(0.272)	234174	50.0000	48.19
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	220644	50.0000	50.54
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	263985	50.0000	52.13
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.979)	192294	50.0000	51.33
$ 48	Toluene-d8	98	6.388	6.388	(0.833)	699299	50.0000	46.85
* 1	Pentafluorobenzene	168	4.189	4.189	(1.000)	383880	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	587319	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.671	(1.000)	531152	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	274042	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190925.b\X092530.D
Date : 25-SEP-2019 21:50
Client ID: CCV-END
Sample Info: CCV-END;CCV-END;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

Y (x10^6)

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6

Min

2 3 4 5 6 7 8 9 10 11 12 13 14

-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-Acrolein+
-Iodomethane+
-Methyl Acetate
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-Vinyl Acetate
-1,1-Dichloroethane
-2-Butanone+
-Propionitrile
-Chloroform+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-1,4-Difluorobenzene
-Trichloroethene
-1,2-Dichloropropane+
-Dibromomethane+
-Bromodichloromethane
-2-Chloroethylvinyl ether
-cis-1,3-Dichloropropene
-4-Methyl-2-Pentanone
-Toluene-d8+
-trans-1,3-Dichloropropene
-1,1,2-Trichloroethane
-1,3-Dichloropropane+
-2-Hexanone+
-1,2-Dibromoethane
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
m,p-Xylenes
o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-n-Propylbenzene+
1,3,5-Trimethylbenzene+
-tert-Butylbenzene+
-sec-Butylbenzene
-1,4-Dichlorobenzene-d4+
n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene

\\nahstws005\Target\chem\voa6.i\X190925.b\X092530.D

MSVOA06 -Logbook

Batch: 37706
Date: 09-26-2019
Method: 8260
Comments:

Analyst: Devak Giga
Reviewer:
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	09-26-2019 01:37 pm	1.00	0.00 mL	0.00 mL	X092601.D	Liquid	Y	NA
	Auto find/purged									
2	CCV	CCV	09-26-2019 02:01 pm	1.00	5.00 mL	0.00 mL	X092602a.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
3	CCV	CCV	09-26-2019 02:25 pm	1.00	5.00 mL	0.00 mL	X092603.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
4	CCB	SAMP	09-26-2019 02:49 pm	1.00	5.00 mL	0.00 mL	X092604.D	Liquid	Y	NA
	CCB									
5	VLCSW-190926	LCS	09-26-2019 03:13 pm	1.00	5.00 mL	0.00 mL	X092605.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
6	BLK	SAMP	09-26-2019 03:37 pm	1.00	5.00 mL	0.00 mL	X092606.D	Liquid	Y	NA
	Cleanup blk									
7	VBLKW-190926	MBLK	09-26-2019 04:01 pm	1.00	5.00 mL	0.00 mL	X092607.D	Liquid	Y	NA
8	HS19090962-09	SAMP	09-26-2019 04:25 pm	1.00	5.00 mL	0.00 mL	X092608.D	Liquid	Y	<2
9	HS19090962-12	SAMP	09-26-2019 04:49 pm	1.00	5.00 mL	0.00 mL	X092609.D	Liquid	Y	<2
10	HS19090962-05	SAMP	09-26-2019 05:13 pm	1.00	5.00 mL	0.00 mL	X092610.D	Liquid	Y	<2
11	HS19090962-07	SAMP	09-26-2019 05:37 pm	1.00	5.00 mL	0.00 mL	X092611.D	Liquid	Y	<2
12	HS19090962-03	SAMP	09-26-2019 06:01 pm	25.00	5.00 mL	0.00 mL	X092612.D	Liquid	Y	<2
13	HS19090962-12MS	MS	09-26-2019 06:25 pm	1.00	5.00 mL	0.00 mL	X092613.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
14	HS19090962-12MSD	MSD	09-26-2019 06:49 pm	1.00	5.00 mL	0.00 mL	X092614.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
15	HS19090962-03	SAMP	09-26-2019 07:13 pm	250.0(	5.00 mL	0.00 mL	X092615.D	Liquid	Y	<2
16	HS19090962-02	SAMP	09-26-2019 07:37 pm	5.00	5.00 mL	0.00 mL	X092616.D	Liquid	Y	<2
17	HS19090962-02	SAMP	09-26-2019 08:01 pm	25.00	5.00 mL	0.00 mL	X092617.D	Liquid	Y	<2
18	HS19090962-13	SAMP	09-26-2019 08:25 pm	5.00	5.00 mL	0.00 mL	X092618.D	Liquid	Y	<2
19	HS19090962-13	SAMP	09-26-2019 08:50 pm	25.00	5.00 mL	0.00 mL	X092619.D	Liquid	Y	<2
20	HS19090962-04	SAMP	09-26-2019 09:14 pm	25.00	5.00 mL	0.00 mL	X092620.D	Liquid	Y	<2
21	HS19090962-04	SAMP	09-26-2019 09:38 pm	250.0(	5.00 mL	0.00 mL	X092621.D	Liquid	Y	<2
22	HS19090962-06	SAMP	09-26-2019 10:02 pm	25.00	5.00 mL	0.00 mL	X092622.D	Liquid	Y	<2
23	HS19090962-06	SAMP	09-26-2019 10:26 pm	250.0(	5.00 mL	0.00 mL	X092623.D	Liquid	Y	<2
24	HS19090962-08	SAMP	09-26-2019 10:50 pm	25.00	5.00 mL	0.00 mL	X092624.D	Liquid	Y	<2
25	HS19090962-08	SAMP	09-26-2019 11:14 pm	250.0(	5.00 mL	0.00 mL	X092625.D	Liquid	Y	<2
26	HS19090962-11	SAMP	09-26-2019 11:38 pm	25.00	5.00 mL	0.00 mL	X092626.D	Liquid	Y	<2
27	HS19090962-11	SAMP	09-27-2019 12:02 am	250.0(	5.00 mL	0.00 mL	X092627.D	Liquid	Y	<2
28	HS19090860-09	SAMP	09-27-2019 12:26 am	1.00	5.00 mL	0.00 mL	X092628.D	Liquid	Y	<2
29	HS19090860-07	SAMP	09-27-2019 12:50 am	1.00	5.00 mL	0.00 mL	X092629.D	Liquid	Y	<2
30	CCV-END	CCV	09-27-2019 01:14 am	1.00	5.00 mL	0.00 mL	X092630.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									

Chemical	Value
SURR SPK ID	30502-94-03
IS ID	30502-94-04
ICV STD ID	30603-84-01
LCS/MS ID	30603-84-01
CAL STD ID	30502-94-01/02
BFB ID	30502-94-03
pH Paper	634-64-11

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

	CLIENT SAMPLE NO.	SMC1 (TOL) #	SMC2 #	SMC3 (DCE) #	OTHER #	TOT OUT
01	VLCSW-190926	91	100	93	97	0
02	VBLKW-190926	98	105	89	93	0
03	HS19090860-0	97	106	86	91	0
04	HS19090860-0	97	102	85	89	0
05						
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28						

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(70-130)
SMC2	= 4-Bromofluorobenzene	(70-130)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(70-130)
OTHER	= Dibromofluoromethane	(70-130)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

VBLKW-190926

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID: X092607 Lab Sample ID: VBLKW-190926

Date Analyzed: 09/26/19 Time Analyzed: 1601

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA6

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VLCSW-190926	VLCSW-190926	X092605	1513
02	HS19090962-1	HS19090962-12M	X092613	1825
03	HS19090962-1	HS19090962-12M	X092614	1849
04	HS19090860-0	HS19090860-09	X092628	0026
05	HS19090860-0	HS19090860-07	X092629	0050
06				
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29				
30				

COMMENTS:

FORM IV VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID: X092601 BFB Injection Date: 09/26/19

Instrument ID: VOA6 BFB Injection Time: 1337

GC Column: DB624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.6
75	30.0 - 60.0% of mass 95	46.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.5 (0.7)1
174	Greater than 50.0% of mass 95	77.1
175	5.0 - 9.0% of mass 174	6.2 (8.0)1
176	95.0 - 101.0% of mass 174	74.5 (96.7)1
177	5.0 - 9.0% of mass 176	5.1 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CCV	CCV	X092603	09/26/19	1425
02	VLCSW-190926	VLCSW-190926	X092605	09/26/19	1513
03	VBLKW-190926	VBLKW-190926	X092607	09/26/19	1601
04	HS19090962-1	HS19090962-12M	X092613	09/26/19	1825
05	HS19090962-1	HS19090962-12M	X092614	09/26/19	1849
06	HS19090860-0	HS19090860-09	X092628	09/27/19	0026
07	HS19090860-0	HS19090860-07	X092629	09/27/19	0050
08	CCV-END	CCV-END	X092630	09/27/19	0114
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Instrument ID: VOA6 Calibration Date: 09/26/19 Time: 1425

Lab File ID: X092603 Init. Calib. Date(s): 09/24/19 09/24/19

Init. Calib. Times: 1112 1511

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dichloroethane	0.4650000	0.4115185	0.4115185	0.1	11.50	20.00	AVRG
Vinyl Chloride	0.6330000	0.6115031	0.6115031	0.1	3.40	20.00	AVRG
1,1,2-Trichloroethane	51.556634	50.000000	0.2839992	0.1	-3.11	20.00	LINR
Methylene Chloride	48.755735	50.000000	0.5382342	0.1	2.49	20.00	LINR
1,1-Dichloroethene	0.4330000	0.4314152	0.4314152	0.1	0.37	20.00	AVRG
Trichloroethene	0.3830000	0.3765914	0.3765914	0.2	1.67	20.00	AVRG
Toluene-d8	1.4050000	1.3174333	1.3174333	0.1	6.23	20.00	AVRG
4-Bromofluorobenzene	52.471334	50.000000	0.4925516	0.1	-4.94	20.00	LINR
1,2-Dichloroethane-d4	48.504003	50.000000	0.5414672	0.1	2.99	20.00	LINR
Dibromofluoromethane	49.725609	50.000000	0.4896506	0.1	0.55	20.00	LINR

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Instrument ID: VOA6 Calibration Date: 09/27/19 Time: 0114

Lab File ID: X092630 Init. Calib. Date(s): 09/24/19 09/24/19

Init. Calib. Times: 1112 1511

GC Column: DB624 ID: 0.18 (mm)

COMPOUND	RRF or AMOUNT	RRF50.000 or AMOUNT	CCAL RRF50.000	MIN RRF	%D or %DRIFT	MAX %D or %DRIFT	CURV TYPE
1,2-Dichloroethane	0.4650000	0.4115185	0.4115185	0.1	11.50	50.00	AVRG
Vinyl Chloride	0.6330000	0.6115031	0.6115031	0.1	3.40	50.00	AVRG
1,1,2-Trichloroethane	49.482651	50.000000	0.2839992	0.1	1.03	50.00	LINR
Methylene Chloride	49.936026	50.000000	0.5382342	0.1	0.13	50.00	LINR
1,1-Dichloroethene	0.4330000	0.4314152	0.4314152	0.1	0.37	50.00	AVRG
Trichloroethene	0.3830000	0.3765914	0.3765914	0.2	1.67	50.00	AVRG
Toluene-d8	1.4050000	1.3174333	1.3174333	0.1	6.23	50.00	AVRG
4-Bromofluorobenzene	51.654438	50.000000	0.4925516	0.1	-3.31	50.00	LINR
1,2-Dichloroethane-d4	47.560929	50.000000	0.5414672	0.1	4.88	50.00	LINR
Dibromofluoromethane	50.156483	50.000000	0.4896506	0.1	-0.31	50.00	LINR

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID (Standard): X092603 Date Analyzed: 09/26/19

Instrument ID: VOA6 Time Analyzed: 1425

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(CBZ) AREA #	RT #	IS2(DCB) AREA #	RT #	IS3(DFB) AREA #	RT #
	12 HOUR STD	529154	7.67	280263	9.67	582176	4.97
	UPPER LIMIT	1058308	8.17	560526	10.17	1164352	5.47
	LOWER LIMIT	264577	7.17	140132	9.17	291088	4.47
	CLIENT SAMPLE NO.						
01	VLCSW-190926	557034	7.67	292060	9.67	615914	4.97
02	VBLKW-190926	661846	7.67	341264	9.67	771604	4.97
03	HS19090962-1	614404	7.67	317289	9.67	720447	4.97
04	HS19090962-1	601116	7.67	299224	9.67	704067	4.97
05	HS19090860-0	604255	7.67	326021	9.67	730797	4.97
06	HS19090860-0	588546	7.67	311793	9.67	717586	4.97
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (CBZ) = Chlorobenzene-d5
IS2 (DCB) = 1,4-Dichlorobenzene-d4
IS3 (DFB) = 1,4-Difluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090860

Lab File ID (Standard): X092603 Date Analyzed: 09/26/19

Instrument ID: VOA6 Time Analyzed: 1425

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	390435	4.19				
	UPPER LIMIT	780870	4.69				
	LOWER LIMIT	195218	3.69				
	CLIENT SAMPLE NO.						
01	VLCSW-190926	409108	4.18				
02	VBLKW-190926	525647	4.18				
03	HS19090962-1	497347	4.18				
04	HS19090962-1	488331	4.19				
05	HS19090860-0	506428	4.18				
06	HS19090860-0	499850	4.19				
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS4 = Pentafluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092601.D

Date : 26-SEP-2019 13:37

Client ID: BFB

Instrument: voa6.i

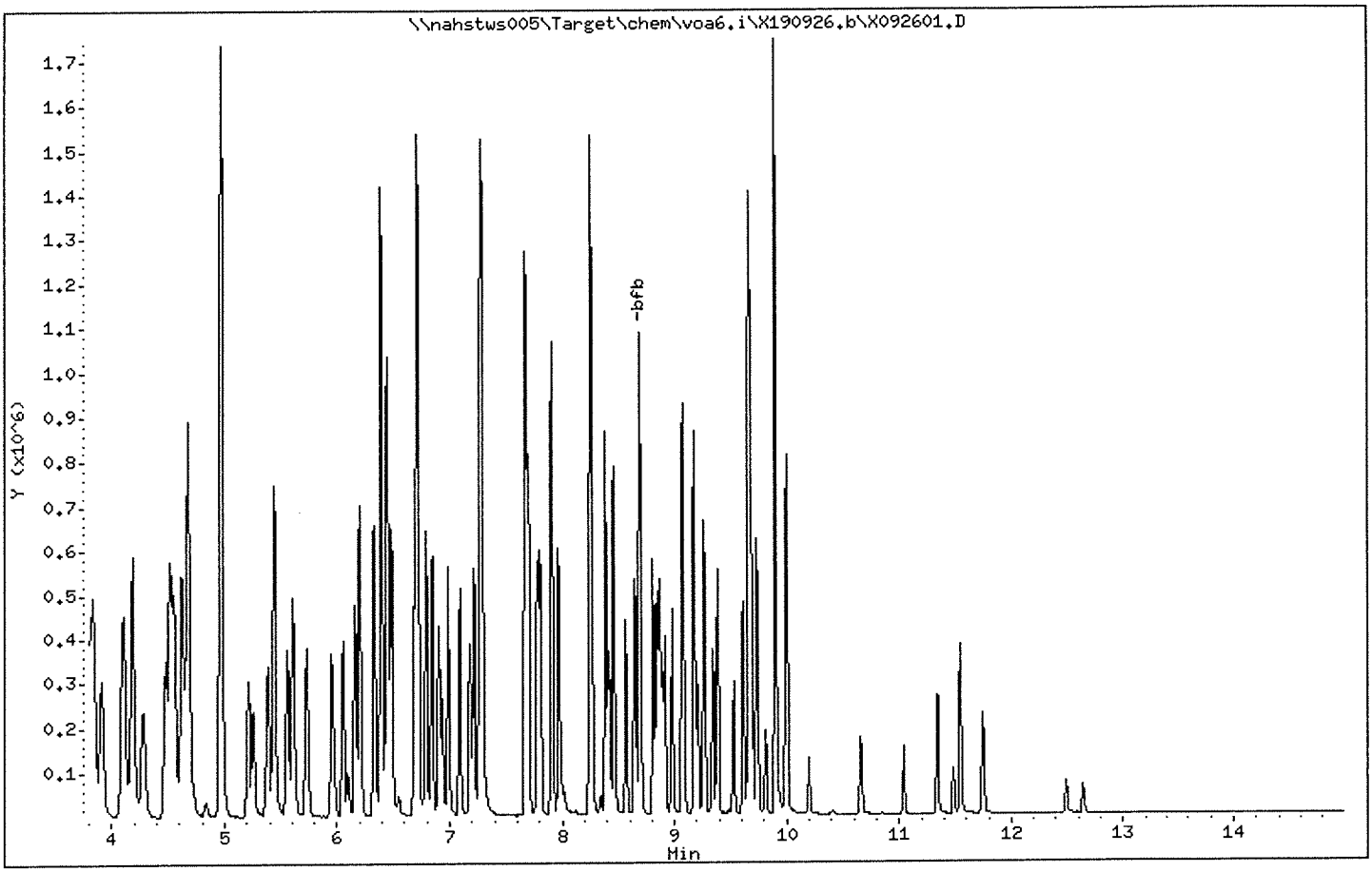
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092601.D

Date : 26-SEP-2019 13:37

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

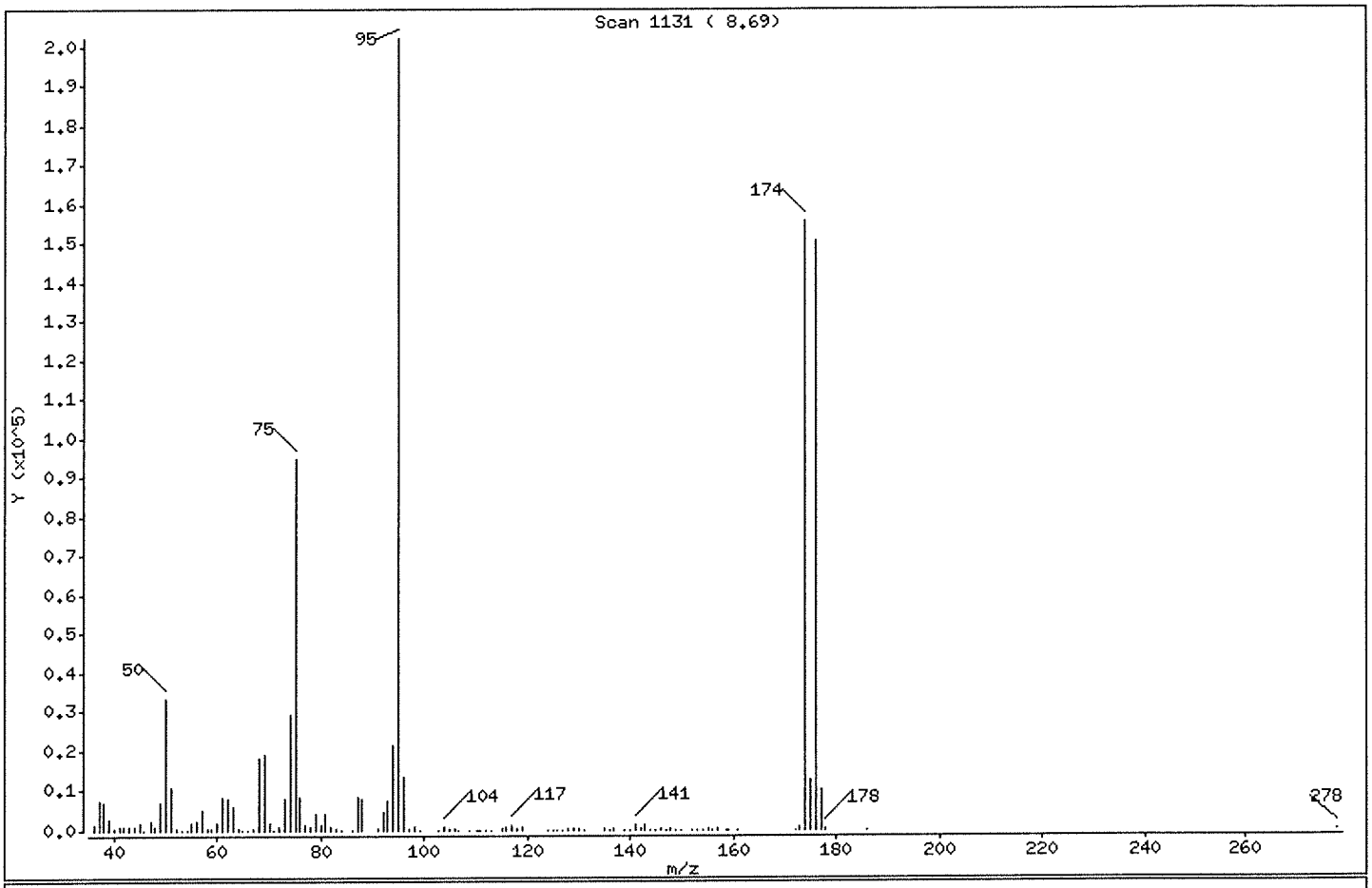
Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	16.57
75	30.00 - 60.00% of mass 95	46.95
96	5.00 - 9.00% of mass 95	6.60
173	Less than 2.00% of mass 174	0.54 (0.70)
174	Greater than 50.00% of mass 95	77.11
175	5.00 - 9.00% of mass 174	6.16 (7.99)
176	95.00 - 101.00% of mass 174	74.55 (96.67)
177	5.00 - 9.00% of mass 176	5.05 (6.78)

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092601.D

Date : 26-SEP-2019 13:37

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: X092601.D
Spectrum: Scan 1131 (8.69)
Location of Maximum: 95.00
Number of points: 118

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	1569	65.90	59	99.10	79	140.90	1530
37.10	7612	67.00	374	102.80	96	141.90	240
38.00	6832	68.00	18016	103.90	762	142.90	1425
39.10	2869	69.00	18840	105.00	274	143.90	106
40.00	618	70.00	1841	106.00	634	144.80	87
41.10	842	70.90	216	106.80	217	146.00	272
42.00	825	72.00	978	108.90	114	147.00	144
43.00	965	73.00	7872	110.00	129	147.80	425
44.00	1116	74.00	29384	110.70	94	148.90	142
45.00	1750	75.00	94912	110.90	94	150.00	210
45.80	118	76.00	8475	111.80	74	152.00	99
47.00	2148	77.00	1223	113.10	177	153.10	116
48.00	998	77.90	773	115.00	295	154.00	136
49.00	6878	78.90	4275	116.00	704	155.00	462
50.00	33496	80.00	1408	116.90	1174	156.00	67
51.00	10467	80.90	4242	117.80	545	156.80	359
52.00	458	81.90	963	119.00	813	158.70	139
53.10	138	83.00	295	123.90	88	159.10	115
54.10	152	84.00	94	124.90	58	160.90	133
55.10	1804	86.10	202	125.80	66	172.00	88
56.00	2503	87.00	8525	126.90	218	173.00	1099
57.00	4982	88.00	8131	127.90	677	174.00	155904
58.10	350	91.00	637	128.80	282	175.00	12458
59.00	238	92.00	4841	129.90	619	176.00	150720
60.00	1665	93.00	7233	131.00	228	177.00	10216
61.10	8431	94.00	21480	135.00	316	177.90	304
62.00	7683	95.00	202176	135.90	51	186.00	171
63.00	5919	96.00	13344	136.70	262	278.10	150
64.10	533	97.10	408	139.00	106		
65.00	121	98.00	749	140.00	111		

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190926.b\X092603.D
Lab Smp Id: CCV Client Smp ID: CCV
Inj Date : 26-SEP-2019 14:25
Operator : PC Inst ID: voa6.i
Smp Info : CCV;CCV;2;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190926.b\8260W.m
Meth Date : 09-Oct-2019 19:11 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 3 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	156452	50.0000	51.55
11 1,1-Dichloroethene	96	1.911	1.919	(0.456)	155590	50.0000	46.02
33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	244975	50.0000	45.19
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	216932	50.0000	45.00
17 Methylene Chloride	84	2.305	2.305	(0.550)	205343	50.0000	48.75
38 Trichloroethene	130	5.214	5.214	(1.049)	206257	50.0000	46.21
5 Vinyl Chloride	62	1.138	1.138	(0.272)	223623	50.0000	45.24
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	215515	50.0000	48.50
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	264664	50.0000	52.47
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.979)	189562	50.0000	49.72
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	701614	50.0000	47.18
* 1 Pentafluorobenzene	168	4.189	4.182	(1.000)	390435	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	582176	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.670	(1.000)	529154	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	280263	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092603.D
Date : 26-SEP-2019 14:25
Client ID: CCV
Sample Info: CCV;CCV;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190926.b\X092605.D
Lab Smp Id: VLCSW-190926 Client Smp ID: VLCSW-190926
Inj Date : 26-SEP-2019 15:13
Operator : PC Inst ID: voa6.i
Smp Info : VLCSW-190926;VLCSW-190926;3;;LCS
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190926.b\8260W.m
Meth Date : 09-Oct-2019 19:11 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 5 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	65323	19.8395	19.83
	11 1,1-Dichloroethene	96	1.919	1.919	(0.459)	64527	18.2150	18.21
	33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	105953	18.4752	18.47
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	92302	18.2757	18.27
	17 Methylene Chloride	84	2.305	2.305	(0.551)	87850	18.8944	18.89
	38 Trichloroethene	130	5.214	5.214	(1.049)	85706	18.1537	18.15
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	92330	17.8289	17.82
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	217710	46.7264	46.72
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	266293	50.0989	50.09
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	193317	48.3731	48.37
$	48 Toluene-d8	98	6.388	6.388	(0.833)	712710	45.5347	45.53
*	1 Pentafluorobenzene	168	4.182	4.182	(1.000)	409108	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	615914	50.0000	
*	47 Chlorobenzene-d5	117	7.670	7.670	(1.000)	557034	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	292060	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092605.D
Date : 26-SEP-2019 15:13
Client ID: VLCSW-190926
Sample Info: VLCSW-190926;VLCSW-190926;3;;LCS
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

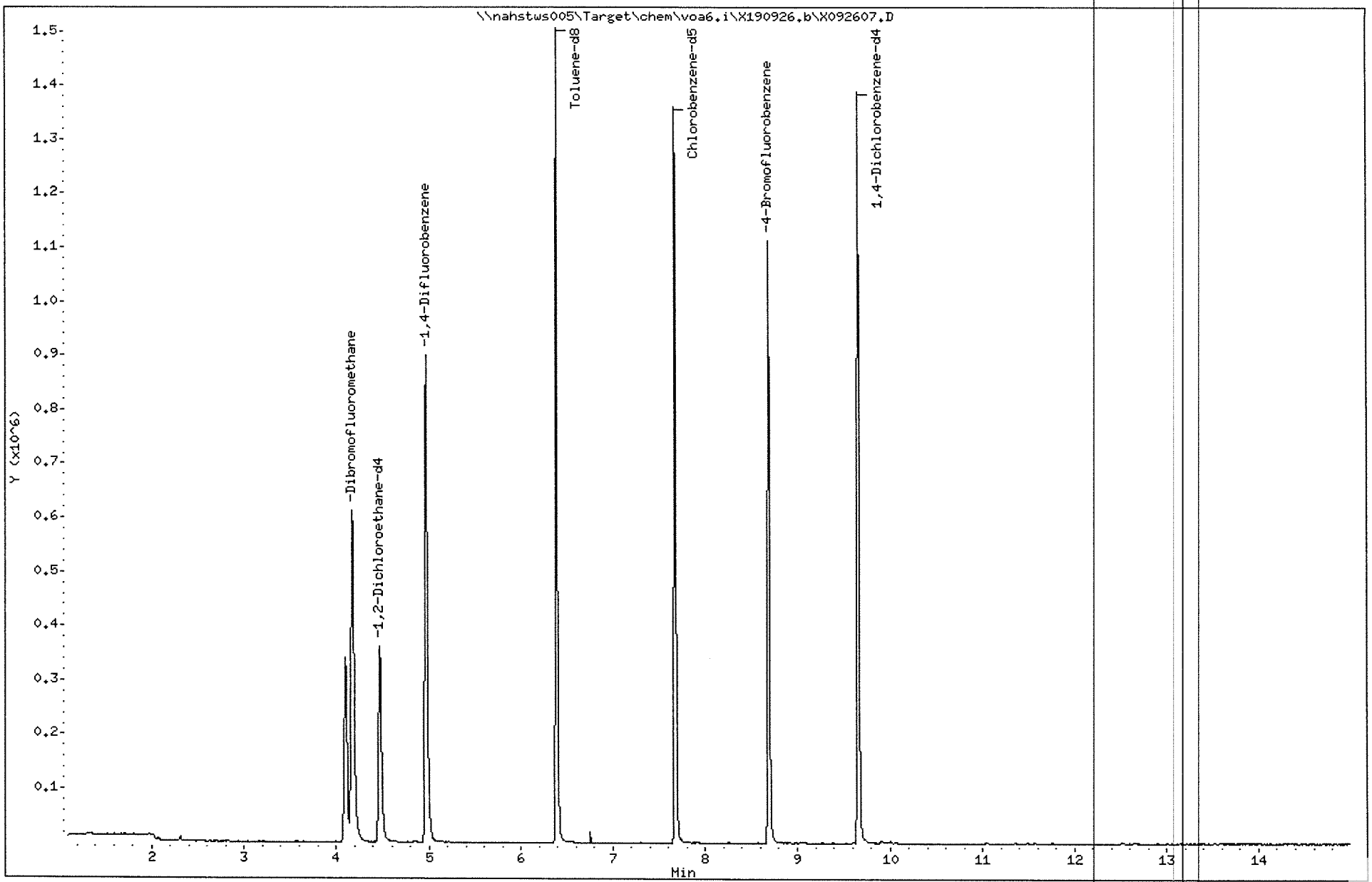
Data file : \\nahstws005\Target\chem\voa6.i\X190926.b\X092607.D
Lab Smp Id: VBLKW-190926 Client Smp ID: VBLKW-190926
Inj Date : 26-SEP-2019 16:01
Operator : PC Inst ID: voa6.i
Smp Info : VBLKW-190926;VBLKW-190926;3;;BLANK
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190926.b\8260W.m
Meth Date : 09-Oct-2019 19:11 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	266245	44.4270	44.42
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	331141	52.4890	52.48
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	239323	46.5769	46.57
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	910081	48.9367	48.93
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	525647	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	771604	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.670	(1.000)	661846	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	341264	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092607.D
Date : 26-SEP-2019 16:01
Client ID: VBLKW-190926
Instrument: voa6.i
Sample Info: VBLKW-190926;VBLKW-190926;3;;BLANK
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190926.b\X092613.D
Lab Smp Id: HS19090962-12MS Client Smp ID: HS19090962-12MS
Inj Date : 26-SEP-2019 18:25
Operator : PC Inst ID: voa6.i
Smp Info : HS19090962-12MS;HS19090962-12MS;3;;MS
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190926.b\8260W.m
Meth Date : 09-Oct-2019 19:11 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 13 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	71351	19.6370	19.63
	11 1,1-Dichloroethene	96	1.911	1.919	(0.457)	75980	17.6427	17.64
	33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	114554	17.0767	17.07
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	104177	16.9673	16.96
	17 Methylene Chloride	84	2.305	2.305	(0.551)	93267	16.2838	16.28
	38 Trichloroethene	130	5.214	5.214	(1.049)	238348	43.1602	43.16
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	89308	14.1857	14.18
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	253864	44.7791	44.77
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	301248	51.4138	51.41
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	227495	46.7983	46.79
$	48 Toluene-d8	98	6.388	6.388	(0.833)	851691	49.3333	49.33
*	1 Pentafluorobenzene	168	4.182	4.182	(1.000)	497347	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	720447	50.0000	
*	47 Chlorobenzene-d5	117	7.670	7.670	(1.000)	614404	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	317289	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092613.D
Date : 26-SEP-2019 18:25
Client ID: HS19090962-12MS
Sample Info: HS19090962-12MS;HS19090962-12MS;3;;MS
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190926.b\X092614.D
Lab Smp Id: HS19090962-12MSD Client Smp ID: HS19090962-12MSD
Inj Date : 26-SEP-2019 18:49
Operator : PC Inst ID: voa6.i
Smp Info : HS19090962-12MSD;HS19090962-12MSD;3;;MSD
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190926.b\8260W.m
Meth Date : 09-Oct-2019 19:11 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 13 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	68975	19.3907	19.39
11	1,1-Dichloroethene	96	1.912	1.919	(0.456)	70768	16.7358	16.73
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	111180	16.9593	16.95
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	97505	16.1738	16.17
17	Methylene Chloride	84	2.305	2.305	(0.550)	88124	15.6054	15.60
38	Trichloroethene	130	5.214	5.214	(1.049)	223216	41.3604	41.36
5	Vinyl Chloride	62	1.138	1.138	(0.272)	80312	12.9923	12.99
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	243924	43.7991	43.79
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	290860	50.7225	50.72
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.979)	221160	46.3266	46.32
$ 48	Toluene-d8	98	6.388	6.388	(0.833)	830042	49.1421	49.14
* 1	Pentafluorobenzene	168	4.189	4.182	(1.000)	488331	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	704067	50.0000	
* 47	Chlorobenzene-d5	117	7.671	7.670	(1.000)	601116	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	299224	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092614.D
Date : 26-SEP-2019 18:49
Client ID: HS19090962-12MSD
Sample Info: HS19090962-12MSD;HS19090962-12MSD;3;;MSD
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190926.b\X092628.D
Lab Smp Id: HS19090860-09 Client Smp ID: HS19090860-09
Inj Date : 27-SEP-2019 00:26
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-09;HS19090860-09;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190926.b\8260W.m
Meth Date : 09-Oct-2019 19:10 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 27
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

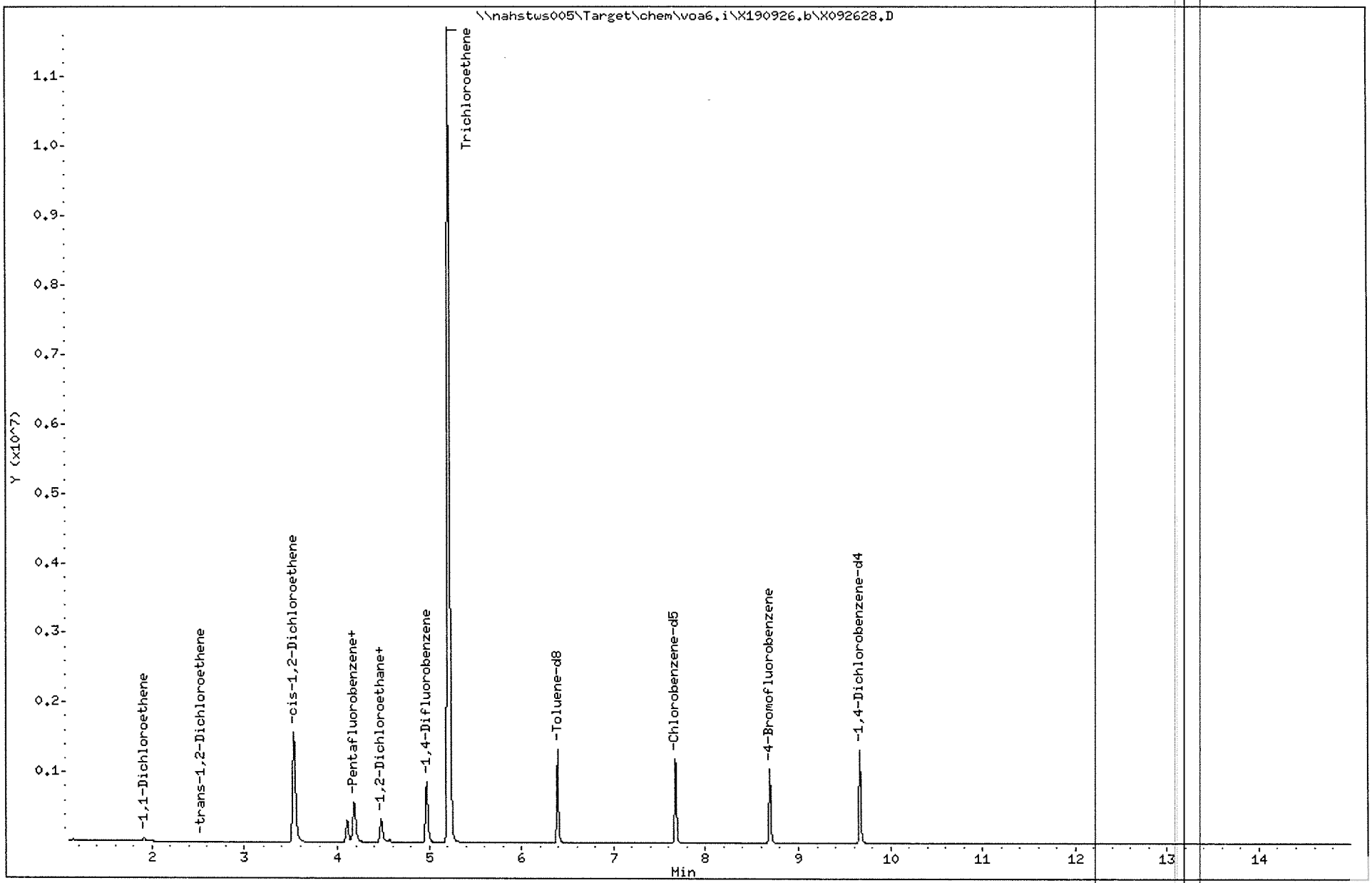
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	11 1,1-Dichloroethene	96	1.919	1.919	(0.459)	16274	3.71109	3.71(a)
	33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	25940	3.81213	3.81(a)
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	839859	134.335	134.33
	38 Trichloroethene	130	5.214	5.214	(1.049)	4263886	761.171	761.17(AM)
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	19477	3.03825	3.03(a)
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	247149	42.7698	42.76
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	305587	53.0680	53.06
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	226039	45.6442	45.64
$	48 Toluene-d8	98	6.388	6.388	(0.833)	820846	48.3452	48.34
*	1 Pentafluorobenzene	168	4.182	4.182	(1.000)	506428	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	730797	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.670	(1.000)	604255	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	326021	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092628.D
Date : 27-SEP-2019 00:26
Client ID: HS19090860-09
Instrument: voa6.i
Sample Info: HS19090860-09;HS19090860-09;;;
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092628.D

Date : 27-SEP-2019 00:26

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

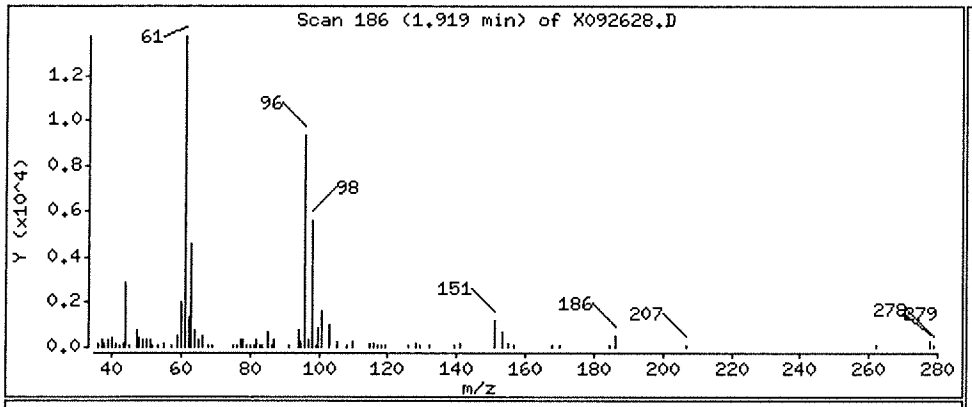
Operator: PC

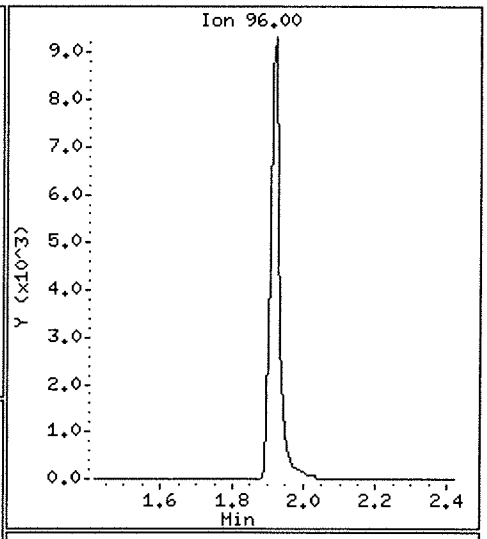
Column phase: DB624

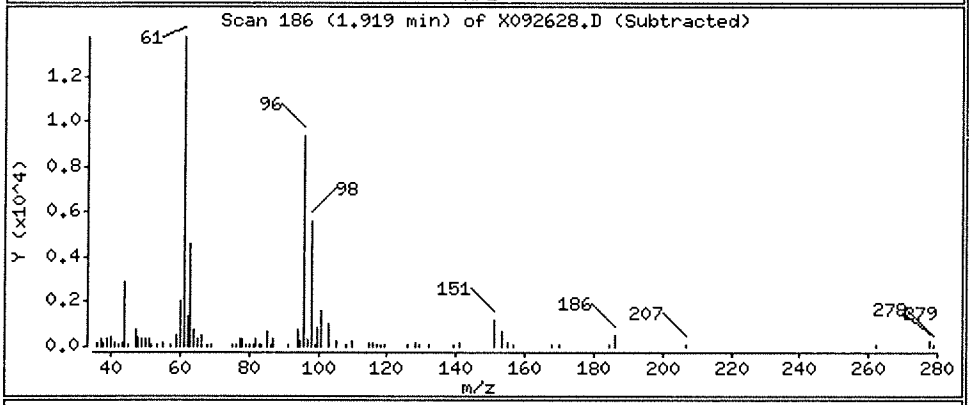
Column diameter: 0.18

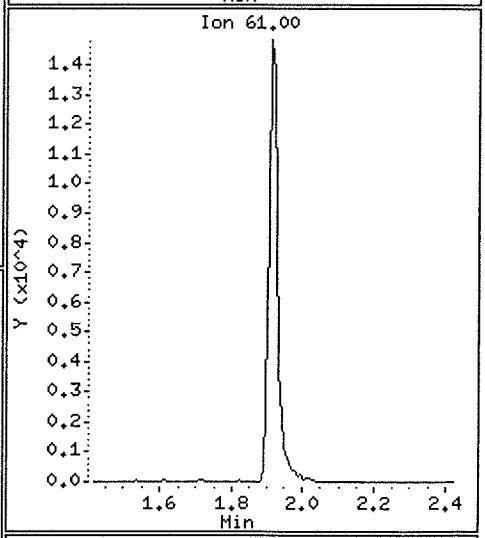
11 1,1-Dichloroethene

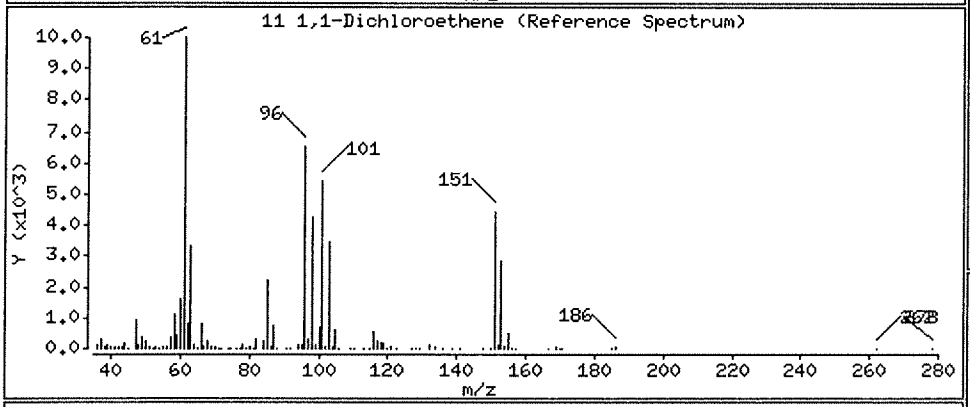
Concentration: 3.71 ug/l

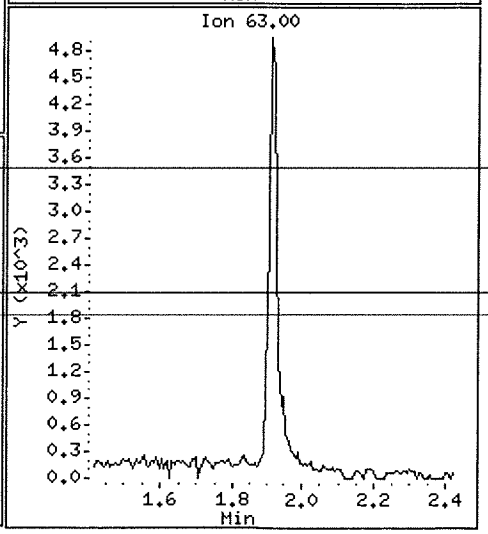


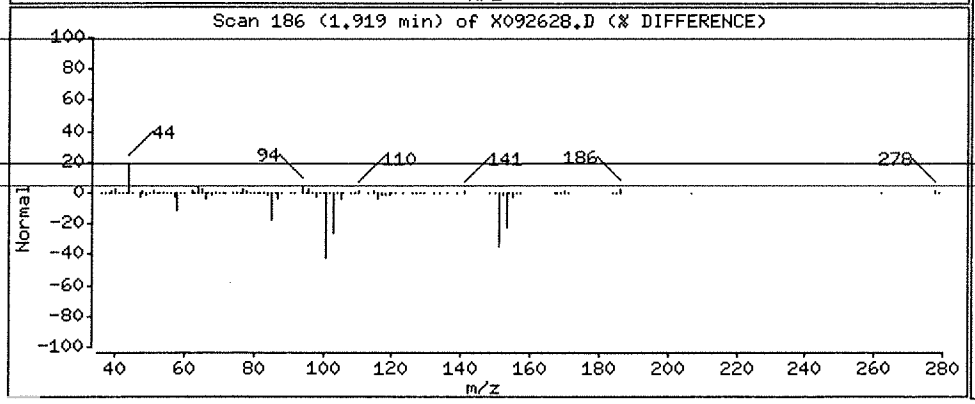












Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092628.D

Date : 27-SEP-2019 00:26

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

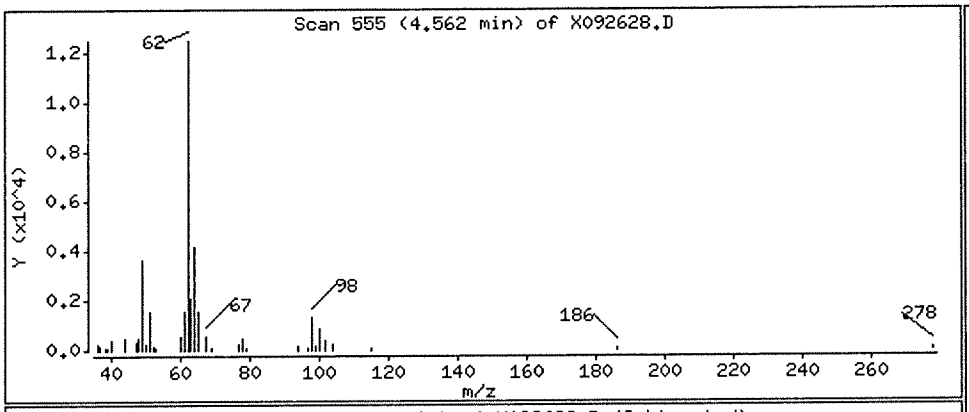
Operator: PC

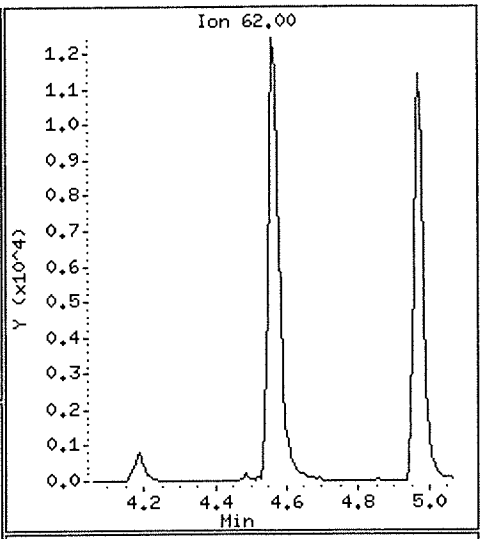
Column phase: DB624

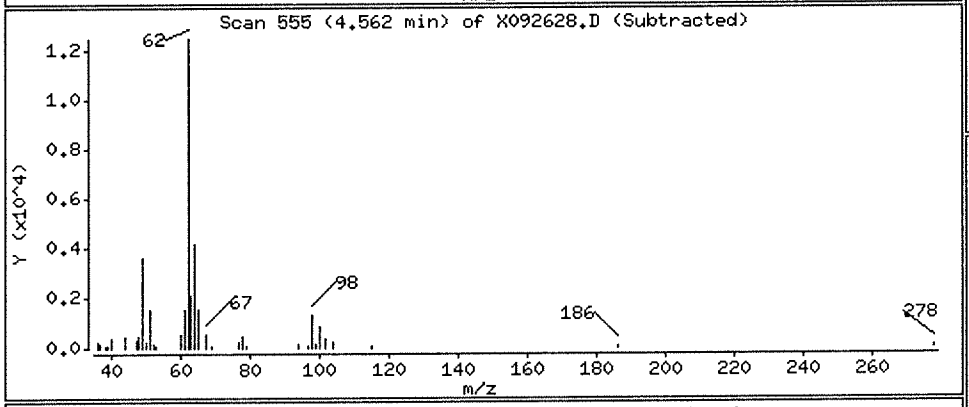
Column diameter: 0.18

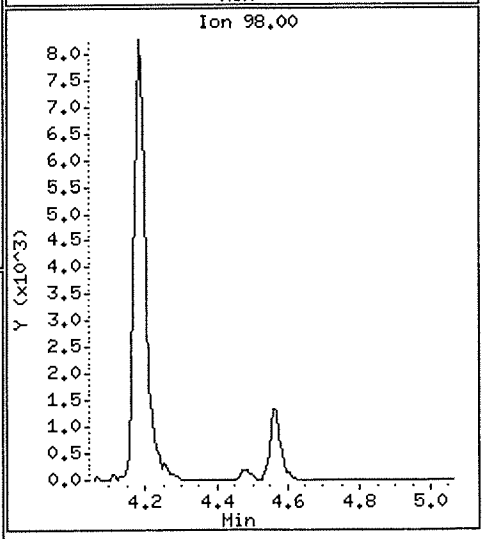
33 1,2-Dichloroethane

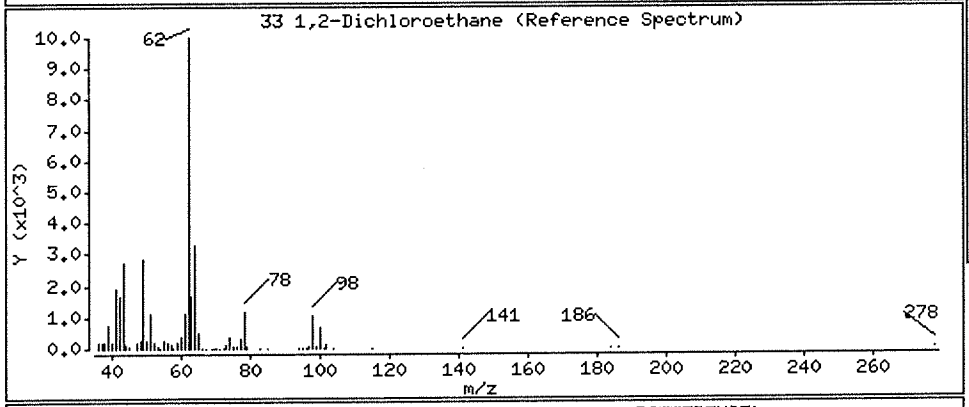
Concentration: 3.81 ug/l

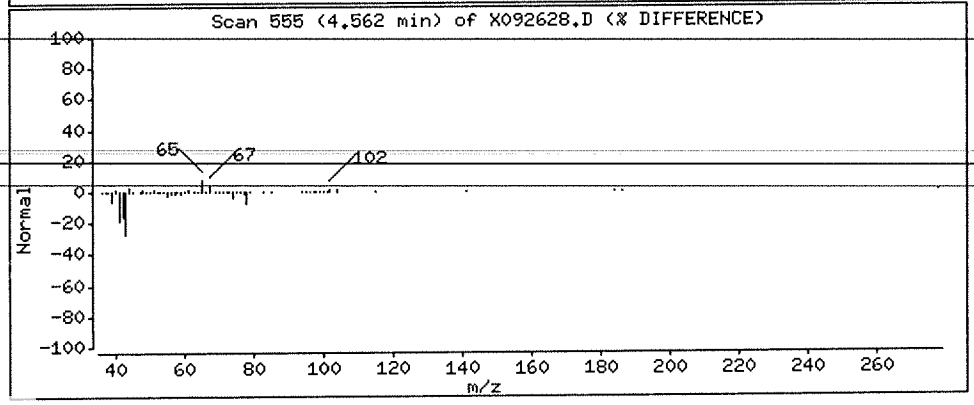












Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092628.D

Date : 27-SEP-2019 00:26

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

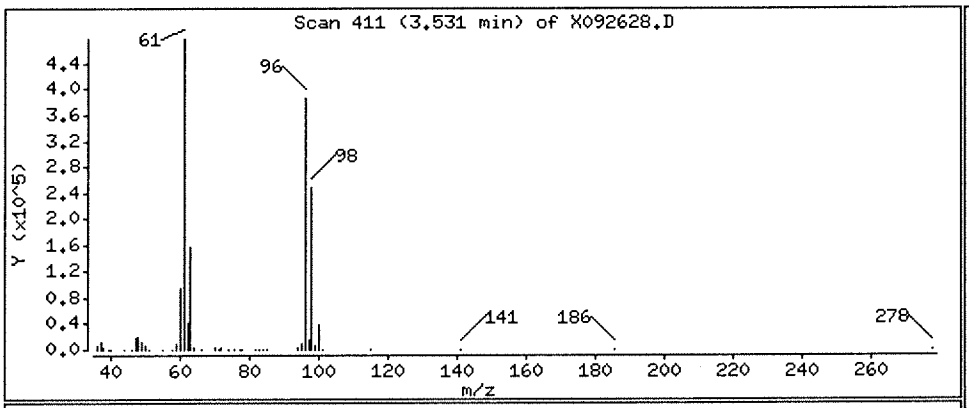
Operator: PC

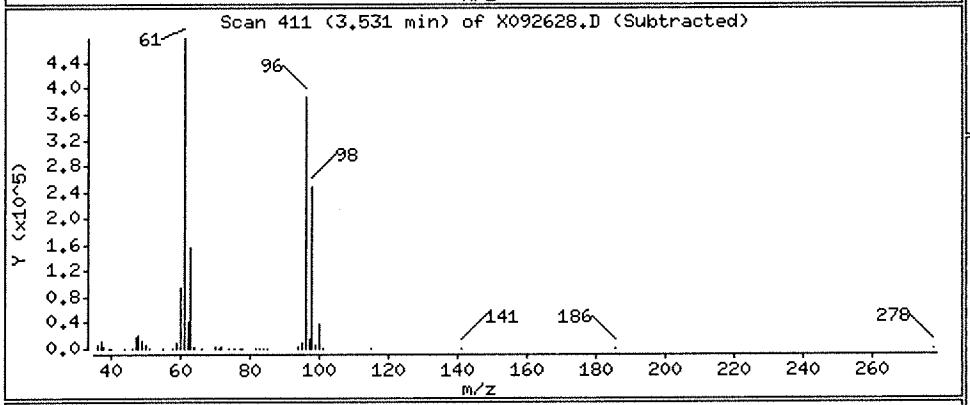
Column phase: DB624

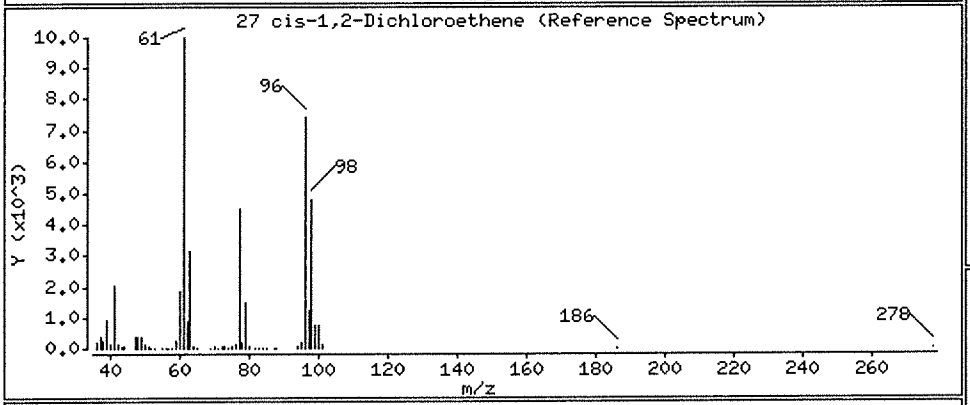
Column diameter: 0.18

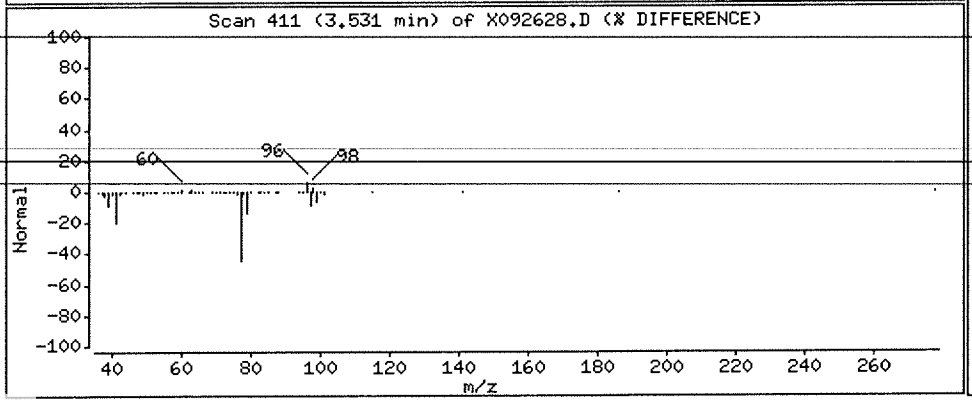
27 cis-1,2-Dichloroethene

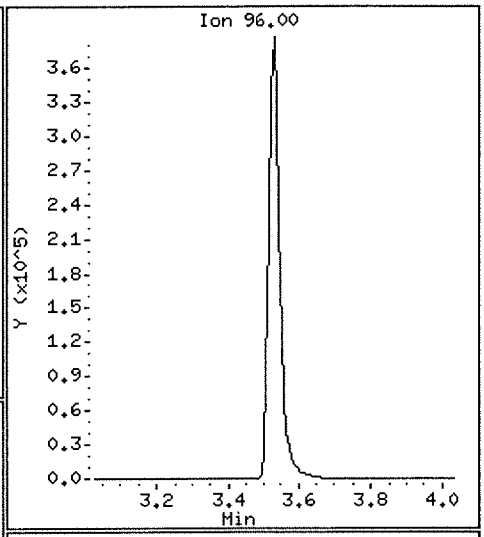
Concentration: 134.33 ug/l

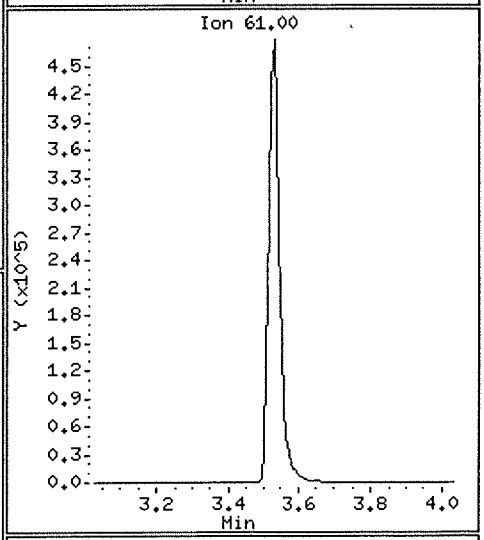


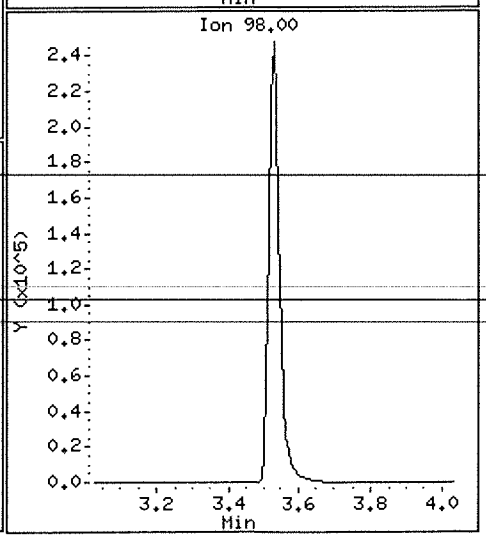












Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092628.D

Date : 27-SEP-2019 00:26

Client ID: HS19090860-09

Instrument: voa6.i

Sample Info: HS19090860-09;HS19090860-09;;;

Purge Volume: 5.0

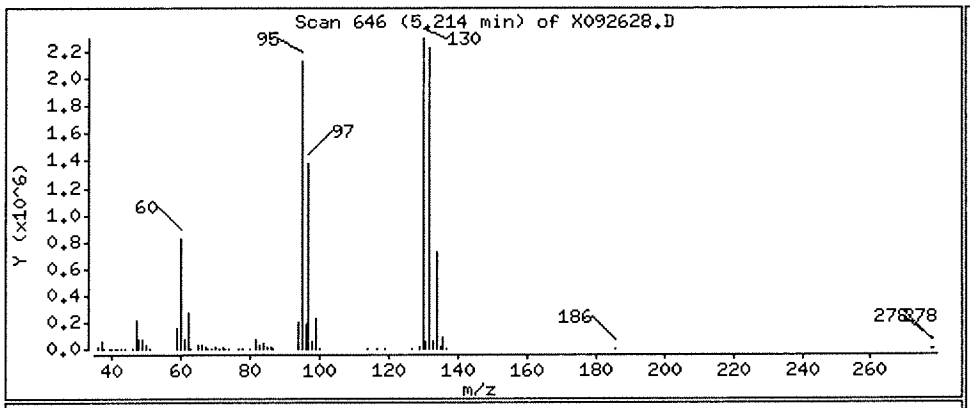
Operator: PC

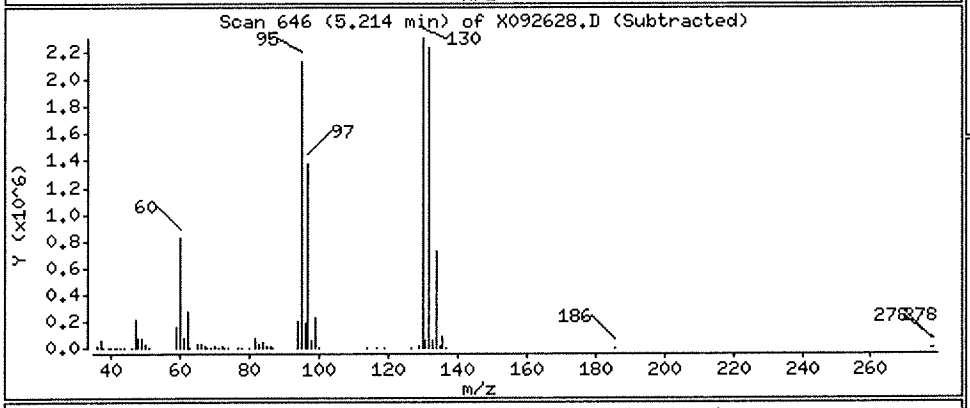
Column phase: DB624

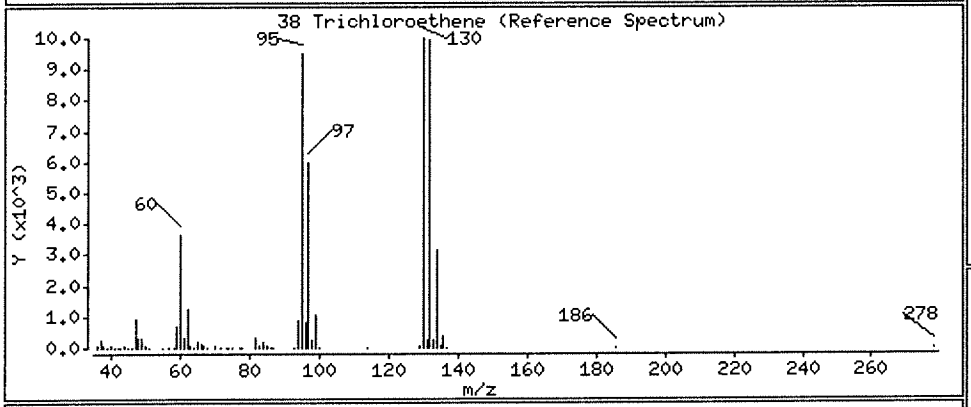
Column diameter: 0.18

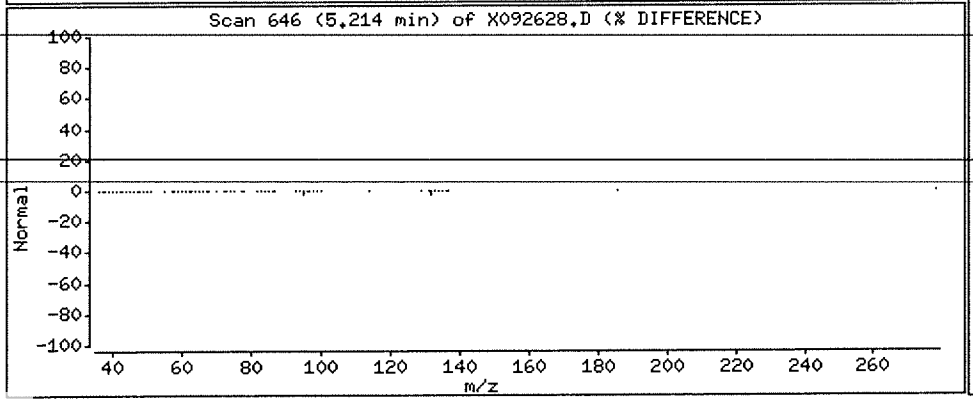
38 Trichloroethene

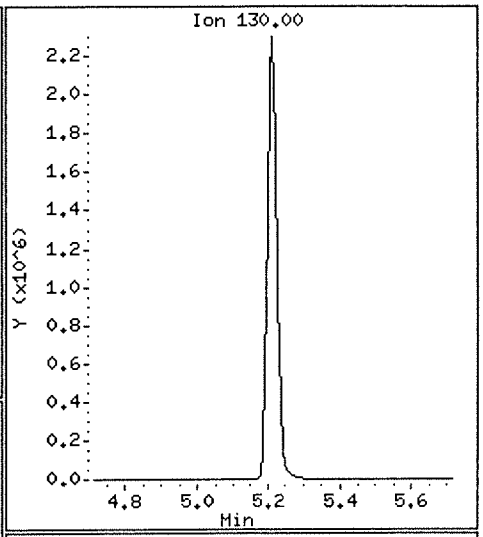
Concentration: 761.17 ug/l

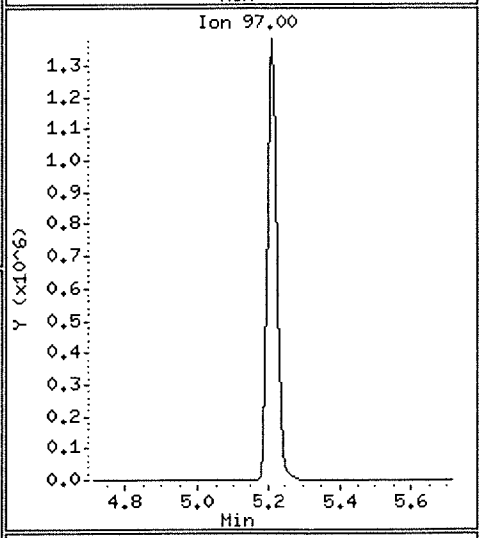


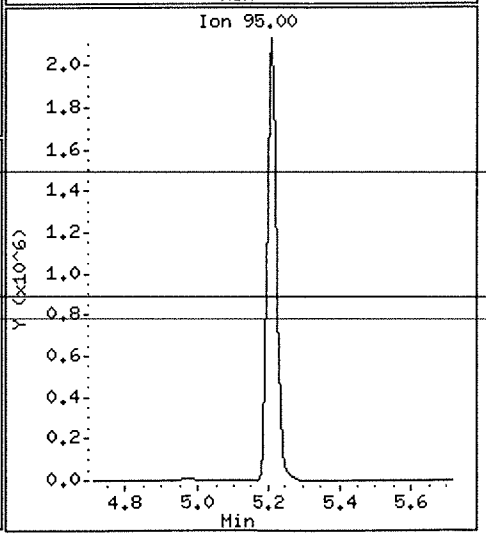












Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092628.D

Date : 27-SEP-2019 00:26

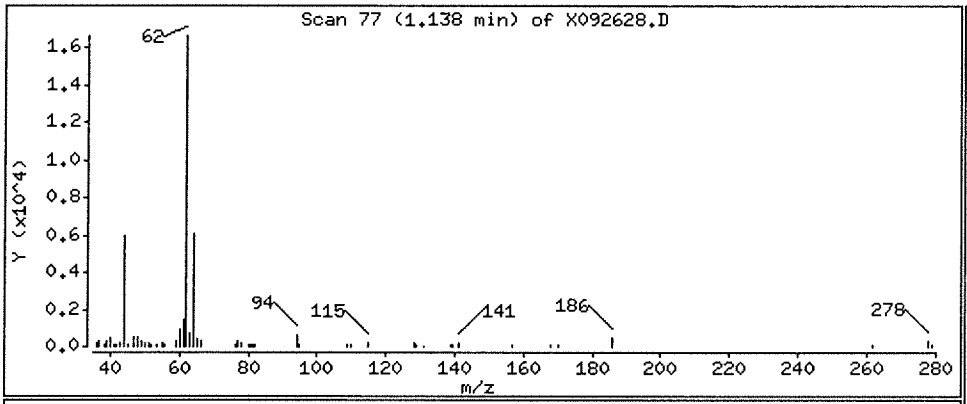
Client ID: HS19090860-09 Instrument: voa6.i

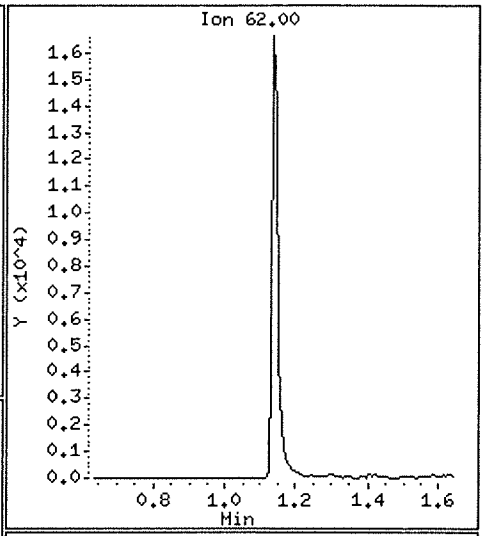
Sample Info: HS19090860-09;HS19090860-09;;;

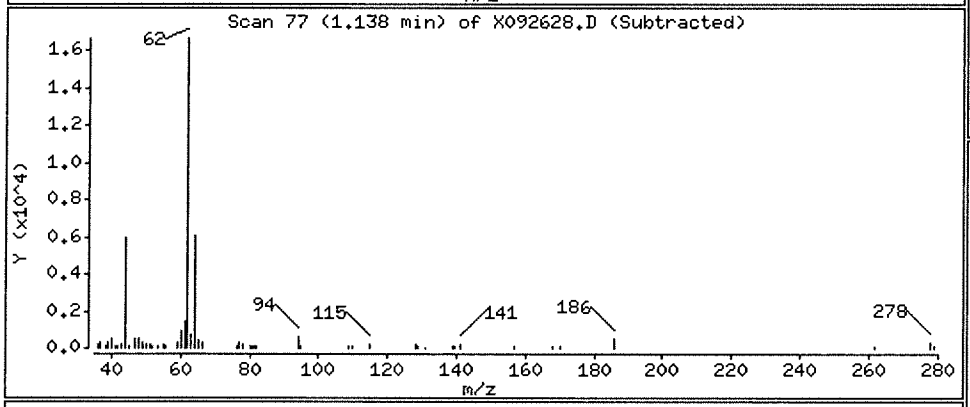
Purge Volume: 5.0 Operator: PC

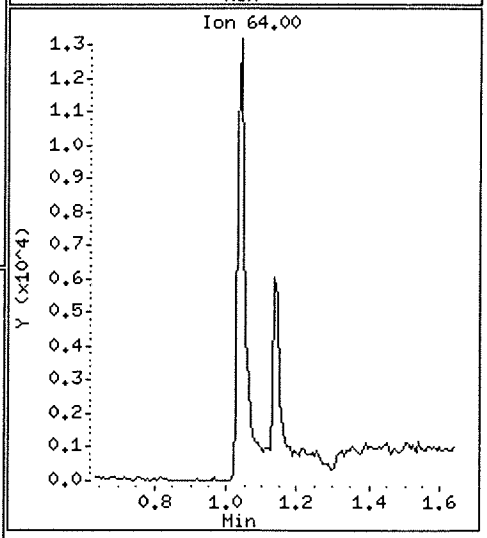
Column phase: DB624 Column diameter: 0.18

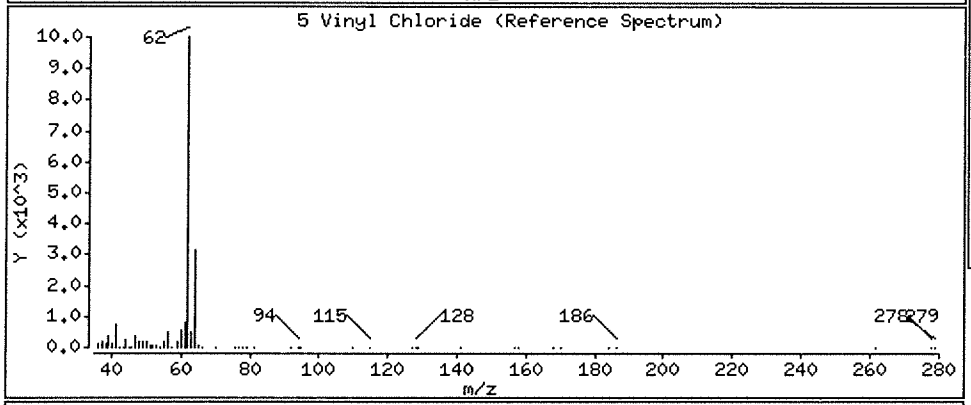
5 Vinyl Chloride Concentration: 3.03 ug/l

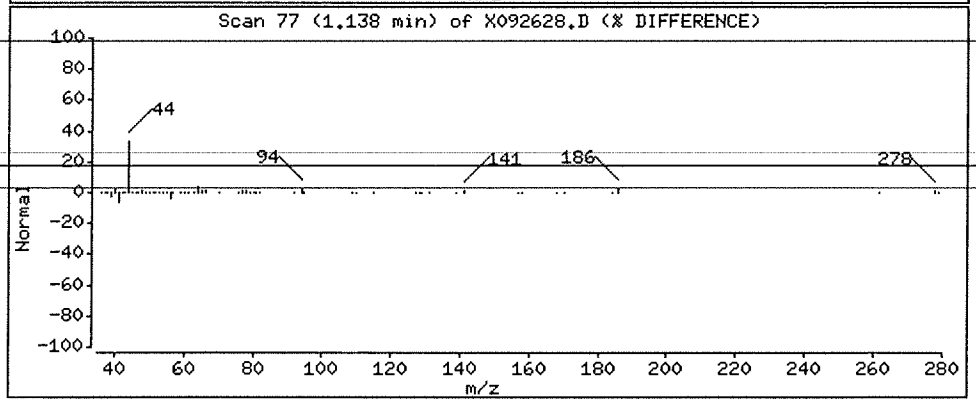






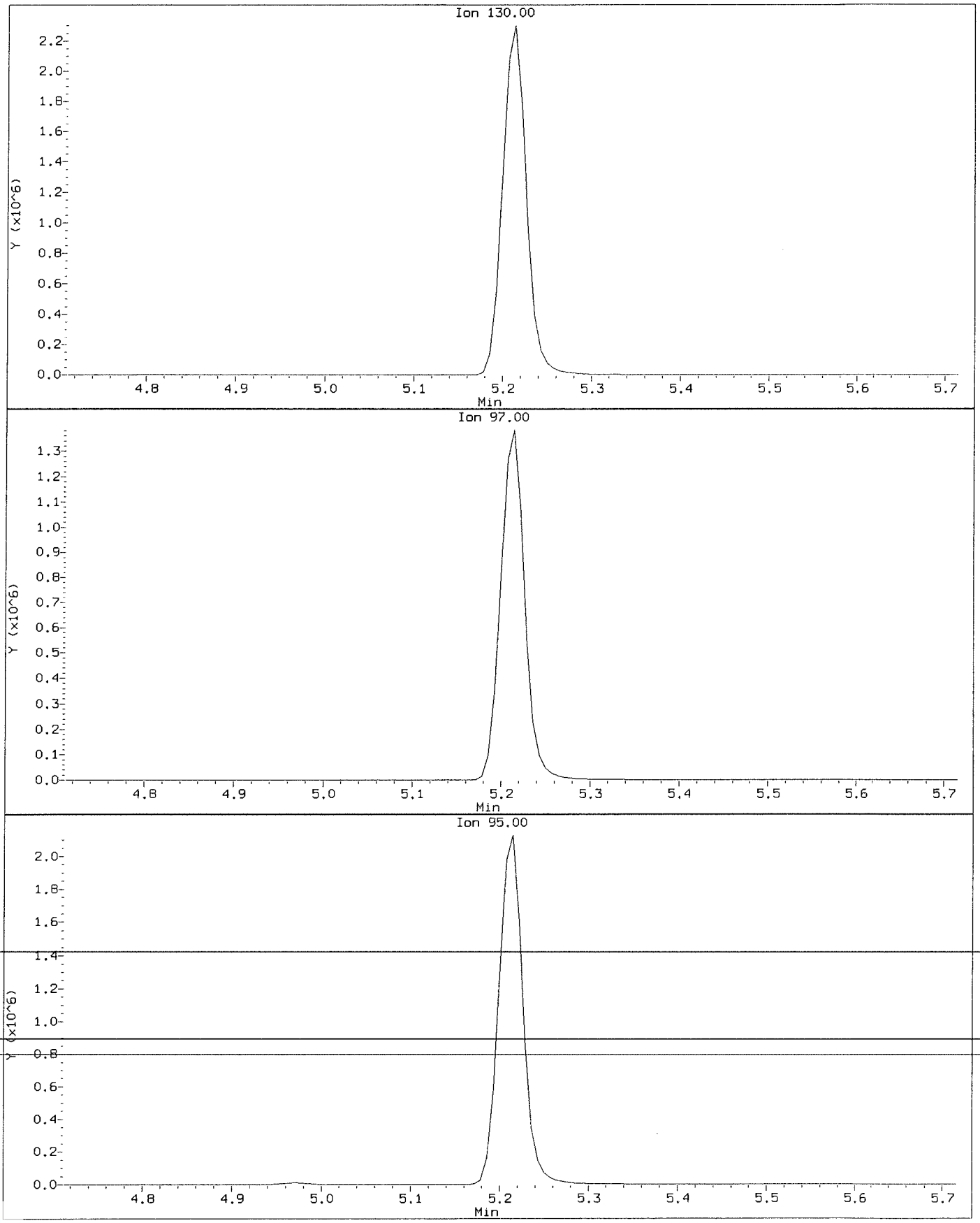






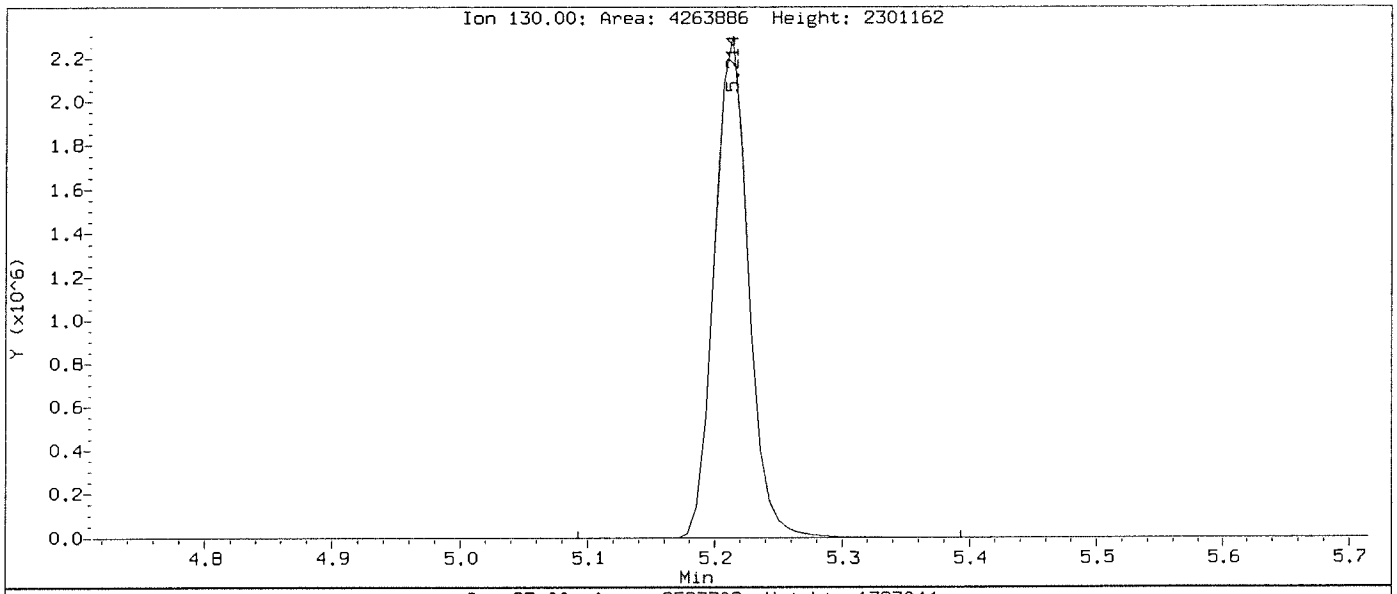
Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\BEFORE\X092628.D
Injection Date: 27-SEP-2019 00:26
Instrument: voa6.i
Client Sample ID: HS19090860-09

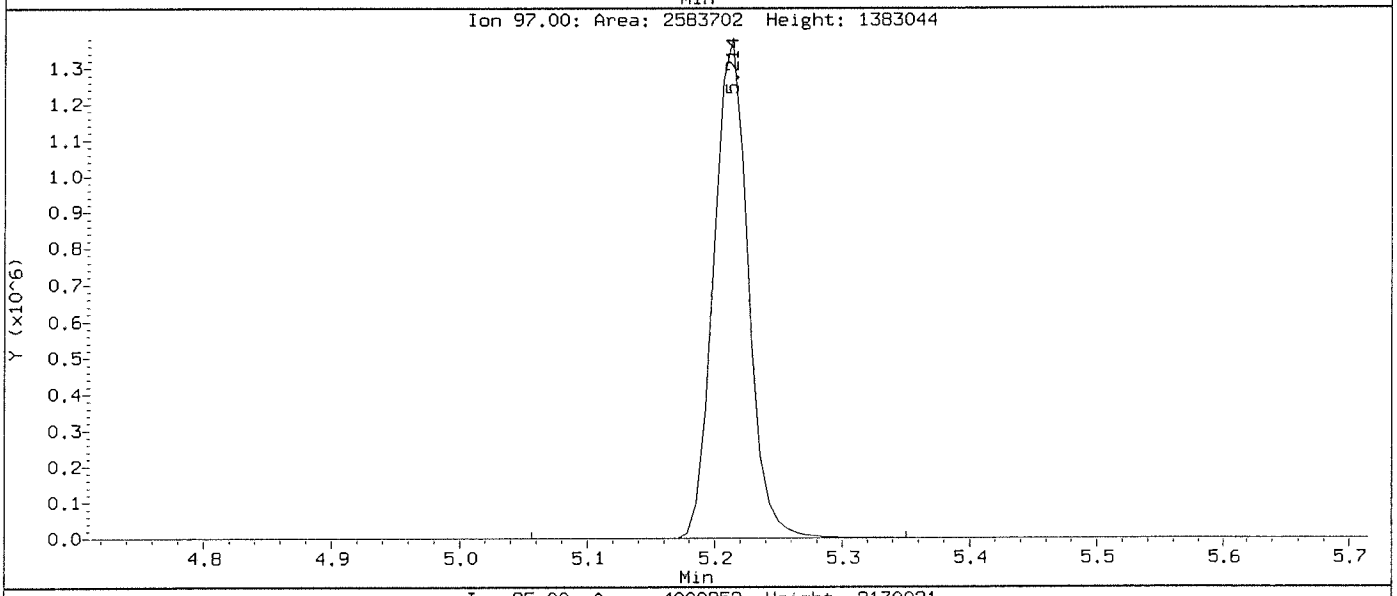
Compound: Trichloroethene
CAS Number: 79-01-6

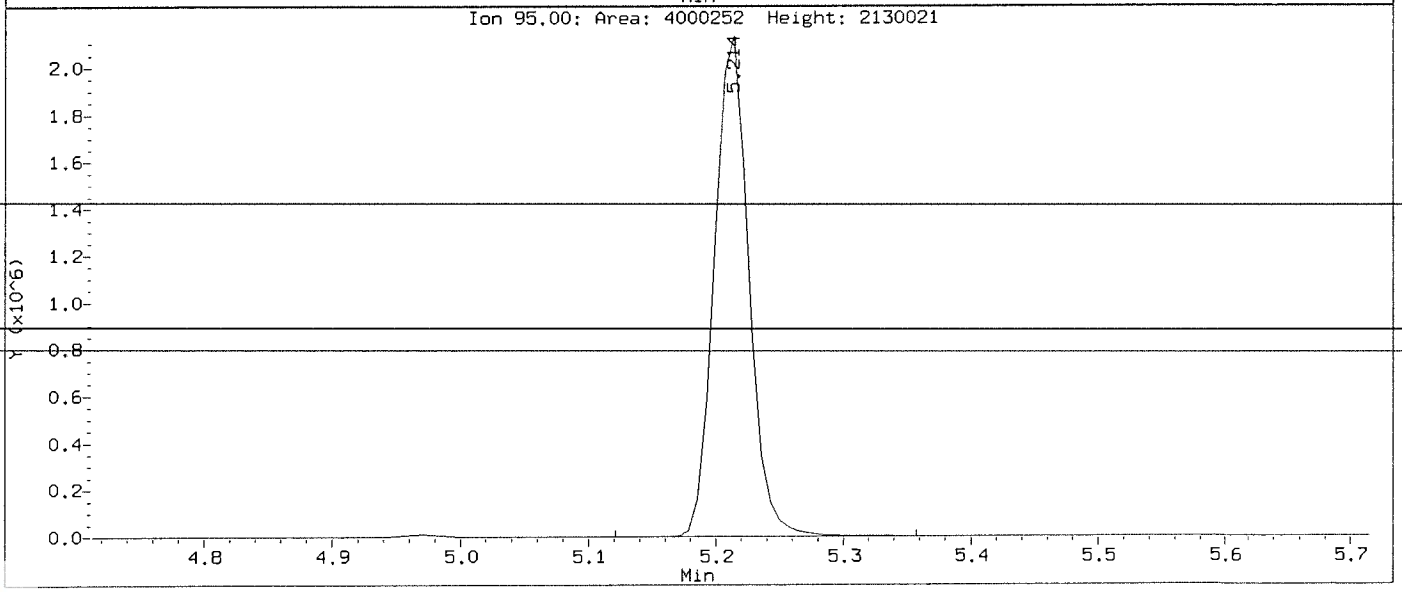


Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092628.D
Injection Date: 27-SEP-2019 00:26
Instrument: voa6.i
Client Sample ID: HS19090860-09

Compound: Trichloroethene
CAS Number: 79-01-6







ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190926.b\X092629.D
Lab Smp Id: HS19090860-07 Client Smp ID: HS19090860-07
Inj Date : 27-SEP-2019 00:50
Operator : PC Inst ID: voa6.i
Smp Info : HS19090860-07;HS19090860-07;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190926.b\8260W.m
Meth Date : 09-Oct-2019 19:10 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 28
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

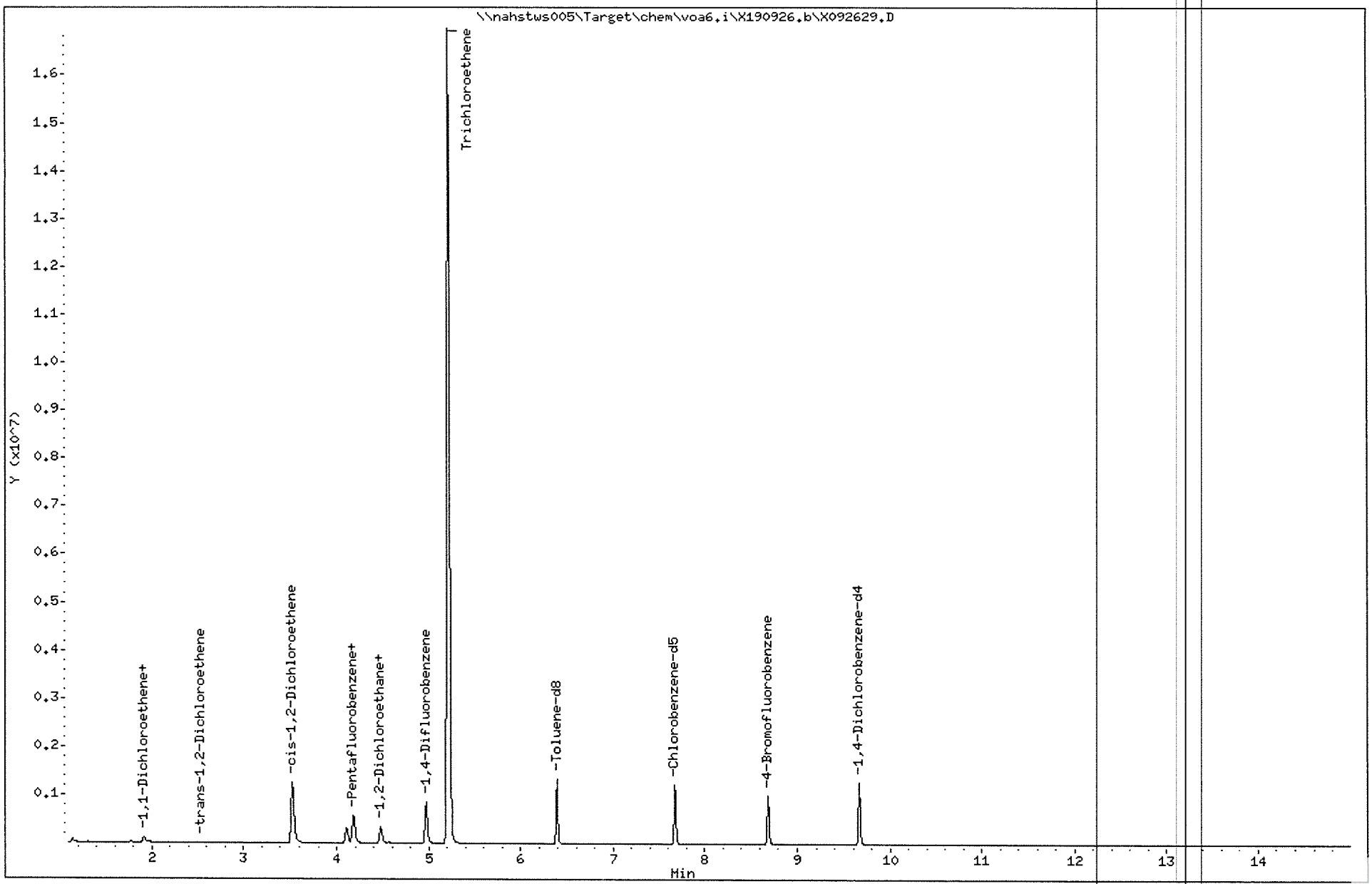
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	11 1,1-Dichloroethene	96	1.919	1.919	(0.458)	11496	2.65602	2.65(a)
	33 1,2-Dichloroethane	62	4.569	4.562	(0.919)	13557	2.02901	2.02(a)
	27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.843)	668392	108.316	108.31
	38 Trichloroethene	130	5.214	5.214	(1.049)	6281953	1142.07	1142.07(A)
	5 Vinyl Chloride	62	1.138	1.138	(0.272)	44685	7.06223	7.06
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.068)	243577	42.7049	42.70
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	286036	50.9519	50.95
$	30 Dibromofluoromethane	113	4.103	4.103	(0.979)	218567	44.6988	44.69
$	48 Toluene-d8	98	6.388	6.388	(0.833)	799734	48.3590	48.35
*	1 Pentafluorobenzene	168	4.189	4.182	(1.000)	499850	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	717586	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.670	(1.000)	588546	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	311793	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092629.D
Date : 27-SEP-2019 00:50
Client ID: HS19090860-07
Instrument: voa6.i
Sample Info: HS19090860-07;HS19090860-07;;;
Purge Volume: 5.0
Operator: PC
Column phase: DB624
Column diameter: 0.18



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Date : 27-SEP-2019 00:50

Client ID: HS19090860-07

Instrument: voa6.i

Sample Info: HS19090860-07;HS19090860-07;;;

Purge Volume: 5.0

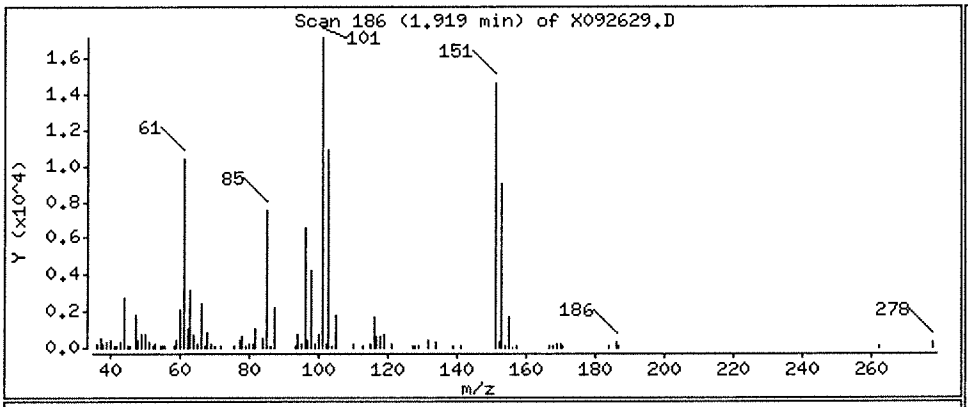
Operator: PC

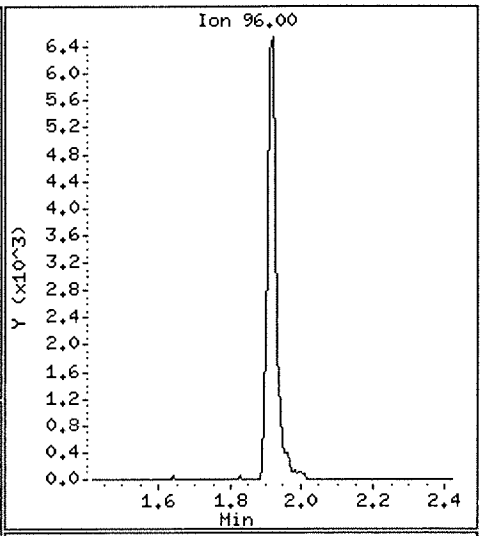
Column phase: DB624

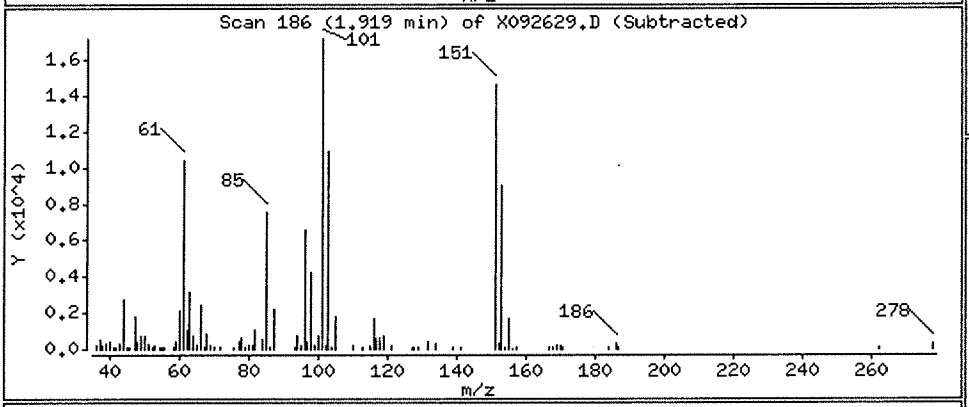
Column diameter: 0.18

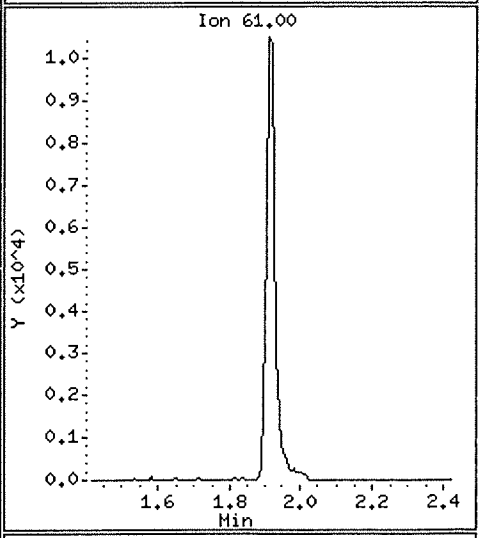
11 1,1-Dichloroethene

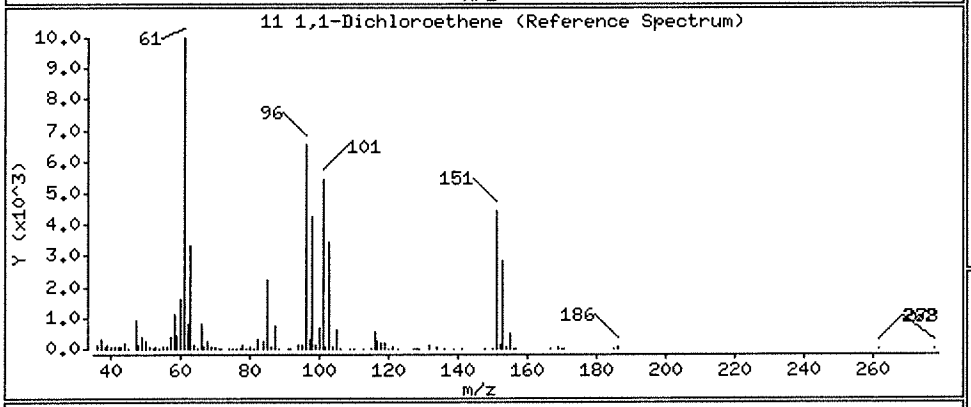
Concentration: 2.65 ug/l

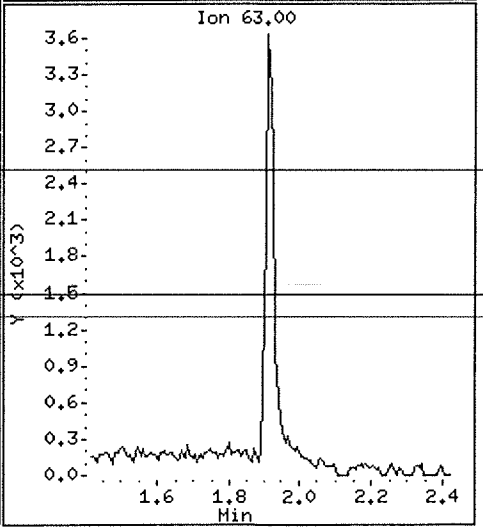


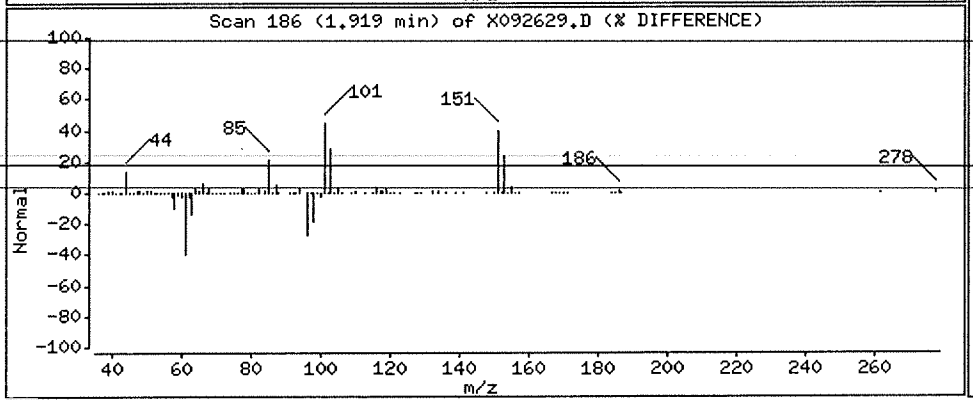












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Date : 27-SEP-2019 00:50

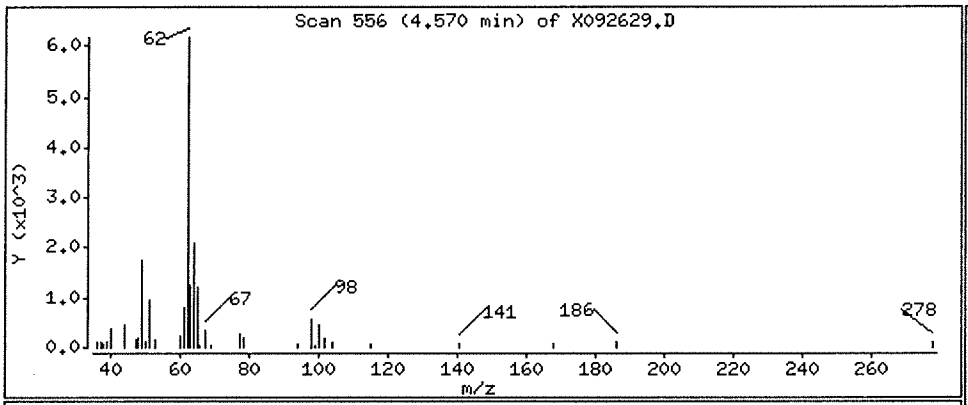
Client ID: HS19090860-07 Instrument: voa6.i

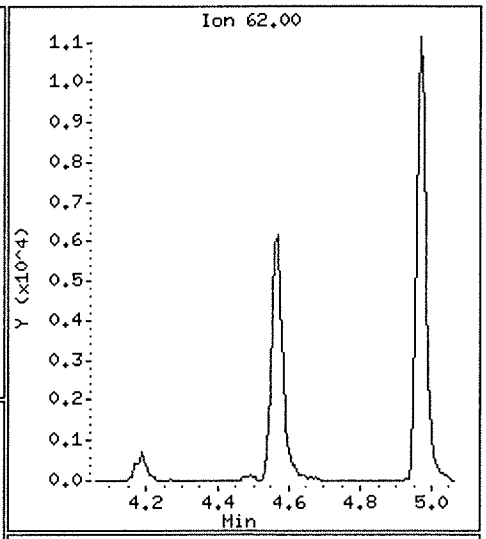
Sample Info: HS19090860-07;HS19090860-07;;;

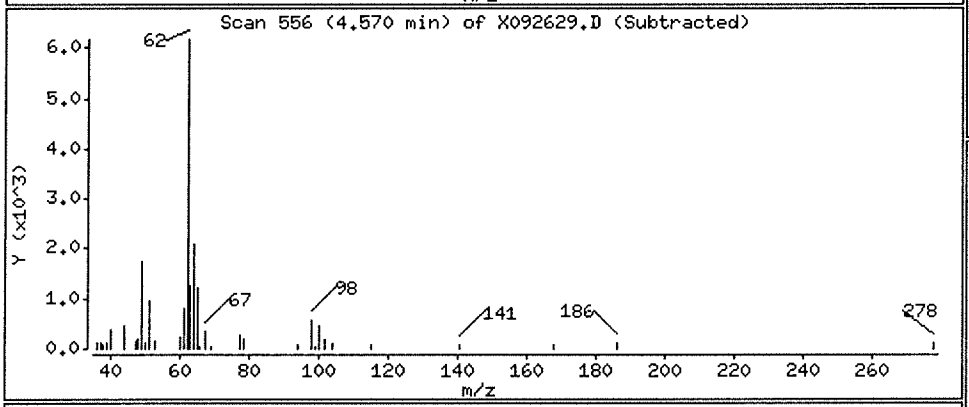
Purge Volume: 5.0 Operator: PC

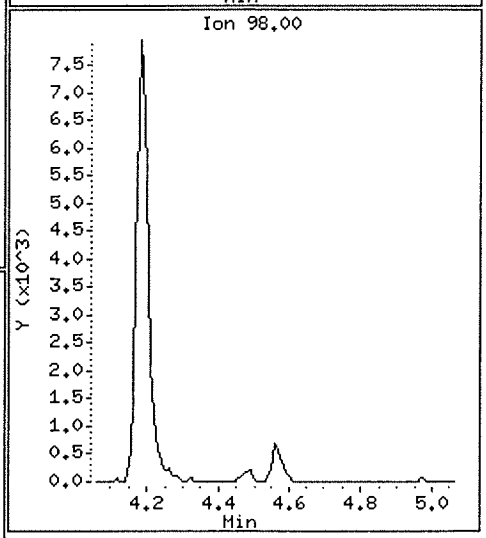
Column phase: DB624 Column diameter: 0.18

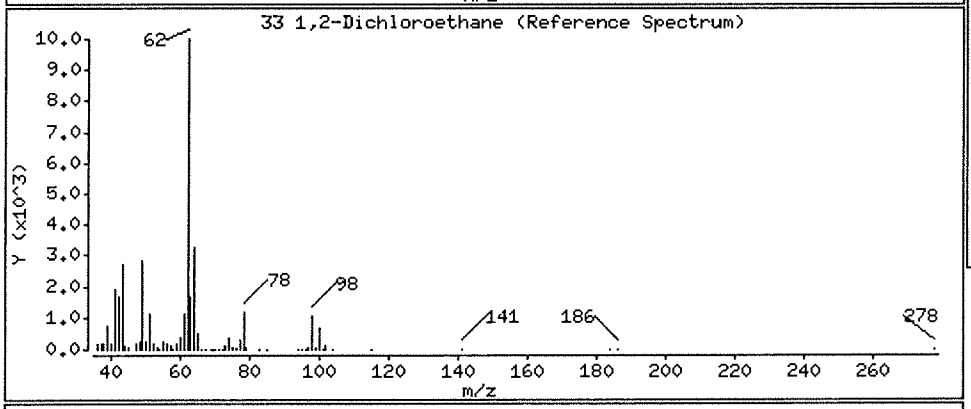
33 1,2-Dichloroethane Concentration: 2.02 ug/l

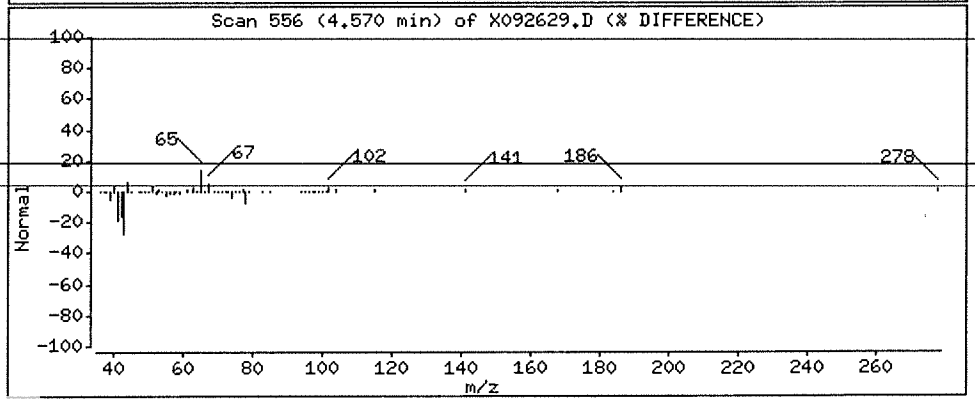












Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092629.D

Date : 27-SEP-2019 00:50

Client ID: HS19090860-07

Instrument: voa6.i

Sample Info: HS19090860-07;HS19090860-07;;;

Purge Volume: 5.0

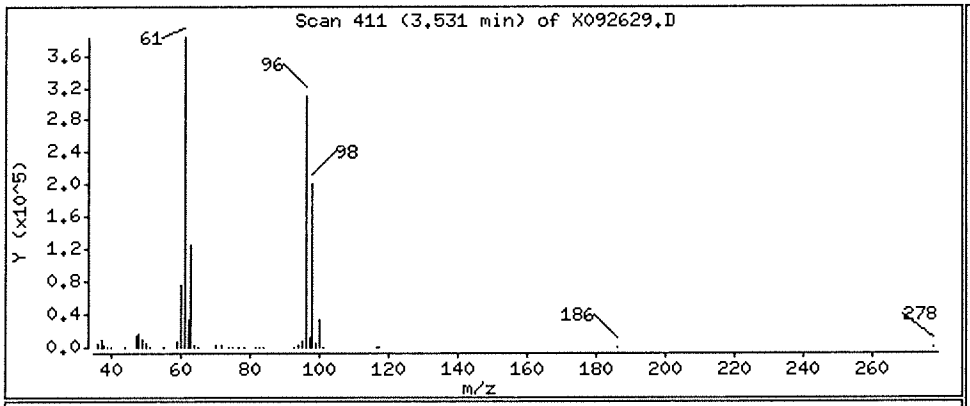
Operator: PC

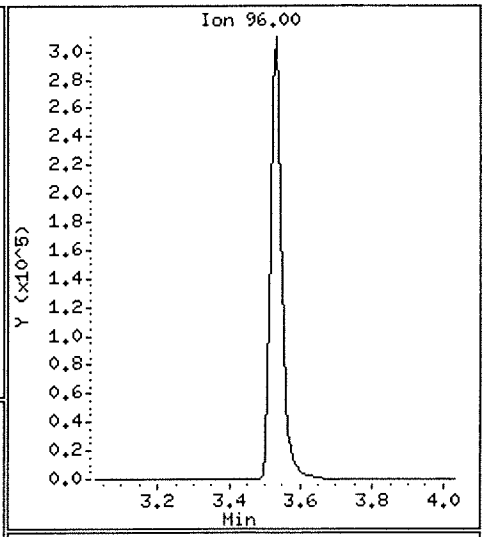
Column phase: DB624

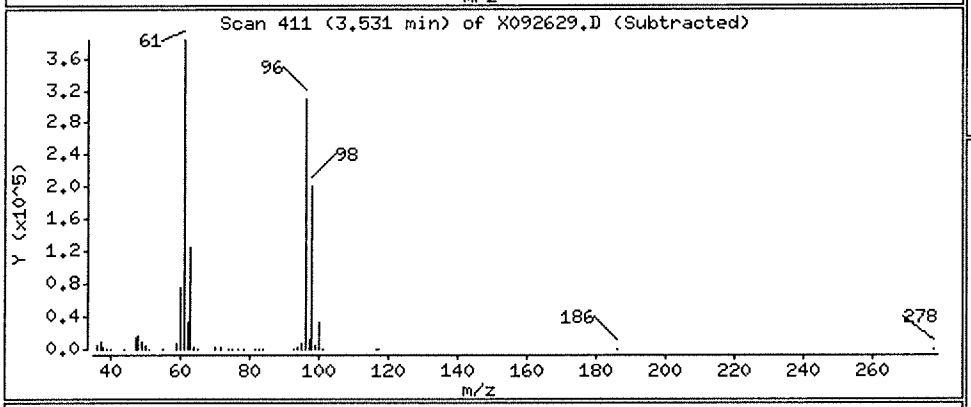
Column diameter: 0.18

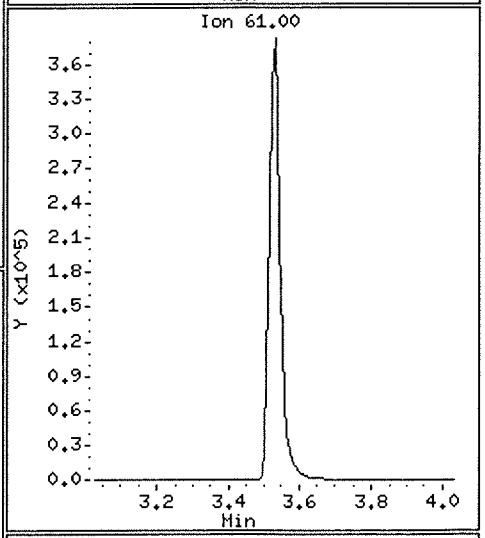
27 cis-1,2-Dichloroethene

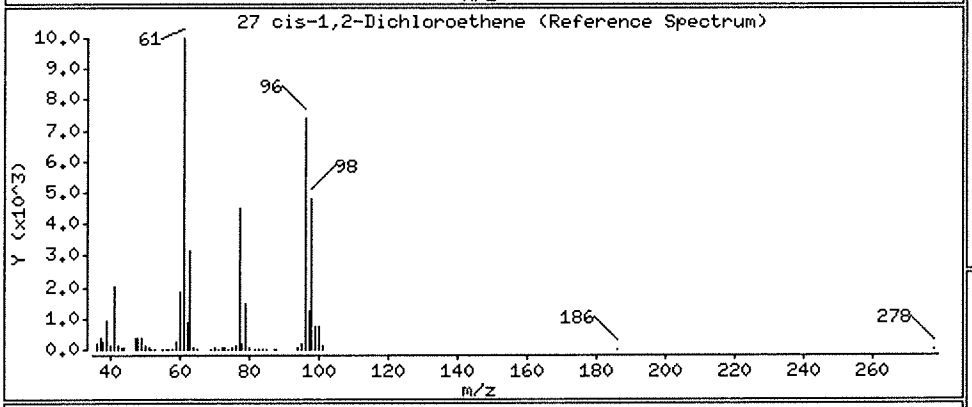
Concentration: 108.31 ug/l

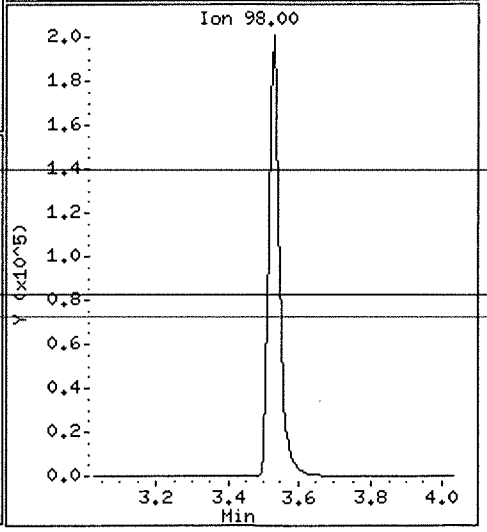


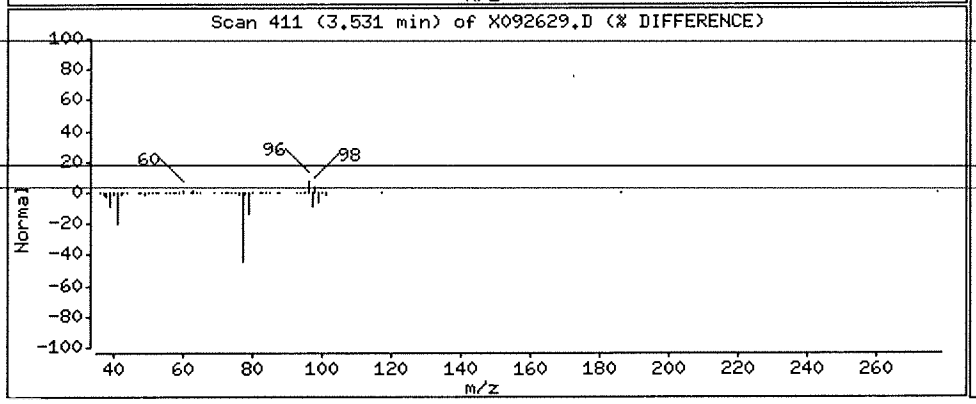












Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092629.D

Date : 27-SEP-2019 00:50

Client ID: HS19090860-07

Instrument: voa6.i

Sample Info: HS19090860-07;HS19090860-07;;;

Purge Volume: 5.0

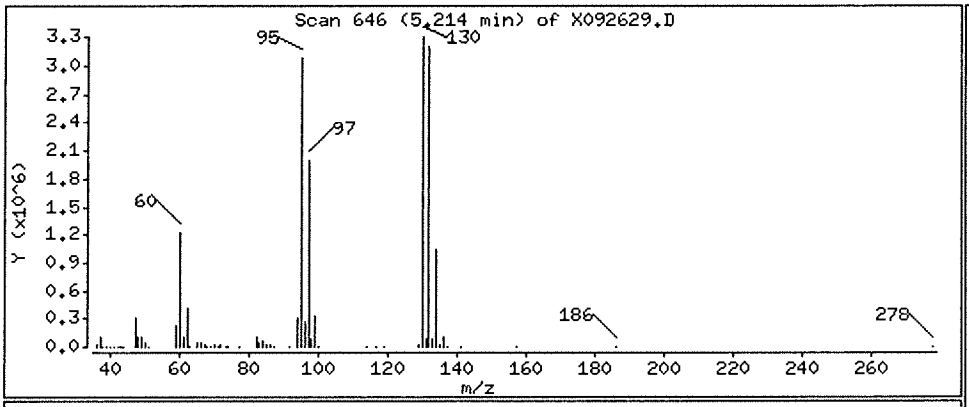
Operator: PC

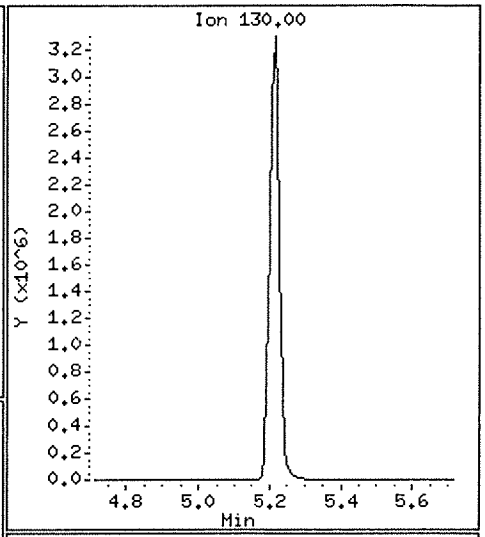
Column phase: DB624

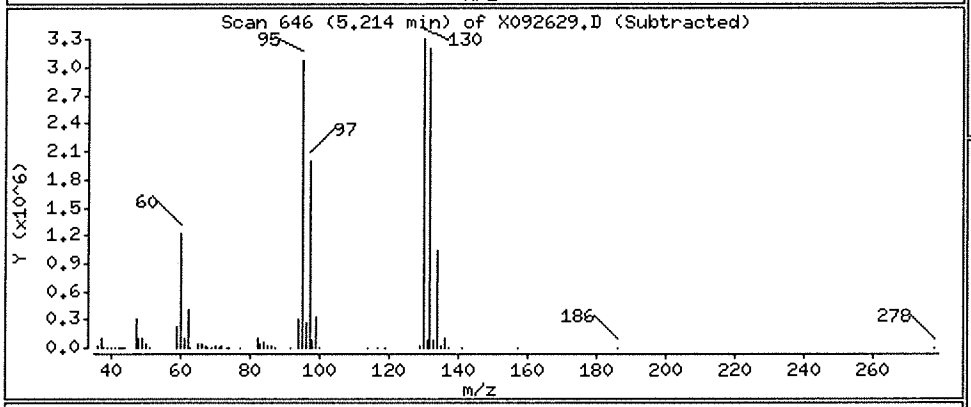
Column diameter: 0.18

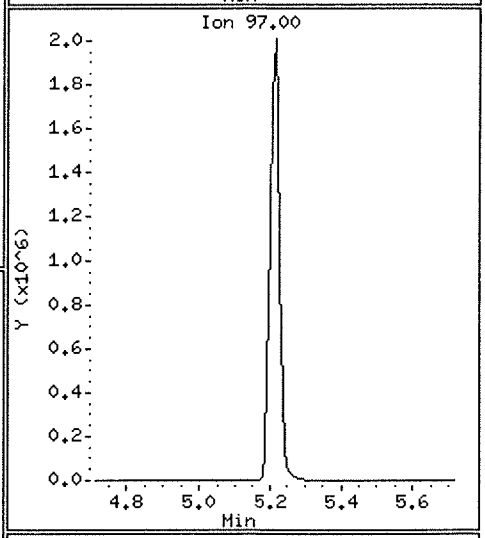
38 Trichloroethene

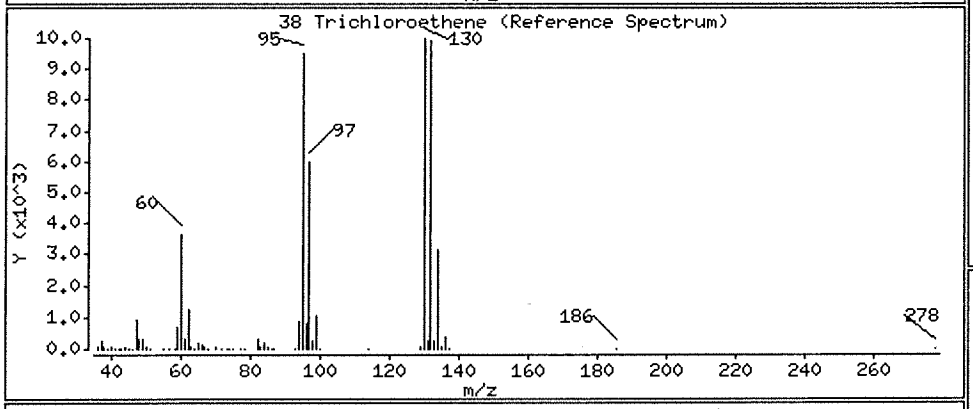
Concentration: 1142.07 ug/l

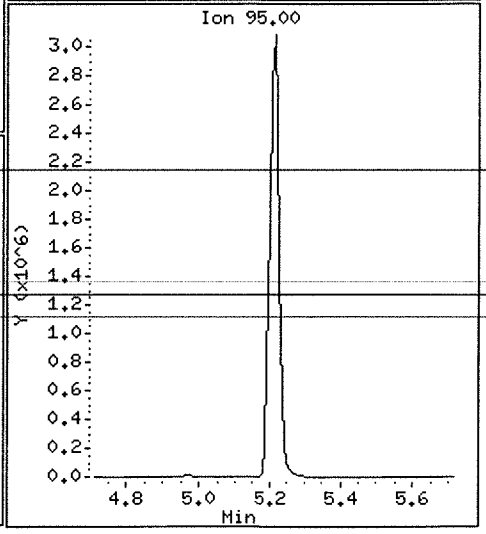


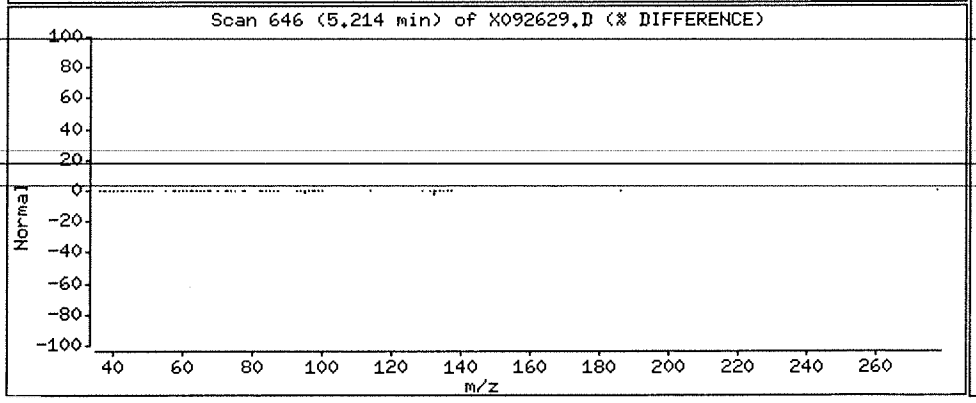












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Date : 27-SEP-2019 00:50

Client ID: HS19090860-07

Instrument: voa6.i

Sample Info: HS19090860-07;HS19090860-07;;;

Purge Volume: 5.0

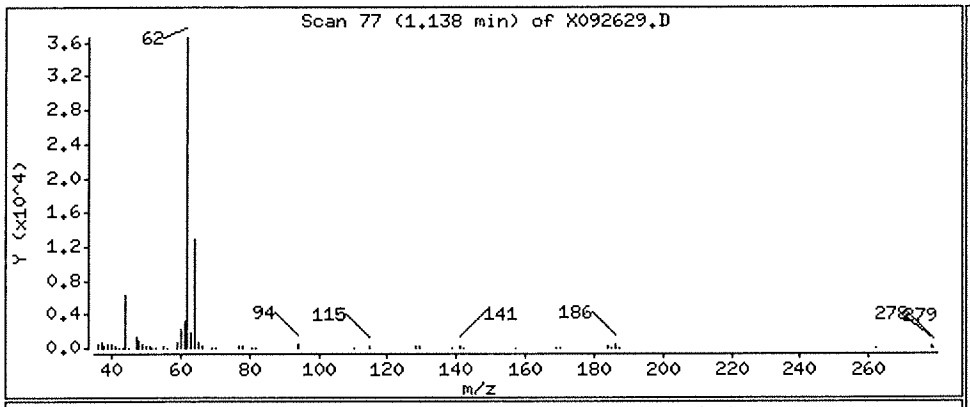
Operator: PC

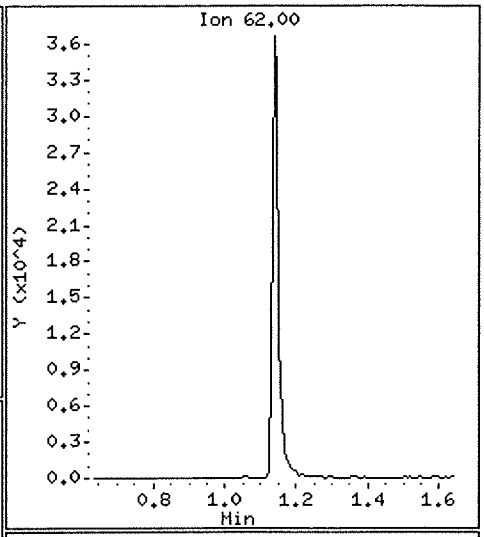
Column phase: DB624

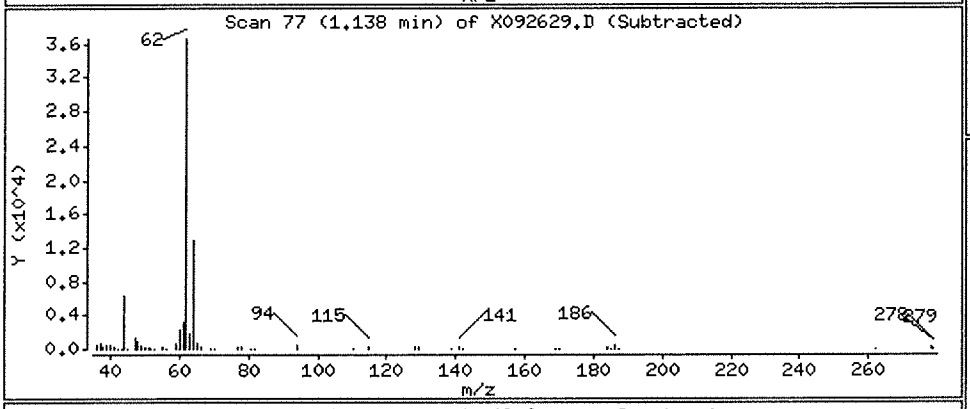
Column diameter: 0.18

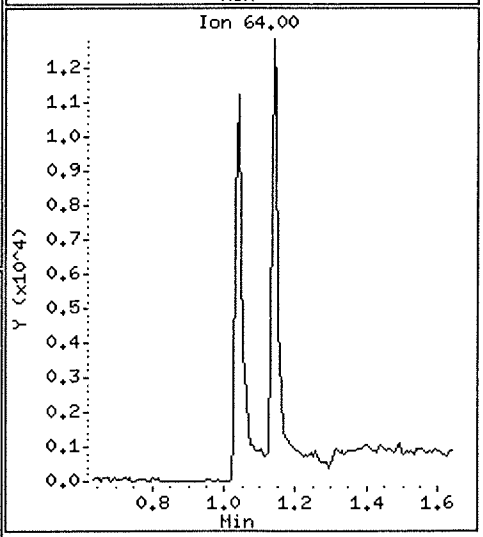
5 Vinyl Chloride

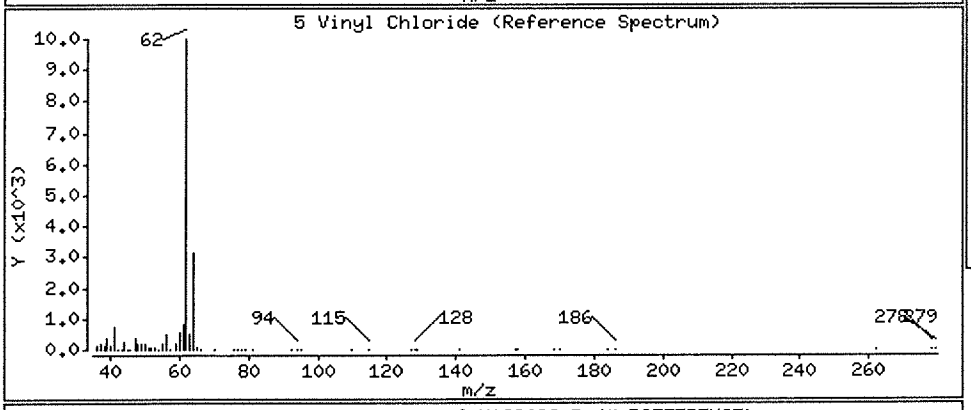
Concentration: 7.06 ug/l

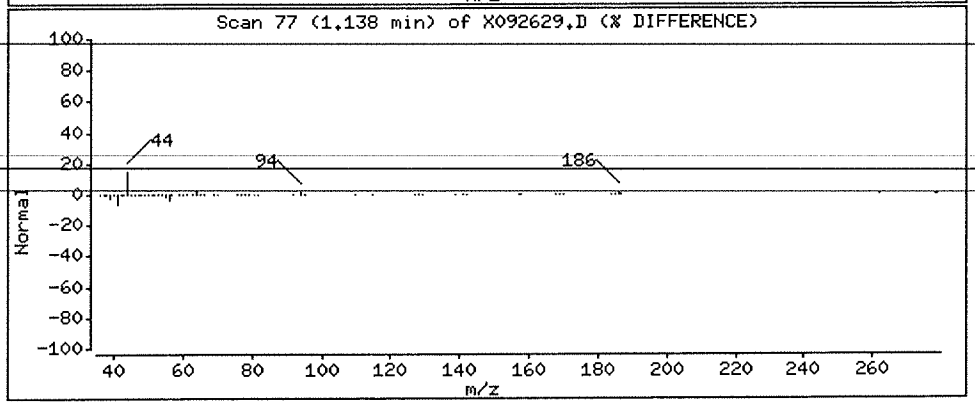












ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X190926.b\X092630.D
Lab Smp Id: CCV-END Client Smp ID: CCV-END
Inj Date : 27-SEP-2019 01:14
Operator : PC Inst ID: voa6.i
Smp Info : CCV-END;CCV-END;2;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X190926.b\8260W.m
Meth Date : 09-Oct-2019 19:11 DevakG Quant Type: ISTD
Cal Date : 24-SEP-2019 13:59 Cal File: X092408.D
Als bottle: 29 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBI-HOU.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
53	1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	141362	50.0000	49.48
11	1,1-Dichloroethene	96	1.919	1.919	(0.459)	155193	50.0000	49.82
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	224392	50.0000	44.19
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	204858	50.0000	46.12
17	Methylene Chloride	84	2.305	2.305	(0.551)	193619	50.0000	49.93
38	Trichloroethene	130	5.214	5.214	(1.049)	205347	50.0000	49.12
5	Vinyl Chloride	62	1.138	1.138	(0.272)	219976	50.0000	48.30
$ 35	1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	194782	50.0000	47.56
$ 69	4-Bromofluorobenzene	95	8.695	8.695	(1.134)	245170	50.0000	51.65
$ 30	Dibromofluoromethane	113	4.103	4.103	(0.981)	176142	50.0000	50.15
$ 48	Toluene-d8	98	6.388	6.388	(0.833)	655759	50.0000	46.88
* 1	Pentafluorobenzene	168	4.182	4.182	(1.000)	359730	50.0000	
* 36	1,4-Difluorobenzene	114	4.970	4.970	(1.000)	545278	50.0000	
* 47	Chlorobenzene-d5	117	7.670	7.670	(1.000)	497755	50.0000	
* 70	1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	264470	50.0000	

Data File: \\nahstws005\Target\chem\voa6.i\X190926.b\X092630.D
Date : 27-SEP-2019 04:14
Client ID: CCV-END
Sample Info: CCV-END;CCV-END;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

HS19090962 LHAAP16 Cover Page

ALS WO# HS19090962

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  - CaseNarrative
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  - 16WW13-190918
  - 16WW48-190918
  - 16WW35-190918
  - 16WW30-190918
  - 16EW06-190918
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Certifications

SampleReceiptCheckList

COC

HS19090962 ALS Kelso Sub Data K1908780

HS19090962 ALS Salt Lake City Combined Report 1927216

HS19090962 RSK 175 Raw Data

HS19090962 Wet Chem Raw Data

10450 Stancliff Rd. Suite 210
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WorkOrder: HS19090962

LHAAP-16

Aptim Environmental & Infrastucture, Inc.

Susan Huang
2500 City West Blvd., Suite 1700
Houston TX 77042

14-Oct-2019

HS19090962 LHAAP16 Final

ALS WO# HS19090962

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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October 04, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19090962**

Laboratory Results for: **LHAAP-16**

Dear Susan,

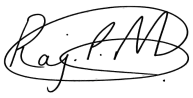
ALS Environmental received 13 sample(s) on Sep 19, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19090962

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090962-01	16LHAAP-TB3-190918	Water	C&G-080519-517	18-Sep-2019 00:00	19-Sep-2019 16:45	☐
HS19090962-02	16WW13-190918	Water		18-Sep-2019 08:45	19-Sep-2019 16:45	☐
HS19090962-03	16WW48-190918	Water		18-Sep-2019 17:20	19-Sep-2019 16:45	☐
HS19090962-04	16WW35-190918	Water		18-Sep-2019 10:55	19-Sep-2019 16:45	☐
HS19090962-05	16WW30-190918	Water		18-Sep-2019 11:11	19-Sep-2019 16:45	☐
HS19090962-06	16EW06-190918	Water		18-Sep-2019 13:35	19-Sep-2019 16:45	☐
HS19090962-07	16WW26-190917	Water		17-Sep-2019 15:53	19-Sep-2019 16:45	☐
HS19090962-08	16EW02-190918	Water		18-Sep-2019 14:55	19-Sep-2019 16:45	☐
HS19090962-09	16LHAAP-TB-5-190918	Water	C&G-080519-514	18-Sep-2019 00:00	19-Sep-2019 16:45	☐
HS19090962-10	16WW29-190918	Water		18-Sep-2019 12:07	19-Sep-2019 16:45	☐
HS19090962-11	16WW12-190918	Water		18-Sep-2019 09:59	19-Sep-2019 16:45	☐
HS19090962-12	16WW57-190918	Water		18-Sep-2019 15:30	19-Sep-2019 16:45	☐
HS19090962-13	16WW26-190917-FD	Water		18-Sep-2019 15:53	19-Sep-2019 16:45	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19090962

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.
- The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R346937

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

GCMS Volatiles by Method SW8260

Batch ID: R347016,R347098,R347193

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

WetChemistry by Method SW9056

Batch ID: R346732

Sample ID: 16WW57-190918 (HS19090962-12MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Sulfate)
- The MS and/or MSD recovery was outside of the control limits for Bromide

WetChemistry by Method SM2320B

Batch ID: R346726

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16LHAAP-TB3-190918
Collection Date: 18-Sep-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 17:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:50
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 17:50
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 17:50
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*81-118*	*%REC*	*1*	*25-Sep-2019 17:50*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*25-Sep-2019 17:50*
Surr: Dibromofluoromethane	*93.6*			**0**	*80-119*	*%REC*	*1*	*25-Sep-2019 17:50*
Surr: Toluene-d8	*99.1*			**0**	*89-112*	*%REC*	*1*	*25-Sep-2019 17:50*

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW13-190918
Collection Date: 18-Sep-2019 08:45

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 13:56
1,1-Dichloroethene	**0.70**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 13:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 13:56
cis-1,2-Dichloroethene	**210**		**1.0**	**2.5**	**5.0**	**UG/L**	5	26-Sep-2019 19:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 13:56
Trichloroethene	**630**		**1.0**	**2.5**	**5.0**	**UG/L**	5	26-Sep-2019 19:37
Vinyl chloride	**5.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 13:56
Surr: 1,2-Dichloroethane-d4	*87.1*			**0**	*81-118*	*%REC*	*5*	*26-Sep-2019 19:37*
Surr: 1,2-Dichloroethane-d4	*84.4*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 13:56*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*5*	*26-Sep-2019 19:37*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 13:56*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*5*	*26-Sep-2019 19:37*
Surr: Dibromofluoromethane	*90.4*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 13:56*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*5*	*26-Sep-2019 19:37*
Surr: Toluene-d8	*97.7*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 13:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-16
Sample ID: 16WW48-190918
Collection Date: 18-Sep-2019 17:20

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Sep-2019 18:45
1,1-Dichloroethene	**7.0**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Sep-2019 18:45
1,2-Dichloroethane	**7.0**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Sep-2019 18:45
cis-1,2-Dichloroethene	**1,800**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 18:01
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	27-Sep-2019 18:45
Trichloroethene	**3,700**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 18:01
Vinyl chloride	**7.4**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Sep-2019 18:45
Surr: 1,2-Dichloroethane-d4	*88.0*			**0**	*81-118*	*%REC*	*25*	*26-Sep-2019 18:01*
Surr: 1,2-Dichloroethane-d4	*83.8*			**0**	*81-118*	*%REC*	*5*	*27-Sep-2019 18:45*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*25*	*26-Sep-2019 18:01*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*5*	*27-Sep-2019 18:45*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*25*	*26-Sep-2019 18:01*
Surr: Dibromofluoromethane	*90.0*			**0**	*80-119*	*%REC*	*5*	*27-Sep-2019 18:45*
Surr: Toluene-d8	*97.8*			**0**	*89-112*	*%REC*	*25*	*26-Sep-2019 18:01*
Surr: Toluene-d8	*95.9*			**0**	*89-112*	*%REC*	*5*	*27-Sep-2019 18:45*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW35-190918
Collection Date: 18-Sep-2019 10:55

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	26-Sep-2019 21:14
1,1-Dichloroethene	**120**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 21:14
1,2-Dichloroethane	12	U	5.0	12	25	UG/L	25	26-Sep-2019 21:14
cis-1,2-Dichloroethene	**8,800**		**50**	**120**	**250**	**UG/L**	250	26-Sep-2019 21:38
Methylene chloride	25	U	10	25	50	UG/L	25	26-Sep-2019 21:14
Trichloroethene	**13,000**		**50**	**120**	**250**	**UG/L**	250	26-Sep-2019 21:38
Vinyl chloride	**75**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 21:14
Surr: 1,2-Dichloroethane-d4	*86.1*			**0**	*81-118*	*%REC*	*25*	*26-Sep-2019 21:14*
Surr: 1,2-Dichloroethane-d4	*87.1*			**0**	*81-118*	*%REC*	*250*	*26-Sep-2019 21:38*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*25*	*26-Sep-2019 21:14*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*250*	*26-Sep-2019 21:38*
Surr: Dibromofluoromethane	*90.3*			**0**	*80-119*	*%REC*	*25*	*26-Sep-2019 21:14*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*250*	*26-Sep-2019 21:38*
Surr: Toluene-d8	*98.0*			**0**	*89-112*	*%REC*	*25*	*26-Sep-2019 21:14*
Surr: Toluene-d8	*99.2*			**0**	*89-112*	*%REC*	*250*	*26-Sep-2019 21:38*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW30-190918
Collection Date: 18-Sep-2019 11:11

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Sep-2019 17:13
1,1-Dichloroethene	**0.82**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Sep-2019 17:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 17:13
cis-1,2-Dichloroethene	**79**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Sep-2019 17:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Sep-2019 17:13
Trichloroethene	**360**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Sep-2019 15:56
Vinyl chloride	**0.41**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Sep-2019 17:13
Surr: 1,2-Dichloroethane-d4	*87.8*			**0**	*81-118*	*%REC*	*1*	*26-Sep-2019 17:13*
Surr: 1,2-Dichloroethane-d4	*83.9*			**0**	*81-118*	*%REC*	*5*	*27-Sep-2019 15:56*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*26-Sep-2019 17:13*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*5*	*27-Sep-2019 15:56*
Surr: Dibromofluoromethane	*92.1*			**0**	*80-119*	*%REC*	*1*	*26-Sep-2019 17:13*
Surr: Dibromofluoromethane	*90.9*			**0**	*80-119*	*%REC*	*5*	*27-Sep-2019 15:56*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*1*	*26-Sep-2019 17:13*
Surr: Toluene-d8	*97.8*			**0**	*89-112*	*%REC*	*5*	*27-Sep-2019 15:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-16
Sample ID: 16EW06-190918
Collection Date: 18-Sep-2019 13:35

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	26-Sep-2019 22:02
1,1-Dichloroethene	**22**	J	**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 22:02
1,2-Dichloroethane	12	U	5.0	12	25	UG/L	25	26-Sep-2019 22:02
cis-1,2-Dichloroethene	**3,700**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 22:02
Methylene chloride	25	U	10	25	50	UG/L	25	26-Sep-2019 22:02
Trichloroethene	**6,500**		**50**	**120**	**250**	**UG/L**	250	26-Sep-2019 22:26
Vinyl chloride	**190**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 22:02
Surr: 1,2-Dichloroethane-d4	*85.6*			**0**	*81-118*	*%REC*	*25*	*26-Sep-2019 22:02*
Surr: 1,2-Dichloroethane-d4	*86.8*			**0**	*81-118*	*%REC*	*250*	*26-Sep-2019 22:26*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*25*	*26-Sep-2019 22:02*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*250*	*26-Sep-2019 22:26*
Surr: Dibromofluoromethane	*90.3*			**0**	*80-119*	*%REC*	*25*	*26-Sep-2019 22:02*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*250*	*26-Sep-2019 22:26*
Surr: Toluene-d8	*98.1*			**0**	*89-112*	*%REC*	*25*	*26-Sep-2019 22:02*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*250*	*26-Sep-2019 22:26*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW26-190917
Collection Date: 17-Sep-2019 15:53

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Sep-2019 17:37
1,1-Dichloroethene	**1.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Sep-2019 17:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 17:37
cis-1,2-Dichloroethene	**35**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Sep-2019 17:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Sep-2019 17:37
Trichloroethene	**380**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Sep-2019 16:20
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 17:37
Surr: 1,2-Dichloroethane-d4	*88.7*			**0**	*81-118*	*%REC*	*1*	*26-Sep-2019 17:37*
Surr: 1,2-Dichloroethane-d4	*83.5*			**0**	*81-118*	*%REC*	*5*	*27-Sep-2019 16:20*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*26-Sep-2019 17:37*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*5*	*27-Sep-2019 16:20*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*26-Sep-2019 17:37*
Surr: Dibromofluoromethane	*90.5*			**0**	*80-119*	*%REC*	*5*	*27-Sep-2019 16:20*
Surr: Toluene-d8	*96.1*			**0**	*89-112*	*%REC*	*1*	*26-Sep-2019 17:37*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*5*	*27-Sep-2019 16:20*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-16
Sample ID: 16EW02-190918
Collection Date: 18-Sep-2019 14:55

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	26-Sep-2019 22:50
1,1-Dichloroethene	**110**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 22:50
1,2-Dichloroethane	**51**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 22:50
cis-1,2-Dichloroethene	**25,000**		**50**	**120**	**250**	**UG/L**	250	26-Sep-2019 23:14
Methylene chloride	25	U	10	25	50	UG/L	25	26-Sep-2019 22:50
Trichloroethene	**42,000**		**50**	**120**	**250**	**UG/L**	250	26-Sep-2019 23:14
Vinyl chloride	**650**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 22:50
Surr: 1,2-Dichloroethane-d4	*85.6*			**0**	*81-118*	*%REC*	*250*	*26-Sep-2019 23:14*
Surr: 1,2-Dichloroethane-d4	*85.1*			**0**	*81-118*	*%REC*	*25*	*26-Sep-2019 22:50*
Surr: 4-Bromofluorobenzene	*106*			**0**	*85-114*	*%REC*	*25*	*26-Sep-2019 22:50*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*250*	*26-Sep-2019 23:14*
Surr: Dibromofluoromethane	*91.2*			**0**	*80-119*	*%REC*	*25*	*26-Sep-2019 22:50*
Surr: Dibromofluoromethane	*90.2*			**0**	*80-119*	*%REC*	*250*	*26-Sep-2019 23:14*
Surr: Toluene-d8	*96.0*			**0**	*89-112*	*%REC*	*25*	*26-Sep-2019 22:50*
Surr: Toluene-d8	*97.9*			**0**	*89-112*	*%REC*	*250*	*26-Sep-2019 23:14*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP-16 WorkOrder:HS19090962
Sample ID: 16LHAAP-TB-5-190918 Lab ID:HS19090962-09
Collection Date: 18-Sep-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Sep-2019 16:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 16:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 16:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 16:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Sep-2019 16:25
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 16:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 16:25
Surr: 1,2-Dichloroethane-d4	*87.2*			**0**	*81-118*	*%REC*	*1*	*26-Sep-2019 16:25*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*26-Sep-2019 16:25*
Surr: Dibromofluoromethane	*91.8*			**0**	*80-119*	*%REC*	*1*	*26-Sep-2019 16:25*
Surr: Toluene-d8	*99.6*			**0**	*89-112*	*%REC*	*1*	*26-Sep-2019 16:25*

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW29-190918
Collection Date: 18-Sep-2019 12:07

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 13:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 13:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 13:32
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 13:32
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 13:32
Trichloroethene	**2.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 13:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 13:32
Surr: 1,2-Dichloroethane-d4	*84.9*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 13:32*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 13:32*
Surr: Dibromofluoromethane	*90.6*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 13:32*
Surr: Toluene-d8	*98.7*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 13:32*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW12-190918
Collection Date: 18-Sep-2019 09:59

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-11
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Sep-2019 19:09
1,1-Dichloroethene	**4.9**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Sep-2019 19:09
1,2-Dichloroethane	**9.2**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Sep-2019 19:09
cis-1,2-Dichloroethene	**52**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Sep-2019 19:09
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	27-Sep-2019 19:09
Trichloroethene	**2,100**		**5.0**	**12**	**25**	**UG/L**	25	26-Sep-2019 23:38
Vinyl chloride	**5.5**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Sep-2019 19:09
Surr: 1,2-Dichloroethane-d4	*85.2*			**0**	*81-118*	*%REC*	*25*	*26-Sep-2019 23:38*
Surr: 1,2-Dichloroethane-d4	*83.7*			**0**	*81-118*	*%REC*	*5*	*27-Sep-2019 19:09*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*25*	*26-Sep-2019 23:38*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*5*	*27-Sep-2019 19:09*
Surr: Dibromofluoromethane	*89.8*			**0**	*80-119*	*%REC*	*25*	*26-Sep-2019 23:38*
Surr: Dibromofluoromethane	*90.5*			**0**	*80-119*	*%REC*	*5*	*27-Sep-2019 19:09*
Surr: Toluene-d8	*98.6*			**0**	*89-112*	*%REC*	*25*	*26-Sep-2019 23:38*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*5*	*27-Sep-2019 19:09*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW57-190918
Collection Date: 18-Sep-2019 15:30

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-12
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Sep-2019 16:49
1,1-Dichloroethene	**0.56**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Sep-2019 16:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 16:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 16:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Sep-2019 16:49
Trichloroethene	**24**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Sep-2019 16:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Sep-2019 16:49
Surr: 1,2-Dichloroethane-d4	*87.8*			**0**	*81-118*	*%REC*	*1*	*26-Sep-2019 16:49*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*26-Sep-2019 16:49*
Surr: Dibromofluoromethane	*92.1*			**0**	*80-119*	*%REC*	*1*	*26-Sep-2019 16:49*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*1*	*26-Sep-2019 16:49*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000246**	J	**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	25-Sep-2019 12:40
Ethene	**0.00118**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	25-Sep-2019 12:40
Methane	**0.00244**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	25-Sep-2019 12:40
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**133**	a	**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Sep-2019 22:47
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.16**		**0.150**	**0.500**	**0.500**	**mg/L**	5	20-Sep-2019 17:08
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	20-Sep-2019 13:34
Sulfate	**2,310**		**10.0**	**25.0**	**25.0**	**mg/L**	50	20-Sep-2019 17:58
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Sep-2019 17:55

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW26-190917-FD
Collection Date: 18-Sep-2019 15:53

ANALYTICAL REPORT
WorkOrder:HS19090962
Lab ID:HS19090962-13
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 14:20
1,1-Dichloroethene	**1.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 14:20
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 14:20
cis-1,2-Dichloroethene	**36**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 14:20
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 14:20
Trichloroethene	**440**		**1.0**	**2.5**	**5.0**	**UG/L**	5	26-Sep-2019 20:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 14:20
Surr: 1,2-Dichloroethane-d4	*88.1*			**0**	*81-118*	*%REC*	*5*	*26-Sep-2019 20:25*
Surr: 1,2-Dichloroethane-d4	*84.6*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 14:20*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*5*	*26-Sep-2019 20:25*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 14:20*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*5*	*26-Sep-2019 20:25*
Surr: Dibromofluoromethane	*90.5*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 14:20*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*5*	*26-Sep-2019 20:25*
Surr: Toluene-d8	*98.4*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 14:20*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346726 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Water	
HS19090962-12	16WW57-190918	18 Sep 2019 15:30			21 Sep 2019 22:47	1
Batch ID: R346732 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS19090962-12	16WW57-190918	18 Sep 2019 15:30			20 Sep 2019 17:58	50
HS19090962-12	16WW57-190918	18 Sep 2019 15:30			20 Sep 2019 17:08	5
HS19090962-12	16WW57-190918	18 Sep 2019 15:30			20 Sep 2019 13:34	1
Batch ID: R346937 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS19090962-12	16WW57-190918	18 Sep 2019 15:30			25 Sep 2019 12:40	1
Batch ID: R347016 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19090962-01	16LHAAP-TB3-190918	18 Sep 2019 00:00			25 Sep 2019 17:50	1
Batch ID: R347098 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19090962-02	16WW13-190918	18 Sep 2019 08:45			26 Sep 2019 19:37	5
HS19090962-03	16WW48-190918	18 Sep 2019 17:20			26 Sep 2019 18:01	25
HS19090962-04	16WW35-190918	18 Sep 2019 10:55			26 Sep 2019 21:38	250
HS19090962-04	16WW35-190918	18 Sep 2019 10:55			26 Sep 2019 21:14	25
HS19090962-05	16WW30-190918	18 Sep 2019 11:11			26 Sep 2019 17:13	1
HS19090962-06	16EW06-190918	18 Sep 2019 13:35			26 Sep 2019 22:26	250
HS19090962-06	16EW06-190918	18 Sep 2019 13:35			26 Sep 2019 22:02	25
HS19090962-07	16WW26-190917	17 Sep 2019 15:53			26 Sep 2019 17:37	1
HS19090962-08	16EW02-190918	18 Sep 2019 14:55			26 Sep 2019 23:14	250
HS19090962-08	16EW02-190918	18 Sep 2019 14:55			26 Sep 2019 22:50	25
HS19090962-09	16LHAAP-TB-5-190918	18 Sep 2019 00:00			26 Sep 2019 16:25	1
HS19090962-11	16WW12-190918	18 Sep 2019 09:59			26 Sep 2019 23:38	25
HS19090962-12	16WW57-190918	18 Sep 2019 15:30			26 Sep 2019 16:49	1
HS19090962-13	16WW26-190917-FD	18 Sep 2019 15:53			26 Sep 2019 20:25	5
Batch ID: R347193 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19090962-02	16WW13-190918	18 Sep 2019 08:45			27 Sep 2019 13:56	1
HS19090962-03	16WW48-190918	18 Sep 2019 17:20			27 Sep 2019 18:45	5
HS19090962-05	16WW30-190918	18 Sep 2019 11:11			27 Sep 2019 15:56	5
HS19090962-07	16WW26-190917	17 Sep 2019 15:53			27 Sep 2019 16:20	5
HS19090962-10	16WW29-190918	18 Sep 2019 12:07			27 Sep 2019 13:32	1
HS19090962-11	16WW12-190918	18 Sep 2019 09:59			27 Sep 2019 19:09	5
HS19090962-13	16WW26-190917-FD	18 Sep 2019 15:53			27 Sep 2019 14:20	1
Batch ID: R347318 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS19090962-12	16WW57-190918	18 Sep 2019 15:30			30 Sep 2019 17:55	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R347602 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS19090962-02	16WW13-190918	18 Sep 2019 08:45			04 Oct 2019 09:41	1
HS19090962-03	16WW48-190918	18 Sep 2019 17:20			04 Oct 2019 09:41	1
HS19090962-04	16WW35-190918	18 Sep 2019 10:55			04 Oct 2019 09:41	1
HS19090962-05	16WW30-190918	18 Sep 2019 11:11			04 Oct 2019 09:41	1
HS19090962-06	16EW06-190918	18 Sep 2019 13:35			04 Oct 2019 09:41	1
HS19090962-07	16WW26-190917	17 Sep 2019 15:53			04 Oct 2019 09:41	1
HS19090962-08	16EW02-190918	18 Sep 2019 14:55			04 Oct 2019 09:41	1
HS19090962-10	16WW29-190918	18 Sep 2019 12:07			04 Oct 2019 09:41	1
HS19090962-11	16WW12-190918	18 Sep 2019 09:59			04 Oct 2019 09:41	1
HS19090962-12	16WW57-190918	18 Sep 2019 15:30			04 Oct 2019 09:41	1
HS19090962-13	16WW26-190917-FD	18 Sep 2019 15:53			04 Oct 2019 09:41	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R346937 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-190925** Units: **mg/L** Analysis Date: **25-Sep-2019 12:26**
Client ID: Run ID: **FID-4_346937** SeqNo: **5267809** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-190925** Units: **mg/L** Analysis Date: **25-Sep-2019 12:00**
Client ID: Run ID: **FID-4_346937** SeqNo: **5267807** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0177	0.00100	0.01804	0	98.1	75 - 125				
Ethene	0.0173	0.00100	0.0168	0	103	75 - 125				
Methane	0.00963	0.000500	0.009647	0	99.9	75 - 125				

LCSD Sample ID: **LCSD-190925** Units: **mg/L** Analysis Date: **25-Sep-2019 12:15**
Client ID: Run ID: **FID-4_346937** SeqNo: **5267808** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0167	0.00100	0.01804	0	92.7	75 - 125	0.01769	5.64	30	
Ethene	0.0161	0.00100	0.0168	0	95.7	75 - 125	0.01731	7.39	30	
Methane	0.00848	0.000500	0.009647	0	87.9	75 - 125	0.009634	12.7	30	

MS Sample ID: **HS19090962-12MS** Units: **mg/L** Analysis Date: **25-Sep-2019 13:16**
Client ID: **16WW57-190918** Run ID: **FID-4_346937** SeqNo: **5267870** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0185	0.00100	0.01804	0.0002460	101	75 - 125				
Ethene	0.0195	0.00100	0.0168	0.001181	109	75 - 125				
Methane	0.0102	0.000500	0.009647	0.002443	80.0	75 - 125				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R346937 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MSD Sample ID: **HS19090962-12MSD** Units: **mg/L** Analysis Date: **25-Sep-2019 13:27**
Client ID: **16WW57-190918** Run ID: **FID-4_346937** SeqNo: **5270103** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0186	0.00100	0.01804	0.0002460	102	75 - 125	0.01853	0.232	30	
Ethene	0.0186	0.00100	0.0168	0.001181	104	75 - 125	0.01948	4.43	30	
Methane	0.00968	0.000500	0.009647	0.002443	75.1	75 - 125	0.01016	4.78	30	

The following samples were analyzed in this batch: HS19090962-12

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R347016 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190925** Units: **UG/L** Analysis Date: **25-Sep-2019 12:37**
Client ID: Run ID: **VOA6_347016** SeqNo: **5269438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.75*	*1.0*	*50*	*0*	*89.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.44*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*46.53*	*1.0*	*50*	*0*	*93.1*	*80 - 119*				
Surr: Toluene-d8	*50.44*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-190925** Units: **UG/L** Analysis Date: **25-Sep-2019 11:49**
Client ID: Run ID: **VOA6_347016** SeqNo: **5269437** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	20.5	1.0	20	0	102	80 - 119				
1,1-Dichloroethene	18.3	1.0	20	0	91.5	71 - 131				
1,2-Dichloroethane	19.2	1.0	20	0	96.0	73 - 128				
cis-1,2-Dichloroethene	18.83	1.0	20	0	94.1	78 - 123				
Methylene chloride	20.03	2.0	20	0	100	74 - 124				
Trichloroethene	17.97	1.0	20	0	89.9	79 - 123				
Vinyl chloride	17.8	1.0	20	0	89.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.58*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.54*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*52.18*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*47.71*	*1.0*	*50*	*0*	*95.4*	*89 - 112*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R347016 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19090847-01MS** Units: **UG/L** Analysis Date: **25-Sep-2019 15:26**
Client ID: Run ID: **VOA6_347016** SeqNo: **5269445** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.48	1.0	20	0	97.4	80 - 119				
1,1-Dichloroethene	17.22	1.0	20	0	86.1	71 - 131				
1,2-Dichloroethane	17.76	1.0	20	0	88.8	73 - 128				
cis-1,2-Dichloroethene	19.9	1.0	20	2.121	88.9	78 - 123				
Methylene chloride	16.8	2.0	20	0	84.0	74 - 124				
Trichloroethene	19.82	1.0	20	1.026	94.0	79 - 123				
Vinyl chloride	14.35	1.0	20	0	71.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.47*	*1.0*	*50*	*0*	*90.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.55*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*46.94*	*1.0*	*50*	*0*	*93.9*	*80 - 119*				
Surr: Toluene-d8	*49.26*	*1.0*	*50*	*0*	*98.5*	*89 - 112*				

MSD Sample ID: **HS19090847-01MSD** Units: **UG/L** Analysis Date: **25-Sep-2019 15:50**
Client ID: Run ID: **VOA6_347016** SeqNo: **5269446** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.64	1.0	20	0	93.2	80 - 119	19.48	4.39	20	
1,1-Dichloroethene	15.96	1.0	20	0	79.8	71 - 131	17.22	7.58	20	
1,2-Dichloroethane	17.06	1.0	20	0	85.3	73 - 128	17.76	4.01	20	
cis-1,2-Dichloroethene	18.34	1.0	20	2.121	81.1	78 - 123	19.9	8.14	20	
Methylene chloride	16.12	2.0	20	0	80.6	74 - 124	16.8	4.15	20	
Trichloroethene	18.29	1.0	20	1.026	86.3	79 - 123	19.82	8.06	20	
Vinyl chloride	13.44	1.0	20	0	67.2	58 - 137	14.35	6.54	20	
Surr: 1,2-Dichloroethane-d4	*45.03*	*1.0*	*50*	*0*	*90.1*	*81 - 118*	*45.47*	*0.978*	*20*	
Surr: 4-Bromofluorobenzene	*52.22*	*1.0*	*50*	*0*	*104*	*85 - 114*	*50.55*	*3.25*	*20*	
Surr: Dibromofluoromethane	*47.19*	*1.0*	*50*	*0*	*94.4*	*80 - 119*	*46.94*	*0.529*	*20*	
Surr: Toluene-d8	*48.77*	*1.0*	*50*	*0*	*97.5*	*89 - 112*	*49.26*	*1*	*20*	

The following samples were analyzed in this batch: HS19090962-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R347098 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190926** Units: **UG/L** Analysis Date: **26-Sep-2019 16:01**
Client ID: Run ID: **VOA6_347098** SeqNo: **5271542** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.43*	*1.0*	*50*	*0*	*88.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.49*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*46.58*	*1.0*	*50*	*0*	*93.2*	*80 - 119*				
Surr: Toluene-d8	*48.94*	*1.0*	*50*	*0*	*97.9*	*89 - 112*				

LCS Sample ID: **VLCSW-190926** Units: **UG/L** Analysis Date: **26-Sep-2019 15:13**
Client ID: Run ID: **VOA6_347098** SeqNo: **5271541** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.84	1.0	20	0	99.2	80 - 119				
1,1-Dichloroethene	18.21	1.0	20	0	91.1	71 - 131				
1,2-Dichloroethane	18.48	1.0	20	0	92.4	73 - 128				
cis-1,2-Dichloroethene	18.28	1.0	20	0	91.4	78 - 123				
Methylene chloride	18.89	2.0	20	0	94.5	74 - 124				
Trichloroethene	18.15	1.0	20	0	90.8	79 - 123				
Vinyl chloride	17.83	1.0	20	0	89.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.73*	*1.0*	*50*	*0*	*93.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.1*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*48.37*	*1.0*	*50*	*0*	*96.7*	*80 - 119*				
Surr: Toluene-d8	*45.53*	*1.0*	*50*	*0*	*91.1*	*89 - 112*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R347098 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19090962-12MS** Units: **UG/L** Analysis Date: **26-Sep-2019 18:25**
Client ID: **16WW57-190918** Run ID: **VOA6_347098** SeqNo: **5271548** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.64	1.0	20	0	98.2	80 - 119				
1,1-Dichloroethene	17.64	1.0	20	0.5633	85.4	71 - 131				
1,2-Dichloroethane	17.08	1.0	20	0	85.4	73 - 128				
cis-1,2-Dichloroethene	16.97	1.0	20	0	84.8	78 - 123				
Methylene chloride	16.28	2.0	20	0	81.4	74 - 124				
Trichloroethene	43.16	1.0	20	23.96	96.0	79 - 123				
Vinyl chloride	14.19	1.0	20	0	70.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.78*	*1.0*	*50*	*0*	*89.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.41*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*46.8*	*1.0*	*50*	*0*	*93.6*	*80 - 119*				
Surr: Toluene-d8	*49.33*	*1.0*	*50*	*0*	*98.7*	*89 - 112*				

MSD Sample ID: **HS19090962-12MSD** Units: **UG/L** Analysis Date: **26-Sep-2019 18:49**
Client ID: **16WW57-190918** Run ID: **VOA6_347098** SeqNo: **5271549** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.39	1.0	20	0	97.0	80 - 119	19.64	1.26	20	
1,1-Dichloroethene	16.74	1.0	20	0.5633	80.9	71 - 131	17.64	5.28	20	
1,2-Dichloroethane	16.96	1.0	20	0	84.8	73 - 128	17.08	0.69	20	
cis-1,2-Dichloroethene	16.17	1.0	20	0	80.9	78 - 123	16.97	4.79	20	
Methylene chloride	15.61	2.0	20	0	78.0	74 - 124	16.28	4.25	20	
Trichloroethene	41.36	1.0	20	23.96	87.0	79 - 123	43.16	4.26	20	
Vinyl chloride	12.99	1.0	20	0	65.0	58 - 137	14.19	8.78	20	
Surr: 1,2-Dichloroethane-d4	*43.8*	*1.0*	*50*	*0*	*87.6*	*81 - 118*	*44.78*	*2.21*	*20*	
Surr: 4-Bromofluorobenzene	*50.72*	*1.0*	*50*	*0*	*101*	*85 - 114*	*51.41*	*1.35*	*20*	
Surr: Dibromofluoromethane	*46.33*	*1.0*	*50*	*0*	*92.7*	*80 - 119*	*46.8*	*1.01*	*20*	
Surr: Toluene-d8	*49.14*	*1.0*	*50*	*0*	*98.3*	*89 - 112*	*49.33*	*0.388*	*20*	

The following samples were analyzed in this batch:

HS19090962-02	HS19090962-03	HS19090962-04	HS19090962-05
HS19090962-06	HS19090962-07	HS19090962-08	HS19090962-09
HS19090962-11	HS19090962-12	HS19090962-13	

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R347193 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190927** Units: **UG/L** Analysis Date: **27-Sep-2019 12:20**
Client ID: Run ID: **VOA6_347193** SeqNo: **5273201** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*41.29*	*1.0*	*50*	*0*	*82.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.75*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*44.75*	*1.0*	*50*	*0*	*89.5*	*80 - 119*				
Surr: Toluene-d8	*49.34*	*1.0*	*50*	*0*	*98.7*	*89 - 112*				

LCS Sample ID: **VLCSW-190927** Units: **UG/L** Analysis Date: **27-Sep-2019 11:32**
Client ID: Run ID: **VOA6_347193** SeqNo: **5273200** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.91	1.0	20	0	94.5	80 - 119				
1,1-Dichloroethene	18.82	1.0	20	0	94.1	71 - 131				
1,2-Dichloroethane	17.88	1.0	20	0	89.4	73 - 128				
cis-1,2-Dichloroethene	17.62	1.0	20	0	88.1	78 - 123				
Methylene chloride	18.5	2.0	20	0	92.5	74 - 124				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Vinyl chloride	18.06	1.0	20	0	90.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.59*	*1.0*	*50*	*0*	*97.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.49*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*50.11*	*1.0*	*50*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*48.05*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R347193 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19090962-10MS** Units: **UG/L** Analysis Date: **27-Sep-2019 15:08**
Client ID: **16WW29-190918** Run ID: **VOA6_347193** SeqNo: **5273208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.87	1.0	20	0	94.3	80 - 119				
1,1-Dichloroethene	17.17	1.0	20	0	85.8	71 - 131				
1,2-Dichloroethane	16.27	1.0	20	0	81.4	73 - 128				
cis-1,2-Dichloroethene	16.64	1.0	20	0	83.2	78 - 123				
Methylene chloride	15.64	2.0	20	0	78.2	74 - 124				
Trichloroethene	20.62	1.0	20	2.663	89.8	79 - 123				
Vinyl chloride	13.68	1.0	20	0	68.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*42.73*	*1.0*	*50*	*0*	*85.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.9*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*45.37*	*1.0*	*50*	*0*	*90.7*	*80 - 119*				
Surr: Toluene-d8	*49.06*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

MSD Sample ID: **HS19090962-10MSD** Units: **UG/L** Analysis Date: **27-Sep-2019 15:32**
Client ID: **16WW29-190918** Run ID: **VOA6_347193** SeqNo: **5273209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.6	1.0	20	0	93.0	80 - 119	18.87	1.45	20	
1,1-Dichloroethene	16.04	1.0	20	0	80.2	71 - 131	17.17	6.81	20	
1,2-Dichloroethane	15.91	1.0	20	0	79.5	73 - 128	16.27	2.26	20	
cis-1,2-Dichloroethene	15.78	1.0	20	0	78.9	78 - 123	16.64	5.31	20	
Methylene chloride	15.13	2.0	20	0	75.6	74 - 124	15.64	3.35	20	
Trichloroethene	19.11	1.0	20	2.663	82.2	79 - 123	20.62	7.61	20	
Vinyl chloride	12.88	1.0	20	0	64.4	58 - 137	13.68	6.03	20	
Surr: 1,2-Dichloroethane-d4	*42.41*	*1.0*	*50*	*0*	*84.8*	*81 - 118*	*42.73*	*0.745*	*20*	
Surr: 4-Bromofluorobenzene	*52.29*	*1.0*	*50*	*0*	*105*	*85 - 114*	*50.9*	*2.69*	*20*	
Surr: Dibromofluoromethane	*45.64*	*1.0*	*50*	*0*	*91.3*	*80 - 119*	*45.37*	*0.581*	*20*	
Surr: Toluene-d8	*48.45*	*1.0*	*50*	*0*	*96.9*	*89 - 112*	*49.06*	*1.25*	*20*	

The following samples were analyzed in this batch:

HS19090962-02	HS19090962-03	HS19090962-05	HS19090962-07
HS19090962-10	HS19090962-11	HS19090962-13	

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R346726 (0) **Instrument:** ManTech01 **Method:** ALKALINITY BY SM2320B

MBLK Sample ID: **WBLKW2-190921** Units: **mg/L** Analysis Date: **21-Sep-2019 19:11**
Client ID: Run ID: **ManTech01_346726** SeqNo: **5263383** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS2-190921** Units: **mg/L** Analysis Date: **21-Sep-2019 19:20**
Client ID: Run ID: **ManTech01_346726** SeqNo: **5263384** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1084	5.00	1000	0	108	85 - 115				

LCSD Sample ID: **WLCSD2-190921** Units: **mg/L** Analysis Date: **21-Sep-2019 19:30**
Client ID: Run ID: **ManTech01_346726** SeqNo: **5263385** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1093	5.00	1000	0	109	85 - 115	1084	0.807	20	

DUP Sample ID: **HS19090962-12DUP** Units: **mg/L** Analysis Date: **21-Sep-2019 22:53**
Client ID: **16WW57-190918** Run ID: **ManTech01_346726** SeqNo: **5263409** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	134.3	5.00					133	0.958	20	

DUP Sample ID: **HS19090740-05DUP** Units: **mg/L** Analysis Date: **21-Sep-2019 22:11**
Client ID: Run ID: **ManTech01_346726** SeqNo: **5263404** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	764.4	5.00					762	0.321	20	

The following samples were analyzed in this batch: HS19090962-12

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R346732 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **WBLKW1-092019** Units: **mg/L** Analysis Date: **20-Sep-2019 16:02**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263511** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-092019** Units: **mg/L** Analysis Date: **20-Sep-2019 16:18**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263512** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.86	0.100	4	0	96.5	80 - 120				
Nitrogen, Nitrate (As N)	4.157	0.100	4	0	104	80 - 120				
Sulfate	21.18	0.500	20	0	106	80 - 120				

LCSD Sample ID: **WLCSDW1-092019** Units: **mg/L** Analysis Date: **20-Sep-2019 16:35**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263513** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.77	0.100	4	0	94.2	80 - 120	3.86	2.38	20	
Nitrogen, Nitrate (As N)	4.041	0.100	4	0	101	80 - 120	4.157	2.84	20	
Sulfate	20.59	0.500	20	0	103	80 - 120	21.18	2.86	20	

MS Sample ID: **HS19090962-12MS** Units: **mg/L** Analysis Date: **20-Sep-2019 13:51**
Client ID: **16WW57-190918** Run ID: **ICS-Integrion_346732** SeqNo: **5263507** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100	2	0	0	80 - 120				S U
Nitrogen, Nitrate (As N)	1.997	0.100	2	0	99.8	80 - 120				
Sulfate	2014	0.500	10	2062	-480	80 - 120				SEO

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R346732 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MS Sample ID: **HS19090962-12MS** Units: **mg/L** Analysis Date: **20-Sep-2019 18:15**
Client ID: **16WW57-190918** Run ID: **ICS-Integrion_346732** SeqNo: **5263518** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	91.32	5.00	100	5.05	86.3	80 - 120				
Nitrogen, Nitrate (As N)	103.2	5.00	100	0	103	80 - 120				
Sulfate	2719	25.0	500	2309	81.9	80 - 120				O

MS Sample ID: **HS19090962-12MS** Units: **mg/L** Analysis Date: **20-Sep-2019 17:25**
Client ID: **16WW57-190918** Run ID: **ICS-Integrion_346732** SeqNo: **5263515** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	12.05	0.500	10	3.158	88.9	80 - 120				
Nitrogen, Nitrate (As N)	10.53	0.500	10	0	105	80 - 120				
Sulfate	2144	2.50	50	2154	-20.9	80 - 120				SEO

MSD Sample ID: **HS19090962-12MSD** Units: **mg/L** Analysis Date: **20-Sep-2019 17:42**
Client ID: **16WW57-190918** Run ID: **ICS-Integrion_346732** SeqNo: **5263516** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	12.05	0.500	10	3.158	88.9	80 - 120	12.05	0.0249	20	
Nitrogen, Nitrate (As N)	10.66	0.500	10	0	107	80 - 120	10.53	1.26	20	
Sulfate	2164	2.50	50	2154	19.5	80 - 120	2144	0.939	20	SEO

MSD Sample ID: **HS19090962-12MSD** Units: **mg/L** Analysis Date: **20-Sep-2019 18:31**
Client ID: **16WW57-190918** Run ID: **ICS-Integrion_346732** SeqNo: **5263519** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	90.79	5.00	100	5.05	85.7	80 - 120	91.32	0.577	20	
Nitrogen, Nitrate (As N)	102.2	5.00	100	0	102	80 - 120	103.2	1	20	
Sulfate	2690	25.0	500	2309	76.2	80 - 120	2719	1.05	20	SO

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090962

QC BATCH REPORT

Batch ID: R346732 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MSD Sample ID: **HS19090962-12MSD** Units: **mg/L** Analysis Date: **20-Sep-2019 14:07**
Client ID: **16WW57-190918** Run ID: **ICS-Integrion_346732** SeqNo: **5263508** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100	2	0	0	80 - 120	0	0	20	S U
Nitrogen, Nitrate (As N)	1.986	0.100	2	0	99.3	80 - 120	1.997	0.568	20	
Sulfate	2033	0.500	10	2062	-292	80 - 120	2014	0.929	20	SEO

The following samples were analyzed in this batch: HS19090962-12

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19090962**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19090962
Date/Time Received: **19-Sep-2019 16:45**
Received by: **AC**

Checklist completed by: *Asad Chaudhry* eSignature — 20-Sep-2019 Date
Reviewed by: *RJ Modashia* eSignature — 20-Sep-2019 Date

Matrices: **Water**
Carrier name: **Client**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.5c, 0.8c C/UC	IR 25
Cooler(s)/Kit(s):	43260, 44953	
Date/Time sample(s) sent to storage:	09/19/2019 19:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Bottle count differs: 16WW57-190918 COC= 31, Received= 29. Sx label time differs: 16WW13-190918 COC= 08:45, Label= 09:10. 16WW26-190917-FD COC= 15:53, Label=15:57. Logged in per COC.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-SEPT2019-ALSHT-1909-18 TURNAROUND TIME: normal RUSH: Page 1 of 7

PROJECT/CLIENT INFO				LABORATORY						
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com		
Project Number	501032			Lab Contact	RJ Modashia					
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang		
	PMB 202							4005 Port Chicago Hwy		
City	Marshall	State	TX	City	Houston	State	TX	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656					
Project Manager	Praveen Srivastav									

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	VOCs in Water by 8260B (see required VOCs below) (3x40 ml VOA, HCL)	Perchlorate in Water by 6850 (1x125 ml HPDE, Ice)	Alkalinity (SM2320B) (1x250 ml HPDE, Ice)	Anions by E300.0 (see required anions below)	Dissolved Gases (methane, ethane, and ethene) by RSK-175 (3x40 ml VOA, HCL)	TOC by (SM5310C) (2x40 ml VOA, HsSO4)	OHC Inventory by Lenders-gPCR
16LHAAP-TB3-190918						9/18/19	lab	2		X						
16WW13-190918						9/18/19	845	4		X	X					
16WW48-190918						9/18/19	1720	4		X	X					
16WW35-190918						9/18/19	1055	4		X	X					
16WW30-190918						9/18/19	1111	4		X	X					
16EW06-190918						9/18/19	1335	4		X	X					
~~16WW26-190918~~						~~9/18/19~~										
16WW26-190917						9/17/19	1553	4		X	X					
16EW02-190918						9/18/19	1455	4		X	X					
16LHAAP-TB-5-190918						9/18/19	lab	2		X						
16WW29-190918						9/18/19	1207	4		X	X					
16WW12-190918						9/18/19	959	4		X	X					
16WW57-190918						9/18/19	1530	11		X	X	X	X	X	X	X
16WW26-190917-FD						9/17/19	1553	4		X	X					

HS19090962

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride	[signature] Aptim	9/18/19 1930		
Required anions are: (1) bromide for sample 16WW49; and (2) nitrate, sulfate and bromide for samples 16WW57 and 16WW58	[signature] Aptim	9/19/19 1645	AC ALS	09/19/19 16:45

VC
1.5c
0.8c
IR#25
CF0.0AC
~~44705~~
43260
44953

APTIM

COC ID: LHAAP16-SEPT2019-ALSHT-1909-18 | TURNAROUND TIME: normal | RUSH: | Page 1 of 2

PROJECT/CLIENT INFO				LABORATORY					
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com	
Project Number	501032			Lab Contact	RJ Modashia				
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stanciff Rd., Suite 210			Susan Huang	
	PMB 202							4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX	Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656				
Project Manager	Praveen Srivastav								

SAMPLE DETAILS

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.
16WW29-190919-MS						9/19/19	1207	4
16WW29-190919-MSD						9/19/19	1207	4
16WW57-190919-MS						9/19/19	1530	10
16WW57-190919-MSD						9/19/19	1530	10

ANALYSIS REQUESTED

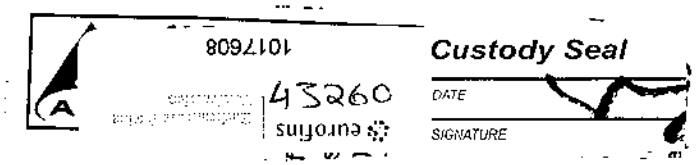
Containers and Preservative	3x40 ml VOA, HCL	1x125 ml HPDE, Ice	1x250 ml HPDE, Ice	3x40 ml VOA, HCL	2x40 ml VOA, H2SO4			
ANALYSIS	VOCs in Water by 8260B (see required VOCs below)	Perchlorate in Water by 6850	Alkalinity (SM2320B)	Anions by E300.0 (see required anions below)	Dissolved Gases (methane, ethane, and ethene) by RSK-175	TOC by (SM5310C)		
	X	X						
	X	X						
	X	X	X	X	X	X		
	X	X	X	X	X	X		

HS19090962

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride Required anions are: (1) bromide for sample 16WW49; and (2) nitrate, sulfate and bromide for samples 16WW57 and 16WW58		9/19/19 1930 9/19/19 1845		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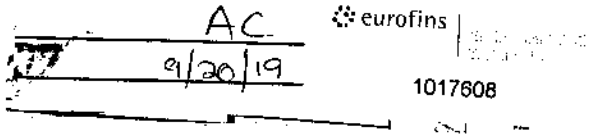
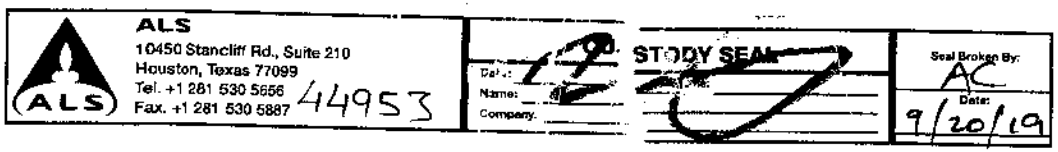
eurofins
Custody Seal
DATE
SIGNATURE


AC
9/20/19
eurofins
1017608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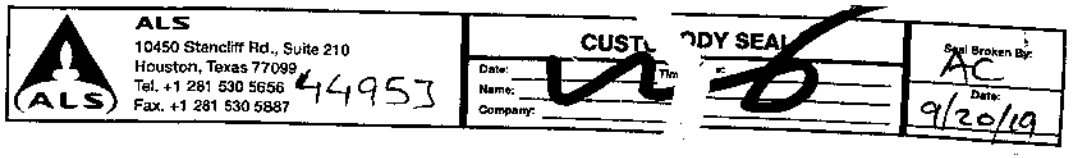
Fax. +1 281 530 5887
44953
Date:
Name:
Company:
STODY SEAL
Seal Broken By:
AC
Date:
9/20/19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Date:
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Company:
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Seal Broken By:
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Date:
9/20/19

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September 30, 2019

Analytical Report for Service Request No: K1908780

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

RE: HS19090962

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory September 21, 2019
For your reference, these analyses have been assigned our service request number **K1908780.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Table of Contents

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Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS19090962
Sample Matrix: Water

Service Request: K1908780
Date Received: 09/21/2019

CASE NARRATIVE

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

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 09/21/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 09/30/2019

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

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

KL1908780

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12202**

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19090962
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19090962-12**	**16WW57-190918**	**Water**	**18 Sep 2019 15:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			27 Sep 2019

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

QC Level: DOD IV (DoD Data Package)

HS19090962-12
MS/MSD

Relinquished By: _____ Date/Time: 9/20/19 1800

Received By: Mederson Date/Time: 9-21-19 0815

Cooler ID(s): _____ Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request *K19* 0878

Received: 9.21.19 Opened: 9.21.19 By: NP Unloaded: 9.21.19 By: NP

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.0	0.0	1.1	1.1	0.0	374	12202	1251 0289 7485	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1908780
Project:	HS19090962	**Date Collected:**	09/18/19
Sample Matrix:	Water	**Date Received:**	09/21/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW57-190918	K1908780-001	**10.9**	0.50	0.20	0.07	1	09/26/19 15:46	
Method Blank	K1908780-MB	ND U	0.50	0.20	0.07	1	09/26/19 15:02	

Client: ALS Environmental - US
Project HS19090962
Sample Matrix: Water

Service Request: K1908780
Date Collected: 09/18/19
Date Received: 09/21/19
Date Analyzed: 09/26/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name: 16WW57-190918
Lab Code: K1908780-001

Units: mg/L
Basis: NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1908780-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	10.9	10.5	10.7	4	10

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1908780
Project:	HS19090962	**Date Collected:**	09/18/19
Sample Matrix:	Water	**Date Received:**	09/21/19
		Date Analyzed:	09/26/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW57-190918	**Units:**	mg/L
Lab Code:	K1908780-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1908780-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	10.9	32.6	25.0	87	83-117

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1908780
Project:	HS19090962	**Date Analyzed:**	09/26/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	653109

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1908780-LCS	24.8	25.0	99	83-117

Client: ALS Environmental - US **Service Request:** K1908780
Project: HS19090962

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	653109	KQ1913846-09	09/26/19 14:33	25.0	24.0	96	90-110
CCV2	653109	KQ1913846-10	09/26/19 18:08	25.0	23.9	95	90-110
CCV3	653109	KQ1913846-11	09/26/19 22:25	25.0	23.8	95	90-110

Client: ALS Environmental - US **Service Request:**K1908780
Project: HS19090962

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	653109	KQ1913846-12	09/26/19 14:47	0.50	0.20	0.07	ND	U
CCB2	653109	KQ1913846-13	09/26/19 18:23	0.50	0.20	0.07	ND	U
CCB3	653109	KQ1913846-14	09/26/19 22:39	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
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General Chemistry

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Work Request # Original ( ) KP0878978781, 86B, T1901580

Tier: IV IV I IV

Date Analyzed: 9/26/19

Analyst: BCD

Analysis: TOC/DOC

TOC: 653109
DOC: 653111, 653112, 653113

Run #

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: T1901580-67167d, 64/64d report a high %RPD. However, these samples are less than 5x the MDL

Final Approved by: [signature] Date: 09/30/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653109 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1908780-001	Carbon, Total Organic	N/A		Water	10.90 mg/L	10 mL	10.9 mg/L	1	0.07	0.50			9/26/19 15:46:00	Y	IV
K1908781-001	Carbon, Total Organic	N/A		Water	4.21 mg/L	10 mL	4.21 mg/L	1	0.07	0.50			9/26/19 16:43:00	Y	IV
K1908781-002	Carbon, Total Organic	N/A		Water	4.27 mg/L	10 mL	4.27 mg/L	1	0.07	0.50			9/26/19 17:40:00	Y	IV
KQ1913846-01	Carbon, Total Organic	MS	K1908780-001	Water	32.59 mg/L	10 mL	32.6 mg/L	1	0.07	0.50	87		9/26/19 16:14:00	N	IV
KQ1913846-02	Carbon, Total Organic	MS	K1908781-002	Water	27.42 mg/L	10 mL	27.4 mg/L	1	0.07	0.50	93		9/26/19 18:38:00	N	IV
KQ1913846-03	Carbon, Total Organic	MS	K1908781-001	Water	27.26 mg/L	10 mL	27.3 mg/L	1	0.07	0.50	92		9/26/19 17:11:00	N	IV
KQ1913846-04	Carbon, Total Organic	DUP	K1908781-002	Water	4.08 mg/L	10 mL	4.08 mg/L	1	0.07	0.50		5	9/26/19 17:40:00	N	IV
KQ1913846-05	Carbon, Total Organic	DUP	K1908780-001	Water	10.45 mg/L	10 mL	10.5 mg/L	1	0.07	0.50		4	9/26/19 15:46:00	N	IV
KQ1913846-06	Carbon, Total Organic	DUP	K1908781-001	Water	4.09 mg/L	10 mL	4.09 mg/L	1	0.07	0.50		3	9/26/19 16:43:00	N	IV
KQ1913846-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 15:02:00	N	IV
KQ1913846-08	Carbon, Total Organic	LCS		Water	24.84 mg/L	10 mL	24.8 mg/L	1	0.07	0.50	99		9/26/19 15:17:00	N	IV
KQ1913846-09	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 mL	24.0 mg/L	1					9/26/19 14:33:00	N	IV
KQ1913846-10	Carbon, Total Organic	CCV		Water	23.87 mg/L	10 mL	23.9 mg/L	1					9/26/19 18:08:00	N	IV
KQ1913846-11	Carbon, Total Organic	CCV		Water	23.83 mg/L	10 mL	23.8 mg/L	1					9/26/19 22:25:00	N	IV
KQ1913846-12	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 14:47:00	N	IV
KQ1913846-13	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 18:23:00	N	IV
KQ1913846-14	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 22:39:00	N	IV

09/30/19

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653111 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1908618-001	Carbon, Dissolved Organic (DOC)	N/A		Water	11.43 mg/L	10 mL	11.4 mg/L	1	0.07	0.50			9/26/19 19:22:00	N	I
KQ1913850-01	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 22:54:00	N	I
KQ1913850-02	Carbon, Dissolved Organic (DOC)	LCS		Water	24.26 mg/L	10 mL	24.3 mg/L	1	0.07	0.50	97		9/26/19 23:09:00	N	I
KQ1913850-03	Carbon, Dissolved Organic (DOC)	MS	T1901580-046	Water	29.38 mg/L	10 mL	29.4 mg/L	1	0.07	0.50	104		9/26/19 22:10:00	N	IV
KQ1913850-04	Carbon, Dissolved Organic (DOC)	DUP	T1901580-060	Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50		1	9/27/19 05:58:00	N	IV
KQ1913850-05	Carbon, Dissolved Organic (DOC)	DUP	T1901580-059	Water	2.32 mg/L	10 mL	2.32 mg/L	1	0.07	0.50		<1	9/27/19 05:30:00	N	IV
KQ1913850-06	Carbon, Dissolved Organic (DOC)	DUP	T1901580-058	Water	2.51 mg/L	10 mL	2.51 mg/L	1	0.07	0.50		<1	9/27/19 05:02:00	N	IV
KQ1913850-07	Carbon, Dissolved Organic (DOC)	DUP	T1901580-057	Water	0.89 mg/L	10 mL	0.89 mg/L	1	0.07	0.50		2	9/27/19 04:34:00	N	IV
KQ1913850-08	Carbon, Dissolved Organic (DOC)	DUP	T1901580-056	Water	2.15 mg/L	10 mL	2.15 mg/L	1	0.07	0.50		<1	9/27/19 04:05:00	N	IV
KQ1913850-09	Carbon, Dissolved Organic (DOC)	DUP	T1901580-055	Water	0.80 mg/L	10 mL	0.80 mg/L	1	0.07	0.50		10	9/27/19 03:37:00	N	IV
KQ1913850-10	Carbon, Dissolved Organic (DOC)	DUP	T1901580-054	Water	1.90 mg/L	10 mL	1.90 mg/L	1	0.07	0.50		3	9/27/19 02:40:00	N	IV
KQ1913850-11	Carbon, Dissolved Organic (DOC)	DUP	T1901580-053	Water	0.80 mg/L	10 mL	0.80 mg/L	1	0.07	0.50		<1	9/27/19 02:12:00	N	IV
KQ1913850-12	Carbon, Dissolved Organic (DOC)	DUP	T1901580-052	Water	1.68 mg/L	10 mL	1.68 mg/L	1	0.07	0.50		2	9/27/19 01:44:00	N	IV
KQ1913850-13	Carbon, Dissolved Organic (DOC)	DUP	T1901580-051	Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50		4	9/27/19 01:16:00	N	IV
KQ1913850-14	Carbon, Dissolved Organic (DOC)	DUP	T1901580-050	Water	3.22 mg/L	10 mL	3.22 mg/L	1	0.07	0.50		<1	9/27/19 00:48:00	N	IV
KQ1913850-15	Carbon, Dissolved Organic (DOC)	DUP	T1901580-049	Water	3.21 mg/L	10 mL	3.21 mg/L	1	0.07	0.50		2	9/27/19 00:19:00	N	IV
KQ1913850-16	Carbon, Dissolved Organic (DOC)	DUP	T1901580-048	Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50		<1	9/26/19 23:51:00	N	IV
KQ1913850-17	Carbon, Dissolved Organic (DOC)	DUP	T1901580-047	Water	3.18 mg/L	10 mL	3.18 mg/L	1	0.07	0.50		2	9/26/19 23:23:00	N	IV
KQ1913850-18	Carbon, Dissolved Organic (DOC)	DUP	T1901580-046	Water	3.31 mg/L	10 mL	3.31 mg/L	1	0.07	0.50		1	9/26/19 21:42:00	N	IV
KQ1913850-19	Carbon, Dissolved Organic (DOC)	DUP	T1901580-045	Water	3.17 mg/L	10 mL	3.17 mg/L	1	0.07	0.50		<1	9/26/19 21:14:00	N	IV
KQ1913850-20	Carbon, Dissolved Organic (DOC)	DUP	T1901580-044	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/26/19 20:46:00	N	IV
KQ1913850-21	Carbon, Dissolved Organic (DOC)	DUP	T1901580-043	Water	2.35 mg/L	10 mL	2.35 mg/L	1	0.07	0.50		2	9/26/19 20:18:00	N	IV
KQ1913850-22	Carbon, Dissolved Organic (DOC)	DUP	T1901580-042	Water	2.69 mg/L	10 mL	2.69 mg/L	1	0.07	0.50		2	9/26/19 19:50:00	N	IV

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

09/30/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653111 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913850-23	Carbon, Dissolved Organic (DOC)	DUP	K1908618-001	Water	11.37 mg/L	10 mL	11.4 mg/L	1	0.07	0.50		<1	9/26/19 19:22:00	N	I
KQ1913850-24	Carbon, Dissolved Organic (DOC)	CCV		Water	23.87 mg/L	10 mL	23.9 mg/L	1					9/26/19 18:08:00	N	I
KQ1913850-25	Carbon, Dissolved Organic (DOC)	CCV		Water	23.83 mg/L	10 mL	23.8 mg/L	1					9/26/19 22:25:00	N	I
KQ1913850-26	Carbon, Dissolved Organic (DOC)	CCV		Water	23.73 mg/L	10 mL	23.7 mg/L	1					9/27/19 03:08:00	N	I
KQ1913850-27	Carbon, Dissolved Organic (DOC)	CCV		Water	23.47 mg/L	10 mL	23.5 mg/L	1					9/27/19 08:05:00	N	I
KQ1913850-28	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 18:23:00	N	I
KQ1913850-29	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 22:39:00	N	I
KQ1913850-30	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 03:22:00	N	I
KQ1913850-31	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 08:20:00	N	I
T1901580-042	Carbon, Dissolved Organic (DOC)	N/A		Water	2.74 mg/L	10 mL	2.74 mg/L	1	0.07	0.50			9/26/19 19:50:00	N	IV
T1901580-043	Carbon, Dissolved Organic (DOC)	N/A		Water	2.39 mg/L	10 mL	2.39 mg/L	1	0.07	0.50			9/26/19 20:18:00	N	IV
T1901580-044	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 20:46:00	N	IV
T1901580-045	Carbon, Dissolved Organic (DOC)	N/A		Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50			9/26/19 21:14:00	N	IV
T1901580-046	Carbon, Dissolved Organic (DOC)	N/A		Water	3.26 mg/L	10 mL	3.26 mg/L	1	0.07	0.50			9/26/19 21:42:00	N	IV
T1901580-047	Carbon, Dissolved Organic (DOC)	N/A		Water	3.26 mg/L	10 mL	3.26 mg/L	1	0.07	0.50			9/26/19 23:23:00	N	IV
T1901580-048	Carbon, Dissolved Organic (DOC)	N/A		Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50			9/26/19 23:51:00	N	IV
T1901580-049	Carbon, Dissolved Organic (DOC)	N/A		Water	3.14 mg/L	10 mL	3.14 mg/L	1	0.07	0.50			9/27/19 00:19:00	N	IV
T1901580-050	Carbon, Dissolved Organic (DOC)	N/A		Water	3.22 mg/L	10 mL	3.22 mg/L	1	0.07	0.50			9/27/19 00:48:00	N	IV
T1901580-051	Carbon, Dissolved Organic (DOC)	N/A		Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50			9/27/19 01:16:00	N	IV
T1901580-052	Carbon, Dissolved Organic (DOC)	N/A		Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50			9/27/19 01:44:00	N	IV
T1901580-053	Carbon, Dissolved Organic (DOC)	N/A		Water	0.79 mg/L	10 mL	0.79 mg/L	1	0.07	0.50			9/27/19 02:12:00	N	IV
T1901580-054	Carbon, Dissolved Organic (DOC)	N/A		Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			9/27/19 02:40:00	N	IV
T1901580-055	Carbon, Dissolved Organic (DOC)	N/A		Water	0.88 mg/L	10 mL	0.88 mg/L	1	0.07	0.50			9/27/19 03:37:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653111 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
T1901580-056	Carbon, Dissolved Organic (DOC)	N/A		Water	2.14 mg/L	10 mL	2.14 mg/L	1	0.07	0.50			9/27/19 04:05:00	N	IV
T1901580-057	Carbon, Dissolved Organic (DOC)	N/A		Water	0.91 mg/L	10 mL	0.91 mg/L	1	0.07	0.50			9/27/19 04:34:00	N	IV
T1901580-058	Carbon, Dissolved Organic (DOC)	N/A		Water	2.49 mg/L	10 mL	2.49 mg/L	1	0.07	0.50			9/27/19 05:02:00	N	IV
T1901580-059	Carbon, Dissolved Organic (DOC)	N/A		Water	2.32 mg/L	10 mL	2.32 mg/L	1	0.07	0.50			9/27/19 05:30:00	N	IV
T1901580-060	Carbon, Dissolved Organic (DOC)	N/A		Water	2.85 mg/L	10 mL	2.85 mg/L	1	0.07	0.50			9/27/19 05:58:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653112 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913851-01	Carbon, Dissolved Organic (DOC)	MS	T1901580-063	Water	27.05 mg/L	10 mL	27.0 mg/L	1	0.07	0.50	98		9/27/19 07:50:00	N	IV
KQ1913851-02	Carbon, Dissolved Organic (DOC)	DUP	T1901580-080	Water	3.23 mg/L	10 mL	3.23 mg/L	1	0.07	0.50		<1	9/27/19 17:03:00	N	IV
KQ1913851-03	Carbon, Dissolved Organic (DOC)	DUP	T1901580-079	Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50		2	9/27/19 16:35:00	N	IV
KQ1913851-04	Carbon, Dissolved Organic (DOC)	DUP	T1901580-078	Water	2.87 mg/L	10 mL	2.87 mg/L	1	0.07	0.50		<1	9/27/19 16:07:00	N	IV
KQ1913851-05	Carbon, Dissolved Organic (DOC)	DUP	T1901580-077	Water	2.71 mg/L	10 mL	2.71 mg/L	1	0.07	0.50		2	9/27/19 15:39:00	N	IV
KQ1913851-06	Carbon, Dissolved Organic (DOC)	DUP	T1901580-076	Water	0.90 mg/L	10 mL	0.90 mg/L	1	0.07	0.50		2	9/27/19 15:10:00	N	IV
KQ1913851-07	Carbon, Dissolved Organic (DOC)	DUP	T1901580-075	Water	2.23 mg/L	10 mL	2.23 mg/L	1	0.07	0.50		1	9/27/19 14:42:00	N	IV
KQ1913851-08	Carbon, Dissolved Organic (DOC)	DUP	T1901580-074	Water	2.23 mg/L	10 mL	2.23 mg/L	1	0.07	0.50		4	9/27/19 14:14:00	N	IV
KQ1913851-09	Carbon, Dissolved Organic (DOC)	DUP	T1901580-073	Water	0.70 mg/L	10 mL	0.70 mg/L	1	0.07	0.50		2	9/27/19 13:46:00	N	IV
KQ1913851-10	Carbon, Dissolved Organic (DOC)	DUP	T1901580-072	Water	1.76 mg/L	10 mL	1.76 mg/L	1	0.07	0.50		5	9/27/19 13:18:00	N	IV
KQ1913851-11	Carbon, Dissolved Organic (DOC)	DUP	T1901580-071	Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50		<1	9/27/19 12:20:00	N	IV
KQ1913851-12	Carbon, Dissolved Organic (DOC)	DUP	T1901580-070	Water	1.19 mg/L	10 mL	1.19 mg/L	1	0.07	0.50		5	9/27/19 11:52:00	N	IV
KQ1913851-13	Carbon, Dissolved Organic (DOC)	DUP	T1901580-069	Water	0.59 mg/L	10 mL	0.59 mg/L	1	0.07	0.50		2	9/27/19 11:24:00	N	IV
KQ1913851-14	Carbon, Dissolved Organic (DOC)	DUP	T1901580-068	Water	1.01 mg/L	10 mL	1.01 mg/L	1	0.07	0.50		8	9/27/19 10:56:00	N	IV
KQ1913851-15	Carbon, Dissolved Organic (DOC)	DUP	T1901580-067	Water	0.45 mg/L	10 mL	0.45 mg/L J	1	0.07	0.50		16*	9/27/19 10:28:00	N	IV
KQ1913851-16	Carbon, Dissolved Organic (DOC)	DUP	T1901580-066	Water	0.75 mg/L	10 mL	0.75 mg/L	1	0.07	0.50		<1	9/27/19 10:00:00	N	IV
KQ1913851-17	Carbon, Dissolved Organic (DOC)	DUP	T1901580-065	Water	0.46 mg/L	10 mL	0.46 mg/L J	1	0.07	0.50		NC	9/27/19 09:32:00	N	IV
KQ1913851-18	Carbon, Dissolved Organic (DOC)	DUP	T1901580-064	Water	0.61 mg/L	10 mL	0.61 mg/L	1	0.07	0.50		19*	9/27/19 09:04:00	N	IV
KQ1913851-19	Carbon, Dissolved Organic (DOC)	DUP	T1901580-063	Water	2.70 mg/L	10 mL	2.70 mg/L	1	0.07	0.50		2	9/27/19 07:22:00	N	IV
KQ1913851-20	Carbon, Dissolved Organic (DOC)	DUP	T1901580-062	Water	2.80 mg/L	10 mL	2.80 mg/L	1	0.07	0.50		2	9/27/19 06:54:00	N	IV
KQ1913851-21	Carbon, Dissolved Organic (DOC)	DUP	T1901580-061	Water	2.41 mg/L	10 mL	2.41 mg/L	1	0.07	0.50		3	9/27/19 06:26:00	N	IV
KQ1913851-22	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 08:34:00	N	IV
KQ1913851-23	Carbon, Dissolved Organic (DOC)	LCS		Water	24.09 mg/L	10 mL	24.1 mg/L	1	0.07	0.50	96		9/27/19 08:49:00	N	IV

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

09/30/19

Printed 9/28/19 15:52

Results Summary

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653112 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913851-24	Carbon, Dissolved Organic (DOC)	CCV		Water	23.73 mg/L	10 mL	23.7 mg/L	1					9/27/19 03:08:00	N	IV
KQ1913851-25	Carbon, Dissolved Organic (DOC)	CCV		Water	23.47 mg/L	10 mL	23.5 mg/L	1					9/27/19 08:05:00	N	IV
KQ1913851-26	Carbon, Dissolved Organic (DOC)	CCV		Water	24.13 mg/L	10 mL	24.1 mg/L	1					9/27/19 12:49:00	N	IV
KQ1913851-27	Carbon, Dissolved Organic (DOC)	CCV		Water	23.64 mg/L	10 mL	23.6 mg/L	1					9/27/19 17:59:00	N	IV
KQ1913851-29	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 03:22:00	N	IV
KQ1913851-30	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 08:20:00	N	IV
KQ1913851-31	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 13:03:00	N	IV
KQ1913851-32	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 18:14:00	N	IV
T1901580-061	Carbon, Dissolved Organic (DOC)	N/A		Water	2.34 mg/L	10 mL	2.34 mg/L	1	0.07	0.50			9/27/19 06:26:00	N	IV
T1901580-062	Carbon, Dissolved Organic (DOC)	N/A		Water	2.85 mg/L	10 mL	2.85 mg/L	1	0.07	0.50			9/27/19 06:54:00	N	IV
T1901580-063	Carbon, Dissolved Organic (DOC)	N/A		Water	2.64 mg/L	10 mL	2.64 mg/L	1	0.07	0.50			9/27/19 07:22:00	N	IV
T1901580-064	Carbon, Dissolved Organic (DOC)	N/A		Water	0.73 mg/L	10 mL	0.73 mg/L	1	0.07	0.50			9/27/19 09:04:00	N	IV
T1901580-065	Carbon, Dissolved Organic (DOC)	N/A		Water	0.46 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 09:32:00	N	IV
T1901580-066	Carbon, Dissolved Organic (DOC)	N/A		Water	0.74 mg/L	10 mL	0.74 mg/L	1	0.07	0.50			9/27/19 10:00:00	N	IV
T1901580-067	Carbon, Dissolved Organic (DOC)	N/A		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			9/27/19 10:28:00	N	IV
T1901580-068	Carbon, Dissolved Organic (DOC)	N/A		Water	0.93 mg/L	10 mL	0.93 mg/L	1	0.07	0.50			9/27/19 10:56:00	N	IV
T1901580-069	Carbon, Dissolved Organic (DOC)	N/A		Water	0.60 mg/L	10 mL	0.60 mg/L	1	0.07	0.50			9/27/19 11:24:00	N	IV
T1901580-070	Carbon, Dissolved Organic (DOC)	N/A		Water	1.12 mg/L	10 mL	1.12 mg/L	1	0.07	0.50			9/27/19 11:52:00	N	IV
T1901580-071	Carbon, Dissolved Organic (DOC)	N/A		Water	0.61 mg/L	10 mL	0.61 mg/L	1	0.07	0.50			9/27/19 12:20:00	N	IV
T1901580-072	Carbon, Dissolved Organic (DOC)	N/A		Water	1.85 mg/L	10 mL	1.85 mg/L	1	0.07	0.50			9/27/19 13:18:00	N	IV
T1901580-073	Carbon, Dissolved Organic (DOC)	N/A		Water	0.71 mg/L	10 mL	0.71 mg/L	1	0.07	0.50			9/27/19 13:46:00	N	IV
T1901580-074	Carbon, Dissolved Organic (DOC)	N/A		Water	2.31 mg/L	10 mL	2.31 mg/L	1	0.07	0.50			9/27/19 14:14:00	N	IV
T1901580-075	Carbon, Dissolved Organic (DOC)	N/A		Water	2.25 mg/L	10 mL	2.25 mg/L	1	0.07	0.50			9/27/19 14:42:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653112 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
T1901580-076	Carbon, Dissolved Organic (DOC)	N/A		Water	0.88 mg/L	10 mL	0.88 mg/L	1	0.07	0.50			9/27/19 15:10:00	N	IV
T1901580-077	Carbon, Dissolved Organic (DOC)	N/A		Water	2.67 mg/L	10 mL	2.67 mg/L	1	0.07	0.50			9/27/19 15:39:00	N	IV
T1901580-078	Carbon, Dissolved Organic (DOC)	N/A		Water	2.85 mg/L	10 mL	2.85 mg/L	1	0.07	0.50			9/27/19 16:07:00	N	IV
T1901580-079	Carbon, Dissolved Organic (DOC)	N/A		Water	3.25 mg/L	10 mL	3.25 mg/L	1	0.07	0.50			9/27/19 16:35:00	N	IV
T1901580-080	Carbon, Dissolved Organic (DOC)	N/A		Water	3.23 mg/L	10 mL	3.23 mg/L	1	0.07	0.50			9/27/19 17:03:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653113 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913852-01	Carbon, Dissolved Organic (DOC)	MS	T1901580-091	Water	28.88 mg/L	10 mL	28.9 mg/L	1	0.07	0.50	103		9/28/19 00:08:00	N	IV
KQ1913852-02	Carbon, Dissolved Organic (DOC)	DUP	T1901580-096	Water	2.98 mg/L	10 mL	2.98 mg/L	1	0.07	0.50		2	9/28/19 02:30:00	N	IV
KQ1913852-03	Carbon, Dissolved Organic (DOC)	DUP	T1901580-095	Water	3.11 mg/L	10 mL	3.11 mg/L	1	0.07	0.50		1	9/28/19 02:02:00	N	IV
KQ1913852-04	Carbon, Dissolved Organic (DOC)	DUP	T1901580-094	Water	2.90 mg/L	10 mL	2.90 mg/L	1	0.07	0.50		<1	9/28/19 01:34:00	N	IV
KQ1913852-05	Carbon, Dissolved Organic (DOC)	DUP	T1901580-093	Water	3.19 mg/L	10 mL	3.19 mg/L	1	0.07	0.50		<1	9/28/19 01:06:00	N	IV
KQ1913852-06	Carbon, Dissolved Organic (DOC)	DUP	T1901580-092	Water	3.01 mg/L	10 mL	3.01 mg/L	1	0.07	0.50		<1	9/28/19 00:38:00	N	IV
KQ1913852-07	Carbon, Dissolved Organic (DOC)	DUP	T1901580-091	Water	3.16 mg/L	10 mL	3.16 mg/L	1	0.07	0.50		<1	9/27/19 23:40:00	N	IV
KQ1913852-08	Carbon, Dissolved Organic (DOC)	DUP	T1901580-090	Water	2.09 mg/L	10 mL	2.09 mg/L	1	0.07	0.50		3	9/27/19 23:12:00	N	IV
KQ1913852-09	Carbon, Dissolved Organic (DOC)	DUP	T1901580-089	Water	2.14 mg/L	10 mL	2.14 mg/L	1	0.07	0.50		2	9/27/19 22:15:00	N	IV
KQ1913852-10	Carbon, Dissolved Organic (DOC)	DUP	T1901580-088	Water	1.95 mg/L	10 mL	1.95 mg/L	1	0.07	0.50		2	9/27/19 21:46:00	N	IV
KQ1913852-11	Carbon, Dissolved Organic (DOC)	DUP	T1901580-087	Water	2.30 mg/L	10 mL	2.30 mg/L	1	0.07	0.50		5	9/27/19 21:18:00	N	IV
KQ1913852-12	Carbon, Dissolved Organic (DOC)	DUP	T1901580-086	Water	1.52 mg/L	10 mL	1.52 mg/L	1	0.07	0.50		<1	9/27/19 20:50:00	N	IV
KQ1913852-13	Carbon, Dissolved Organic (DOC)	DUP	T1901580-085	Water	2.39 mg/L	10 mL	2.39 mg/L	1	0.07	0.50		<1	9/27/19 20:22:00	N	IV
KQ1913852-14	Carbon, Dissolved Organic (DOC)	DUP	T1901580-084	Water	3.30 mg/L	10 mL	3.30 mg/L	1	0.07	0.50		<1	9/27/19 19:54:00	N	IV
KQ1913852-15	Carbon, Dissolved Organic (DOC)	DUP	T1901580-083	Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50		2	9/27/19 19:26:00	N	IV
KQ1913852-16	Carbon, Dissolved Organic (DOC)	DUP	T1901580-082	Water	3.23 mg/L	10 mL	3.23 mg/L	1	0.07	0.50		3	9/27/19 18:58:00	N	IV
KQ1913852-17	Carbon, Dissolved Organic (DOC)	DUP	T1901580-081	Water	3.32 mg/L	10 mL	3.32 mg/L	1	0.07	0.50		1	9/27/19 17:31:00	N	IV
KQ1913852-18	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 18:28:00	N	IV
KQ1913852-19	Carbon, Dissolved Organic (DOC)	LCS		Water	24.35 mg/L	10 mL	24.4 mg/L	1	0.07	0.50	97		9/27/19 18:43:00	N	IV
KQ1913852-20	Carbon, Dissolved Organic (DOC)	CCV		Water	24.13 mg/L	10 mL	24.1 mg/L	1					9/27/19 12:49:00	N	IV
KQ1913852-21	Carbon, Dissolved Organic (DOC)	CCV		Water	23.64 mg/L	10 mL	23.6 mg/L	1					9/27/19 17:59:00	N	IV
KQ1913852-22	Carbon, Dissolved Organic (DOC)	CCV		Water	23.39 mg/L	10 mL	23.4 mg/L	1					9/27/19 22:43:00	N	IV
KQ1913852-23	Carbon, Dissolved Organic (DOC)	CCV		Water	23.31 mg/L	10 mL	23.3 mg/L	1					9/28/19 02:58:00	N	IV

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

09/30/19

Printed 9/28/19 16:03

Results Summary

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653113 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913852-24	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 13:03:00	N	IV
KQ1913852-25	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 18:14:00	N	IV
KQ1913852-26	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 22:57:00	N	IV
KQ1913852-27	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/28/19 03:13:00	N	IV
T1901580-081	Carbon, Dissolved Organic (DOC)	N/A		Water	3.36 mg/L	10 mL	3.36 mg/L	1	0.07	0.50			9/27/19 17:31:00	N	IV
T1901580-082	Carbon, Dissolved Organic (DOC)	N/A		Water	3.34 mg/L	10 mL	3.34 mg/L	1	0.07	0.50			9/27/19 18:58:00	N	IV
T1901580-083	Carbon, Dissolved Organic (DOC)	N/A		Water	3.34 mg/L	10 mL	3.34 mg/L	1	0.07	0.50			9/27/19 19:26:00	N	IV
T1901580-084	Carbon, Dissolved Organic (DOC)	N/A		Water	3.30 mg/L	10 mL	3.30 mg/L	1	0.07	0.50			9/27/19 19:54:00	N	IV
T1901580-085	Carbon, Dissolved Organic (DOC)	N/A		Water	2.37 mg/L	10 mL	2.37 mg/L	1	0.07	0.50			9/27/19 20:22:00	N	IV
T1901580-086	Carbon, Dissolved Organic (DOC)	N/A		Water	1.51 mg/L	10 mL	1.51 mg/L	1	0.07	0.50			9/27/19 20:50:00	N	IV
T1901580-087	Carbon, Dissolved Organic (DOC)	N/A		Water	2.20 mg/L	10 mL	2.20 mg/L	1	0.07	0.50			9/27/19 21:18:00	N	IV
T1901580-088	Carbon, Dissolved Organic (DOC)	N/A		Water	1.99 mg/L	10 mL	1.99 mg/L	1	0.07	0.50			9/27/19 21:46:00	N	IV
T1901580-089	Carbon, Dissolved Organic (DOC)	N/A		Water	2.17 mg/L	10 mL	2.17 mg/L	1	0.07	0.50			9/27/19 22:15:00	N	IV
T1901580-090	Carbon, Dissolved Organic (DOC)	N/A		Water	2.16 mg/L	10 mL	2.16 mg/L	1	0.07	0.50			9/27/19 23:12:00	N	IV
T1901580-091	Carbon, Dissolved Organic (DOC)	N/A		Water	3.14 mg/L	10 mL	3.14 mg/L	1	0.07	0.50			9/27/19 23:40:00	N	IV
T1901580-092	Carbon, Dissolved Organic (DOC)	N/A		Water	3.00 mg/L	10 mL	3.00 mg/L	1	0.07	0.50			9/28/19 00:38:00	N	IV
T1901580-093	Carbon, Dissolved Organic (DOC)	N/A		Water	3.22 mg/L	10 mL	3.22 mg/L	1	0.07	0.50			9/28/19 01:06:00	N	IV
T1901580-094	Carbon, Dissolved Organic (DOC)	N/A		Water	2.92 mg/L	10 mL	2.92 mg/L	1	0.07	0.50			9/28/19 01:34:00	N	IV
T1901580-095	Carbon, Dissolved Organic (DOC)	N/A		Water	3.14 mg/L	10 mL	3.14 mg/L	1	0.07	0.50			9/28/19 02:02:00	N	IV
T1901580-096	Carbon, Dissolved Organic (DOC)	N/A		Water	3.04 mg/L	10 mL	3.04 mg/L	1	0.07	0.50			9/28/19 02:30:00	N	IV

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

TOC: 653109
DOC: 653111,
653112,
653113

Schedule: 9262019

Version: 5
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/09/26 14:18 - Thursday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1908780-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1908780-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	rb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1908781-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1908781-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	rb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
9	Sample	K1908781-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1908781-002.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
11	Sample	rb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
12	Sample	fb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
13	Sample	k1908618-1 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	T1901580-042.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	T1901580-043.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	T1901580-044.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	T1901580-045.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	T1901580-046.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	T1901580-046.06 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	T1901580-047.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	T1901580-048.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	T1901580-049.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	T1901580-050.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	T1901580-051.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	T1901580-052.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	T1901580-053.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	T1901580-054.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	T1901580-055.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	T1901580-056.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	T1901580-057.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	T1901580-058.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	T1901580-059.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	T1901580-060.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	T1901580-061.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	T1901580-062.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	T1901580-063.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	T1901580-063.05 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

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Schedule: 9262019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	T1901580-064.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	T1901580-065.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	T1901580-066.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	T1901580-067.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	T1901580-068.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	T1901580-069.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	T1901580-070.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	T1901580-071.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	T1901580-072.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	T1901580-073.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	T1901580-074.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	T1901580-075.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	T1901580-076.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	T1901580-077.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	T1901580-078.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	T1901580-079.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	T1901580-080.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	T1901580-081.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	T1901580-082.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	T1901580-083.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	T1901580-084.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	T1901580-085.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	T1901580-086.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	T1901580-087.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	T1901580-088.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	T1901580-089.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	T1901580-090.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	T1901580-091.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	T1901580-091.06 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
70	Sample	rb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
71	Sample	T1901580-092.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	T1901580-093.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	T1901580-094.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	T1901580-095.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	T1901580-096.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 9262019
Thursday, September 26, 2019 12:37 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/09/28 08:47 - Saturday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	9262019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5)		
Comment:			

09/30/19

Report Results

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/09/26 12:37

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.14	16.79	3.65	49.73	05:25
2	TC Clean	8.74	12.32	3.59	50.04	04:04
3	TC Clean	4.64	8.22	3.58	50.08	03:50
4	TC Clean	3.02	6.49	3.47	50.09	03:49

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/09/26 12:59

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.03	4.58	3.56	49.72	05:13
2	TC Clean	9.28	12.97	3.69	50.07	04:01
3	TC Clean	3.50	7.22	3.72	50.09	03:48

4	TC Clean	2.13	5.64	3.51	50.02	03:54

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/09/26 13:22

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	8.52	11.95	3.43	49.75	05:24
2	TC Clean	5.19	8.77	3.58	50.05	04:05
3	TC Clean	2.80	6.46	3.66	50.09	03:50
4	TC Clean	1.78	5.40	3.62	50.05	03:56

Sample Type: Blank (Creating v1299) — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/09/26 13:44

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.78	14.36	3.58	49.75	05:22
2	TC Clean	5.36	8.94	3.58	50.06	04:01
3	TC Clean	3.23	6.83	3.59	50.06	03:42
4	TC Clean	1.99	5.80	3.81	50.10	03:49
5	Reagent Blank	3.25	6.96	3.71	50.03	05:04
6	Acid Blank	0.92	4.60	3.68	49.92	05:32

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.5217 ppm	0.0000 ppm	0.0000%	2019/09/26 14:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5217	5.2166	12.27	15.92	3.65	50.11	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0485 ppm (PASS)	0.0000 ppm	0%	2019/09/26 14:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0485	240.4846	172.70	176.21	3.51	50.22	10:34

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/26 14:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.98	10.59	3.61	50.25	10:30

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 15:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.25	9.74	3.48	50.20	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.8388 ppm (PASS)	0.0000 ppm	0%	2019/09/26 15:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.8388	248.3883	178.07	181.82	3.75	50.26	10:32

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0992 ppm	0.0000 ppm	0.0000%	2019/09/26 15:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0992	0.9915	9.41	13.18	3.77	50.27	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1908780-001.01	10.6789 ppm	0.3175 ppm	2.9700%	2019/09/26 15:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.9035	109.0346	82.74	86.33	3.58	50.25	10:30
2	TOC	10.4544	104.5443	79.70	83.19	3.49	50.30	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1908780-001.01 ms	32.5859 ppm	0.0000 ppm	0.0000%	2019/09/26 16:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.5859	325.8588	229.92	233.49	3.57	50.32	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	rb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 16:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.30	9.75	3.45	50.27	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC)	CAS_salt_010711	CAS_salt_010711

(v1299) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	K1908781-001.01	4.1457 ppm	0.0854 ppm	2.0600%	2019/09/26 16:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2061	42.0614	37.28	40.95	3.66	50.30	10:27
2	TOC	4.0853	40.8534	36.46	40.05	3.58	50.27	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K1908781-001.01 ms	27.2625 ppm	0.0000 ppm	0.0000%	2019/09/26 17:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.2625	272.6247	193.79	197.44	3.65	50.26	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	rb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 17:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.91	9.51	3.60	50.32	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	9	TOC	K1908781-002.01	4.1727 ppm	0.1375 ppm	3.3000%	2019/09/26 17:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2699	42.6993	37.72	41.38	3.66	50.30	10:26
2	TOC	4.0755	40.7547	36.40	39.93	3.53	50.31	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8733 ppm	0.0000 ppm	0%	2019/09/26 18:08

							(PASS)				

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8733	238.7329	171.51	175.12	3.61	50.35	10:33

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/26 18:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.49	9.18	3.69	50.28	10:31

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1908781-002.01 ms	27.4195 ppm	0.0000 ppm	0.0000%	2019/09/26 18:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.4195	274.1951	194.86	198.39	3.53	50.32	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	rb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 18:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.39	8.96	3.57	50.28	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	fb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 19:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.15	8.61	3.45	50.24	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	k1908618-1 doc	11.3985 ppm	0.0454 ppm	0.4000%	2019/09/26 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.4306	114.3057	86.32	89.86	3.54	50.20	10:26
2	TOC	11.3663	113.6634	85.89	89.64	3.75	50.18	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	T1901580-042.04 doc	2.7172 ppm	0.0335 ppm	1.2300%	2019/09/26 19:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7409	27.4089	27.34	31.02	3.69	50.16	10:29
2	TOC	2.6935	26.9346	27.02	30.61	3.59	50.17	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	T1901580-043.04 doc	2.3677 ppm	0.0295 ppm	1.2500%	2019/09/26 20:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3885	23.8850	24.95	28.33	3.38	50.14	10:29
2	TOC	2.3468	23.4681	24.66	28.20	3.54	50.16	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	T1901580-044.04 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 20:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.16	9.61	3.45	50.15	10:32
2	TOC	0.0000	0.0000	6.03	9.52	3.49	50.15	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	T1901580-045.04 doc	3.1883 ppm	0.0215 ppm	0.6700%	2019/09/26 21:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2035	32.0348	30.48	34.01	3.54	50.16	10:25
2	TOC	3.1731	31.7313	30.27	33.76	3.49	50.16	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	T1901580-046.06 doc	3.2843 ppm	0.0334 ppm	1.0200%	2019/09/26 21:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2606	32.6064	30.87	34.29	3.42	50.15	10:28
2	TOC	3.3079	33.0793	31.19	34.58	3.40	50.15	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	T1901580-046.06 ms doc	29.3793 ppm	0.0000 ppm	0.0000%	2019/09/26 22:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.3793	293.7931	208.16	211.59	3.43	50.16	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8262 ppm (PASS)	0.0000 ppm	0%	2019/09/26 22:25

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8262	238.2615	171.19	174.87	3.68	50.18	10:34

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/26 22:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.92	9.64	3.73	50.17	10:34

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 22:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.86	8.66	3.81	50.18	10:34

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.2630 ppm (PASS)	0.0000 ppm	0%	2019/09/26 23:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.2630	242.6296	174.16	177.74	3.58	50.17	10:31

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	T1901580-047.04 doc	3.2183 ppm	0.0549 ppm	1.7100%	2019/09/26 23:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2571	32.5710	30.84	34.57	3.73	50.19	10:25

2	TOC	3.1795	31.7947	30.32	33.86	3.55	50.20	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	T1901580-048.04 doc	3.1974 ppm	0.0016 ppm	0.0500%	2019/09/26 23:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1985	31.9847	30.44	33.94	3.49	50.20	10:27
2	TOC	3.1963	31.9626	30.43	34.21	3.78	50.19	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	T1901580-049.04 doc	3.1742 ppm	0.0552 ppm	1.7400%	2019/09/27 00:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1351	31.3512	30.01	33.61	3.59	50.20	10:29
2	TOC	3.2132	32.1320	30.54	34.02	3.48	50.21	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	T1901580-050.04 doc	3.2210 ppm	0.0002 ppm	0.0100%	2019/09/27 00:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2212	32.2116	30.60	34.04	3.44	50.22	10:28
2	TOC	3.2209	32.2086	30.60	34.28	3.68	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	T1901580-051.06 doc	1.5612 ppm	0.0449 ppm	2.8800%	2019/09/27 01:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5295	15.2948	19.12	22.66	3.54	50.27	10:31
2	TOC	1.5930	15.9298	19.55	23.09	3.54	50.26	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	26	TOC	T1901580-052.04 doc	1.6600 ppm	0.0227 ppm	1.3700%	2019/09/27 01:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6439	16.4395	19.89	23.34	3.45	50.28	10:27
2	TOC	1.6761	16.7606	20.11	23.70	3.59	50.31	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	T1901580-053.04 doc	0.7946 ppm	0.0035 ppm	0.4500%	2019/09/27 02:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7921	7.9214	14.11	17.59	3.48	50.31	10:28
2	TOC	0.7972	7.9715	14.14	17.60	3.46	50.32	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	T1901580-054.04 doc	1.9312 ppm	0.0381 ppm	1.9700%	2019/09/27 02:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9582	19.5818	22.02	25.65	3.62	50.35	10:28
2	TOC	1.9043	19.0426	21.66	25.32	3.66	50.36	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.7261 ppm (PASS)	0.0000 ppm	0%	2019/09/27 03:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7261	237.2612	170.51	174.03	3.51	50.38	10:30

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

Sample Type: Check Standard --> CCB From Schedule Version 5

			Concentration			Min / Max				

	Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 03:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.61	9.21	3.60	50.39	10:34

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	T1901580-055.04 doc	0.8421 ppm	0.0604 ppm	7.1700%	2019/09/27 03:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8848	8.8481	14.74	18.24	3.51	50.40	10:26
2	TOC	0.7994	7.9936	14.16	17.89	3.73	50.41	10:29

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	T1901580-056.04 doc	2.1449 ppm	0.0139 ppm	0.6500%	2019/09/27 04:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1351	21.3511	23.23	26.69	3.46	50.44	10:31
2	TOC	2.1547	21.5471	23.36	26.88	3.52	50.43	10:27

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	T1901580-057.04 doc	0.9001 ppm	0.0134 ppm	1.4900%	2019/09/27 04:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9096	9.0956	14.91	18.27	3.36	50.47	10:28
2	TOC	0.8906	8.9055	14.78	18.18	3.40	50.48	10:29

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	T1901580-058.04 doc	2.5001 ppm	0.0159 ppm	0.6400%	2019/09/27 05:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4888	24.8883	25.63	29.15	3.52	50.49	10:28
2	TOC	2.5114	25.1137	25.78	29.36	3.58	50.50	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	T1901580-059.04 doc	2.3192 ppm	0.0028 ppm	0.1200%	2019/09/27 05:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3172	23.1720	24.46	28.02	3.56	50.50	10:25
2	TOC	2.3212	23.2118	24.49	28.07	3.58	50.49	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	T1901580-060.04 doc	2.8313 ppm	0.0293 ppm	1.0300%	2019/09/27 05:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8520	28.5197	28.09	31.50	3.41	50.51	10:27
2	TOC	2.8106	28.1058	27.81	31.29	3.48	50.51	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	T1901580-061.04 doc	2.3749 ppm	0.0451 ppm	1.9000%	2019/09/27 06:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3430	23.4298	24.64	28.33	3.70	50.50	10:29
2	TOC	2.4068	24.0677	25.07	28.64	3.57	50.52	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	T1901580-062.04 doc	2.8271 ppm	0.0360 ppm	1.2700%	2019/09/27 06:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8526	28.5256	28.10	31.72	3.62	50.51	10:27
2	TOC	2.8016	28.0159	27.75	31.30	3.55	50.51	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC)	CAS_salt_010711	CAS_salt_010711

(v1299) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	T1901580-063.05 doc	2.6698 ppm	0.0370 ppm	1.3900%	2019/09/27 07:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6437	26.4366	26.68	30.23	3.56	50.52	10:31
2	TOC	2.6960	26.9596	27.03	30.50	3.46	50.50	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	T1901580-063.05 ms doc	27.0484 ppm	0.0000 ppm	0.0000%	2019/09/27 07:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.0484	270.4841	192.34	195.94	3.60	50.47	10:36

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.4673 ppm (PASS)	0.0000 ppm	0%	2019/09/27 08:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.4673	234.6728	168.76	172.31	3.55	50.51	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 08:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.65	9.15	3.50	50.47	10:28

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/27 08:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.97	8.39	3.41	50.47	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.0856 ppm (PASS)	0.0000 ppm	0%	2019/09/27 08:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.0856	240.8558	172.95	176.60	3.65	50.46	10:30

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	T1901580-064.04 doc	0.6699 ppm	0.0892 ppm	13.3100%	2019/09/27 09:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7329	7.3292	13.71	17.28	3.57	50.45	10:28
2	TOC	0.6068	6.0682	12.85	16.36	3.51	50.43	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	T1901580-065.04 doc	0.4597 ppm	0.0005 ppm	0.1100%	2019/09/27 09:32

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	0.4601	4.6008	11.86	15.49	3.63	50.45	10:27
2	TOC	0.4593	4.5935	11.85	15.50	3.65	50.44	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	42	TOC	T1901580-066.04 doc	0.7479 ppm	0.0047 ppm	0.6300%	2019/09/27 10:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7446	7.4456	13.79	17.48	3.70	50.38	10:31
2	TOC	0.7512	7.5119	13.83	17.52	3.69	50.39	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	T1901580-067.04 doc	0.4893 ppm	0.0568 ppm	11.6000%	2019/09/27 10:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5295	5.2947	12.33	15.98	3.65	50.36	10:30
2	TOC	0.4492	4.4918	11.78	15.67	3.89	50.33	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	44	TOC	T1901580-068.05 doc	0.9681 ppm	0.0536 ppm	5.5400%	2019/09/27 10:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9302	9.3018	15.05	18.62	3.57	50.34	10:26
2	TOC	1.0061	10.0605	15.56	19.04	3.48	50.33	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	T1901580-069.05 doc	0.5941 ppm	0.0102 ppm	1.7200%	2019/09/27 11:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6014	6.0136	12.82	16.37	3.56	50.30	10:27
2	TOC	0.5869	5.8693	12.72	16.16	3.45	50.30	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1246	11.2465	16.37	19.94	3.57	50.28	10:28
2	TOC	1.1876	11.8755	16.79	20.41	3.62	50.33	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	47	TOC	T1901580-071.04 doc	0.6137 ppm	0.0026 ppm	0.4200%	2019/09/27 12:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6118	6.1182	12.89	16.56	3.67	50.27	10:31
2	TOC	0.6155	6.1551	12.91	16.44	3.53	50.26	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1317 ppm (PASS)	0.0000 ppm	0%	2019/09/27 12:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1317	241.3169	173.27	176.86	3.60	50.24	10:29

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 13:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.72	9.31	3.59	50.35	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	T1901580-072.04 doc	1.8056 ppm	0.0607 ppm	3.3600%	2019/09/27 13:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8486	18.4858	21.28	24.93	3.65	50.24	10:26
2	TOC	1.7627	17.6269	20.70	24.26	3.57	50.21	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	T1901580-073.04 doc	0.7033 ppm	0.0079 ppm	1.1300%	2019/09/27 13:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7089	7.0891	13.54	17.09	3.54	50.18	10:30
2	TOC	0.6977	6.9771	13.47	17.11	3.65	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	T1901580-074.04 doc	2.2656 ppm	0.0572 ppm	2.5200%	2019/09/27 14:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3060	23.0601	24.39	27.98	3.59	50.20	10:27
2	TOC	2.2251	22.2513	23.84	27.59	3.75	50.17	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	T1901580-075.04 doc	2.2386 ppm	0.0164 ppm	0.7300%	2019/09/27 14:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2502	22.5017	24.01	27.63	3.62	50.17	10:31
2	TOC	2.2270	22.2704	23.85	27.50	3.65	50.22	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	52	TOC	T1901580-076.04 doc	0.8877 ppm	0.0111 ppm	1.2600%	2019/09/27 15:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8798	8.7980	14.70	18.32	3.62	50.24	10:25
2	TOC	0.8956	8.9556	14.81	18.41	3.59	50.22	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	T1901580-077.04 doc	2.6888 ppm	0.0303 ppm	1.1300%	2019/09/27 15:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6674	26.6738	26.84	30.30	3.46	50.18	10:27
2	TOC	2.7103	27.1025	27.13	30.59	3.46	50.17	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	T1901580-078.04 doc	2.8607 ppm	0.0199 ppm	0.7000%	2019/09/27 16:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8467	28.4667	28.06	31.64	3.58	50.22	10:27
2	TOC	2.8748	28.7481	28.25	31.85	3.60	50.19	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	T1901580-079.04 doc	3.2227 ppm	0.0353 ppm	1.1000%	2019/09/27 16:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2477	32.4768	30.78	34.43	3.65	50.16	10:28
2	TOC	3.1977	31.9773	30.44	34.08	3.64	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	T1901580-080.04 doc	3.2299 ppm	0.0018 ppm	0.0500%	2019/09/27 17:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2287	32.2867	30.65	34.08	3.43	50.14	10:28
2	TOC	3.2312	32.3118	30.67	33.98	3.32	50.13	10:27

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	T1901580-081.04 doc	3.3384 ppm	0.0242 ppm	0.7200%	2019/09/27 17:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3555	33.5551	31.51	34.96	3.45	50.23	10:30
2	TOC	3.3213	33.2134	31.28	34.83	3.56	50.20	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6352 ppm (PASS)	0.0000 ppm	0%	2019/09/27 17:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6352	236.3523	169.90	173.64	3.74	50.20	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 18:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.21	8.80	3.59	50.23	10:29

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/27 18:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.89	8.49	3.59	50.26	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.3513 ppm (PASS)	0.0000 ppm	0%	2019/09/27 18:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.3513	243.5135	174.76	178.42	3.66	50.27	10:35

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	59	TOC	T1901580-082.04 doc	3.2832 ppm	0.0765 ppm	2.3300%	2019/09/27 18:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3372	33.3725	31.39	35.07	3.68	50.28	10:29
2	TOC	3.2291	32.2911	30.65	34.20	3.55	50.31	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	T1901580-083.04 doc	3.3769 ppm	0.0504 ppm	1.4900%	2019/09/27 19:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3412	33.4122	31.41	35.07	3.66	50.32	10:28
2	TOC	3.4125	34.1253	31.90	35.30	3.41	50.34	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	T1901580-084.04 doc	3.3003 ppm	0.0028 ppm	0.0900%	2019/09/27 19:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3023	33.0233	31.15	34.58	3.43	50.33	10:28
2	TOC	3.2984	32.9835	31.12	34.58	3.46	50.35	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	T1901580-085.04 doc	2.3832 ppm	0.0165 ppm	0.6900%	2019/09/27 20:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3716	23.7156	24.83	28.49	3.65	50.36	10:27
2	TOC	2.3948	23.9484	24.99	28.58	3.59	50.40	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	T1901580-086.04 doc	1.5178 ppm	0.0042 ppm	0.2700%	2019/09/27 20:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5149	15.1490	19.02	22.55	3.53	50.40	10:25
2	TOC	1.5208	15.2079	19.06	22.59	3.53	50.44	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	T1901580-087.04 doc	2.2527 ppm	0.0718 ppm	3.1900%	2019/09/27 21:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2020	22.0200	23.68	27.22	3.54	50.43	10:27
2	TOC	2.3035	23.0350	24.37	27.91	3.54	50.43	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	T1901580-088.04 doc	1.9667 ppm	0.0290 ppm	1.4700%	2019/09/27 21:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9872	19.8720	22.22	25.89	3.67	50.45	10:27
2	TOC	1.9462	19.4625	21.94	25.47	3.53	50.47	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC)	CAS_salt_010711	CAS_salt_010711

(v1299) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	T1901580-089.04 doc	2.1539 ppm	0.0259 ppm	1.2000%	2019/09/27 22:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1722	21.7224	23.48	26.85	3.37	50.47	10:26
2	TOC	2.1356	21.3556	23.23	26.67	3.44	50.47	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.3857 ppm (PASS)	0.0000 ppm	0%	2019/09/27 22:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.3857	233.8567	168.20	171.82	3.62	50.50	10:28

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 22:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.33	8.84	3.51	50.51	10:35

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	T1901580-090.04 doc	2.1261 ppm	0.0444 ppm	2.0900%	2019/09/27 23:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1575	21.5751	23.38	26.93	3.55	50.50	10:32
2	TOC	2.0947	20.9475	22.95	26.32	3.37	50.51	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	T1901580-091.06 doc	3.1494 ppm	0.0200 ppm	0.6400%	2019/09/27 23:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1353	31.3527	30.02	33.58	3.57	50.51	10:27
2	TOC	3.1636	31.6356	30.21	33.77	3.56	50.51	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	T1901580-091.06 ms doc	28.8836 ppm	0.0000 ppm	0.0000%	2019/09/28 00:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.8836	288.8358	204.79	208.36	3.57	50.53	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	rb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/28 00:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.67	9.35	3.69	50.52	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	T1901580-092.06 doc	3.0072 ppm	0.0076 ppm	0.2500%	2019/09/28 00:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0018	30.0180	29.11	32.71	3.60	50.53	10:29
2	TOC	3.0126	30.1255	29.18	32.73	3.55	50.54	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	72	TOC	T1901580-093.04 doc	3.2041 ppm	0.0207 ppm	0.6500%	2019/09/28 01:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2188	32.1880	30.58	34.22	3.64	50.55	10:32
2	TOC	3.1895	31.8948	30.38	34.04	3.65	50.53	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	73	TOC	T1901580-094.04 doc	2.9106 ppm	0.0135 ppm	0.4700%	2019/09/28 01:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9202	29.2018	28.56	32.15	3.59	50.54	10:27
2	TOC	2.9010	29.0103	28.43	32.15	3.72	50.56	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	74	TOC	T1901580-095.04 doc	3.1272 ppm	0.0227 ppm	0.7300%	2019/09/28 02:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1432	31.4323	30.07	33.56	3.49	50.56	10:28
2	TOC	3.1111	31.1111	29.85	33.45	3.59	50.55	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	75	TOC	T1901580-096.06 doc	3.0090 ppm	0.0379 ppm	1.2600%	2019/09/28 02:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0358	30.3583	29.34	32.81	3.47	50.57	10:27
2	TOC	2.9822	29.8220	28.98	32.56	3.58	50.56	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.3092 ppm	0.0000 ppm	0%	2019/09/28 02:58

							(PASS)			

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.3092	233.0921	167.68	171.31	3.63	50.57	10:30

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/28 03:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.36	8.97	3.61	50.55	10:31

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1298	2.2570	1.4920	0.0000	0.0000	0.0000	2019/09/24 13:13	Fusion1 (Fusion1)
v1299	1.0837	0.9200	0.0000	0.0000	0.0000	2019/09/26 14:18	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v30	Calibration curve formula:	TOC: y = 6.788x + 9.463
Ver Creation:	2019/03/05 17:42	r^2 value:	TOC: r^2 = 0.99963
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)

Ver Creation: 2019/02/21 17:57

Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/09/28 03:28

StarLIMS Run: 653109, 653111, 653112, 653113

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-80N

21 % H3PO4: 11-GEN-05-80L

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: BCD	Date Analyzed: 9/26/19
Reviewed By:	Date Reviewed: 09/30/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1927216

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2296 (248804)

General Set Information: There were fifteen field samples in this Work Order. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1927216003/11 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 676275) was less than 1/2 the CRDL. The recovery for the LCS (676276) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1927216009/10 and 1927216013/14 (Client ID's: 16WW29-190918 and 16WW57-190918). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits for samples 1927216009/10. The MS/MSD (1927216013/14) failed QC acceptance criteria for percent recoveries and for the 83/85 ion ratio. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 676273) is reported from the analysis of the Laboratory Control Sample (LCS – 676276) at a level of 3.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 30SEPD13/14/17-19. Field samples 1927216002/07/12 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.

Thomas Bosch — Analyst
October 02, 2019 — Date

ANALYTICAL REPORT

Report Date: October 03, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1927216**
Project ID: HS19090962
Purchase Order: HS19090962
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16WW13-190918	1927216001	09/18/19	09/21/19	
16WW48-190918	1927216002	09/18/19	09/21/19	
16WW35-190918	1927216003	09/18/19	09/21/19	
16WW30-190918	1927216004	09/18/19	09/21/19	
16EW06-190918	1927216005	09/18/19	09/21/19	
16WW26-190917	1927216006	09/17/19	09/21/19	
16EW02-190918	1927216007	09/18/19	09/21/19	
16WW29-190918	1927216008	09/18/19	09/21/19	
16WW12-190918	1927216011	09/18/19	09/21/19	
16WW57-190918	1927216012	09/18/19	09/21/19	
16WW26-190917-FD	1927216015	09/18/19	09/21/19	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
16WW29-190918MS	1927216009	09/18/19	09/21/19	
16WW29-190918MSD	1927216010	09/18/19	09/21/19	
16WW57-190918MS	1927216013	09/18/19	09/21/19	
16WW57-190918MSD	1927216014	09/18/19	09/21/19	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1927216
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW13-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216001 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 09:50 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW48-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216002 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 10:04 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW35-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216003 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 10:17 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**410**	10	20	40	10	

Sample ID: **16WW30-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216004 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 10:31 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1927216
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16EW06-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216005 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 10:45 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**42**	1.0	2.0	4.0	1	

Sample ID: **16WW26-190917** | Sampling Site: NA | Collected: 09/17/2019
Lab ID: 1927216006 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 10:59 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16EW02-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216007 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 11:13 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW29-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216008 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 11:26 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1927216
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW12-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216011 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 12:21 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**120**	10	20	40	10	

Sample ID: **16WW57-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216012 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 12:35 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW26-190917-FD** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927216015 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2296 (HBN: 248804) | **%Solids:** NA
Analyzed: 09/30/2019 13:17 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/01/2019 14:24	/S/ Stephen Brose 10/03/2019 10:09

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1927216
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1927216

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2296 (HBN: 248804)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 676275
Analyzed: 09/30/2019 09:36
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 676276
Analyzed: 09/30/2019 09:08
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	2.92	3.00	97.4	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample: 1927216008	MS: 1927216009	MSD: 1927216010
	Analyzed: 09/30/2019 11:26	Analyzed: 09/30/2019 11:40	Analyzed: 09/30/2019 11:54
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.47	3	116	78.8	123.8	3.46	115	0.173	0.0	20.0

	Sample: 1927216012	MS: 1927216013	MSD: 1927216014
	Analyzed: 09/30/2019 12:35	Analyzed: 09/30/2019 12:49	Analyzed: 09/30/2019 13:03
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.82	3	# 161	78.8	123.8	4.94	# 165	2.48	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
10/02/2019 13:31	10/03/2019 10:09

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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

W 1927216

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: **Texas**

COC ID: **12203**

1927216

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19090962
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19090962-02**	**16WW13-190918**	**Water**	**18 Sep 2019 08:45**
	SUB_Perch-6850			27 Sep 2019
2.	**HS19090962-03**	**16WW48-190918**	**Water**	**18 Sep 2019 17:20**
	SUB_Perch-6850			27 Sep 2019
3.	**HS19090962-04**	**16WW35-190918**	**Water**	**18 Sep 2019 10:55**
	SUB_Perch-6850			27 Sep 2019
4.	**HS19090962-05**	**16WW30-190918**	**Water**	**18 Sep 2019 11:11**
	SUB_Perch-6850			27 Sep 2019
5.	**HS19090962-06**	**16EW06-190918**	**Water**	**18 Sep 2019 13:35**
	SUB_Perch-6850			27 Sep 2019
6.	**HS19090962-07**	**16WW26-190917**	**Water**	**17 Sep 2019 15:53**
	SUB_Perch-6850			27 Sep 2019
7.	**HS19090962-08**	**16EW02-190918**	**Water**	**18 Sep 2019 14:55**
	SUB_Perch-6850			27 Sep 2019
8.	**HS19090962-10**	**16WW29-190918**	**Water**	**18 Sep 2019 12:07**
(3)	SUB_Perch-6850			27 Sep 2019
9.	**HS19090962-11**	**16WW12-190918**	**Water**	**18 Sep 2019 09:59**

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID: 12203**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
	SUB_Perch-6850			27 Sep 2019
10.	**HS19090962-12**	**16WW57-190918** MS/MSD	**Water**	**18 Sep 2019 15:30**
(3)	SUB_Perch-6850			27 Sep 2019
11.	**HS19090962-13**	**16WW26-190917-FD**	**Water**	**18 Sep 2019 15:53**
	SUB_Perch-6850			27 Sep 2019

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

QC Level: DOD IV (DoD Data Package)

HS19090962-10&12 MS/MSD

Relinquished By:	[signature]	Date/Time:	9/20/19 1800
Received By:	Meredel [signature]	Date/Time:	9/21/19 1915
Cooler ID(s):	9840	Temperature(s):	2°

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19090962	Split:	Workorder ID: 1927216	Level: ENV_LVL4	Requested Analysis
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly	
Comments:			Preservatives	
			COOL	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850, DoD QSM
1	09/18/2019 08:45	16WW13-190918	1927216001		Water	A	1	A
2	09/18/2019 17:20	16WW48-190918	1927216002		Water	A	1	A
3	09/18/2019 10:55	16WW35-190918	1927216003		Water	A	1	A
4	09/18/2019 11:11	16WW30-190918	1927216004		Water	A	1	A
5	09/18/2019 13:35	16EW06-190918	1927216005		Water	A	1	A
6	09/17/2019 15:53	16WW26-190917	1927216006		Water	A	1	A
7	09/18/2019 14:55	16EW02-190918	1927216007		Water	A	1	A
8	09/18/2019 12:07	16WW29-190918	1927216008		Water	A	1	A
9	09/18/2019 12:07	16WW29-190918MS	1927216009	MS	Water	A	1	A
10	09/18/2019 12:07	16WW29-190918MSD	1927216010	MSD	Water	A	1	A

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Waratti, Julie	09/21/2019 09:15	ALS Sample Receiving	Sample Login
Julie Waratti R.33.1	9/23/19 1600 09-27-19/09:15	15C T. Bush	storage CLO4 ANALYSIS

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19090962	Split:	Workorder ID: 1927216	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
11	09/18/2019 09:59	16WW12-190918	1927216011		Water	A	1	A
12	09/18/2019 15:30	16WW57-190918	1927216012		Water	A	1	A
13	09/18/2019 15:30	16WW57-190918MS	1927216013	MS	Water	A	1	A
14	09/18/2019 15:30	16WW57-190918MSD	1927216014	MSD	Water	A	1	A
15	09/18/2019 15:53	16WW26-190917-FD	1927216015	FLDDUP	Water	A	1	A
16								
17								
18								
19								
20								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	09/21/2019 09:15	ALS Sample Receiving	Sample Login
Julie Warath	9/23/19 1600	15C	Storage
R-33.1	09-27-19/09:15	T. Bush	CLOA ANALYSIS

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 1927216

Date/Time of Receipt: 9/21/19 1915

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Cooler/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 01890	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Meredith Stump (Signature) Meredith Stump (Printed Name) 9/21/2019 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

Part #:159469-434 RIT2 EXP 05/20 *

ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD.
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 20SEP19
ACTWGT: 41.45 LB
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19090804/860/962/964 - RJ

FedEx Express

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 **1251 0289 7452**

XO BTFA

84123
UT-US **SLC**

Batch Worklist

Batch: ELMS/ 2296 **Created:** 9/30/2019 07:44 **Instrument:** **HBN:** 248804

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1927216 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	676272	CCV for HBN 248804 [ELMS/2296]				CCV	3		E685041C3Q	5311		10/3/2019	
2	676273	RLVS for HBN 248804 [ELMS/2296				RLVS	3		E685041C3Q	5311		10/3/2019	
3	676274	ICS for HBN 248804 [ELMS/2296]				ICS	3		E6850..D3Q	5311		10/3/2019	
4	676275	LMB for HBN 248804 [ELMS/2296]				LMB	3		E6850Q413Q	5311		10/3/2019	
5	676276	LCS for HBN 248804 [ELMS/2296]				LCS	3		E6850Q413Q	5311		10/3/2019	
6	1927216001	16WW13-190918				SAMPLE	3	1927216001-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
7	1927216002	16WW48-190918				SAMPLE	3	1927216002-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
8	1927216003	16WW35-190918				SAMPLE	3	1927216003-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
9	1927216004	16WW30-190918				SAMPLE	3	1927216004-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
10	1927216005	16EW06-190918				SAMPLE	3	1927216005-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
11	1927216006	16WW26-190917				SAMPLE	3	1927216006-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
12	1927216007	16EW02-190918				SAMPLE	3	1927216007-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
13	1927216008	16WW29-190918				SAMPLE	3	1927216008-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
14	1927216009	16WW29-190918MS				MS	3	1927216009-A	E6850Q413Q	5480		10/3/2019	
15	1927216010	16WW29-190918MSD				MSD	3	1927216010-A	E6850Q413Q	5480		10/3/2019	
16	676277	CCV for HBN 248804 [ELMS/2296]				CCV	3		E685041C3Q	5311		10/3/2019	
17	1927216011	16WW12-190918				SAMPLE	3	1927216011-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
18	1927216012	16WW57-190918				SAMPLE	3	1927216012-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
19	1927216013	16WW57-190918MS				MS	3	1927216013-A	E6850Q413Q	5480		10/3/2019	
20	1927216014	16WW57-190918MSD				MSD	3	1927216014-A	E6850Q413Q	5480		10/3/2019	
21	1927216015	16WW26-190917-FD				FLDDUP	3	1927216015-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
22	676278	CCV for HBN 248804 [ELMS/2296]				CCV	3		E685041C3Q	5311		10/3/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 1927216 (001-15)
ELMS Batch/HBN ID: 2296 (248804)
Prep Date: 09/27/2019 Analysis Date: 09/30/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\30SEP19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 676276; Target = 3.0µg/L. ASTM type II water was used for LMB 676275.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1927216009/10 and 1927216013/14 (Client ID's: 16WW29-190918 and 16WW57-190918). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1927216003/11 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly. Field samples 1927216002/07/12 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD (1927216013/14) failed QC acceptance criteria for percent recoveries and for the 83/85 ion ratio. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\SEP\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\248804-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 676273) is reported from the analysis of the Laboratory Control Sample (LCS – 676276) at a level of 3.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 30SEP19D13/14/17/18/19.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria **Batch(es)/SDG:** ELMS: 2296 HBN: 248804 **Sample Set IDs if Applicable:** WO: 1927216	**Analyst Initials**	**Reviewer Initials**
Sample positions on autosampler verified against instrument sequence	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#_____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 49946	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/23/2019 03:09PM	**Expires:** 09/19/2020
MFG Lot: TNB: 09/20/2019	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 47863	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 05/23/2019 10:05AM	**Expires:** 12/05/2028
MFG Lot: SDIH-016	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — **Description - 6850 WKG Std 100.ug/L**

Standard: 49948
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025
MFG Lot: Not Provided		**Usable:** Yes
Part ID: Not Provided		**Lab Lot:** LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 49947
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/23/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025
MFG Lot: Not Provided		**Usable:** Yes
Part ID: Not Provided		**Lab Lot:** LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL
Standard: 36748	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: Ultra Scientific	**Create Date:** 05/11/2017 01:05PM	**Expires:** 03/31/2020
MFG Lot: CP-0860		**Usable:** Yes
Part ID: ICC-013		**Lab Lot:** CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

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CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ISO 9001 Registered Quality System – TUV USA

250 SMITH STREET • NORTH KINGSTOWN, RHODE ISLAND 02852 • WWW.ULTRASCI.COM

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ULTRA ISO 17025 • ISO GUIDE 34 • ISO 9001

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ACCREDITATION TESTING LABORATORY

Cambridge Isotope Laboratories, Inc. Certificate of Analysis

S 47863

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: ≥98%

MW*: 130.44
** For isotopically labeled compounds, MW listed is for the fully enriched product.*

$NaCl^{18}O_4$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.
Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number . Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\30SEP19D\30SEP19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	676272 CCV@25	Vial 71	1	Control	1	1.56600e6	7.595	26.02108
#*	676276 QC@3.0	Vial 72	1	Control	2	1.96115e5	7.644	2.92087
#*	676274 ICS@3.0	Vial 73	1	Control	3	1.45680e5	7.390	2.81629
#*	676275 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927216001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927216002	Vial 76	1	Sample	6	2.88811e5	6.748	5.75121 NR
#*	1927216003 10X	Vial 77	1	Sample	7	2.28133e6	7.063	407.99148
#*	1927216004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927216005	Vial 79	1	Sample	9	2.04676e6	6.340	42.11030
#*	1927216006	Vial 80	1	Sample	10	0.00000	0.000	0.00000
#*	1927216007	Vial 81	1	Sample	11	2.26434e5	6.705	4.60499 NR
#*	1927216008	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927216009 MS	Vial 83	1	Sample	13	1.18250e5	6.955	3.46729
#*	1927216010 MSD	Vial 84	1	Sample	14	1.20090e5	6.904	3.46127
#*	676277 CCV@25	Vial 71	1	Control	15	1.23242e6	7.640	24.44201
#*	1927216011 10X	Vial 85	1	Sample	16	6.61980e5	7.247	123.77046
#*	1927216012	Vial 86	1	Sample	17	6.13980e4	6.905	1.17967 NR
#*	1927216013 MS	Vial 87	1	Sample	18	2.33237e5	6.575	4.82136
#*	1927216014 MSD	Vial 88	1	Sample	19	2.35404e5	6.609	4.94234
#*	1927216015	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	676278 CCV@25	Vial 71	1	Control	21	1.24264e6	7.614	24.78286

NR- NOT REPORTED / FAILS 83/85 ION RATIO TB 10.2.19

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	676272 CCV@25	Vial 71	1	Control	1	2.04773e5	7.613	5.00000
#*	676276 QC@3.0	Vial 72	1	Control	2	2.46957e5	7.670	5.00000
#*	676274 ICS@3.0	Vial 73	1	Control	3	1.90155e5	7.412	5.00000
#*	676275 LMB	Vial 74	1	Control	4	2.16188e5	7.678	5.00000
#*	1927216001	Vial 75	1	Sample	5	1.73072e5	7.114	5.00000
#*	1927216002	Vial 76	1	Sample	6	1.84829e5	6.767	5.00000
#*	1927216003 10X	Vial 77	1	Sample	7	1.79251e5	7.082	50.00000
#*	1927216004	Vial 78	1	Sample	8	1.74979e5	7.371	5.00000
#*	1927216005	Vial 79	1	Sample	9	1.55012e5	6.349	5.00000
#*	1927216006	Vial 80	1	Sample	10	1.58772e5	6.958	5.00000
#*	1927216007	Vial 81	1	Sample	11	1.81295e5	6.735	5.00000
#*	1927216008	Vial 82	1	Sample	12	1.13295e5	6.855	5.00000
#*	1927216009 MS	Vial 83	1	Sample	13	1.25674e5	7.005	5.00000
#*	1927216010 MSD	Vial 84	1	Sample	14	1.27849e5	6.965	5.00000
#*	676277 CCV@25	Vial 71	1	Control	15	1.72685e5	7.670	5.00000
#*	1927216011 10X	Vial 85	1	Sample	16	1.92472e5	7.273	50.00000
#*	1927216012	Vial 86	1	Sample	17	1.85346e5	6.895	5.00000
#*	1927216013 MS	Vial 87	1	Sample	18	1.78326e5	6.601	5.00000
#*	1927216014 MSD	Vial 88	1	Sample	19	1.75551e5	6.629	5.00000
#*	1927216015	Vial 89	1	Sample	20	1.53702e5	6.971	5.00000
*	676278 CCV@25	Vial 71	1	Control	21	1.71481e5	7.648	5.00000

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	676272 CCV@25	Vial 71	1	Control	1	4.77767e5	7.612	26.04245
#*	676276 QC@3.0	Vial 72	1	Control	2	6.23333e4	7.664	2.95484
#*	676274 ICS@3.0	Vial 73	1	Control	3	5.07831e4	7.406	3.13355
#*	676275 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927216001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927216002	Vial 76	1	Sample	6	6.87489e4	6.763	4.40463
#*	1927216003 10X	Vial 77	1	Sample	7	6.82059e5	7.081	402.85341
#*	1927216004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927216005	Vial 79	1	Sample	9	5.51912e5	6.355	38.01171
#*	1927216006	Vial 80	1	Sample	10	0.00000	0.000	0.00000

Batch Report: C:\HPCHEM\1\DATA\30SEP19D\30SEP19S.B

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	1927216007	Vial 81	1	Sample	11	4.30990e4	6.725	2.77560
#*	1927216008	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927216009 MS	Vial 83	1	Sample	13	4.04878e4	6.955	3.80300
#*	1927216010 MSD	Vial 84	1	Sample	14	4.23395e4	6.954	3.91199
#*	676277 CCV@25	Vial 71	1	Control	15	3.73453e5	7.656	24.29674
#*	1927216011 10X	Vial 85	1	Sample	16	2.01335e5	7.268	122.64925
#*	1927216012	Vial 86	1	Sample	17	6506.67236	6.905	2.72099e-1
#*	1927216013 MS	Vial 87	1	Sample	18	4.23561e4	6.571	2.77307
#*	1927216014 MSD	Vial 88	1	Sample	19	4.21995e4	6.612	2.80803
#*	1927216015	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	676278 CCV@25	Vial 71	1	Control	21	3.80145e5	7.632	24.85402

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

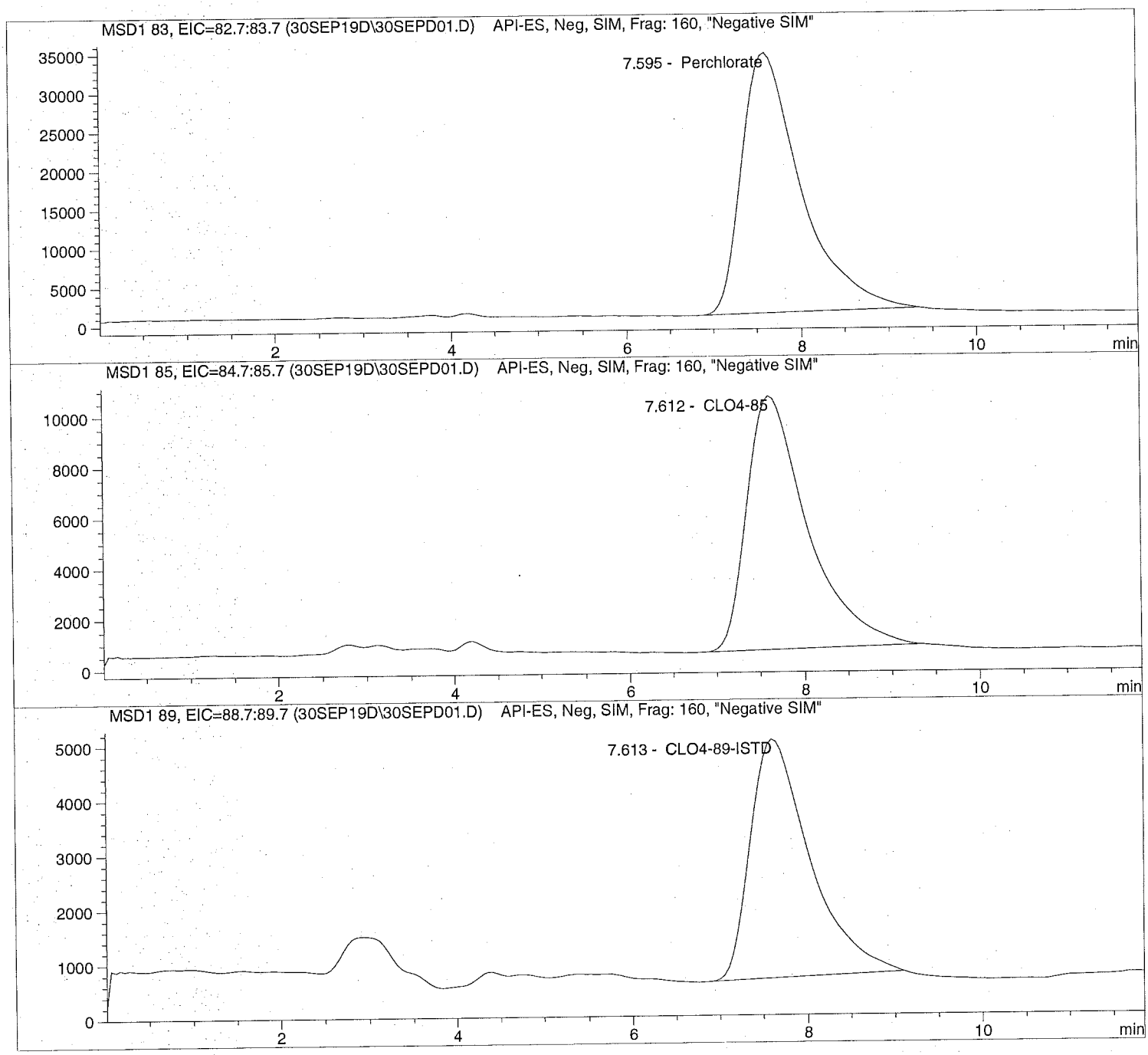
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	676272 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	676276 QC@3.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	676274 ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	676275 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1927216001	CLO4-AQN	1	Sample		
6	Vial 76	1927216002	CLO4-AQN	1	Sample		
7	Vial 77	1927216003 10X	CLO4-AQN	1	Sample		
8	Vial 78	1927216004	CLO4-AQN	1	Sample		
9	Vial 79	1927216005	CLO4-AQN	1	Sample		
10	Vial 80	1927216006	CLO4-AQN	1	Sample		
11	Vial 81	1927216007	CLO4-AQN	1	Sample		
12	Vial 82	1927216008	CLO4-AQN	1	Sample		
13	Vial 83	1927216009 MS	CLO4-AQN	1	Sample		
14	Vial 84	1927216010 MSD	CLO4-AQN	1	Sample		
15	Vial 71	676277 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1927216011 10X	CLO4-AQN	1	Sample		
17	Vial 86	1927216012	CLO4-AQN	1	Sample		
18	Vial 87	1927216013 MS	CLO4-AQN	1	Sample		
19	Vial 88	1927216014 MSD	CLO4-AQN	1	Sample		
20	Vial 89	1927216015	CLO4-AQN	1	Sample		
21	Vial 71	676278 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD01.D Sample Name: 676272 CCV@25

Injection Date:	9/30/2019 08:52:57	Seq Line:	1
Sample Name:	676272 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD01.D Sample Name: 676272 CCV@25

Injection Date:	9/30/2019 08:52:57	Seq Line:	1
Sample Name:	676272 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.595	PBA	1565998.9	26.0211	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.612	PBA	477766.8	26.0424	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.613	PBA	204773.1	5.0000	CLO4-89-ISTD

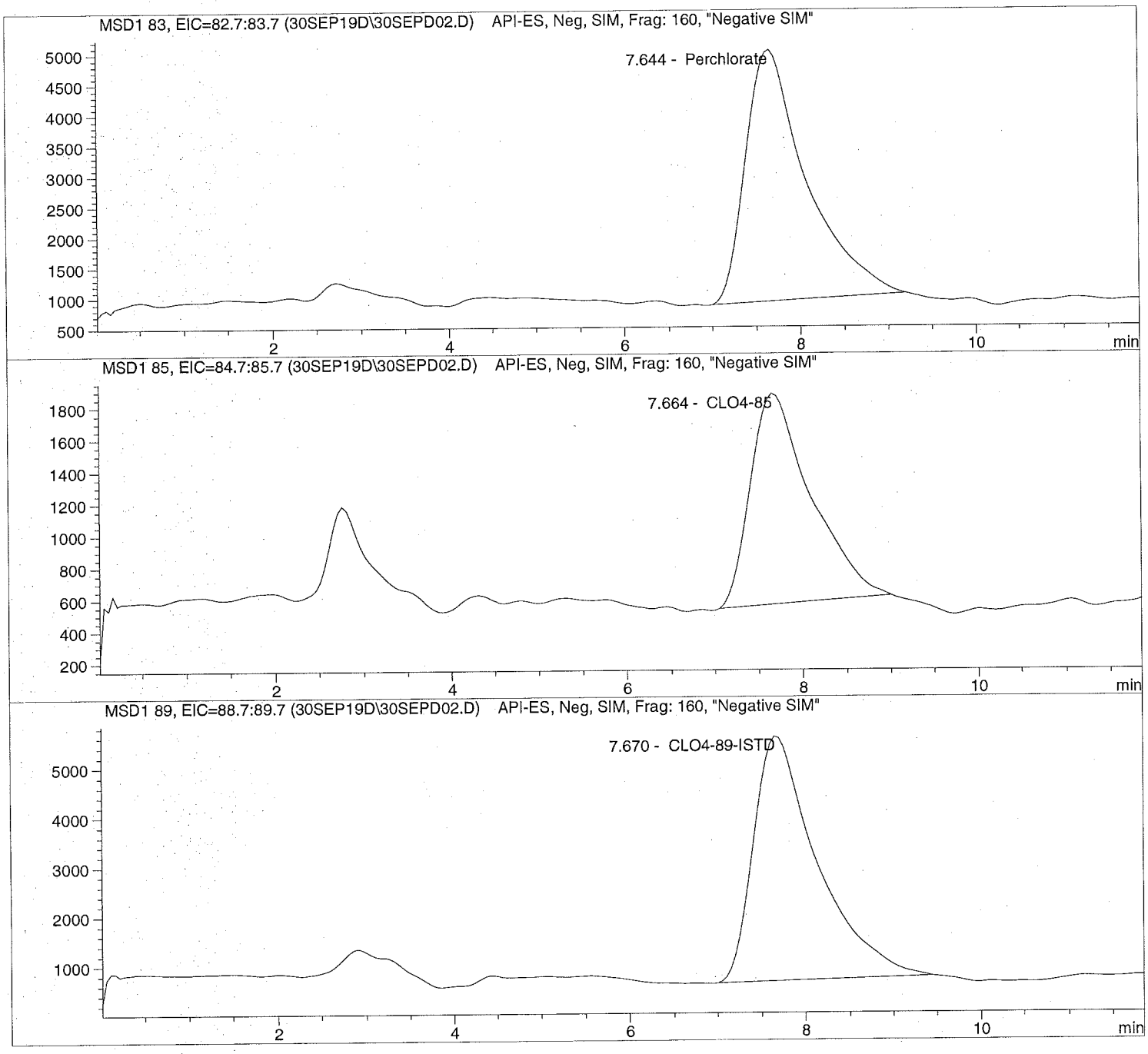
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD02.D Sample Name: 676276 QC@3.0

Injection Date:	9/30/2019 09:08:53	Seq Line:	2
Sample Name:	676276 QC@3.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD02.D Sample Name: 676276 QC@3.0

Injection Date:	9/30/2019 09:08:53	Seq Line:	2
Sample Name:	676276 QC@3.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.644	PBA	196115.4	2.9209	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.664	PBA	62333.3	2.9548	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.670	PBA	246957.3	5.0000	CLO4-89-ISTD

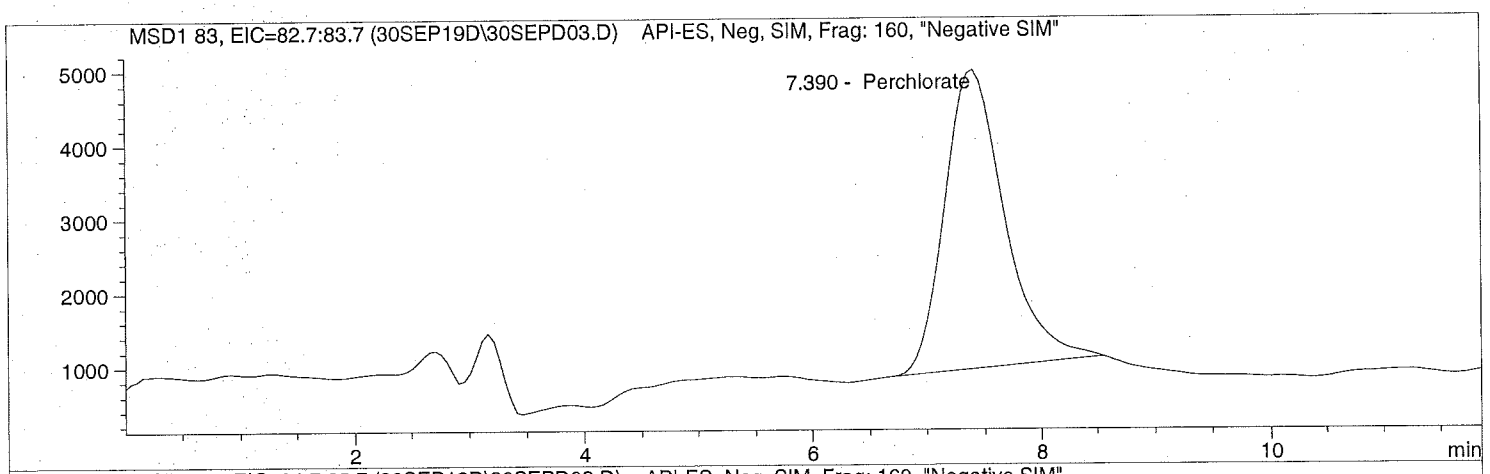
*** End of Report ***

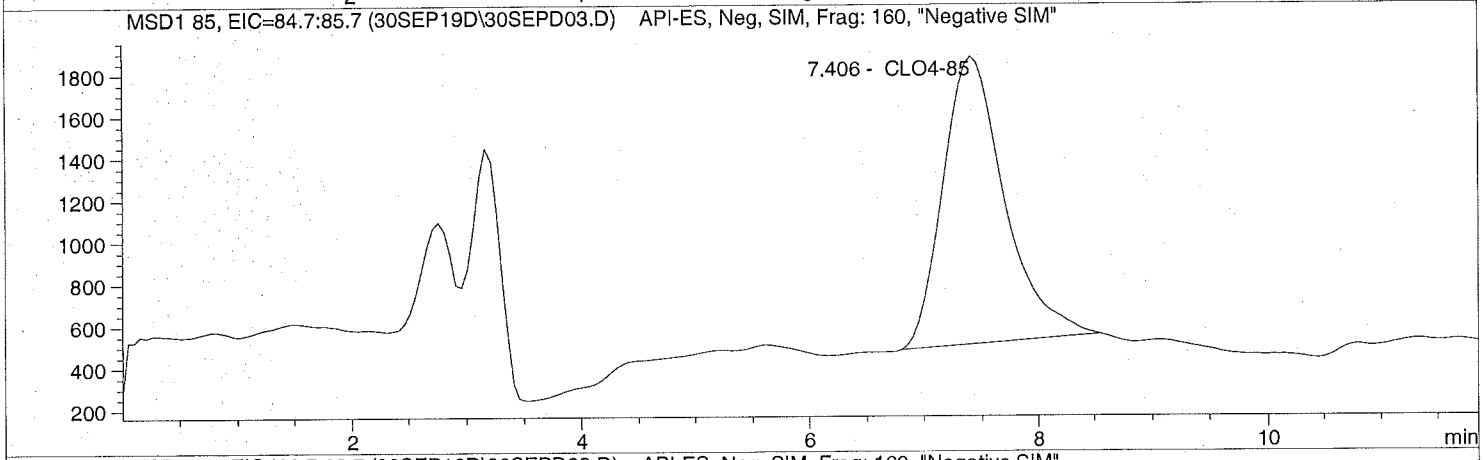
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD03.D Sample Name: 676274 ICS@3.0

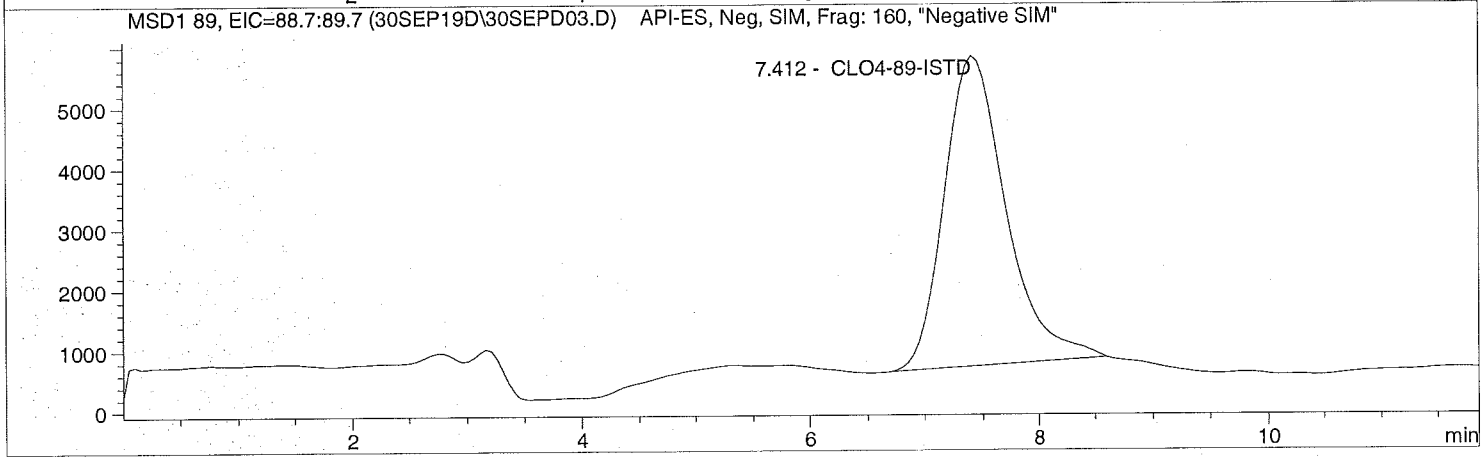
Injection Date:	9/30/2019 09:22:40	Seq Line:	3
Sample Name:	676274 ICS@3.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD03.D Sample Name: 676274 ICS@3.0

Injection Date:	9/30/2019 09:22:40	Seq Line:	3
Sample Name:	676274 ICS@3.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.390	PBA	145680.2	2.8163	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.406	PBA	50783.1	3.1335	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.412	PBA	190155.2	5.0000	CLO4-89-ISTD

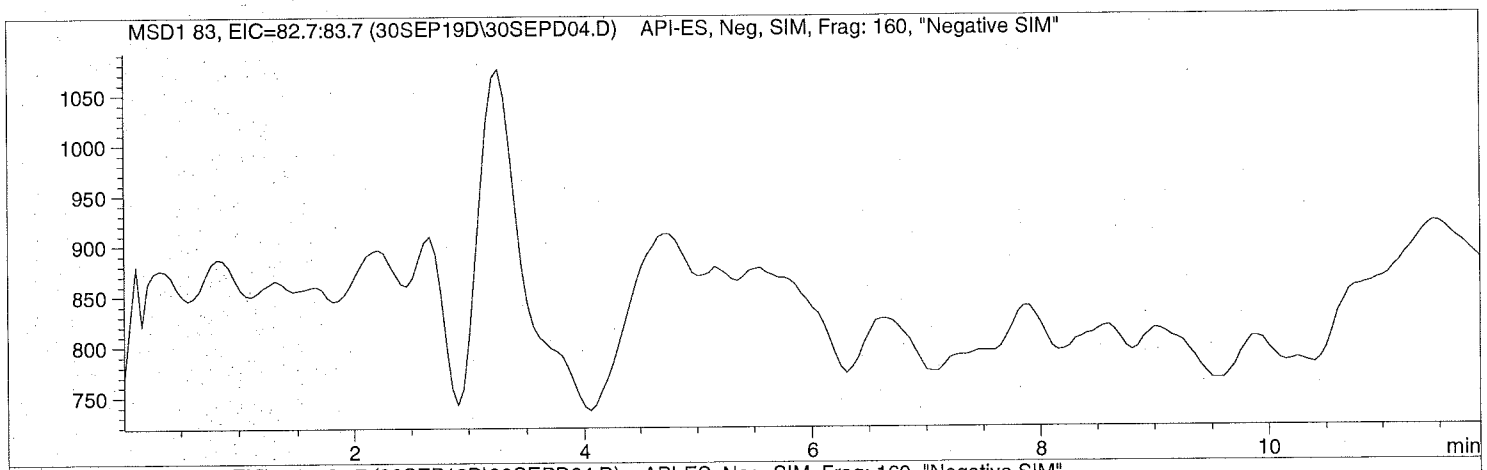
*** End of Report ***

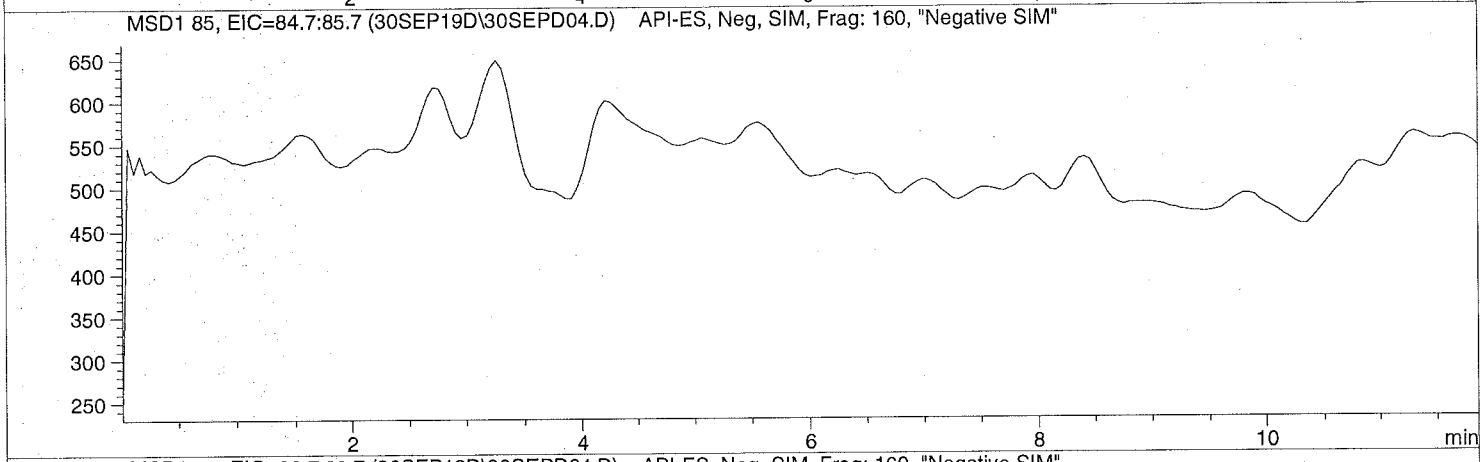
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD04.D Sample Name: 676275 LMB

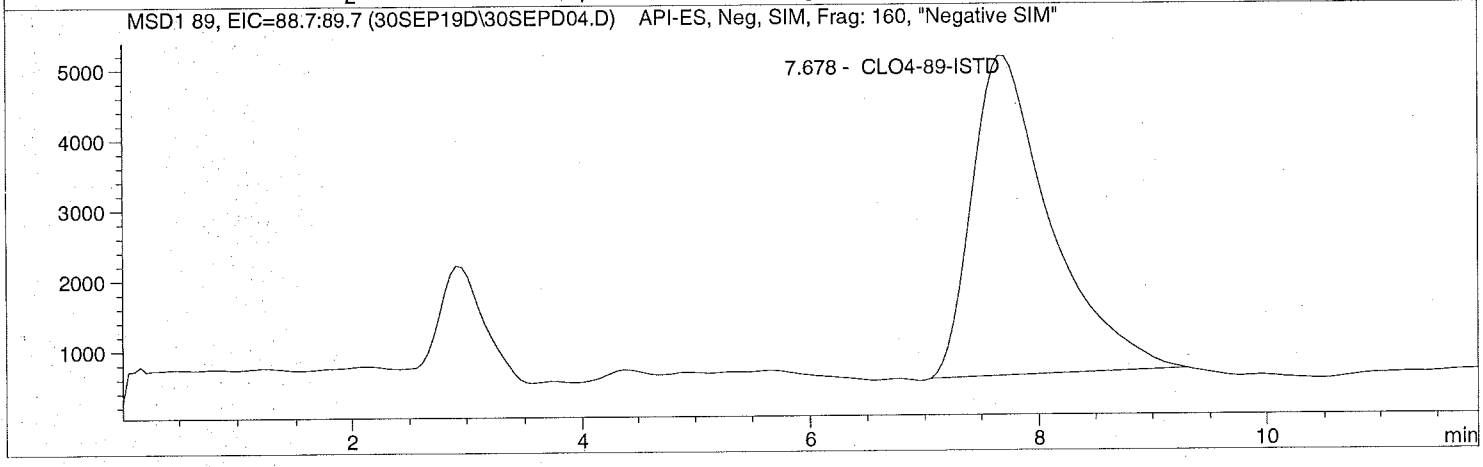
Injection Date:	9/30/2019 09:36:31	Seq Line:	4
Sample Name:	676275 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD04.D Sample Name: 676275 LMB

Injection Date:	9/30/2019 09:36:31	Seq Line:	4
Sample Name:	676275 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.678	PBA	216188.0	5.0000	CLO4-89-ISTD

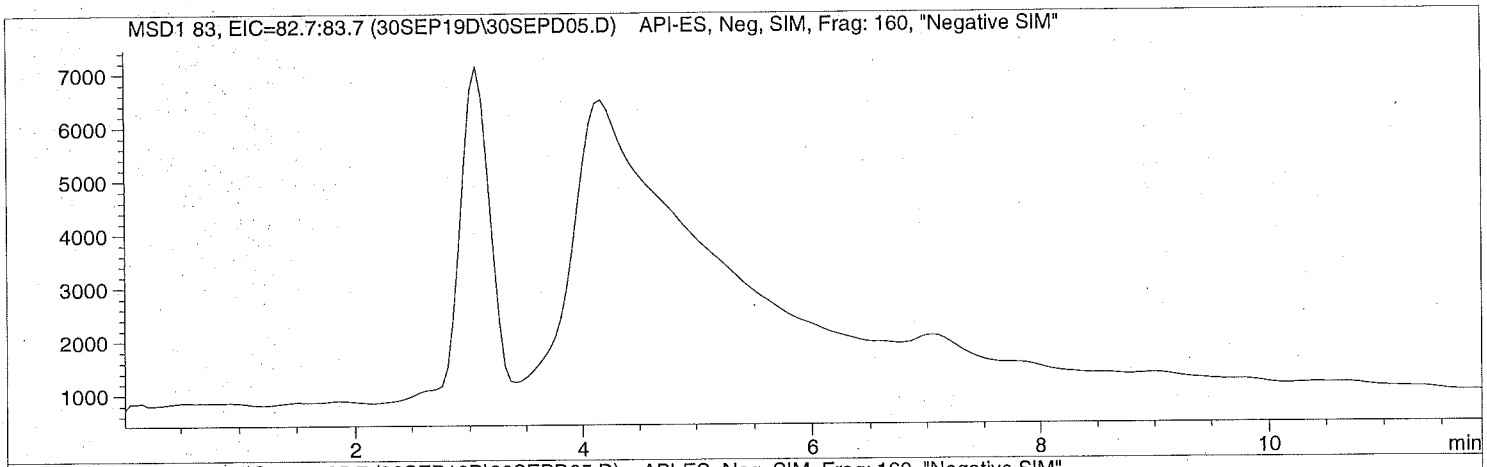
*** End of Report ***

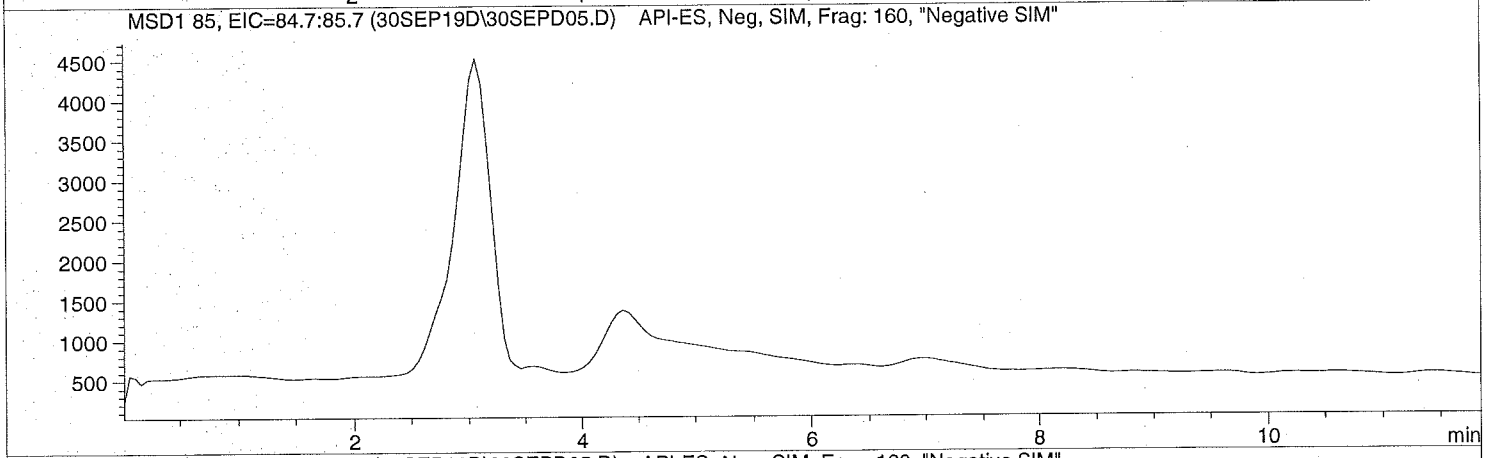
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD05.D Sample Name: 1927216001

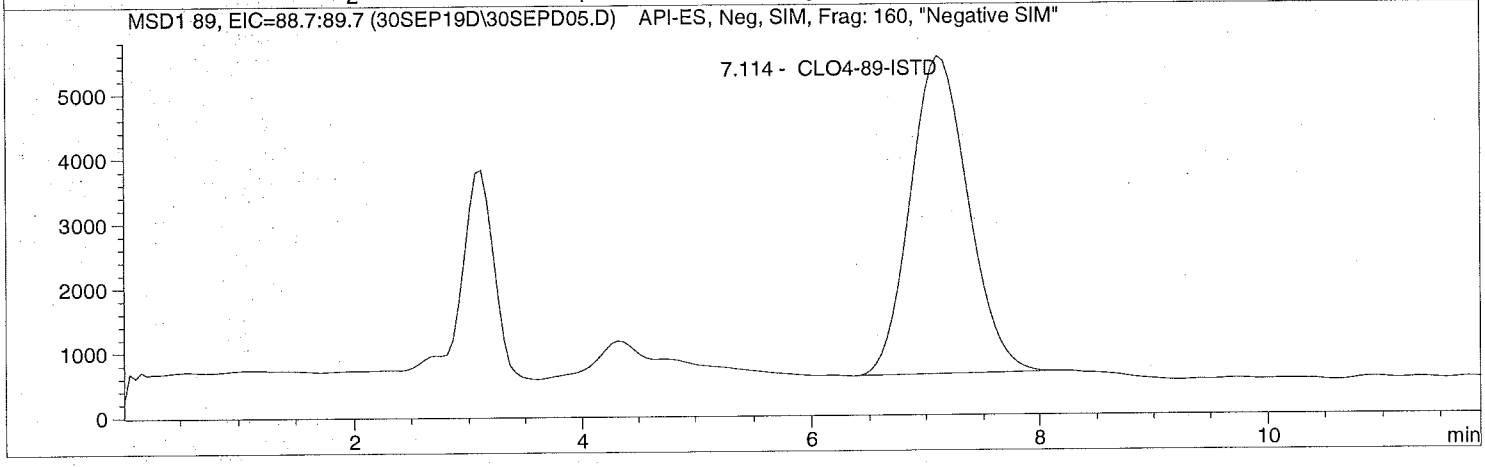
Injection Date:	9/30/2019 09:50:16	Seq Line:	5
Sample Name:	1927216001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD05.D Sample Name: 1927216001

Injection Date:	9/30/2019 09:50:16	Seq Line:	5
Sample Name:	1927216001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.114	PBA	173072.1	5.0000	CLO4-89-ISTD

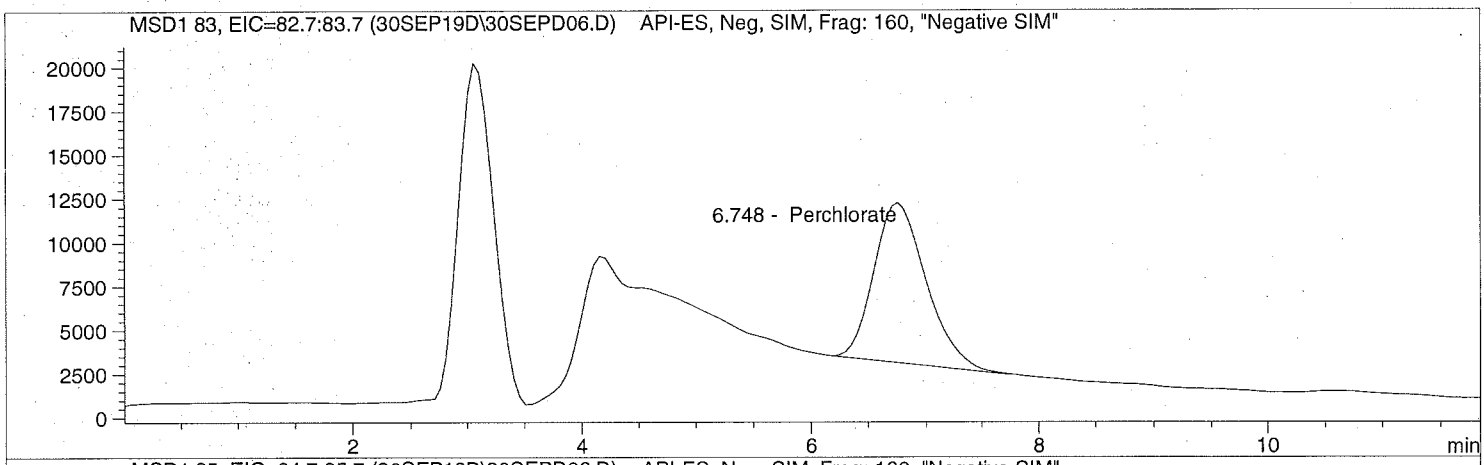
*** End of Report ***

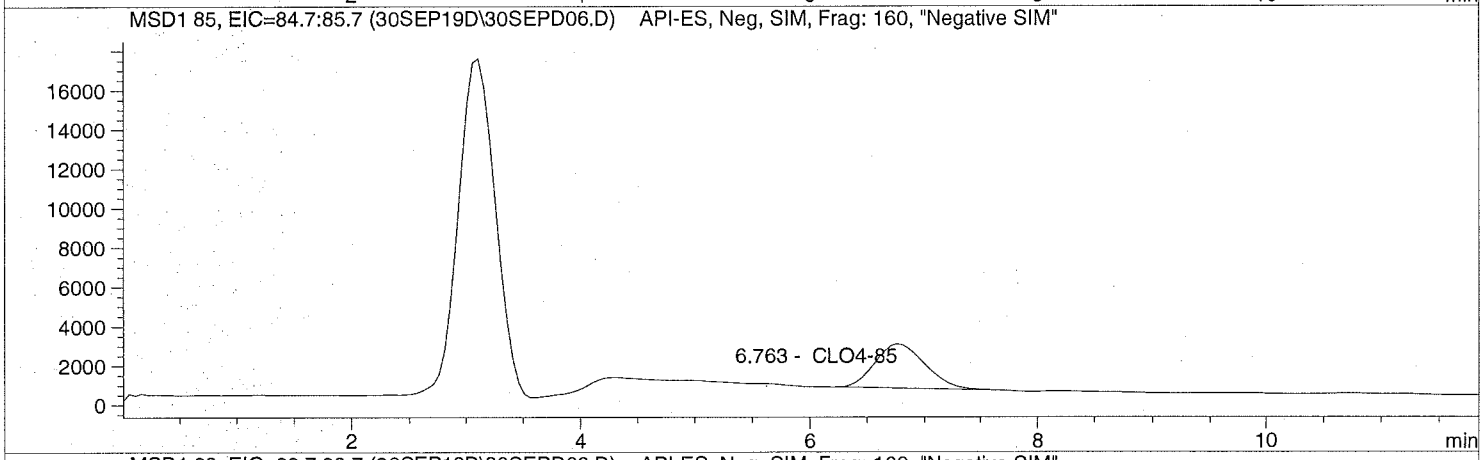
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD06.D Sample Name: 1927216002

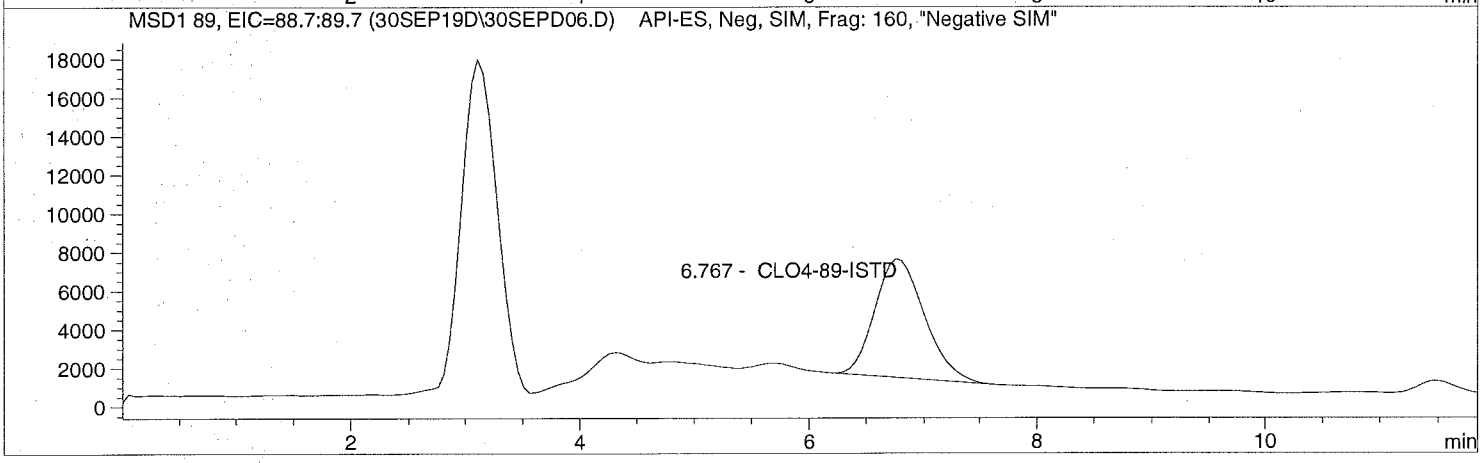
Injection Date:	9/30/2019 10:04:04	Seq Line:	6
Sample Name:	1927216002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD06.D Sample Name: 1927216002

Injection Date:	9/30/2019 10:04:04	Seq Line:	6
Sample Name:	1927216002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.748	BBA	288811.3	5.7512	Perchlorate

NOT REPORTED
FAILS ION RATIO

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.763	PBA	68748.9	4.4046	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.767	PBA	184829.5	5.0000	CLO4-89-ISTD

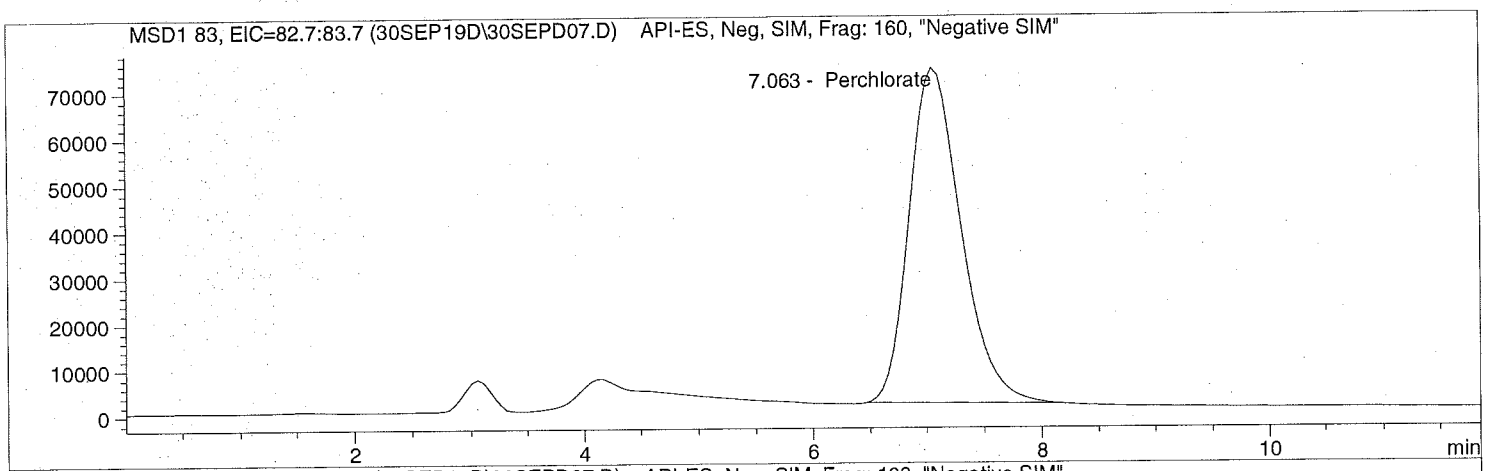
*** End of Report ***

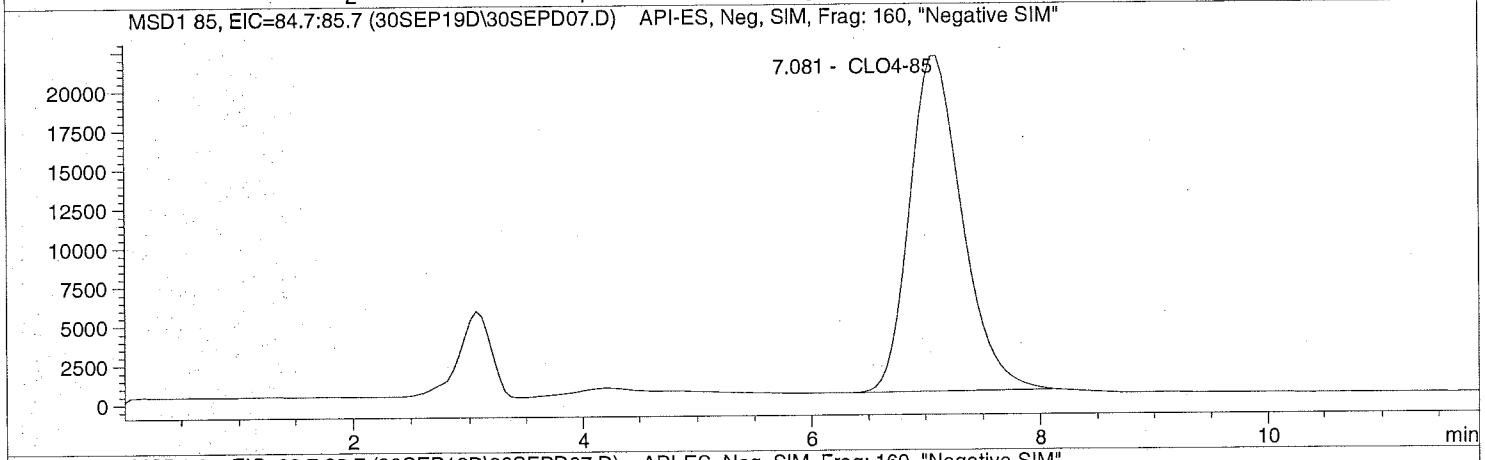
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD07.D Sample Name: 1927216003 10X

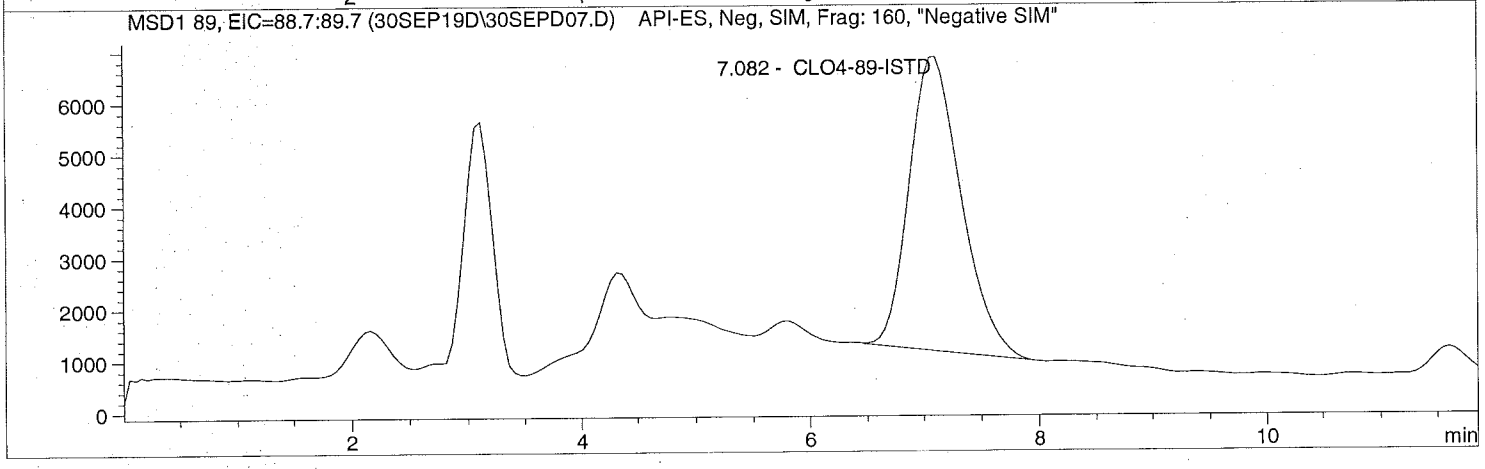
Injection Date:	9/30/2019 10:17:53	Seq Line:	7
Sample Name:	1927216003 10X	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD07.D Sample Name: 1927216003 10X

Injection Date:	9/30/2019 10:17:53	Seq Line:	7
Sample Name:	1927216003 10X	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.063	PBA	2281326.7	407.9915	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.081	PBA	682058.6	402.8534	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.082	BBA	179251.3	50.0000	CLO4-89-ISTD

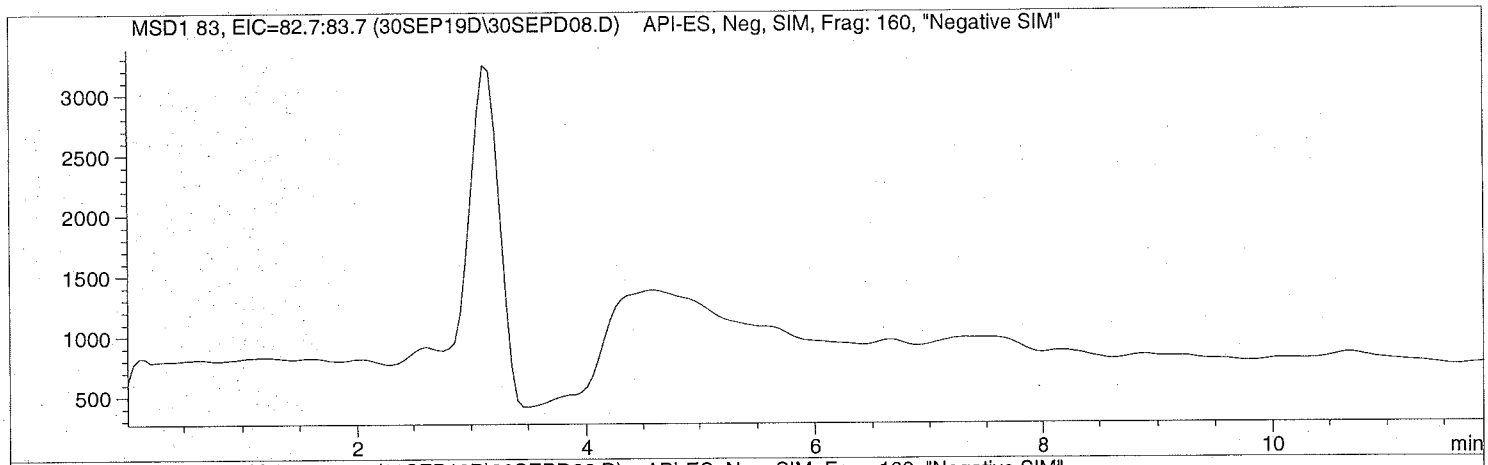
*** End of Report ***

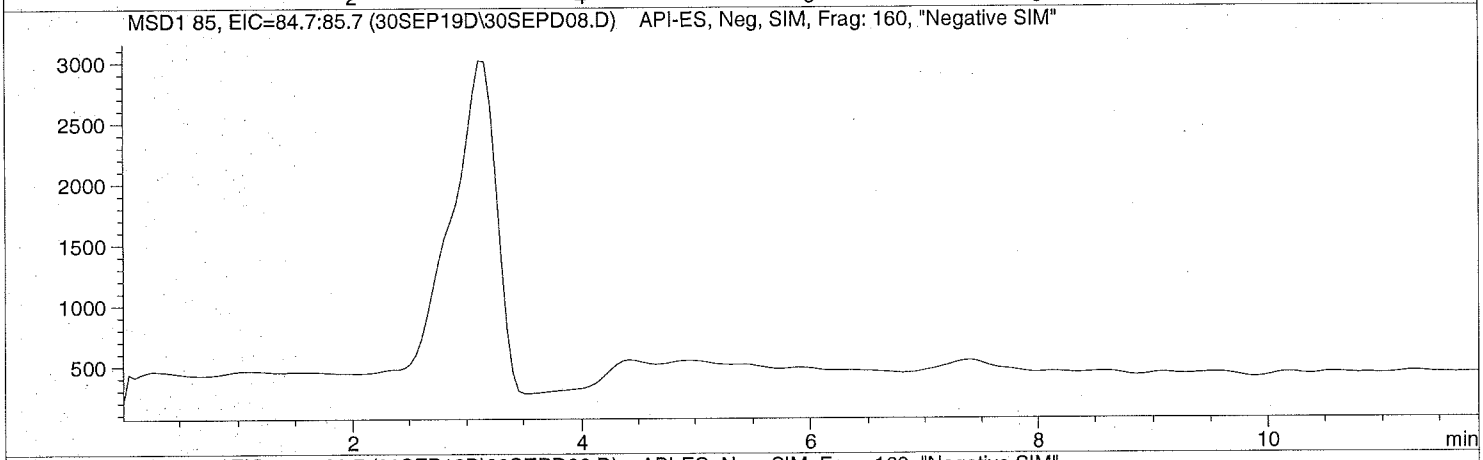
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD08.D Sample Name: 1927216004

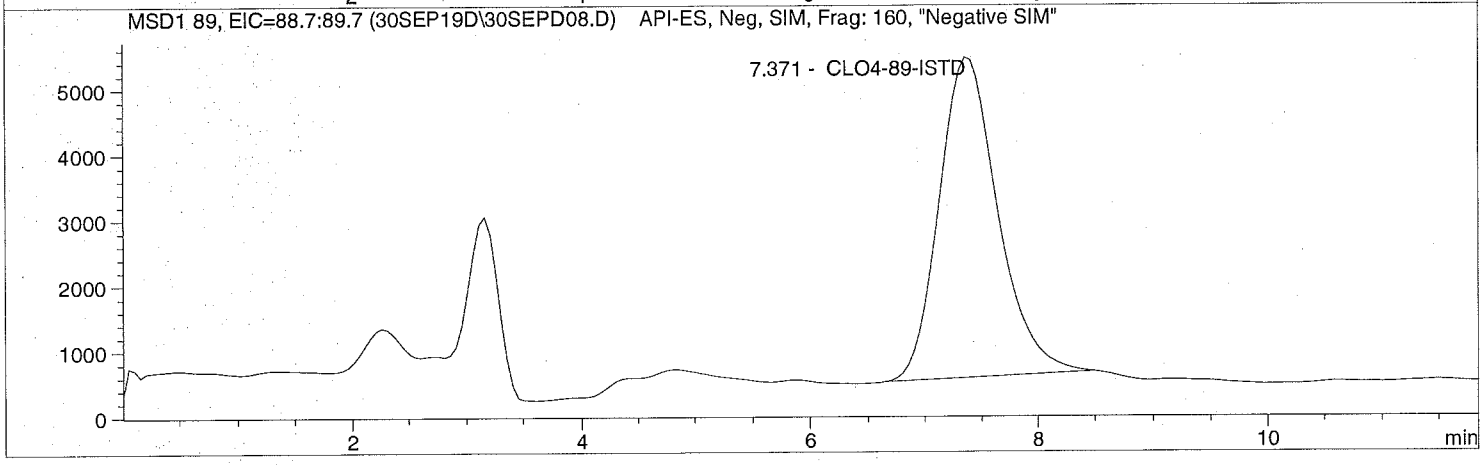
Injection Date:	9/30/2019 10:31:39	Seq Line:	8
Sample Name:	1927216004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD08.D Sample Name: 1927216004

Injection Date:	9/30/2019 10:31:39	Seq Line:	8
Sample Name:	1927216004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.371	PBA	174978.6	5.0000	CLO4-89-ISTD

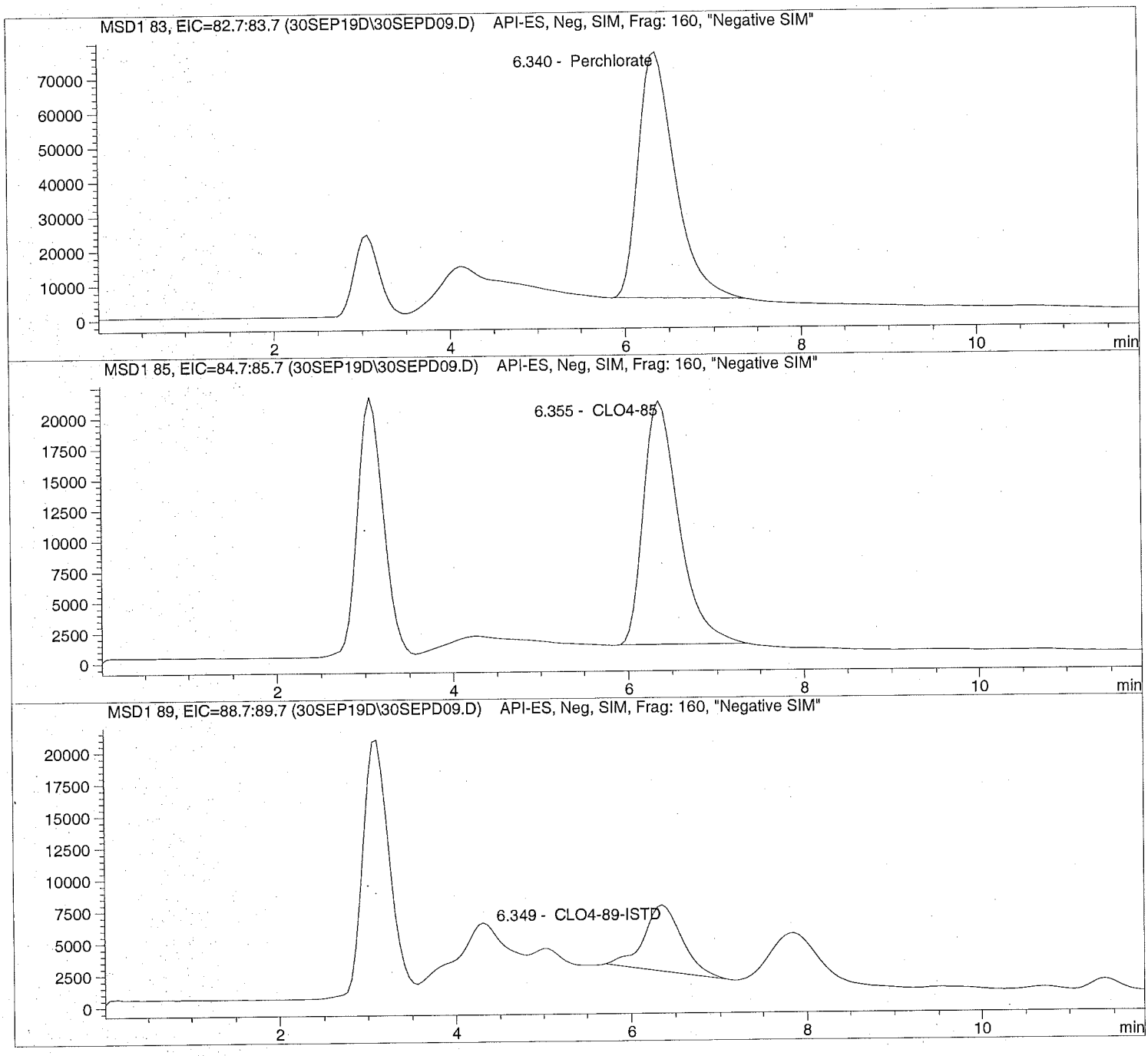
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD09.D Sample Name: 1927216005

Injection Date:	9/30/2019 10:45:27	Seq Line:	9
Sample Name:	1927216005	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD09.D Sample Name: 1927216005

Injection Date:	9/30/2019 10:45:27	Seq Line:	9
Sample Name:	1927216005	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.340	PBA	2046757.0	42.1103	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.355	PBA	551912.3	38.0117	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.349	PBA	155012.2	5.0000	CLO4-89-ISTD

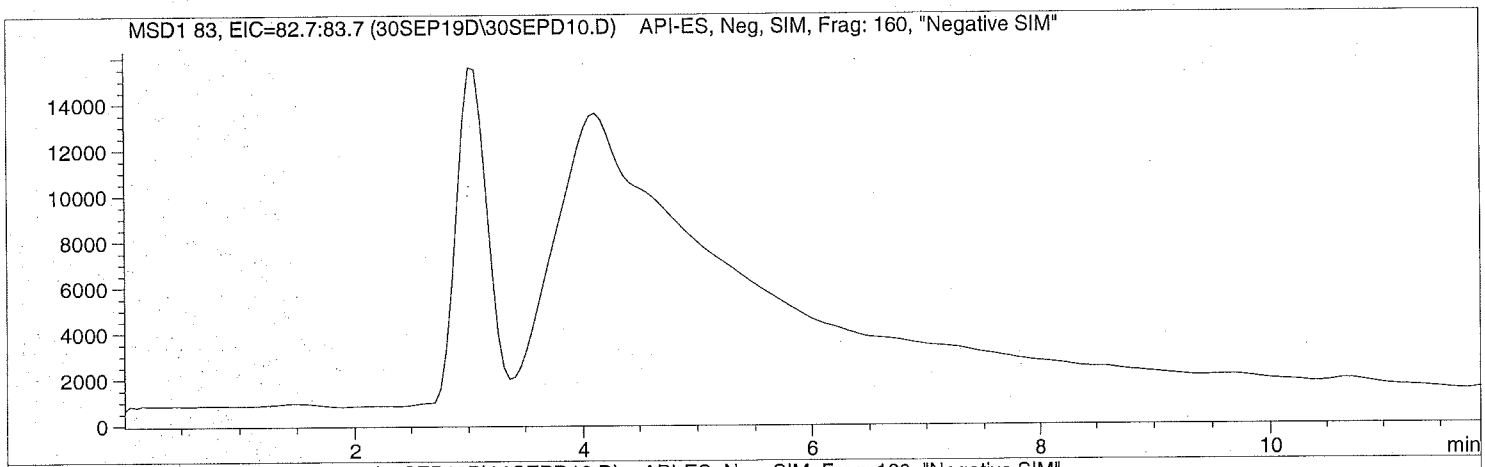
*** End of Report ***

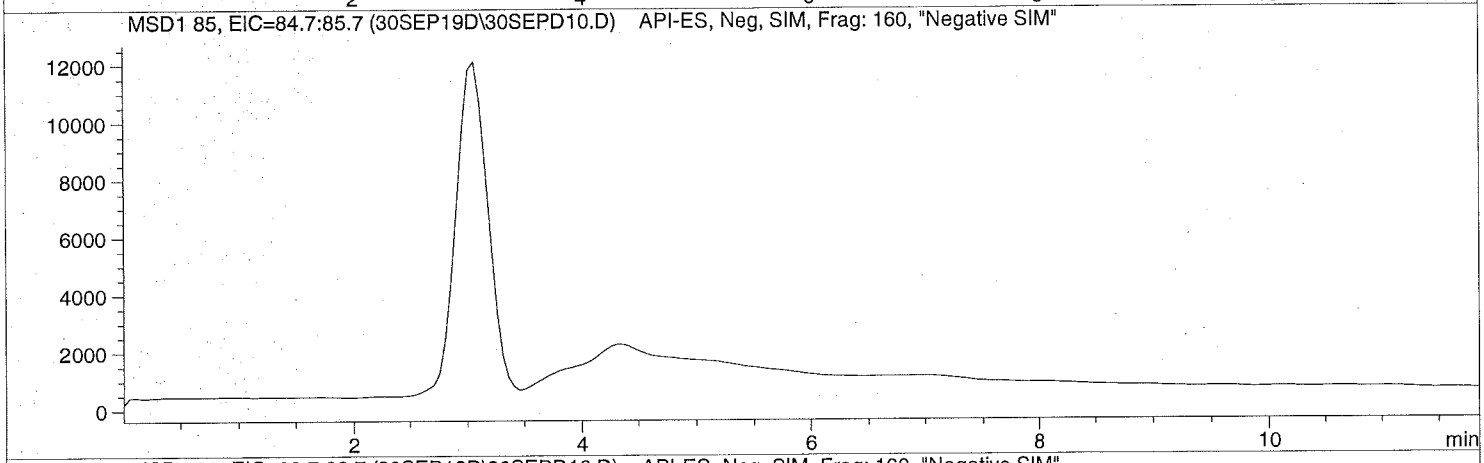
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD10.D Sample Name: 1927216006

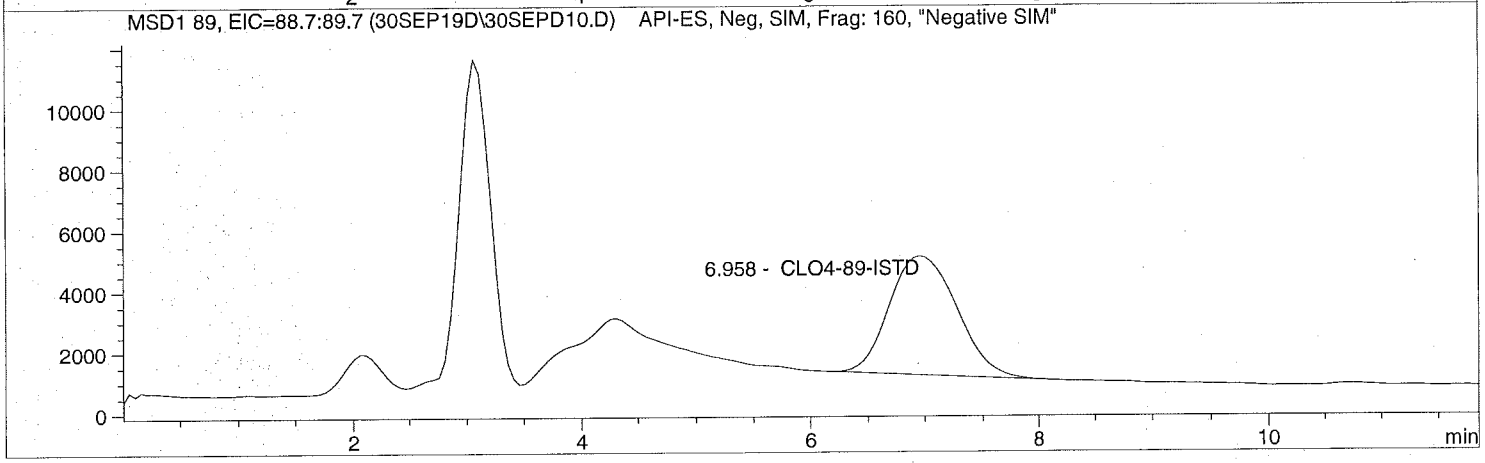
Injection Date:	9/30/2019 10:59:16	Seq Line:	10
Sample Name:	1927216006	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD10.D Sample Name: 1927216006

Injection Date:	9/30/2019 10:59:16	Seq Line:	10
Sample Name:	1927216006	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.958	PBA	158772.2	5.0000	CLO4-89-ISTD

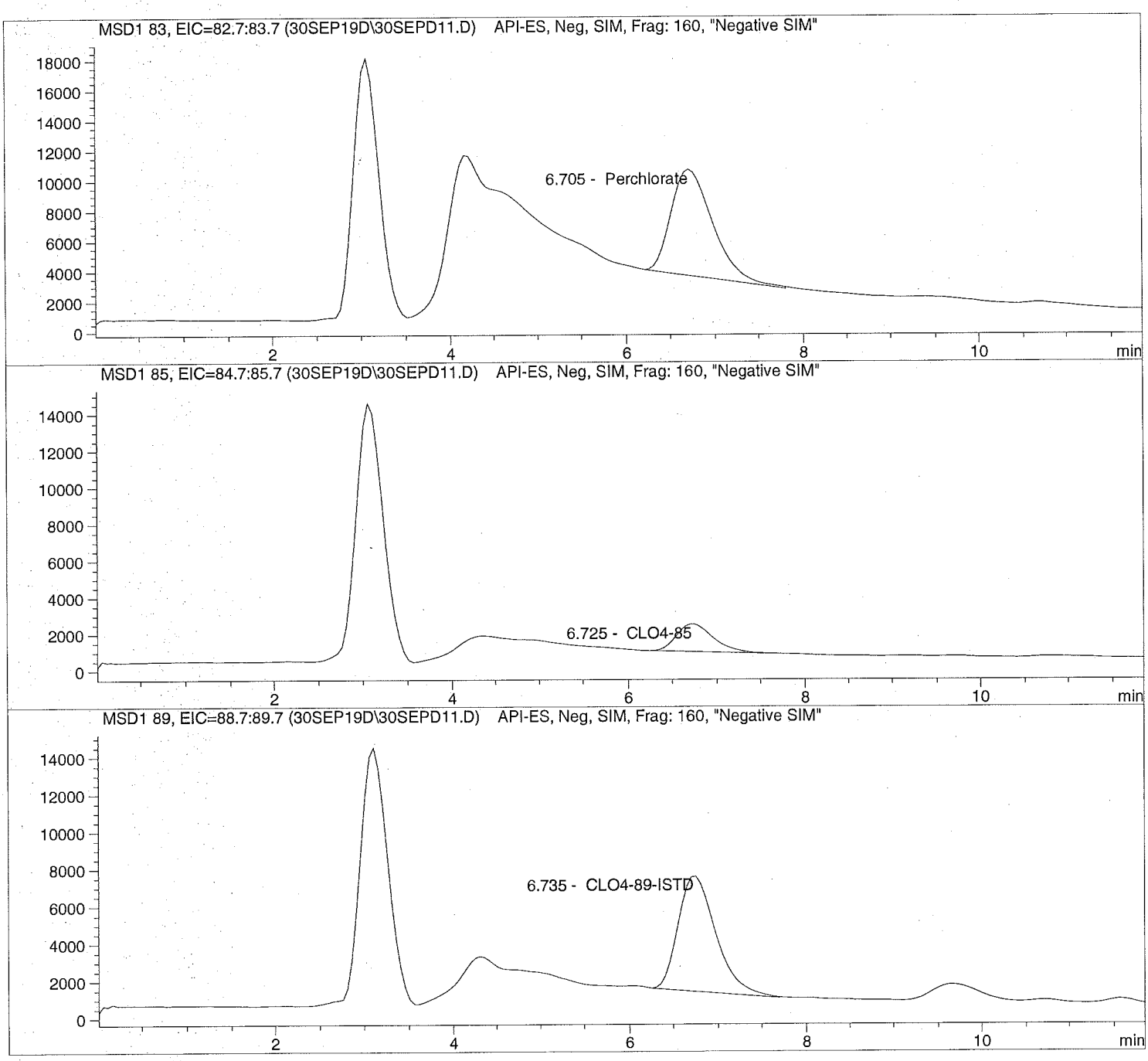
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD11.D Sample Name: 1927216007

Injection Date:	9/30/2019 11:13:04	Seq Line:	11
Sample Name:	1927216007	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD11.D Sample Name: 1927216007

Injection Date:	9/30/2019 11:13:04	Seq Line:	11
Sample Name:	1927216007	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.705	BBA	226434.1	4.6050	Perchlorate

NOT REPORTED
FAILS 83/85 ION RATIO

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.725	PBA	43099.0	2.7756	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.735	BBA	181295.4	5.0000	CLO4-89-ISTD

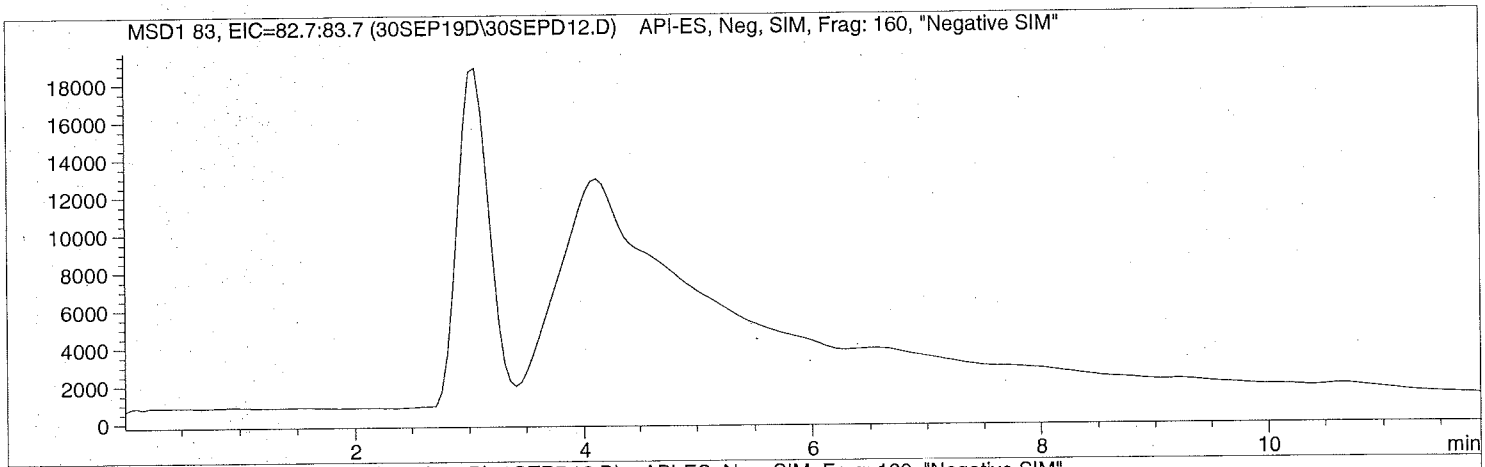
*** End of Report ***

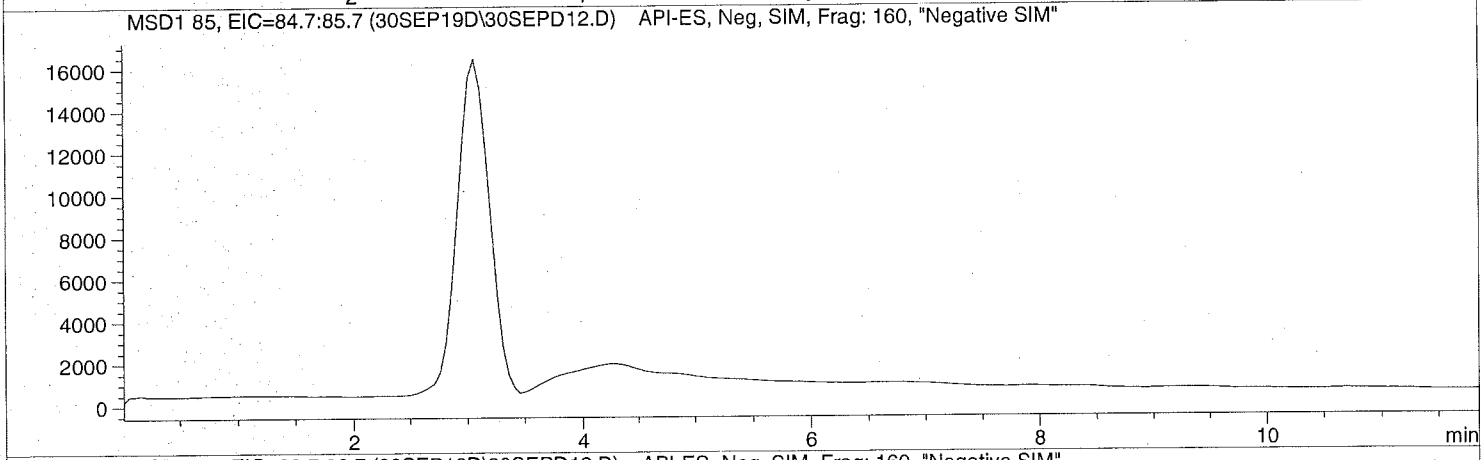
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD12.D Sample Name: 1927216008

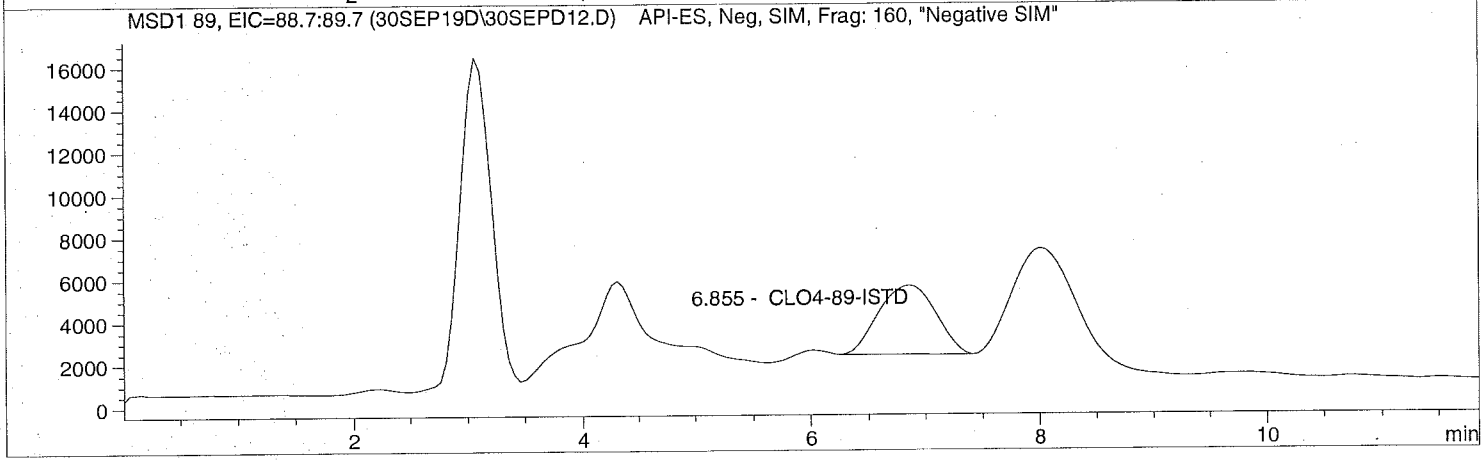
Injection Date:	9/30/2019 11:26:49	Seq Line:	12
Sample Name:	1927216008	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD12.D Sample Name: 1927216008

Injection Date:	9/30/2019 11:26:49	Seq Line:	12
Sample Name:	1927216008	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.855	BB	113295.4	5.0000	CLO4-89-ISTD

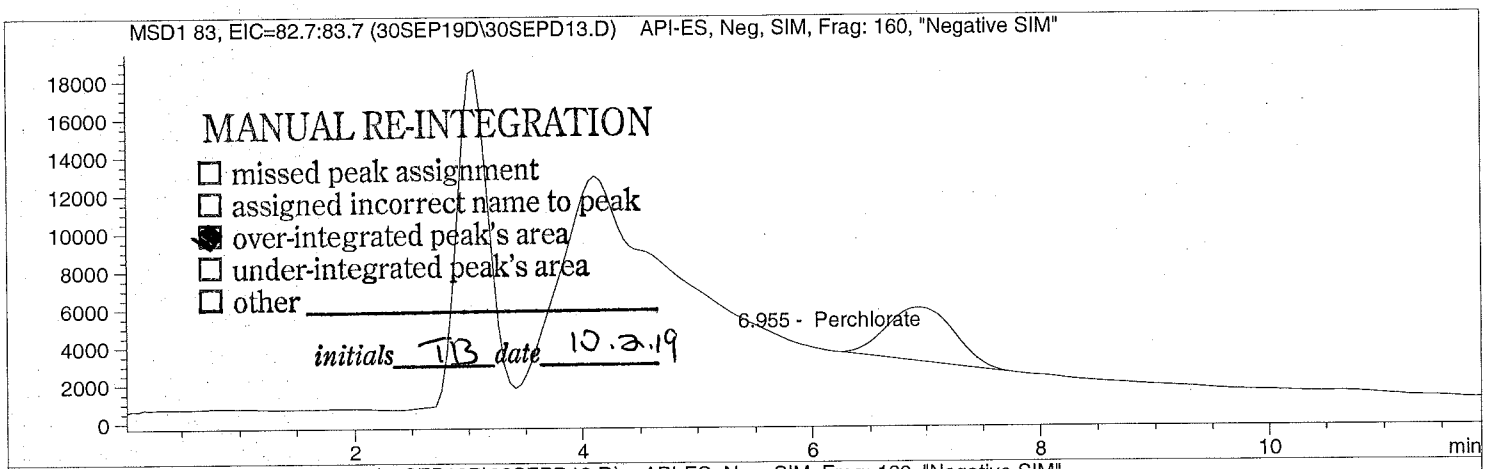
*** End of Report ***

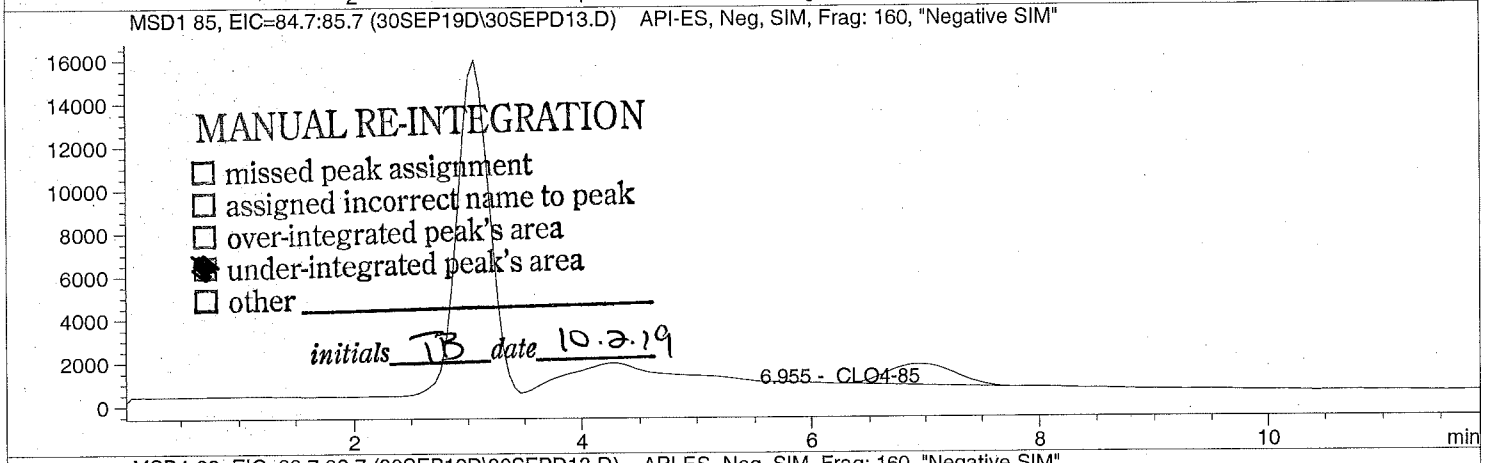
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD13.D Sample Name: 1927216009 MS

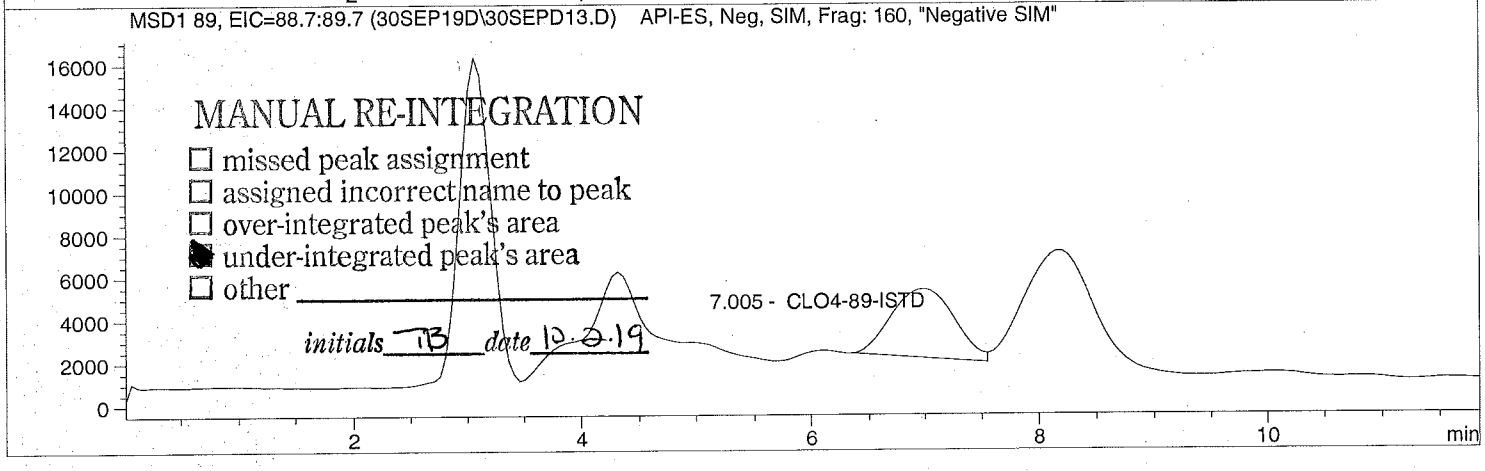
Injection Date:	9/30/2019 11:40:35	Seq Line:	13
Sample Name:	1927216009 MS	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD13.D Sample Name: 1927216009 MS

Injection Date:	9/30/2019 11:40:35	Seq Line:	13
Sample Name:	1927216009 MS	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.955	MM	118250.5	3.4673	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.955	MM	40487.8	3.8030	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.005	MF	125673.6	5.0000	CLO4-89-ISTD

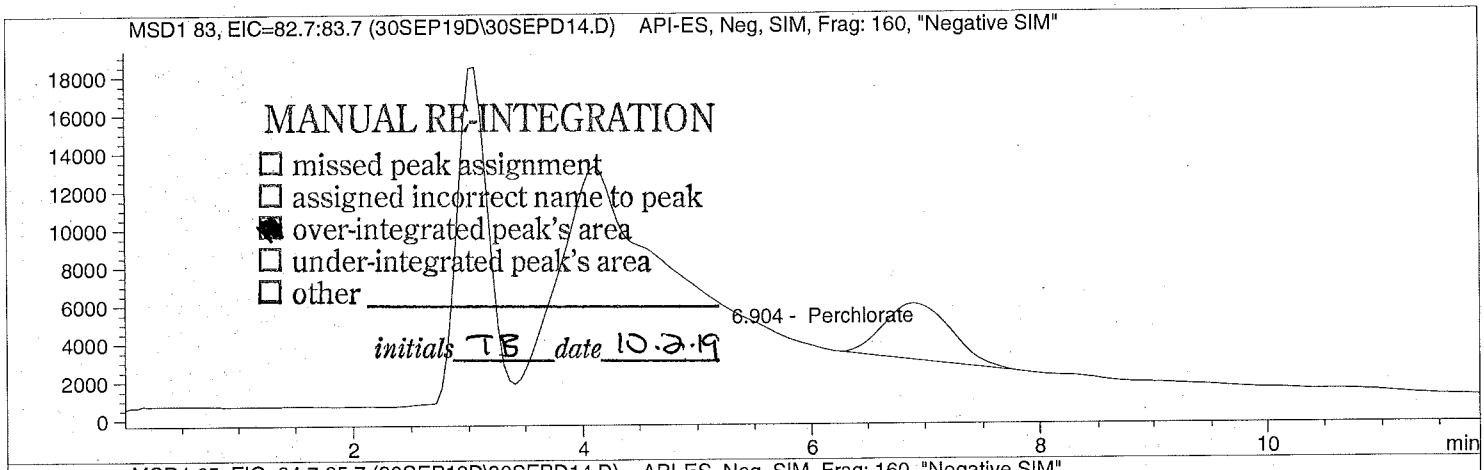
*** End of Report ***

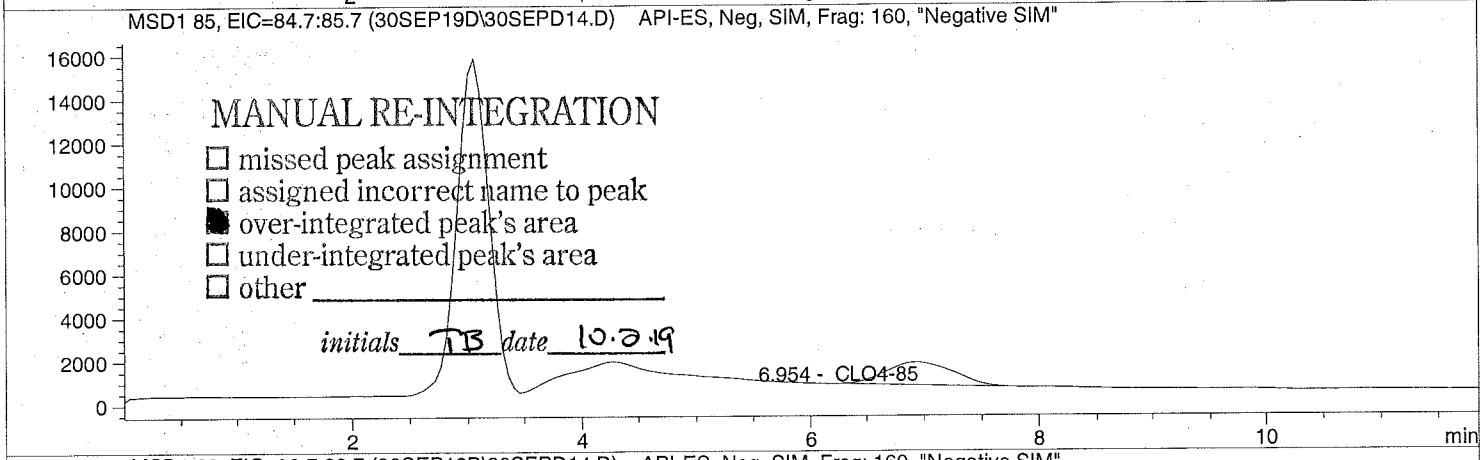
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD14.D Sample Name: 1927216010 MSD

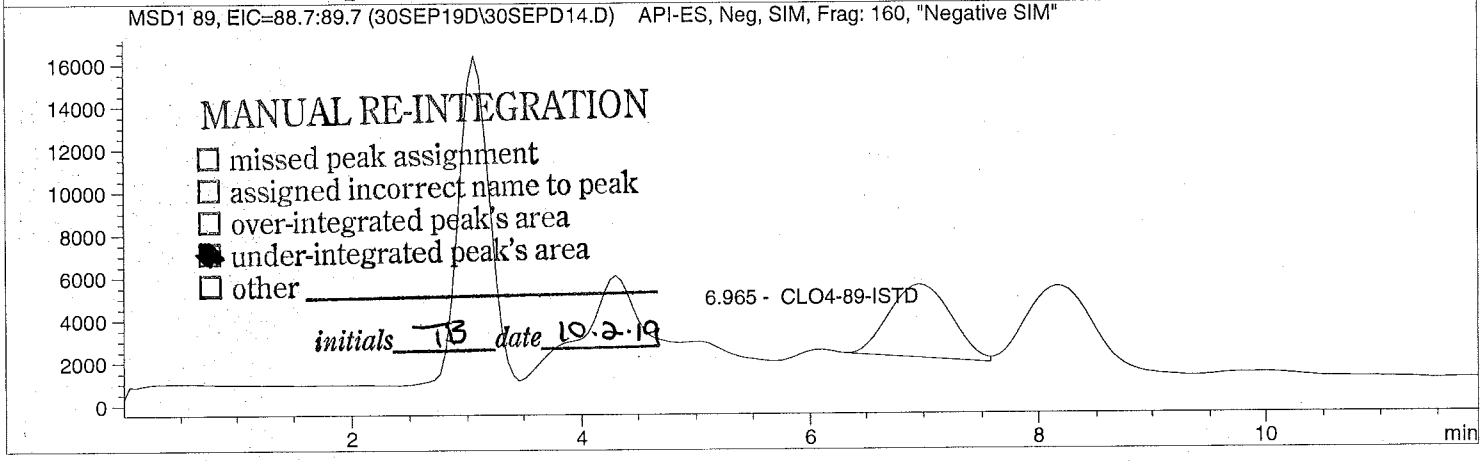
Injection Date:	9/30/2019 11:54:25	Seq Line:	14
Sample Name:	1927216010 MSD	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD14.D Sample Name: 1927216010 MSD

Injection Date:	9/30/2019 11:54:25	Seq Line:	14
Sample Name:	1927216010 MSD	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.904	MM	120090.4	3.4613	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.954	MM	42339.5	3.9120	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.965	MF	127849.4	5.0000	CLO4-89-ISTD

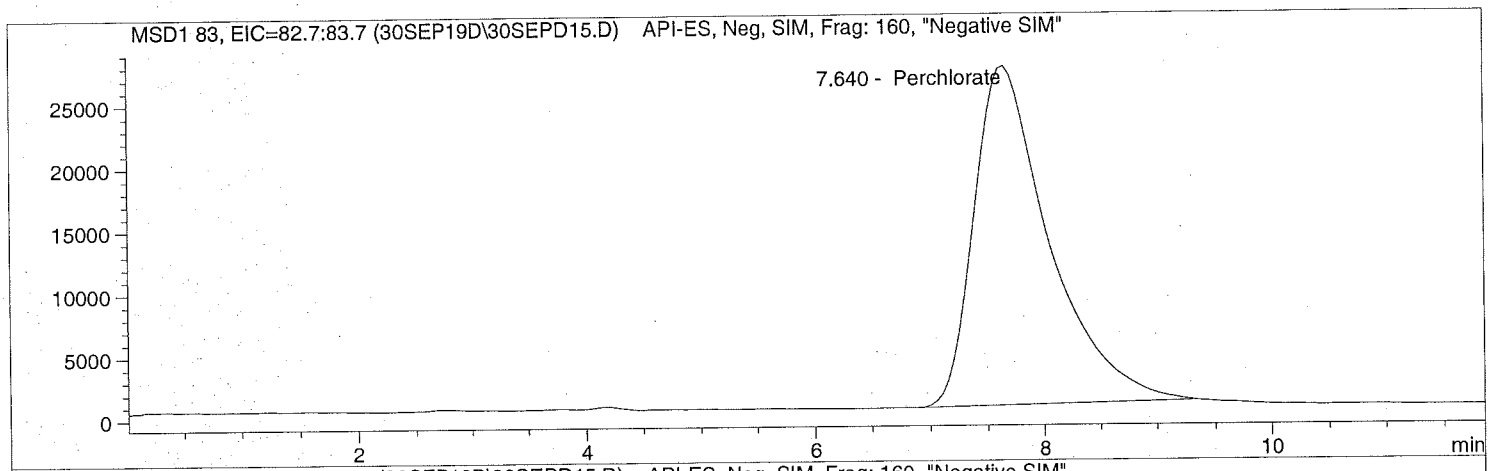
*** End of Report ***

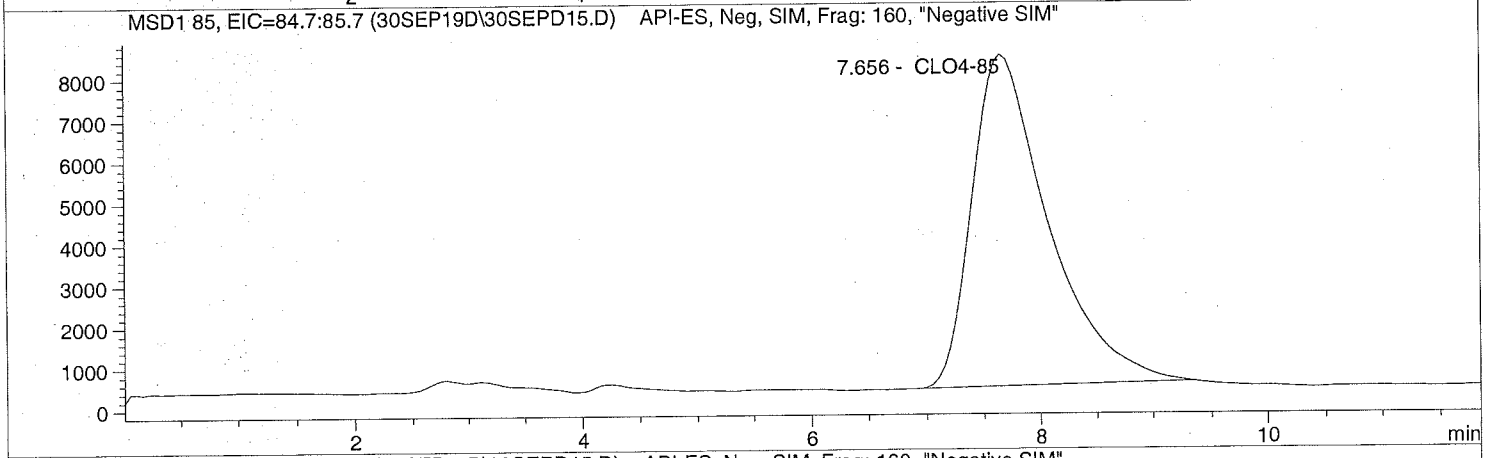
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD15.D Sample Name: 676277 CCV@25

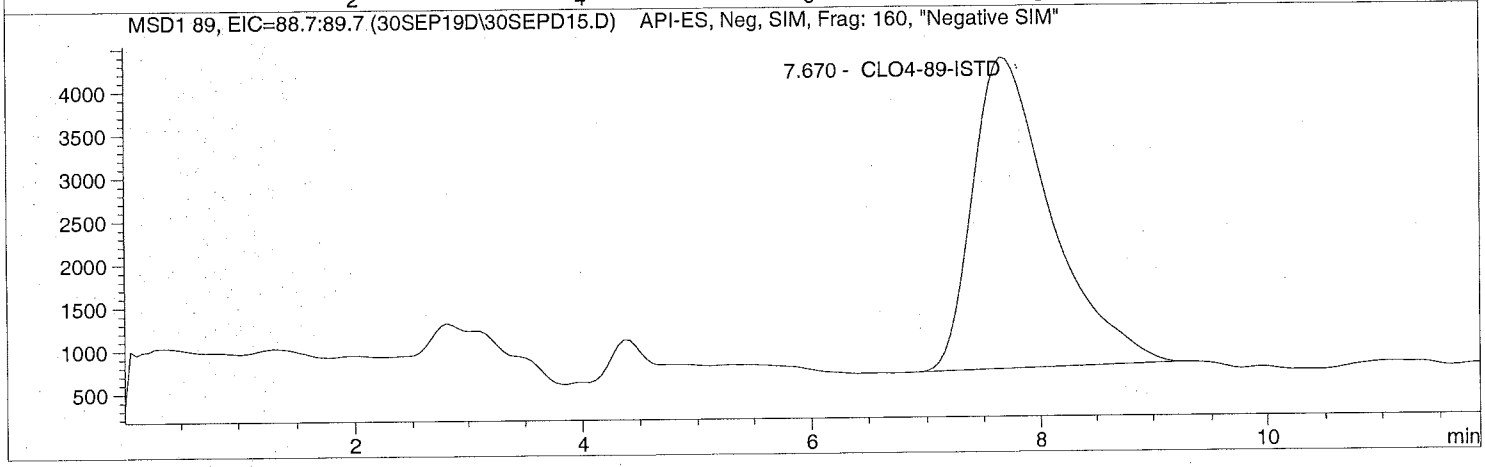
Injection Date:	9/30/2019 12:08:12	Seq Line:	15
Sample Name:	676277 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD15.D Sample Name: 676277 CCV@25

Injection Date:	9/30/2019 12:08:12	Seq Line:	15
Sample Name:	676277 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.640	PBA	1232417.8	24.4420	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.656	PBA	373453.4	24.2967	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.670	PBA	172684.8	5.0000	CLO4-89-ISTD

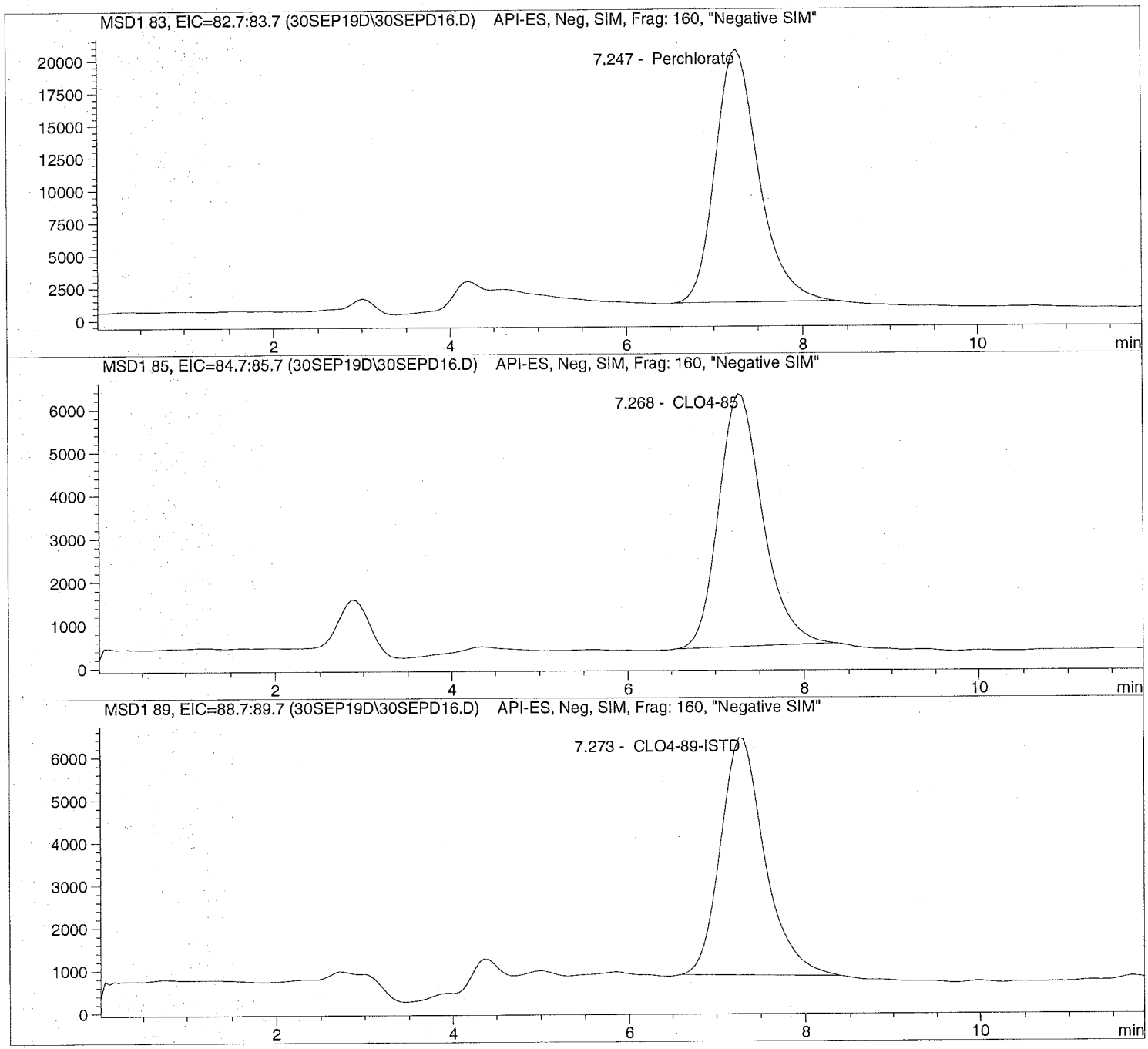
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD16.D Sample Name: 1927216011 10X

Injection Date:	9/30/2019 12:21:59	Seq Line:	16
Sample Name:	1927216011 10X	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD16.D Sample Name: 1927216011 10X

Injection Date:	9/30/2019 12:21:59	Seq Line:	16
Sample Name:	1927216011 10X	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.247	PBA	661979.6	123.7705	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.268	PBA	201335.2	122.6492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.273	BBA	192472.1	50.0000	CLO4-89-ISTD

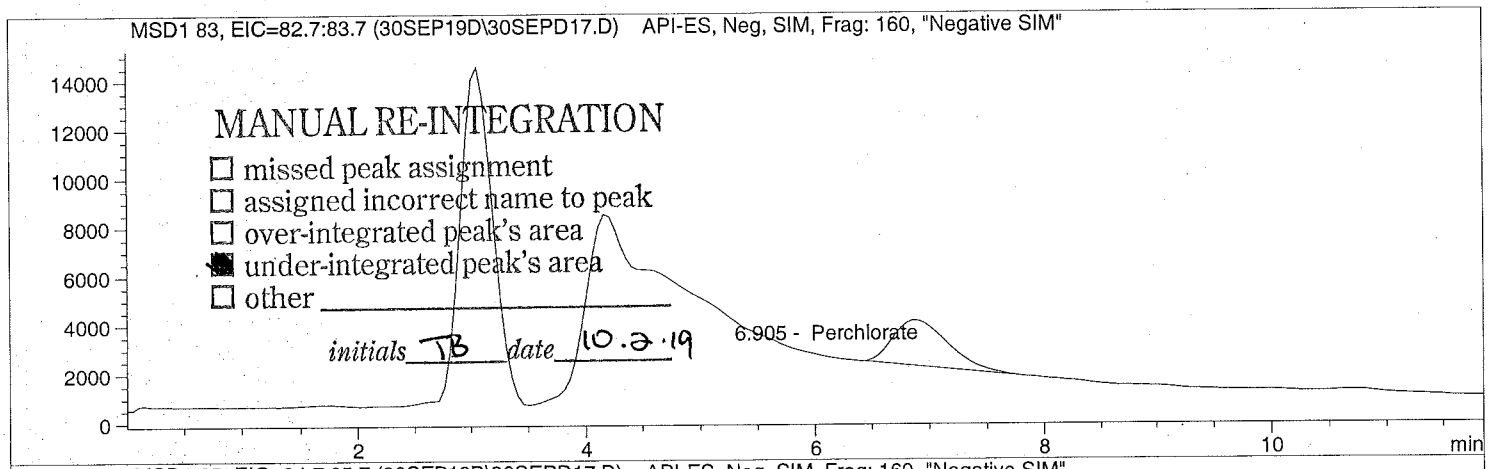
*** End of Report ***

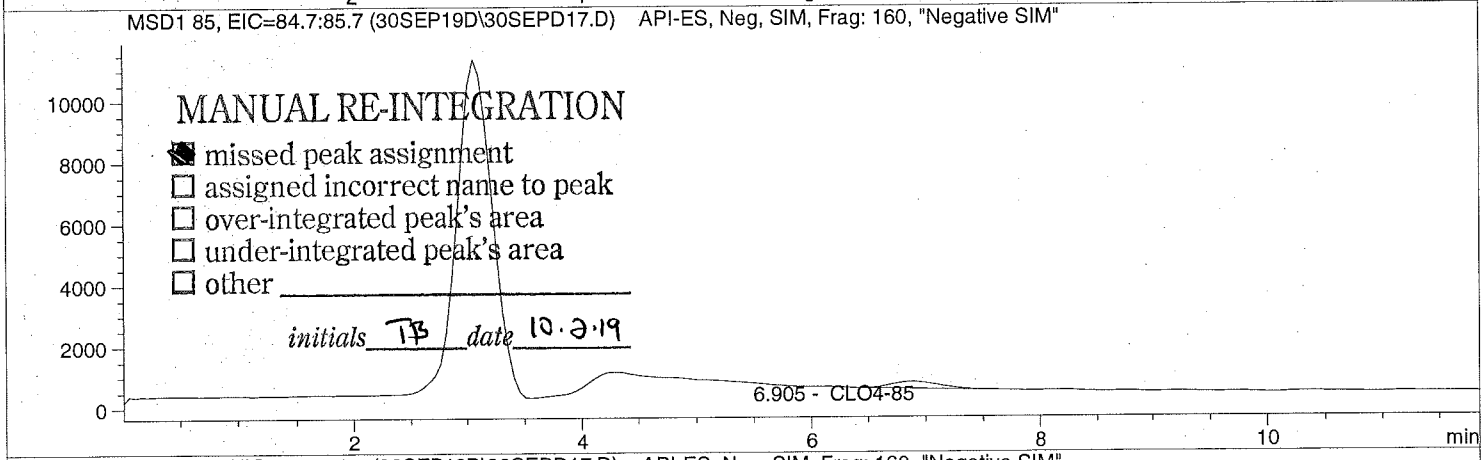
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD17.D Sample Name: 1927216012

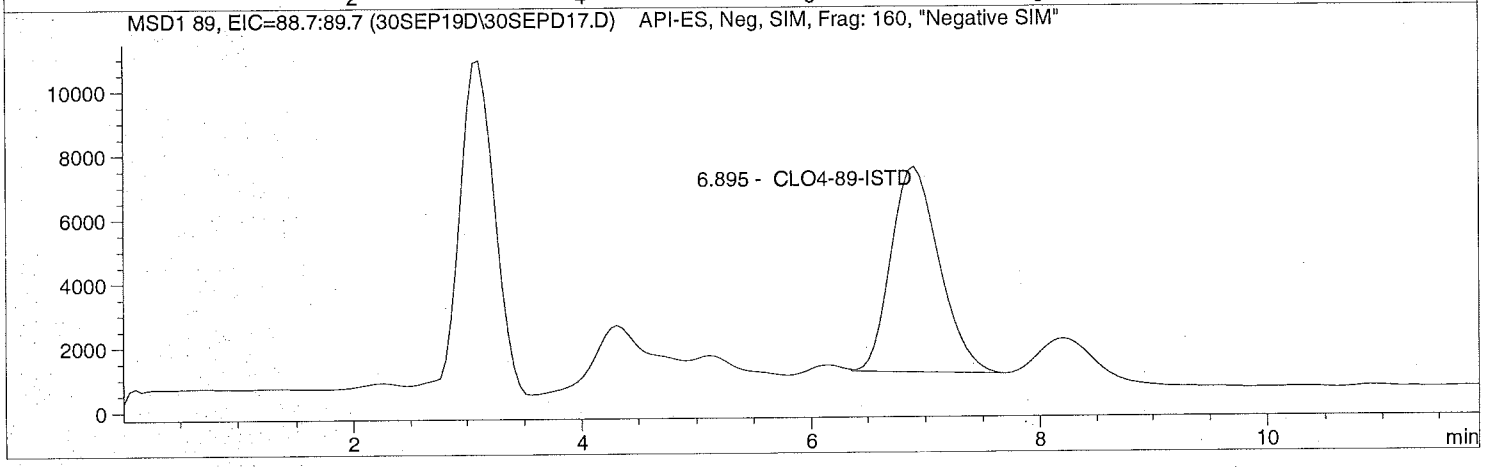
Injection Date:	9/30/2019 12:35:46	Seq Line:	17
Sample Name:	1927216012	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD17.D Sample Name: 1927216012

Injection Date:	9/30/2019 12:35:46	Seq Line:	17
Sample Name:	1927216012	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.905	MM	61398.0	1.1797	Perchlorate

NOT REPORTED
FAILS 83/85 ION RATIO.

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.905	MM	6506.7	0.2721	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.895	BB	185345.9	5.0000	CLO4-89-ISTD

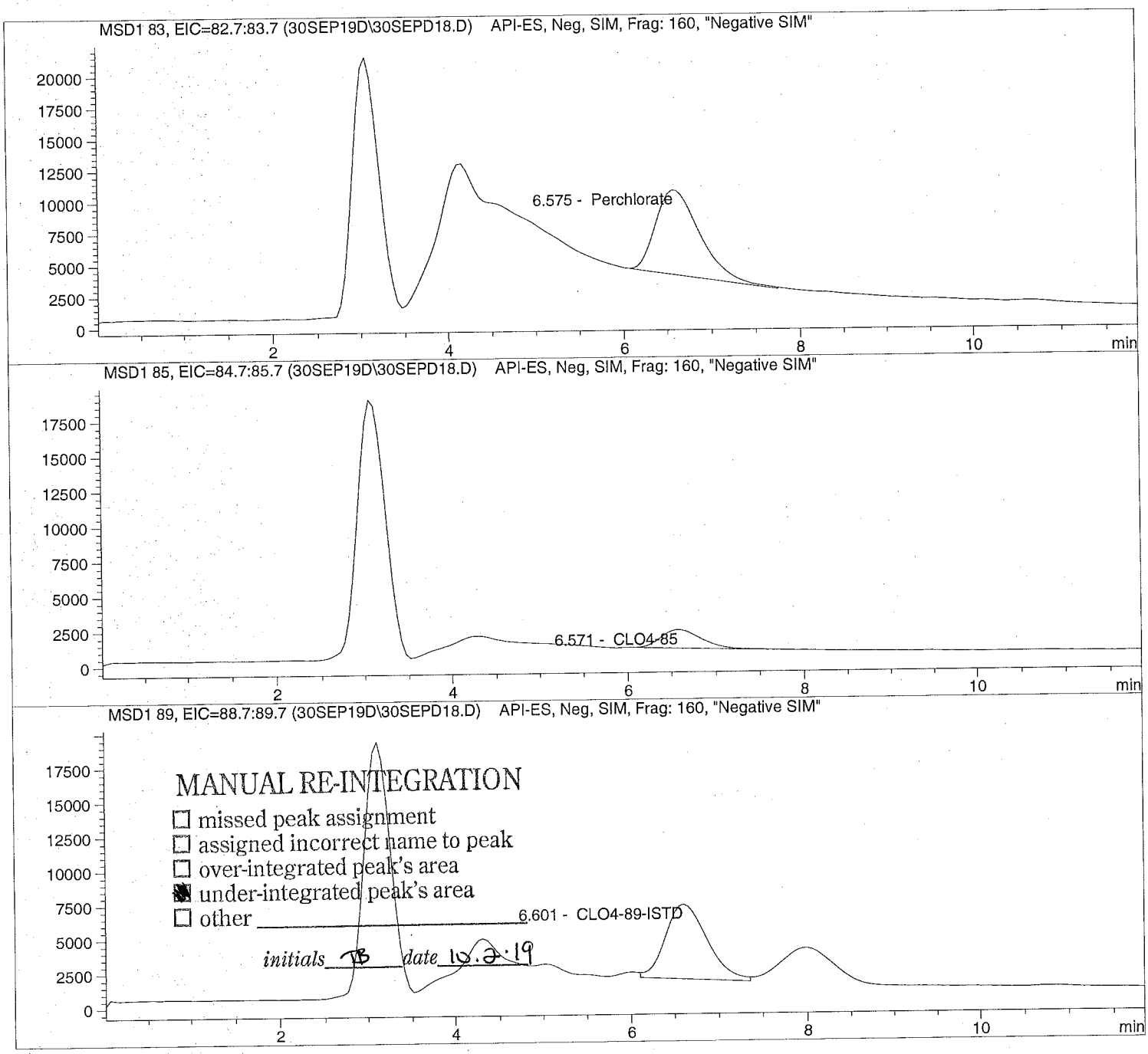
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD18.D Sample Name: 1927216013 MS

Injection Date:	9/30/2019 12:49:35	Seq Line:	18
Sample Name:	1927216013 MS	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD18.D Sample Name: 1927216013 MS

Injection Date:	9/30/2019 12:49:35	Seq Line:	18
Sample Name:	1927216013 MS	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.575	BBA	233237.3	4.8214	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.571	PBA	42356.1	2.7731	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.601	MF	178325.9	5.0000	CLO4-89-ISTD

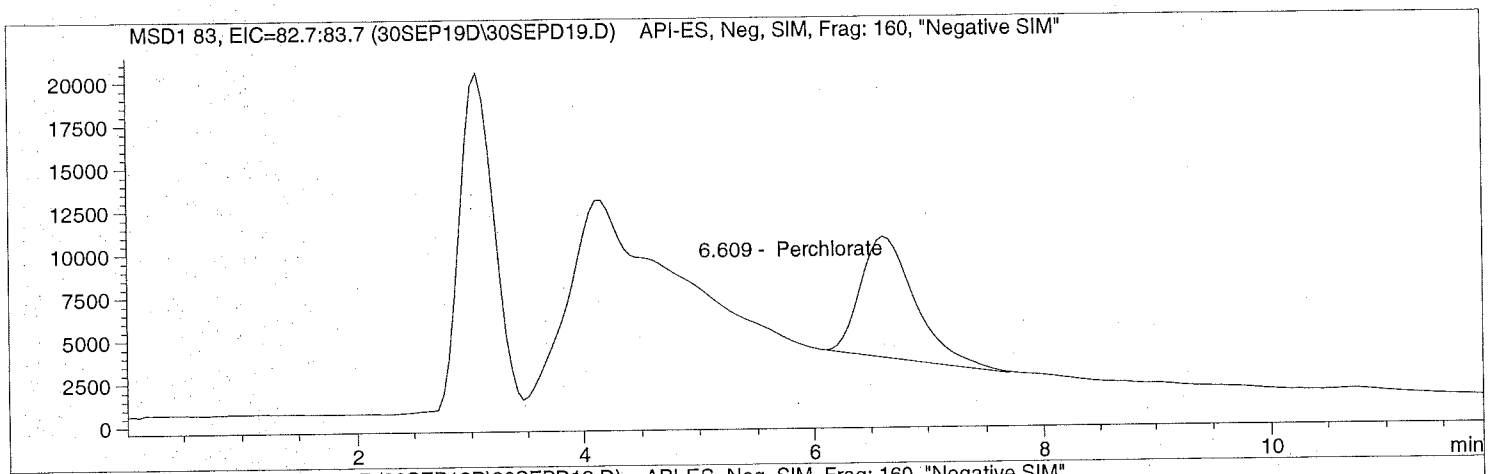
*** End of Report ***

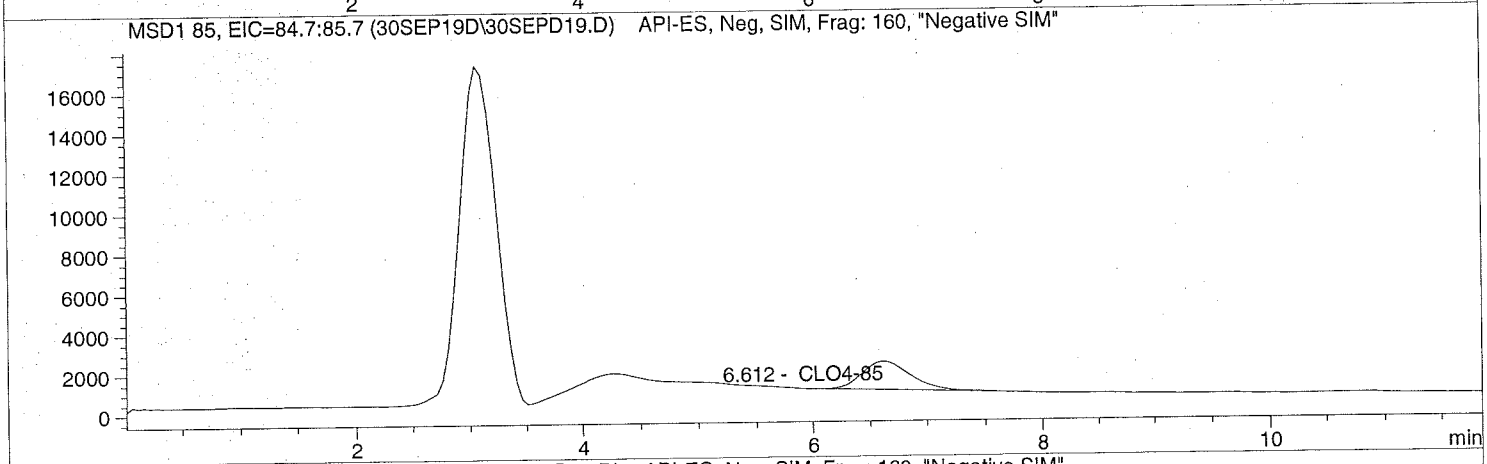
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD19.D Sample Name: 1927216014 MSD

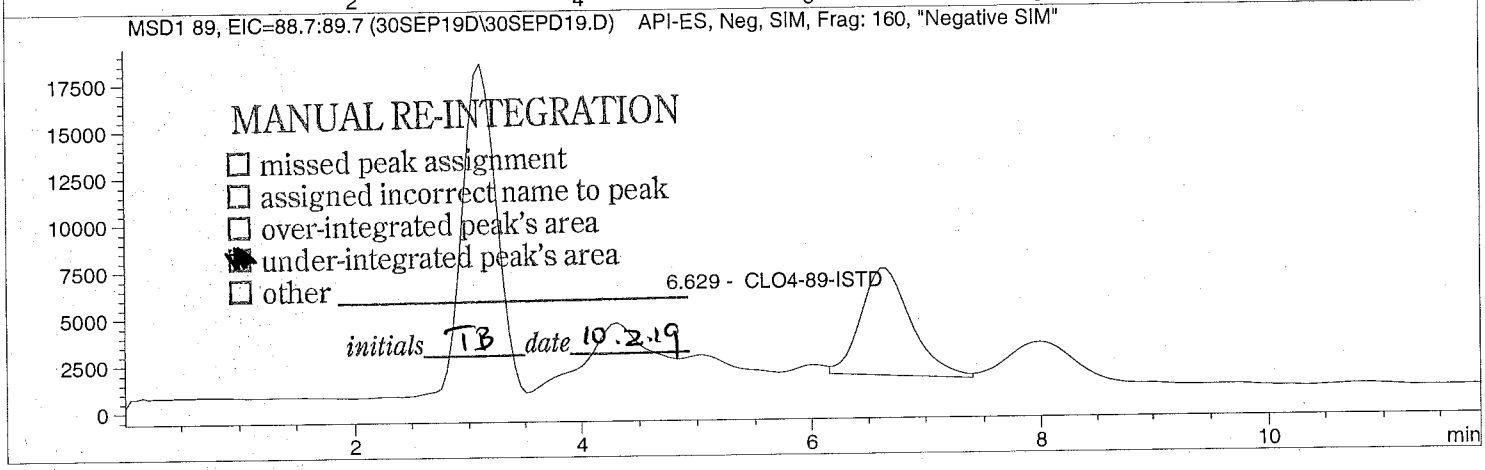
Injection Date:	9/30/2019 13:03:22	Seq Line:	19
Sample Name:	1927216014 MSD	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD19.D Sample Name: 1927216014 MSD

Injection Date:	9/30/2019 13:03:22	Seq Line:	19
Sample Name:	1927216014 MSD	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.609	BBA	235403.7	4.9423	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.612	PBA	42199.5	2.8080	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.629	MF	175551.4	5.0000	CLO4-89-ISTD

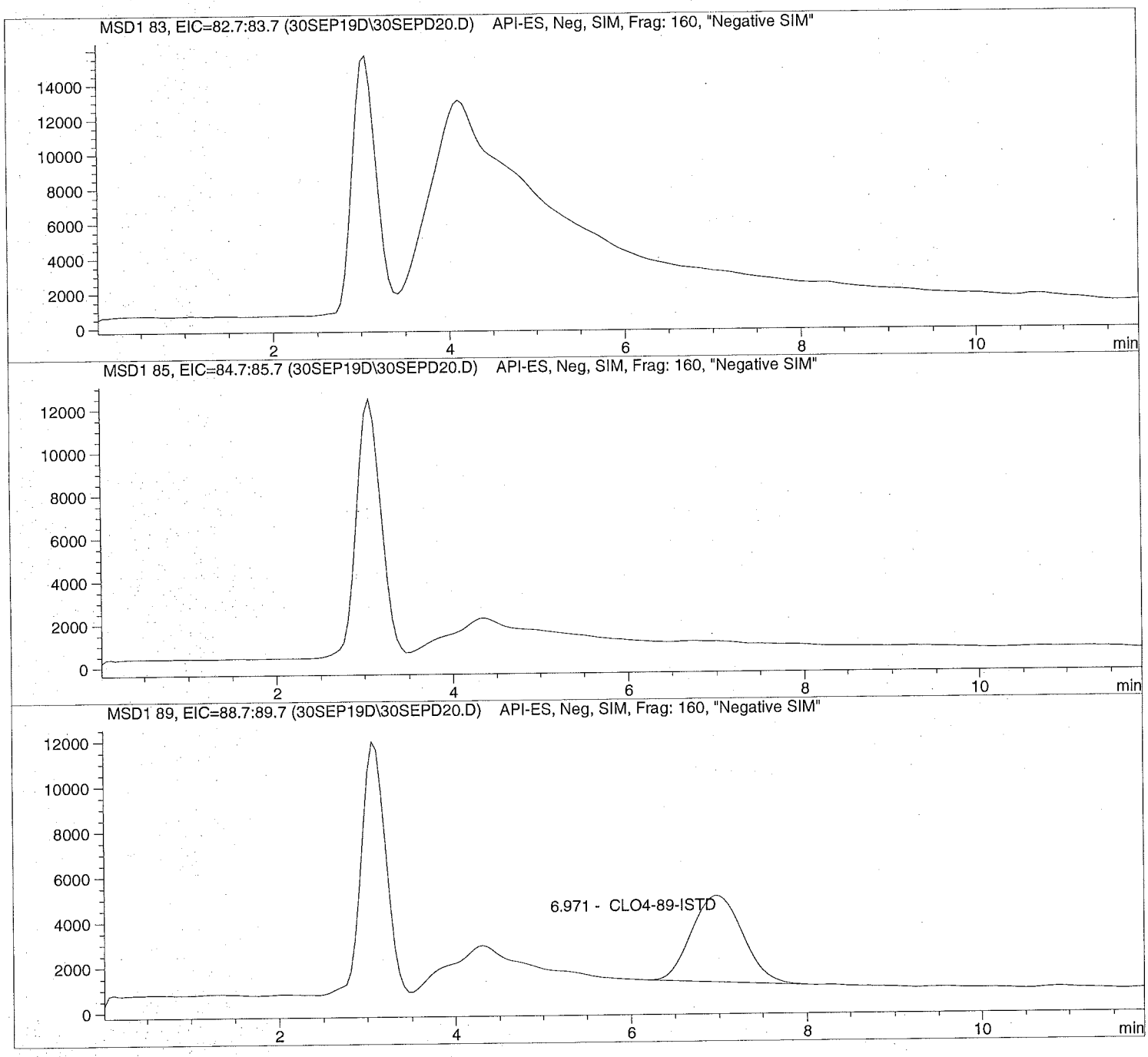
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD20.D Sample Name: 1927216015

Injection Date:	9/30/2019 13:17:11	Seq Line:	20
Sample Name:	1927216015	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD20.D Sample Name: 1927216015

Injection Date:	9/30/2019 13:17:11	Seq Line:	20
Sample Name:	1927216015	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.971	PBA	153701.9	5.0000	CLO4-89-ISTD

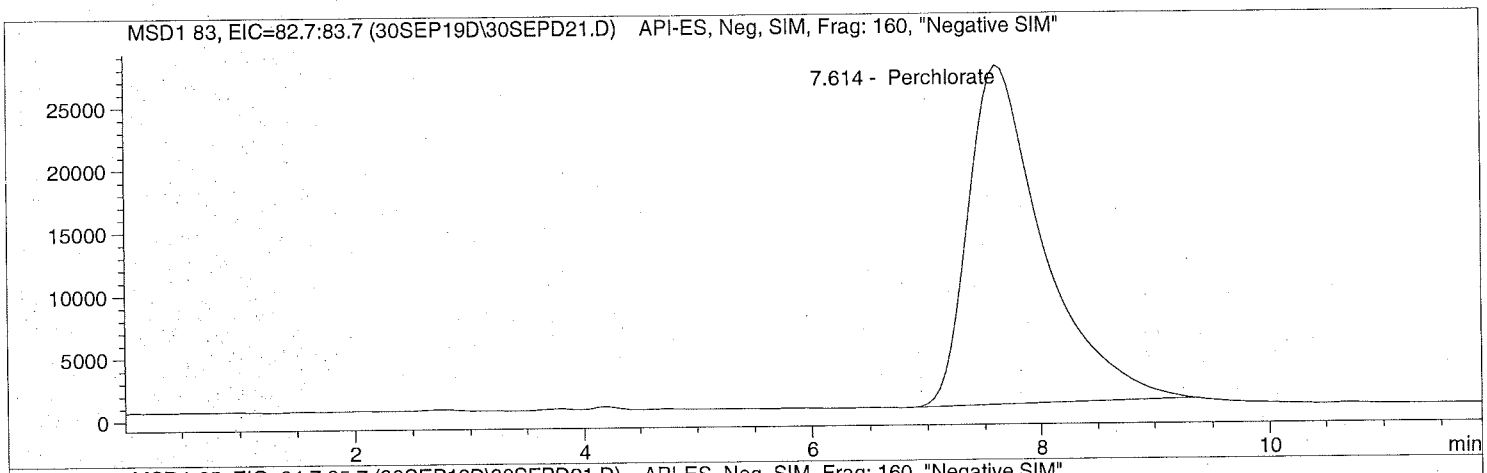
*** End of Report ***

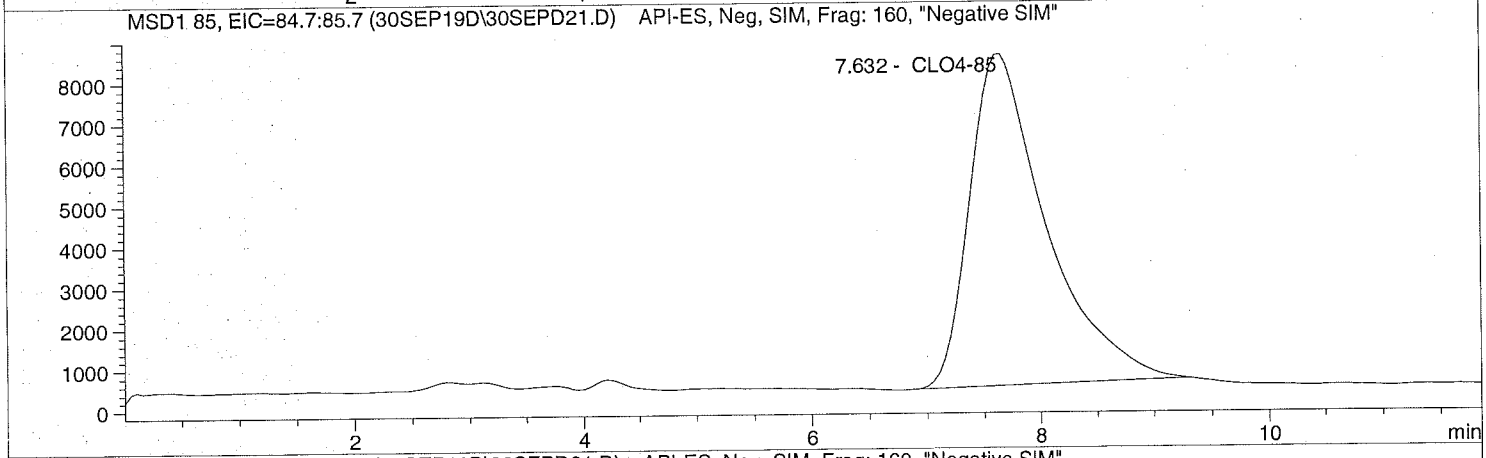
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD21.D Sample Name: 676278 CCV@25

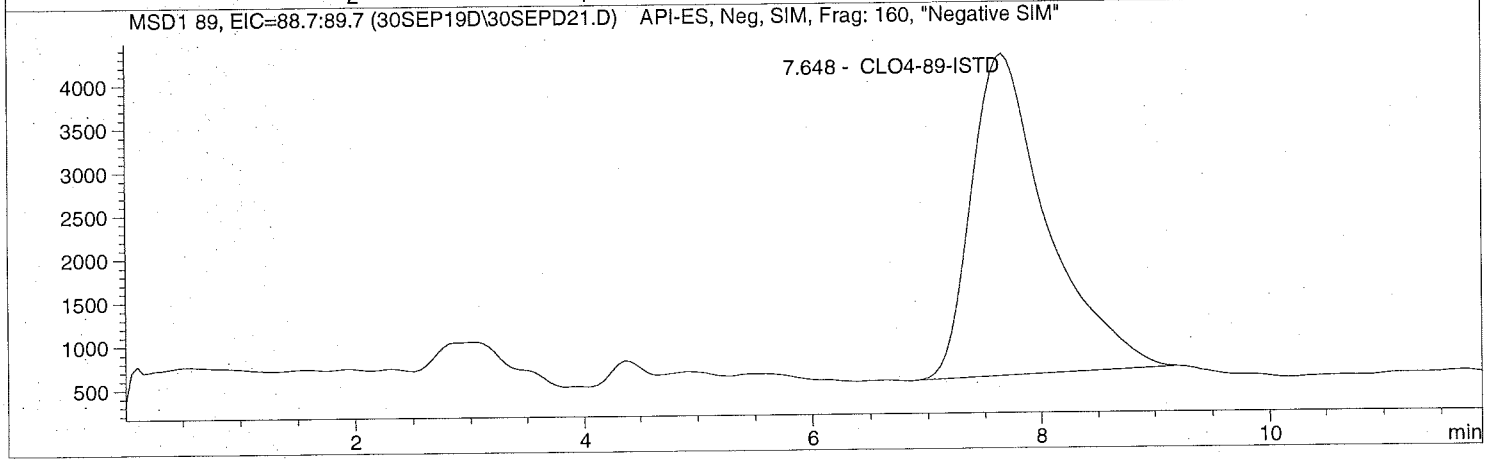
Injection Date:	9/30/2019 13:32:27	Seq Line:	21
Sample Name:	676278 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD21.D Sample Name: 676278 CCV@25

Injection Date:	9/30/2019 13:32:27	Seq Line:	21
Sample Name:	676278 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.614	PBA	1242642.1	24.7829	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.632	PBA	380145.4	24.8540	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.648	PBA	171481.5	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
7.750	1	3	1.00000	5.39218e4	1.85454e-5	1		Perchlorate
		4	2.00000	1.32825e5	1.50574e-5			
		5	5.00000	2.76271e5	1.80982e-5			
		6	10.00000	5.61298e5	1.78159e-5			
		7	25.00000	1.51820e6	1.64669e-5			
		8	50.00000	3.31156e6	1.50986e-5			
		9	75.00000	5.23914e6	1.43153e-5			
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1		CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5			
		5	5.00000	2.13407e5	2.34294e-5			
		6	5.00000	2.09246e5	2.38953e-5			
		7	5.00000	2.07403e5	2.41077e-5			
		8	5.00000	2.02929e5	2.46391e-5			
		9	5.00000	1.97933e5	2.52611e-5			
7.778	2	3	1.00000	1.70436e4	5.86732e-5	1		CLO4-85
		4	2.00000	4.20754e4	4.75337e-5			
		5	5.00000	9.24707e4	5.40712e-5			
		6	10.00000	1.68622e5	5.93041e-5			
		7	25.00000	4.63724e5	5.39114e-5			
		8	50.00000	9.95933e5	5.02042e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		9	75.00000	1.58066e6	4.74484e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 3.581 min To 11.899 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 0.5
  - Level 5 : 0.2
  - Level 6 : 0.1
  - Level 7 : 0.04
  - Level 8 : 0.02
  - Level 9 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

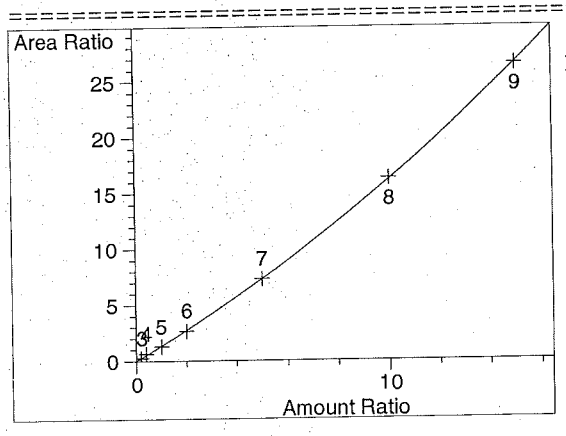
Compound: CLO4-85
- Time Window : From 3.601 min To 11.913 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 0.5
  - Level 5 : 0.2
  - Level 6 : 0.1
  - Level 7 : 0.04
  - Level 8 : 0.02
  - Level 9 : 0.013333

Peak Sum Table

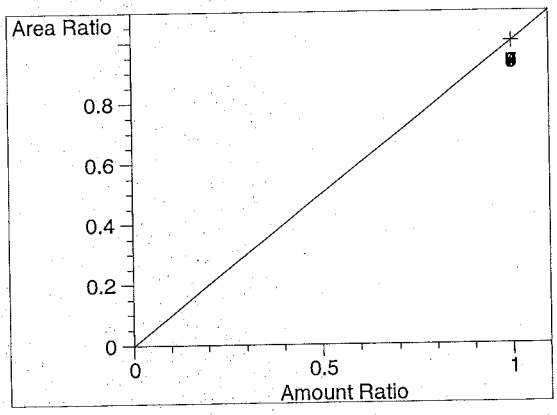
No Entries in table

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

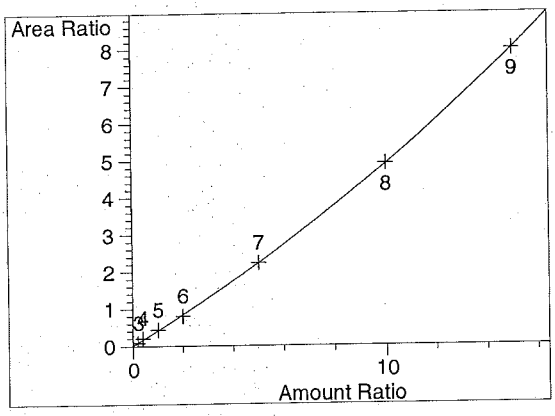
Calibration Curves



Perchlorate at exp. RT: 7.750
MSD1 83, EIC=82.7:83.7
Correlation: 0.99975
Residual Std. Dev.: 0.10284
Formula: $y = ax^2 + bx + c$
a: 3.10463e-2
b: 1.30369
c: 2.19496e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1
Level 8 : 1
Level 9 : 1



CLO4-85 at exp. RT: 7.778
MSD1 85, EIC=84.7:85.7
Correlation: 0.99969
Residual Std. Dev.: 0.02601
Formula: $y = ax^2 + bx + c$
a: 8.85207e-3
b: 3.99283e-1
c: 1.33505e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333

Batch Report: C:\HPCHEM\1\DATA\20SEP19I\20SEP19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\20SEP19I.S

Sequence Table:

Method and Injection Info Part:

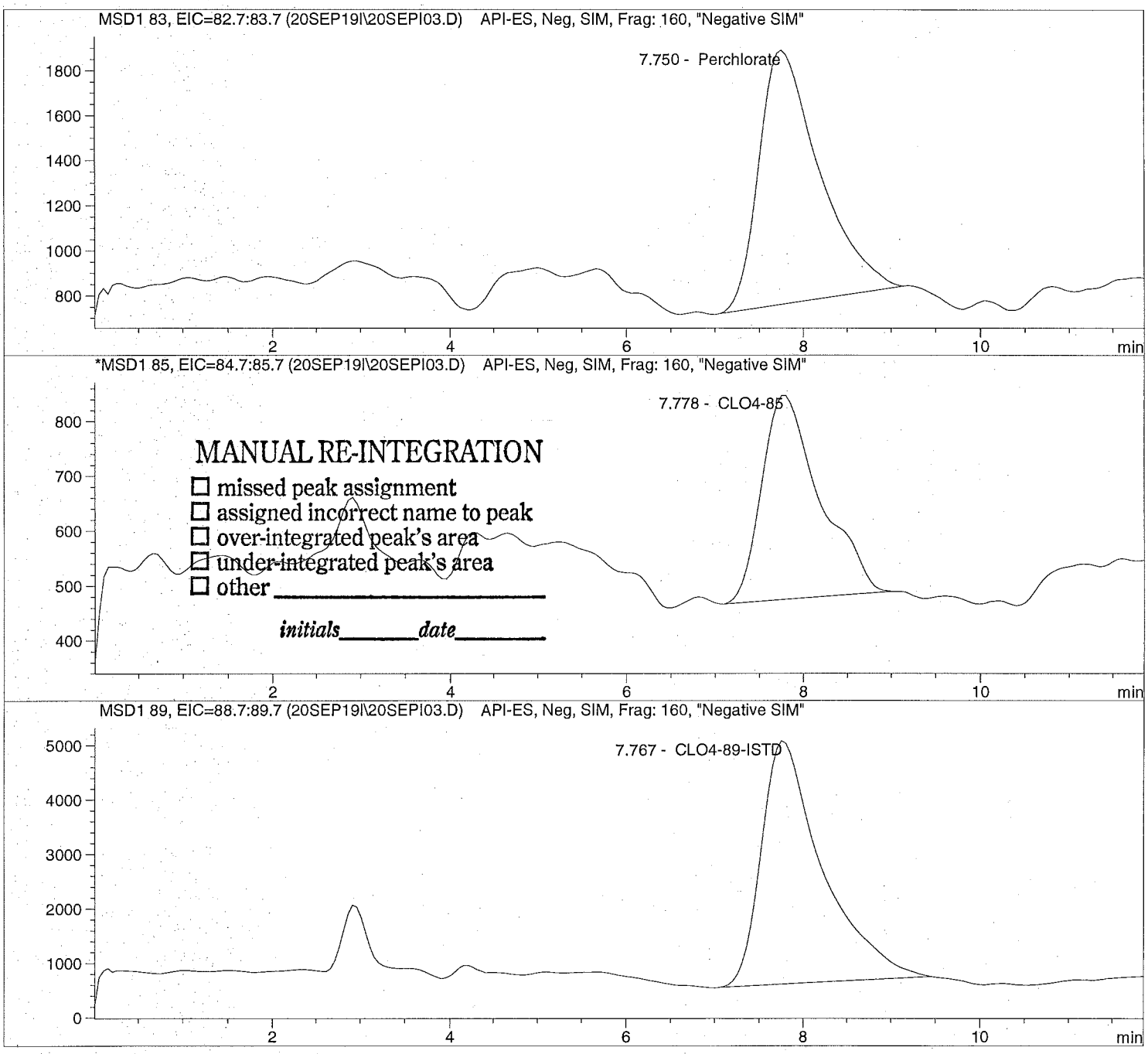
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

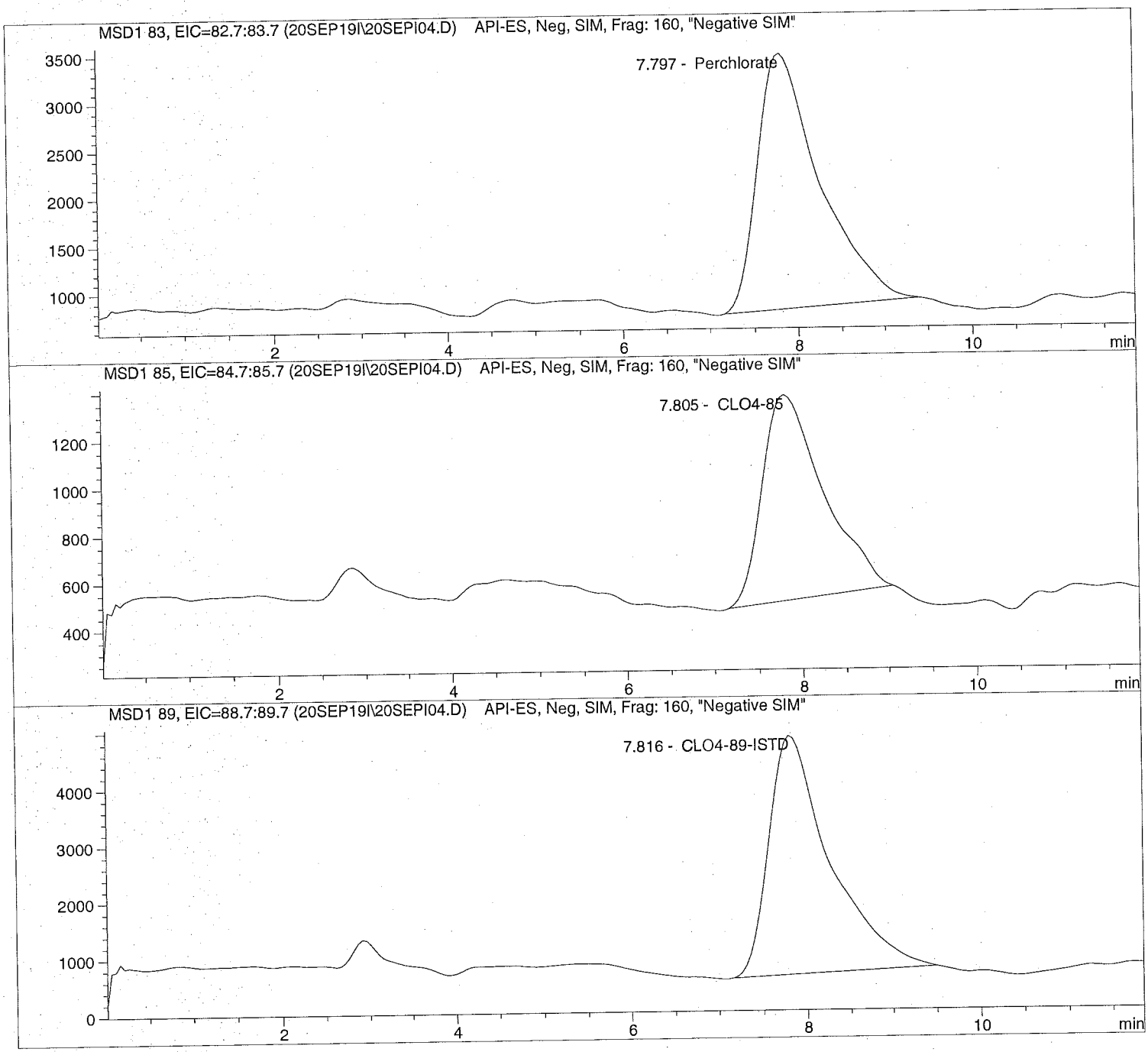
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

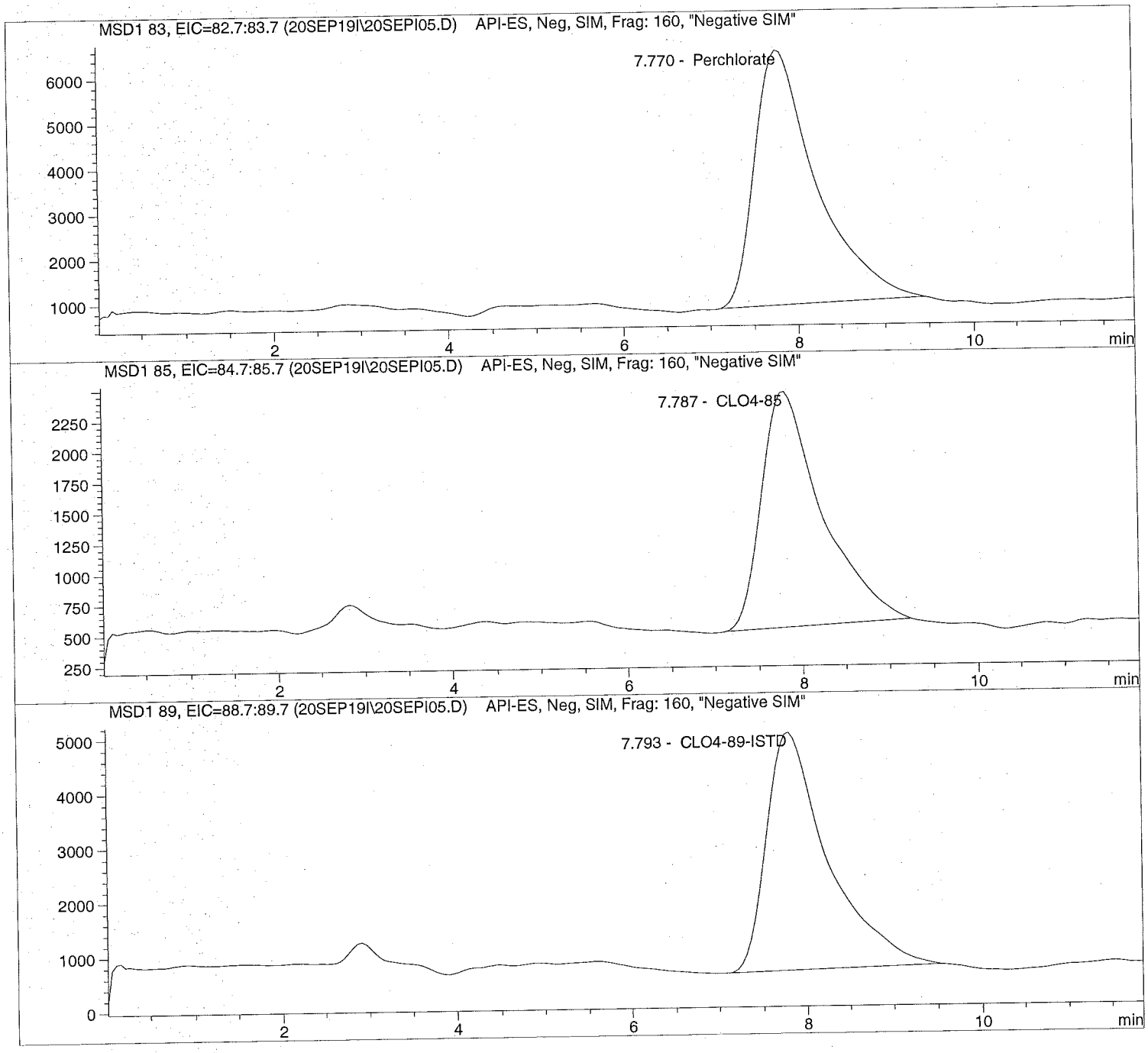
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	9/20/2019 09:51:49	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	9/20/2019 09:51:49	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

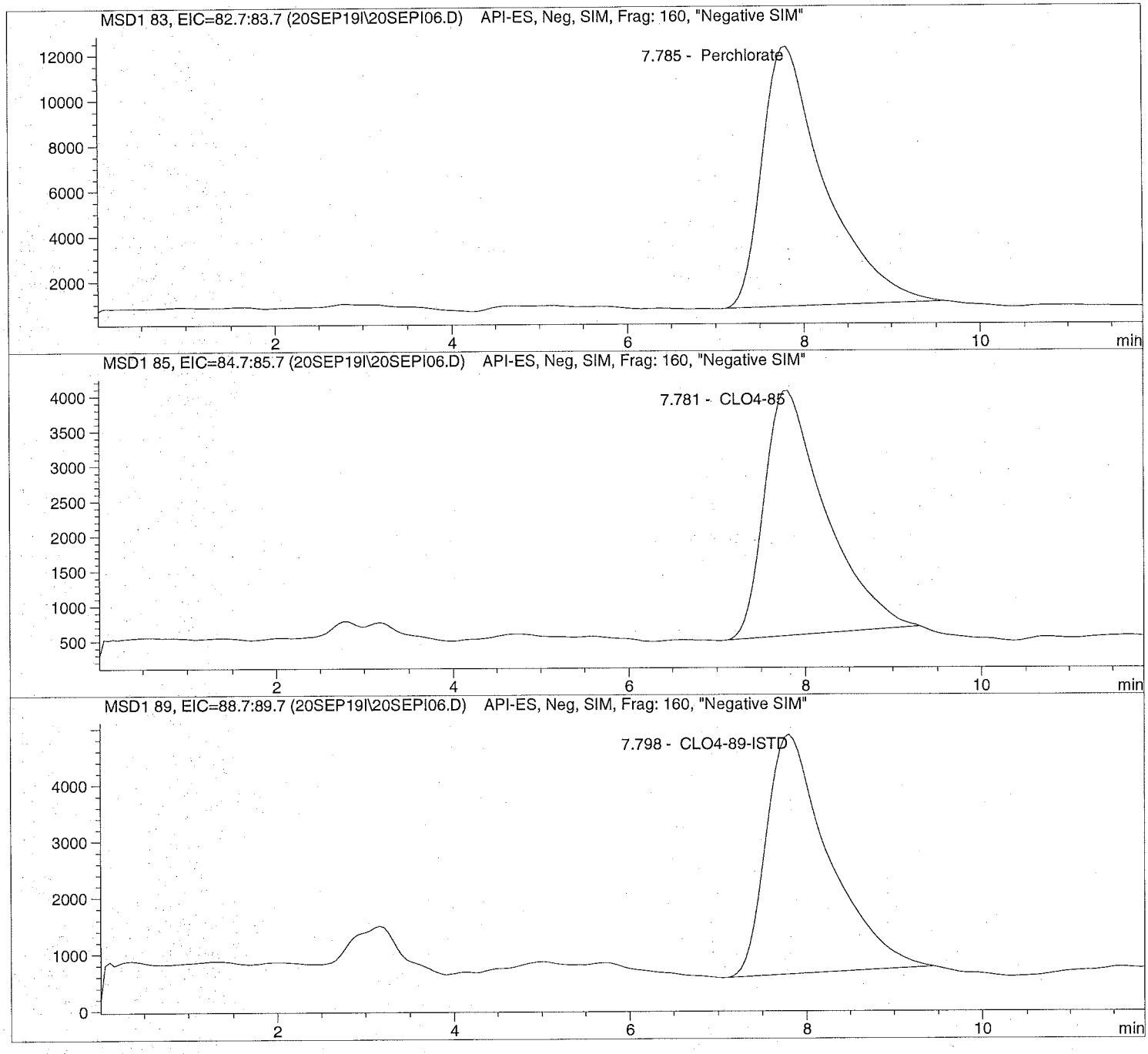
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

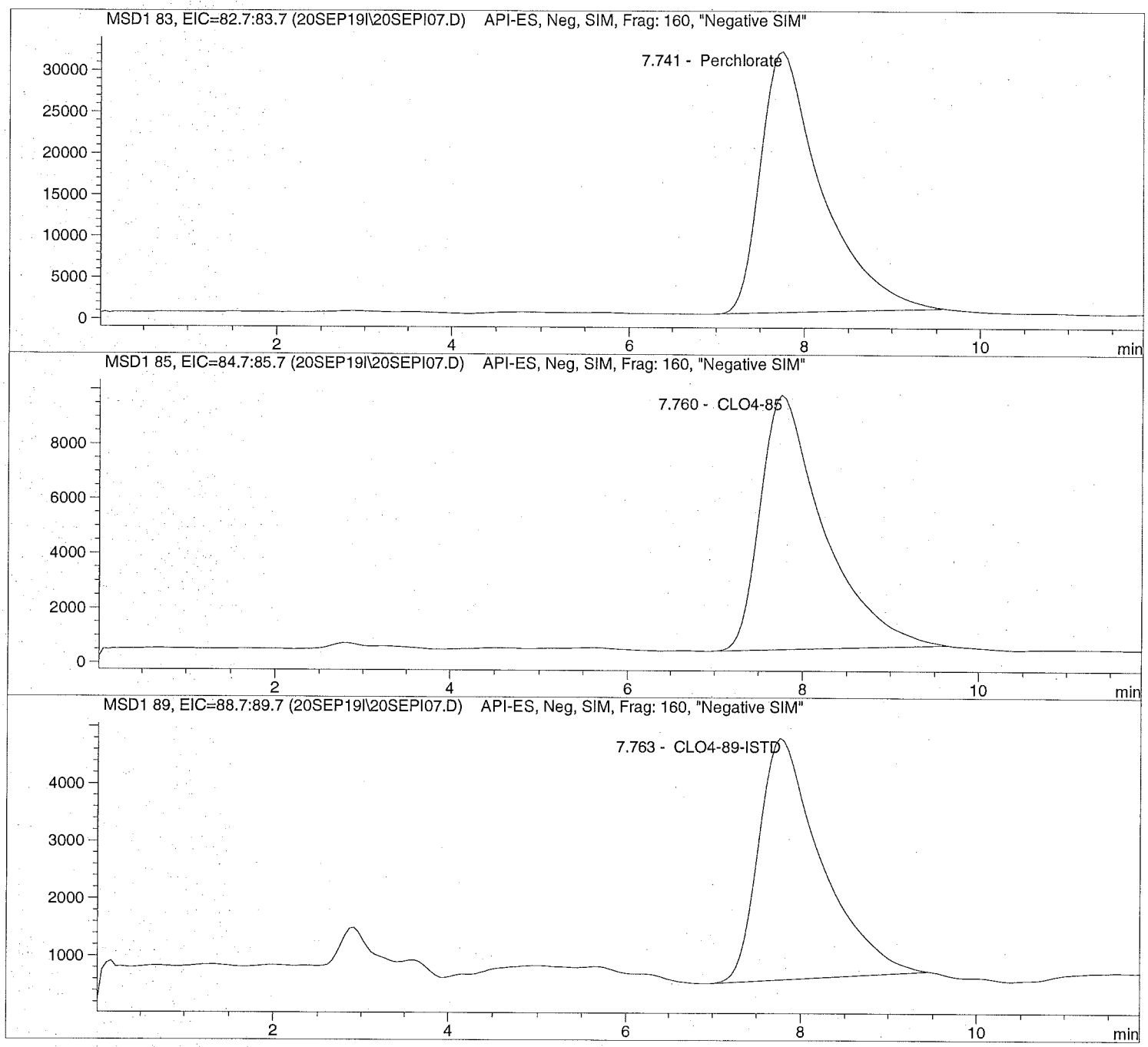
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	9/20/2019 10:19:23	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	9/20/2019 10:19:23	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

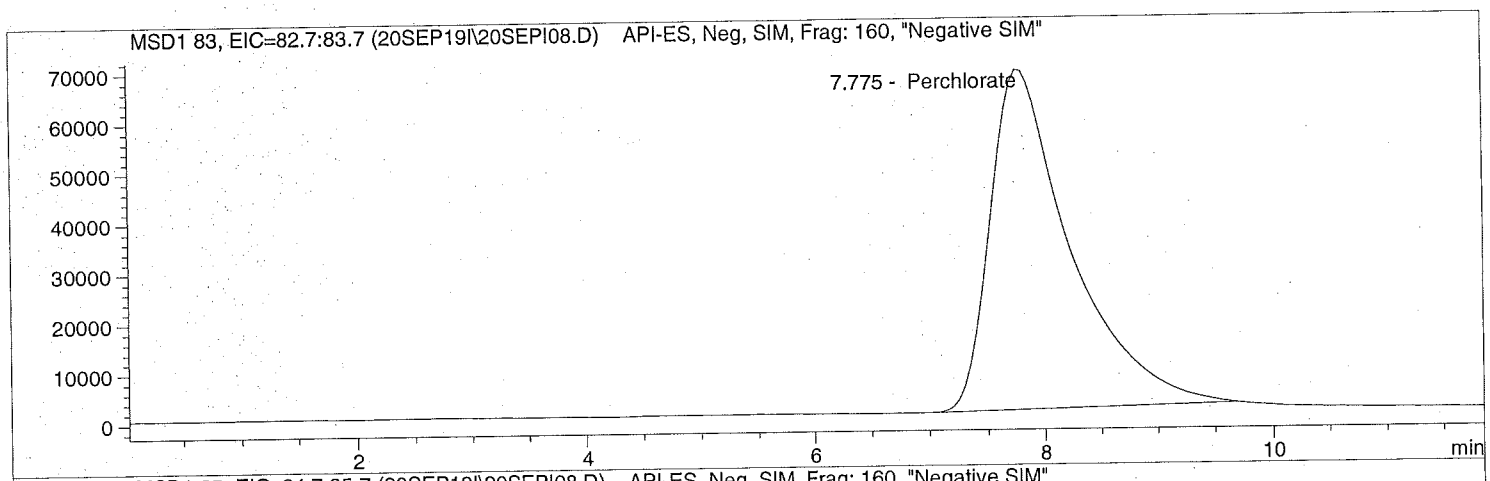
*** End of Report ***

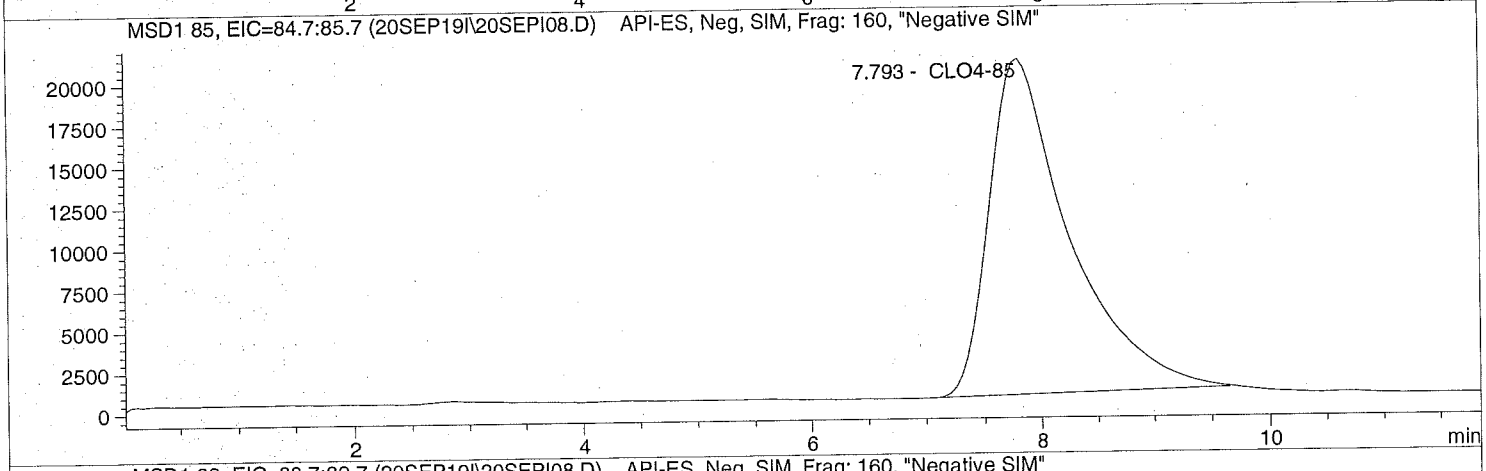
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

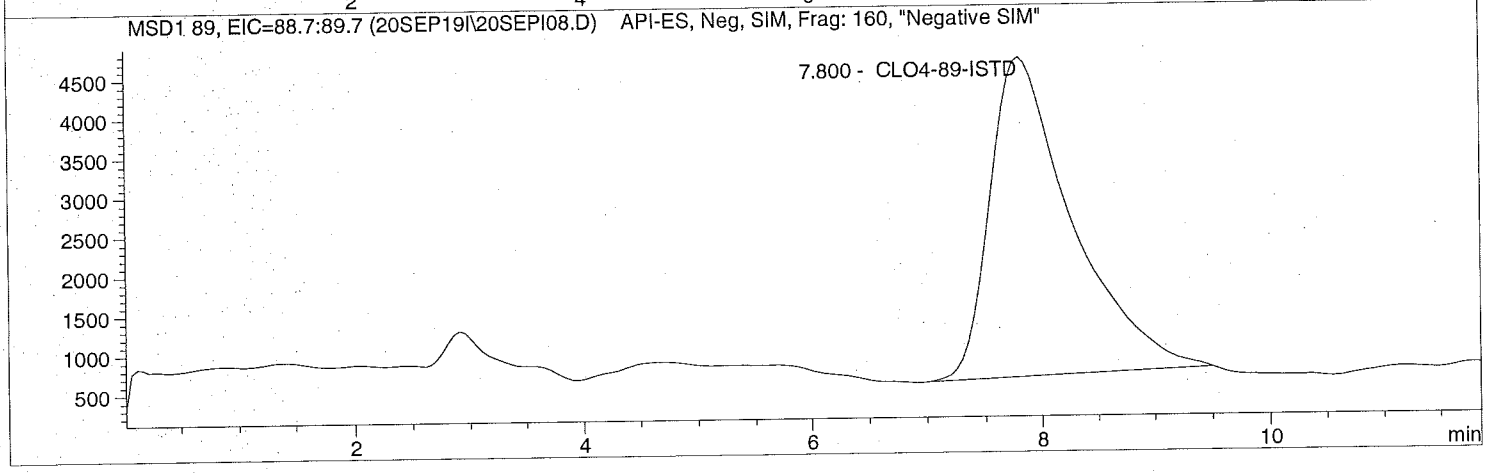
Injection Date:	9/20/2019 10:33:18	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:21:47

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	9/20/2019 10:33:18	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

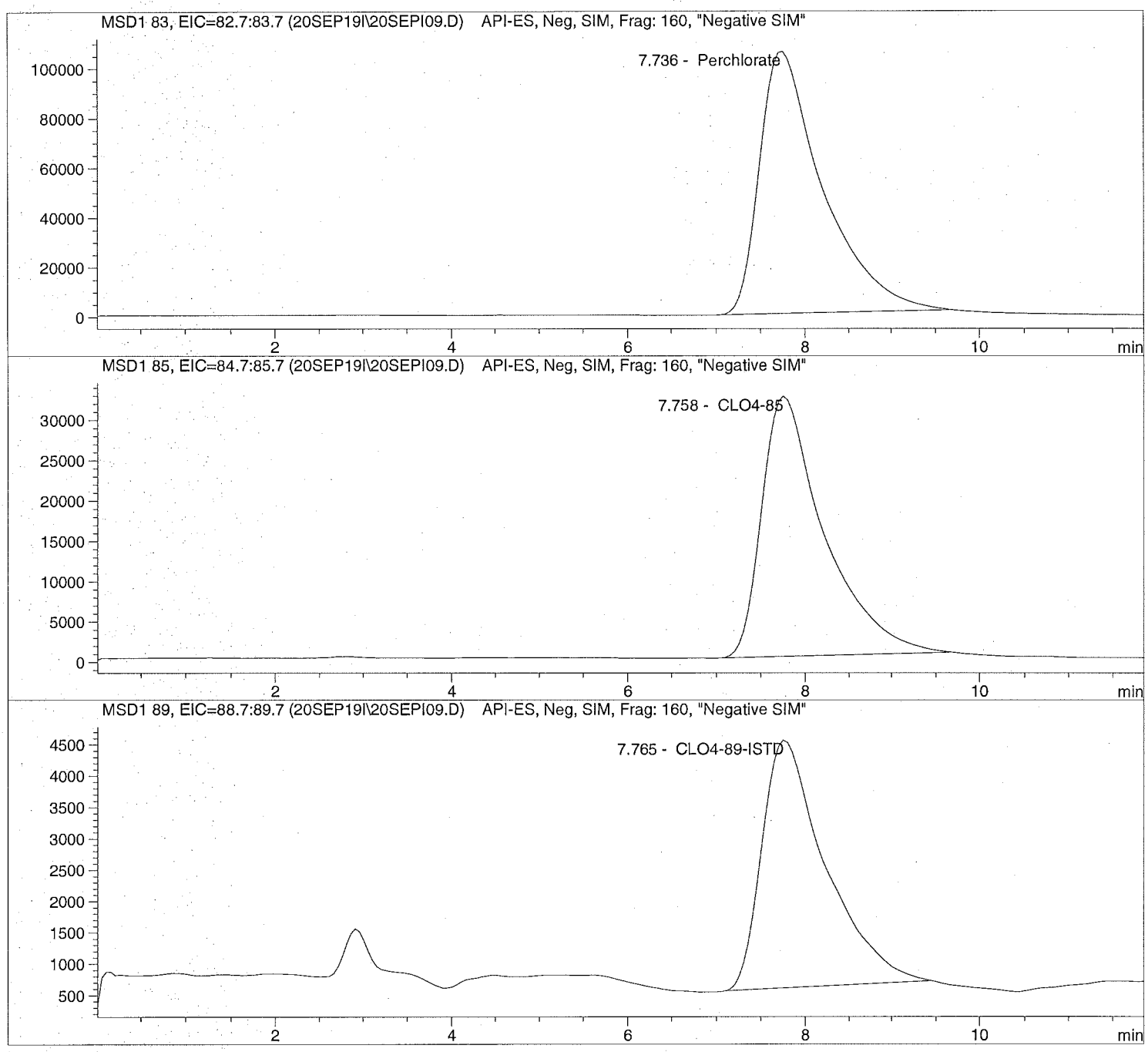
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	9/20/2019 10:47:05	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	9/20/2019 10:47:05	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

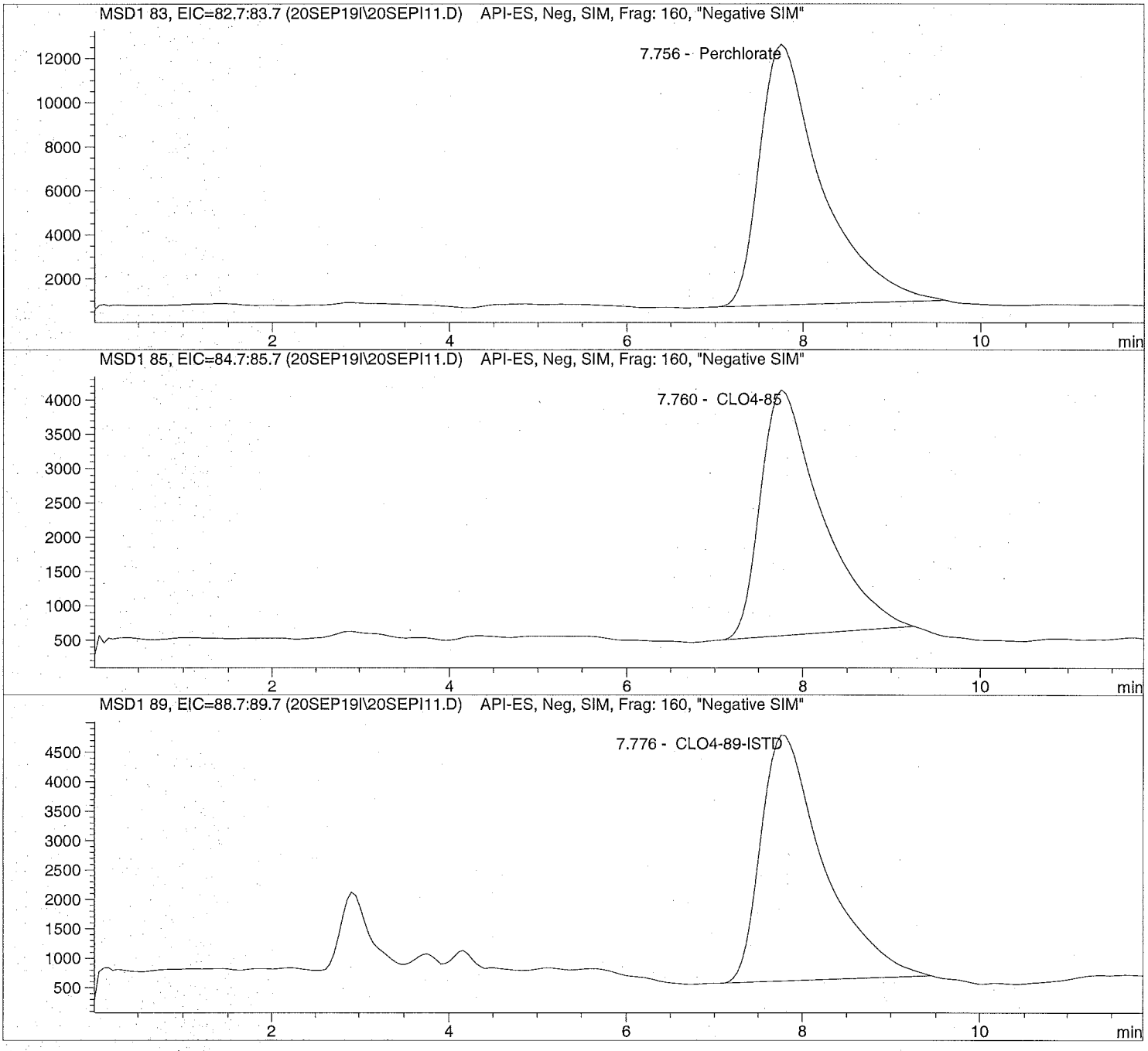
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

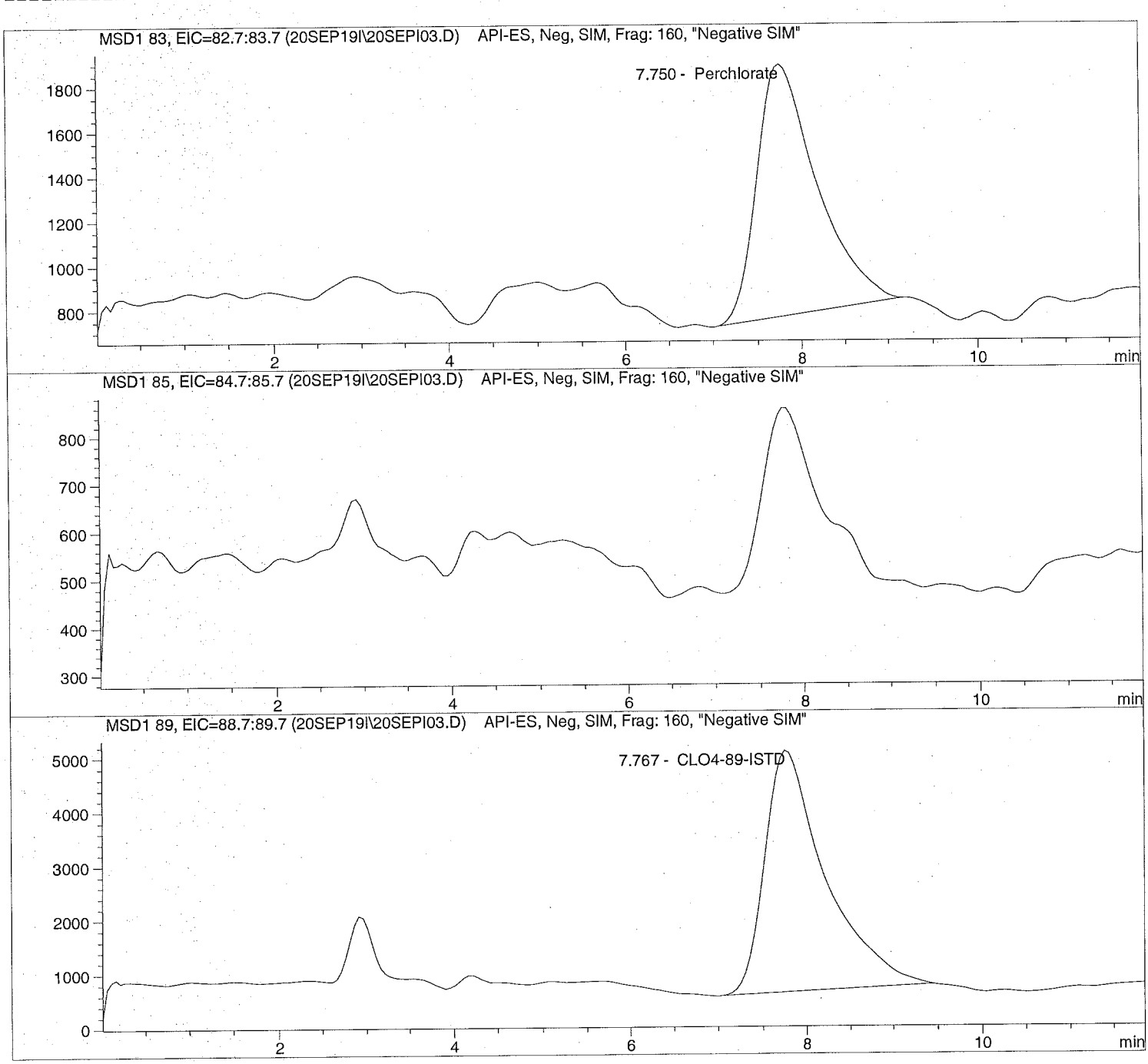
Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

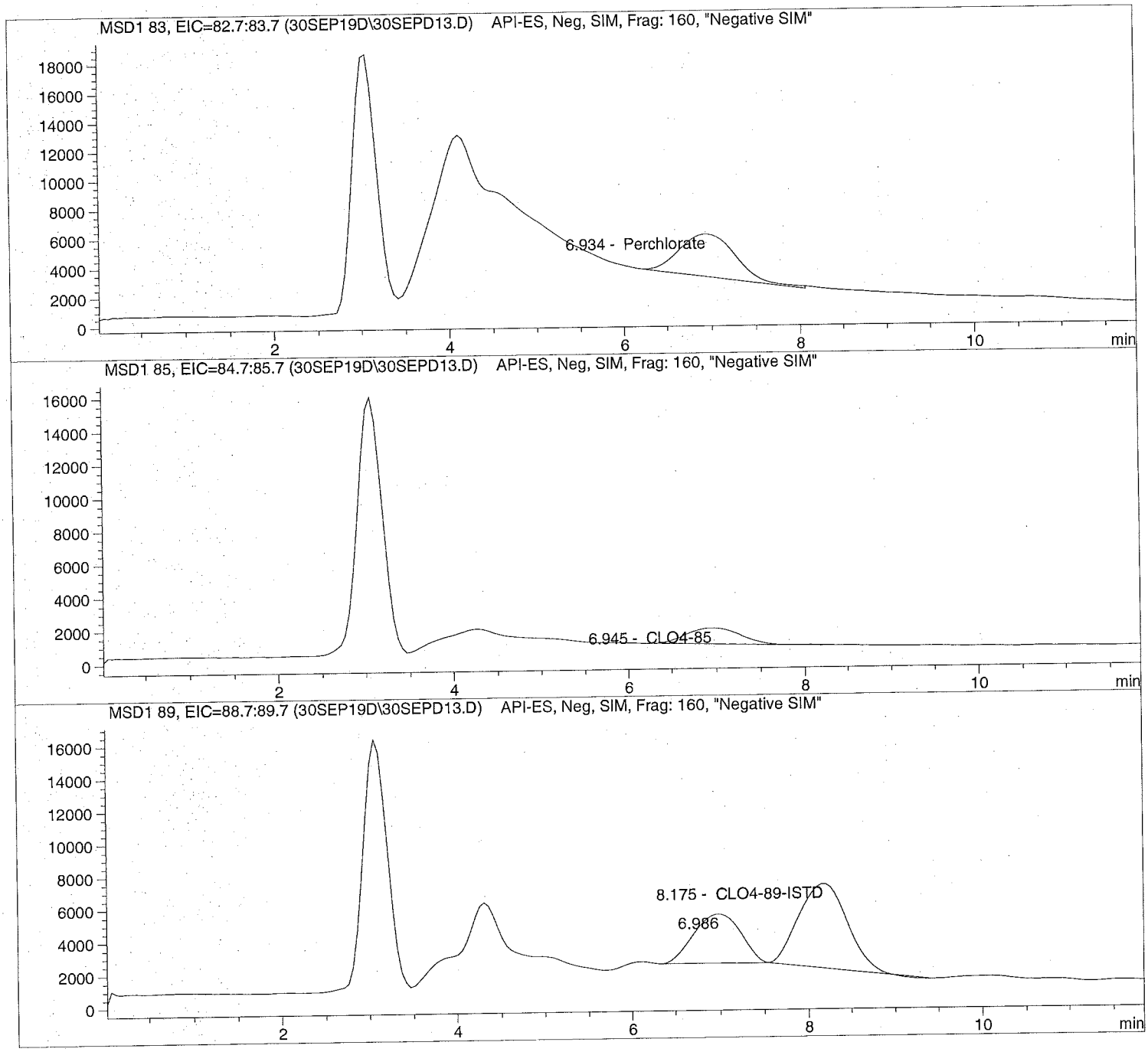
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD13.D Sample Name: 1927216009 MS

Injection Date:	9/30/2019 11:40:35	Seq Line:	13
Sample Name:	1927216009 MS	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD13.D Sample Name: 1927216009 MS

Injection Date:	9/30/2019 11:40:35	Seq Line:	13
Sample Name:	1927216009 MS	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.934	BBA	126608.7	2.3391	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.945	PBA	40368.7	2.3581	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.986	PB	109804.3	0.0000	
8.175	VBA	198249.3	5.0000	CLO4-89-ISTD

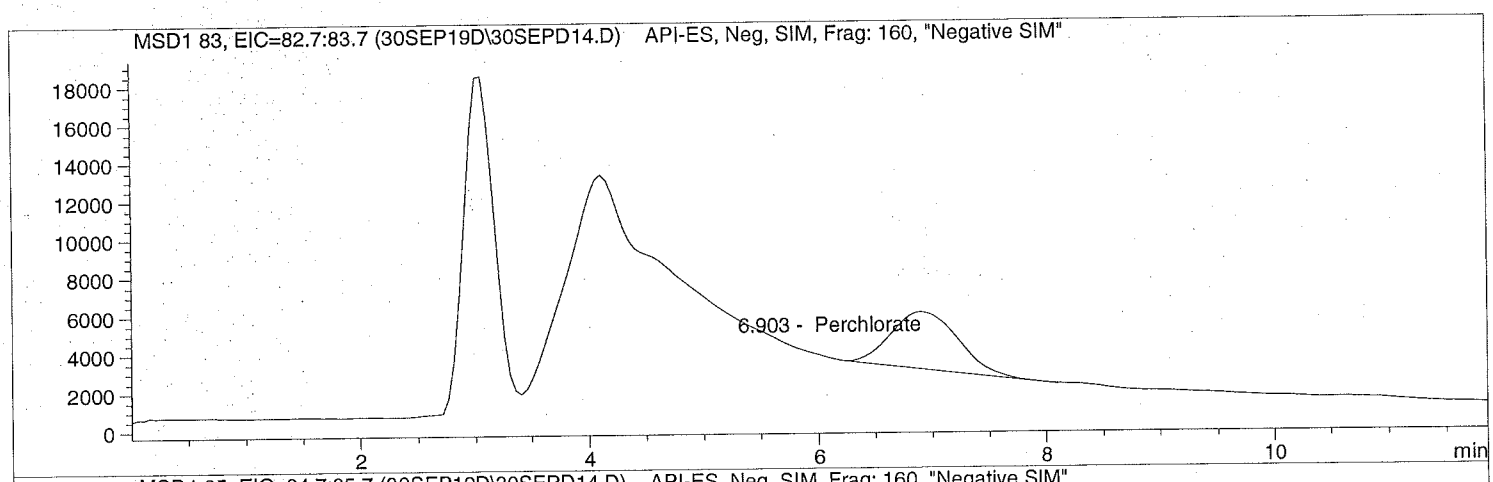
*** End of Report ***

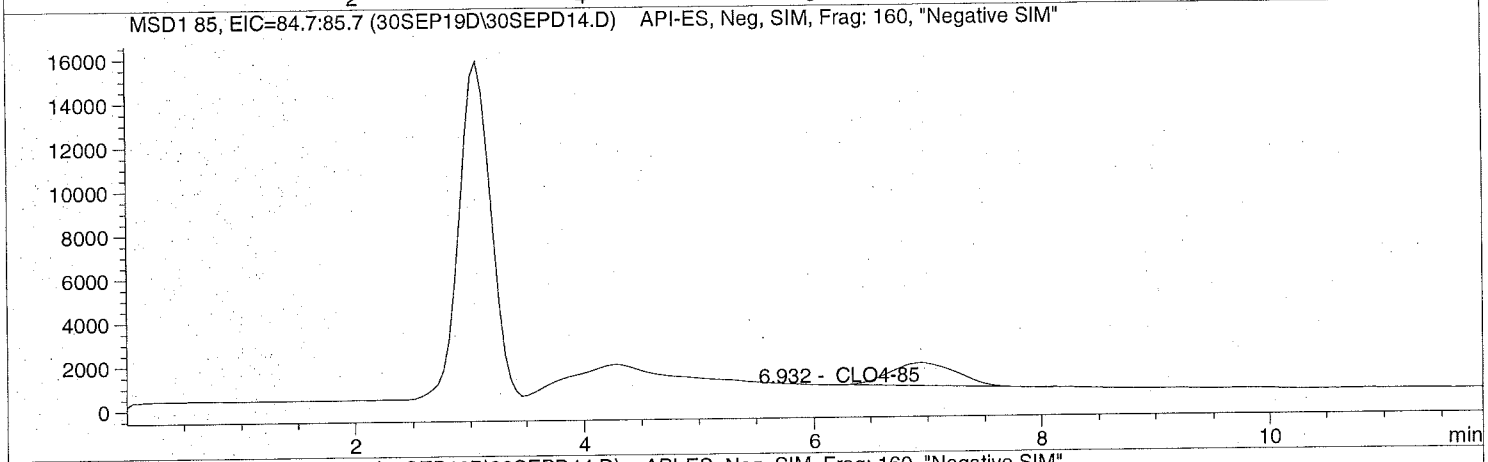
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD14.D Sample Name: 1927216010 MSD

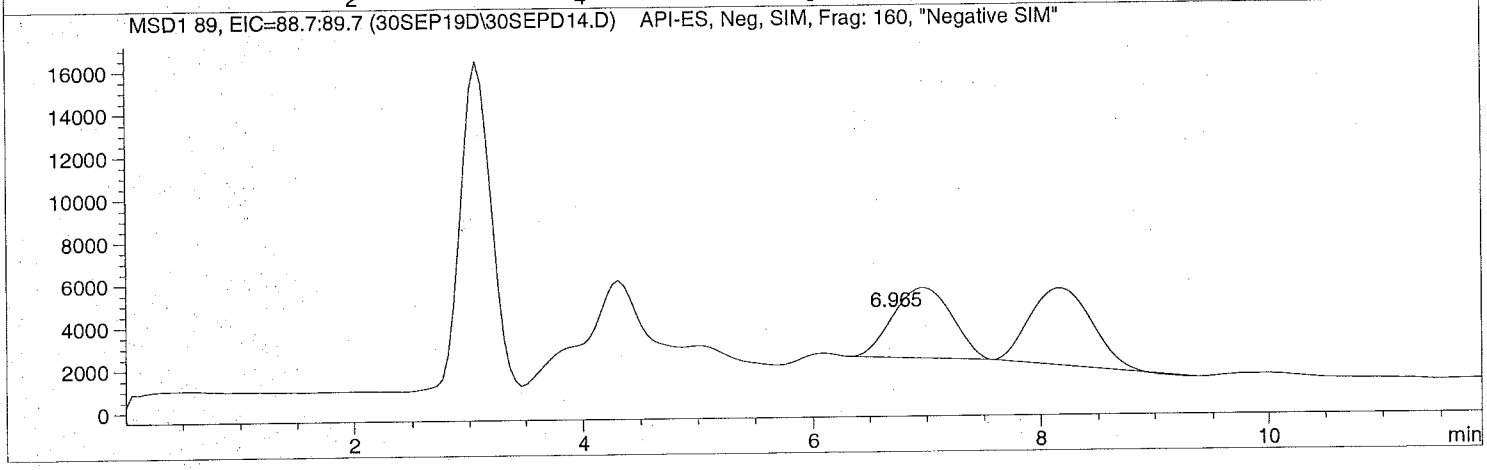
Injection Date:	9/30/2019 11:54:25	Seq Line:	14
Sample Name:	1927216010 MSD	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD14.D Sample Name: 1927216010 MSD

Injection Date:	9/30/2019 11:54:25	Seq Line:	14
Sample Name:	1927216010 MSD	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.903	BBA	121425.1	3.3051	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.932	PBA	42796.4	3.7312	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.965	PB	118620.5	0.0000	
8.165	VBA	135327.0	5.0000	CLO4-89-ISTD

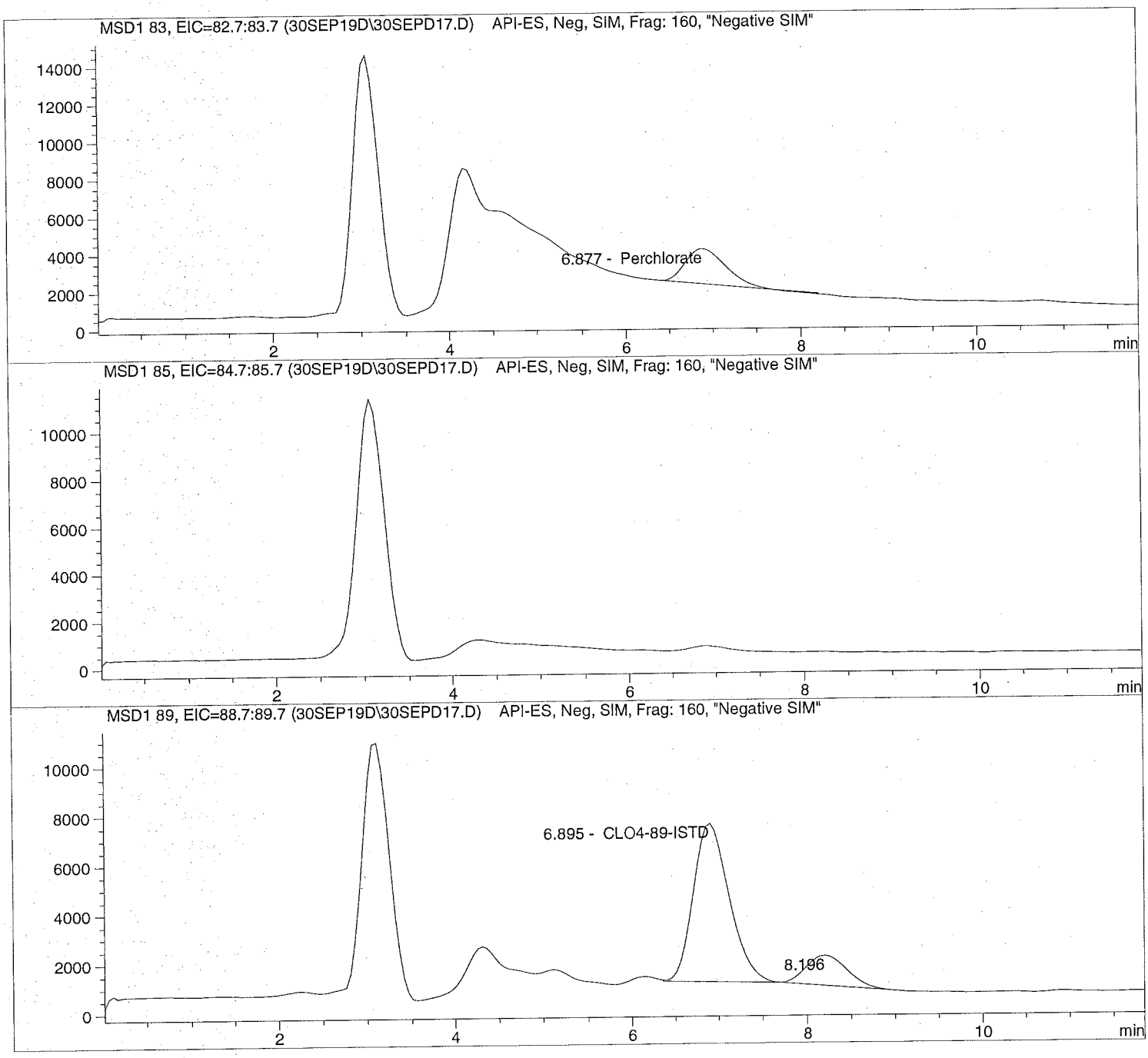
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD17.D Sample Name: 1927216012

Injection Date:	9/30/2019 12:35:46	Seq Line:	17
Sample Name:	1927216012	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD17.D Sample Name: 1927216012

Injection Date:	9/30/2019 12:35:46	Seq Line:	17
Sample Name:	1927216012	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.877	PBA	59494.6	1.1407	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.895	BB	185345.9	5.0000	CLO4-89-ISTD
8.196	VBA	38813.2	0.0000	

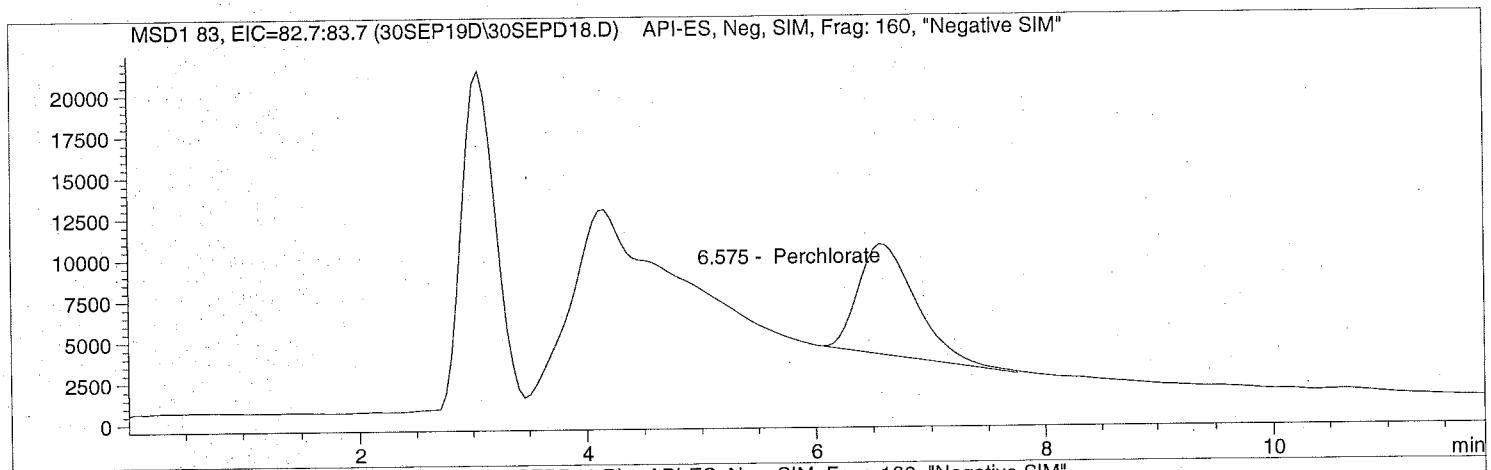
*** End of Report ***

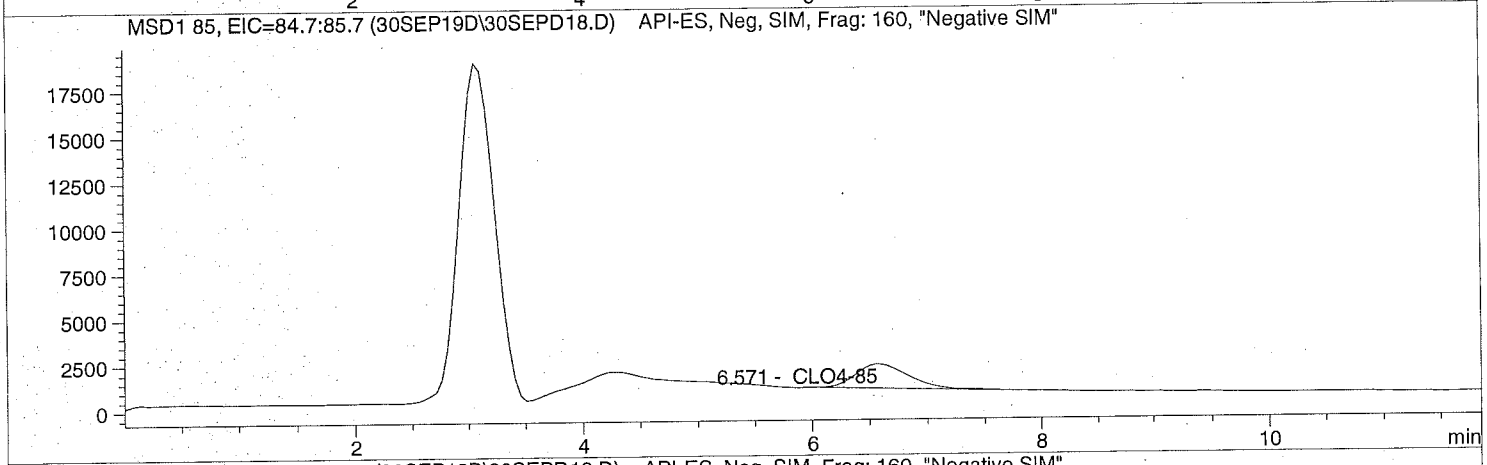
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD18.D Sample Name: 1927216013 MS

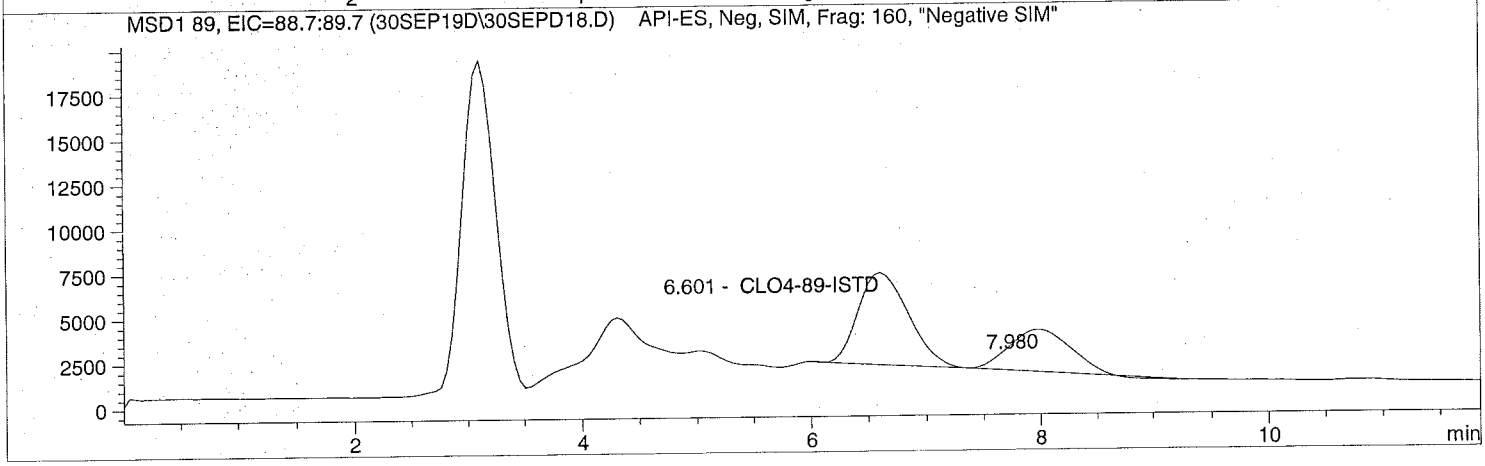
Injection Date:	9/30/2019 12:49:35	Seq Line:	18
Sample Name:	1927216013 MS	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD18.D Sample Name: 1927216013 MS

Injection Date:	9/30/2019 12:49:35	Seq Line:	18
Sample Name:	1927216013 MS	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.575	BBA	233237.3	5.5188	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.571	PBA	42356.1	3.1958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.601	PB	155623.9	5.0000	CLO4-89-ISTD
7.980	VBA	86769.1	0.0000	

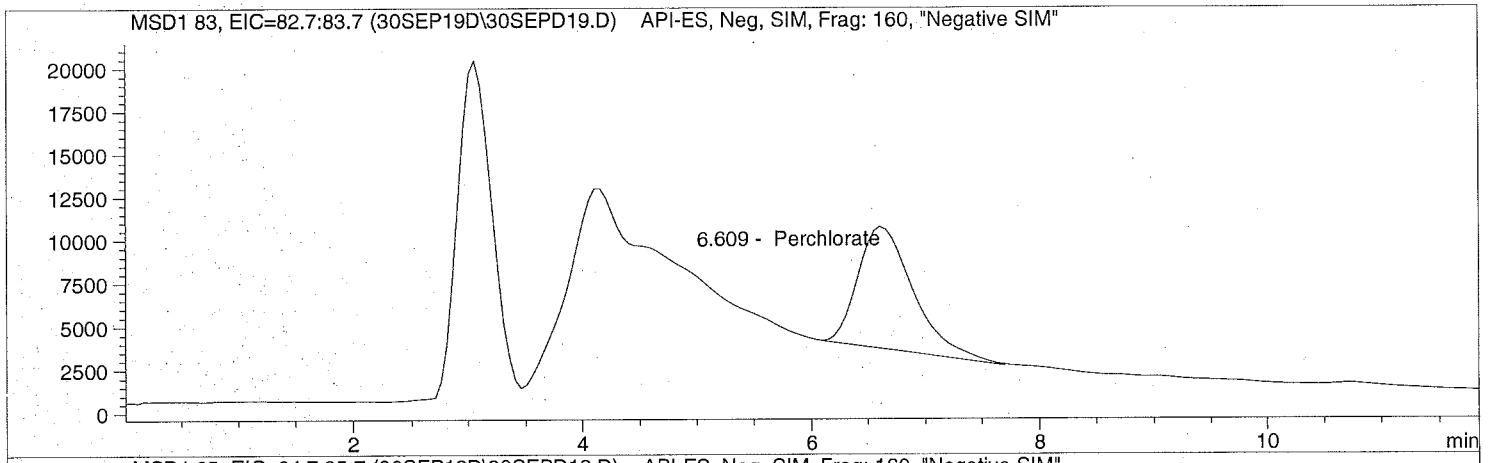
*** End of Report ***

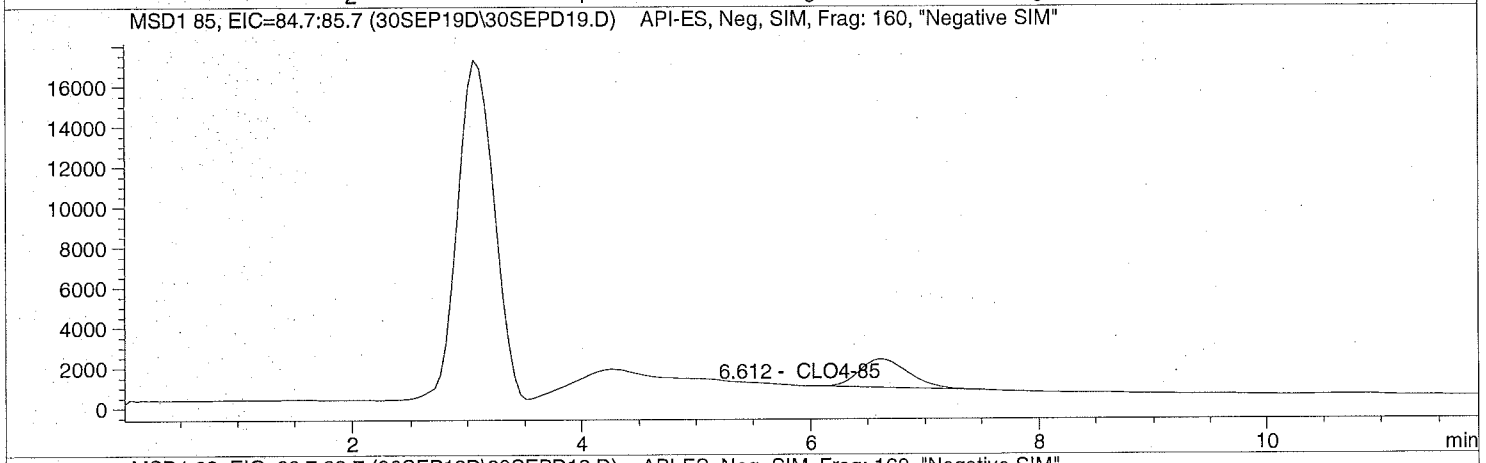
Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD19.D Sample Name: 1927216014 MSD

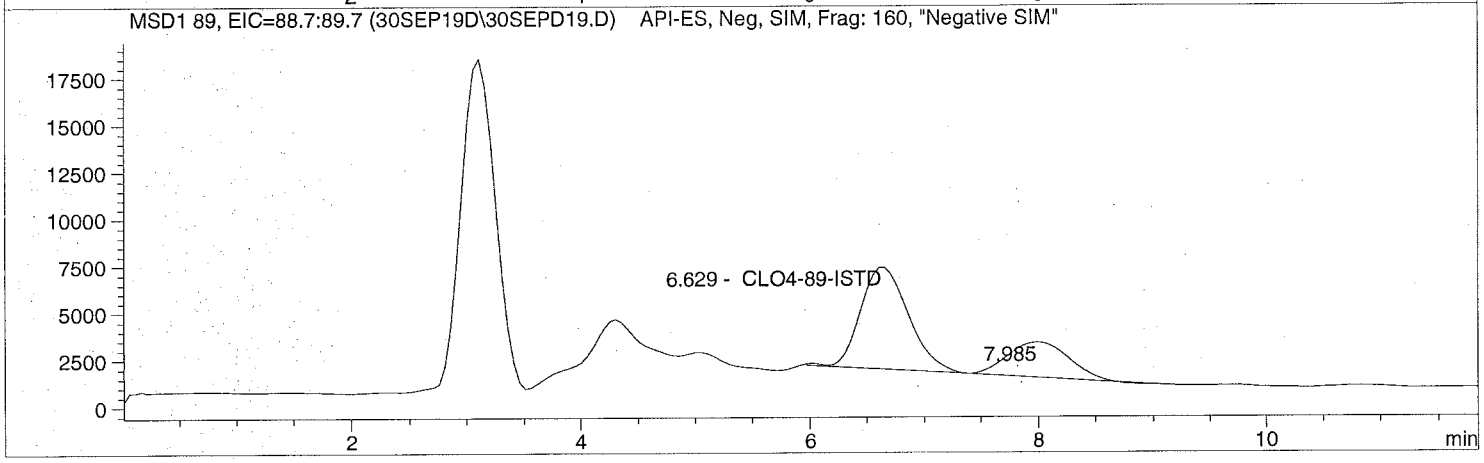
Injection Date:	9/30/2019 13:03:22	Seq Line:	19
Sample Name:	1927216014 MSD	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\30SEP19D\30SEPD19.D Sample Name: 1927216014 MSD

Injection Date:	9/30/2019 13:03:22	Seq Line:	19
Sample Name:	1927216014 MSD	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 12:27:01

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.609	BBA	235403.7	5.5268	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.612	PBA	42199.5	3.1579	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.629	BB	156838.8	5.0000	CLO4-89-ISTD
7.985	VBA	69146.4	0.0000	

*** End of Report ***

HS19090962 RSK 175 Raw Data

ALS WO# HS19090962

FID04 -Logbook

Batch: 26730 **Analyst:** Nosa Izekor

Date: 01-24-2017 **Reviewer:**

Method: RSK 175 ICAL **Laboratory:** Houston

Comments: Target Sequence 170124

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	ICAL1	CALIB_1	01-24-2017 09:06 am	1.00	0.00 mL	0.00 mL	001.D	Liquid	Y	NA
2	ICAL2	CALIB_2	01-24-2017 09:30 am	1.00	0.00 mL	0.00 mL	002.D	Liquid	Y	NA
3	ICAL3	CALIB_3	01-24-2017 09:59 am	1.00	0.00 mL	0.00 mL	003.D	Liquid	Y	NA
4	ICAL4	CALIB_4	01-24-2017 10:15 am	1.00	0.00 mL	0.00 mL	004.D	Liquid	Y	NA
5	ICAL5	CALIB_5	01-24-2017 10:39 am	1.00	0.00 mL	0.00 mL	005.D	Liquid	Y	NA
6	ICAL6	CALIB_6	01-24-2017 10:57 am	1.00	0.00 mL	0.00 mL	006.D	Liquid	Y	NA
7	ICAL7	CALIB_7	01-24-2017 11:13 am	1.00	0.00 mL	0.00 mL	007.D	Liquid	Y	NA
8	ICV	METHSPIKI	01-24-2017 12:05 pm	1.00	0.00 mL	0.00 mL	008.D	Liquid	Y	NA
9	LCS-170124	LCS	01-24-2017 12:24 pm	1.00	0.00 mL	0.00 mL	009.D	Liquid	Y	NA
10	LCSD-170124	LCSD	01-24-2017 12:40 pm	1.00	0.00 mL	0.00 mL	010.D	Liquid	Y	NA
11	MBLK-170124	MBLK	01-24-2017 12:57 pm	1.00	0.00 mL	0.00 mL	011.D	Liquid	Y	NA
12	HS17010778-01	SAMP	01-24-2017 01:14 pm	1.00	0.00 mL	0.00 mL	012.D	Liquid	Y	NA
13	HS17010779-01	SAMP	01-24-2017 01:31 pm	1.00	0.00 mL	0.00 mL	013.D	Liquid	Y	NA
14	HS17010779-01DUP	SAMP	01-24-2017 01:47 pm	1.00	0.00 mL	0.00 mL	014.D	Liquid	Y	NA
15	CCV	CCV	01-24-2017 02:01 pm	1.00	0.00 mL	0.00 mL	015.D	Liquid	Y	NA

Chemical	Value
ICAL STD ID	30010700217
ICV STD ID	30010700610

FORM 3
WATER GASES METHOD SPIKE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090962

Matrix Spike - ENG SC Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
Ethene	16.800	19.106	114	75-125
Methane	9.647	9.591	99	75-125
Ethane	18.043	20.117	111	75-125
Propane	26.463	27.184	103	75-125
N-Butane	34.955	36.314	104	75-125

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM III GASES

FORM 6
GASES INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090962

Instrument ID: FID-4 Calibration Date(s): 01/24/17 01/24/17

Column: RTX-PLOT ID: 0.53 (mm) Calibration Time(s): 0906 1113

LAB FILE ID: RF10: 001 RF25: 002 RF50: 003
RF100: 004 RF250: 005 RF500: 006

COMPOUND	RF10	RF25	RF50	RF100	RF250	RF500
Ethene	590.504	567.359	564.985	527.151	665.282	428.186
Methane	968.912	978.238	1019.699	880.798	960.713	935.006
Ethane	641.274	670.177	658.908	624.082	808.513	821.648
Propane	500	1279	2602	4785	18436	38286
N-Butane	474	1032	2082	3780	18270	42405

FORM VI GASES

FORM 6
GASES INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1909096

Instrument ID: FID-4 Calibration Date(s): 01/24/17 01/24/17

Column: RTX-PLOT ID: 0.53 (mm) Calibration Time(s): 0906 1113

RF1000: 007

COMPOUND	RF1000	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MA
Ethene	756.854	AVRG		585.760435		17.722	
Methane	1081.580	AVRG		974.992337		6.498	
Ethane	811.824	AVRG		719.489678		12.458	
Propane	96632	2ORDR	0.97326263	1.526e-003	-4.56e-009	0.9990955	0
N-Butane	114164	2ORDR	2.40105031	1.857e-003	-5.73e-009	0.9980163	0

FORM VI GASES

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\001.D
Lab Smp Id: ICAL1 Client Smp ID: ICAL1
Inj Date : 24-JAN-2017 09:06
Operator : JA Inst ID: FID-4.i
Smp Info : ICAL1;ICAL1;;;
Misc Info :
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 09:06 Cal File: 001.D
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(ug/L)	(ug/L)
1 Methane	1.043	1.026	0.017	374	0.38600	0.383(a)
2 Ethene	1.553	1.553	0.000	398	0.67400	0.679(aM)
3 Ethane	1.713	1.720	-0.007	463	0.72200	0.643(aM)
4 Propane	4.073	4.106	-0.033	500	1.05900	1.735
5 N-Butane	7.640	7.686	-0.046	474	1.39800	3.280(M)

QC Flag Legend

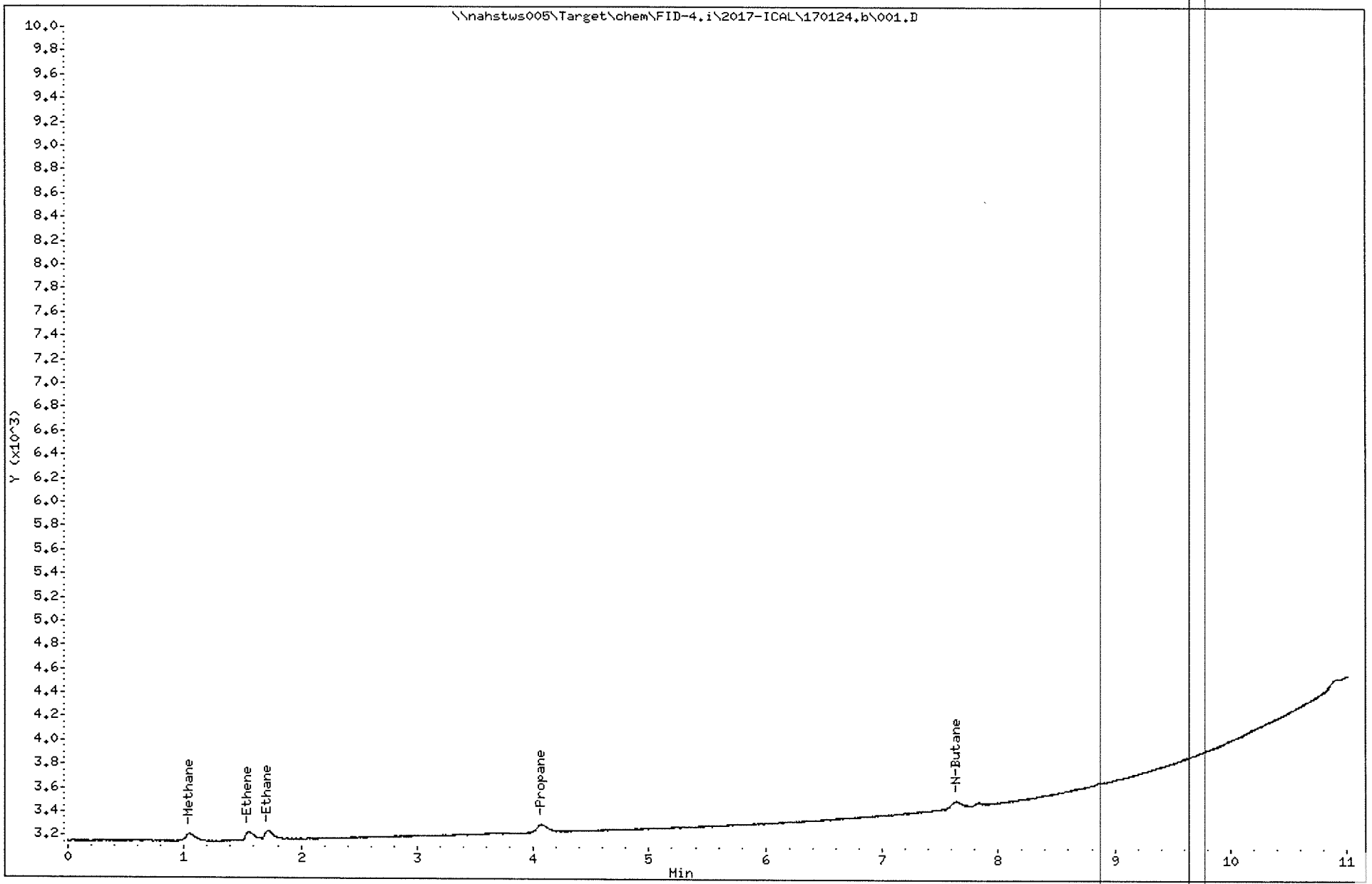
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

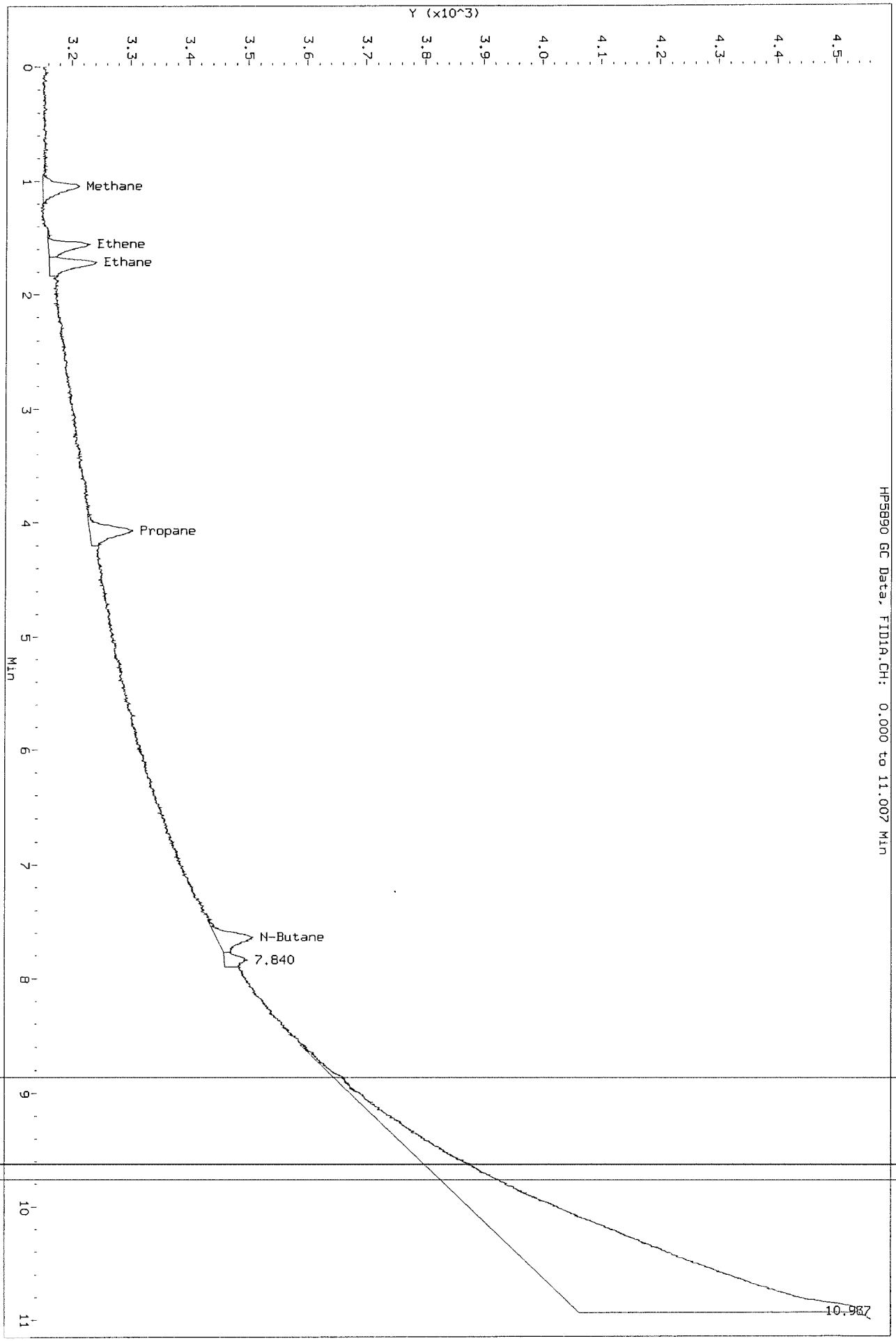
Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\001.D
Date : 24-JAN-2017 09:06
Client ID: ICAL1
Sample Info: ICAL1;ICAL1;;;

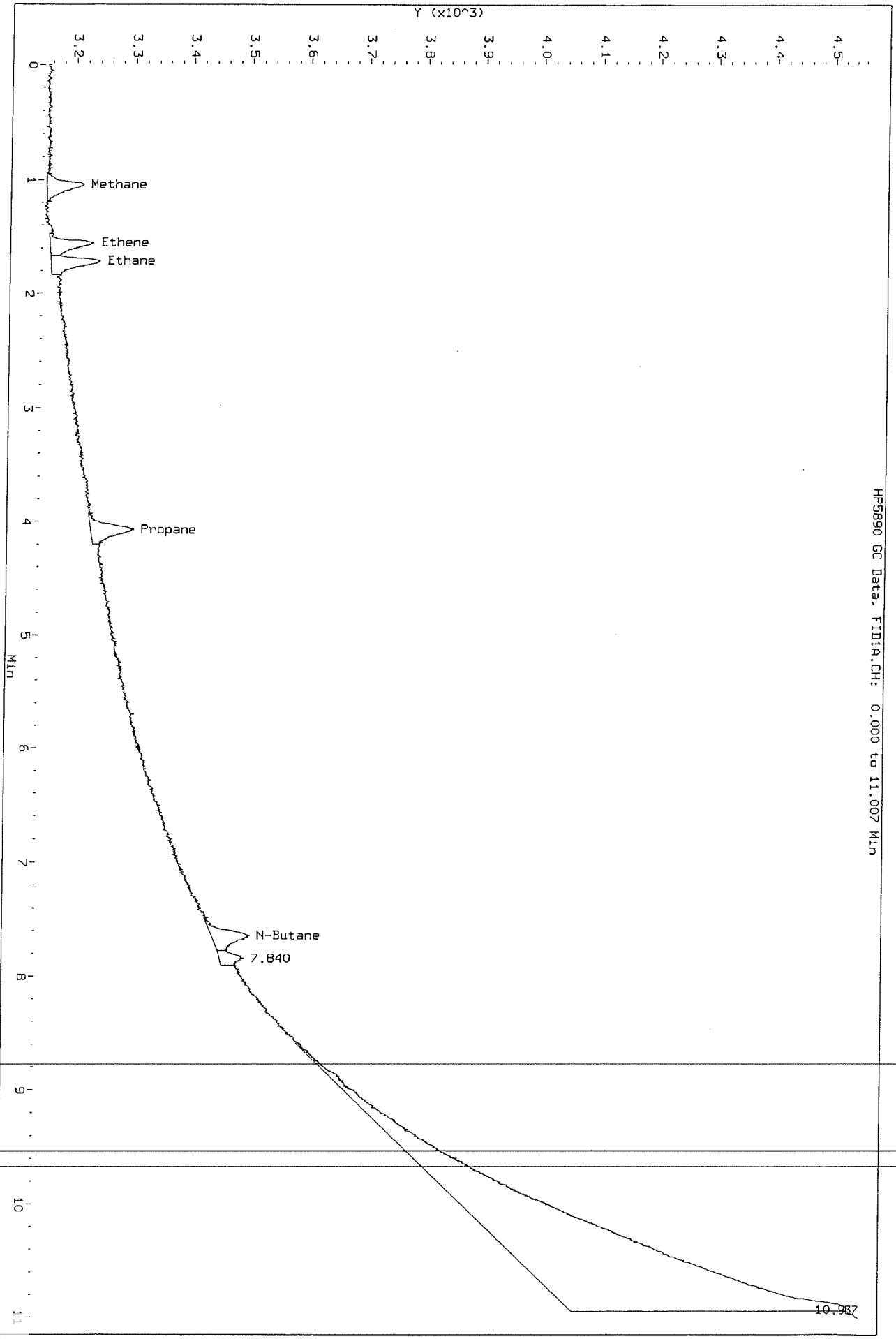
Instrument: FID-4.i

Operator: JA
Column diameter: 0.53

Column phase: Rtx-PLOT




Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\001.D
Injection Date: 24-JAN-2017 09:06
Instrument: FID-4.i
Client Sample ID: ICAL1
HP5890 GC Data, FID1A.CH: 0.000 to 11.007 Min
Y (x10^3)
Min
Methane
Ethene
Ethane
Propane
N-Butane
7.840
10.987


Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\001.D
Injection Date: 24-JAN-2017 09:06
Instrument: FID-4.i
Client Sample ID: ICAL1
HP5890 GC Data, FID1A.CH: 0.000 to 11.007 Min
Y (x10^3)
Min
Methane
Ethene
Ethane
Propane
N-Butane
7.840
10.987

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\002.D
Lab Smp Id: ICAL2 Client Smp ID: ICAL2
Inj Date : 24-JAN-2017 09:30
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL2;ICAL2;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 09:30 Cal File: 002.D
Als bottle: 2 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

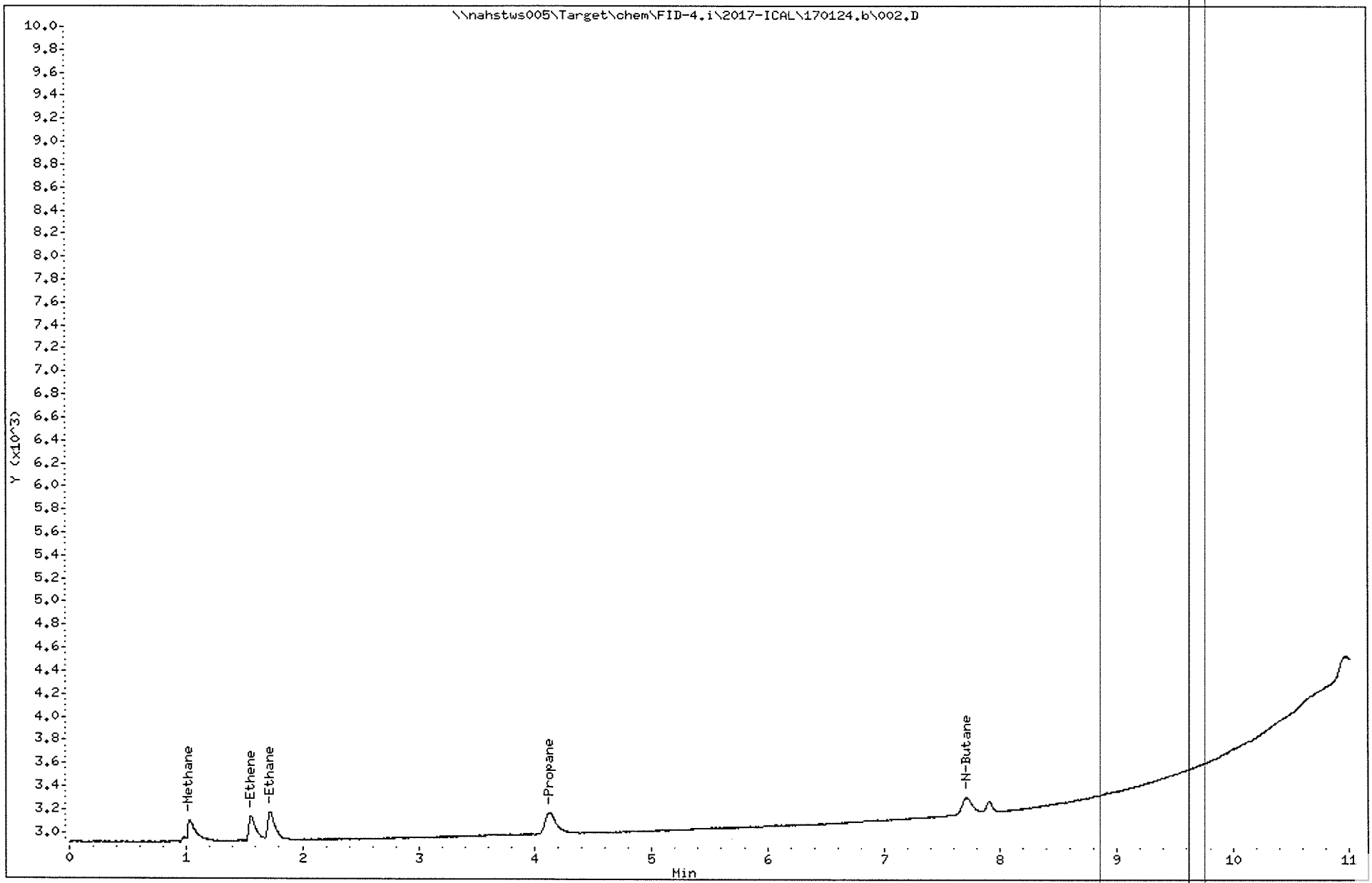
Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.023	1.026	-0.003	944	0.96500	0.968
2 Ethene	1.560	1.553	0.007	956	1.68500	1.632
3 Ethane	1.723	1.720	0.003	1209	1.80400	1.680
4 Propane	4.123	4.106	0.017	1279	2.64600	2.917
5 N-Butane	7.706	7.686	0.020	1032	3.49600	4.311(M)

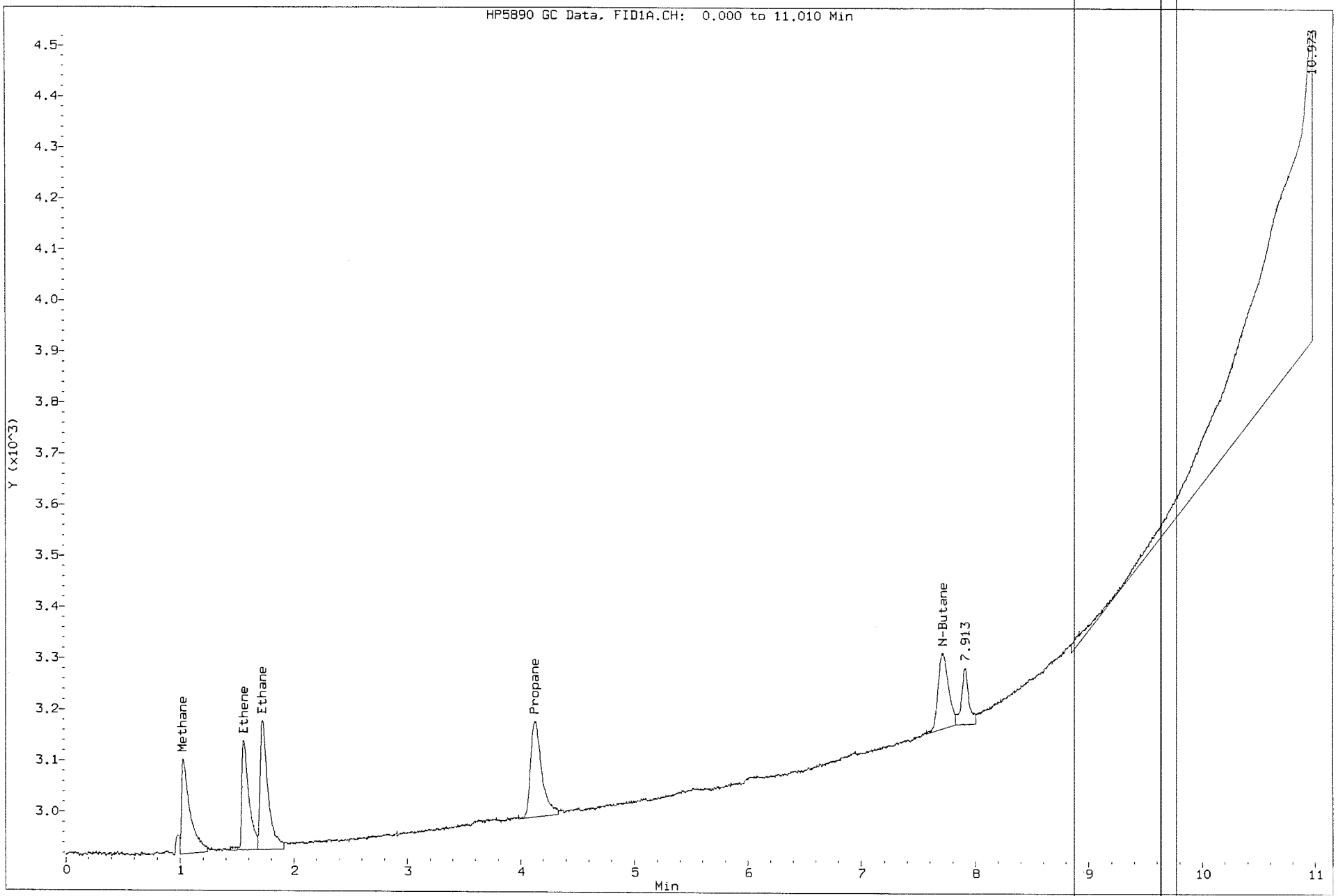
QC Flag Legend

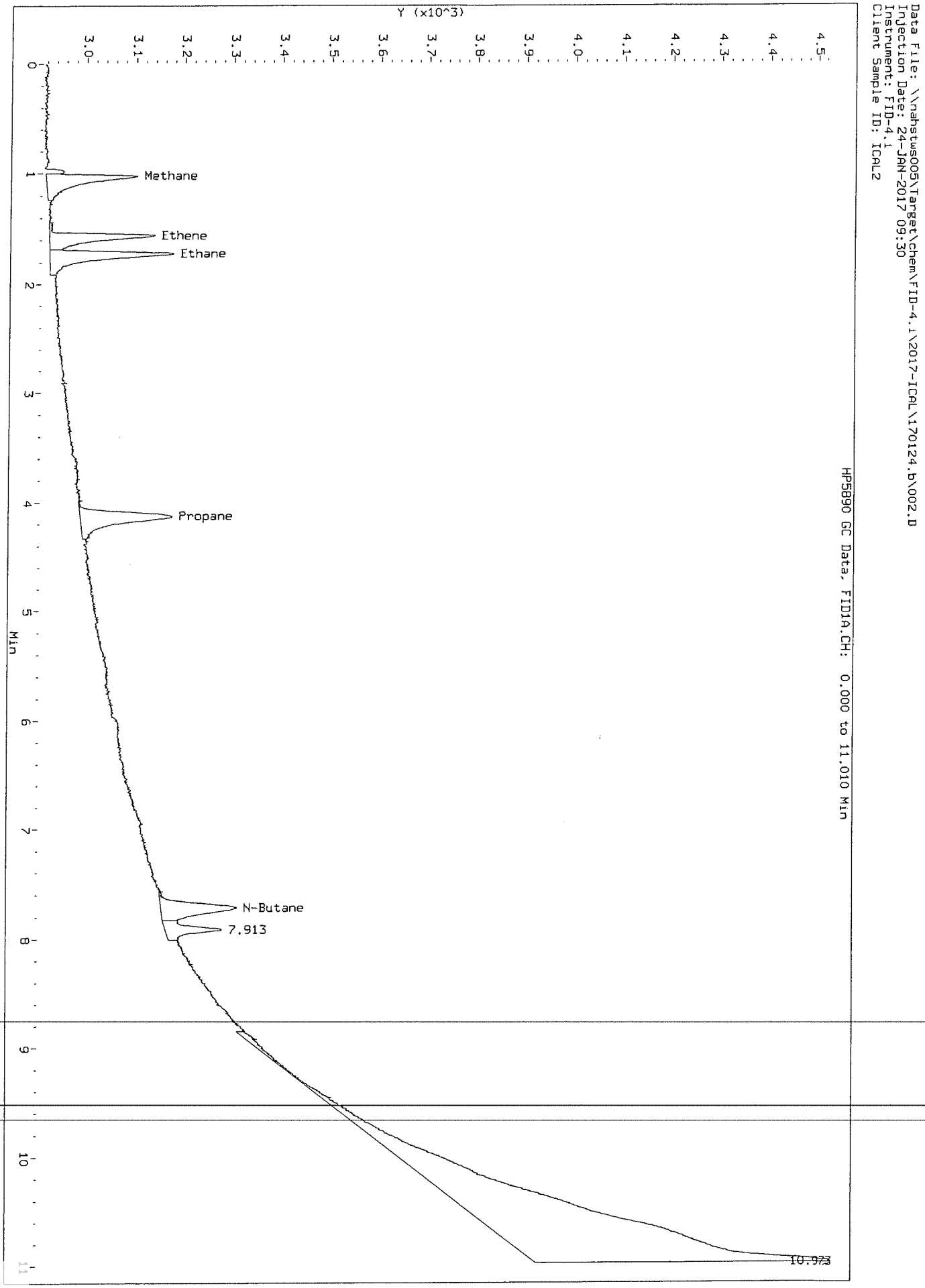
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\002.D
Date : 24-JAN-2017 09:30
Client ID: ICAL2
Instrument: FID-4.i
Sample Info: ICAL2;ICAL2;;;
Operator: MA
Column phase: Rtx-PLOT
Column diameter: 0.53



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\002.D
Injection Date: 24-JAN-2017 09:30
Instrument: FID-4.i
Client Sample ID: ICAL2




Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\002.D
Injection Date: 24-JAN-2017 09:30
Instrument: FID-4.i
Client Sample ID: ICAL2
Y (x10^3)
Methane
Ethene
Ethane
Propane
N-Butane
7.913
10.973
Min
HP5890 GC Data, FID1A.CH: 0.000 to 11.010 Min

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\003.D
Lab Smp Id: ICAL3 Client Smp ID: ICAL3
Inj Date : 24-JAN-2017 09:59
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL3;ICAL3;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 09:59 Cal File: 003.D
Als bottle: 3 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.043	1.026	0.017	1967	1.92900	2.017
2 Ethene	1.570	1.553	0.017	1904	3.37000	3.250
3 Ethane	1.736	1.720	0.016	2378	3.60900	3.305
4 Propane	4.123	4.106	0.017	2602	5.29300	4.912
5 N-Butane	7.703	7.686	0.017	2082	6.99100	6.242(M)

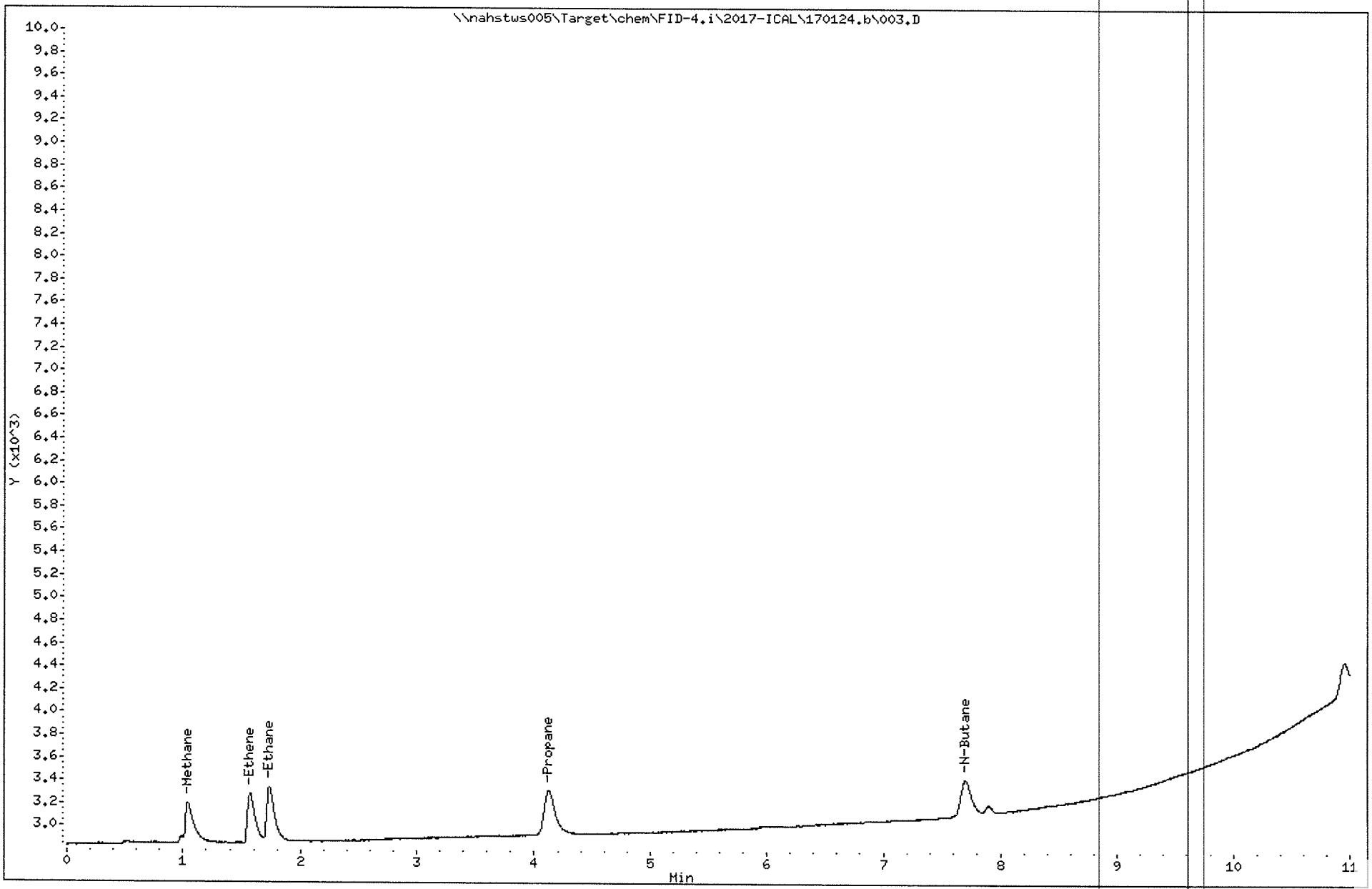
QC Flag Legend

M - Compound response manually integrated.

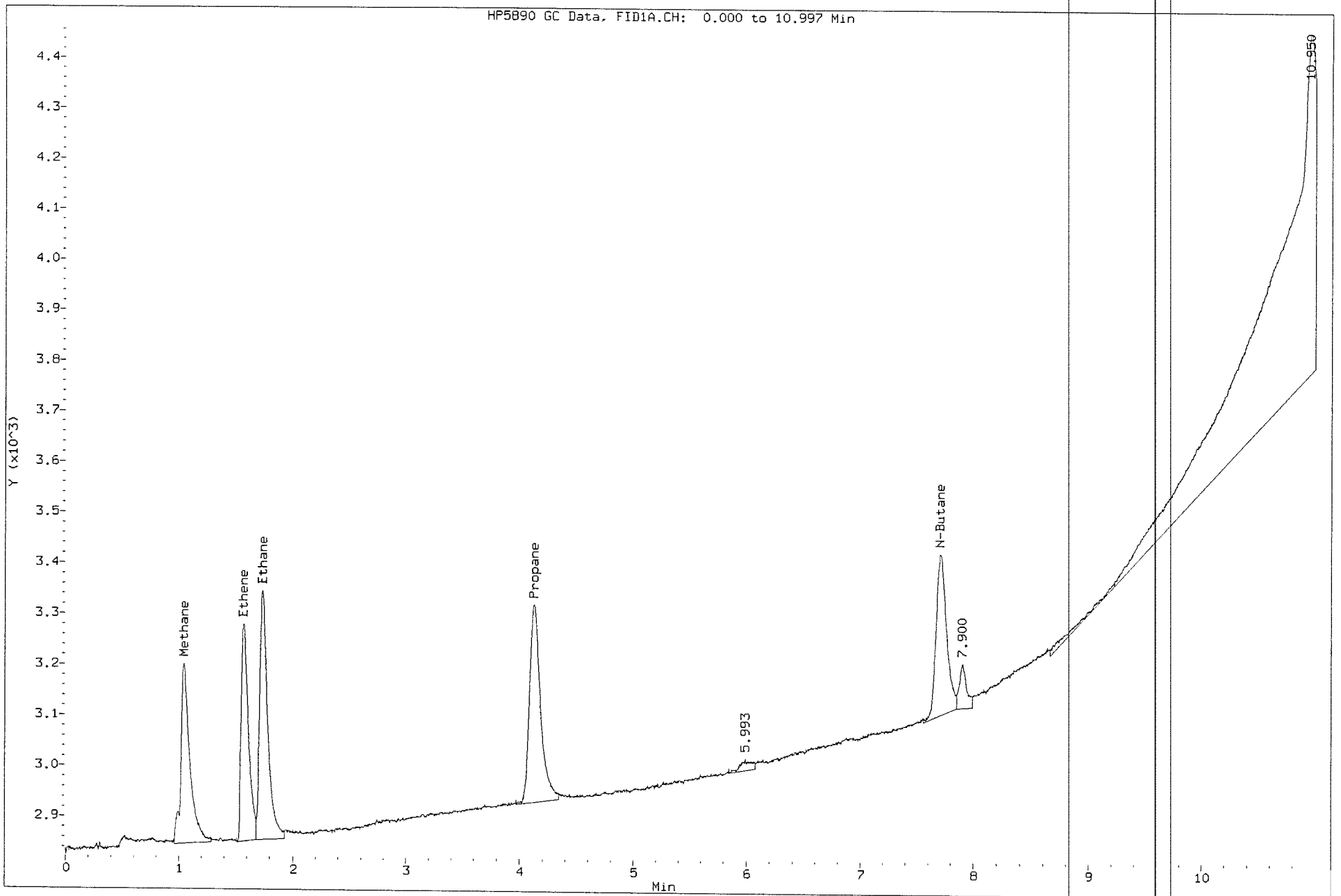
Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\003.D
Date : 24-JAN-2017 09:59
Client ID: ICAL3
Sample Info: ICAL3;ICAL3;;;

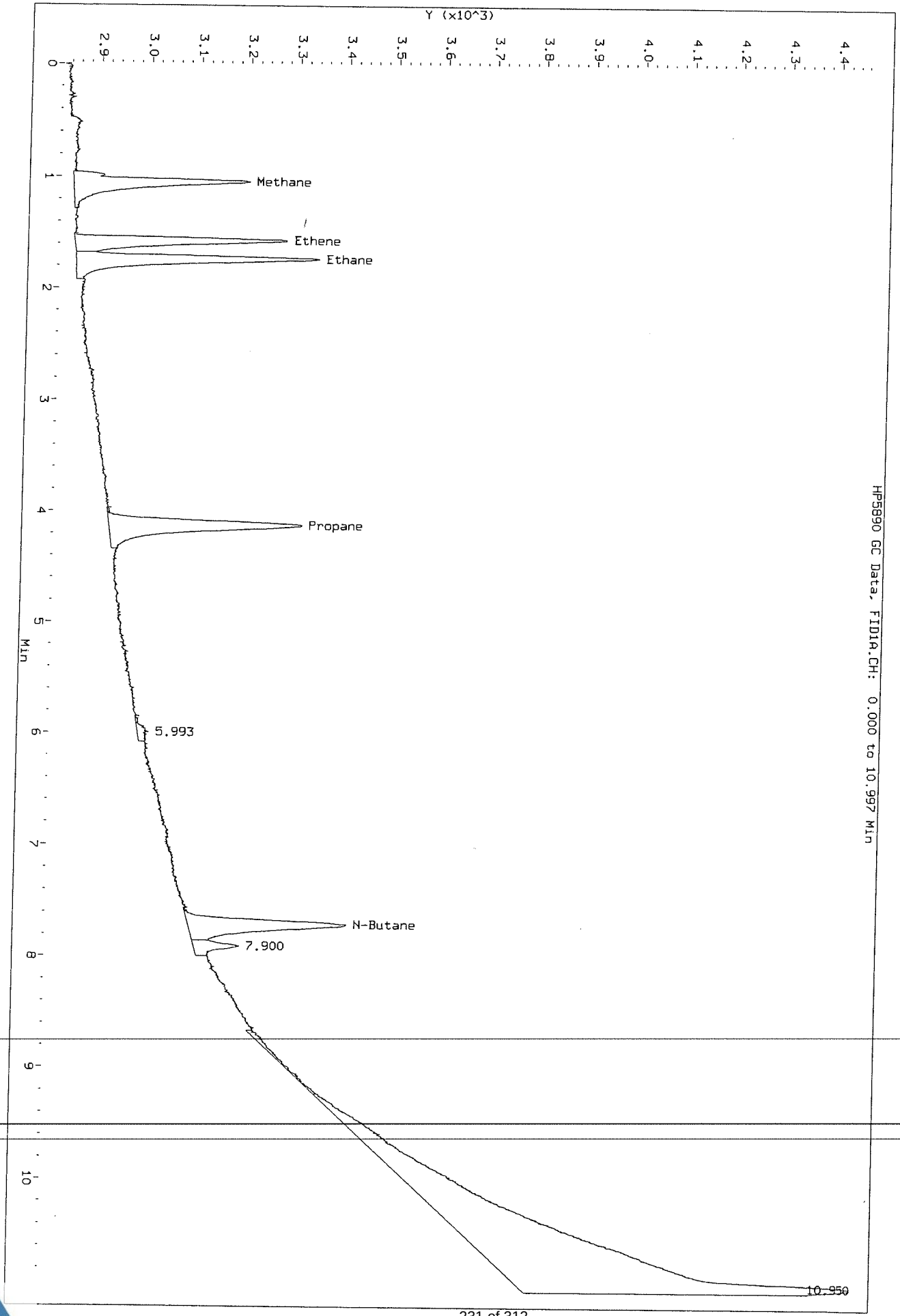
Instrument: FID-4.i
Operator: MA
Column diameter: 0.53

Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\003.D
Injection Date: 24-JAN-2017 09:59
Instrument: FID-4.i
Client Sample ID: ICAL3




Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\003.D
Injection Date: 24-JAN-2017 09:59
Instrument: FID-4.i
Client Sample ID: ICAL3
Y (x10^3)
Methane
Ethene
Ethane
Propane
5.993
N-Butane
7.900
10.950
Min
HP5890 GC Data, FID1A.CH: 0.000 to 10.997 Min

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\004.D
Lab Smp Id: ICAL4 Client Smp ID: ICAL4
Inj Date : 24-JAN-2017 10:15
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL4;ICAL4;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 4 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.033	1.026	0.007	3399	3.85900	3.486
2 Ethene	1.560	1.553	0.007	3553	6.74000	6.065(M)
3 Ethane	1.726	1.720	0.006	4504	7.21700	6.259(M)
4 Propane	4.120	4.106	0.014	4785	10.5850	8.169
5 N-Butane	7.703	7.686	0.017	3780	13.9820	9.339(M)

QC Flag Legend

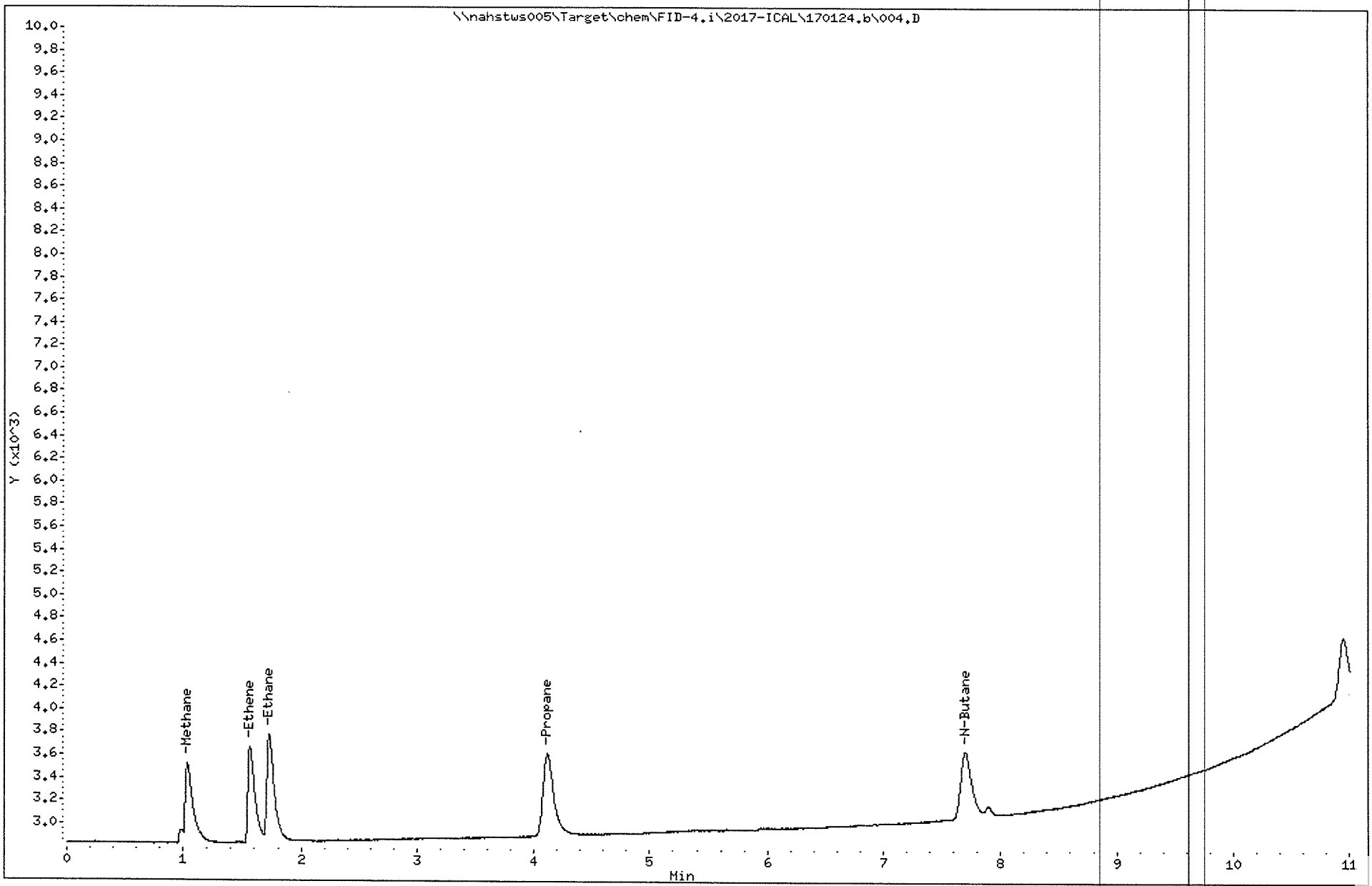
M - Compound response manually integrated.

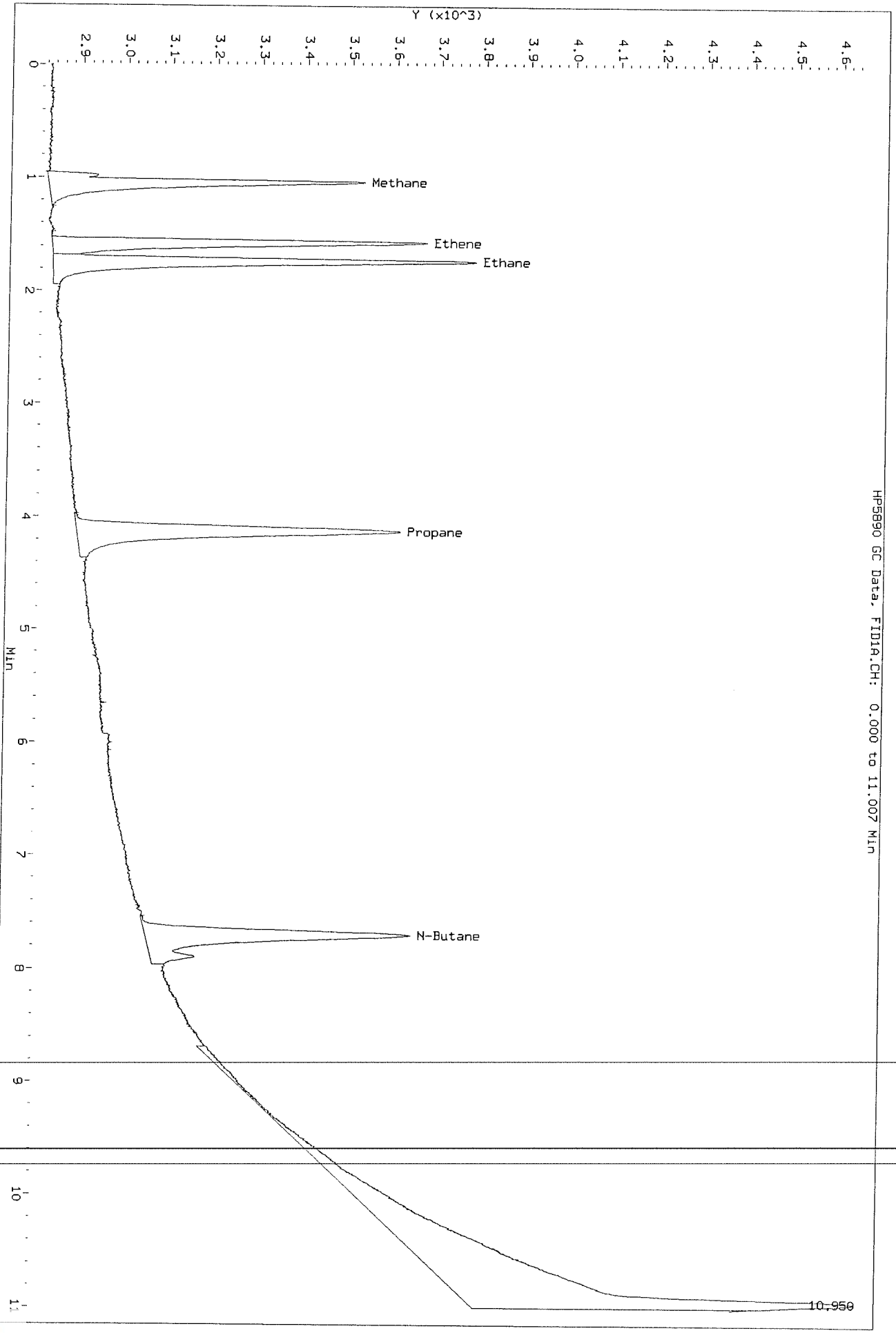
Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\004.D
Date : 24-JAN-2017 10:15
Client ID: ICAL4
Sample Info: ICAL4;ICAL4;;;

Instrument: FID-4.i

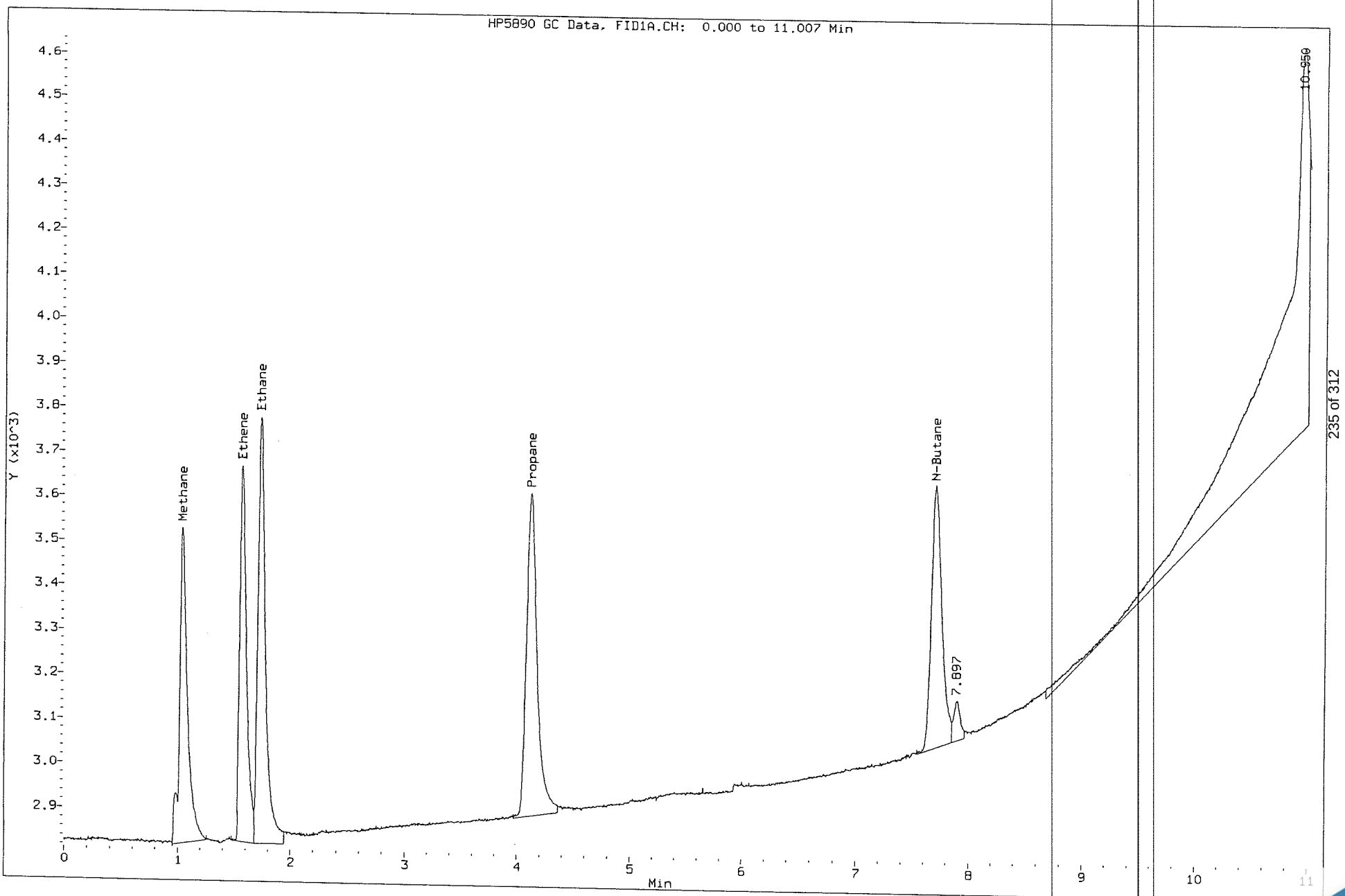
Operator: MA
Column diameter: 0.53

Column phase: Rtx-PLOT




Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\004.D
Injection Date: 24-JAN-2017 10:15
Instrument: FID-4.i
Client Sample ID: ICAL4
HP5890 GC Data, FID1A.CH: 0.000 to 11.007 Min
Y (x10^3)
Min
Methane
Ethene
Ethane
Propane
N-Butane
10.950

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\004.D
Injection Date: 24-JAN-2017 10:15
Instrument: FID-4.i
Client Sample ID: ICAL4



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\005.D
Lab Smp Id: ICAL5 Client Smp ID: ICAL5
Inj Date : 24-JAN-2017 10:39
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL5;ICAL5;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 10:39 Cal File: 005.D
Als bottle: 5 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.043	1.026	0.017	9268	9.64700	9.505
2 Ethene	1.570	1.553	0.017	11210	16.8500	19.137
3 Ethane	1.733	1.720	0.013	14588	18.0430	20.275
4 Propane	4.120	4.106	0.014	18436	26.4630	27.554(M)
5 N-Butane	7.700	7.686	0.014	18270	34.9550	34.419(M)

QC Flag Legend

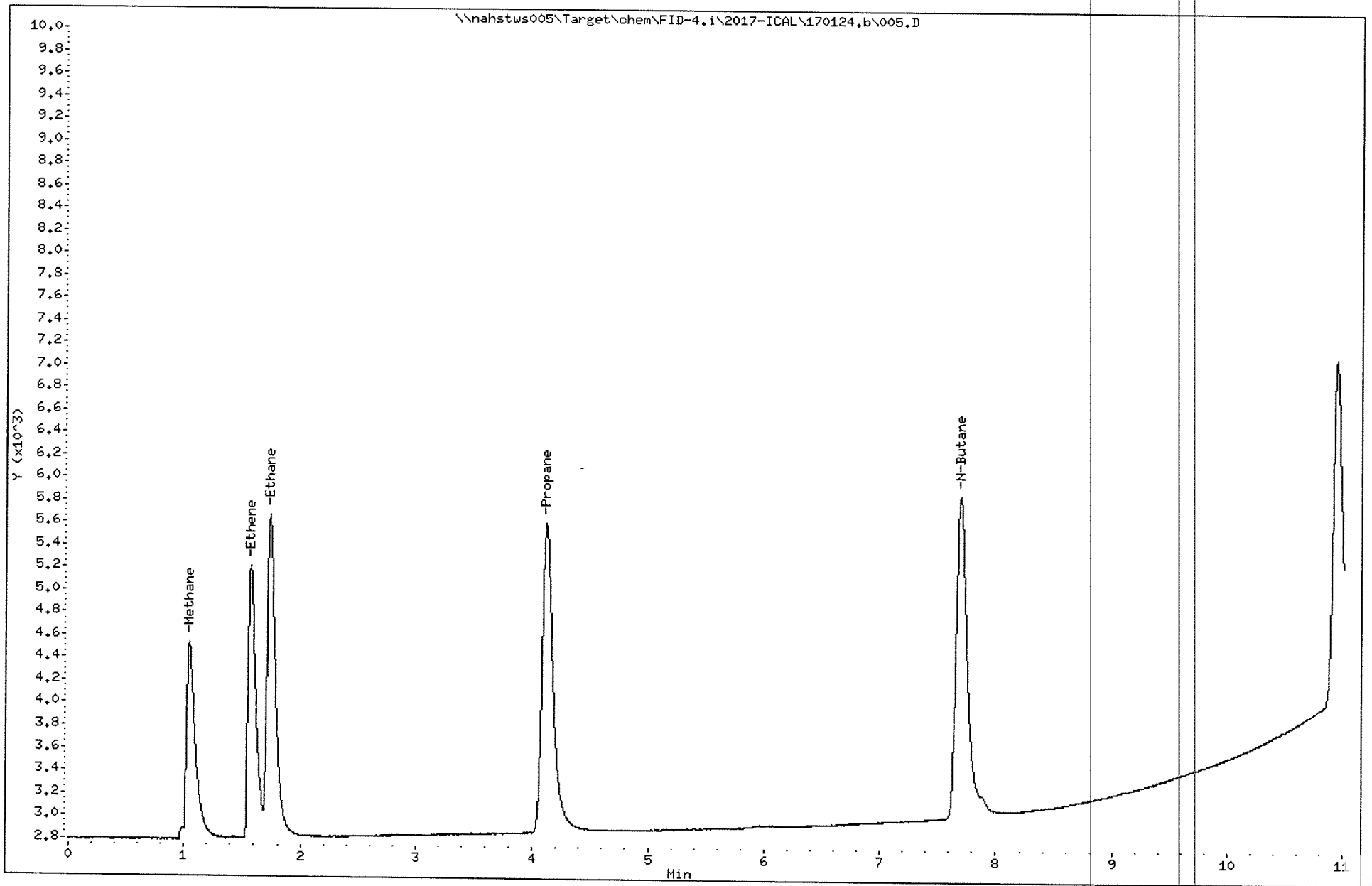
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\005.D
Date : 24-JAN-2017 10:39
Client ID: ICAL5
Sample Info: ICAL5;ICAL5;;;

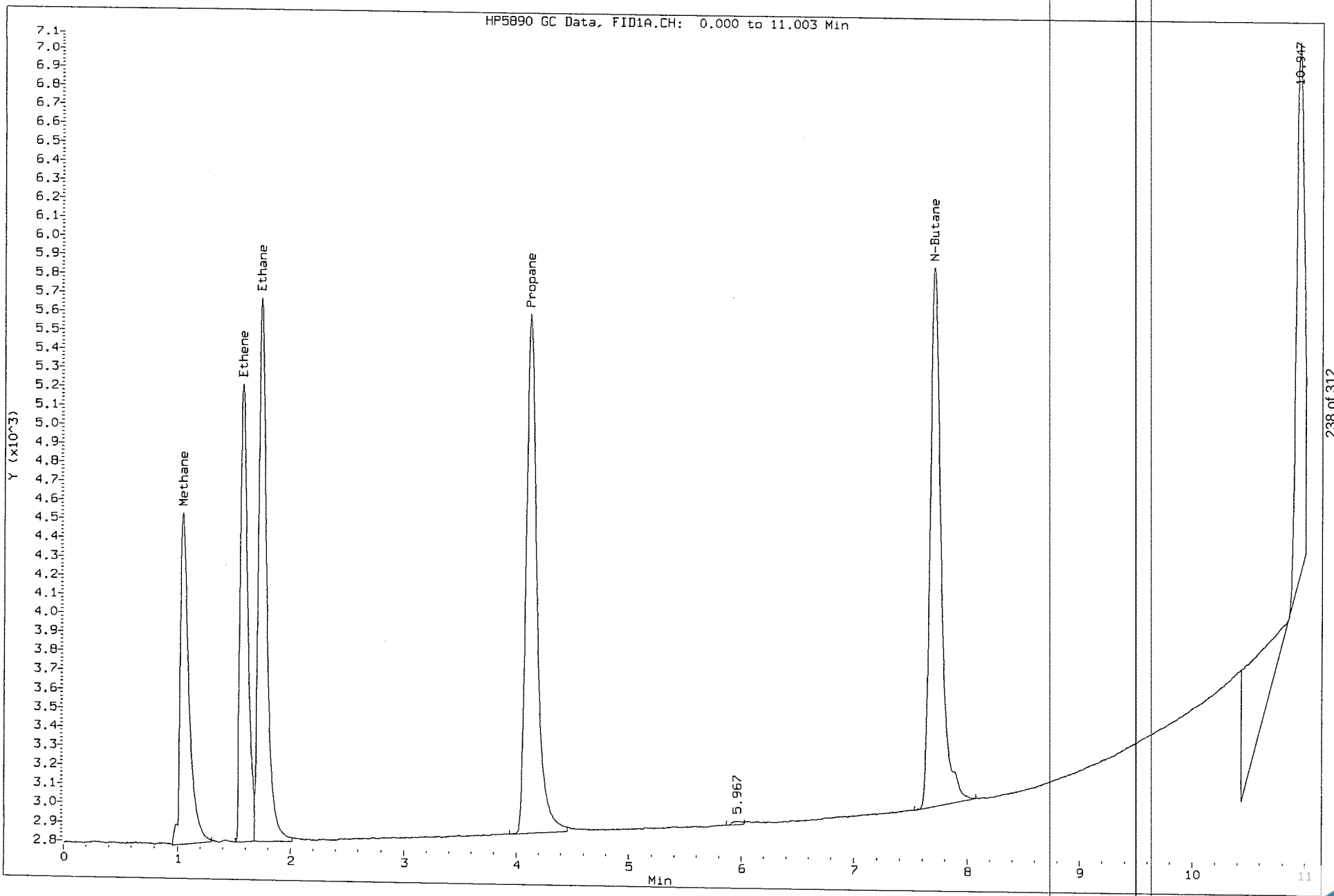
Instrument: FID-4.i

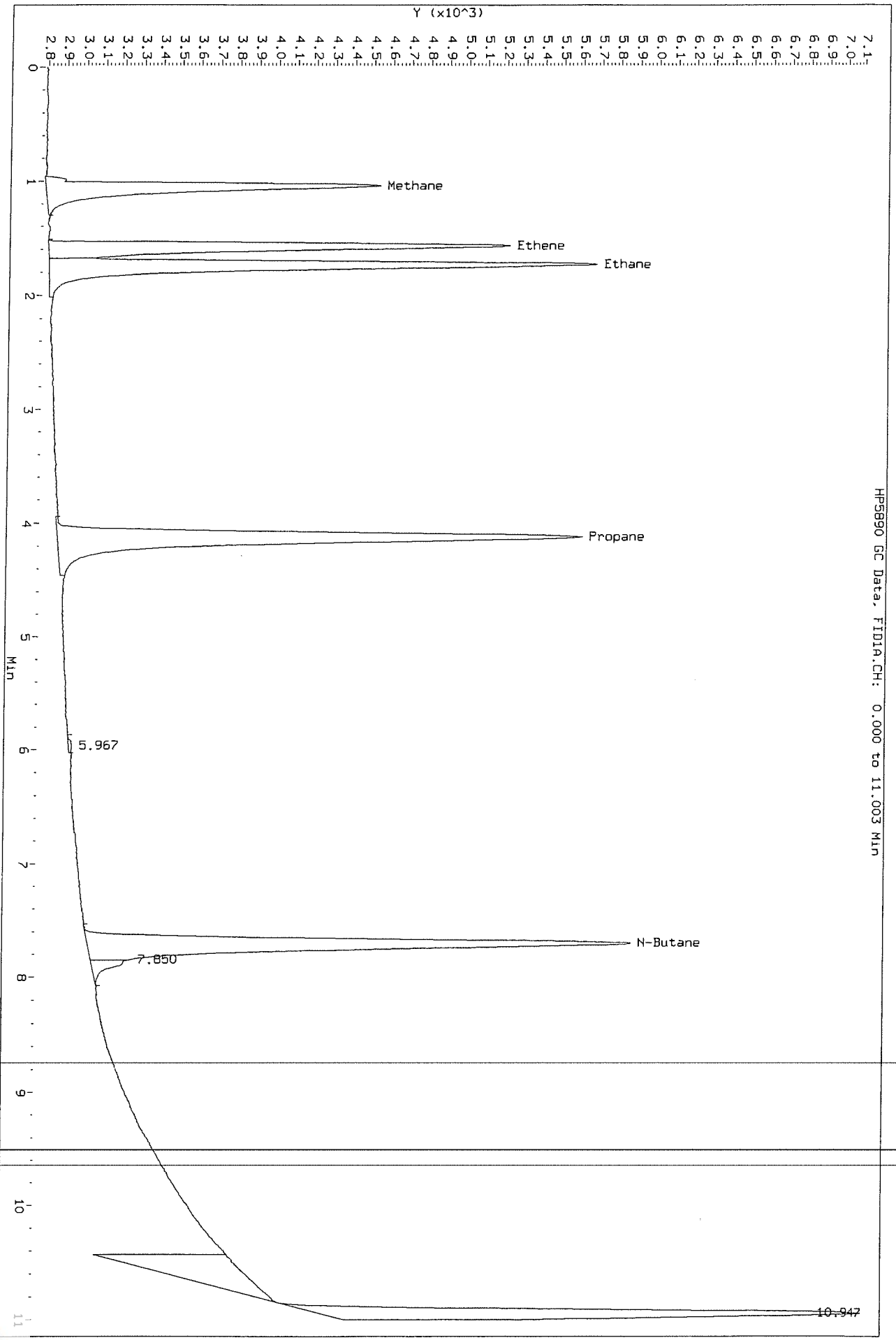
Operator: MA
Column diameter: 0.53

Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\005.D
Injection Date: 24-JAN-2017 10:39
Instrument: FID-4.i
Client Sample ID: ICAL5




Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\005.D
Injection Date: 24-JAN-2017 10:39
Instrument: FID-4.i
Client Sample ID: ICAL5
HP5890 GC Data, FID1A.CH: 0.000 to 11.003 Min
Y (x10^3)
Min
Methane
Ethene
Ethane
Propane
5.967
N-Butane
7.850
10.947

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\006.D
Lab Smp Id: ICAL6 Client Smp ID: ICAL6
Inj Date : 24-JAN-2017 10:57
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL6;ICAL6;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 10:57 Cal File: 006.D
Als bottle: 6 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	ON-COL (ug/L)
1 Methane	1.023	1.026	-0.003	18040	19.2940	18.502(M)
2 Ethene	1.550	1.553	-0.003	23045	53.8200	39.342(M)
3 Ethane	1.716	1.720	-0.004	29650	36.0860	41.209(M)
4 Propane	4.110	4.106	0.004	38286	52.9260	52.709
5 N-Butane	7.696	7.686	0.010	42405	69.9110	70.848(M)

QC Flag Legend

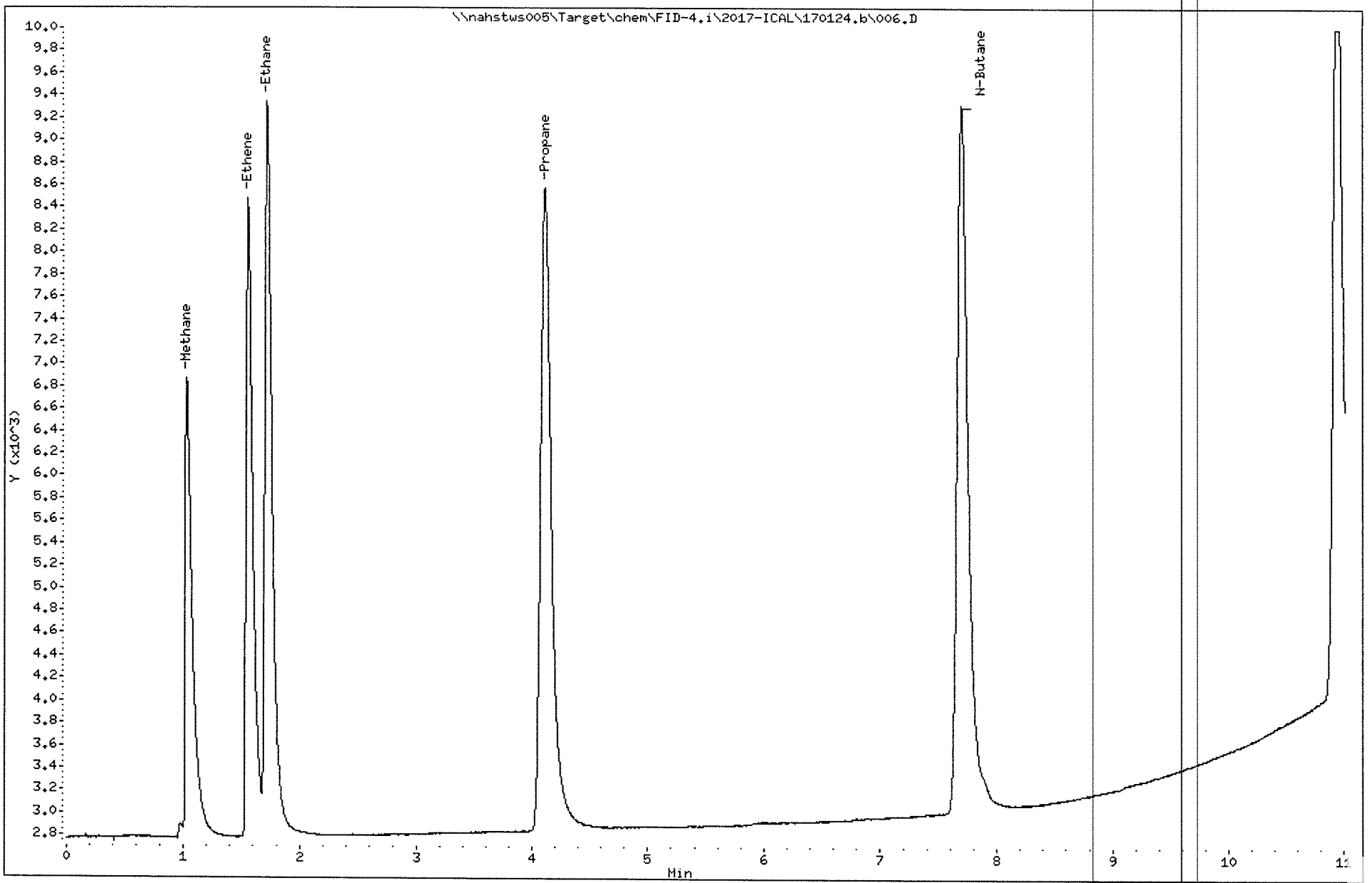
M - Compound response manually integrated.

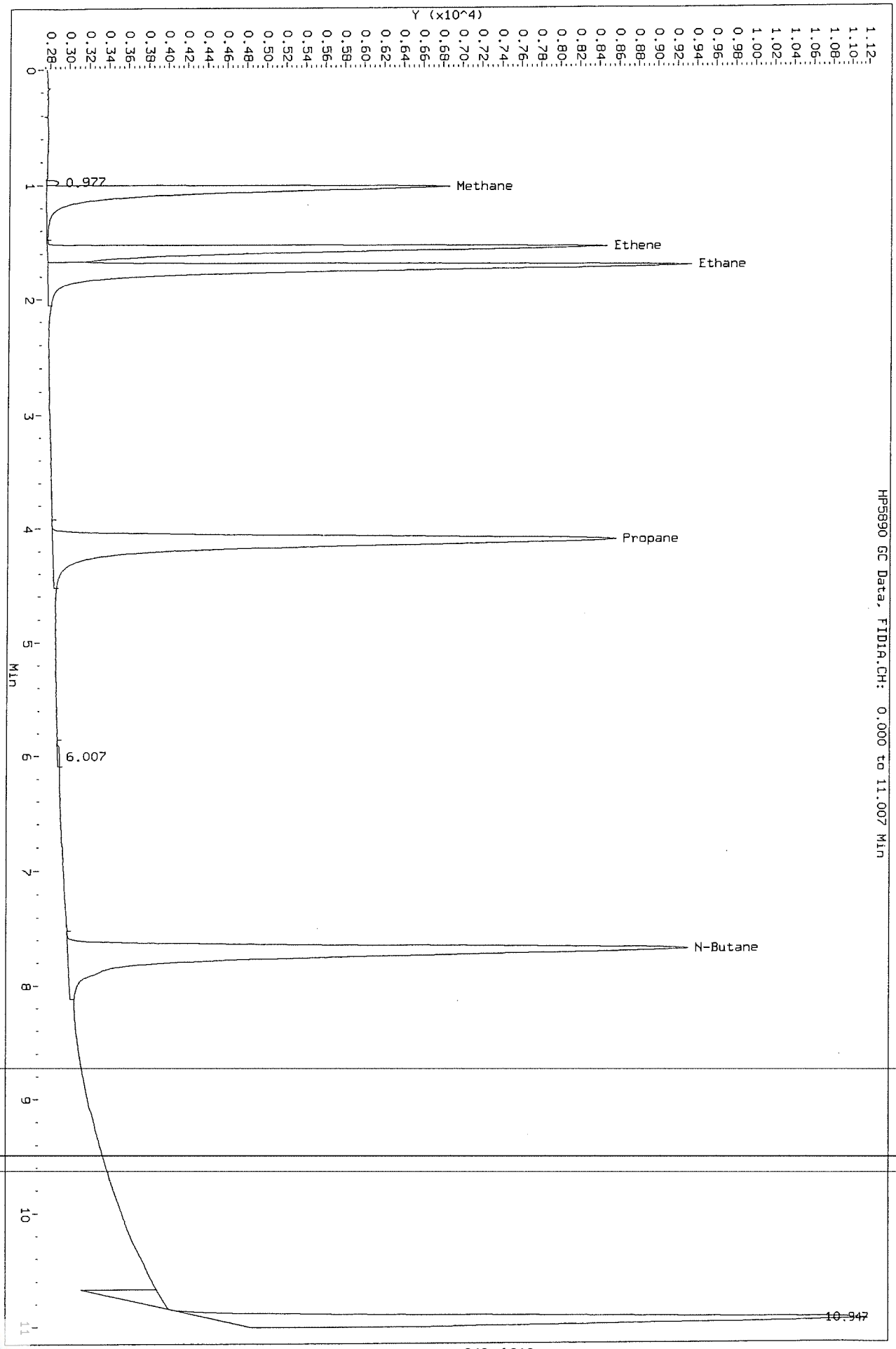
Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\006.D
Date : 24-JAN-2017 10:57
Client ID: ICAL6
Sample Info: ICAL6;ICAL6;;;

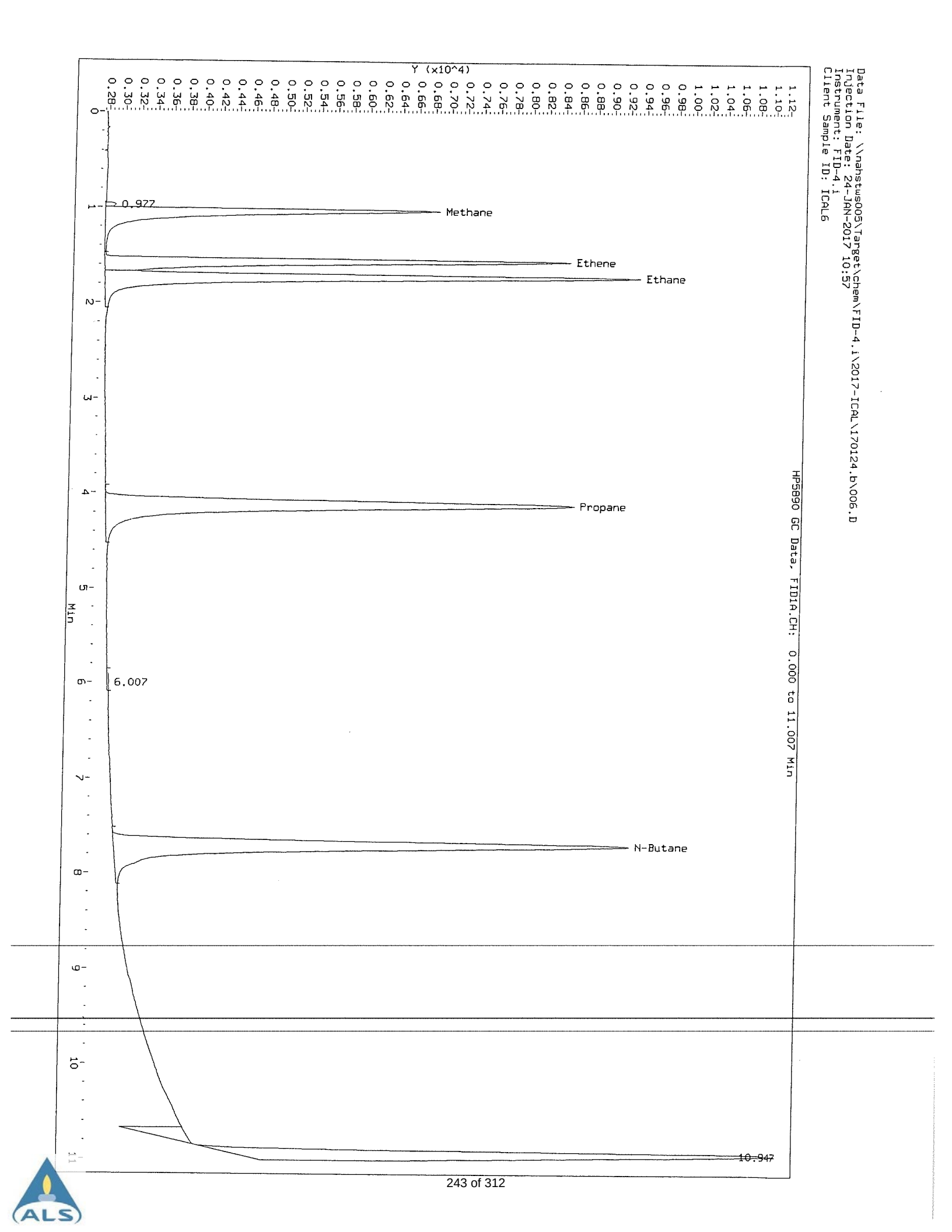
Instrument: FID-4.i

Operator: MA
Column diameter: 0.53

Column phase: Rtx-PLOT




Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\006.D
Injection Date: 24-JAN-2017 10:57
Instrument: FID-4.i
Client Sample ID: ICAL6
HP5890 GC Data, FID1A.CH: 0.000 to 11.007 Min
Y (x10^4)
Min
0.977
Methane
Ethene
Ethane
Propane
6.007
N-Butane
10.947


Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\006.D
Injection Date: 24-JAN-2017 10:57
Instrument: FID-4.i
Client Sample ID: ICAL6
HP5890 GC Data, FID1A.CH: 0.000 to 11.007 Min
Y (x10^4)
Min
0.977
Methane
Ethene
Ethane
Propane
6.007
N-Butane
10.947

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\007.D
Lab Smp Id: ICAL7 Client Smp ID: ICAL7
Inj Date : 24-JAN-2017 11:13
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL7;ICAL7;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 11:13 Cal File: 007.D
Als bottle: 7 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.030	1.026	0.004	41736	38.5880	42.806(A)
2 Ethene	1.556	1.553	0.003	51012	67.4000	87.086(AM)
3 Ethane	1.723	1.720	0.003	58591	72.1720	81.434(AM)
4 Propane	4.113	4.106	0.007	96632	105.852	105.852(AM)
5 N-Butane	7.690	7.686	0.004	114164	139.821	139.710

QC Flag Legend

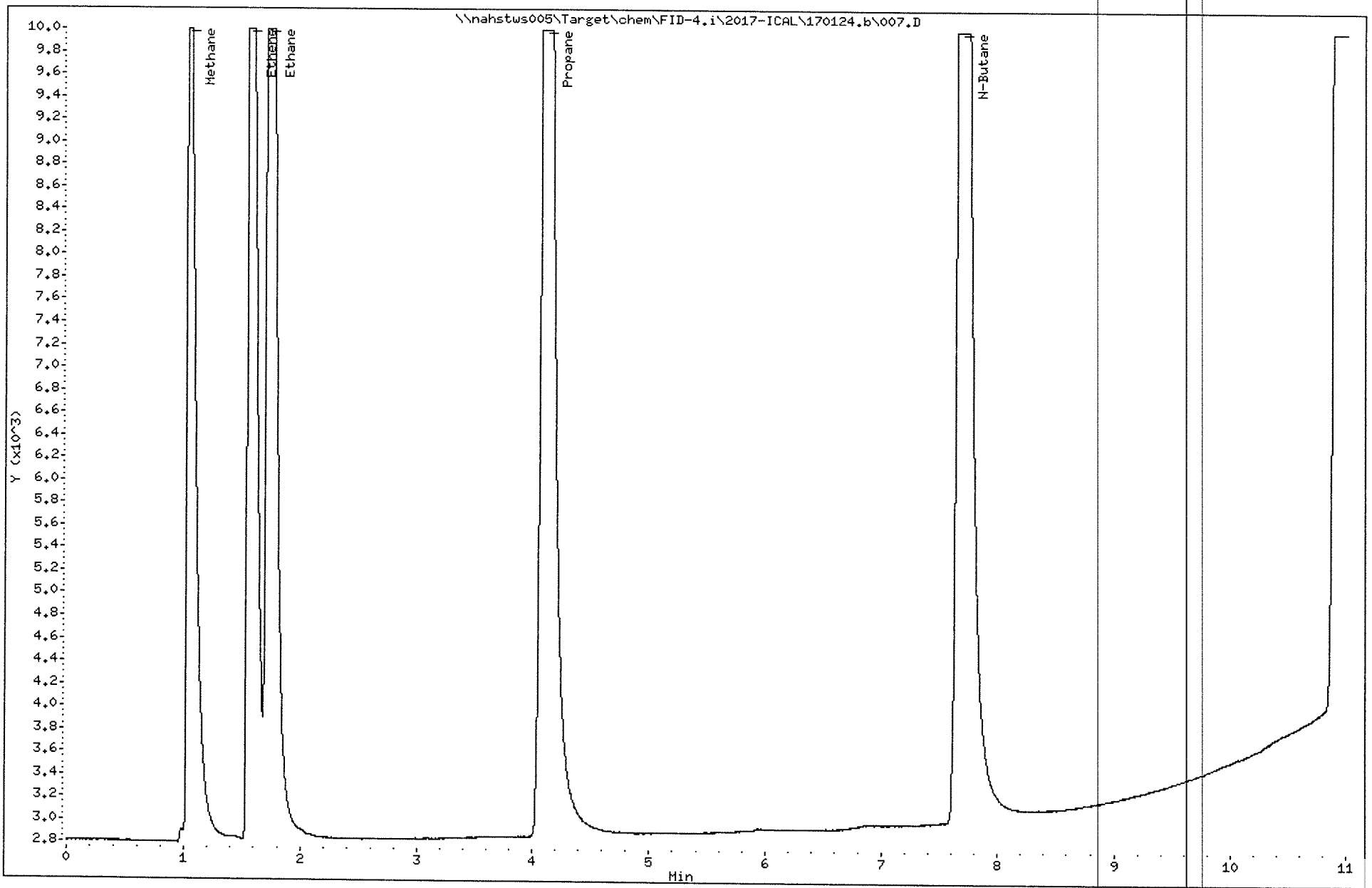
A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\007.D
Date : 24-JAN-2017 11:13
Client ID: ICAL7
Sample Info: ICAL7;ICAL7;;;

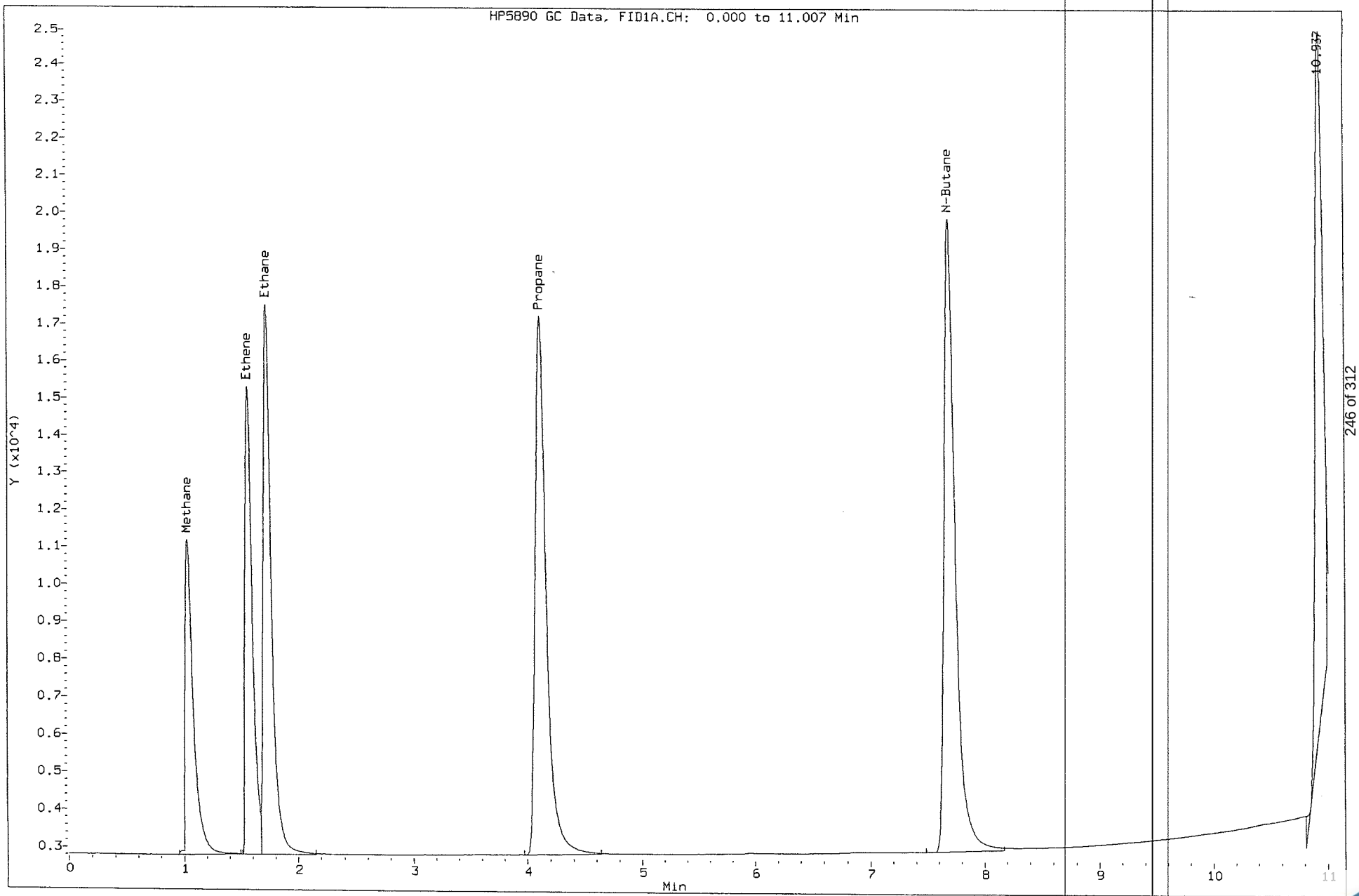
Column phase: Rtx-PLOT

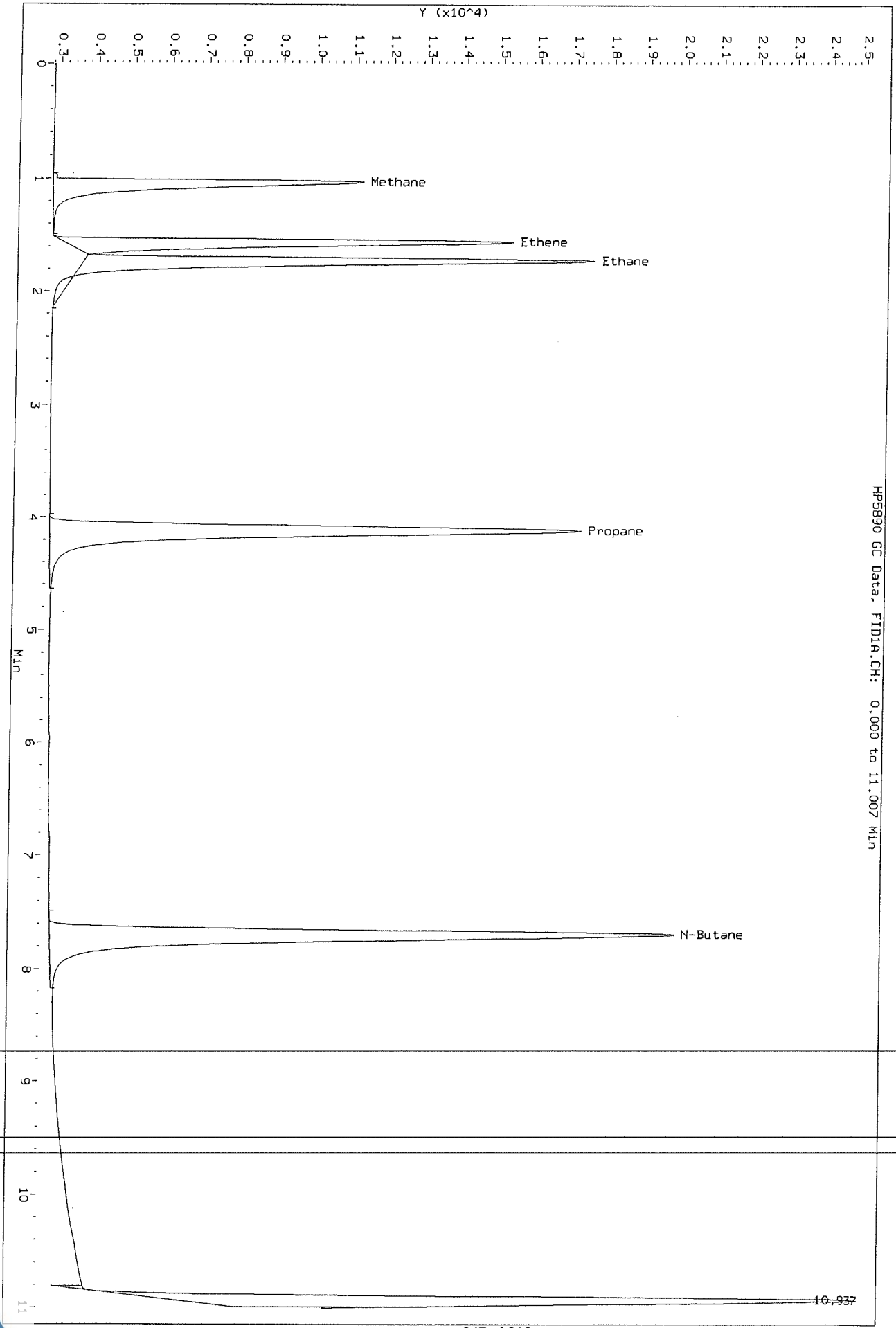
Instrument: FID-4.i

Operator: MA
Column diameter: 0.53



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\007.D
Injection Date: 24-JAN-2017 11:13
Instrument: FID-4.i
Client Sample ID: ICAL7




Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\007.D
Injection Date: 24-JAN-2017 11:13
Instrument: FID-4.i
Client Sample ID: ICAL7
HP5890 GC Data, FID1A.CH: 0.000 to 11.007 Min
Y (x10^4)
Min
Methane
Ethene
Ethane
Propane
N-Butane
10.937

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\008.D
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 24-JAN-2017 12:05
Operator : MA Inst ID: FID-4.i
Smp Info : ICV;ICV;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 8 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

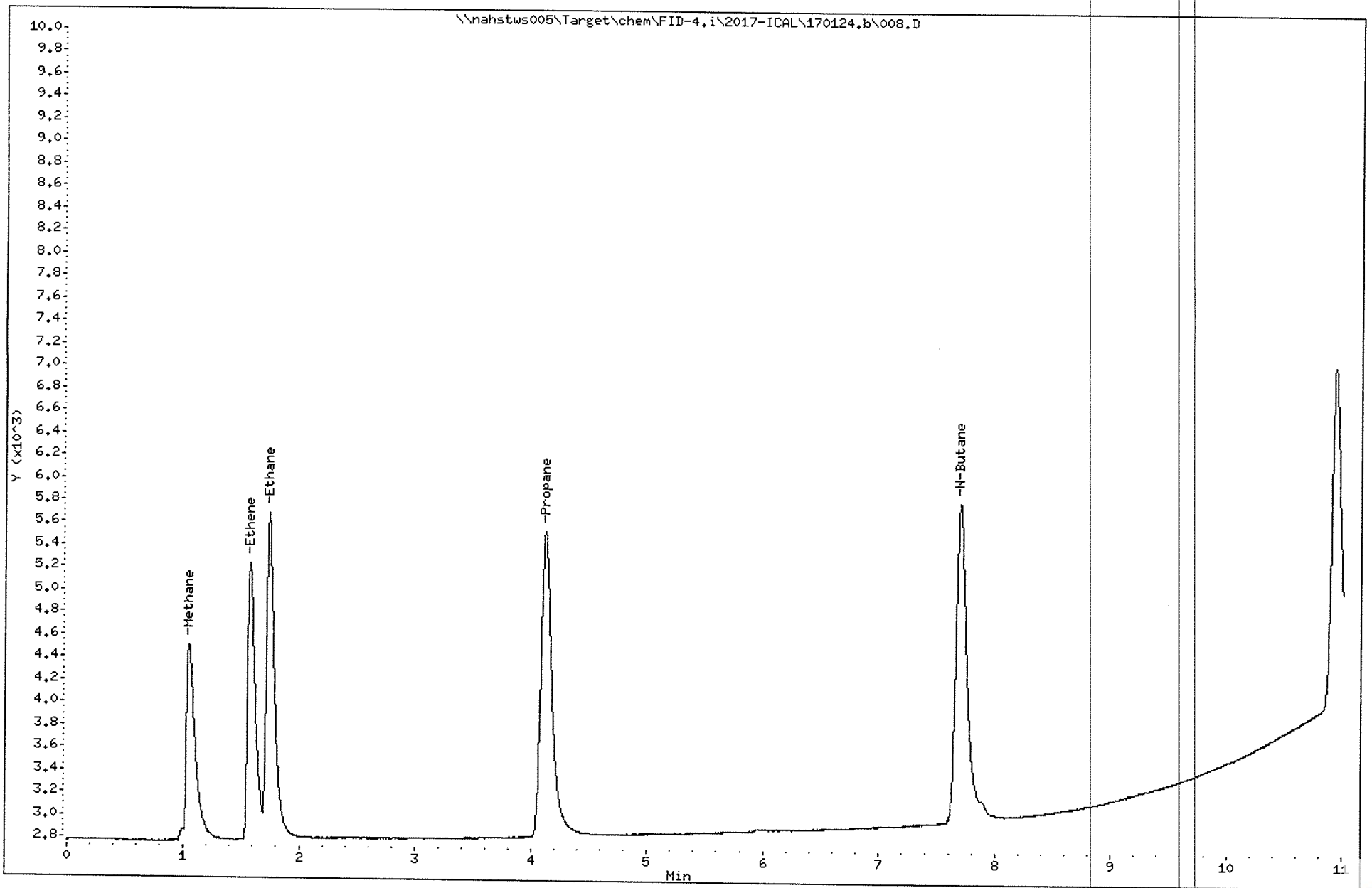
Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	1.046	1.026	0.020	9352	9.59187	9.591
2 Ethene	1.573	1.553	0.020	11192	19.1068	19.106
3 Ethane	1.736	1.720	0.016	14474	20.1170	20.117
4 Propane	4.116	4.106	0.010	18164	27.1844	27.184
5 N-Butane	7.696	7.686	0.010	19425	36.3149	36.314

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\008.D
Date : 24-JAN-2017 12:05
Client ID: ICV
Sample Info: ICV;ICV;;;

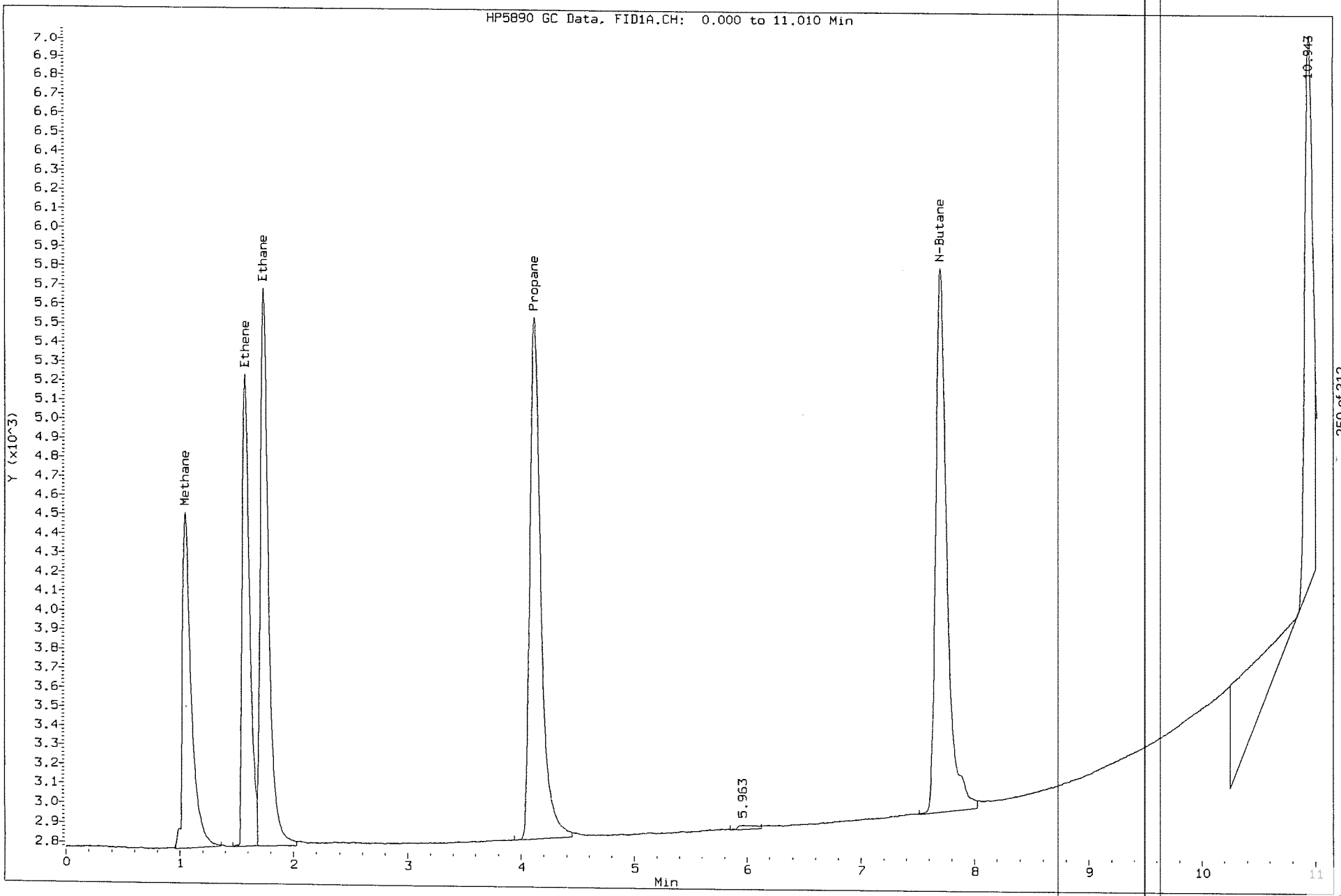
Instrument: FID-4.i

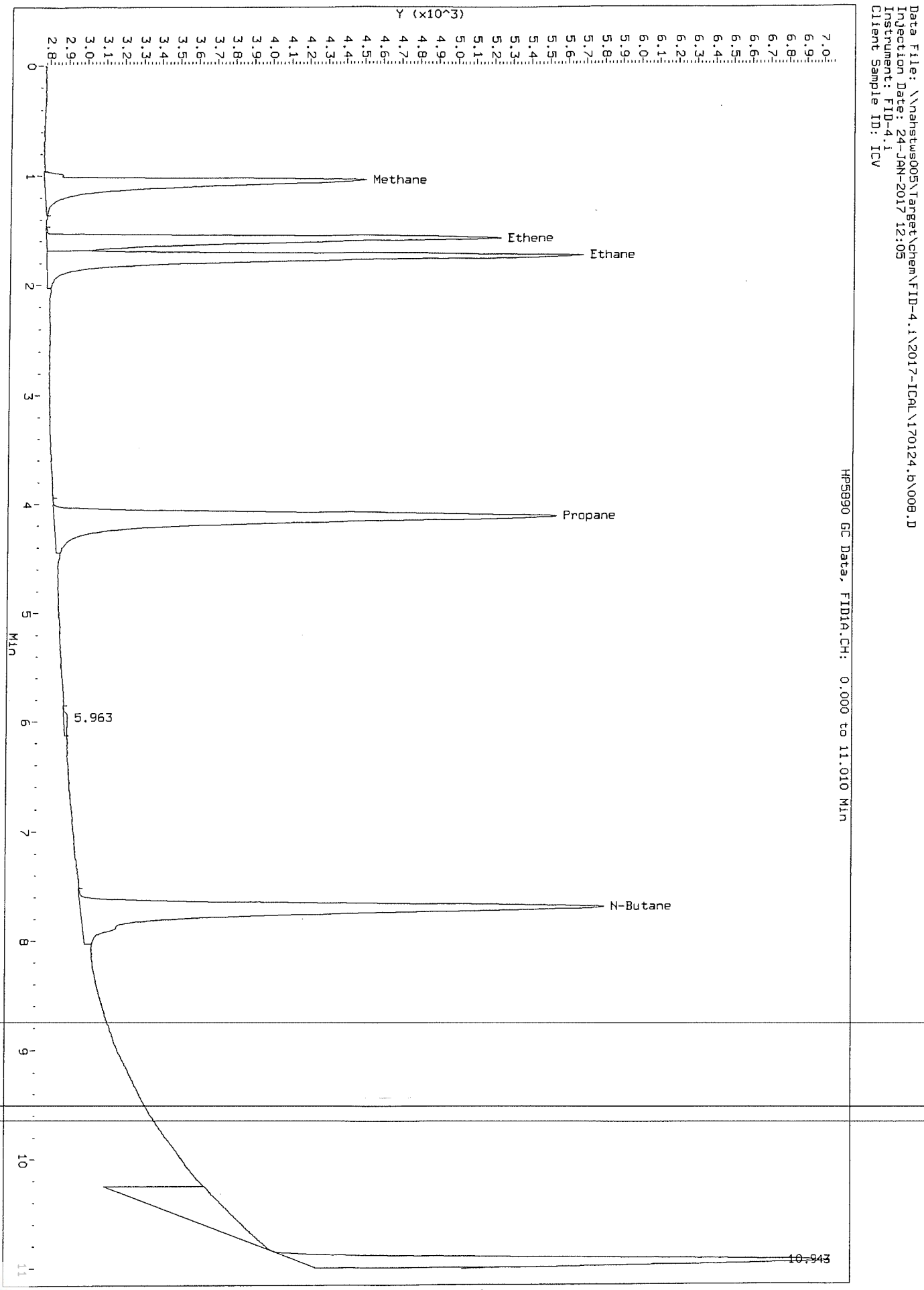
Operator: MA
Column diameter: 0.53

Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\008.D
Injection Date: 24-JAN-2017 12:05
Instrument: FID-4.i
Client Sample ID: ICV




Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\008.D
Injection Date: 24-JAN-2017 12:05
Instrument: FID-4.i
Client Sample ID: ICV
HP5890 GC Data, FID1A.CH: 0.000 to 11.010 Min
Y (x10^3)
Min
Methane
Ethene
Ethane
Propane
5.963
N-Butane
10.943

FID04 -Logbook

Batch: 37666
Date: 09-25-2019
Method: RSK175
Comments: Target sequence 190925

Analyst: Purvi Lad
Reviewer:
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	RSK-CCV	CCV	09-25-2019 11:40 am	1.00	0.00 mL	0.00 mL	001.D	Liquid	Y	NA
2	LCS-190925	LCS	09-25-2019 12:00 pm	1.00	0.00 mL	0.00 mL	002.D	Liquid	Y	NA
3	LCSD-190925	LCSD	09-25-2019 12:15 pm	1.00	0.00 mL	0.00 mL	003.D	Liquid	Y	NA
4	MBLK-190925	MBLK	09-25-2019 12:26 pm	1.00	0.00 mL	0.00 mL	004.D	Liquid	Y	NA
5	HS19090962-12	SAMP	09-25-2019 12:40 pm	1.00	0.00 mL	0.00 mL	005.D	Liquid	Y	NA
6	HS19090962-12MS	MS	09-25-2019 01:16 pm	1.00	0.00 mL	0.00 mL	006.D	Liquid	Y	NA
7	HS19090962-12MSD	MSD	09-25-2019 01:27 pm	1.00	0.00 mL	0.00 mL	007.D	Liquid	Y	NA
8	HS19090964-04	SAMP	09-25-2019 01:46 pm	1.00	0.00 mL	0.00 mL	008.D	Liquid	Y	NA
9	HS19090964-06	SAMP	09-25-2019 01:58 pm	1.00	0.00 mL	0.00 mL	009.D	Liquid	Y	NA
10	HS19090965-10	SAMP	09-25-2019 02:08 pm	1.00	0.00 mL	0.00 mL	010.D	Liquid	Y	NA
11	RSK-CCV	CCV	09-25-2019 02:17 pm	1.00	0.00 mL	0.00 mL	011.D	Liquid	Y	NA
12	HS19090965-10	SAMP	09-25-2019 02:51 pm	5.00	0.00 mL	0.00 mL	012.D	Liquid	Y	NA
13	HS19091014-02	SAMP	09-25-2019 03:08 pm	1.00	0.00 mL	0.00 mL	013.D	Liquid	Y	NA
14	HS19091014-02	SAMP	09-25-2019 03:26 pm	5.00	0.00 mL	0.00 mL	014.D	Liquid	Y	NA
15	HS19091014-03	SAMP	09-25-2019 03:37 pm	1.00	0.00 mL	0.00 mL	015.D	Liquid	Y	NA
16	RSK-CCV	CCV	09-25-2019 04:24 pm	1.00	0.00 mL	0.00 mL	016.D	Liquid	Y	NA

FORM 2
WATER GASES SURROGATE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090962

	ENG SC SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	LCS-190925									0
02	LCSD-190925									0
03	MBLK-190925									0
04	HS19090962-1									0
05	HS19090962-1									0
06	HS19090962-1									0
07										
08										
09										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										

QC LIMITS

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate diluted out

FORM 7B
GASES CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090962

Instrument ID: FID-4 Calibration Date: 09/25/19 Time: 1140

Lab File ID: 001 Init. Calib. Date(s): 01/24/17 01/24/17

Init. Calib. Times: 0906 1113

GC Column: RTX-PLOT ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF250.00 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Ethane	719.48900	613.64518	0.01	14.71	20.00	AVRG
Methane	974.99200	961.64611	0.01	1.37	20.00	AVRG
Ethene	585.76000	534.42136	0.01	8.76	20.00	AVRG

FORM VII GASES

FORM 7B
GASES CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090962

Instrument ID: FID-4 Calibration Date: 09/25/19 Time: 1417

Lab File ID: 011 Init. Calib. Date(s): 01/24/17 01/24/17

Init. Calib. Times: 0906 1113

GC Column: RTX-PLOT ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF250.00 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Ethane	719.48900	613.64518	0.01	14.71	20.00	AVRG
Methane	974.99200	961.64611	0.01	1.37	20.00	AVRG
Ethene	585.76000	534.42136	0.01	8.76	20.00	AVRG

FORM VII GASES

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\001.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 25-SEP-2019 11:40
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

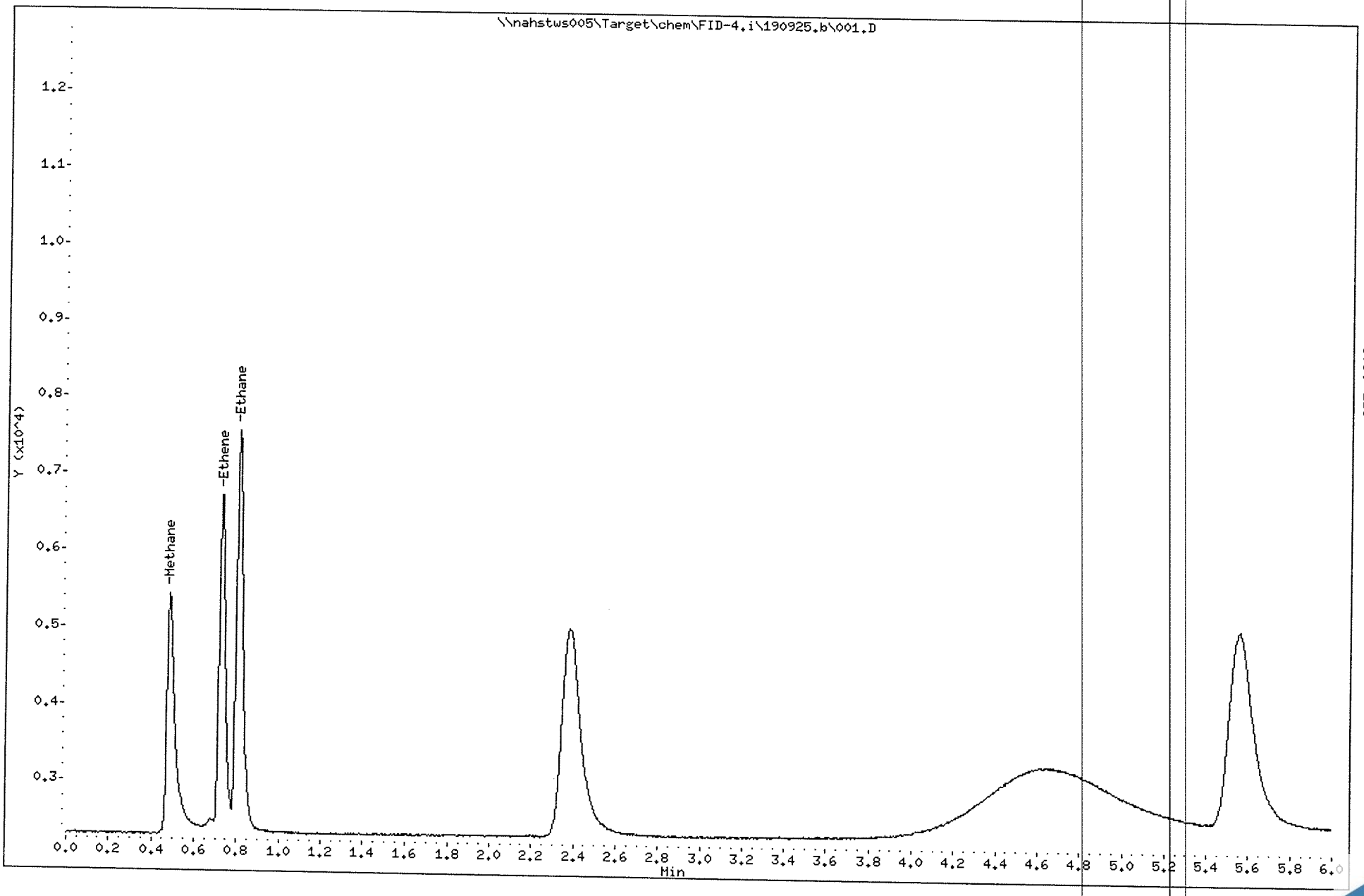
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	0.480	0.480	0.000	9208	9.64700	9.444
2 Ethene	0.726	0.723	0.003	10172	16.8500	17.365
3 Ethane	0.806	0.806	0.000	12703	18.0430	17.655

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\001.D
Date : 25-SEP-2019 11:40
Client ID: RSK-CCV
Sample Info: RSK-CCV;RSK-CCV;2;4

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

Column phase: Rtx-PLOT



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\002.D
Lab Smp Id: LCS-190925 Client Smp ID: LCS-190925
Inj Date : 25-SEP-2019 12:00
Operator : PL Inst ID: FID-4.i
Smp Info : LCS-190925;LCS-190925;3;;LCS
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 2 QC Sample: LCS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

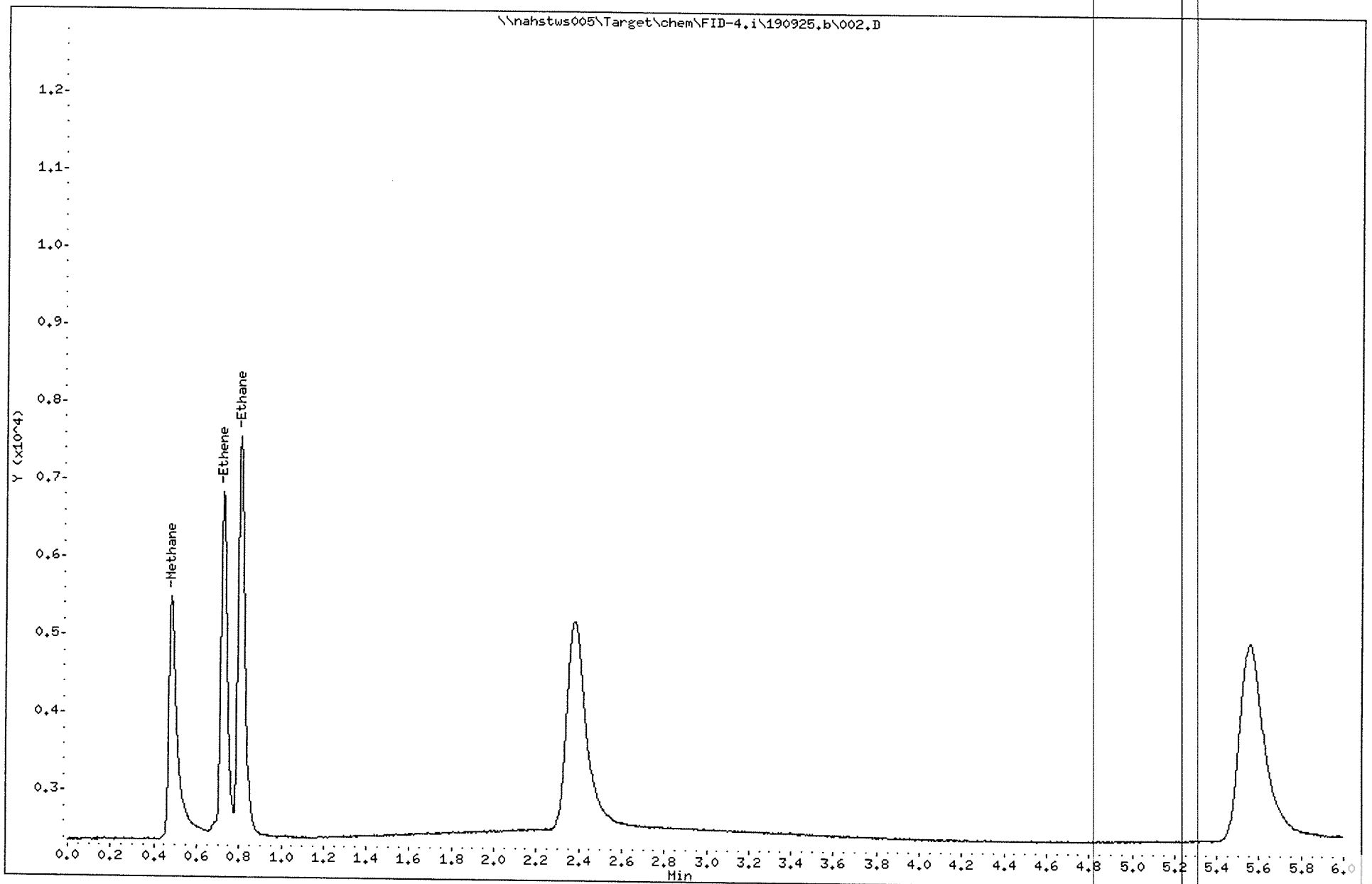
Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.480	0.480	0.000	9393	9.63392	9.633
2 Ethene	0.723	0.723	0.000	10140	17.3108	17.310
3 Ethane	0.803	0.806	-0.003	12730	17.6931	17.693

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\002.D
Date : 25-SEP-2019 12:00
Client ID: LCS-190925
Sample Info: LCS-190925;LCS-190925;3;;LCS

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

Column phase: Rtx-PLOT



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\003.D
Lab Smp Id: LCSD-190925 Client Smp ID: LCSD-190925
Inj Date : 25-SEP-2019 12:15
Operator : PL Inst ID: FID-4.i
Smp Info : LCSD-190925;LCSD-190925;3;;LCSD
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 3 QC Sample: LCSD
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

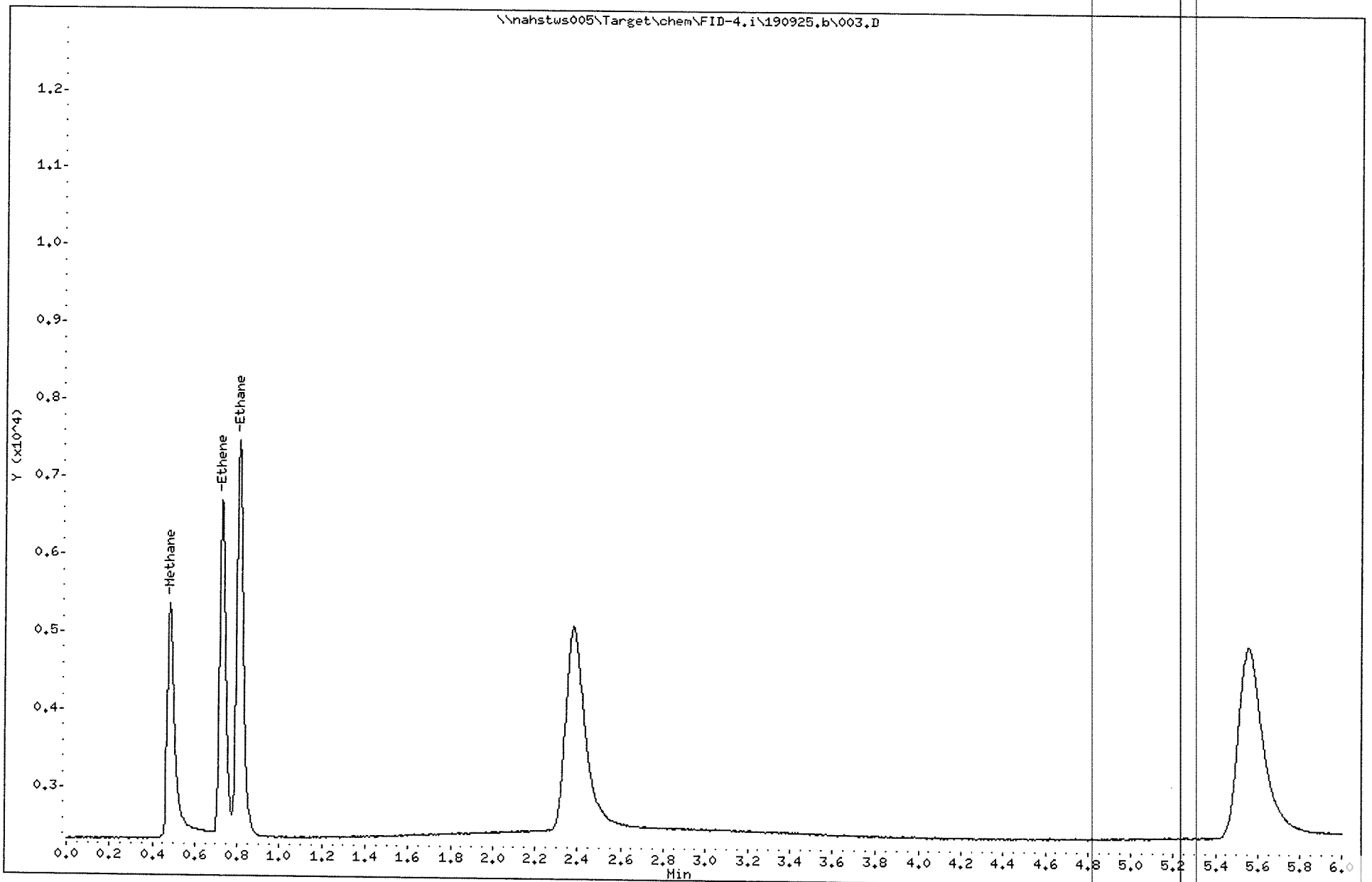
Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.480	0.480	0.000	8270	8.48212	8.482
2 Ethene	0.723	0.723	0.000	9417	16.0765	16.076
3 Ethane	0.806	0.806	0.000	12032	16.7230	16.722

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\003.D
Date : 25-SEP-2019 12:15
Client ID: LCSD-190925
Sample Info: LCSD-190925;LCSD-190925;3;;LCSD

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

Column phase: Rtx-PLOT



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\004.D
Lab Smp Id: MBLK-190925 Client Smp ID: MBLK-190925
Inj Date : 25-SEP-2019 12:26
Operator : PL Inst ID: FID-4.i
Smp Info : MBLK-190925; MBLK-190925;3;;BLANK
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 4 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

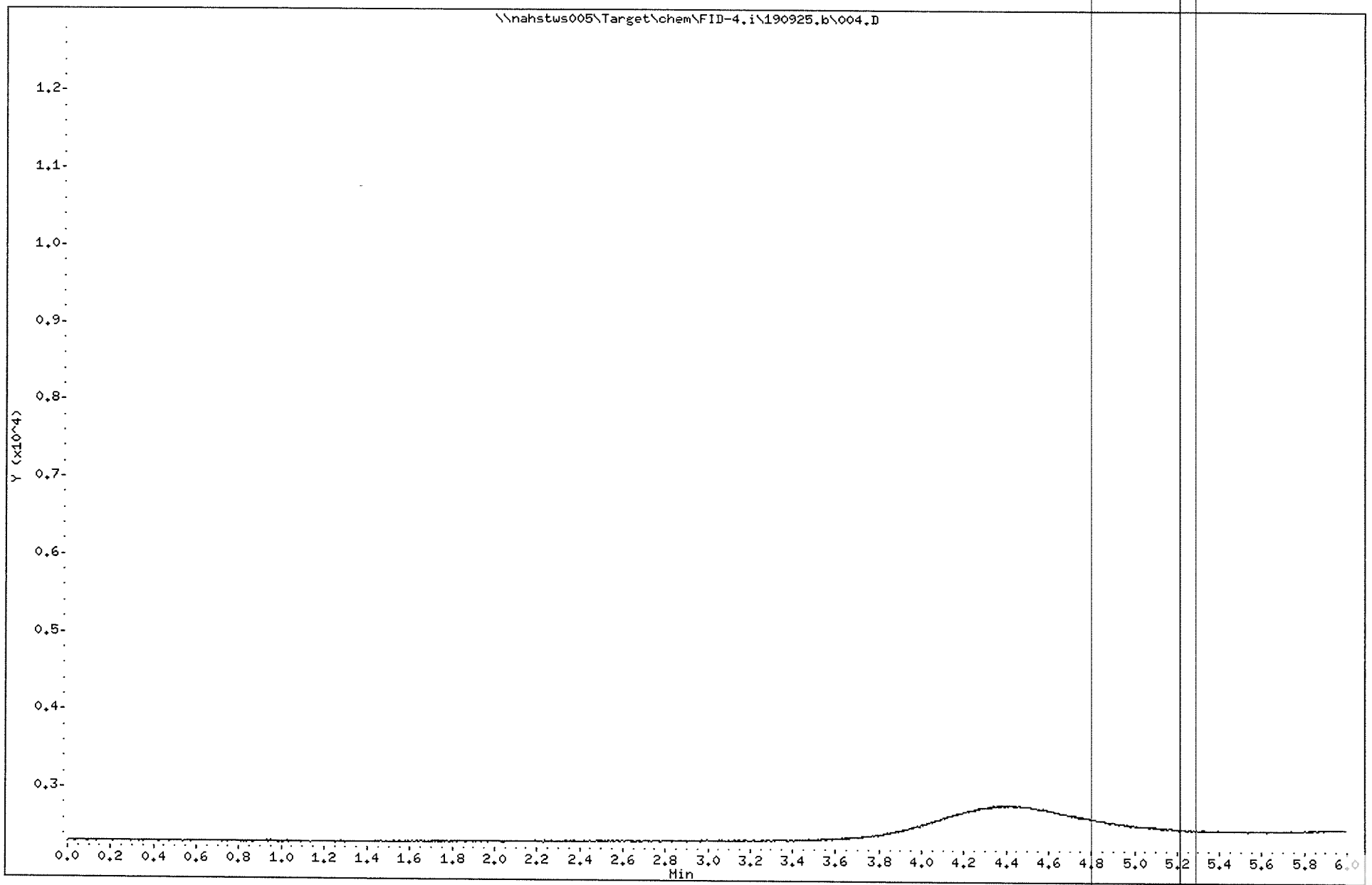
Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\004.D
Date : 25-SEP-2019 12:26
Client ID: MBLK-190925
Sample Info: MBLK-190925; MBLK-190925;3;;BLANK

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

Column phase: Rtx-PLOT



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\005.D
Lab Smp Id: HS19090962-12 Client Smp ID: HS19090962-12
Inj Date : 25-SEP-2019 12:40
Operator : PL Inst ID: FID-4.i
Smp Info : HS19090962-12; HS19090962-12
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 5
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	0.483	0.480	0.003	2375	2.43592	2.435
2 Ethene	0.706	0.723	-0.017	692	1.18137	1.181(M)
3 Ethane	0.826	0.806	0.020	177	0.24601	0.246(aM)

QC Flag Legend

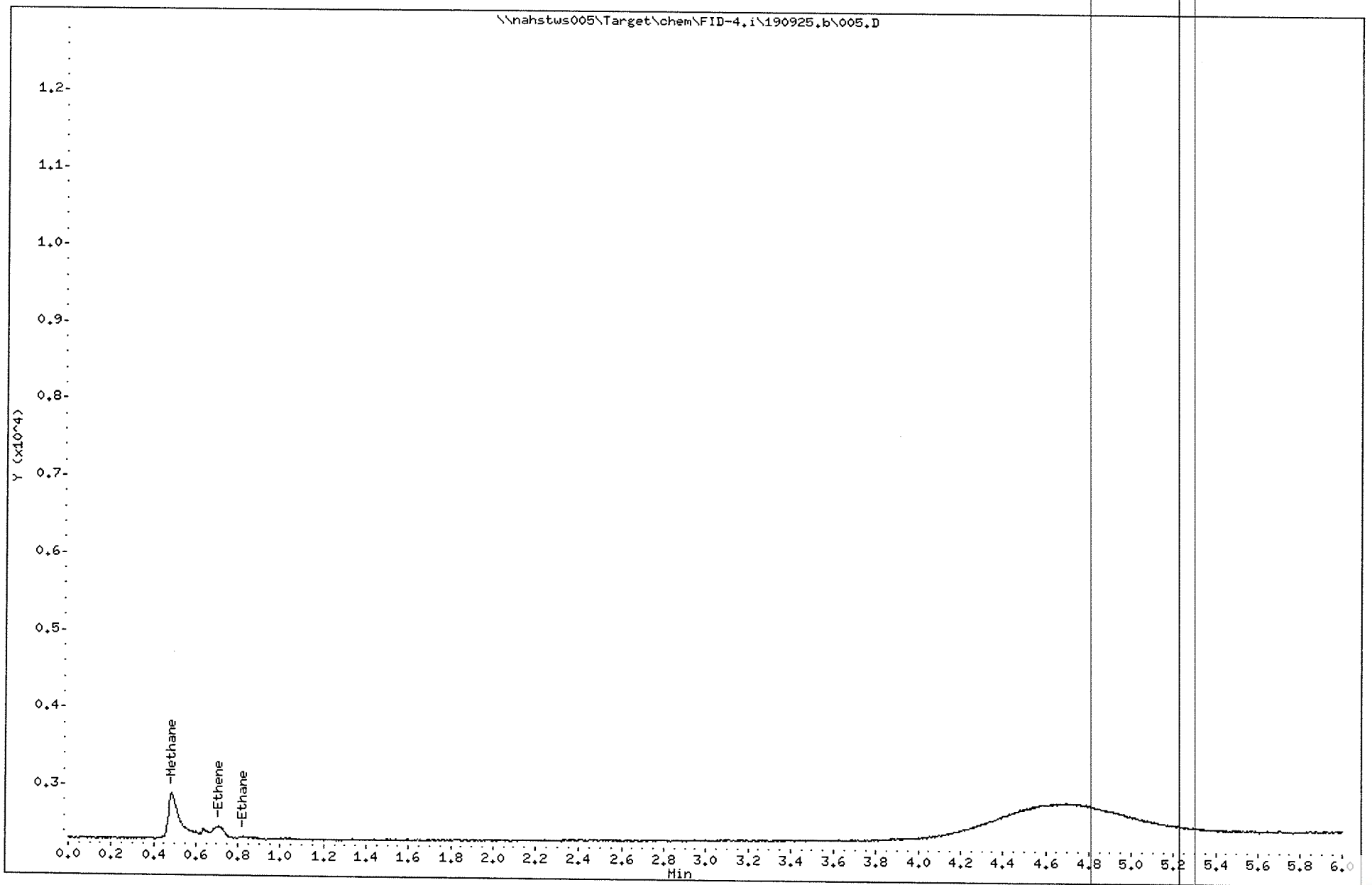
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\005.D
Date : 25-SEP-2019 12:40
Client ID: HS19090962-12
Sample Info: HS19090962-12; HS19090962-12

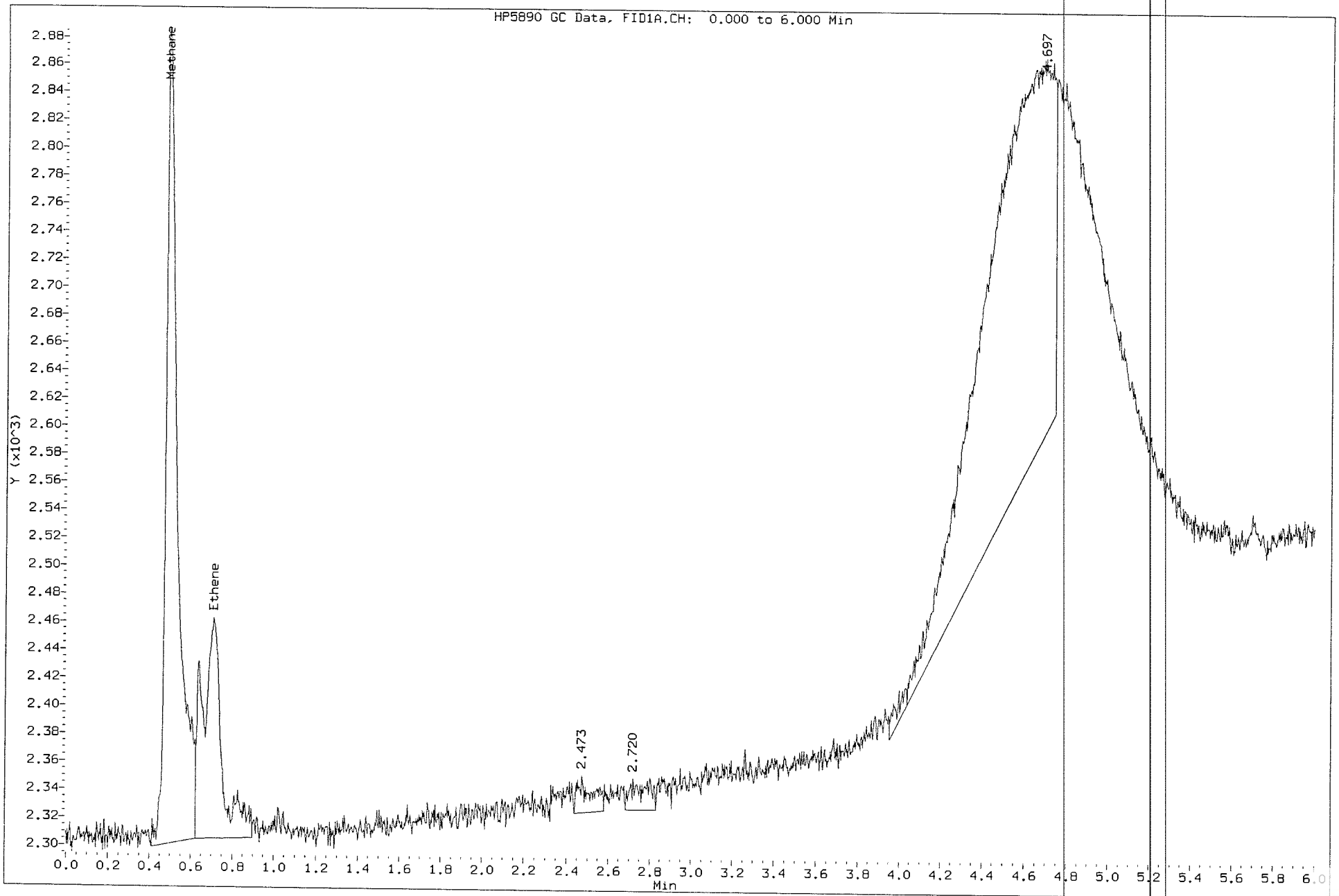
Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

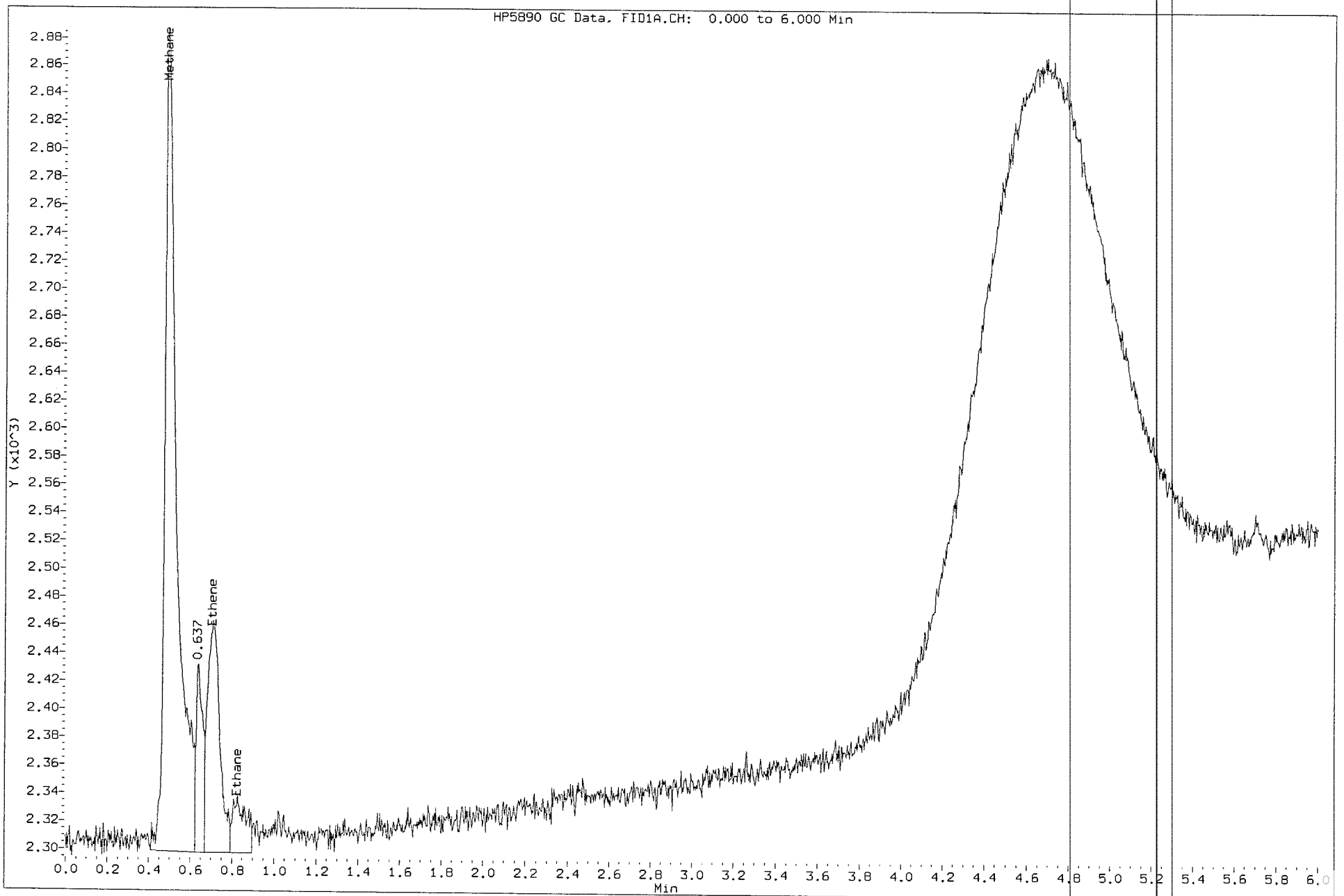
Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\BEFORE2\005.D
Injection Date: 25-SEP-2019 12:40
Instrument: FID-4.i
Client Sample ID: HS19090962-12



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\005.D
Injection Date: 25-SEP-2019 12:40
Instrument: FID-4.i
Client Sample ID: HS19090962-12



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\006.D
Lab Smp Id: HS19090962-12MS Client Smp ID: HS19090962-12MS
Inj Date : 25-SEP-2019 13:16
Operator : PL Inst ID: FID-4.i
Smp Info : HS19090962-12MS; HS19090962-12MS
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 6 QC Sample: MS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.483	0.480	0.003	9905	10.1591	10.159
2 Ethene	0.723	0.723	0.000	10905	18.6168	18.616(M)
3 Ethane	0.806	0.806	0.000	13166	18.2991	18.299(M)

QC Flag Legend

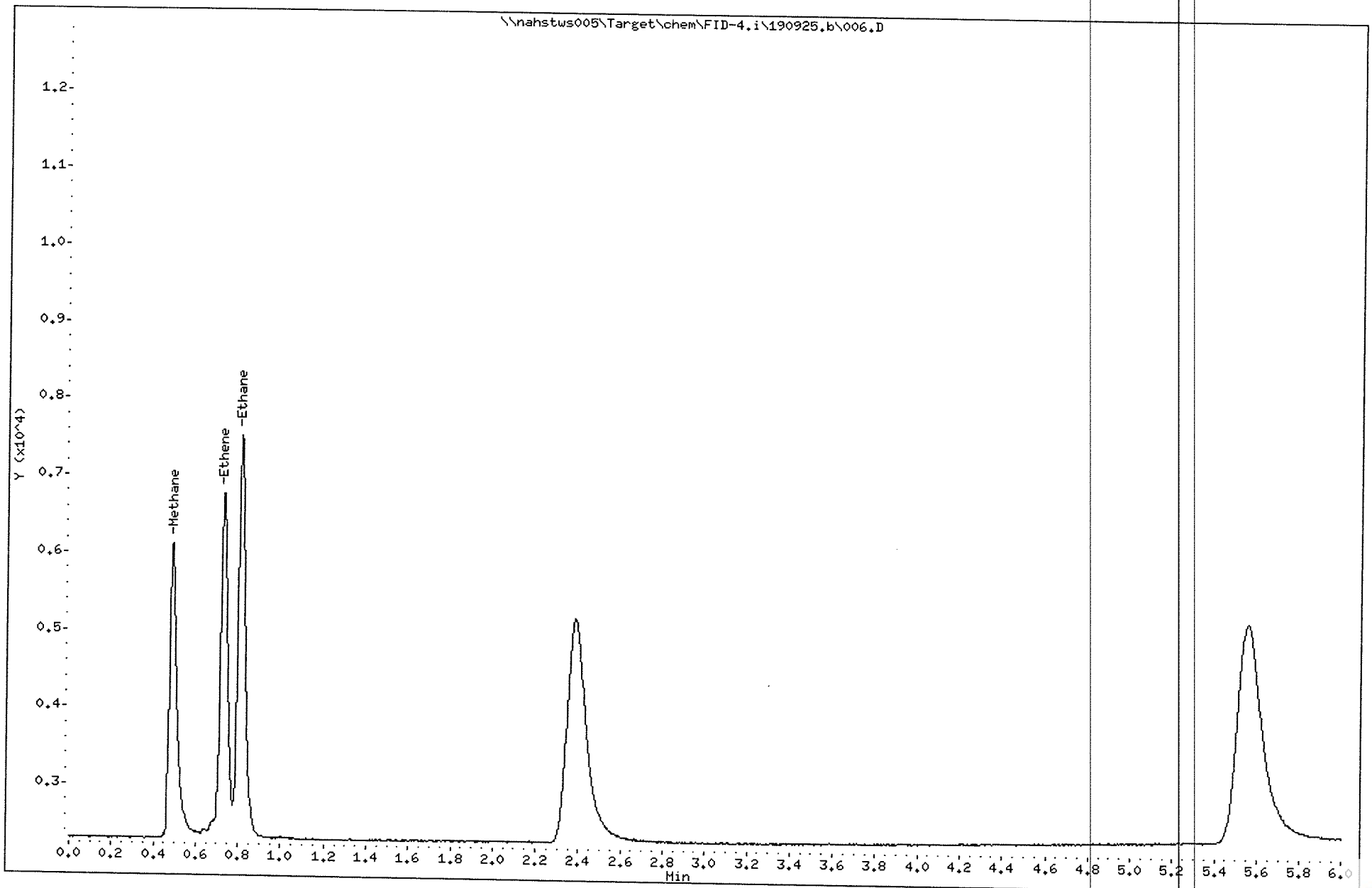
M - Compound response manually integrated.

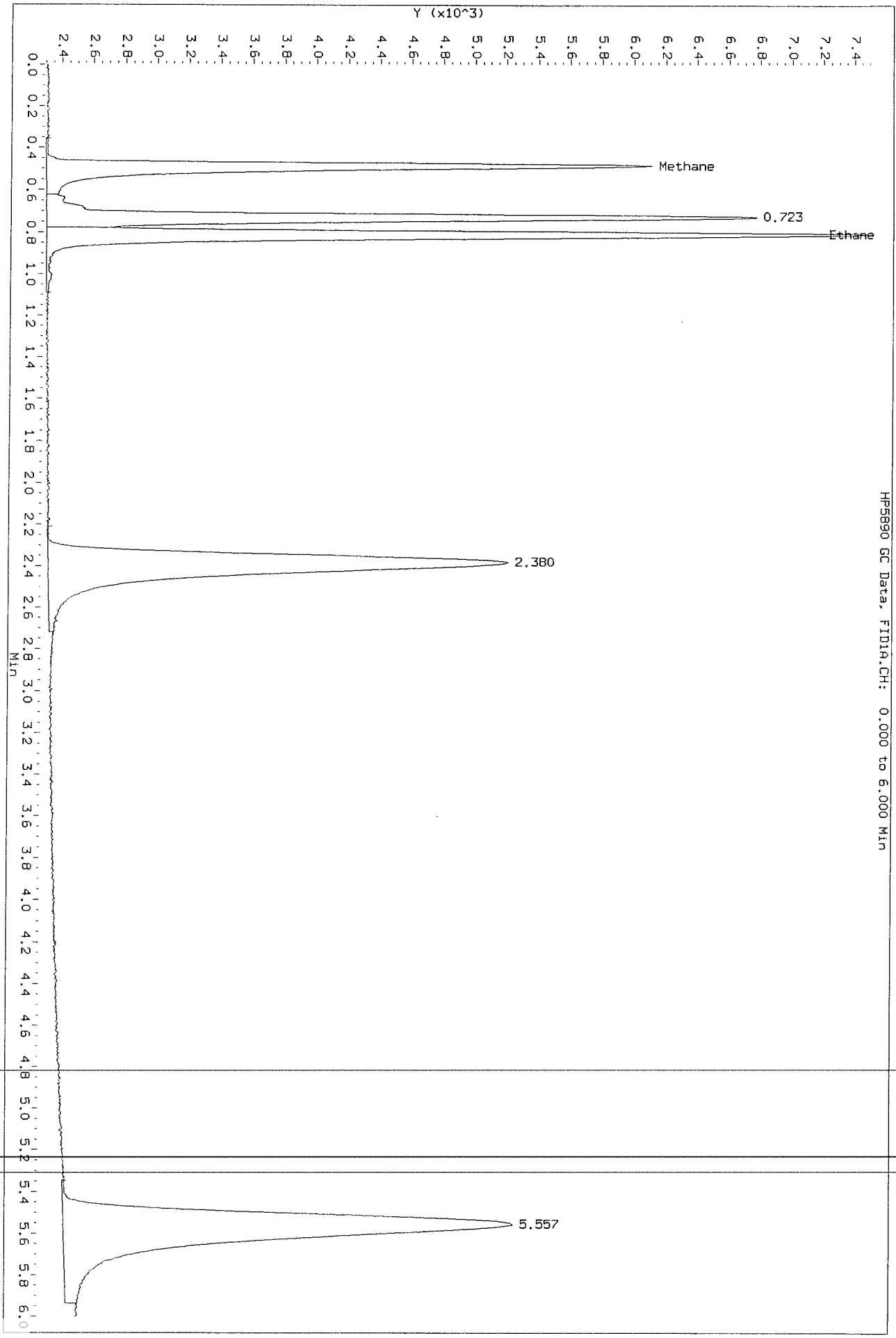
Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\006.D
Date : 25-SEP-2019 13:16
Client ID: HS19090962-12MS
Sample Info: HS19090962-12MS; HS19090962-12MS

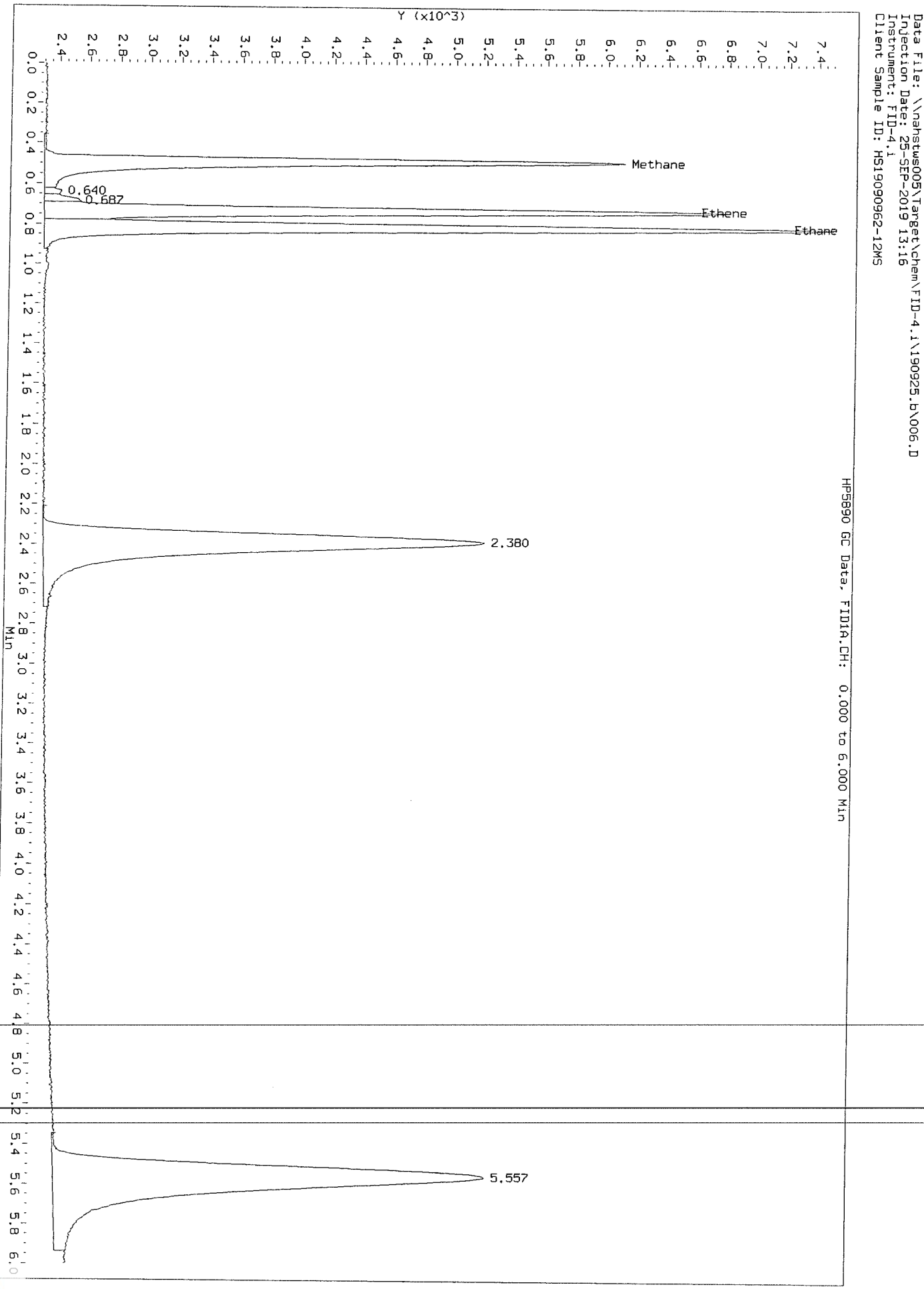
Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

Column phase: Rtx-PLOT




Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\Before\006.D
Injection Date: 25-SEP-2019 13:16
Instrument: FID-4.i
Client Sample ID: HS19090962-12MS
HP5890 GC Data, FID1A.CH: 0.000 to 6.000 Min
Y (x10^3)
Min
Methane
0.723
Ethane
2.380
5.557


Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\006.D
Injection Date: 25-SEP-2019 13:16
Instrument: FID-4.i
Client Sample ID: HS19090962-12MS
HP5890 GC Data, FID1A.CH: 0.000 to 6.000 Min
Y (x10^3)
Min
Methane
0.640
0.687
Ethene
Ethane
2.380
5.557

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\007.D
Lab Smp Id: HS19090962-12MSD Client Smp ID: HS19090962-12MSD
Inj Date : 25-SEP-2019 13:27
Operator : PL Inst ID: FID-4.i
Smp Info : HS19090962-12MSD; HS19090962-12MSD
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 7 QC Sample: MSD
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.463	0.480	-0.017	9443	9.68520	9.685(M)
2 Ethene	0.706	0.723	-0.017	10914	18.6322	18.632
3 Ethane	0.790	0.806	-0.016	13361	18.5701	18.570

QC Flag Legend

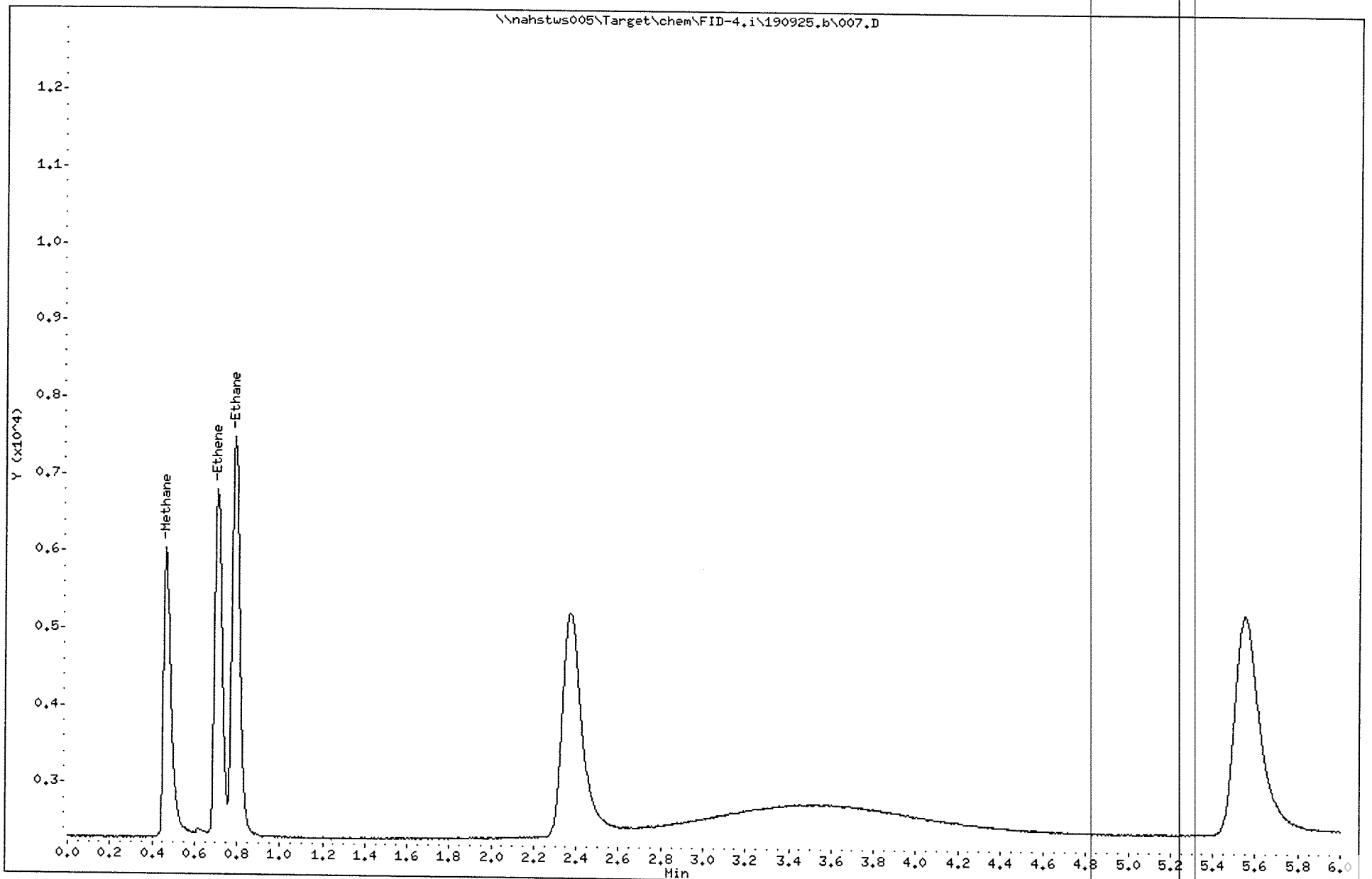
M - Compound response manually integrated.

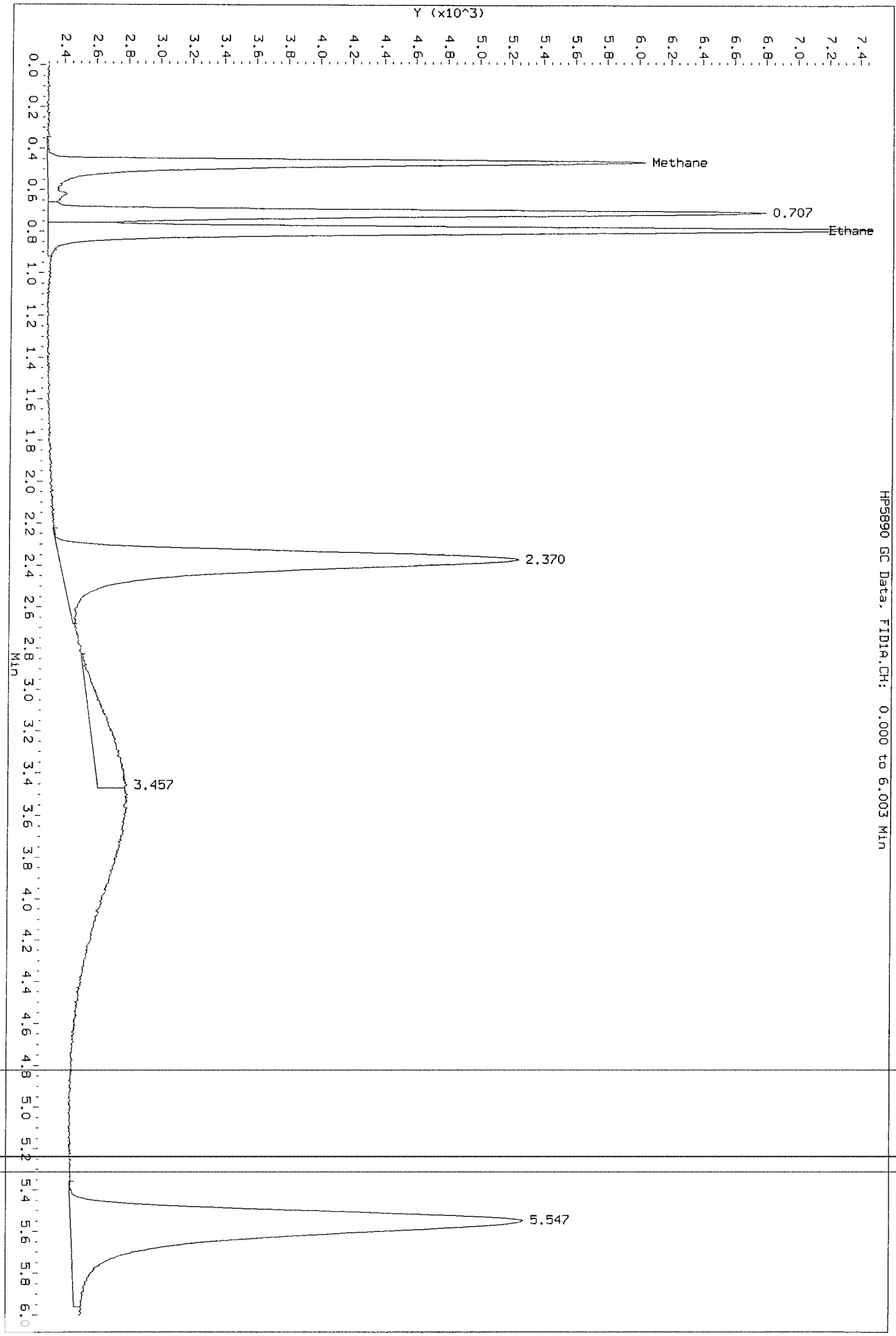
Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\007.D
Date : 25-SEP-2019 13:27
Client ID: HS19090962-12MSD
Sample Info: HS19090962-12MSD; HS19090962-12MSD

Column phase: Rtx-PLOT

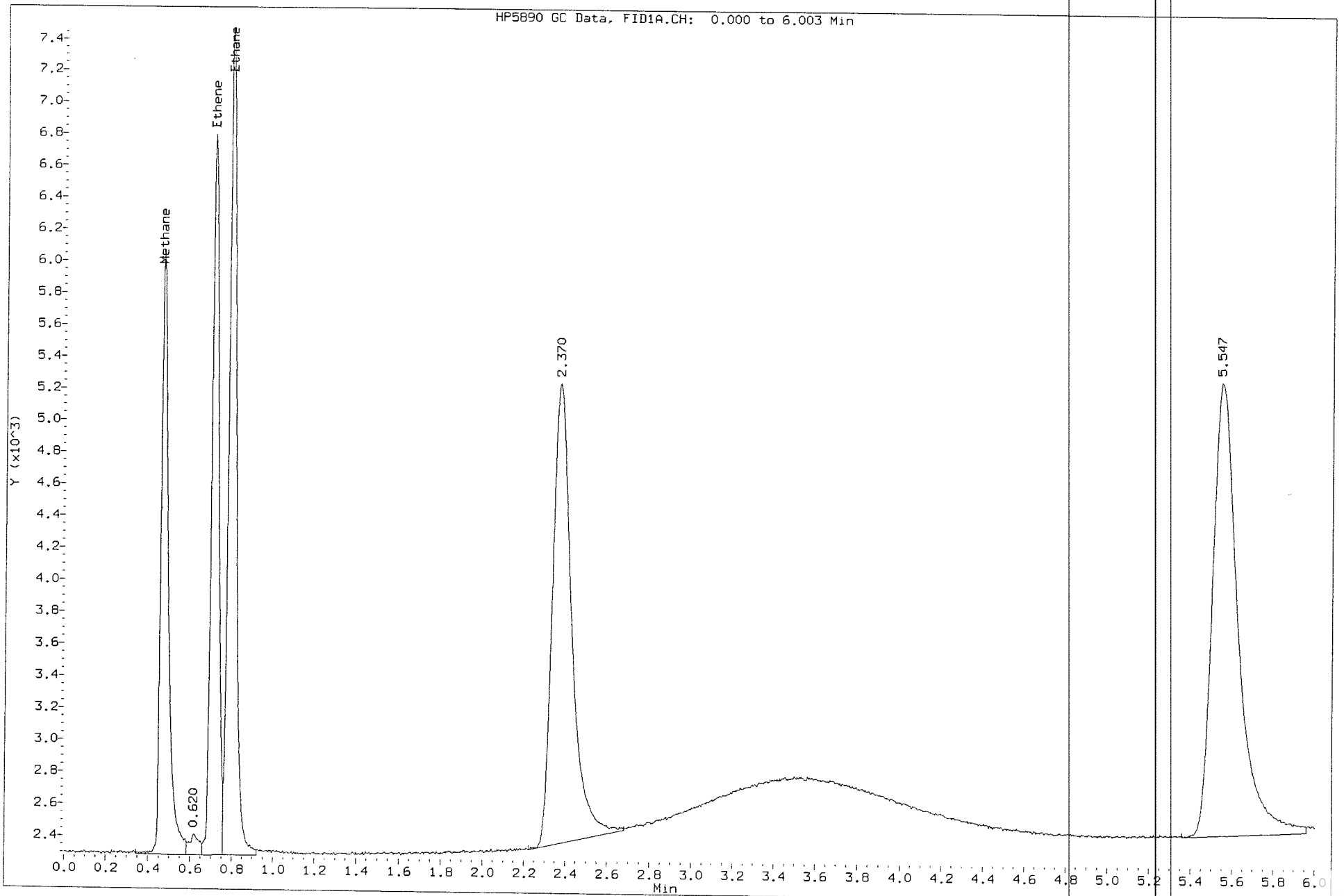
Instrument: FID-4.i

Operator: PL
Column diameter: 0.53




Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\Before\007.D
Injection Date: 25-SEP-2019 13:27
Instrument: FID-4.i
Client Sample ID: HS19090962-12MSD
HP5890 GC Data. FID1A.CH: 0.000 to 6.003 Min
Y (x10^3)
Min
Methane
0.707
Ethane
2.370
3.457
5.547

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\007.D
Injection Date: 25-SEP-2019 13:27
Instrument: FID-4.i
Client Sample ID: HS19090962-12MSD



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\011.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 25-SEP-2019 14:17
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 11 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

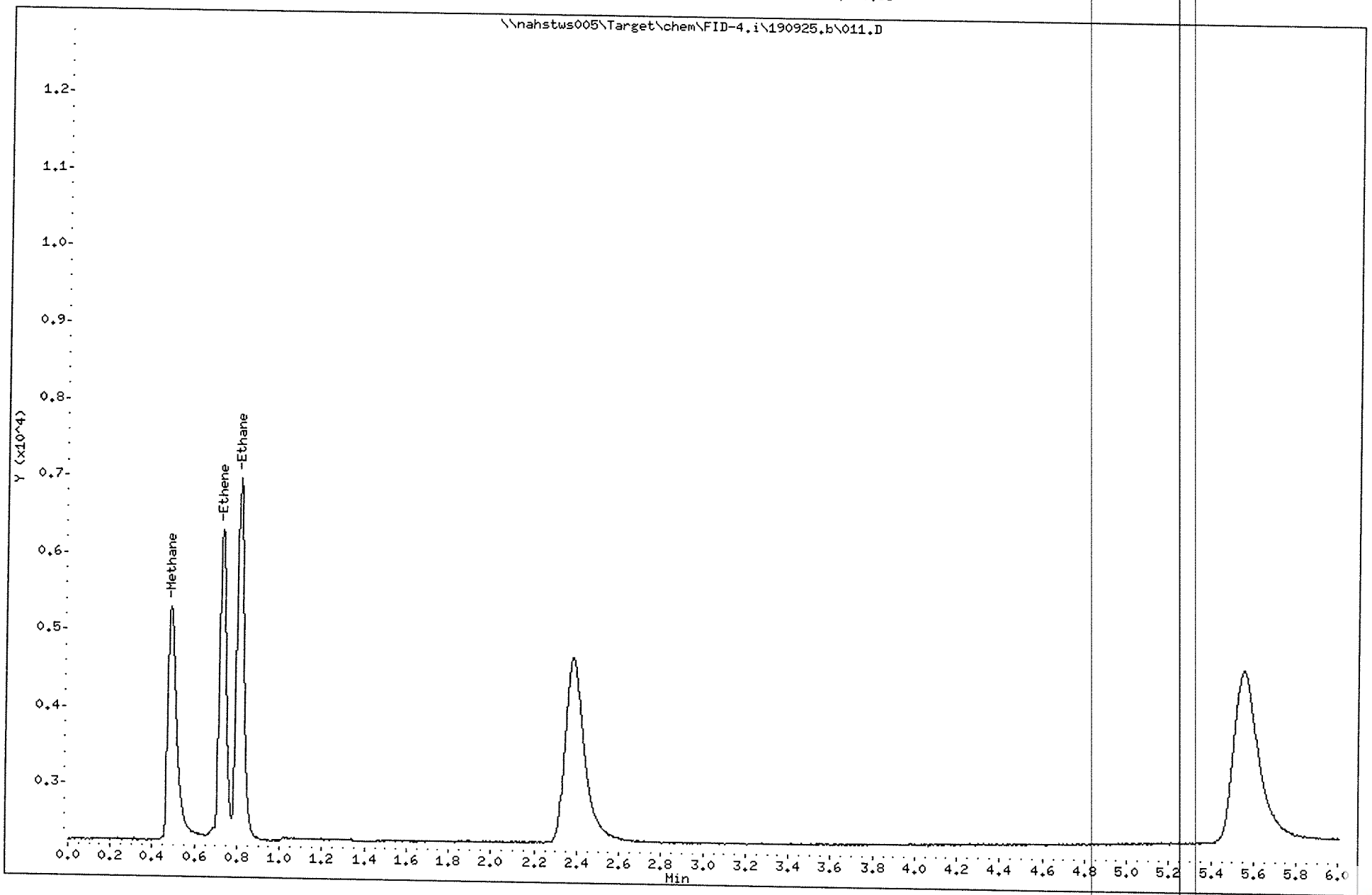
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	0.480	0.480	0.000	9277	9.64700	9.514
2 Ethene	0.723	0.723	0.000	9005	16.8500	15.373
3 Ethane	0.806	0.806	0.000	11072	18.0430	15.388

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\011.D
Date : 25-SEP-2019 14:17
Client ID: RSK-CCV
Sample Info: RSK-CCV;RSK-CCV;2;4

Column phase: Rtx-PLOT

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

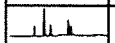
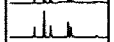
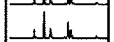
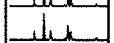
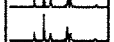
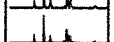
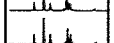
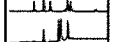
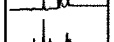
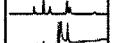
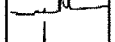
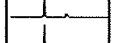
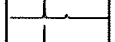
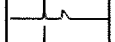
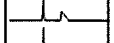
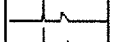
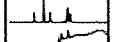
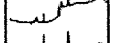
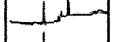
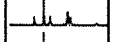
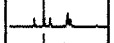
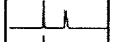
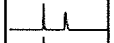
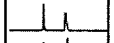
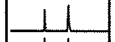
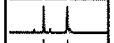
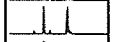
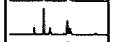


HS19090962 Wet Chem Raw Data

ALS WO# HS19090962

Sequence: 091819
Last Update Operator: alshs.nouser

HS19090962

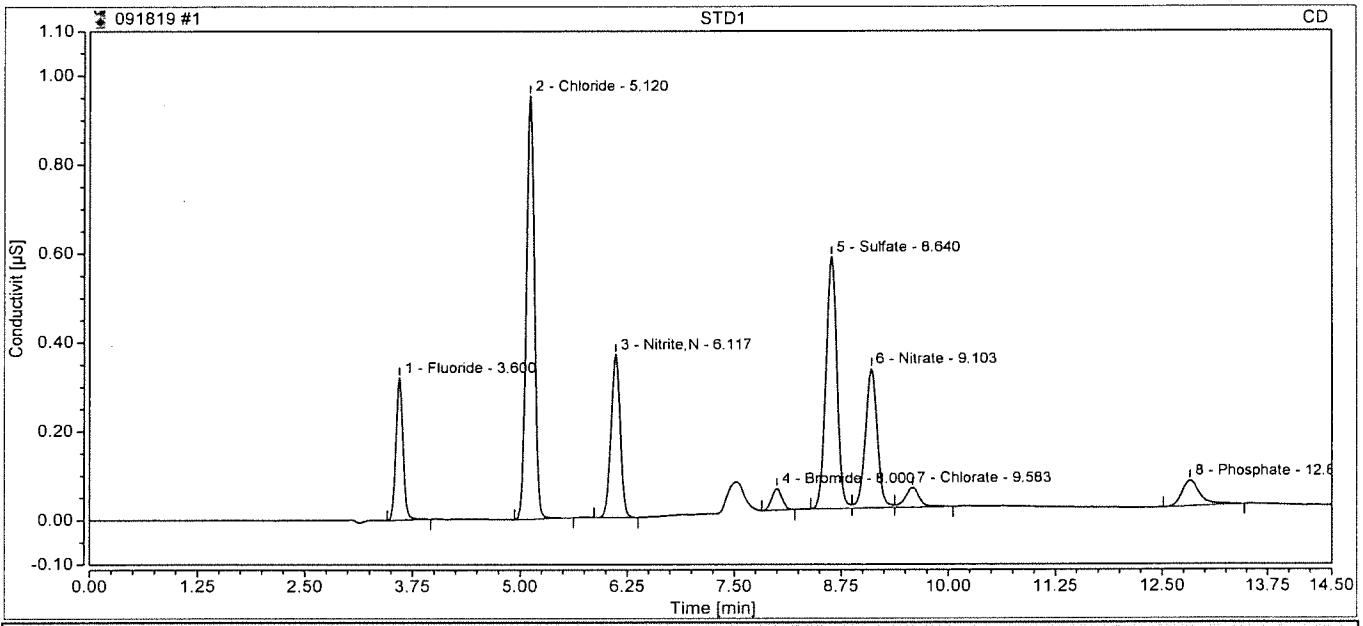
CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	Volume [ul]	Status	Inject Time
	STD1	2970209205	Calibration	GA1	1.0000	1	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:08:06 PM -05:00
	STD2		Calibration	GA2	1.0000	2	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:24:42 PM -05:00
	STD3		Calibration	GA3	1.0000	3	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:41:19 PM -05:00
	STD4		Calibration	GA4	1.0000	4	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:57:54 PM -05:00
	STD5		Calibration	GA5	1.0000	5	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 3:14:30 PM -05:00
	STD6	NO2,F MAX 10PPM	Calibration	GB8	1.0000	6	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:37:32 PM -05:00
	ICV	2970209123	Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:54:07 PM -05:00
	ICB		Unknown	GB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 7:29:52 PM -05:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 11:54:49 AM -05:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 12:11:24 PM -05:00
	HS19090964-04		Unknown	GA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 1:01:23 PM -05:00
	HS19090964-06		Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 1:17:59 PM -05:00
	HS19090962-12		Unknown	GA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 1:34:38 PM -05:00
	HS19090962-12MS	man.int.NO3 KMU 9/	Unknown	GB1	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 1:51:13 PM -05:00
	HS19090962-12MSD	man.int.NO3 KMU 9/	Unknown	GB2	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 2:07:48 PM -05:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 3:29:06 PM -05:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 3:45:41 PM -05:00
	WBLKW1-092019		Unknown	GB3	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 4:02:17 PM -05:00
	WLCSW1-092019		Unknown	GB4	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 4:18:52 PM -05:00
	WLCSDW1-092019		Unknown	GB5	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 4:35:31 PM -05:00
	HS19090962-12DF5	9056_W	Unknown	GC2	5.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 5:08:41 PM -05:00
	HS19090962-12MSDF5		Unknown	GC3	5.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 5:25:17 PM -05:00
	HS19090962-12MSDDF5		Unknown	GC4	5.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 5:42:00 PM -05:00
	HS19090962-12DF50		Unknown	GC5	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 5:58:35 PM -05:00
	HS19090962-12MSDF50		Unknown	GC6	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 6:15:11 PM -05:00
	HS19090962-12MSDDF50		Unknown	GC7	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 6:31:46 PM -05:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 6:48:30 PM -05:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 7:05:05 PM -05:00

Peak No.	Peak Name	Cal.Type	Eval.Type	Number of Points	Rel.Std.Dev. %	Coeff.of Determination	C0 (Offset)	C1 (Slope)	C2 (Curve)
1	*Fluoride*	*Lin, WithOffset, 1/*	*Area*	*5*	*10.1532*	*0.99927*	*-0.0056*	*0.3716*	*0.0000*
2	Chloride	Lin, WithOffset, 1/	Area	6	0.2804	1.00000	-0.0135	0.2355	0.0000
3	Nitrite,N	Lin, WithOffset, 1/	Area	5	15.1147	0.99824	0.0003	0.5120	0.0000
4	Bromide	Lin, WithOffset, 1/	Area	6	14.0217	0.99919	-0.0052	0.1009	0.0000
5	Sulfate	Lin, WithOffset, 1/	Area	6	1.1258	0.99999	-0.0022	0.1717	0.0000
6	Nitrate	Lin, WithOffset, 1/	Area	6	2.2249	0.99998	-0.0102	0.5876	0.0000
7	Chlorate	Lin, WithOffset, 1/	Area	6	10.0265	0.99953	-0.0024	0.0944	0.0000
8	Phosphate	Lin, WithOffset, 1/	Area	6	6.6198	0.99981	-0.0110	0.2321	0.0000
Maximum					**15.1147**	1.00000			
Minimum					0.2804	**0.99824**			

1 STD1

Sample Name:	**STD1**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:08**	*Sample Weight:*	**1.0000**

Run Time:



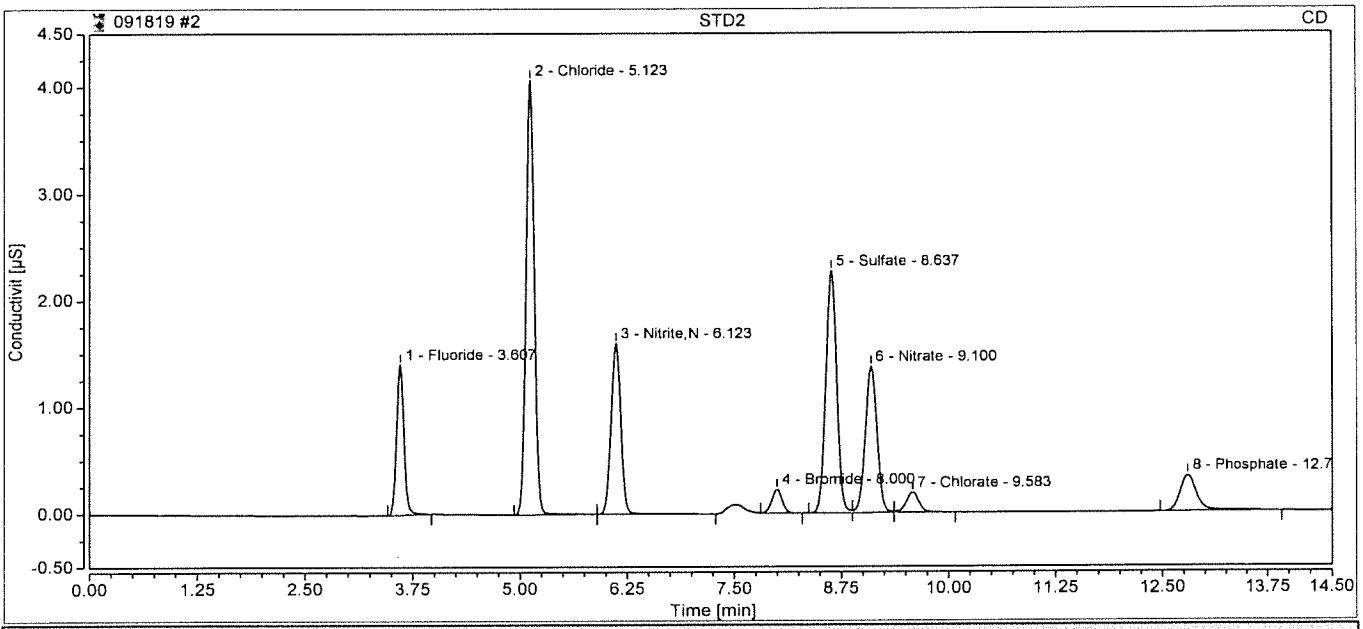
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.031	0.0973	0.0973	1.0000
2	5.12	Chloride	BMB	0.105	0.5026	0.5026	1.0000
3	6.12	Nitrite,N	BMB	0.046	0.0893	0.0893	1.0000
4	8.00	Bromide	BMB	0.007	0.1192	0.1192	1.0000
5	8.64	Sulfate	BM	0.084	0.5042	0.5042	1.0000
6	9.10	Nitrate	M	0.051	0.1034	0.1034	1.0000
7	9.58	Chlorate	MB	0.008	0.1143	0.1143	1.0000
8	12.83	Phosphate	BMB	0.014	0.1085	0.1085	1.0000
Total:			**0.000**	**0.346**		**1.64**	

2 *STD2*

Sample Name:	**STD2**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:24**	*Sample Weight:*	**1.0000**

Run Time:



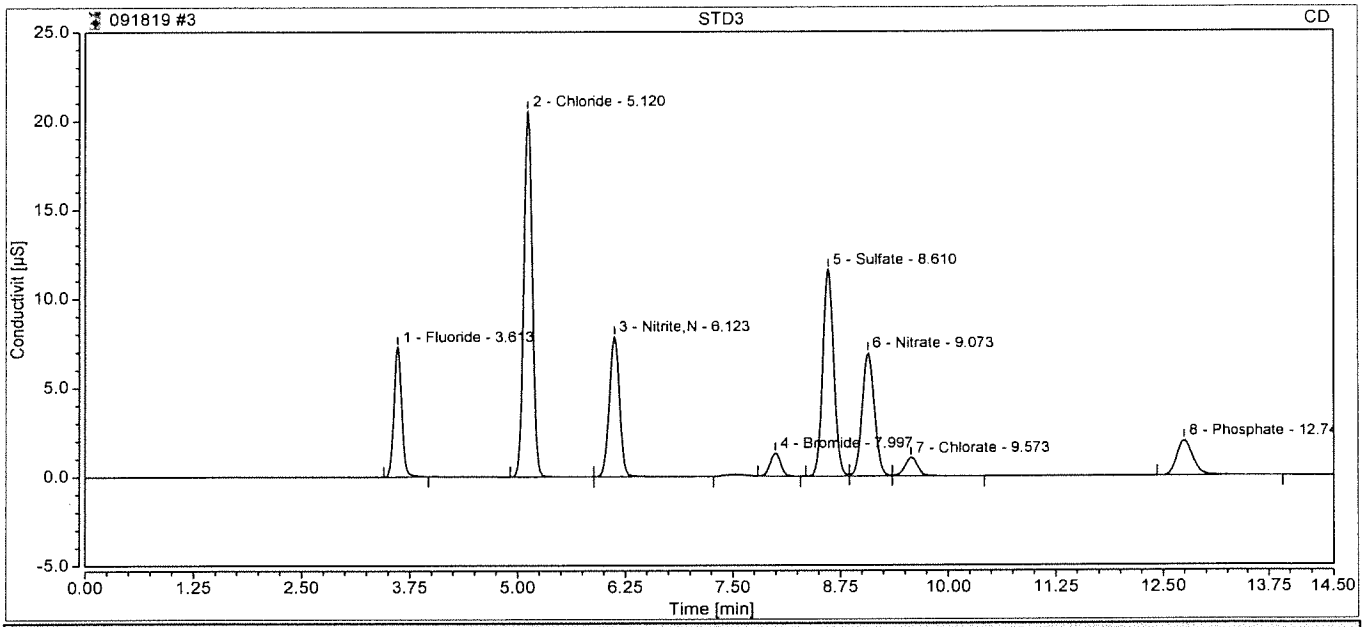
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.140	0.3929	0.3929	1.0000
2	5.12	Chloride	BMB	0.456	1.9918	1.9918	1.0000
3	6.12	Nitrite,N	BMB	0.211	0.4119	0.4119	1.0000
4	8.00	Bromide	BMB	0.031	0.3593	0.3593	1.0000
5	8.64	Sulfate	BM	0.337	1.9733	1.9733	1.0000
6	9.10	Nitrate	M	0.220	0.3917	0.3917	1.0000
7	9.58	Chlorate	MB	0.033	0.3704	0.3704	1.0000
8	12.80	Phosphate	BMB	0.078	0.3841	0.3841	1.0000
Total:			**0.000**	**1.506**		**6.28**	

3 STD3

Sample Name:	**STD3**	*Injection Volume:*	**5.00**
Vial Number:	**GA3**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:41**	*Sample Weight:*	**1.0000**

Run Time:



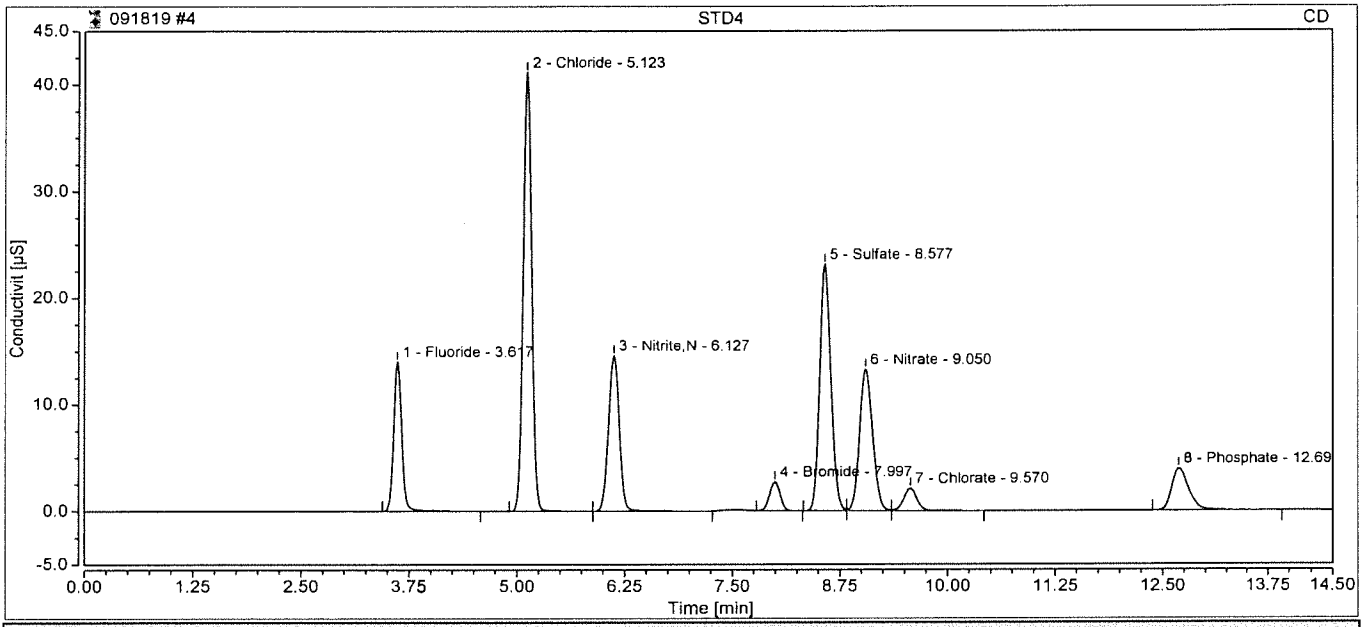
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.758	2.0551	2.0551	1.0000
2	5.12	Chloride	BMB	2.339	9.9888	9.9888	1.0000
3	6.12	Nitrite,N	BMB	1.091	2.1305	2.1305	1.0000
4	8.00	Bromide	BMB	0.182	1.8590	1.8590	1.0000
5	8.61	Sulfate	BM	1.715	10.0007	10.0007	1.0000
6	9.07	Nitrate	M	1.153	1.9792	1.9792	1.0000
7	9.57	Chlorate	MB	0.176	1.8940	1.8940	1.0000
8	12.75	Phosphate	BMB	0.436	1.9269	1.9269	1.0000
Total:			**0.000**	**7.851**		**31.83**	

4 STD4

Sample Name:	**STD4**	*Injection Volume:*	**5.00**
Vial Number:	**GA4**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:57**	*Sample Weight:*	**1.0000**

Run Time:



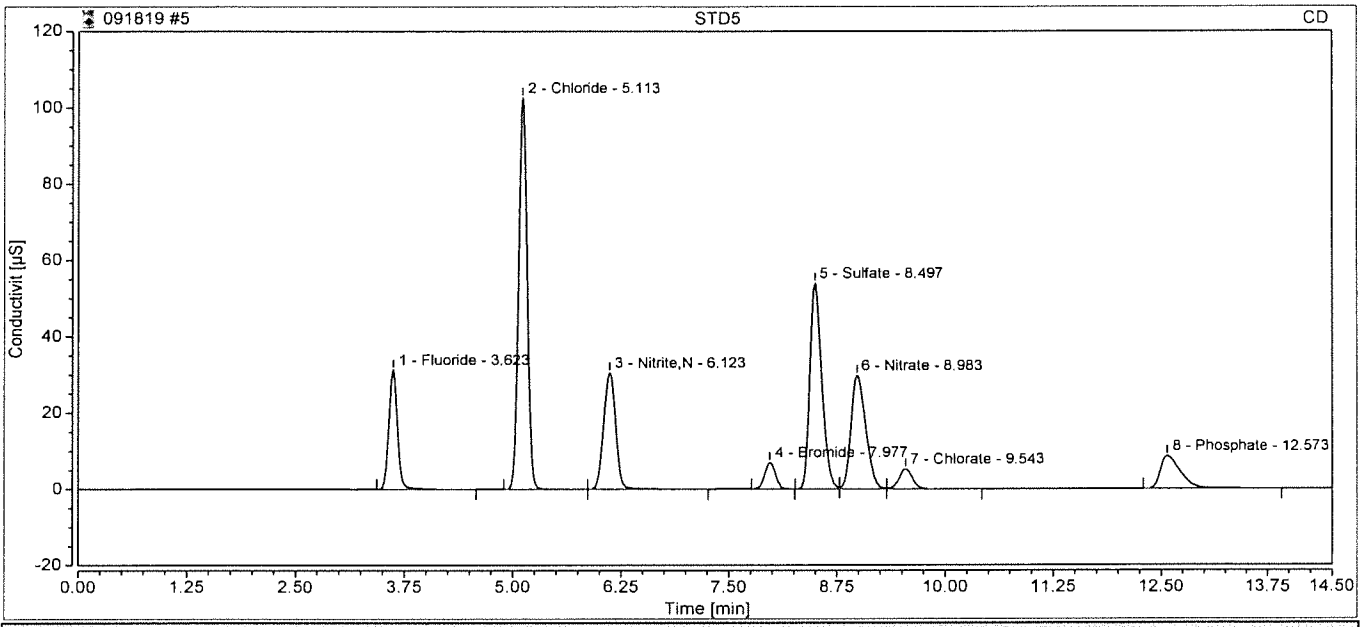
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.535	4.1457	4.1457	1.0000
2	5.12	Chloride	BMB	4.695	19.9948	19.9948	1.0000
3	6.13	Nitrite,N	BMB	2.133	4.1659	4.1659	1.0000
4	8.00	Bromide	BMB	0.385	3.8642	3.8642	1.0000
5	8.58	Sulfate	BM	3.451	20.1082	20.1082	1.0000
6	9.05	Nitrate	M	2.330	3.9823	3.9823	1.0000
7	9.57	Chlorate	MB	0.365	3.8956	3.8956	1.0000
8	12.69	Phosphate	BMB	0.903	3.9395	3.9395	1.0000
Total:			**0.000**	**15.798**		**64.10**	

5 STD5

Sample Name:	**STD5**	*Injection Volume:*	**5.00**
Vial Number:	**GA5**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 15:14**	*Sample Weight:*	**1.0000**

Run Time:



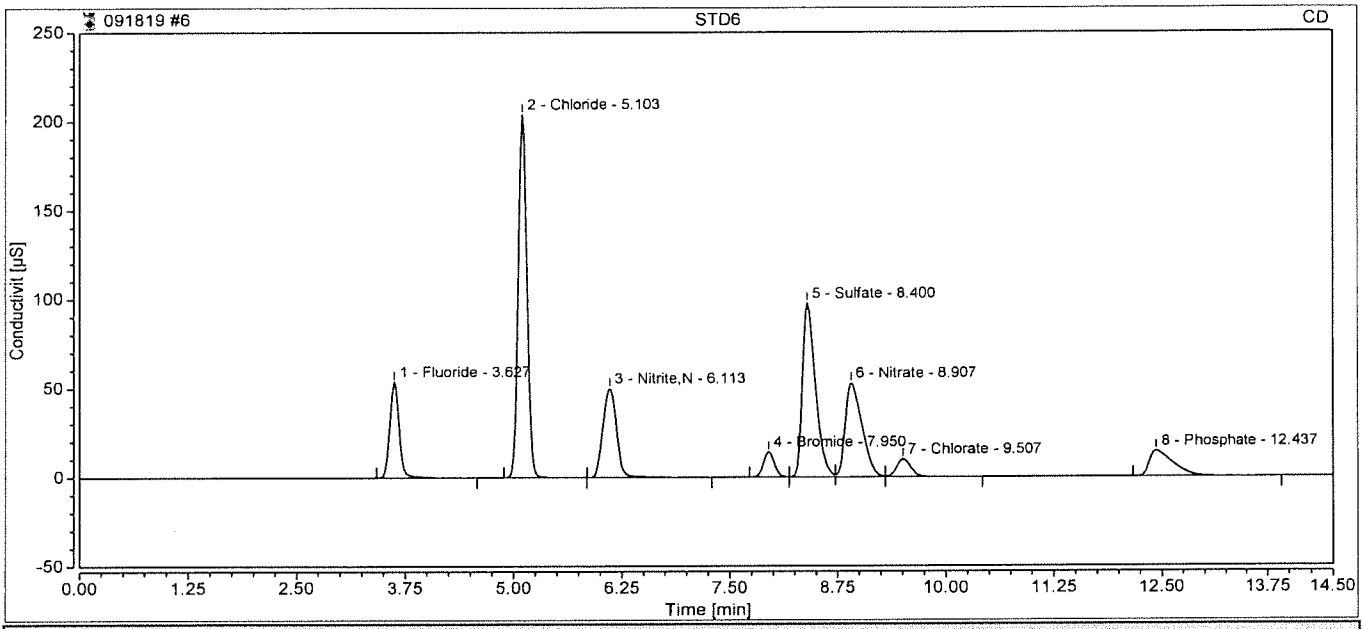
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.639	9.8090	9.8090	1.0000
2	5.11	Chloride	BMB	11.762	49.9996	49.9996	1.0000
3	6.12	Nitrite,N	BMB	4.968	9.7023	9.7023	1.0000
4	7.98	Bromide	BMB	1.001	9.9786	9.9786	1.0000
5	8.50	Sulfate	BM	8.590	50.0271	50.0271	1.0000
6	8.98	Nitrate	M	5.854	9.9805	9.9805	1.0000
7	9.54	Chlorate	MB	0.939	9.9670	9.9670	1.0000
8	12.57	Phosphate	BMB	2.305	9.9803	9.9803	1.0000
Total:			**0.000**	**39.057**		**159.44**	

6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:37**	*Sample Weight:*	**1.0000**

Run Time:



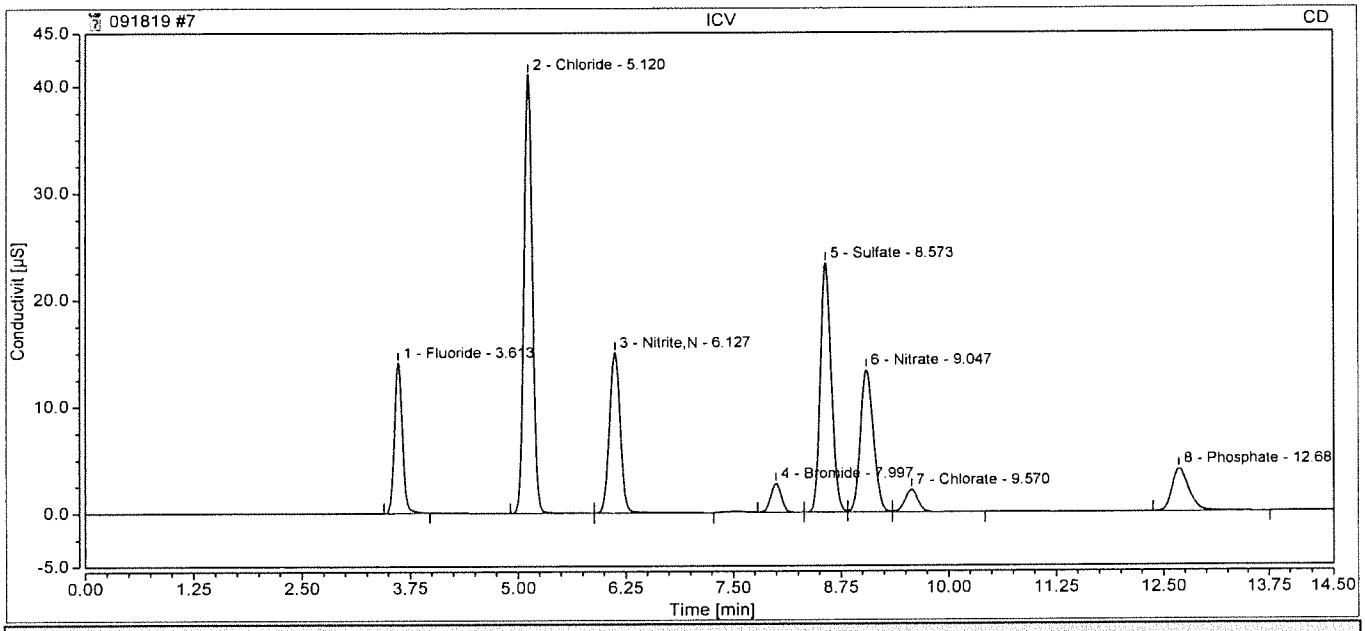
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	6.773	18.2418	18.2418	1.0000
2	5.10	Chloride	BMB	23.542	100.0224	100.0224	1.0000
3	6.11	Nitrite,N	BMB	9.157	17.8850	17.8850	1.0000
4	7.95	Bromide	BM	2.045	20.3197	20.3197	1.0000
5	8.40	Sulfate	M	17.153	99.8863	99.8863	1.0000
6	8.91	Nitrate	M	11.778	20.0629	20.0629	1.0000
7	9.51	Chlorate	MB	1.910	20.2586	20.2586	1.0000
8	12.44	Phosphate	BMB	4.668	20.1606	20.1606	1.0000
Total:			**0.000**	**77.025**		**316.84**	

7 ICV

Sample Name:	**ICV**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:54**	*Sample Weight:*	**1.0000**

Run Time:



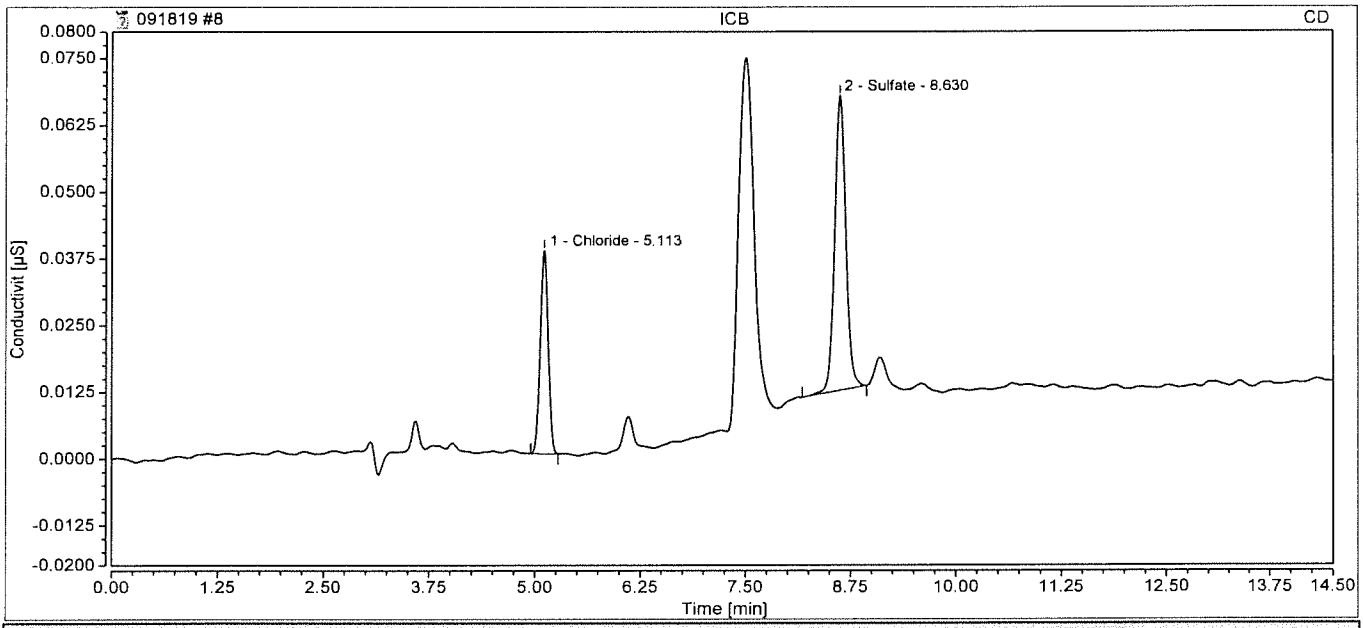
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.495	4.0374	4.0374	1.0000
2	5.12	Chloride	BMB	4.681	19.9333	19.9333	1.0000
3	6.13	Nitrite,N	BMB	2.195	4.2858	4.2858	1.0000
4	8.00	Bromide	BMB	0.384	3.8585	3.8585	1.0000
5	8.57	Sulfate	BM	3.469	20.2132	20.2132	1.0000
6	9.05	Nitrate	M	2.340	3.9993	3.9993	1.0000
7	9.57	Chlorate	MB	0.367	3.9104	3.9104	1.0000
8	12.68	Phosphate	BMB	0.911	3.9732	3.9732	1.0000
Total:			**0.000**	**15.841**		**64.21**	

8 ICB

Sample Name:	**ICB**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 19:29**	*Sample Weight:*	**1.0000**

Run Time:



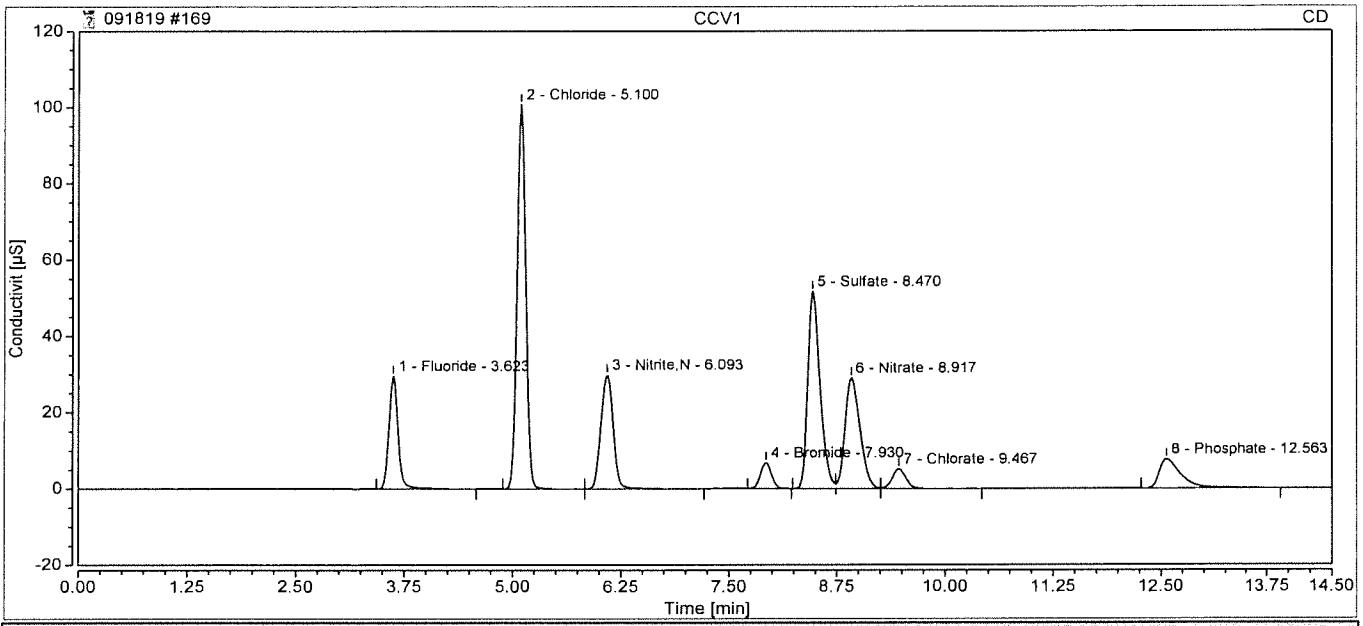
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.11	Chloride	BMB	0.004	0.0748	0.0748	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.63	Sulfate	BMB	0.008	0.0618	0.0618	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.013**		**0.14**	

169 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 11:54**	*Sample Weight:*	**1.0000**

Run Time:



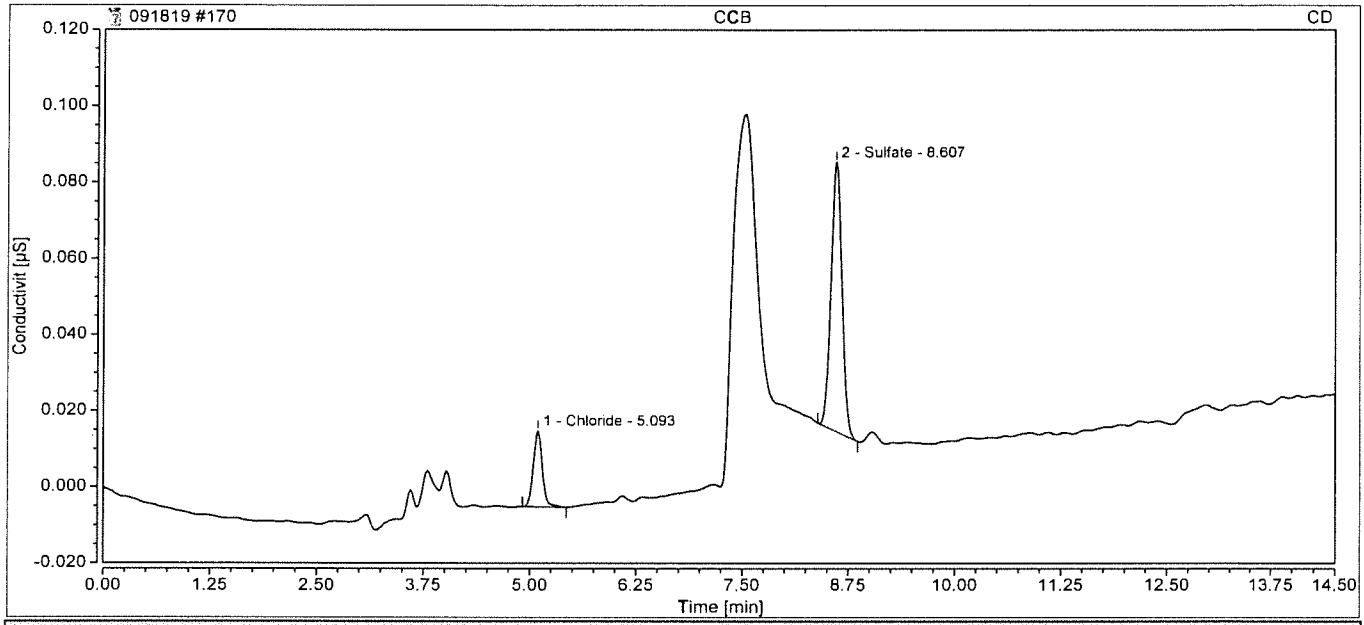
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.639	9.8082	9.8082	1.0000
2	5.10	Chloride	BMB	11.725	49.8435	49.8435	1.0000
3	6.09	Nitrite,N	BMB	4.944	9.6563	9.6563	1.0000
4	7.93	Bromide	BMB	0.987	9.8365	9.8365	1.0000
5	8.47	Sulfate	BM	8.581	49.9789	49.9789	1.0000
6	8.92	Nitrate	M	5.853	9.9791	9.9791	1.0000
7	9.47	Chlorate	MB	0.940	9.9812	9.9812	1.0000
8	12.56	Phosphate	BMB	2.226	9.6394	9.6394	1.0000
Total:			**0.000**	**38.896**		**158.72**	

170 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 12:11**	*Sample Weight:*	**1.0000**

Run Time:



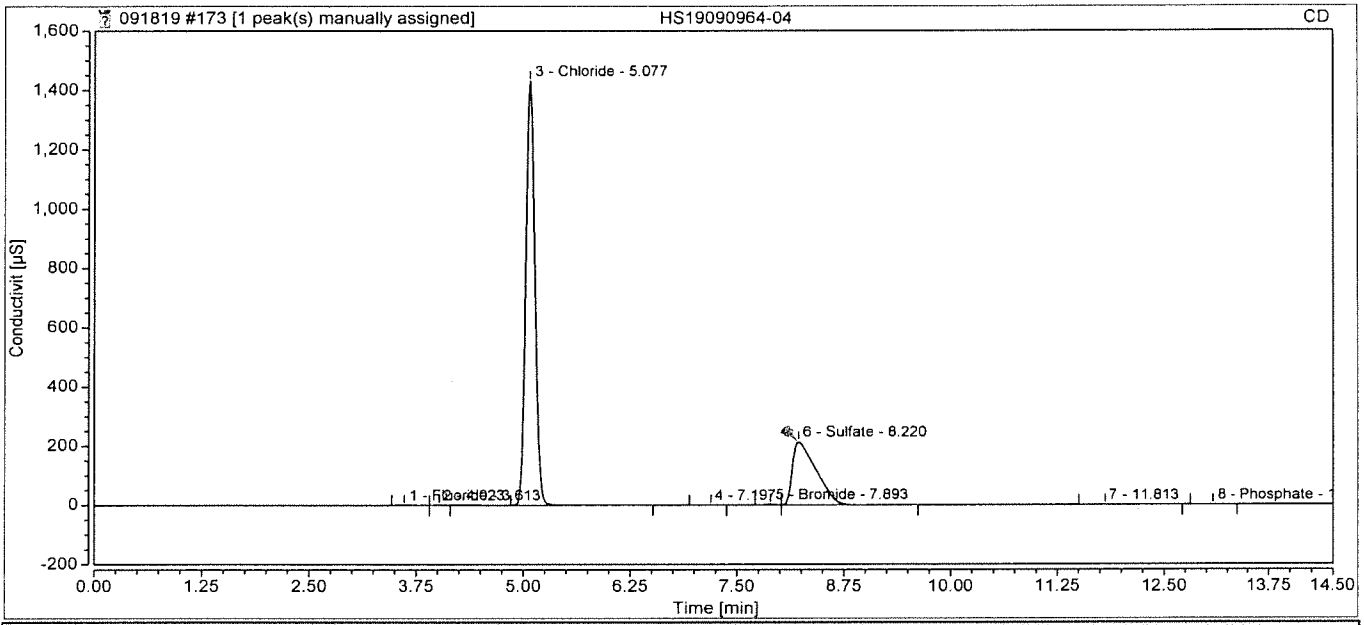
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.09	Chloride	BMB	0.002	0.0677	0.0677	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.61	Sulfate	BMB	0.011	0.0745	0.0745	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.013**		**0.14**	

173 HS19090964-04

Sample Name:	**HS19090964-04**	*Injection Volume:*	**5.00**
Vial Number:	**GA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 13:01**	*Sample Weight:*	**1.0000**

Run Time:



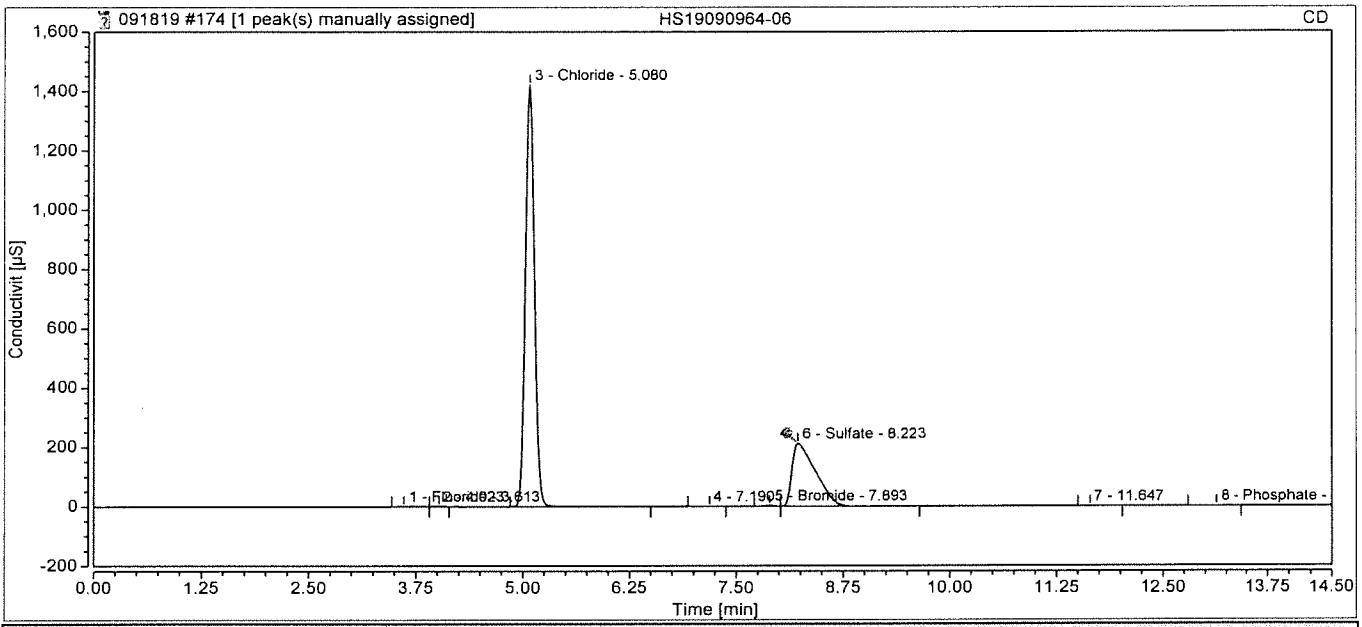
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.034	0.1056	0.1056	1.0000
3	5.08	Chloride	BMB	176.700	750.3727	750.3727	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
5	7.89	Bromide	BM	0.350	3.5224	3.5224	1.0000
6	8.22	Sulfate	MB^	67.409	392.5082	392.5082	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
8	13.08	Phosphate	BMB	0.003	0.0588	0.0588	1.0000
Total:			**0.000**	**244.496**		**1146.57**	

174 HS19090964-06

Sample Name:	**HS19090964-06**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 13:17**	*Sample Weight:*	**1.0000**

Run Time:

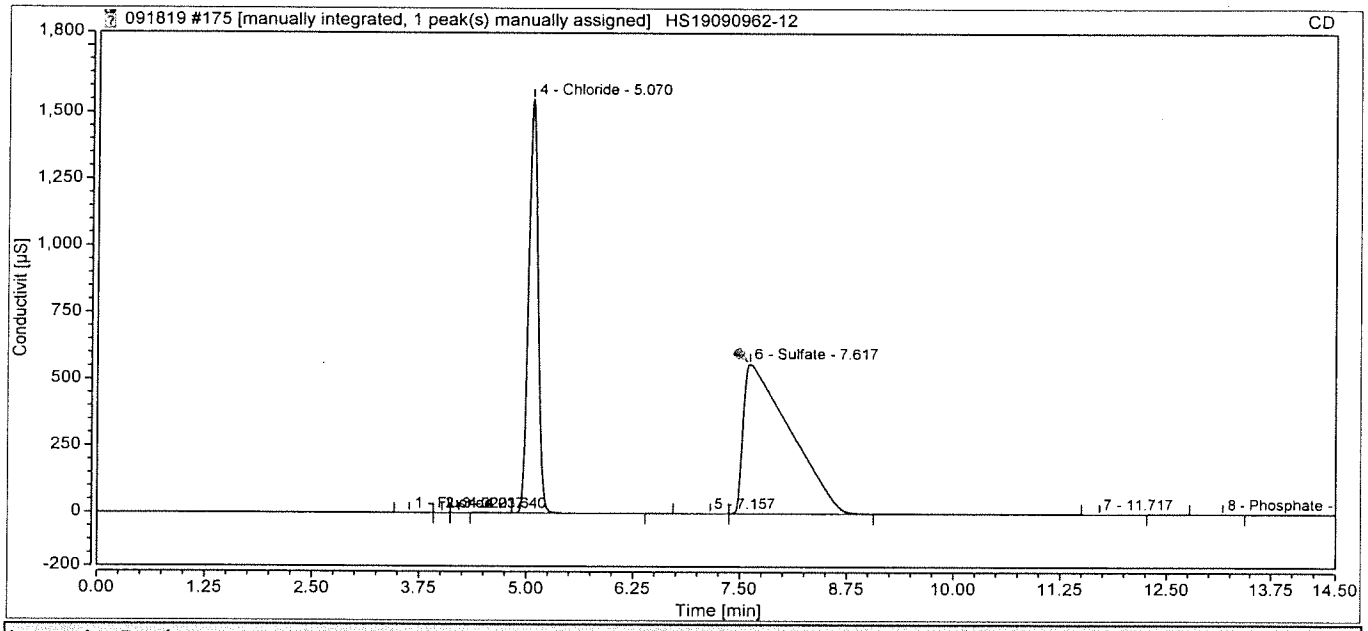


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.030	0.0958	0.0958	1.0000
3	5.08	Chloride	BMB	175.536	745.4286	745.4286	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
5	7.89	Bromide	BM	0.346	3.4773	3.4773	1.0000
6	8.22	Sulfate	MB^	66.818	389.0673	389.0673	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
8	13.13	Phosphate	BMB	0.003	0.0599	0.0599	1.0000
Total:			**0.000**	**242.733**		**1138.13**	

175 HS19090962-12

Sample Name:	**HS19090962-12**	*Injection Volume:*	**5.00**
Vial Number:	**GA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 13:34**	*Sample Weight:*	**1.0000**
Run Time:			



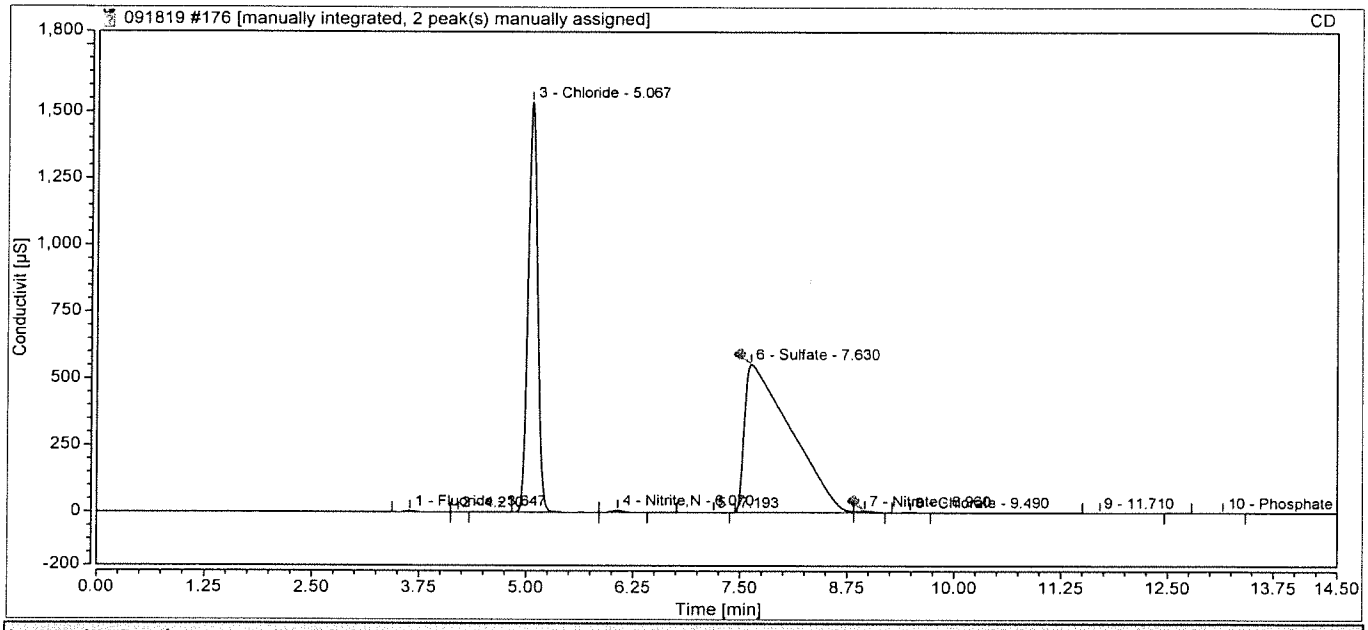
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.64	Fluoride	BMB	0.037	0.1151	0.1151	1.0000
4	5.07	Chloride	BMB	198.541	843.1149	843.1149	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
6	7.62	Sulfate	BMB*^	354.205	2062.3989	2062.3989	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
8	13.16	Phosphate	BMB	0.011	0.0940	0.0940	1.0000
Total:			**0.000**	**552.795**		**2905.72**	

176 HS19090962-12MS

Sample Name:	**HS19090962-12MS**	*Injection Volume:*	**5.00**
Vial Number:	**GB1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 13:51**	*Sample Weight:*	**1.0000**

Run Time:



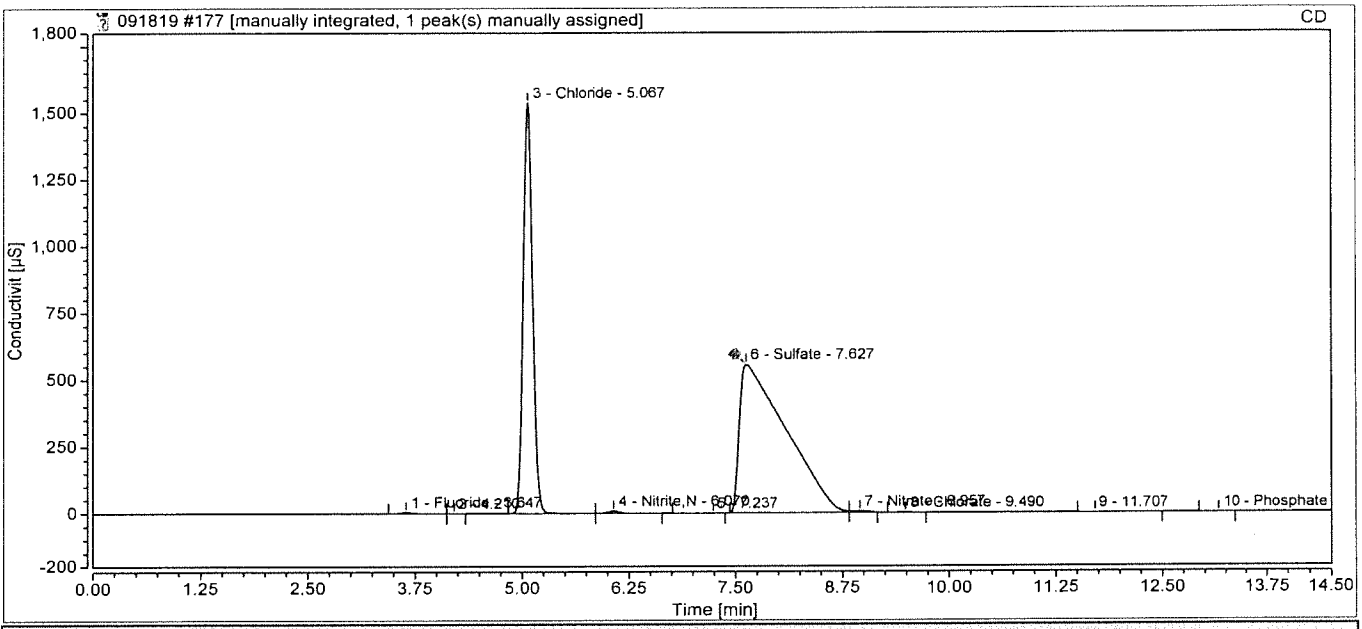
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.65	Fluoride	BMB	0.591	1.6054	1.6054	1.0000
3	5.07	Chloride	BMB	196.329	833.7200	833.7200	1.0000
4	6.07	Nitrite,N	BMB	1.081	2.1110	2.1110	1.0000
6	7.63	Sulfate	BM *^	345.965	2014.4179	2014.4179	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
7	8.96	Nitrate	MB*^	1.163	1.9968	1.9968	1.0000
8	9.49	Chlorate	BMB	0.148	1.5953	1.5953	1.0000
10	13.15	Phosphate	BMB	0.008	0.0841	0.0841	1.0000
Total:			**0.000**	**545.286**		**2855.53**	

177 HS19090962-12MSD

Sample Name:	**HS19090962-12MSD**	*Injection Volume:*	**5.00**
Vial Number:	**GB2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 14:07**	*Sample Weight:*	**1.0000**

Run Time:



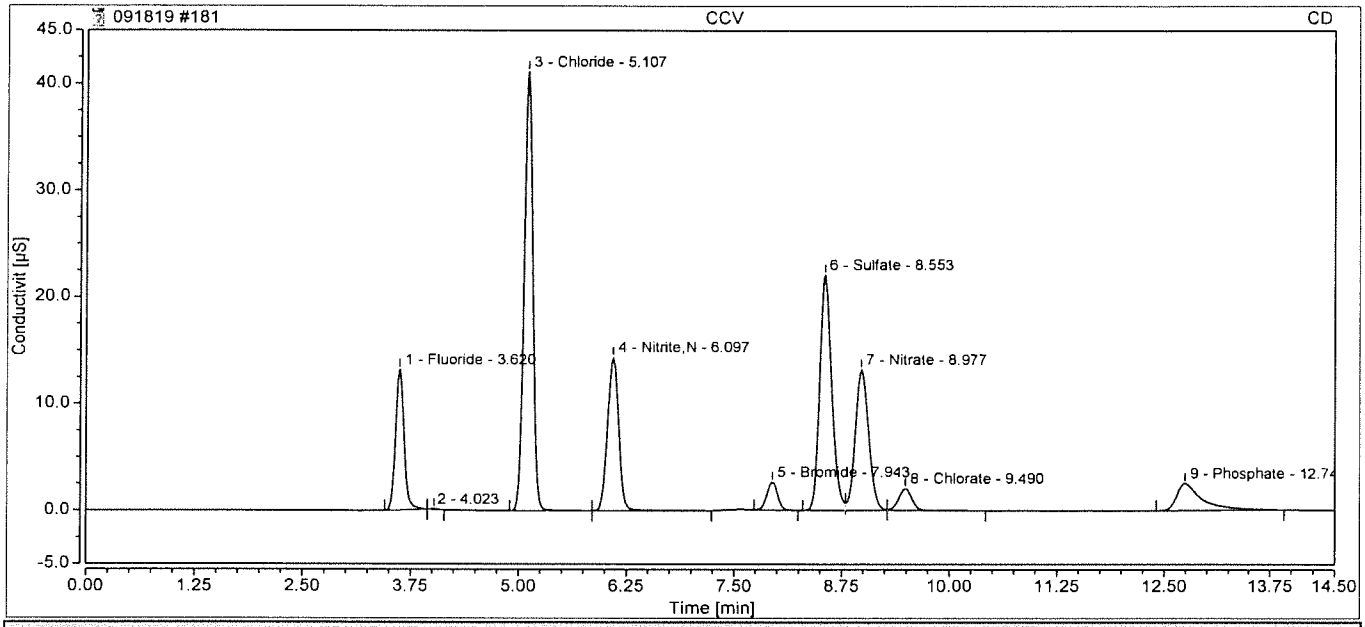
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.65	Fluoride	BMB	0.596	1.6195	1.6195	1.0000
3	5.07	Chloride	BMB	196.858	835.9674	835.9674	1.0000
4	6.07	Nitrite,N	BMB	1.091	2.1307	2.1307	1.0000
6	7.63	Sulfate	BM *^	349.195	2033.2248	2033.2248	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
7	8.96	Nitrate	MB*	1.156	1.9855	1.9855	1.0000
8	9.49	Chlorate	BMB	0.149	1.6036	1.6036	1.0000
10	13.16	Phosphate	BMB	0.008	0.0807	0.0807	1.0000
Total:			**0.000**	**549.054**		**2876.61**	

181 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 15:29**	*Sample Weight:*	**1.0000**

Run Time:



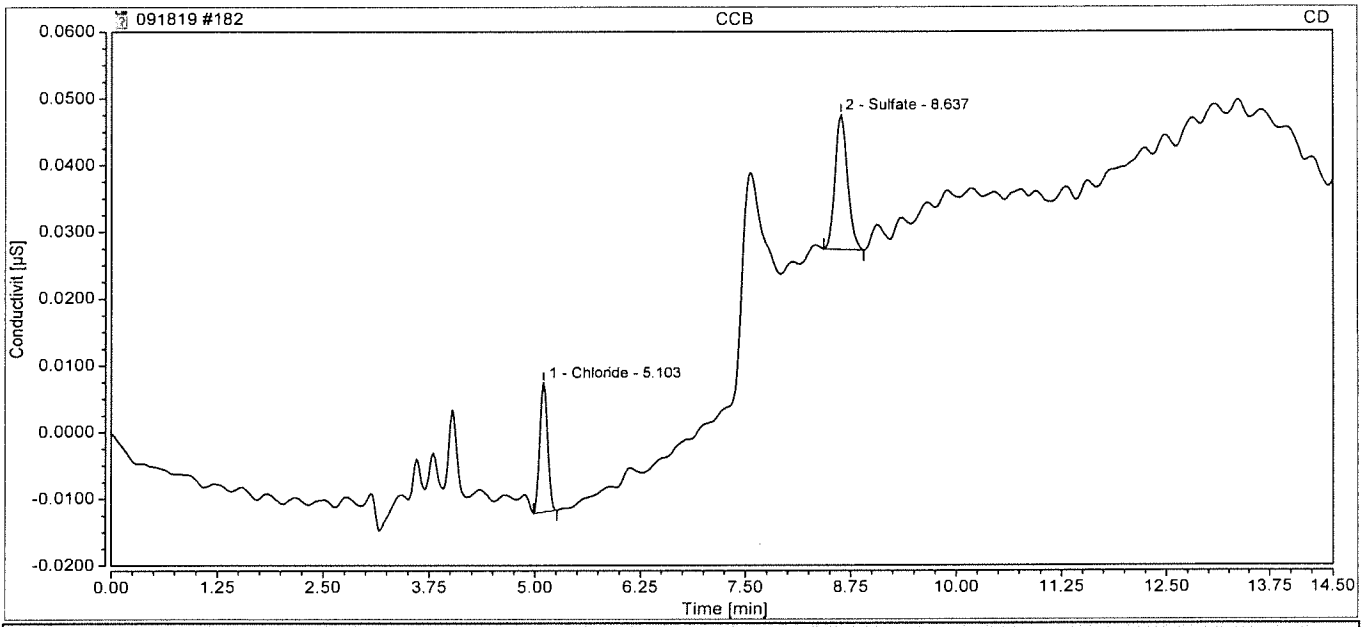
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.502	4.0563	4.0563	1.0000
3	5.11	Chloride	BMB	4.786	20.3783	20.3783	1.0000
4	6.10	Nitrite,N	BMB	2.150	4.1979	4.1979	1.0000
5	7.94	Bromide	BMB	0.379	3.8089	3.8089	1.0000
6	8.55	Sulfate	BM	3.564	20.7661	20.7661	1.0000
7	8.98	Nitrate	M	2.389	4.0836	4.0836	1.0000
8	9.49	Chlorate	MB	0.375	3.9971	3.9971	1.0000
9	12.74	Phosphate	BMB	0.871	3.8027	3.8027	1.0000
Total:			**0.000**	**16.016**		**65.09**	

182 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 15:45**	*Sample Weight:*	**1.0000**

Run Time:



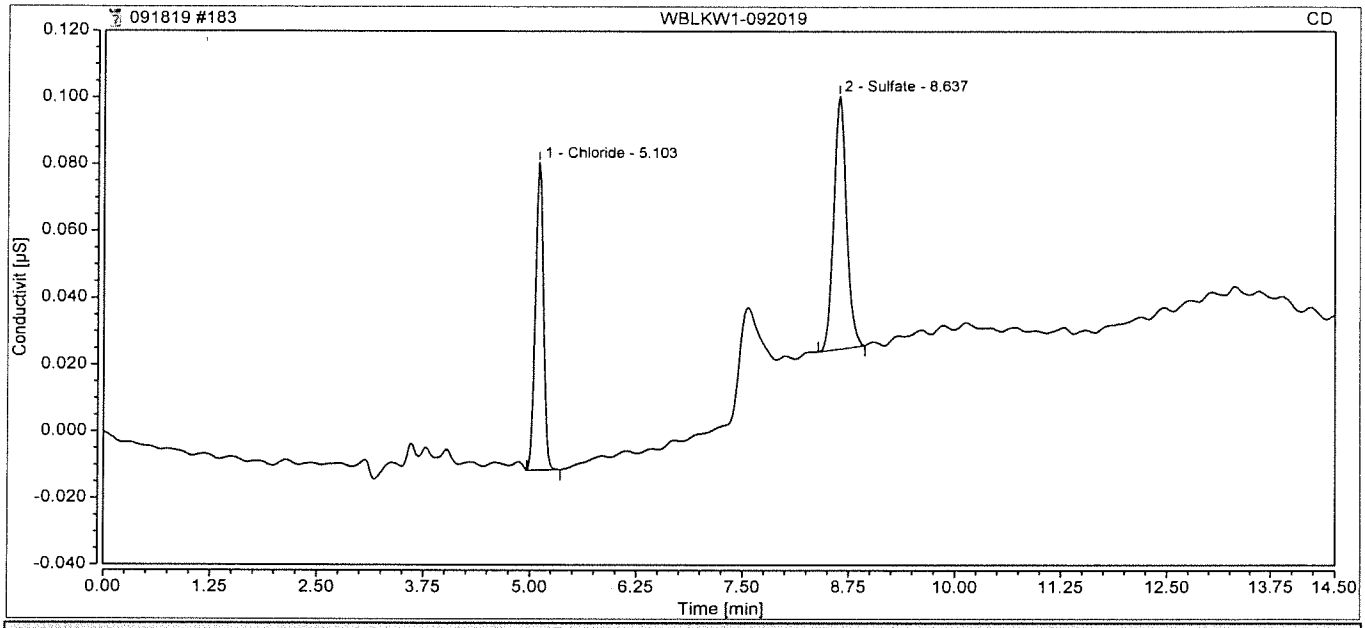
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.002	0.0660	0.0660	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.64	Sulfate	BMB	0.003	0.0330	0.0330	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.006**		**0.10**	

183 WBLKW1-092019

Sample Name:	**WBLKW1-092019**	*Injection Volume:*	**5.00**
Vial Number:	**GB3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 16:02**	*Sample Weight:*	**1.0000**

Run Time:



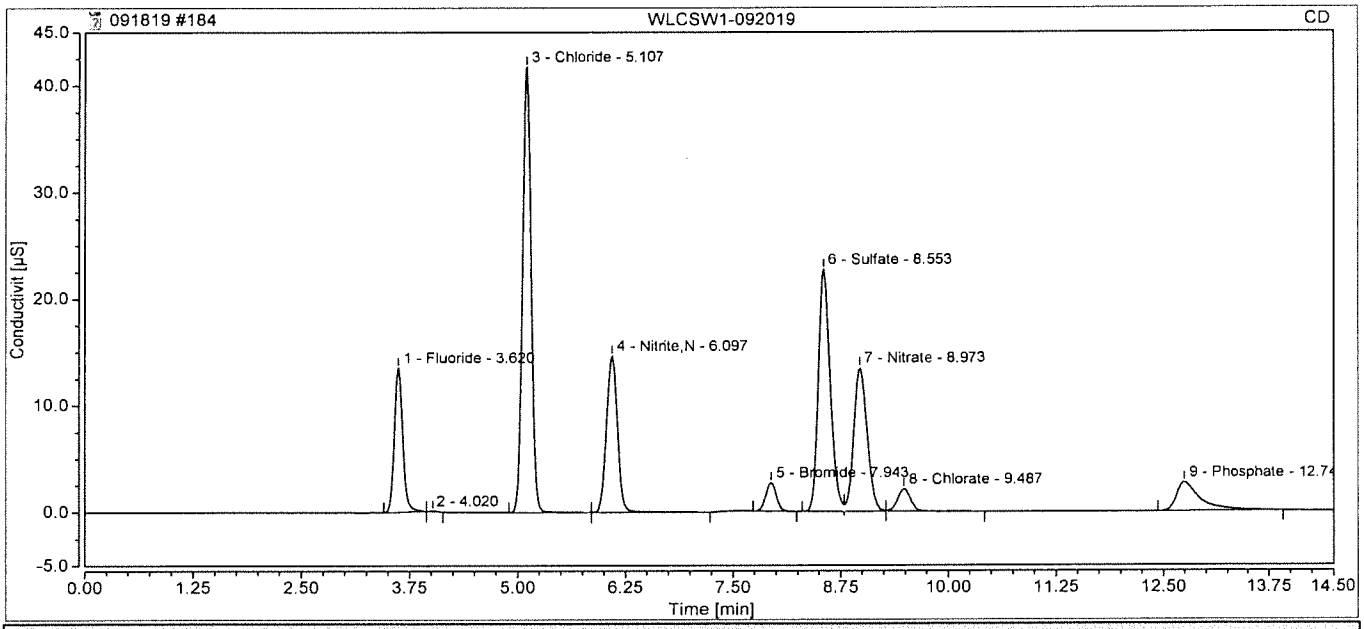
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.010	0.1007	0.1007	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.64	Sulfate	BMB	0.013	0.0892	0.0892	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.023**		**0.19**	

184 WLCSW1-092019

Sample Name:	**WLCSW1-092019**	*Injection Volume:*	**5.00**
Vial Number:	**GB4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 16:18**	*Sample Weight:*	**1.0000**

Run Time:

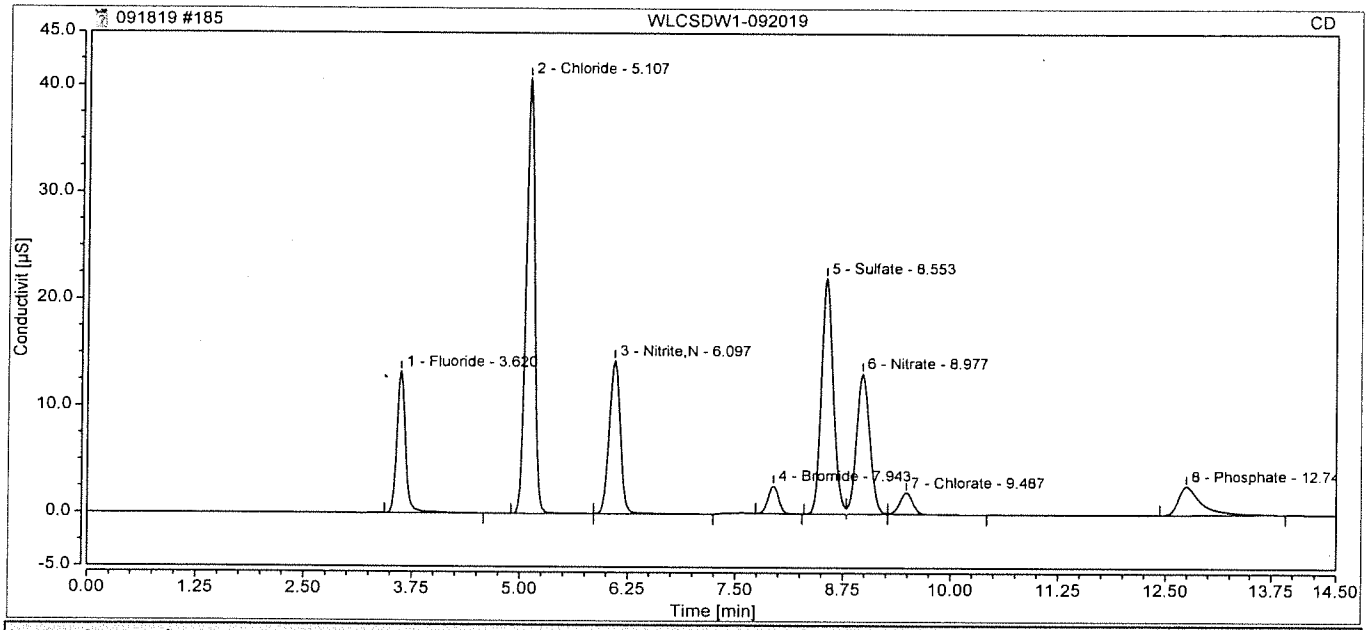


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.529	4.1305	4.1305	1.0000
3	5.11	Chloride	BMB	4.841	20.6139	20.6139	1.0000
4	6.10	Nitrite,N	BMB	2.184	4.2648	4.2648	1.0000
5	7.94	Bromide	BMB	0.384	3.8604	3.8604	1.0000
6	8.55	Sulfate	BM	3.636	21.1844	21.1844	1.0000
7	8.97	Nitrate	M	2.432	4.1573	4.1573	1.0000
8	9.49	Chlorate	MB	0.383	4.0812	4.0812	1.0000
9	12.74	Phosphate	BMB	0.877	3.8251	3.8251	1.0000
Total:			**0.000**	**16.267**		**66.12**	

185 WLCSDW1-092019

Sample Name:	WLCSDW1-092019	Injection Volume:	5.00
Vial Number:	GB5	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	1.0000
Recording Time:	09/20/2019 16:35	Sample Weight:	1.0000
Run Time:			

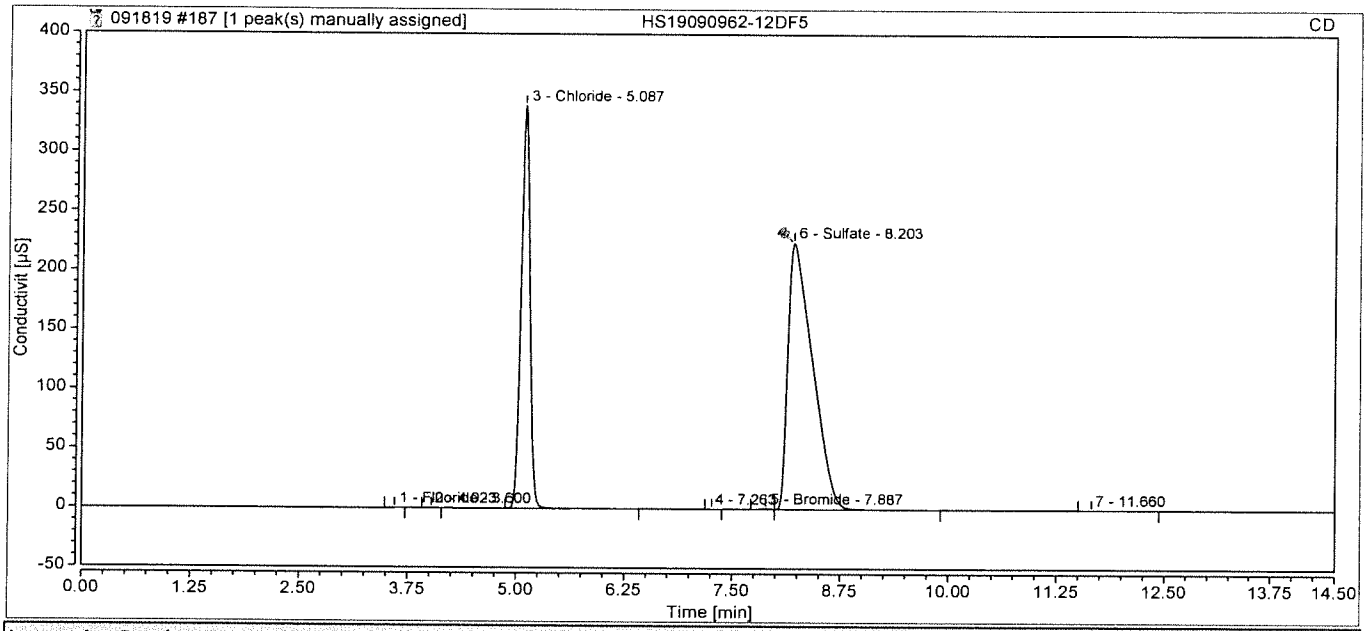


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.544	4.1706	4.1706	1.0000
2	5.11	Chloride	BMB	4.714	20.0751	20.0751	1.0000
3	6.10	Nitrite,N	BMB	2.136	4.1719	4.1719	1.0000
4	7.94	Bromide	BMB	0.375	3.7696	3.7696	1.0000
5	8.55	Sulfate	BM	3.534	20.5876	20.5876	1.0000
6	8.98	Nitrate	M	2.364	4.0409	4.0409	1.0000
7	9.49	Chlorate	MB	0.369	3.9339	3.9339	1.0000
8	12.74	Phosphate	BMB	0.865	3.7751	3.7751	1.0000
Total:			**0.000**	**15.902**		**64.52**	

187 HS19090962-12DF5

Sample Name:	**HS19090962-12DF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**09/20/2019 17:08**	*Sample Weight:*	**1.0000**
Run Time:			



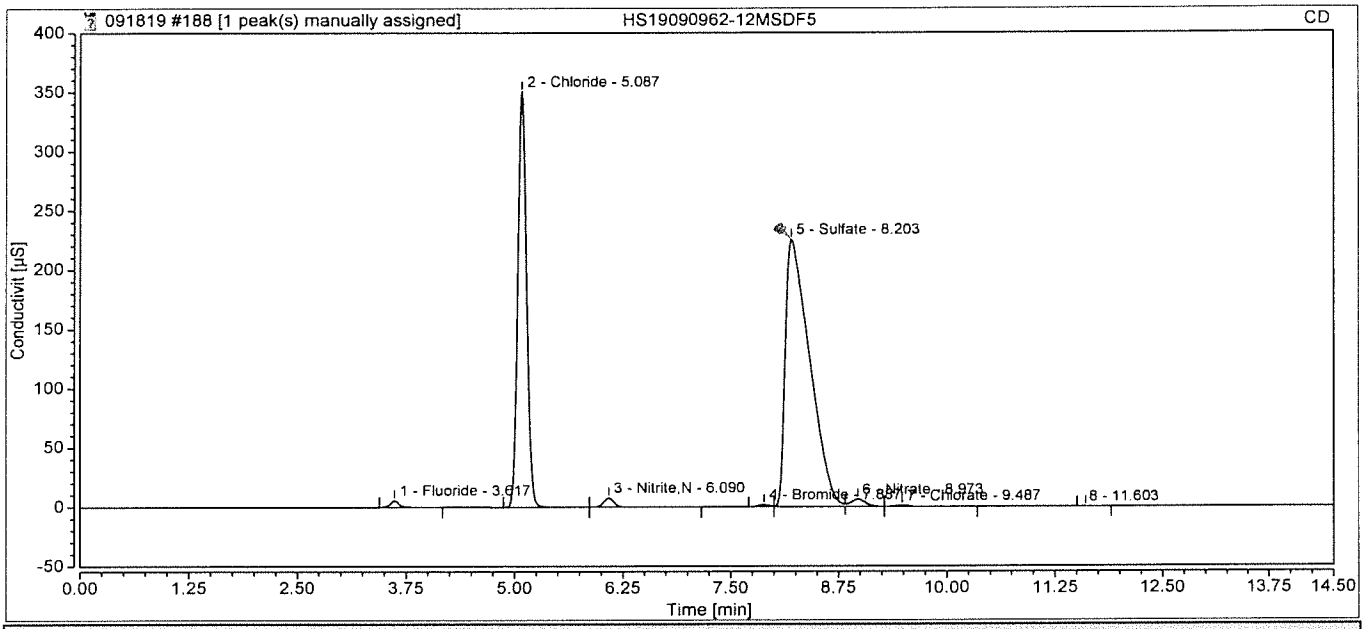
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.007	0.0336	0.1682	5.0000
3	5.09	Chloride	BMB	40.168	170.6214	853.1072	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
5	7.89	Bromide	BM	0.058	0.6315	3.1574	5.0000
6	8.20	Sulfate	MB^	74.003	430.8978	2154.4891	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**114.236**		**3010.92**	

188 HS19090962-12MSDF5

Sample Name:	**HS19090962-12MSDF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**09/20/2019 17:25**	*Sample Weight:*	**1.0000**

Run Time:



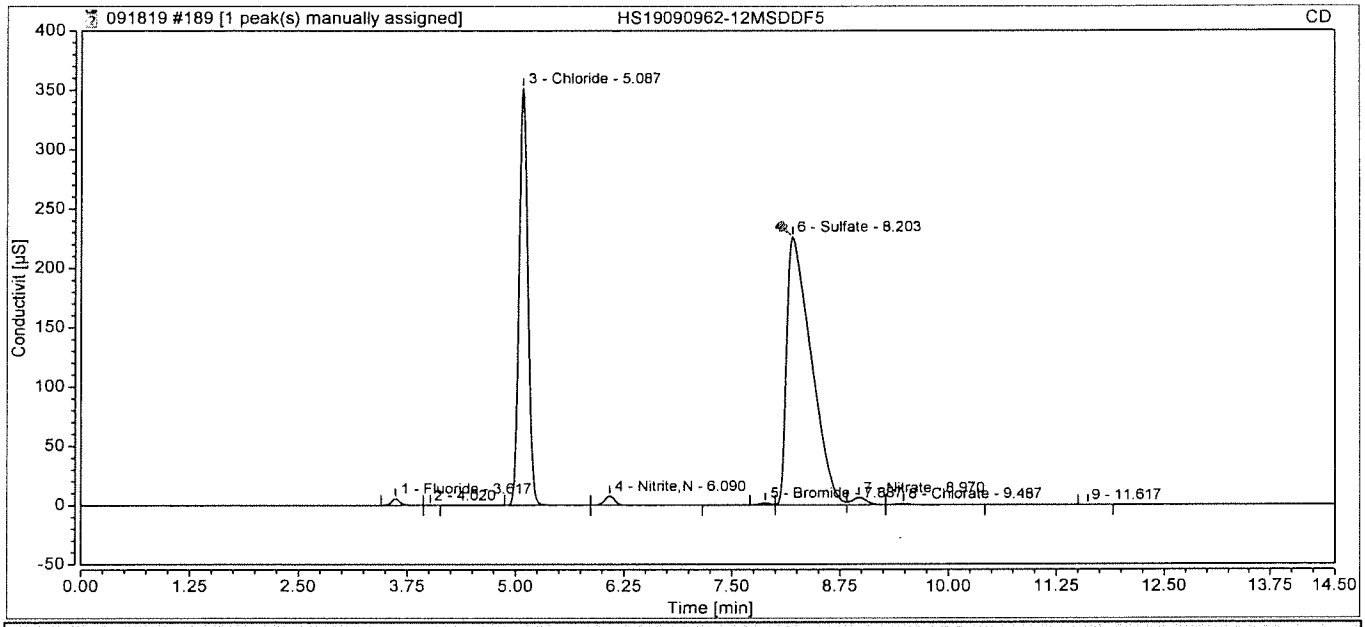
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.655	1.7776	8.8879	5.0000
2	5.09	Chloride	BMB	41.504	176.2955	881.4774	5.0000
3	6.09	Nitrite,N	BMB	1.090	2.1289	10.6446	5.0000
4	7.89	Bromide	BM	0.238	2.4098	12.0492	5.0000
5	8.20	Sulfate	M ^	73.643	428.8036	2144.0181	5.0000
6	8.97	Nitrate	M	1.227	2.1054	10.5272	5.0000
7	9.49	Chlorate	MB	0.182	1.9553	9.7764	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**118.539**		**3077.38**	

189 HS19090962-12MSDDF5

Sample Name:	**HS19090962-12MSDDF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**09/20/2019 17:42**	*Sample Weight:*	**1.0000**

Run Time:



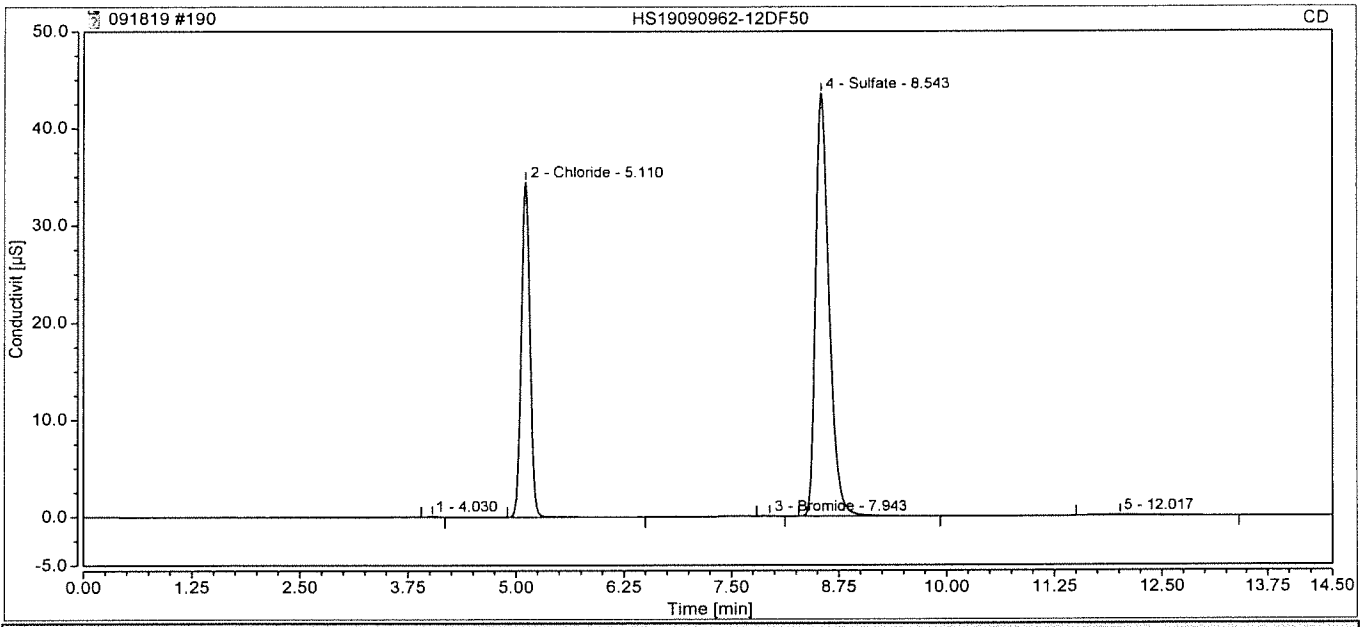
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.637	1.7300	8.6500	5.0000
3	5.09	Chloride	BMB	41.664	176.9721	884.8607	5.0000
4	6.09	Nitrite,N	BMB	1.090	2.1289	10.6446	5.0000
5	7.89	Bromide	BM	0.238	2.4104	12.0519	5.0000
6	8.20	Sulfate	M ^	74.337	432.8479	2164.2396	5.0000
7	8.97	Nitrate	M	1.243	2.1322	10.6608	5.0000
8	9.49	Chlorate	MB	0.184	1.9737	9.8683	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**119.393**		**3100.98**	

190 HS19090962-12DF50

Sample Name:	**HS19090962-12DF50**	*Injection Volume:*	**5.00**
Vial Number:	**GC5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**50.0000**
Recording Time:	**09/20/2019 17:58**	*Sample Weight:*	**1.0000**

Run Time:



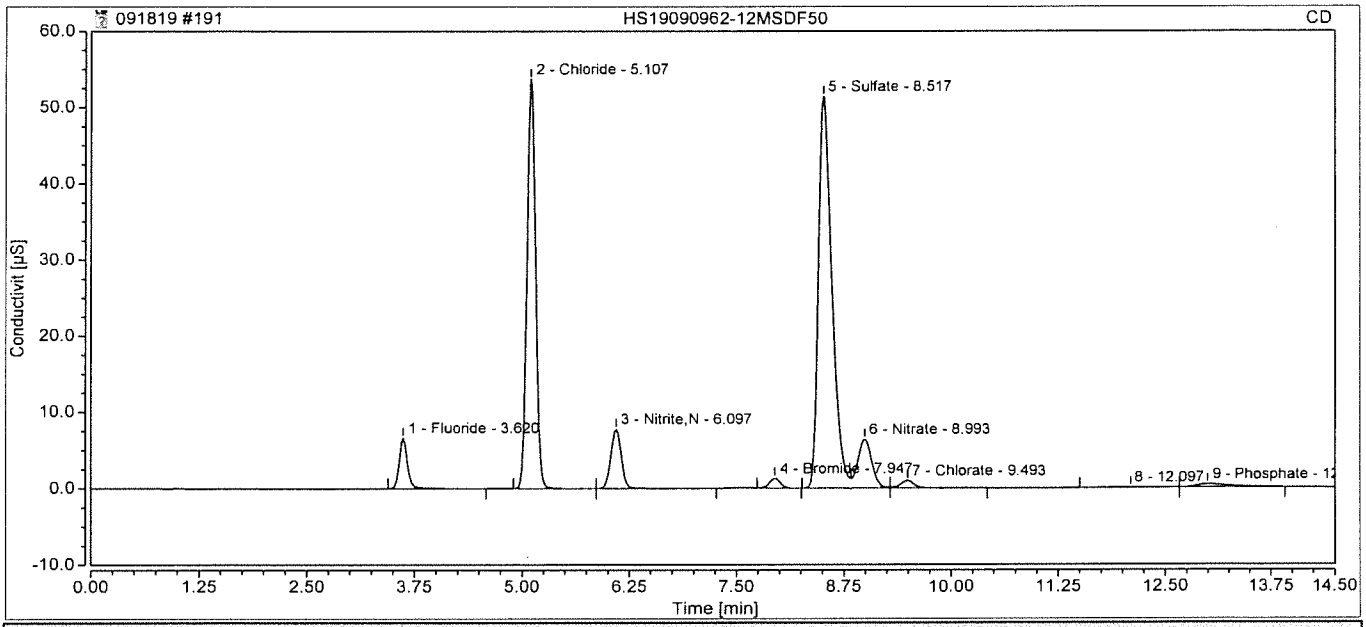
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	50.0000
2	5.11	Chloride	BMB	4.004	17.0596	852.9803	50.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	50.0000
3	7.94	Bromide	BMB	0.005	0.1010	5.0496	50.0000
4	8.54	Sulfate	BMB	7.930	46.1864	2309.3207	50.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	50.0000
Total:			**0.000**	**11.939**		**3167.35**	

191 HS19090962-12MSDF50

Sample Name:	**HS19090962-12MSDF50**	*Injection Volume:*	**5.00**
Vial Number:	**GC6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**50.0000**
Recording Time:	**09/20/2019 18:15**	*Sample Weight:*	**1.0000**

Run Time:



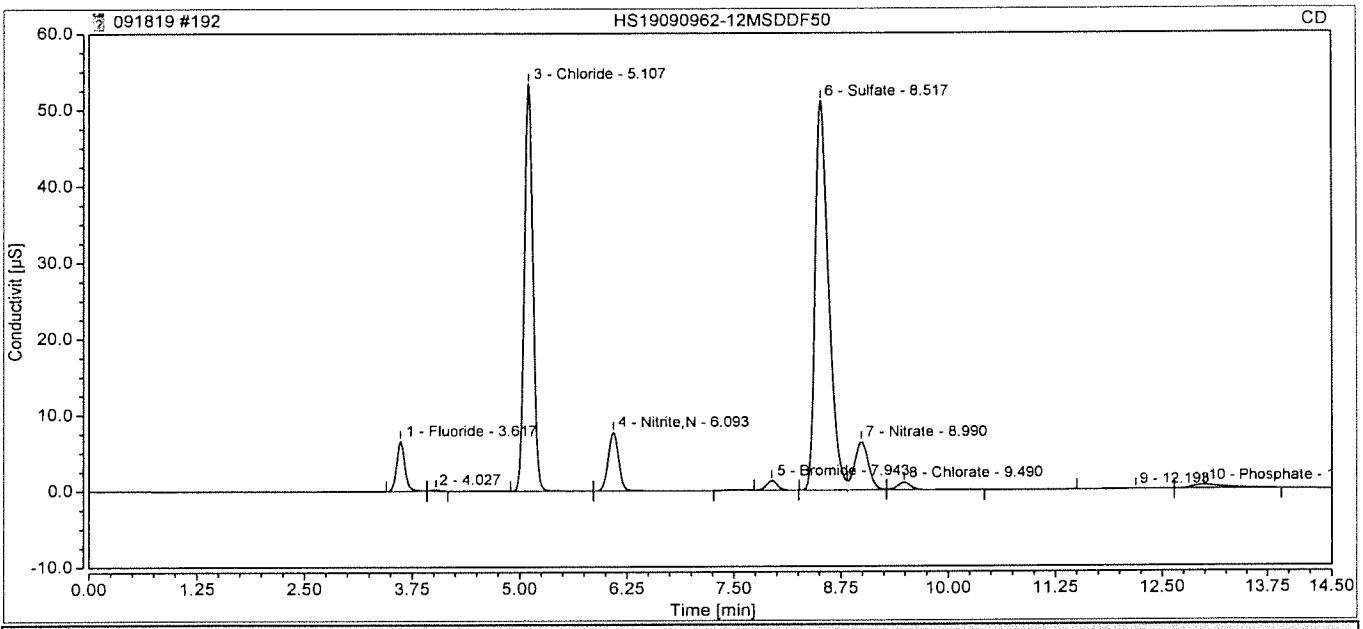
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.751	2.0353	101.7647	50.0000
2	5.11	Chloride	BMB	6.231	26.5142	1325.7080	50.0000
3	6.10	Nitrite,N	BMB	1.096	2.1398	106.9910	50.0000
4	7.95	Bromide	BMB	0.179	1.8263	91.3145	50.0000
5	8.52	Sulfate	BM	9.336	54.3752	2718.7601	50.0000
6	8.99	Nitrate	M	1.202	2.0636	103.1781	50.0000
7	9.49	Chlorate	MB	0.184	1.9706	98.5300	50.0000
9	13.00	Phosphate	BMB	0.203	0.9227	46.1329	50.0000
Total:			0.000	19.182		4592.38	

192 HS19090962-12MSDDF50

Sample Name:	**HS19090962-12MSDDF50**	*Injection Volume:*	**5.00**
Vial Number:	**GC7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**50.0000**
Recording Time:	**09/20/2019 18:31**	*Sample Weight:*	**1.0000**

Run Time:

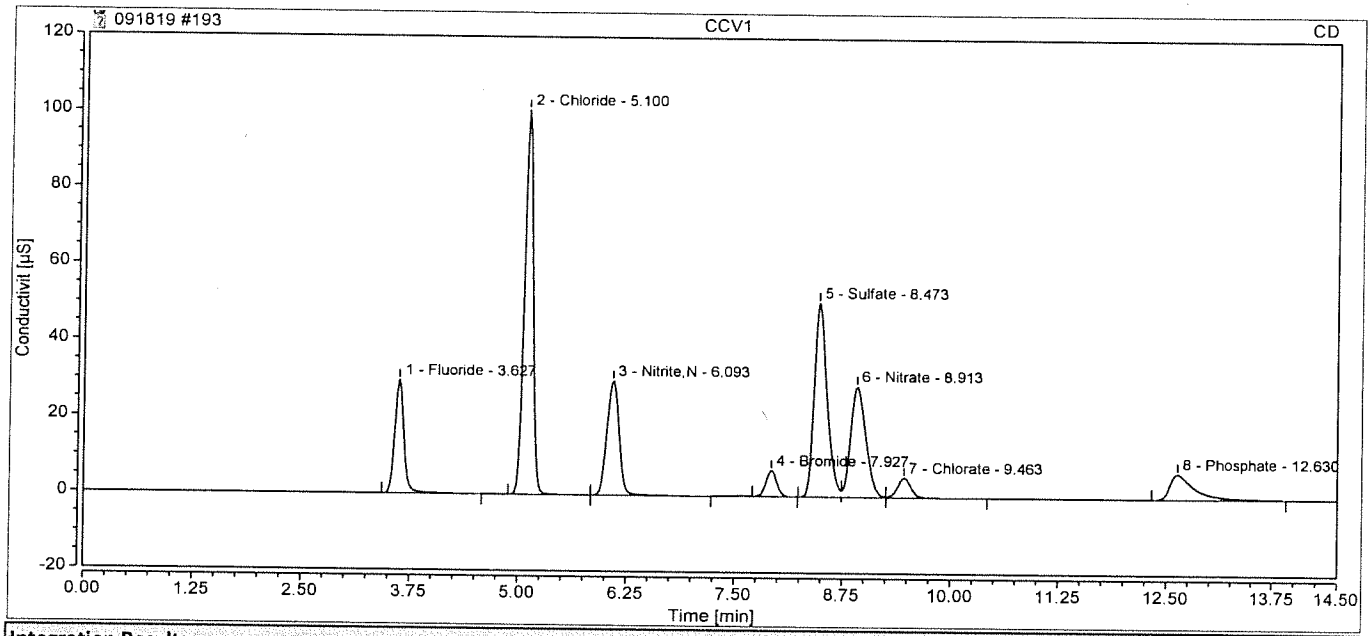


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.716	1.9410	97.0510	50.0000
3	5.11	Chloride	BMB	6.201	26.3883	1319.4157	50.0000
4	6.09	Nitrite,N	BMB	1.092	2.1326	106.6285	50.0000
5	7.94	Bromide	BMB	0.178	1.8158	90.7906	50.0000
6	8.52	Sulfate	BM	9.239	53.8047	2690.2329	50.0000
7	8.99	Nitrate	M	1.190	2.0430	102.1500	50.0000
8	9.49	Chlorate	MB	0.182	1.9583	97.9151	50.0000
10	12.98	Phosphate	BMB	0.229	1.0347	51.7356	50.0000
Total:			0.000	**19.027**		**4555.92**	

193 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 18:48**	*Sample Weight:*	**1.0000**
Run Time:			



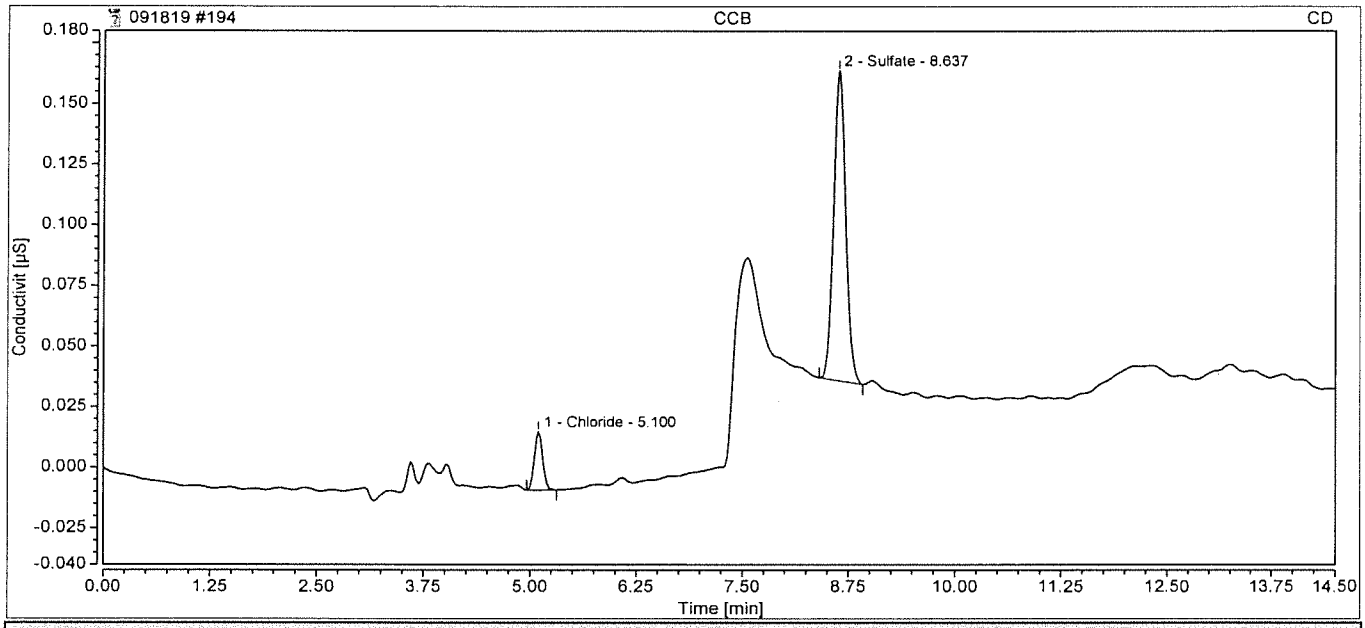
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	3.632	9.7882	9.7882	1.0000
2	5.10	Chloride	BMB	11.734	49.8813	49.8813	1.0000
3	6.09	Nitrite,N	BMB	4.945	9.6582	9.6582	1.0000
4	7.93	Bromide	BMB	0.984	9.8085	9.8085	1.0000
5	8.47	Sulfate	BM	8.693	50.6283	50.6283	1.0000
6	8.91	Nitrate	M	5.874	10.0143	10.0143	1.0000
7	9.46	Chlorate	MB	0.937	9.9481	9.9481	1.0000
8	12.63	Phosphate	BMB	2.231	9.6603	9.6603	1.0000
Total:			**0.000**	**39.029**		**159.39**	

194 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 19:05**	*Sample Weight:*	**1.0000**

Run Time:



Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.003	0.0688	0.0688	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.64	Sulfate	BMB	0.021	0.1347	0.1347	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.024**		**0.20**	

HS19090962

Report Date: 09/21/2019 : 2:51

PC-TitratION PLUS
Calibration Report

Calibration Record # 2158

Calibration Settings

Calibration ID	PH CAL 4-7-10	Date	09/21/2019
Channel	1	Time	2:51 PM
Probe Type	pH	Temperature	295.61 K 22.46 C
Probe ID	PH ELECTRODE	Analysis Type	Single Line Fit

Calibration Results

Slope	-57.900	CorrCoeff	0.9999
Intercept	3.093	Equation:	Y = (-57.900) X + (3.093)

Calibration Validity True Operator

	Result	Minimum	Maximum
Slope	-57.900	-65.00	-53.00
Intercept	3.093	-100.00	100.00
Correlation Coefficient	0.9999	0.99	1.00

Note: "True" means the calibration was within the specified ranges
"False" means the calibration was NOT within the specified ranges

AIK (A) R# 346725

AIK (B) R# 346726

Calibration Data	Standard	Reading
	4.00	178.46
	7.00	-0.24
	10.00	-168.94

PH 4502 (A) R# 346793

PH 4500 (B) R# 346794

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PC-TitratION PLUS
Water Analysis Report

Run Number 3622 **Order Number** 20190921-2

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
ICV-PH	9/21/2019	3:25 PM	22.60	-1.00	6.04	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TAP WATER	9/21/2019	3:31 PM	22.70	-1.00	7.91	.00	279.23	279.23	.00	.00	.00	2.66	2.66
WBLKW1-190921	9/21/2019	3:37 PM	22.58	-1.00	5.83	.00	.55	.55	.00	.00	.00	.02	.02
LCS1-190921	9/21/2019	3:45 PM	22.63	-1.00	10.99	560.41	1,081.63	.00	1,042.44	39.19	5.34	10.30	10.30
LCSD1-190921	9/21/2019	3:54 PM	22.72	-1.00	10.99	564.41	1,091.68	.00	1,054.53	37.15	5.38	10.40	10.40
HS19090430-04	9/21/2019	4:02 PM	22.72	-1.00	7.89	.00	619.85	619.85	.00	.00	.00	5.90	5.90
HS19090430-04DUP	9/21/2019	4:09 PM	22.64	-1.00	7.88	.00	621.92	621.92	.00	.00	.00	5.92	5.92
HS19090539-02	9/21/2019	4:17 PM	22.57	-1.00	7.46	.00	995.93	995.93	.00	.00	.00	9.49	9.49
HS19090539-03	9/21/2019	4:27 PM	22.54	-1.00	7.69	.00	1,002.02	1,002.02	.00	.00	.00	9.54	9.54
HS19090539-05	9/21/2019	4:34 PM	22.63	-1.00	7.63	.00	802.51	802.51	.00	.00	.00	7.64	7.64
HS19090539-05DUP	9/21/2019	4:42 PM	22.61	-1.00	7.64	.00	807.96	807.96	.00	.00	.00	7.69	7.69
CCV-PH	9/21/2019	4:45 PM	22.86	-1.00	7.06	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	4:54 PM	22.84	-1.00	10.96	556.73	1,085.02	.00	1,056.59	28.43	5.30	10.33	10.33
DI RINSE	9/21/2019	4:59 PM	22.77	-1.00	5.91	.00	.44	.44	.00	.00	.00	.02	.02
HS19090539-04	9/21/2019	5:07 PM	22.72	-1.00	7.42	.00	1,002.15	1,002.15	.00	.00	.00	9.54	9.54
HS19090539-06	9/21/2019	5:16 PM	22.80	-1.00	7.46	.00	928.25	928.25	.00	.00	.00	8.84	8.84
HS19090539-07	9/21/2019	5:21 PM	22.80	-1.00	5.62	.00	.30	.30	.00	.00	.00	.02	.02
HS19090807-01	9/21/2019	5:28 PM	22.75	-1.00	7.61	.00	343.72	343.72	.00	.00	.00	3.27	3.27
HS19090807-02	9/21/2019	5:34 PM	22.74	-1.00	7.64	.00	316.64	316.64	.00	.00	.00	3.02	3.02
HS19090807-03	9/21/2019	5:41 PM	22.72	-1.00	7.74	.00	313.78	313.78	.00	.00	.00	2.99	2.99
HS19090807-04	9/21/2019	5:47 PM	22.87	-1.00	7.73	.00	340.91	340.91	.00	.00	.00	3.25	3.25
HS19090807-05	9/21/2019	5:52 PM	22.86	-1.00	5.88	.00	.52	.52	.00	.00	.00	.02	.02
HS19090904-01	9/21/2019	5:59 PM	22.77	-1.00	7.76	.00	93.42	93.42	.00	.00	.00	.89	.89
CCV-PH	9/21/2019	6:02 PM	22.72	-1.00	7.06	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	6:10 PM	22.60	-1.00	10.94	552.15	1,086.21	.00	1,068.11	18.10	5.26	10.34	10.34
DI RINSE	9/21/2019	6:15 PM	22.57	-1.00	5.93	.00	.36	.36	.00	.00	.00	.02	.02
HS19090580-02	9/21/2019	6:26 PM	22.52	-1.00	8.24	.00	1,389.15	1,389.15	.00	.00	.00	13.23	13.23

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Run Number 3622 **Order Number** 20190921-2

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS19090580-03	9/21/2019	6:33 PM	22.55	-1.00	7.92	.00	591.10	591.10	.00	.00	.00	5.63	5.63
HS19090580-04	9/21/2019	6:41 PM	22.60	-1.00	7.86	.00	686.16	686.16	.00	.00	.00	6.53	6.53
HS19090835-01DF500	9/21/2019	6:51 PM	22.57	-1.00	11.77	423.52	449.50	.00	51.96	397.54	4.03	4.28	4.28
HS19090835-01DF1000	9/21/2019	6:59 PM	22.54	-1.00	11.56	207.36	225.49	.00	36.26	189.22	1.97	2.15	2.15
HS19090892-01	9/21/2019	7:06 PM	22.42	-1.00	8.67	11.56	290.06	266.94	23.13	.00	.11	2.76	2.76
WBLKW2-190921	9/21/2019	7:11 PM	22.37	-1.00	5.86	.00	.35	.35	.00	.00	.00	.02	.02
WLCS2-190921	9/21/2019	7:20 PM	22.32	-1.00	10.92	548.80	1,083.78	.00	1,069.96	13.82	5.23	10.32	10.32
WLCSD2-190921	9/21/2019	7:30 PM	22.28	-1.00	10.92	546.08	1,092.56	.40	1,092.16	.00	5.20	10.41	10.41
CCV-PH	9/21/2019	7:32 PM	22.22	-1.00	7.06	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	7:41 PM	22.13	-1.00	10.91	551.36	1,093.30	.00	1,083.89	9.41	5.25	10.41	10.41
DI RINSE	9/21/2019	7:46 PM	22.28	-1.00	5.95	.00	.44	.44	.00	.00	.00	.02	.02
HS19090816-04	9/21/2019	7:54 PM	22.28	-1.00	7.51	.00	860.46	860.46	.00	.00	.00	8.19	8.19
HS19090816-04DUP	9/21/2019	8:02 PM	22.23	-1.00	7.46	.00	859.50	859.50	.00	.00	.00	8.19	8.19
HS19090633-01	9/21/2019	8:10 PM	22.16	-1.00	7.82	.00	594.81	594.81	.00	.00	.00	5.66	5.66
HS19090633-02	9/21/2019	8:18 PM	22.13	-1.00	7.66	.00	915.69	915.69	.00	.00	.00	8.72	8.72
HS19090633-03	9/21/2019	8:26 PM	22.10	-1.00	7.89	.00	484.68	484.68	.00	.00	.00	4.62	4.62
HS19090633-04	9/21/2019	8:33 PM	22.03	-1.00	7.58	.00	813.75	813.75	.00	.00	.00	7.75	7.75
HS19090633-05	9/21/2019	8:41 PM	22.08	-1.00	7.51	.00	701.78	701.78	.00	.00	.00	6.68	6.68
HS19090816-01	9/21/2019	8:49 PM	22.20	-1.00	7.56	.00	850.16	850.16	.00	.00	.00	8.10	8.10
HS19090816-02	9/21/2019	8:57 PM	22.14	-1.00	7.46	.00	933.99	933.99	.00	.00	.00	8.90	8.90
CCV-PH	9/21/2019	9:00 PM	22.20	-1.00	7.06	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	9:08 PM	22.13	-1.00	10.88	539.83	1,078.42	.00	1,077.18	1.23	5.14	10.27	10.27
DI RINSE	9/21/2019	9:13 PM	22.10	-1.00	5.92	.00	.53	.53	.00	.00	.00	.02	.02
HS19090816-03	9/21/2019	9:20 PM	22.10	-1.00	7.94	.00	260.19	260.19	.00	.00	.00	2.48	2.48
HS19090805-01	9/21/2019	9:27 PM	22.13	-1.00	8.62	11.58	319.34	296.18	23.16	.00	.11	3.04	3.04
HS19090740-01	9/21/2019	9:35 PM	22.07	-1.00	7.44	.00	656.68	656.68	.00	.00	.00	6.25	6.25
HS19090740-02	9/21/2019	9:42 PM	22.05	-1.00	7.61	.00	639.25	639.25	.00	.00	.00	6.09	6.09
HS19090740-03	9/21/2019	9:49 PM	22.19	-1.00	7.59	.00	584.62	584.62	.00	.00	.00	5.57	5.57
HS19090740-04	9/21/2019	9:56 PM	22.10	-1.00	7.78	.00	588.56	588.56	.00	.00	.00	5.61	5.61
HS19090740-05	9/21/2019	10:04 PM	22.05	-1.00	6.80	.00	761.95	761.95	.00	.00	.00	7.26	7.26

PC-TitratION PLUS by Man-Tech Associates, Inc.

GENERAL RESULTS REPORT SRW

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Run Number 3622 **Order Number** 20190921-2

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS19090740-05DUP	9/21/2019	10:11 PM	22.00	-1.00	6.79	.00	764.40	764.40	.00	.00	.00	7.28	7.28
HS19090927-01	9/21/2019	10:17 PM	21.99	-1.00	8.09	.00	161.39	161.39	.00	.00	.00	1.54	1.54
CCV-PH	9/21/2019	10:20 PM	22.07	-1.00	7.05	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	10:29 PM	21.99	-1.00	10.86	543.16	1,096.34	10.03	1,086.31	.00	5.17	10.44	10.44
DI RINSE	9/21/2019	10:33 PM	22.02	-1.00	5.87	.00	.41	.41	.00	.00	.00	.02	.02
HS19090885-04	9/21/2019	10:41 PM	22.16	-1.00	7.57	.00	1,021.74	1,021.74	.00	.00	.00	9.73	9.73
HS19090962-12	9/21/2019	10:47 PM	22.10	-1.00	6.41	.00	132.99	132.99	.00	.00	.00	1.27	1.27
HS19090962-12DUP	9/21/2019	10:53 PM	22.03	-1.00	6.39	.00	134.27	134.27	.00	.00	.00	1.28	1.28
HS19090964-04	9/21/2019	10:58 PM	22.00	-1.00	6.55	.00	93.98	93.98	.00	.00	.00	.90	.90
HS19090964-06	9/21/2019	11:04 PM	22.02	-1.00	6.58	.00	106.86	106.86	.00	.00	.00	1.02	1.02
HS19090980-01	9/21/2019	11:11 PM	21.98	-1.00	7.77	.00	328.40	328.40	.00	.00	.00	3.13	3.13
HS19090988-01	9/21/2019	11:17 PM	21.95	-1.00	7.70	.00	341.10	341.10	.00	.00	.00	3.25	3.25
CCV-PH	9/21/2019	11:19 PM	21.93	-1.00	7.05	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	11:28 PM	21.83	-1.00	10.86	544.62	1,094.45	5.21	1,089.24	.00	5.19	10.42	10.42
DI RINSE	9/21/2019	11:33 PM	22.05	-1.00	5.92	.00	.49	.49	.00	.00	.00	.02	.02

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HS19090964 LHAAP16 Cover Page

ALS WO# HS19090964

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WorkOrder: HS19090964

LHAAP-16

Aptim Environmental & Infrastucture, Inc.

Susan Huang
2500 City West Blvd., Suite 1700
Houston TX 77042

14-Oct-2019

HS19090964 LHAAP16 Final

ALS WO# HS19090964

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October 04, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19090964**

Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 7 sample(s) on Sep 19, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19090964

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090964-01	16WW25-190919	Water		19-Sep-2019 09:30	19-Sep-2019 16:45	☐
HS19090964-02	16WW25-190919-FD	Water		19-Sep-2019 09:30	19-Sep-2019 16:45	☐
HS19090964-03	16WW49-190919	Water		19-Sep-2019 08:35	19-Sep-2019 16:45	☐
HS19090964-04	16WW58-190918	Water		18-Sep-2019 14:08	19-Sep-2019 16:45	☐
HS19090964-05	16LHAAP-TB6-190919	Water	C&G-080519-518	19-Sep-2019 00:00	19-Sep-2019 16:45	☐
HS19090964-06	16WW58-190918-FD	Water		18-Sep-2019 14:08	19-Sep-2019 16:45	☐
HS19090964-07	16WW51-190919	Water		18-Sep-2019 18:00	19-Sep-2019 16:45	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19090964

Work Order Comments

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

Work Order Comments

• The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R346937

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

GCMS Volatiles by Method SW8260

Batch ID: R347193,R347232

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

WetChemistry by Method SW9056

Batch ID: R346732

Sample ID: HS19090962-12MS

• MS and MSD are for an unrelated sample

Batch ID: R346978

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

WetChemistry by Method SM2320B

Batch ID: R346726

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW25-190919
Collection Date: 19-Sep-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19090964
Lab ID:HS19090964-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:56
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:56
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 17:56
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:56
Surr: 1,2-Dichloroethane-d4	*83.9*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 17:56*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 17:56*
Surr: Dibromofluoromethane	*90.2*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 17:56*
Surr: Toluene-d8	*99.3*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 17:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW25-190919-FD
Collection Date: 19-Sep-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19090964
Lab ID:HS19090964-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 18:21
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 18:21
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 18:21
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 18:21
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 18:21
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 18:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 18:21
Surr: 1,2-Dichloroethane-d4	*84.2*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 18:21*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 18:21*
Surr: Dibromofluoromethane	*89.6*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 18:21*
Surr: Toluene-d8	*97.4*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 18:21*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW49-190919
Collection Date: 19-Sep-2019 08:35

ANALYTICAL REPORT
WorkOrder:HS19090964
Lab ID:HS19090964-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 14:44
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 14:44
1,2-Dichloroethane	**0.86**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 14:44
cis-1,2-Dichloroethene	**130**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 14:44
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 14:44
Trichloroethene	**260**		**1.0**	**2.5**	**5.0**	**UG/L**	5	29-Sep-2019 13:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 14:44
Surr: 1,2-Dichloroethane-d4	*83.8*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 14:44*
Surr: 1,2-Dichloroethane-d4	*94.2*			**0**	*81-118*	*%REC*	*5*	*29-Sep-2019 13:31*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 14:44*
Surr: 4-Bromofluorobenzene	*109*			**0**	*85-114*	*%REC*	*5*	*29-Sep-2019 13:31*
Surr: Dibromofluoromethane	*91.2*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 14:44*
Surr: Dibromofluoromethane	*99.9*			**0**	*80-119*	*%REC*	*5*	*29-Sep-2019 13:31*
Surr: Toluene-d8	*97.4*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 14:44*
Surr: Toluene-d8	*95.7*			**0**	*89-112*	*%REC*	*5*	*29-Sep-2019 13:31*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW58-190918
Collection Date: 18-Sep-2019 14:08

ANALYTICAL REPORT
WorkOrder:HS19090964
Lab ID:HS19090964-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	29-Sep-2019 15:31
1,1-Dichloroethene	**3.9**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	29-Sep-2019 15:31
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	29-Sep-2019 15:31
cis-1,2-Dichloroethene	**170**		**1.0**	**2.5**	**5.0**	**UG/L**	5	29-Sep-2019 15:31
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	29-Sep-2019 15:31
Trichloroethene	**4,300**		**5.0**	**12**	**25**	**UG/L**	25	27-Sep-2019 19:33
Vinyl chloride	2.5	U	1.0	2.5	5.0	UG/L	5	29-Sep-2019 15:31
Surr: 1,2-Dichloroethane-d4	*81.2*			**0**	*81-118*	*%REC*	*25*	*27-Sep-2019 19:33*
Surr: 1,2-Dichloroethane-d4	*96.1*			**0**	*81-118*	*%REC*	*5*	*29-Sep-2019 15:31*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*25*	*27-Sep-2019 19:33*
Surr: 4-Bromofluorobenzene	*107*			**0**	*85-114*	*%REC*	*5*	*29-Sep-2019 15:31*
Surr: Dibromofluoromethane	*88.4*			**0**	*80-119*	*%REC*	*25*	*27-Sep-2019 19:33*
Surr: Dibromofluoromethane	*104*			**0**	*80-119*	*%REC*	*5*	*29-Sep-2019 15:31*
Surr: Toluene-d8	*98.5*			**0**	*89-112*	*%REC*	*25*	*27-Sep-2019 19:33*
Surr: Toluene-d8	*93.9*			**0**	*89-112*	*%REC*	*5*	*29-Sep-2019 15:31*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000332**	J	**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	25-Sep-2019 13:46
Ethene	**0.00151**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	25-Sep-2019 13:46
Methane	**0.00362**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	25-Sep-2019 13:46
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**94.0**		**5.00**	**5.00**	**5.00**	**mg/L**	1	21-Sep-2019 22:58
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.52**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	20-Sep-2019 13:01
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	20-Sep-2019 13:01
Sulfate	**394**		**2.00**	**5.00**	**5.00**	**mg/L**	10	26-Sep-2019 04:18
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 11:55

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16LHAAP-TB6-190919
Collection Date: 19-Sep-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19090964
Lab ID:HS19090964-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 12:44
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 12:44
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 12:44
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 12:44
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 12:44
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 12:44
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 12:44
Surr: 1,2-Dichloroethane-d4	*84.1*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 12:44*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 12:44*
Surr: Dibromofluoromethane	*89.7*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 12:44*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 12:44*

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW58-190918-FD
Collection Date: 18-Sep-2019 14:08

ANALYTICAL REPORT
WorkOrder:HS19090964
Lab ID:HS19090964-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	29-Sep-2019 15:55
1,1-Dichloroethene	**3.9**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	29-Sep-2019 15:55
1,2-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	29-Sep-2019 15:55
cis-1,2-Dichloroethene	**180**		**1.0**	**2.5**	**5.0**	**UG/L**	5	29-Sep-2019 15:55
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	29-Sep-2019 15:55
Trichloroethene	**4,100**		**5.0**	**12**	**25**	**UG/L**	25	27-Sep-2019 20:21
Vinyl chloride	2.5	U	1.0	2.5	5.0	UG/L	5	29-Sep-2019 15:55
Surr: 1,2-Dichloroethane-d4	*81.3*			**0**	*81-118*	*%REC*	*25*	*27-Sep-2019 20:21*
Surr: 1,2-Dichloroethane-d4	*92.6*			**0**	*81-118*	*%REC*	*5*	*29-Sep-2019 15:55*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*25*	*27-Sep-2019 20:21*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*5*	*29-Sep-2019 15:55*
Surr: Dibromofluoromethane	*88.3*			**0**	*80-119*	*%REC*	*25*	*27-Sep-2019 20:21*
Surr: Dibromofluoromethane	*99.2*			**0**	*80-119*	*%REC*	*5*	*29-Sep-2019 15:55*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*25*	*27-Sep-2019 20:21*
Surr: Toluene-d8	*90.5*			**0**	*89-112*	*%REC*	*5*	*29-Sep-2019 15:55*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: PVL
Ethane	**0.000318**	J	**0.000144**	**0.000250**	**0.00100**	**mg/L**	1	25-Sep-2019 13:58
Ethene	**0.00143**		**0.000234**	**0.000500**	**0.00100**	**mg/L**	1	25-Sep-2019 13:58
Methane	**0.00437**		**0.000107**	**0.000250**	**0.000500**	**mg/L**	1	25-Sep-2019 13:58
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: TH
Alkalinity, Total (As CaCO3)	**107**		**5.00**	**10.0**	**5.00**	**mg/L**	1	21-Sep-2019 23:04
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.48**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	20-Sep-2019 13:17
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	20-Sep-2019 13:17
Sulfate	**396**		**2.00**	**5.00**	**5.00**	**mg/L**	10	26-Sep-2019 04:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 11:55

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW51-190919
Collection Date: 18-Sep-2019 18:00

ANALYTICAL REPORT
WorkOrder:HS19090964
Lab ID:HS19090964-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 13:08
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 13:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 13:08
cis-1,2-Dichloroethene	**9.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 13:08
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 13:08
Trichloroethene	**90**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Sep-2019 13:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 13:08
Surr: 1,2-Dichloroethane-d4	*84.6*			**0**	*81-118*	*%REC*	*1*	*27-Sep-2019 13:08*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*1*	*27-Sep-2019 13:08*
Surr: Dibromofluoromethane	*91.0*			**0**	*80-119*	*%REC*	*1*	*27-Sep-2019 13:08*
Surr: Toluene-d8	*97.9*			**0**	*89-112*	*%REC*	*1*	*27-Sep-2019 13:08*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346726 (0)	**Test Name :** ALKALINITY BY SM2320B				**Matrix:** Water	
HS19090964-04	16WW58-190918	18 Sep 2019 14:08			21 Sep 2019 22:58	1
HS19090964-06	16WW58-190918-FD	18 Sep 2019 14:08			21 Sep 2019 23:04	1
Batch ID: R346732 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS19090964-04	16WW58-190918	18 Sep 2019 14:08			20 Sep 2019 13:01	1
HS19090964-06	16WW58-190918-FD	18 Sep 2019 14:08			20 Sep 2019 13:17	1
Batch ID: R346937 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS19090964-04	16WW58-190918	18 Sep 2019 14:08			25 Sep 2019 13:46	1
HS19090964-06	16WW58-190918-FD	18 Sep 2019 14:08			25 Sep 2019 13:58	1
Batch ID: R346978 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS19090964-04	16WW58-190918	18 Sep 2019 14:08			26 Sep 2019 04:18	10
HS19090964-06	16WW58-190918-FD	18 Sep 2019 14:08			26 Sep 2019 04:34	10
Batch ID: R347193 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19090964-01	16WW25-190919	19 Sep 2019 09:30			27 Sep 2019 17:56	1
HS19090964-02	16WW25-190919-FD	19 Sep 2019 09:30			27 Sep 2019 18:21	1
HS19090964-03	16WW49-190919	19 Sep 2019 08:35			27 Sep 2019 14:44	1
HS19090964-04	16WW58-190918	18 Sep 2019 14:08			27 Sep 2019 19:33	25
HS19090964-05	16LHAAP-TB6-190919	19 Sep 2019 00:00			27 Sep 2019 12:44	1
HS19090964-06	16WW58-190918-FD	18 Sep 2019 14:08			27 Sep 2019 20:21	25
HS19090964-07	16WW51-190919	18 Sep 2019 18:00			27 Sep 2019 13:08	1
Batch ID: R347232 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19090964-03	16WW49-190919	19 Sep 2019 08:35			29 Sep 2019 13:31	5
HS19090964-04	16WW58-190918	18 Sep 2019 14:08			29 Sep 2019 15:31	5
HS19090964-06	16WW58-190918-FD	18 Sep 2019 14:08			29 Sep 2019 15:55	5
Batch ID: R347602 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS19090964-01	16WW25-190919	19 Sep 2019 09:30			04 Oct 2019 09:41	1
HS19090964-02	16WW25-190919-FD	19 Sep 2019 09:30			04 Oct 2019 09:41	1
HS19090964-03	16WW49-190919	19 Sep 2019 08:35			04 Oct 2019 09:41	1
HS19090964-04	16WW58-190918	18 Sep 2019 14:08			04 Oct 2019 09:41	1
HS19090964-06	16WW58-190918-FD	18 Sep 2019 14:08			04 Oct 2019 09:41	1
HS19090964-07	16WW51-190919	18 Sep 2019 18:00			04 Oct 2019 09:41	1
Batch ID: R347625 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS19090964-04	16WW58-190918	18 Sep 2019 14:08			04 Oct 2019 11:55	1
HS19090964-06	16WW58-190918-FD	18 Sep 2019 14:08			04 Oct 2019 11:55	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R346937 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-190925** Units: **mg/L** Analysis Date: **25-Sep-2019 12:26**
Client ID: Run ID: **FID-4_346937** SeqNo: **5267809** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000250	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000250	0.000500								U

LCS Sample ID: **LCS-190925** Units: **mg/L** Analysis Date: **25-Sep-2019 12:00**
Client ID: Run ID: **FID-4_346937** SeqNo: **5267807** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0177	0.00100	0.01804	0	98.1	75 - 125				
Ethene	0.0173	0.00100	0.0168	0	103	75 - 125				
Methane	0.00963	0.000500	0.009647	0	99.9	75 - 125				

LCSD Sample ID: **LCSD-190925** Units: **mg/L** Analysis Date: **25-Sep-2019 12:15**
Client ID: Run ID: **FID-4_346937** SeqNo: **5267808** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0167	0.00100	0.01804	0	92.7	75 - 125	0.01769	5.64	30	
Ethene	0.0161	0.00100	0.0168	0	95.7	75 - 125	0.01731	7.39	30	
Methane	0.00848	0.000500	0.009647	0	87.9	75 - 125	0.009634	12.7	30	

MS Sample ID: **HS19090962-12MS** Units: **mg/L** Analysis Date: **25-Sep-2019 13:16**
Client ID: Run ID: **FID-4_346937** SeqNo: **5267870** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0185	0.00100	0.01804	0.0002460	101	75 - 125				
Ethene	0.0195	0.00100	0.0168	0.001181	109	75 - 125				
Methane	0.0102	0.000500	0.009647	0.002443	80.0	75 - 125				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R346937 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MSD Sample ID: **HS19090962-12MSD** Units: **mg/L** Analysis Date: **25-Sep-2019 13:27**
Client ID: Run ID: **FID-4_346937** SeqNo: **5270103** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0186	0.00100	0.01804	0.0002460	102	75 - 125	0.01853	0.232	30	
Ethene	0.0186	0.00100	0.0168	0.001181	104	75 - 125	0.01948	4.43	30	
Methane	0.00968	0.000500	0.009647	0.002443	75.1	75 - 125	0.01016	4.78	30	

The following samples were analyzed in this batch: HS19090964-04 HS19090964-06

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R347193 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190927** Units: **UG/L** Analysis Date: **27-Sep-2019 12:20**
Client ID: Run ID: **VOA6_347193** SeqNo: **5273201** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*41.29*	*1.0*	*50*	*0*	*82.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.75*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*44.75*	*1.0*	*50*	*0*	*89.5*	*80 - 119*				
Surr: Toluene-d8	*49.34*	*1.0*	*50*	*0*	*98.7*	*89 - 112*				

LCS Sample ID: **VLCSW-190927** Units: **UG/L** Analysis Date: **27-Sep-2019 11:32**
Client ID: Run ID: **VOA6_347193** SeqNo: **5273200** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.91	1.0	20	0	94.5	80 - 119				
1,1-Dichloroethene	18.82	1.0	20	0	94.1	71 - 131				
1,2-Dichloroethane	17.88	1.0	20	0	89.4	73 - 128				
cis-1,2-Dichloroethene	17.62	1.0	20	0	88.1	78 - 123				
Methylene chloride	18.5	2.0	20	0	92.5	74 - 124				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Vinyl chloride	18.06	1.0	20	0	90.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.59*	*1.0*	*50*	*0*	*97.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.49*	*1.0*	*50*	*0*	*107*	*85 - 114*				
Surr: Dibromofluoromethane	*50.11*	*1.0*	*50*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*48.05*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R347193 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19090962-10MS** Units: **UG/L** Analysis Date: **27-Sep-2019 15:08**
Client ID: Run ID: **VOA6_347193** SeqNo: **5273208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.87	1.0	20	0	94.3	80 - 119				
1,1-Dichloroethene	17.17	1.0	20	0	85.8	71 - 131				
1,2-Dichloroethane	16.27	1.0	20	0	81.4	73 - 128				
cis-1,2-Dichloroethene	16.64	1.0	20	0	83.2	78 - 123				
Methylene chloride	15.64	2.0	20	0	78.2	74 - 124				
Trichloroethene	20.62	1.0	20	2.663	89.8	79 - 123				
Vinyl chloride	13.68	1.0	20	0	68.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*42.73*	*1.0*	*50*	*0*	*85.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.9*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*45.37*	*1.0*	*50*	*0*	*90.7*	*80 - 119*				
Surr: Toluene-d8	*49.06*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

MSD Sample ID: **HS19090962-10MSD** Units: **UG/L** Analysis Date: **27-Sep-2019 15:32**
Client ID: Run ID: **VOA6_347193** SeqNo: **5273209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	18.6	1.0	20	0	93.0	80 - 119	18.87	1.45	20	
1,1-Dichloroethene	16.04	1.0	20	0	80.2	71 - 131	17.17	6.81	20	
1,2-Dichloroethane	15.91	1.0	20	0	79.5	73 - 128	16.27	2.26	20	
cis-1,2-Dichloroethene	15.78	1.0	20	0	78.9	78 - 123	16.64	5.31	20	
Methylene chloride	15.13	2.0	20	0	75.6	74 - 124	15.64	3.35	20	
Trichloroethene	19.11	1.0	20	2.663	82.2	79 - 123	20.62	7.61	20	
Vinyl chloride	12.88	1.0	20	0	64.4	58 - 137	13.68	6.03	20	
Surr: 1,2-Dichloroethane-d4	*42.41*	*1.0*	*50*	*0*	*84.8*	*81 - 118*	*42.73*	*0.745*	*20*	
Surr: 4-Bromofluorobenzene	*52.29*	*1.0*	*50*	*0*	*105*	*85 - 114*	*50.9*	*2.69*	*20*	
Surr: Dibromofluoromethane	*45.64*	*1.0*	*50*	*0*	*91.3*	*80 - 119*	*45.37*	*0.581*	*20*	
Surr: Toluene-d8	*48.45*	*1.0*	*50*	*0*	*96.9*	*89 - 112*	*49.06*	*1.25*	*20*	

The following samples were analyzed in this batch:

HS19090964-01	HS19090964-02	HS19090964-03	HS19090964-04
HS19090964-05	HS19090964-06	HS19090964-07	

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R347232 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190929** Units: **UG/L** Analysis Date: **29-Sep-2019 13:07**
Client ID: Run ID: **VOA6_347232** SeqNo: **5274248** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Trichloroethene	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.8*	*1.0*	*50*	*0*	*89.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*55.75*	*1.0*	*50*	*0*	*111*	*85 - 114*				
Surr: Dibromofluoromethane	*49.34*	*1.0*	*50*	*0*	*98.7*	*80 - 119*				
Surr: Toluene-d8	*50.69*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-190929** Units: **UG/L** Analysis Date: **29-Sep-2019 12:19**
Client ID: Run ID: **VOA6_347232** SeqNo: **5274247** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	19.88	1.0	20	0	99.4	80 - 119				
1,1-Dichloroethene	18.27	1.0	20	0	91.4	71 - 131				
1,2-Dichloroethane	17.9	1.0	20	0	89.5	73 - 128				
cis-1,2-Dichloroethene	18.06	1.0	20	0	90.3	78 - 123				
Methylene chloride	18.68	2.0	20	0	93.4	74 - 124				
Trichloroethene	18.84	1.0	20	0	94.2	79 - 123				
Vinyl chloride	17.03	1.0	20	0	85.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.88*	*1.0*	*50*	*0*	*93.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.98*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*48.74*	*1.0*	*50*	*0*	*97.5*	*80 - 119*				
Surr: Toluene-d8	*46.12*	*1.0*	*50*	*0*	*92.2*	*89 - 112*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R347232 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19090964-03MS** Units: **UG/L** Analysis Date: **29-Sep-2019 14:19**
Client ID: **16WW49-190919** Run ID: **VOA6_347232** SeqNo: **5274250** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	94.37	5.0	100	0	94.4	80 - 119				
1,1-Dichloroethene	85.6	5.0	100	0	85.6	71 - 131				
1,2-Dichloroethane	85.8	5.0	100	0	85.8	73 - 128				
cis-1,2-Dichloroethene	234.2	5.0	100	147.7	86.5	78 - 123				
Methylene chloride	87.03	10	100	0	87.0	74 - 124				
Trichloroethene	348	5.0	100	259.3	88.6	79 - 123				
Vinyl chloride	64.28	5.0	100	0	64.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	*230*	*5.0*	*250*	*0*	*92.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*263.6*	*5.0*	*250*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*247.6*	*5.0*	*250*	*0*	*99.0*	*80 - 119*				
Surr: Toluene-d8	*235.5*	*5.0*	*250*	*0*	*94.2*	*89 - 112*				

MSD Sample ID: **HS19090964-03MSD** Units: **UG/L** Analysis Date: **29-Sep-2019 14:43**
Client ID: **16WW49-190919** Run ID: **VOA6_347232** SeqNo: **5274251** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	96.74	5.0	100	0	96.7	80 - 119	94.37	2.48	20	
1,1-Dichloroethene	84.24	5.0	100	0	84.2	71 - 131	85.6	1.6	20	
1,2-Dichloroethane	88.76	5.0	100	0	88.8	73 - 128	85.8	3.39	20	
cis-1,2-Dichloroethene	233.8	5.0	100	147.7	86.2	78 - 123	234.2	0.148	20	
Methylene chloride	87.96	10	100	0	88.0	74 - 124	87.03	1.06	20	
Trichloroethene	340.6	5.0	100	259.3	81.3	79 - 123	348	2.13	20	
Vinyl chloride	63.61	5.0	100	0	63.6	58 - 137	64.28	1.04	20	
Surr: 1,2-Dichloroethane-d4	*242.7*	*5.0*	*250*	*0*	*97.1*	*81 - 118*	*230*	*5.37*	*20*	
Surr: 4-Bromofluorobenzene	*263.8*	*5.0*	*250*	*0*	*106*	*85 - 114*	*263.6*	*0.0826*	*20*	
Surr: Dibromofluoromethane	*252.3*	*5.0*	*250*	*0*	*101*	*80 - 119*	*247.6*	*1.88*	*20*	
Surr: Toluene-d8	*234.6*	*5.0*	*250*	*0*	*93.8*	*89 - 112*	*235.5*	*0.394*	*20*	

The following samples were analyzed in this batch: HS19090964-03 HS19090964-04 HS19090964-06

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R346726 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM2320B**

MBLK Sample ID: **WBLKW2-190921** Units: **mg/L** Analysis Date: **21-Sep-2019 19:11**
Client ID: Run ID: **ManTech01_346726** SeqNo: **5263383** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **WLCS2-190921** Units: **mg/L** Analysis Date: **21-Sep-2019 19:20**
Client ID: Run ID: **ManTech01_346726** SeqNo: **5263384** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1084	5.00	1000	0	108	85 - 115				

LCSD Sample ID: **WLCSD2-190921** Units: **mg/L** Analysis Date: **21-Sep-2019 19:30**
Client ID: Run ID: **ManTech01_346726** SeqNo: **5263385** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1093	5.00	1000	0	109	85 - 115	1084	0.807	20	

DUP Sample ID: **HS19090962-12DUP** Units: **mg/L** Analysis Date: **21-Sep-2019 22:53**
Client ID: Run ID: **ManTech01_346726** SeqNo: **5263409** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	134.3	5.00					133	0.958	20	

DUP Sample ID: **HS19090740-05DUP** Units: **mg/L** Analysis Date: **21-Sep-2019 22:11**
Client ID: Run ID: **ManTech01_346726** SeqNo: **5263404** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	764.4	5.00					762	0.321	20	

The following samples were analyzed in this batch: HS19090964-04 HS19090964-06

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R346732 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-092019** Units: **mg/L** Analysis Date: **20-Sep-2019 16:02**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263511** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U
Nitrogen, Nitrate (As N)	0.100	0.100								U

LCS Sample ID: **WLCSW1-092019** Units: **mg/L** Analysis Date: **20-Sep-2019 16:18**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263512** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.86	0.100	4	0	96.5	80 - 120				
Nitrogen, Nitrate (As N)	4.157	0.100	4	0	104	80 - 120				

LCSD Sample ID: **WLCSDW1-092019** Units: **mg/L** Analysis Date: **20-Sep-2019 16:35**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263513** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.77	0.100	4	0	94.2	80 - 120	3.86	2.38	20	
Nitrogen, Nitrate (As N)	4.041	0.100	4	0	101	80 - 120	4.157	2.84	20	

MS Sample ID: **HS19090962-12MS** Units: **mg/L** Analysis Date: **20-Sep-2019 18:15**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263518** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	91.32	5.00	100	5.05	86.3	80 - 120				
Nitrogen, Nitrate (As N)	103.2	5.00	100	0	103	80 - 120				

MS Sample ID: **HS19090962-12MS** Units: **mg/L** Analysis Date: **20-Sep-2019 13:51**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263507** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100	2	0	0	80 - 120				S U
Nitrogen, Nitrate (As N)	1.997	0.100	2	0	99.8	80 - 120				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R346732 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MS Sample ID: **HS19090962-12MS** Units: **mg/L** Analysis Date: **20-Sep-2019 17:25**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263515** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	12.05	0.500	10	3.158	88.9	80 - 120				
Nitrogen, Nitrate (As N)	10.53	0.500	10	0	105	80 - 120				

MSD Sample ID: **HS19090962-12MSD** Units: **mg/L** Analysis Date: **20-Sep-2019 17:42**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263516** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	12.05	0.500	10	3.158	88.9	80 - 120	12.05	0.0249	20	
Nitrogen, Nitrate (As N)	10.66	0.500	10	0	107	80 - 120	10.53	1.26	20	

MSD Sample ID: **HS19090962-12MSD** Units: **mg/L** Analysis Date: **20-Sep-2019 18:31**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263519** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	90.79	5.00	100	5.05	85.7	80 - 120	91.32	0.577	20	
Nitrogen, Nitrate (As N)	102.2	5.00	100	0	102	80 - 120	103.2	1	20	

MSD Sample ID: **HS19090962-12MSD** Units: **mg/L** Analysis Date: **20-Sep-2019 14:07**
Client ID: Run ID: **ICS-Integrion_346732** SeqNo: **5263508** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100	2	0	0	80 - 120	0	0	20	S U
Nitrogen, Nitrate (As N)	1.986	0.100	2	0	99.3	80 - 120	1.997	0.568	20	

The following samples were analyzed in this batch: HS19090964-04 HS19090964-06

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19090964

QC BATCH REPORT

Batch ID: R346978 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-092519** Units: **mg/L** Analysis Date: **26-Sep-2019 00:25**
Client ID: Run ID: **ICS-Integrion_346978** SeqNo: **5268869** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW2-092519** Units: **mg/L** Analysis Date: **26-Sep-2019 00:42**
Client ID: Run ID: **ICS-Integrion_346978** SeqNo: **5268870** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	20.25	0.500	20	0	101	80 - 120				

LCSD Sample ID: **WLCSDW2-092519** Units: **mg/L** Analysis Date: **26-Sep-2019 00:58**
Client ID: Run ID: **ICS-Integrion_346978** SeqNo: **5268871** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	20.08	0.500	20	0	100	80 - 120	20.25	0.834	20	

MS Sample ID: **HS19090511-02MS** Units: **mg/L** Analysis Date: **26-Sep-2019 01:48**
Client ID: Run ID: **ICS-Integrion_346978** SeqNo: **5268874** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	1377	10.0	200	1197	90.1	80 - 120				O

MSD Sample ID: **HS19090511-02MSD** Units: **mg/L** Analysis Date: **26-Sep-2019 02:05**
Client ID: Run ID: **ICS-Integrion_346978** SeqNo: **5268875** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	1365	10.0	200	1197	84.3	80 - 120	1377	0.841	20	O

The following samples were analyzed in this batch: HS19090964-04 HS19090964-06

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19090964**

QUALIFIERS, ACRONYMS, UNITS

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

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

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19090964

Date/Time Received: **19-Sep-2019 16:45**
Received by: **AC**

Checklist completed by: *Asad Chaudhry* eSignature — 20-Sep-2019 Date

Reviewed by: *RJ Modashia* eSignature — 20-Sep-2019 Date

Matrices: **Water**

Carrier name: **Client**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.5c, 0.8c C/UC	IR 25
Cooler(s)/Kit(s):	43260, 44953	
Date/Time sample(s) sent to storage:	09/19/2019 19:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

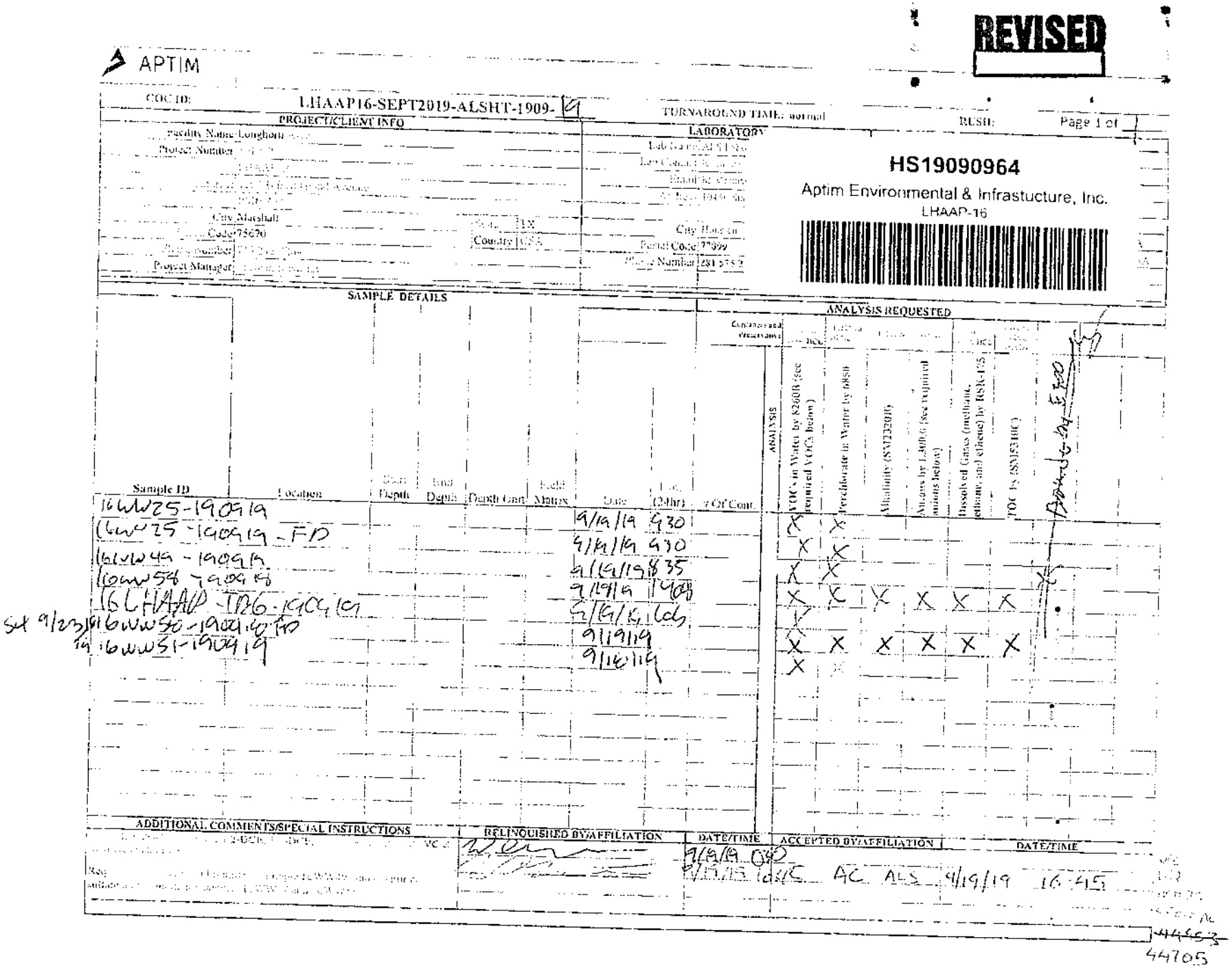
Login Notes: Received extra samples, not on COC. "16WW58-FD-091819" & "16WW51-091819". Logged in for analysis.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:



APTIM

REVISED

COC ID: LHAAP16-SEPT2019-ALSHT-1909-19

TURNAROUND TIME: normal

RUSH:

Page 1 of 1

PROJECT/CLIENT INFO

Facility Name: Longhorn [illegible]
Project Number: [illegible]
[illegible]
[illegible]
[illegible]
City: Marshall
Code: 75670
Project Number: [illegible]
Project Manager: [illegible]

State: TX
Country: USA

LABORATORY

Lab Name: [illegible]
Lab Contact: [illegible]
Email: [illegible]
Address: [illegible]
City: Houston
Postal Code: 77099
Phone Number: 281 575 2[illegible]

HS19090964

Aptim Environmental & Infrastucture, Inc.
LHAAP-16

SAMPLE DETAILS

ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	VOCs in Water by 8260B (see required VOCs below)	Perchlorate in Water by 6850	Alkalinity (SM2320B)	Anions by 1,300.0 (see required anions below)	Dissolved Gases (methane, ethane, and ethene) by RSK-175	TOC by (SM5310C)	Bounds by 8300
16WW25-190919						9/19/19	930		X	X					
16WW25-190919-FD						9/19/19	930		X	X					
16WW49-190919						9/19/19	835		X	X					
16WW58-190919						9/19/19	1408		X	X	X	X	X	X	
16LHAAP-TB6-190919						9/19/19	1405		X						
Set 9/23/19 16WW50-190919-FD						9/19/19			X	X	X	X	X	X	
19 16WW51-190919						9/19/19			X						

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

[illegible]

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
[signature]	9/19/19 0[illegible]		
[signature]	9/19/19 1[illegible]	AC ALS	9/19/19 16:45

~~44453~~
44705

APTIM

COC ID: LHAAP16-SEPT2019-ALSHT-1909-9

TURNAROUND TIME: normal

RUSH:

Page 1 of 1

PROJECT/CLIENT INFO

Facility Name	Longhorn AAP
Project Number	501032
	LHAAP-16
Address	1203-B East Grand Avenue
	PMB 202
City	Marshall
State	TX
Postal Code	75670
Country	USA
Phone Number	713.243.7264
Project Manager	Praveen Srivastav

LABORATORY

Lab Name	ALS Labo
Lab Contact	RJ Modas
Email	RJ.Modast
Address	10450 Sta
City	Houston
Postal Code	77099
Phone Number	281.575.2

HS19090964

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

SAMPLE DETAILS

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.
16WW25-190919						9/19/19	930	
16WW25-190919-FD						9/19/19	930	
16WW49-190919						9/19/19	835	
16WW58-190919						9/19/19	1400	
16LHAAP-TB6-190919						9/19/19	labs	

ANALYSIS REQUESTED

Containers and Preservative	3x40 ml VOA, HCL	1x125 ml HPDE, Ice	1x250 ml HPDE, Ice	3x40 ml VOA, HCL	2x40 ml VOA, H2SO4	
ANALYSIS	VOCs in Water by 8260B (see required VOCs below)	Perchlorate in Water by 6850	Alkalinity (SM2320B)	Anions by E300.0 (see required anions below)	Dissolved Gases (methane, ethane, and ethene) by RSK-175	TOC by (SM5310C)	E300
16WW25-190919	X	X					X
16WW25-190919-FD	X	X					
16WW49-190919	X	X					
16WW58-190919	X	X	X	X	X	X	
16LHAAP-TB6-190919	X						

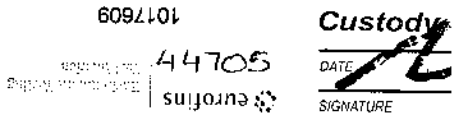
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

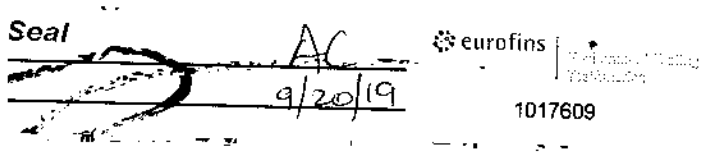
Select list VOC's (TCE, cis-1,2-DCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA, VC & methylene chloride

Required anions are: (1) bromide for sample 16WW49; and (2) nitrate, sulfate and bromide for samples 16WW57 and 16WW58

RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	9/19/19 0840		
	9/19/19 1645	AC ALS	9/19/19 16:45

4/C
1-2
IR#25
CFo.c AC
~~44453~~
44705


1017609
44705
eurofins
Custody
DATE
SIGNATURE


Seal
AC
9/20/19
eurofins
1017609

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1927220; 1927568; 1927591; 1927596

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2298 (248917)

General Set Information: There were eleven field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 676591) was less than 1/2 the CRDL. The recovery for the LCS (676592) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1927220005/06 (Client ID: 16WW58-190918). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 676589) is reported from the analysis of the Laboratory Control Sample (LCS – 676592) at a level of 3.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 01OCTD02/05/06. Samples 1927220001/02 failed the 50-150% method requirement for ISTD recoveries. These samples were re-prepped, re-analyzed and reported.

Thomas Bosch October 03, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: October 03, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1927220**
Project ID: HS19090964
Purchase Order: HS19090964
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16WW25-190919	1927220001	09/19/19	09/21/19	
16WW25-190919-FD	1927220002	09/19/19	09/21/19	
16WW49-190919	1927220003	09/19/19	09/21/19	
16WW58-190918	1927220004	09/18/19	09/21/19	
16WW58-190918-FD	1927220007	09/18/19	09/21/19	
16WW51-190919	1927220008	09/18/19	09/21/19	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
16WW58-190918MS	1927220005	09/18/19	09/21/19	
16WW58-190918MSD	1927220006	09/18/19	09/21/19	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1927220
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW25-190919** | Sampling Site: NA | Collected: 09/19/2019
Lab ID: 1927220001 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2298 (HBN: 248917) | **%Solids:** NA
Analyzed: 10/01/2019 13:49 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW25-190919-FD** | Sampling Site: NA | Collected: 09/19/2019
Lab ID: 1927220002 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2298 (HBN: 248917) | **%Solids:** NA
Analyzed: 10/01/2019 14:09 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW49-190919** | Sampling Site: NA | Collected: 09/19/2019
Lab ID: 1927220003 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2298 (HBN: 248917) | **%Solids:** NA
Analyzed: 10/01/2019 12:05 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW58-190918** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927220004 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2298 (HBN: 248917) | **%Solids:** NA
Analyzed: 10/01/2019 12:19 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1927220
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16WW58-190918-FD** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927220007 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2298 (HBN: 248917) | **%Solids:** NA
Analyzed: 10/01/2019 13:00 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **16WW51-190919** | Sampling Site: NA | Collected: 09/18/2019
Lab ID: 1927220008 | Media: 125 mL Nalgene | Received: 09/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2298 (HBN: 248917) | **%Solids:** NA
Analyzed: 10/01/2019 13:14 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 248917)**

Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/03/2019 09:55	/S/ Stephen Brose 10/03/2019 13:30

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1927220
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1927220

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2298 (HBN: 248917)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 676591
Analyzed: 10/01/2019 11:23
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 676592
Analyzed: 10/01/2019 10:56
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.01	3.00	100	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1927220004	**MS:**	1927220005	**MSD:**	1927220006
Analyzed:	10/01/2019 12:19	**Analyzed:**	10/01/2019 12:32	**Analyzed:**	10/01/2019 12:46
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	2.94	3	97.8	78.8	123.8	2.93	97.7	0.157	0.0	20.0

Comments

Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
10/03/2019 11:24	10/03/2019 13:30

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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

W 1927220

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: **Texas**

COC ID: **12204**

SUBCONTRACT TO:

1927226

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19090964
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19090964-01**	**16WW25-190919**	**Water**	**19 Sep 2019 09:30**
	SUB_Perch-6850			27 Sep 2019
2.	**HS19090964-02**	**16WW25-190919-FD**	**Water**	**19 Sep 2019 09:30**
	SUB_Perch-6850			27 Sep 2019
3.	**HS19090964-03**	**16WW49-190919**	**Water**	**19 Sep 2019 08:35**
	SUB_Perch-6850			27 Sep 2019
4.	**HS19090964-04**	**16WW58-190918** MS/MSD	**Water**	**18 Sep 2019 14:08**
	SUB_Perch-6850			27 Sep 2019
5.	**HS19090964-06**	**16WW58-190918-FD**	**Water**	**18 Sep 2019 14:08**
	SUB_Perch-6850			27 Sep 2019
6.	**HS19090964-07**	**16WW51-190919**	**Water**	**18 Sep 2019 18:00**
	SUB_Perch-6850			27 Sep 2019

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

QC Level: DOD IV (DoD Data Package)

HS19090964-04&06 MS/MSD

KT as per RJ

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **12204**

Relinquished By: _____ Date/Time: 9/20/19 1800

Received By: _____ Date/Time: _____

Cooler ID(s): _____ Temperature(s): _____

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston — Project/Task/Site: 1927226

Date/Time of Receipt: 9/21/19 1915 — Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Cooler/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 1810	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Meredith Stump (Signature) — Meredith Stump (Printed Name) — 9/21/2019 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

Part # 159469-434 RIT2 EXP 05/20 •

ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 20SEP19
ACTWGT: 41.45 LB
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19090804/860/962/964 - RJ

FedEx Express

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 **1251 0289 7452**

XO BTFA

84123
UT-US **SLC**

ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19090964	***Split:***	**Workorder ID:** 1927220	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM	COOL
1	09/19/2019 09:30	16WW25-190919	1927220001		Water	A	1	A	
2	09/19/2019 09:30	16WW25-190919-FD	1927220002	FLDDUP	Water	A	1	A	
3	09/19/2019 08:35	16WW49-190919	1927220003		Water	A	2	A	
4	09/18/2019 14:08	16WW58-190918	1927220004		Water	A	1	A	
5	09/18/2019 14:08	16WW58-190918MS	1927220005	MS	Water	A	1	A	
6	09/18/2019 14:08	16WW58-190918MSD	1927220006	MSD	Water	A	1	A	
7	09/18/2019 14:08	16WW58-190918-FD	1927220007	FLDDUP	Water	A	1	A	
8	09/18/2019 18:00	16WW51-190919	1927220008		Water	A	1	A	
9									
10									

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	09/21/2019 09:15	ALS Sample Receiving	Sample Login
Julie Warath	9/23/19 1600	15B	Storage
R.33.1	09.30.19/10:00	T. Bosch	CLOA Analysis

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

Batch Worklist

Batch: ELMS/ 2298 **Created:** 10/1/2019 10:29 **Instrument:** **HBN:** 248917

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1927220 [ENV_LVL4]
Workorder: 1927568 [ENV_LVL4]
Workorder: 1927591 [ENV_LVL4]
Workorder: 1927596 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	676588	CCV for HBN 248917 [ELMS/2298]				CCV	3		E685041C3Q	5311		10/3/2019	
2	676589	RLVS for HBN 248917 [ELMS/2298				RLVS	3		E685041C3Q	5311		10/3/2019	
3	676590	ICS for HBN 248917 [ELMS/2298]				ICS	3		E6850..D3Q	5311		10/3/2019	
4	676591	LMB for HBN 248917 [ELMS/2298]				LMB	3		E6850Q413Q	5311		10/3/2019	
5	676592	LCS for HBN 248917 [ELMS/2298]				LCS	3		E6850Q413Q	5311		10/3/2019	
6	1927220001	16WW25-190919				SAMPLE	3	1927220001-A	E6850Q41.3	5480	10/17/2019	10/3/2019	
7	1927220002	16WW25-190919-FD				FLDDUP	3	1927220002-A	E6850Q41.3	5480	10/17/2019	10/3/2019	
8	1927220003	16WW49-190919				SAMPLE	3	1927220003-A	E6850Q41.3	5480	10/17/2019	10/3/2019	
9	1927220004	16WW58-190918				SAMPLE	3	1927220004-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
10	1927220005	16WW58-190918MS				MS	3	1927220005-A	E6850Q413Q	5480		10/3/2019	
11	1927220006	16WW58-190918MSD				MSD	3	1927220006-A	E6850Q413Q	5480		10/3/2019	
12	1927220007	16WW58-190918-FD				FLDDUP	3	1927220007-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
13	1927220008	16WW51-190919				SAMPLE	3	1927220008-A	E6850Q41.3	5480	10/16/2019	10/3/2019	
14	1927568001	LH18/24-SP140_092419				SAMPLE	3	1927568001-A	E6850Q41.3	5480	10/22/2019	10/9/2019	
15	1927591001	LH18/24-SP650_092419_AIX				SAMPLE	3	1927591001-A	E6850Q41.3	5480	10/22/2019	10/9/2019	
16	676593	CCV for HBN 248917 [ELMS/2298]				CCV	3		E685041C3Q	5311		10/3/2019	
17	1927596001	LH18/24-SP650_092419				SAMPLE	3	1927596001-A	E6850Q41.3	5480	10/22/2019	10/9/2019	
18	676594	CCV for HBN 248917 [ELMS/2298]				CCV	3		E685041C3Q	5311		10/3/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 1927220 (001-08); 1927568 (001); 1927591 (001); 1927596 (001)
ELMS Batch/HBN ID: 2296 (248804)
Prep Date: 09/30/2019 Analysis Date: 10/01/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\OCT\01OCT19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 676592; Target = 3.0µg/L. ASTM type II water was used for LMB 676591.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1927220005/06 (Client ID's: 16WW58-190918). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly. Samples 1927220001/02 failed the 50-150% method requirement for ISTD recoveries. These samples were re-prepped, re-analyzed and reported.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\248917-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 676589) is reported from the analysis of the Laboratory Control Sample (LCS – 676592) at a level of 3.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 01OCT19D02/05/06.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria **Batch(es)/SDG:** ELMS. 2298 HBN. 248917 **Sample Set IDs if Applicable:** WI's 1927220/1927568 1927591 / 1927596	**Analyst Initials**	**Reviewer Initials**
Sample positions on autosampler verified against instrument sequence	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#_____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — **Description - Perchlorate ISTD Wrk 1,000ug/L**

Standard:	**49946**	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG:	ALS/SLC	**Create Date:** 09/23/2019 03:09PM	**Expires:** 09/19/2020
MFG Lot:	TNB: 09/20/2019	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID:	Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 47863	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 05/23/2019 10:05AM	**Expires:** 12/05/2028
MFG Lot: SDIH-016	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — **Description - 6850 WKG Std 100.ug/L**

Standard: 49948
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020

Stock Standard - CLO4 STOCK

CLO4 STOCK — **Description - 6850 Stock AccStd 1,000ug/mL**

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 49947
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/23/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK	Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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New Haven, CT 06513
USA

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CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ISO 9001 Registered Quality System – TUV USA

250 SMITH STREET • NORTH KINGSTOWN, RHODE ISLAND 02852 • WWW.ULTRASCI.COM

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S 47863

Product Name: PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
(Isotopic Label & Enrichment Specification)

Lot Number: SDIH-016

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: ≥ 98%

MW*: 130.44
** For isotopically labeled compounds, MW listed is for the fully enriched product.*

$NaCl^{18}O_4$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.
Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number . Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\01OCT19D\01OCT19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	676588 CCV@25	Vial 71	1	Control	1	1.54525e6	7.598	25.01921
#*	676592 QC@3.0	Vial 72	1	Control	2	1.95090e5	7.638	3.01143
#*	676590 ICS@3.0	Vial 73	1	Control	3	1.58401e5	7.470	2.89276
#*	676591 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927220001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927220002	Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1927220003	Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1927220004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927220005 MS	Vial 79	1	Sample	9	1.24857e5	7.081	2.93501
#*	1927220006 MSD	Vial 80	1	Sample	10	1.25081e5	7.109	2.93042
#*	1927220007	Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1927220008	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927220001 RE	Vial 86	1	Sample	13	0.00000	0.000	0.00000
#*	1927220002 RE	Vial 87	1	Sample	14	0.00000	0.000	0.00000
#*	676593 CCV@25	Vial 71	1	Control	15	1.16163e6	7.635	24.36237
#*	1927568001 1K	Vial 83	1	Sample	16	7.34459e5	7.710	1.48902e4
#*	1927591001	Vial 84	1	Sample	17	0.00000	0.000	0.00000
#*	1927596001	Vial 85	1	Sample	18	0.00000	0.000	0.00000
#*	676594 CCV@25	Vial 71	1	Control	19	1.23687e6	7.622	25.30819

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	676588 CCV@25	Vial 71	1	Control	1	2.11020e5	7.618	5.00000
#*	676592 QC@3.0	Vial 72	1	Control	2	2.38378e5	7.665	5.00000
#*	676590 ICS@3.0	Vial 73	1	Control	3	2.01376e5	7.487	5.00000
#*	676591 LMB	Vial 74	1	Control	4	2.07694e5	7.734	5.00000
#*	1927220001	Vial 75	1	Sample	5	4.33588e5	7.953	5.00000
#*	1927220002	Vial 76	1	Sample	6	4.80845e5	7.953	5.00000
#*	1927220003	Vial 77	1	Sample	7	1.29768e5	7.177	5.00000
#*	1927220004	Vial 78	1	Sample	8	1.55844e5	7.141	5.00000
#*	1927220005 MS	Vial 79	1	Sample	9	1.56479e5	7.113	5.00000
#*	1927220006 MSD	Vial 80	1	Sample	10	1.57002e5	7.138	5.00000
#*	1927220007	Vial 81	1	Sample	11	1.53526e5	7.105	5.00000
#*	1927220008	Vial 82	1	Sample	12	1.25991e5	7.173	5.00000
#*	1927220001 RE	Vial 86	1	Sample	13	2.84559e5	7.943	5.00000
#*	1927220002 RE	Vial 87	1	Sample	14	2.52777e5	7.981	5.00000
#*	676593 CCV@25	Vial 71	1	Control	15	1.63352e5	7.642	5.00000
#*	1927568001 1K	Vial 83	1	Sample	16	1.75719e5	7.734	5000.00000
#*	1927591001	Vial 84	1	Sample	17	1.54254e5	7.342	5.00000
#*	1927596001	Vial 85	1	Sample	18	1.53002e5	7.317	5.00000
#*	676594 CCV@25	Vial 71	1	Control	19	1.66780e5	7.660	5.00000

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	676588 CCV@25	Vial 71	1	Control	1	4.70692e5	7.614	24.99478
#*	676592 QC@3.0	Vial 72	1	Control	2	6.47386e4	7.668	3.18858
#*	676590 ICS@3.0	Vial 73	1	Control	3	5.51383e4	7.474	3.21571
#*	676591 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927220001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927220002	Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1927220003	Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1927220004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927220005 MS	Vial 79	1	Sample	9	4.29875e4	7.108	3.22679
#*	1927220006 MSD	Vial 80	1	Sample	10	4.26524e4	7.129	3.18966

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	1927220007	Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1927220008	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927220001 RE	Vial 86	1	Sample	13	0.00000	0.000	0.00000
#*	1927220002 RE	Vial 87	1	Sample	14	0.00000	0.000	0.00000
#*	676593 CCV@25	Vial 71	1	Control	15	3.50571e5	7.646	24.12639
#*	1927568001 1K	Vial 83	1	Sample	16	2.20256e5	7.727	1.45858e4
#*	1927591001	Vial 84	1	Sample	17	0.00000	0.000	0.00000
#*	1927596001	Vial 85	1	Sample	18	0.00000	0.000	0.00000
#*	676594 CCV@25	Vial 71	1	Control	19	3.71181e5	7.641	24.94374

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

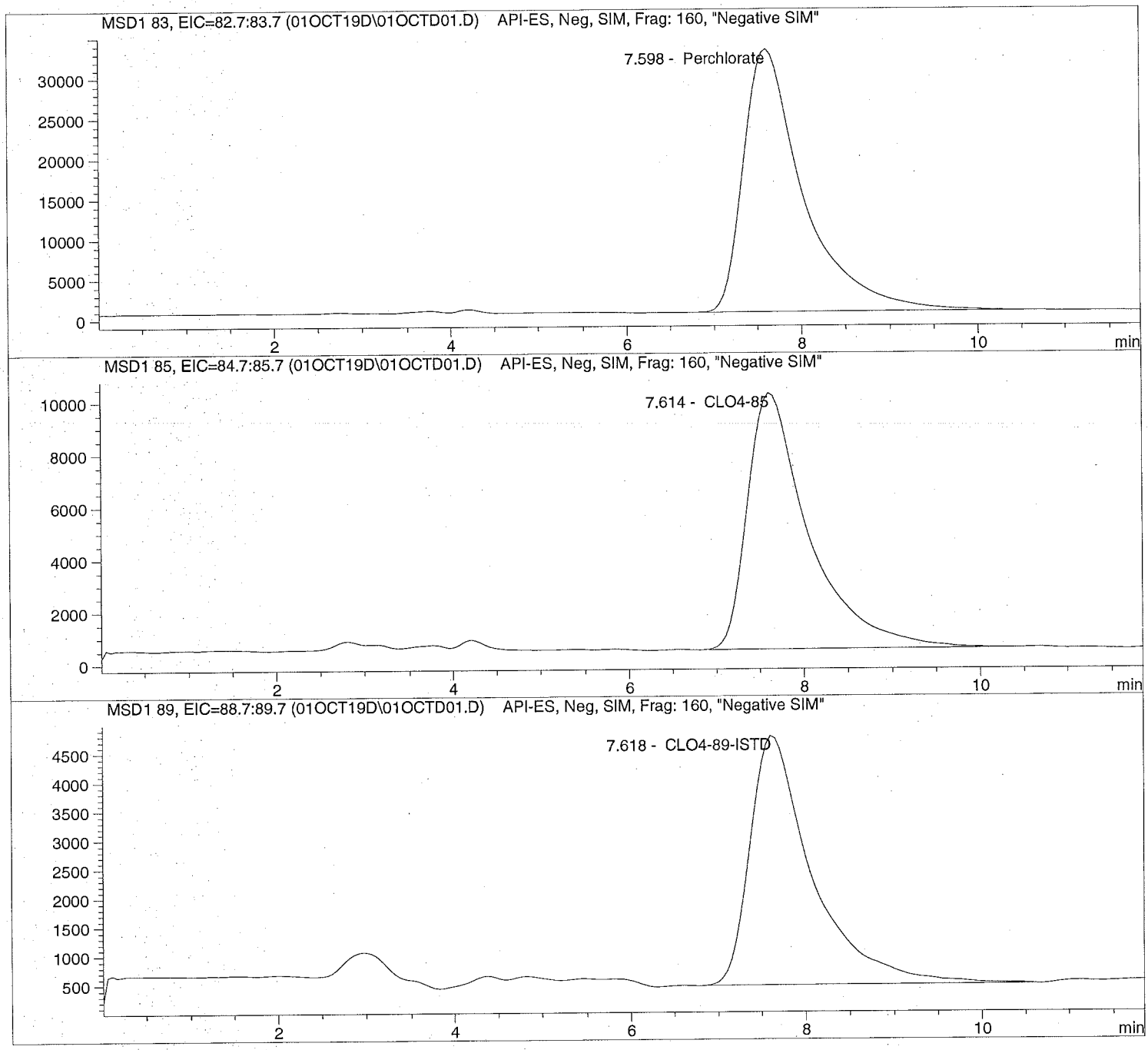
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	676588	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	676592	QC@3.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	676590	ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	676591	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1927220001		CLO4-AQN	1	Sample		
6	Vial 76	1927220002		CLO4-AQN	1	Sample		
7	Vial 77	1927220003		CLO4-AQN	1	Sample		
8	Vial 78	1927220004		CLO4-AQN	1	Sample		
9	Vial 79	1927220005	MS	CLO4-AQN	1	Sample		
10	Vial 80	1927220006	MSD	CLO4-AQN	1	Sample		
11	Vial 81	1927220007		CLO4-AQN	1	Sample		
12	Vial 82	1927220008		CLO4-AQN	1	Sample		
13	Vial 86	1927220001	RE	CLO4-AQN	1	Sample		
14	Vial 87	1927220002	RE	CLO4-AQN	1	Sample		
15	Vial 71	676593	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 83	1927568001	1K	CLO4-AQN	1	Sample		
17	Vial 84	1927591001		CLO4-AQN	1	Sample		
18	Vial 85	1927596001		CLO4-AQN	1	Sample		
19	Vial 71	676594	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD01.D Sample Name: 676588 CCV@25

Injection Date:	10/01/2019 10:42:23	Seq Line:	1
Sample Name:	676588 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD01.D Sample Name: 676588 CCV@25

Injection Date:	10/01/2019 10:42:23	Seq Line:	1
Sample Name:	676588 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.598	BB S	1545248.1	25.0192	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.614	BB S	470692.3	24.9948	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PB S	211020.1	5.0000	CLO4-89-ISTD

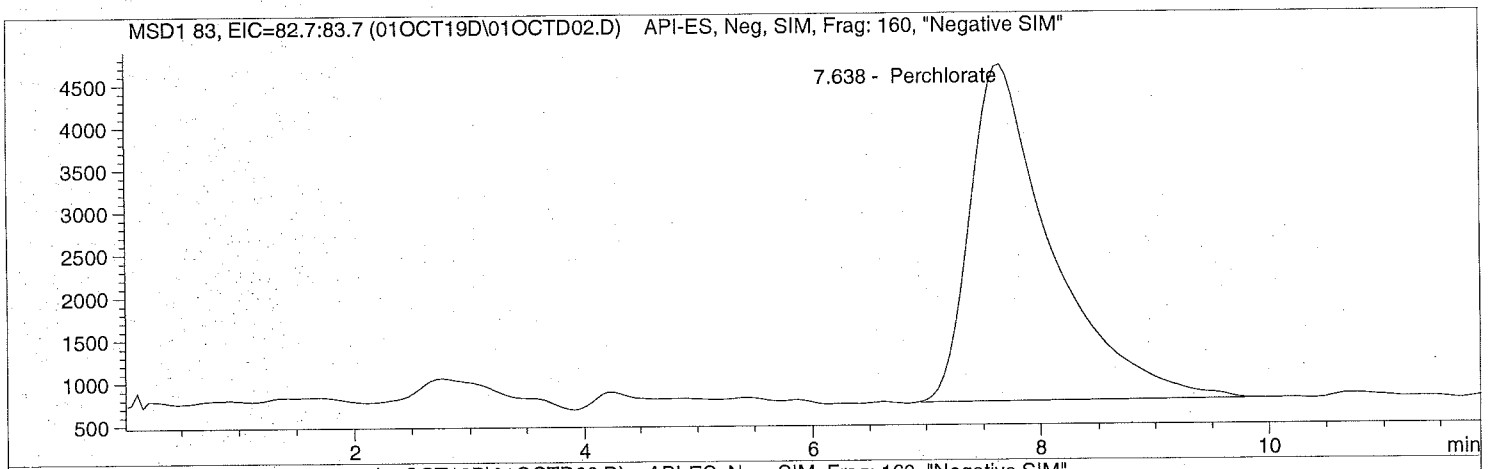
*** End of Report ***

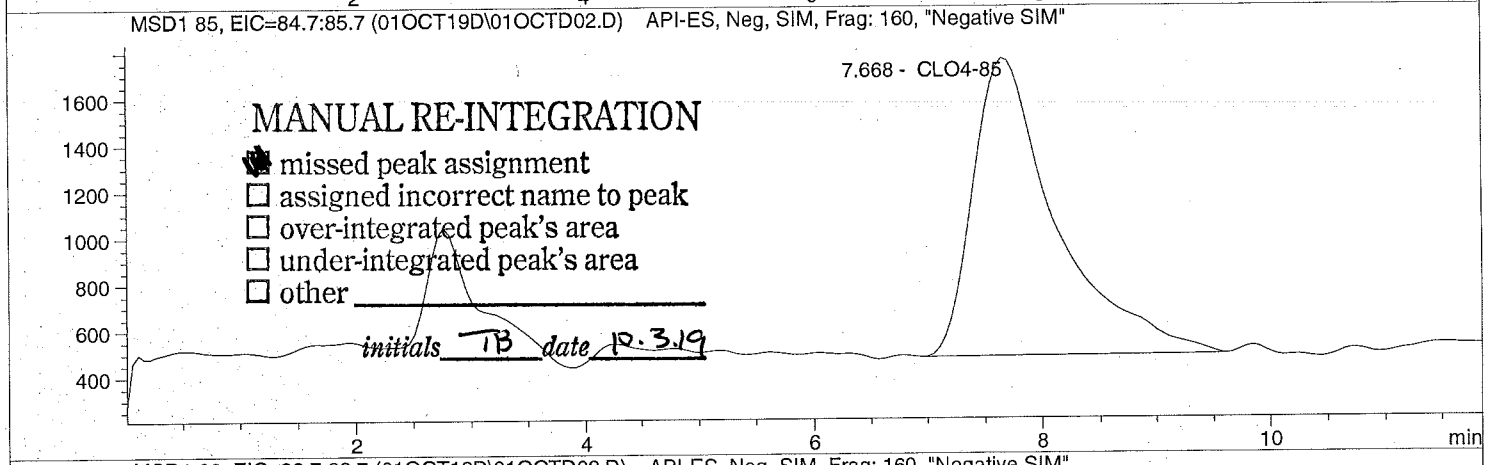
Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D Sample Name: 676592 QC@3.0

Injection Date:	10/01/2019 10:56:09	Seq Line:	2
Sample Name:	676592 QC@3.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

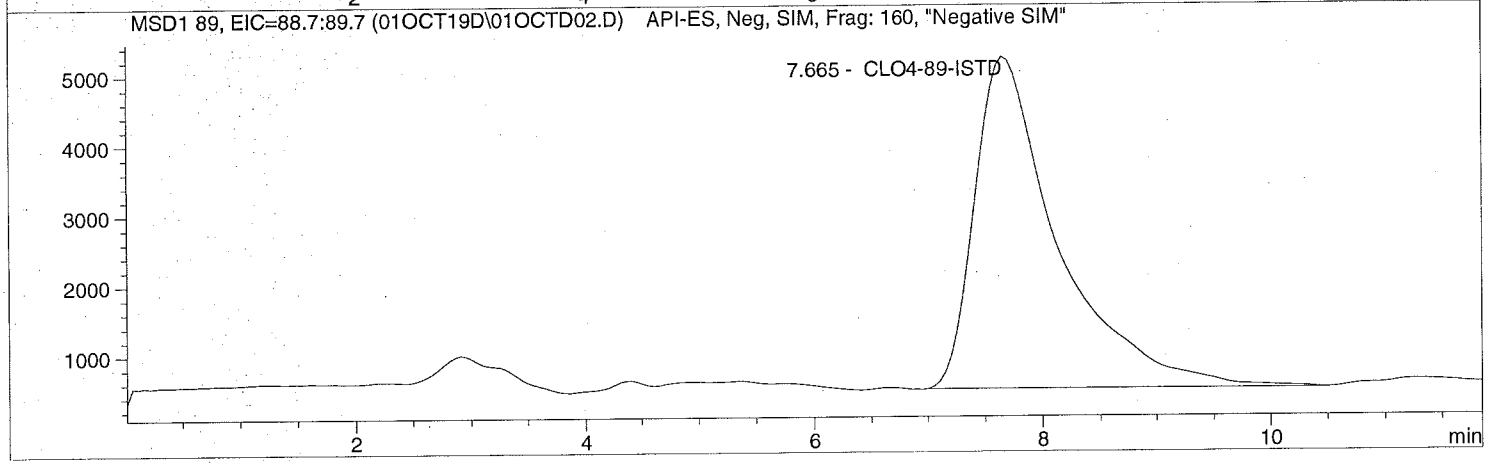
Perchlorate analysis





MANUAL RE-INTEGRATION
- ☒ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ☐ under-integrated peak's area
- ☐ other _____

initials TB *date* 10.3.19



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D Sample Name: 676592 QC@3.0

Injection Date:	10/01/2019 10:56:09	Seq Line:	2
Sample Name:	676592 QC@3.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.638	BB S	195089.7	3.0114	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.668	MM	64738.6	3.1886	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.665	PB S	238378.3	5.0000	CLO4-89-ISTD

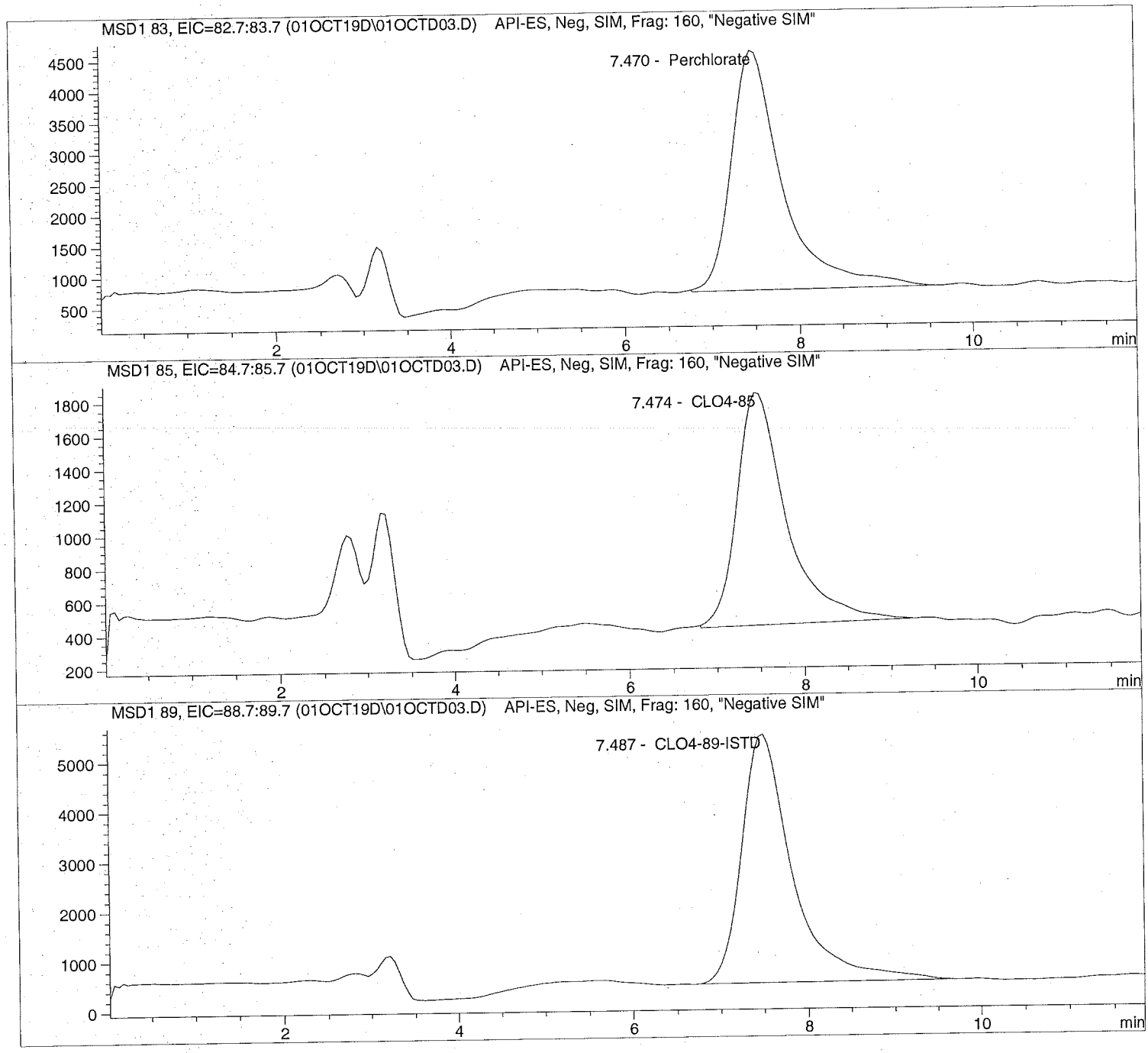
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD03.D Sample Name: 676590 ICS@3.0

Injection Date:	10/01/2019 11:09:58	Seq Line:	3
Sample Name:	676590 ICS@3.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD03.D Sample Name: 676590 ICS@3.0

Injection Date:	10/01/2019 11:09:58	Seq Line:	3
Sample Name:	676590 ICS@3.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.470	BB S	158401.3	2.8928	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.474	BB S	55138.3	3.2157	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.487	PB S	201376.3	5.0000	CLO4-89-ISTD

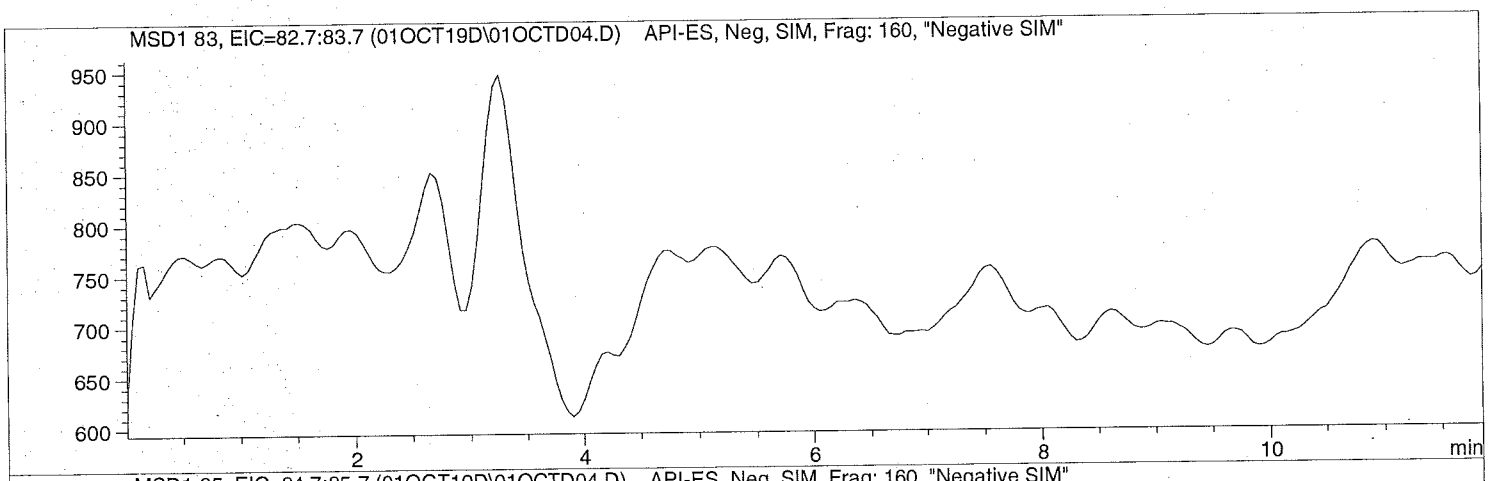
*** End of Report ***

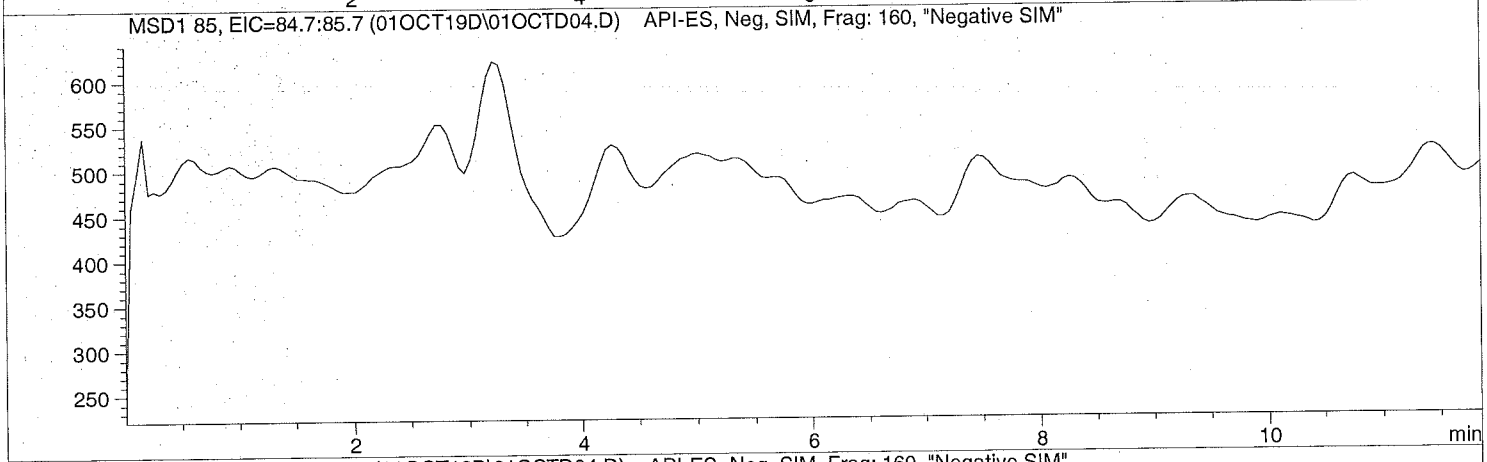
Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD04.D Sample Name: 676591 LMB

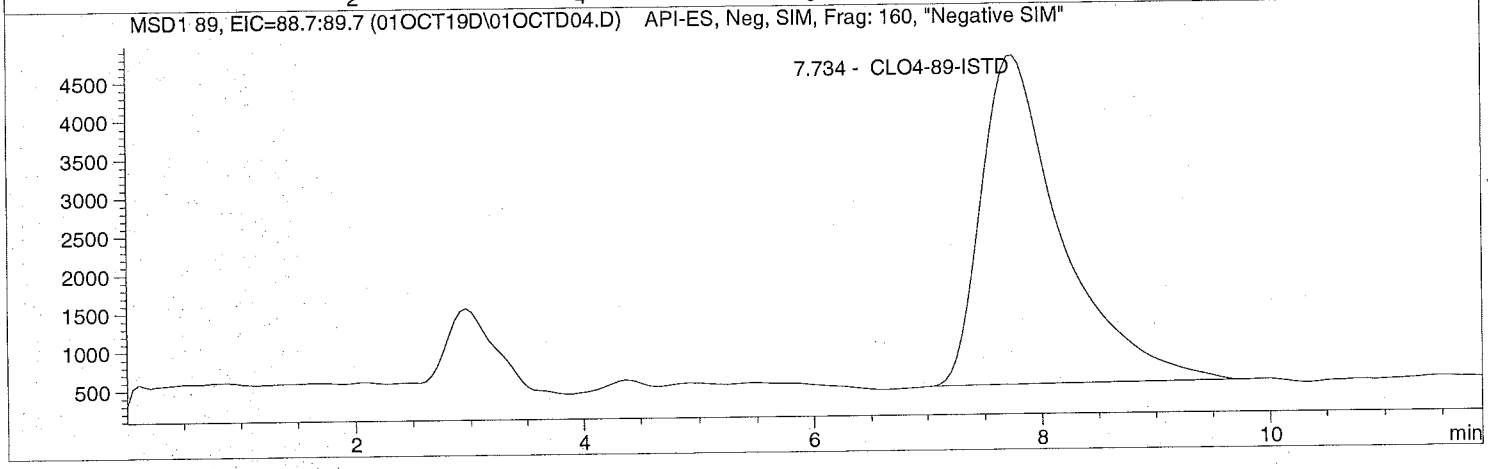
Injection Date:	10/01/2019 11:23:50	Seq Line:	4
Sample Name:	676591 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD04.D Sample Name: 676591 LMB

Injection Date:	10/01/2019 11:23:50	Seq Line:	4
Sample Name:	676591 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PB S	207693.8	5.0000	CLO4-89-ISTD

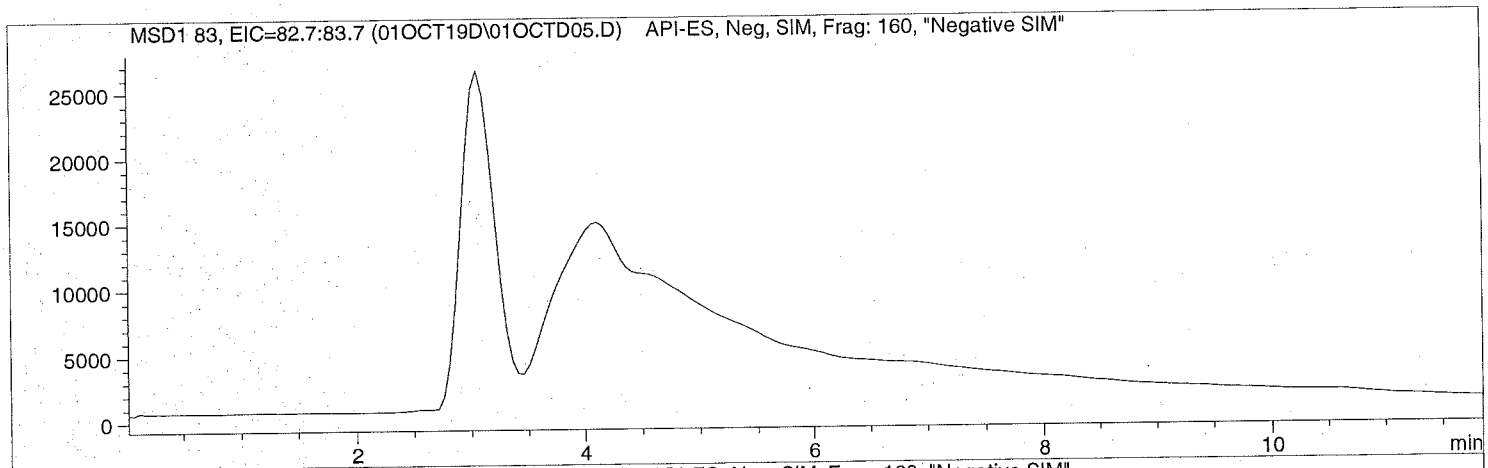
*** End of Report ***

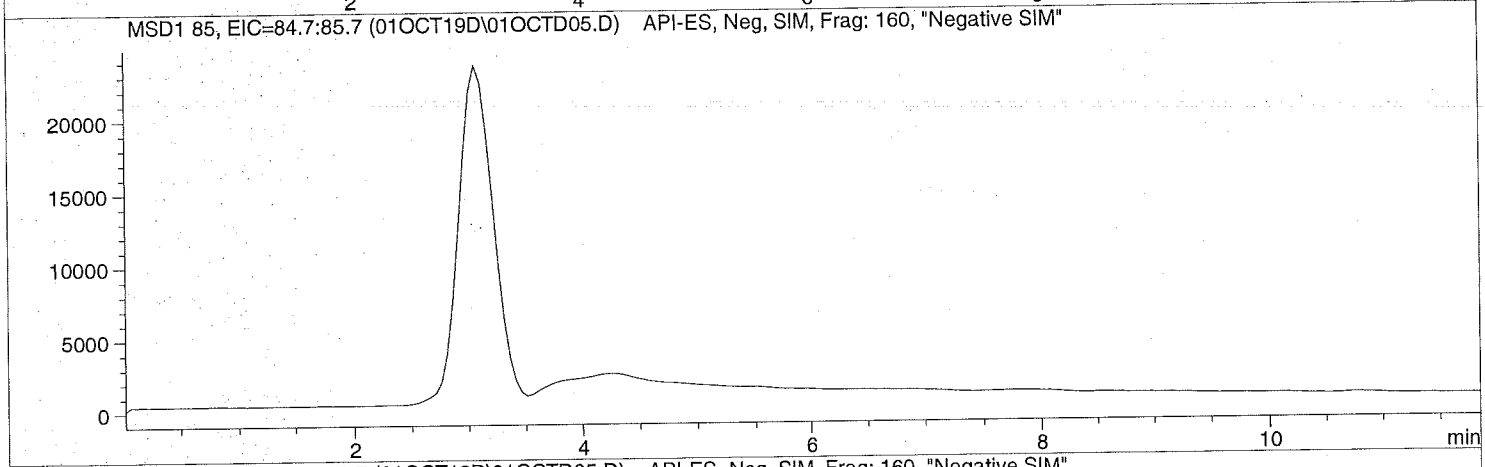
Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D Sample Name: 1927220001

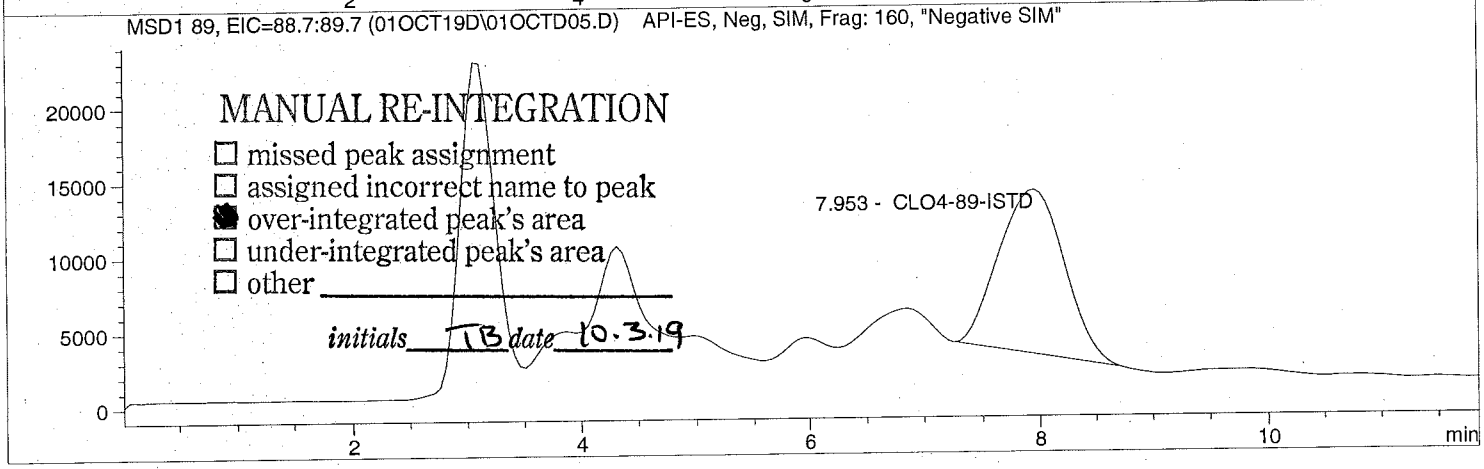
Injection Date:	10/01/2019 11:37:35	Seq Line:	5
Sample Name:	1927220001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D Sample Name: 1927220001

Injection Date:	10/01/2019 11:37:35	Seq Line:	5
Sample Name:	1927220001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.953	MM	433588.3	5.0000	CLO4-89-ISTD

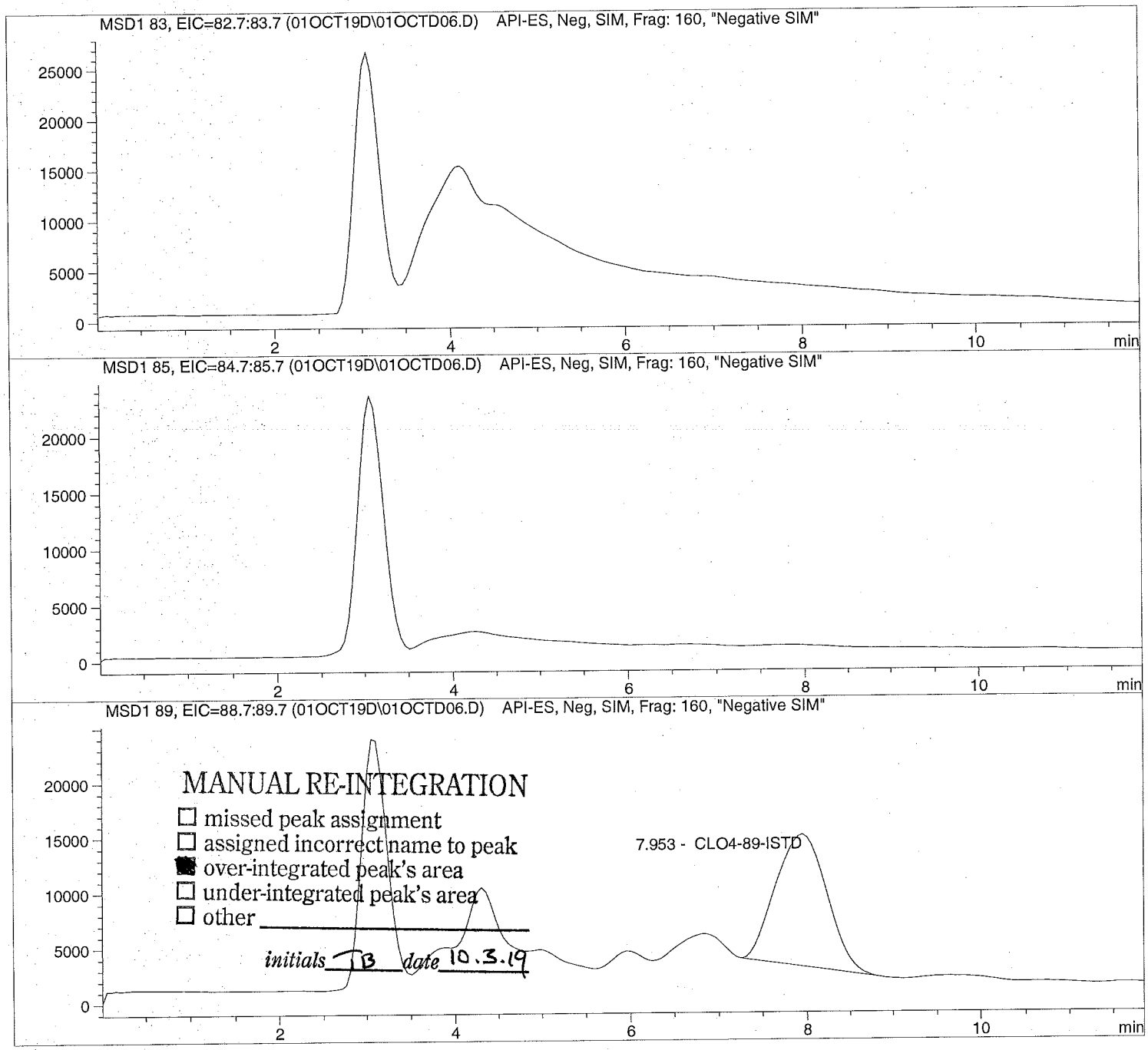
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D Sample Name: 1927220002

Injection Date:	10/01/2019 11:51:24	Seq Line:	6
Sample Name:	1927220002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D Sample Name: 1927220002

Injection Date:	10/01/2019 11:51:24	Seq Line:	6
Sample Name:	1927220002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.953	MM	480844.6	5.0000	CLO4-89-ISTD

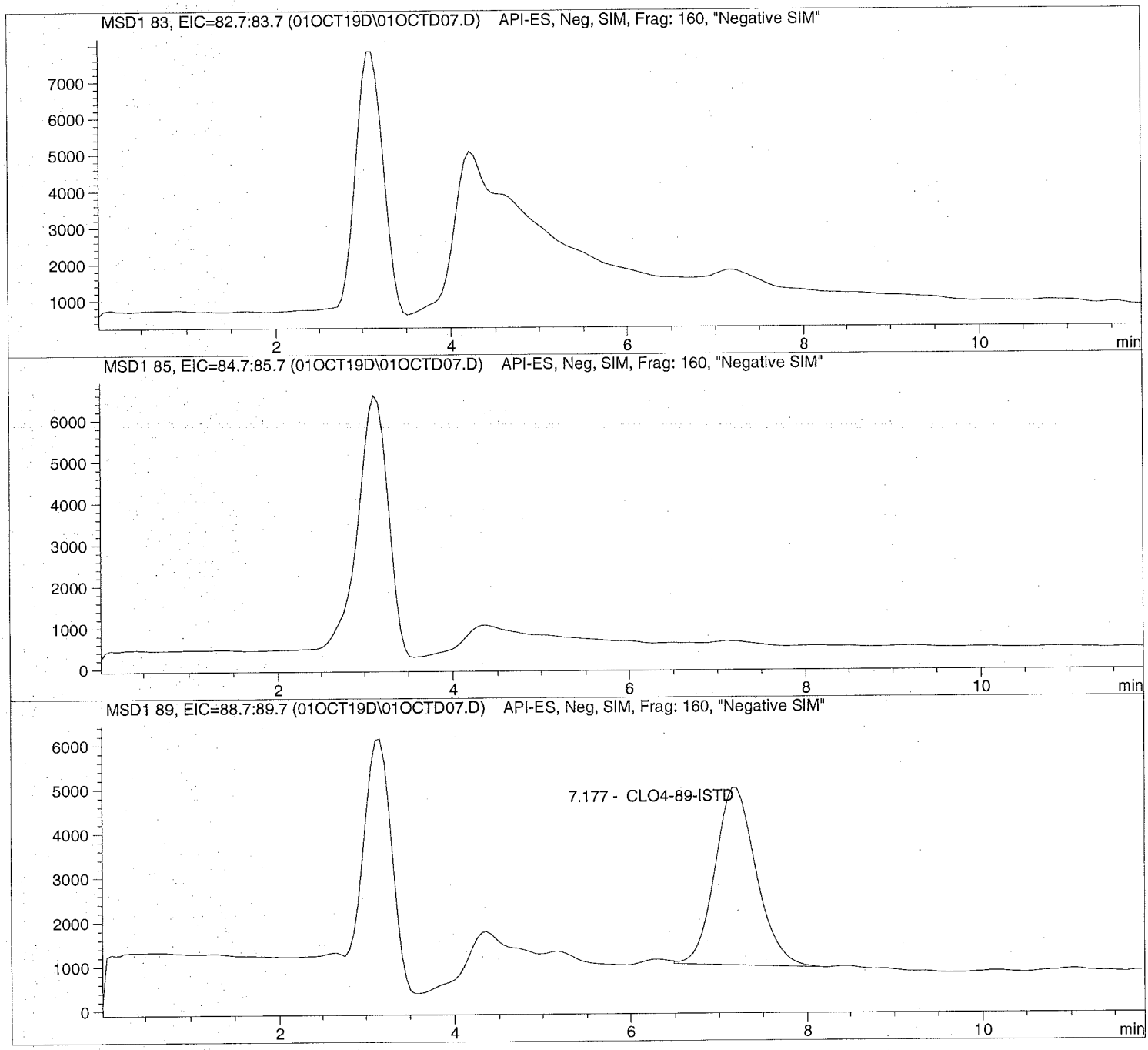
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD07.D Sample Name: 1927220003

Injection Date:	10/01/2019 12:05:17	Seq Line:	7
Sample Name:	1927220003	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD07.D Sample Name: 1927220003

Injection Date:	10/01/2019 12:05:17	Seq Line:	7
Sample Name:	1927220003	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.177	BBA	129768.3	5.0000	CLO4-89-ISTD

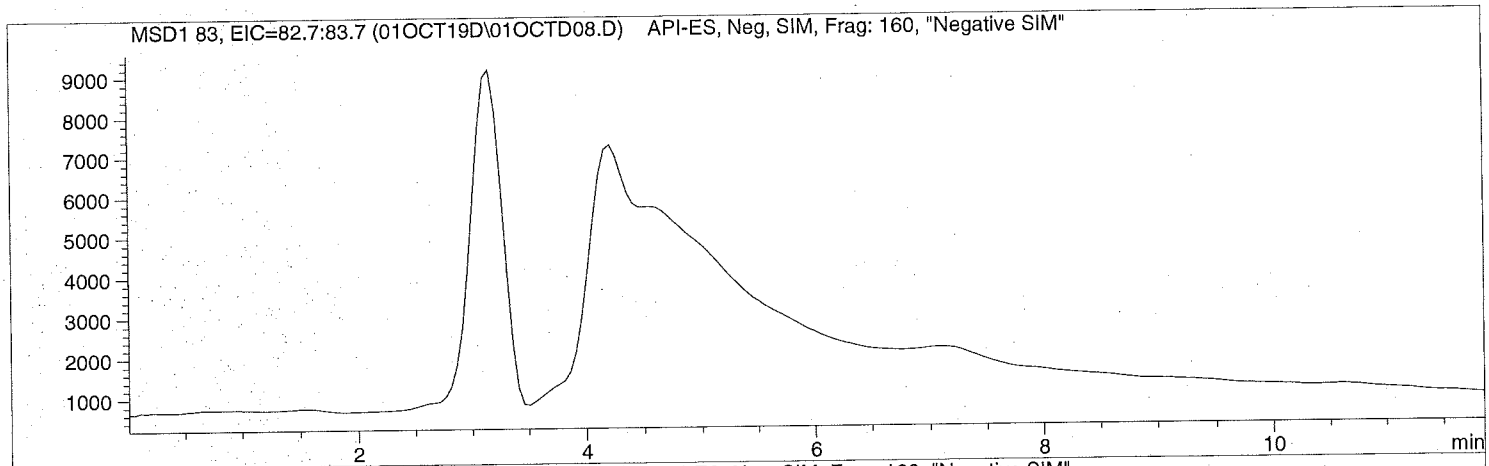
*** End of Report ***

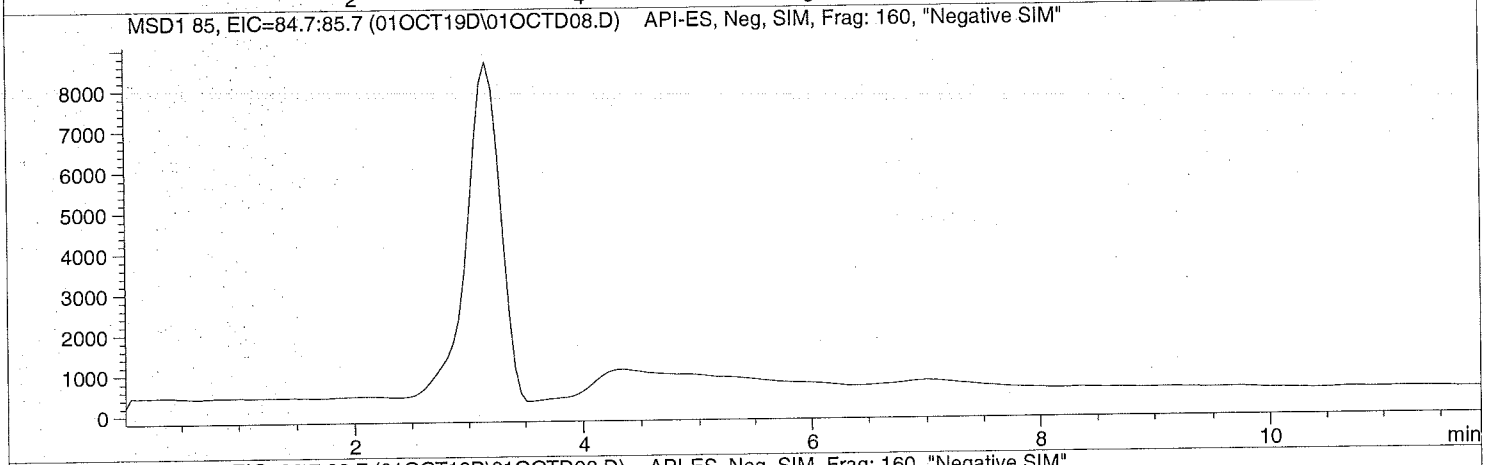
Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD08.D Sample Name: 1927220004

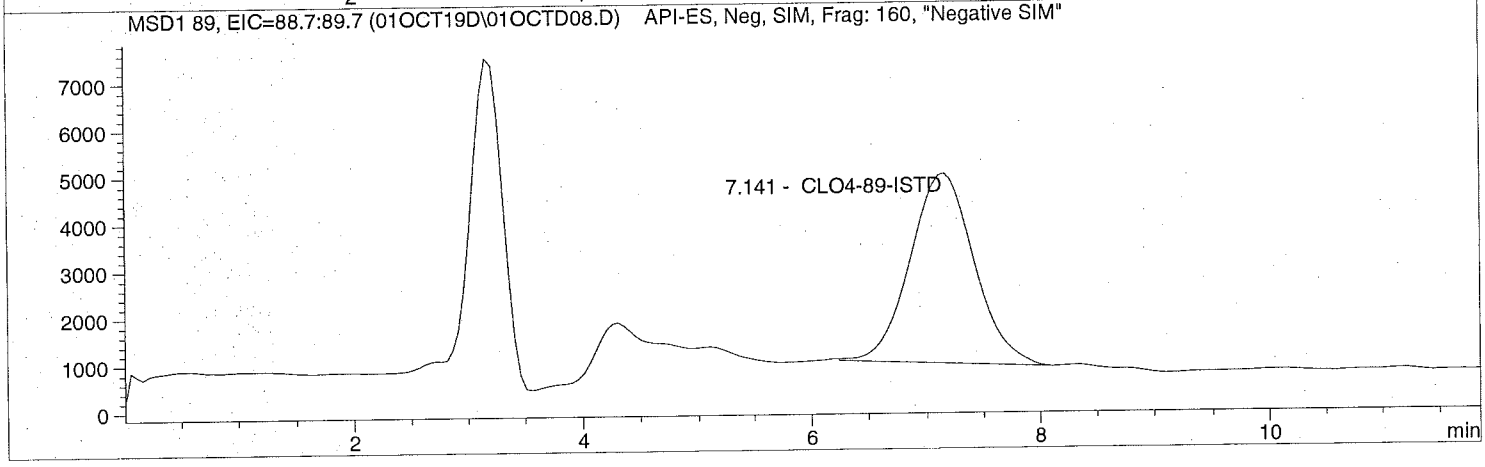
Injection Date:	10/01/2019 12:19:05	Seq Line:	8
Sample Name:	1927220004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD08.D Sample Name: 1927220004

Injection Date:	10/01/2019 12:19:05	Seq Line:	8
Sample Name:	1927220004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.141	BBA	155843.6	5.0000	CLO4-89-ISTD

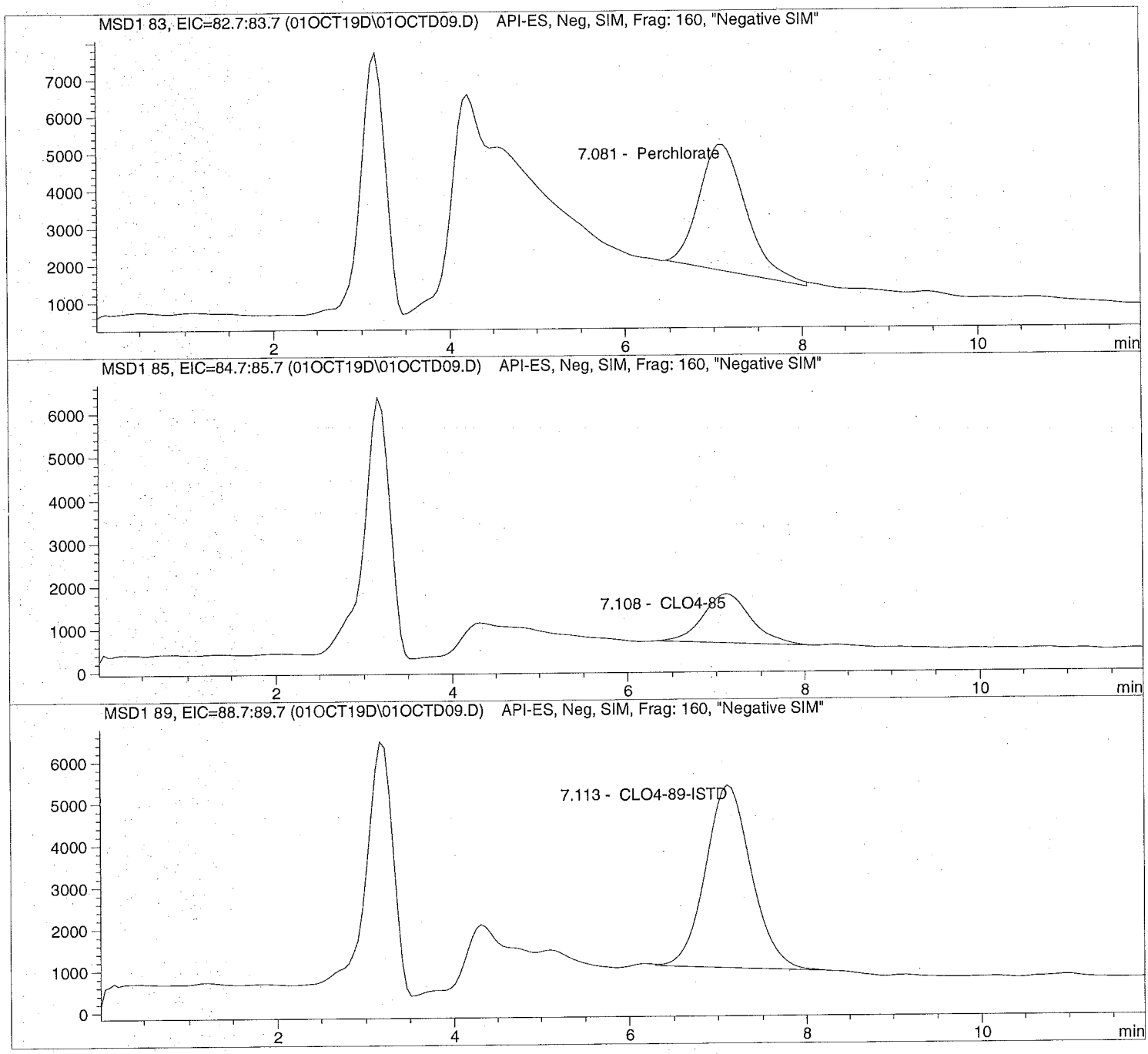
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD09.D Sample Name: 1927220005 MS

Injection Date:	10/01/2019 12:32:51	Seq Line:	9
Sample Name:	1927220005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD09.D Sample Name: 1927220005 MS

Injection Date:	10/01/2019 12:32:51	Seq Line:	9
Sample Name:	1927220005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.081	PBA	124857.0	2.9350	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.108	PBA	42987.5	3.2268	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.113	BBA	156479.1	5.0000	CLO4-89-ISTD

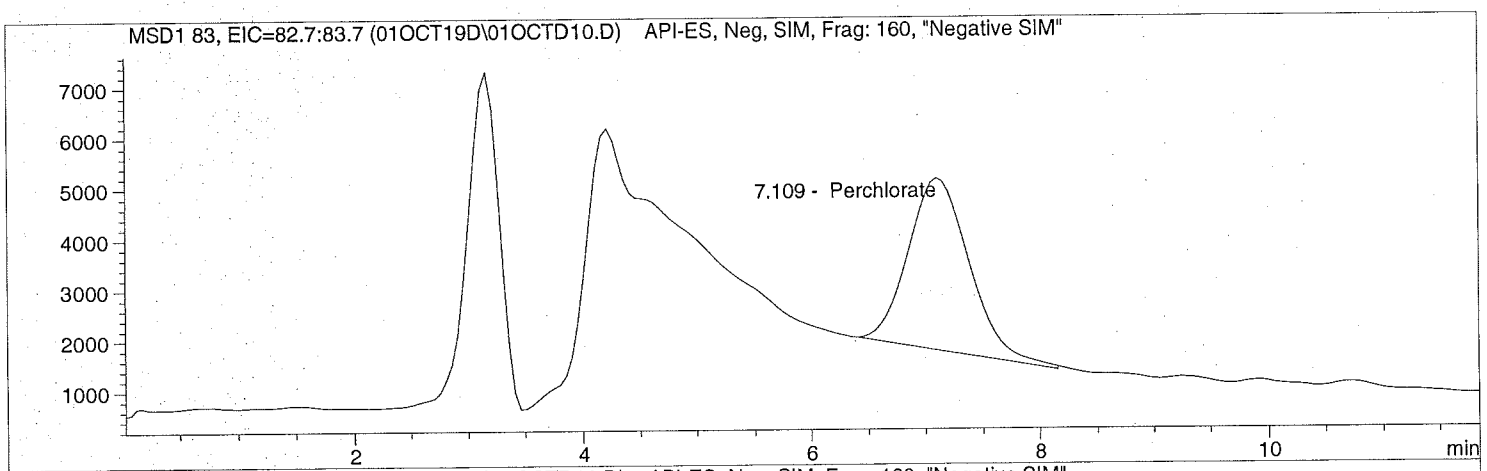
*** End of Report ***

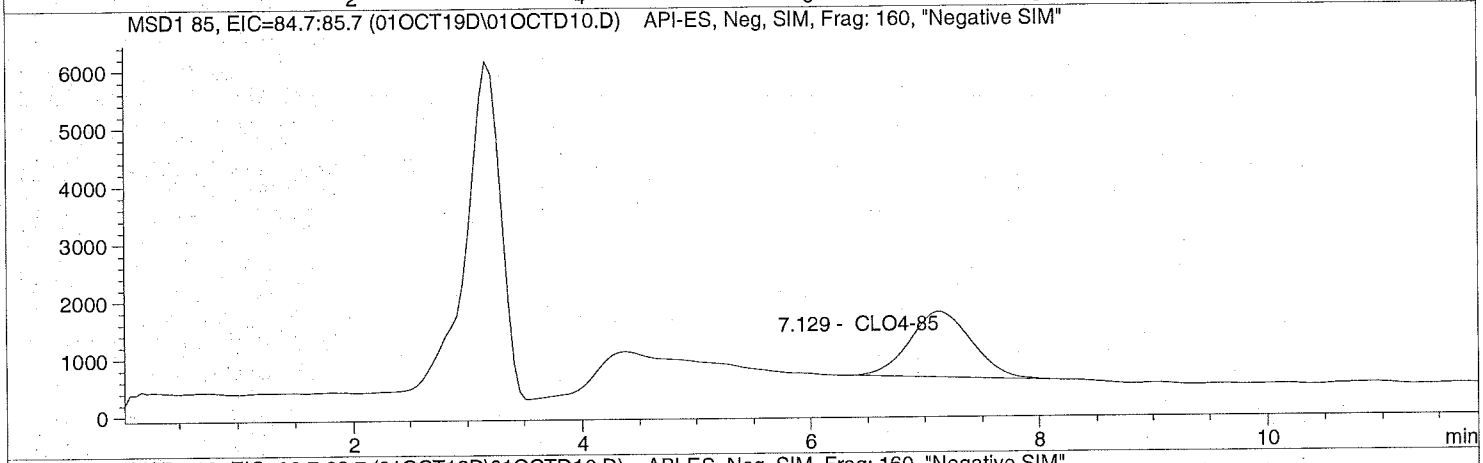
Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD10.D Sample Name: 1927220006 MSD

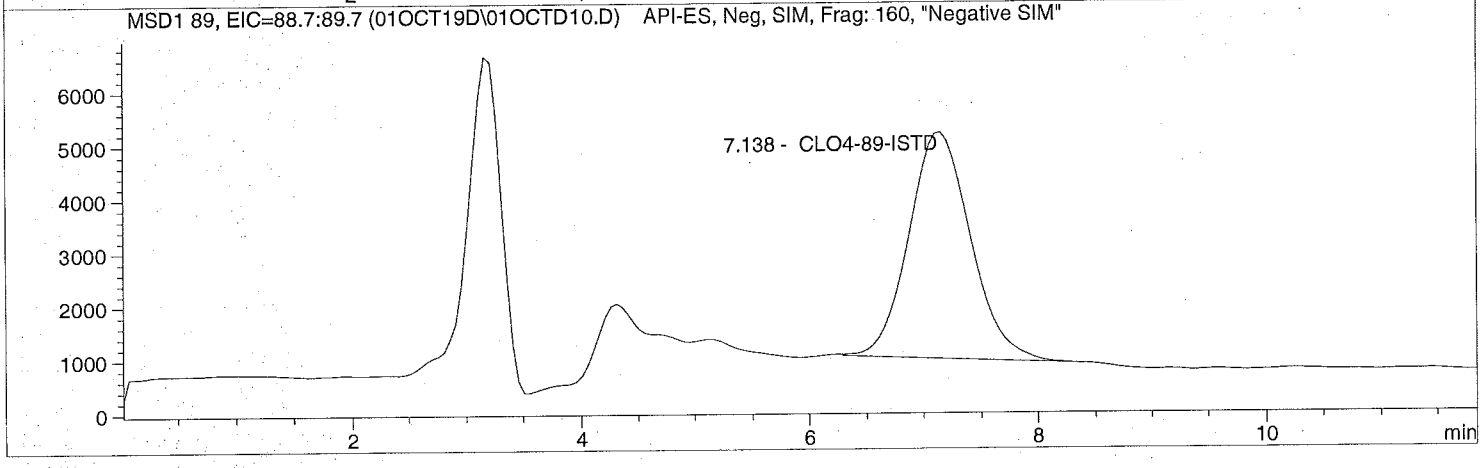
Injection Date:	10/01/2019 12:46:41	Seq Line:	10
Sample Name:	1927220006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD10.D Sample Name: 1927220006 MSD

Injection Date:	10/01/2019 12:46:41	Seq Line:	10
Sample Name:	1927220006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.109	PBA	125081.4	2.9304	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.129	PBA	42652.4	3.1897	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.138	BBA	157002.2	5.0000	CLO4-89-ISTD

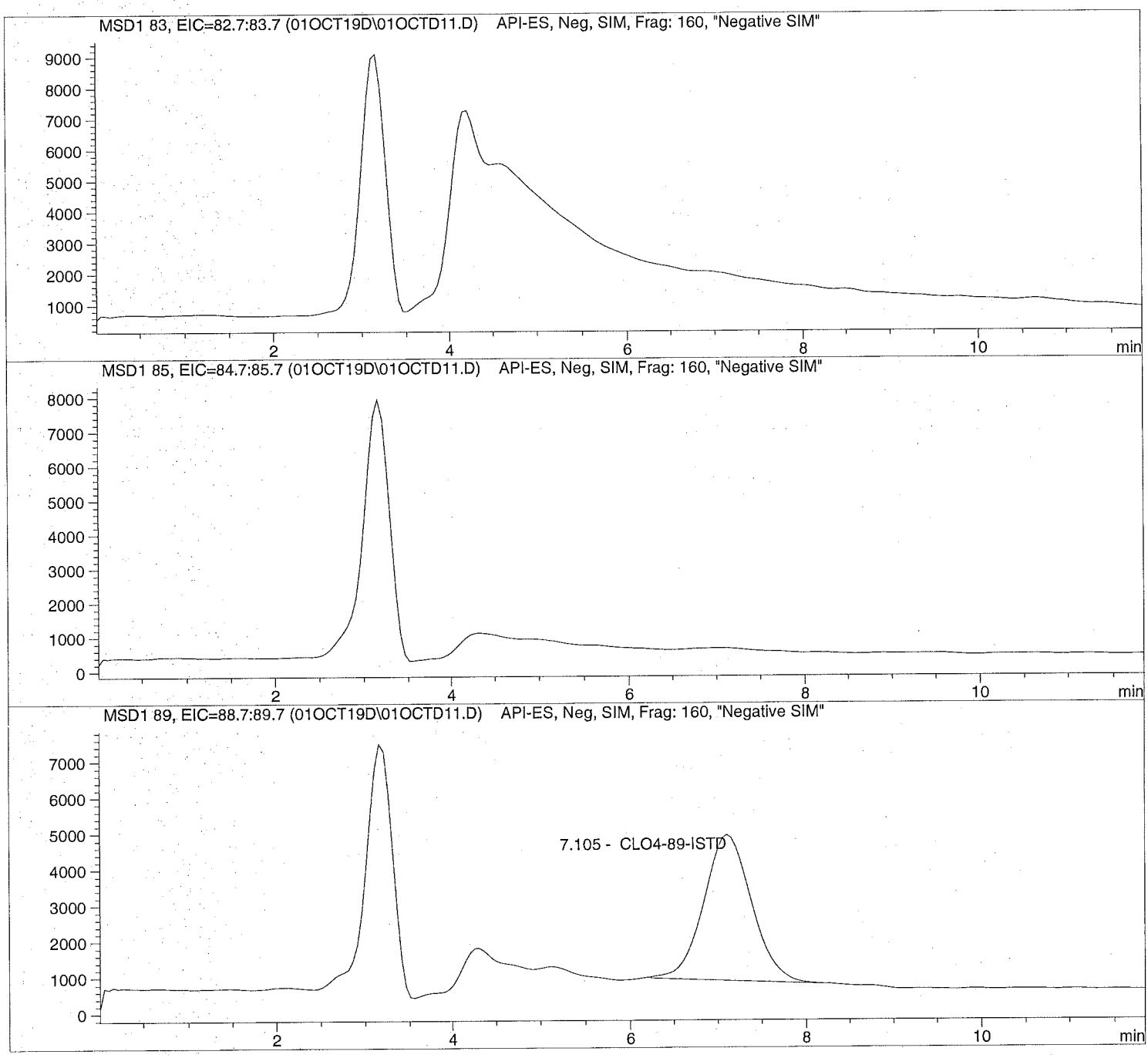
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD11.D Sample Name: 1927220007

Injection Date:	10/01/2019 13:00:30	Seq Line:	11
Sample Name:	1927220007	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD11.D Sample Name: 1927220007

Injection Date:	10/01/2019 13:00:30	Seq Line:	11
Sample Name:	1927220007	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.105	BBA	153526.1	5.0000	CLO4-89-ISTD

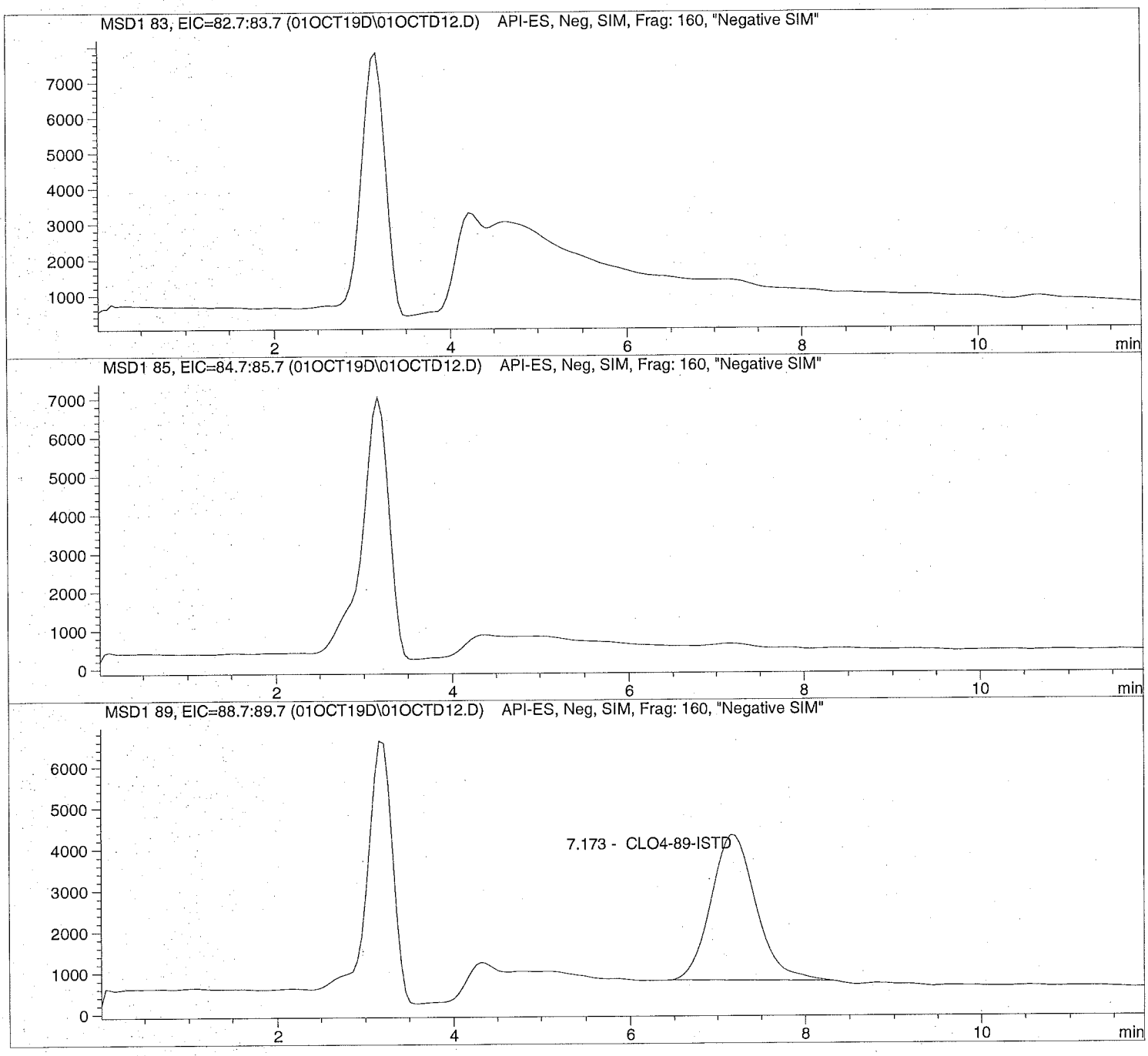
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD12.D Sample Name: 1927220008

Injection Date:	10/01/2019 13:14:17	Seq Line:	12
Sample Name:	1927220008	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD12.D Sample Name: 1927220008

Injection Date:	10/01/2019 13:14:17	Seq Line:	12
Sample Name:	1927220008	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.173	PBA	125991.0	5.0000	CLO4-89-ISTD

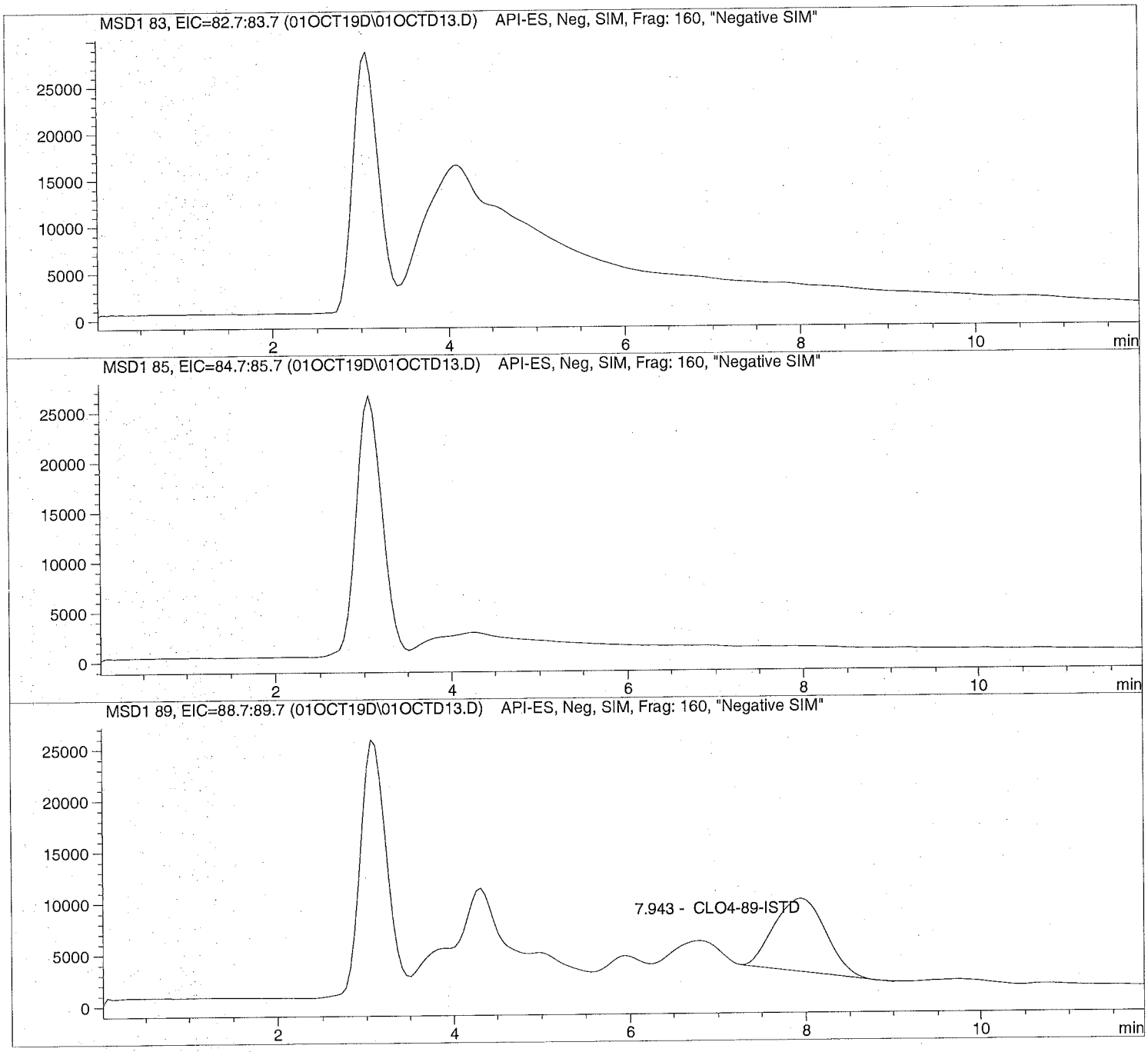
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD13.D Sample Name: 1927220001 RE

Injection Date:	10/01/2019 13:49:07	Seq Line:	13
Sample Name:	1927220001 RE	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD13.D Sample Name: 1927220001 RE

Injection Date:	10/01/2019 13:49:07	Seq Line:	13
Sample Name:	1927220001 RE	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.943	VBA	284558.6	5.0000	CLO4-89-ISTD

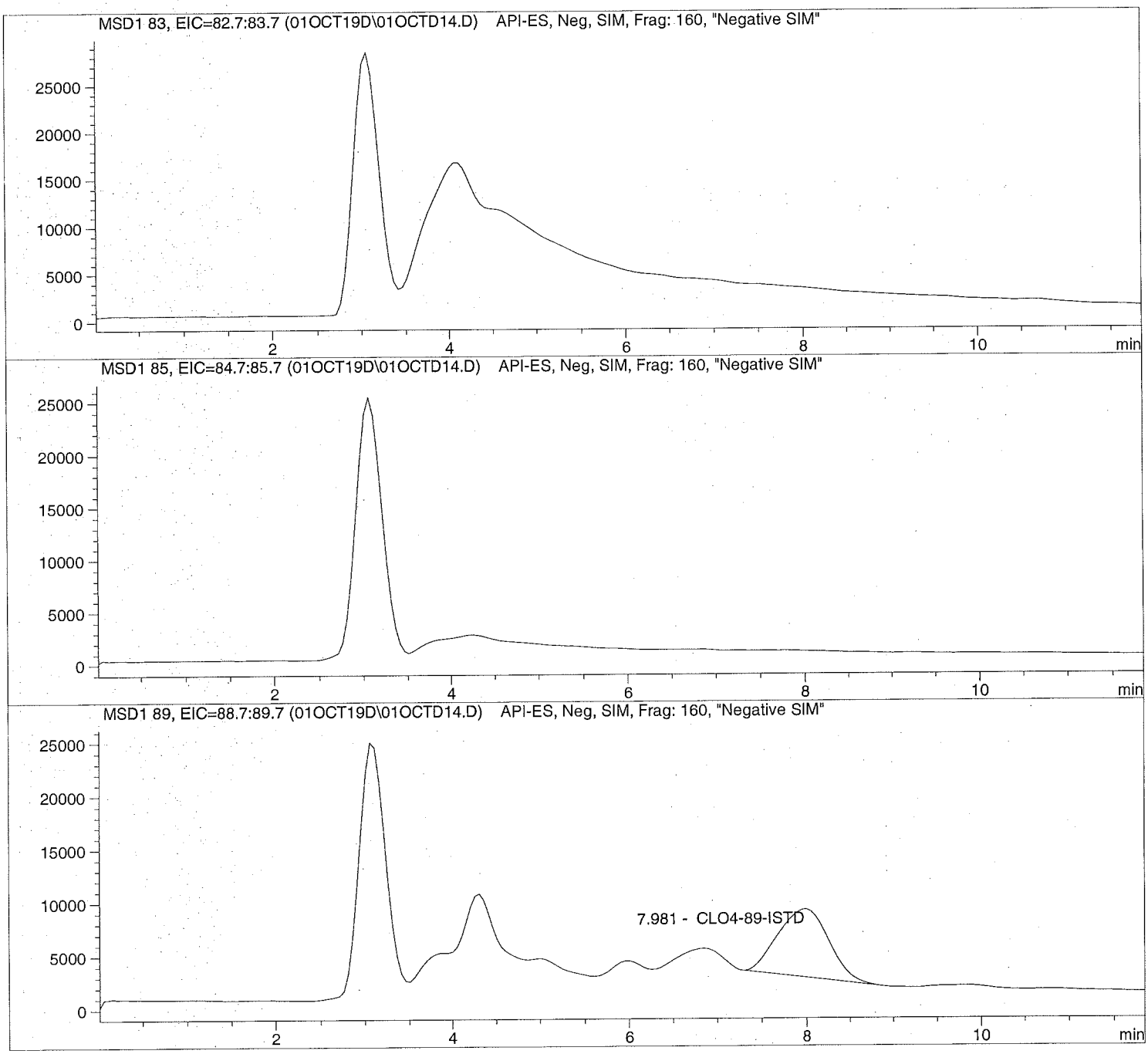
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD14.D Sample Name: 1927220002 RE

Injection Date:	10/01/2019 14:09:00	Seq Line:	14
Sample Name:	1927220002 RE	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD14.D Sample Name: 1927220002 RE

Injection Date:	10/01/2019 14:09:00	Seq Line:	14
Sample Name:	1927220002 RE	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.981	VBA	252777.4	5.0000	CLO4-89-ISTD

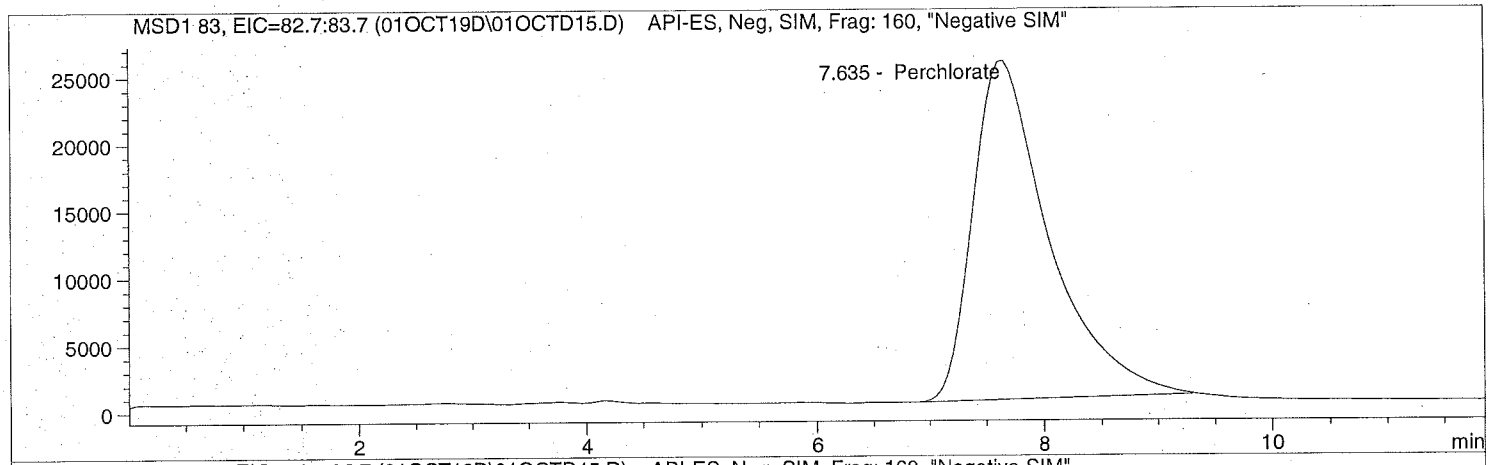
*** End of Report ***

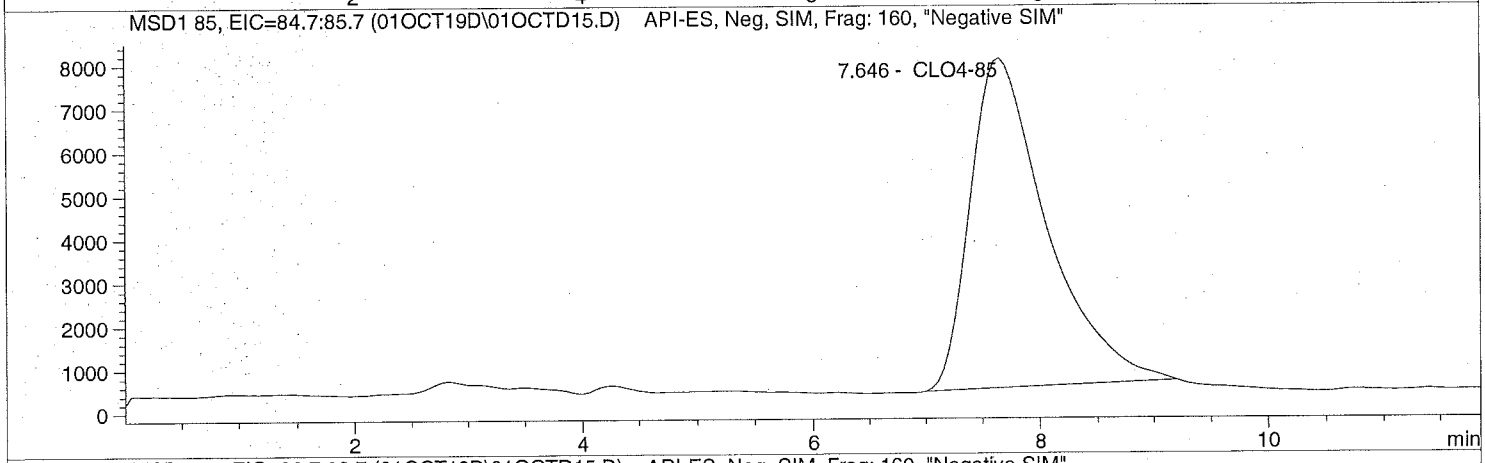
Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD15.D Sample Name: 676593 CCV@25

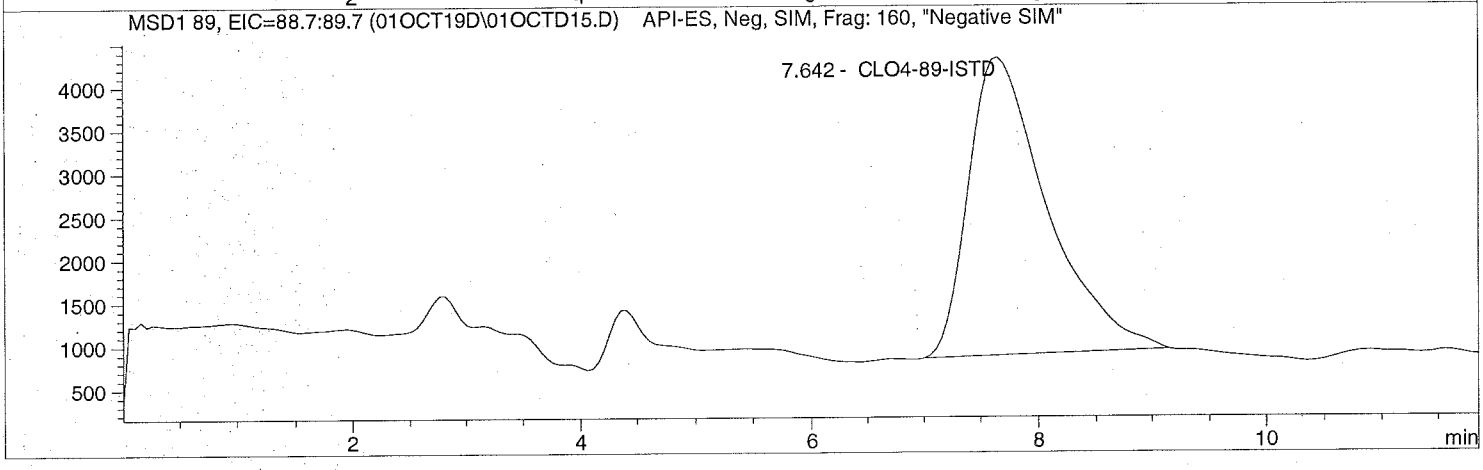
Injection Date:	10/01/2019 14:22:50	Seq Line:	15
Sample Name:	676593 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD15.D Sample Name: 676593 CCV@25

Injection Date:	10/01/2019 14:22:50	Seq Line:	15
Sample Name:	676593 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.635	PBA	1161631.1	24.3624	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.646	PBA	350571.0	24.1264	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.642	PBA	163352.1	5.0000	CLO4-89-ISTD

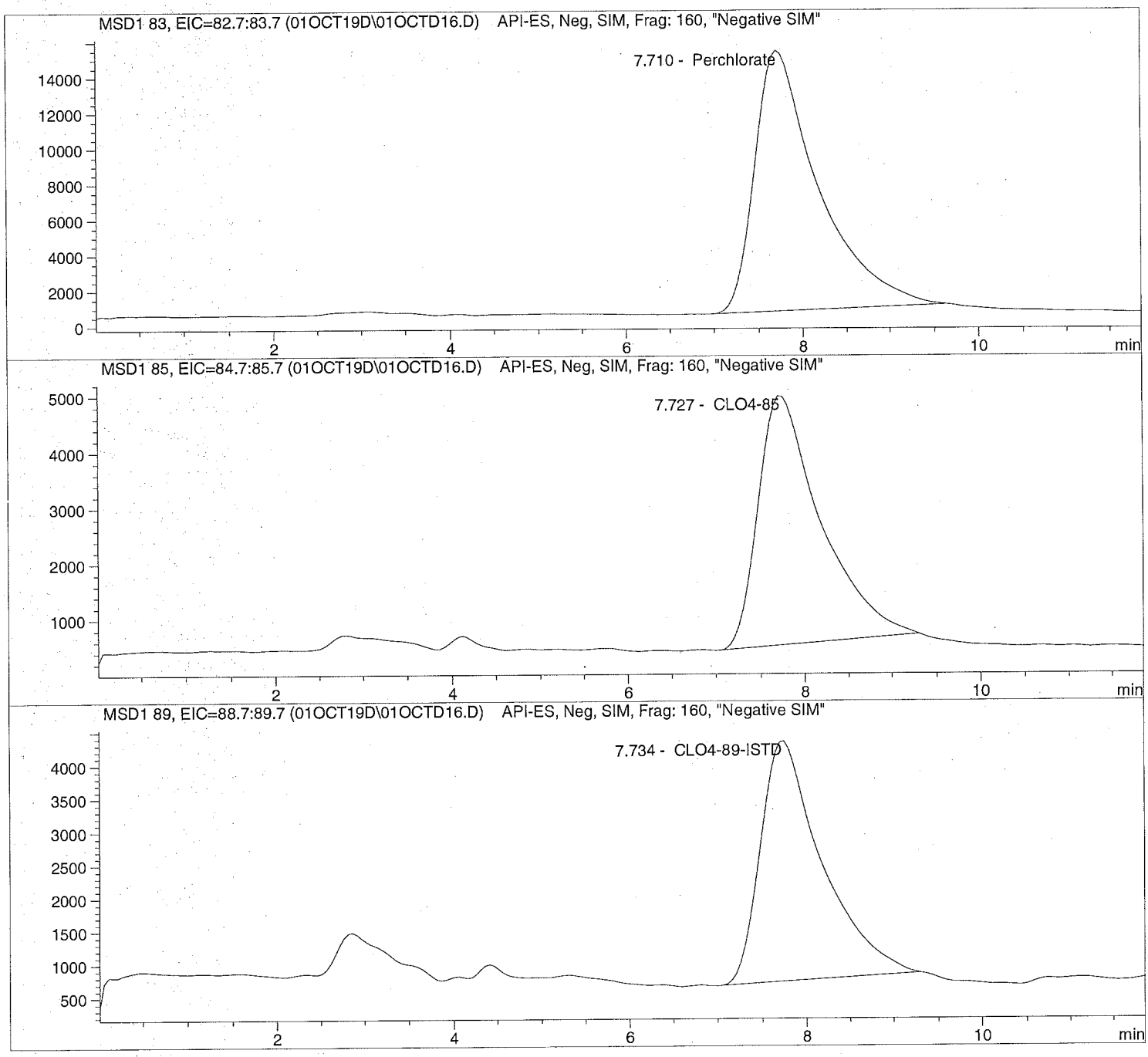
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD16.D Sample Name: 1927568001 1K

Injection Date:	10/01/2019 14:36:36	Seq Line:	16
Sample Name:	1927568001 1K	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD16.D Sample Name: 1927568001 1K

Injection Date:	10/01/2019 14:36:36	Seq Line:	16
Sample Name:	1927568001 1K	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.710	PBA	734459.3	14890.2051	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.727	PBA	220255.9	14585.8174	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	175719.3	5000.0000	CLO4-89-ISTD

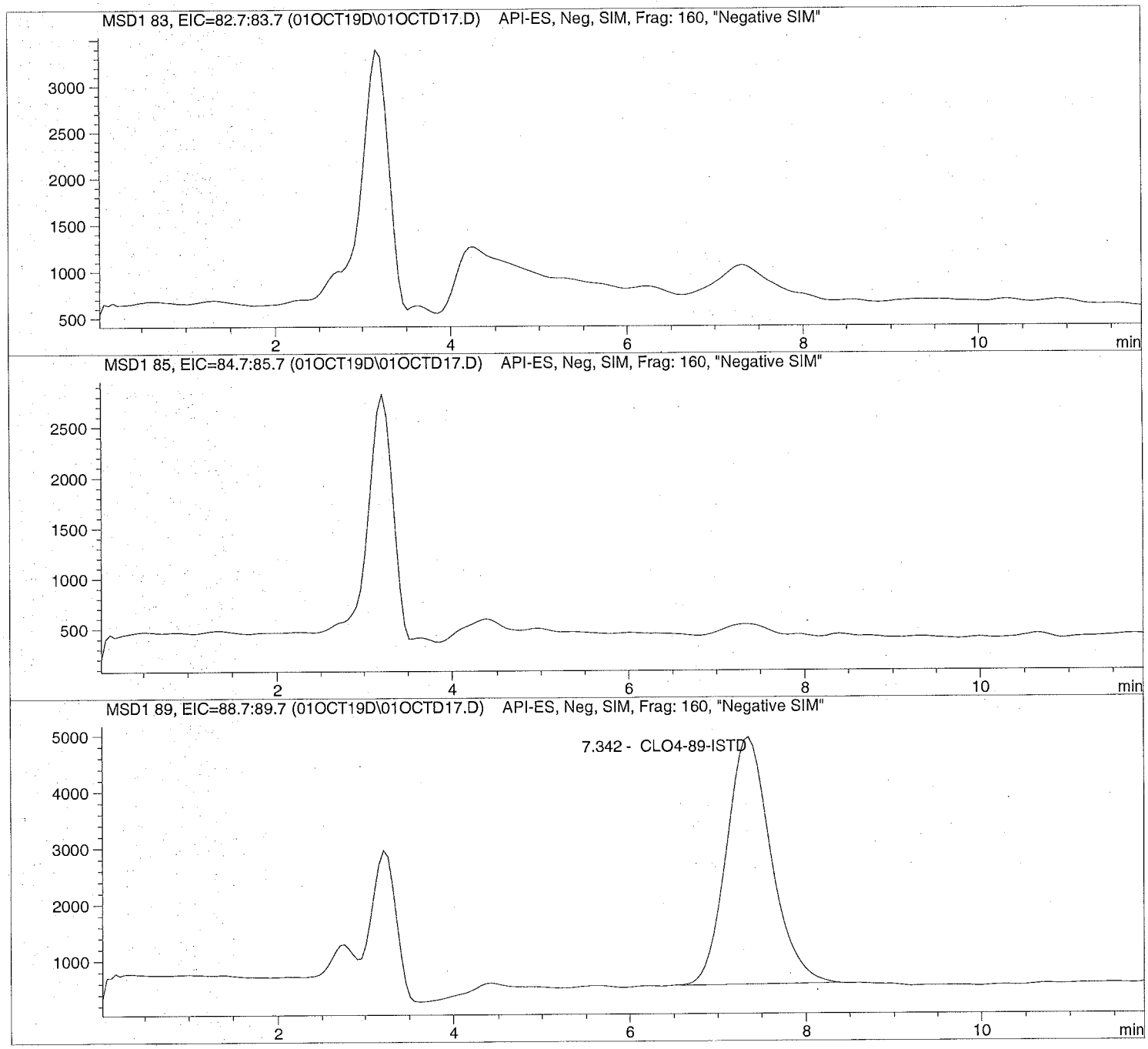
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD17.D Sample Name: 1927591001

Injection Date:	10/01/2019 14:50:25	Seq Line:	17
Sample Name:	1927591001	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD17.D Sample Name: 1927591001

Injection Date:	10/01/2019 14:50:25	Seq Line:	17
Sample Name:	1927591001	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.342	BBA	154253.7	5.0000	CLO4-89-ISTD

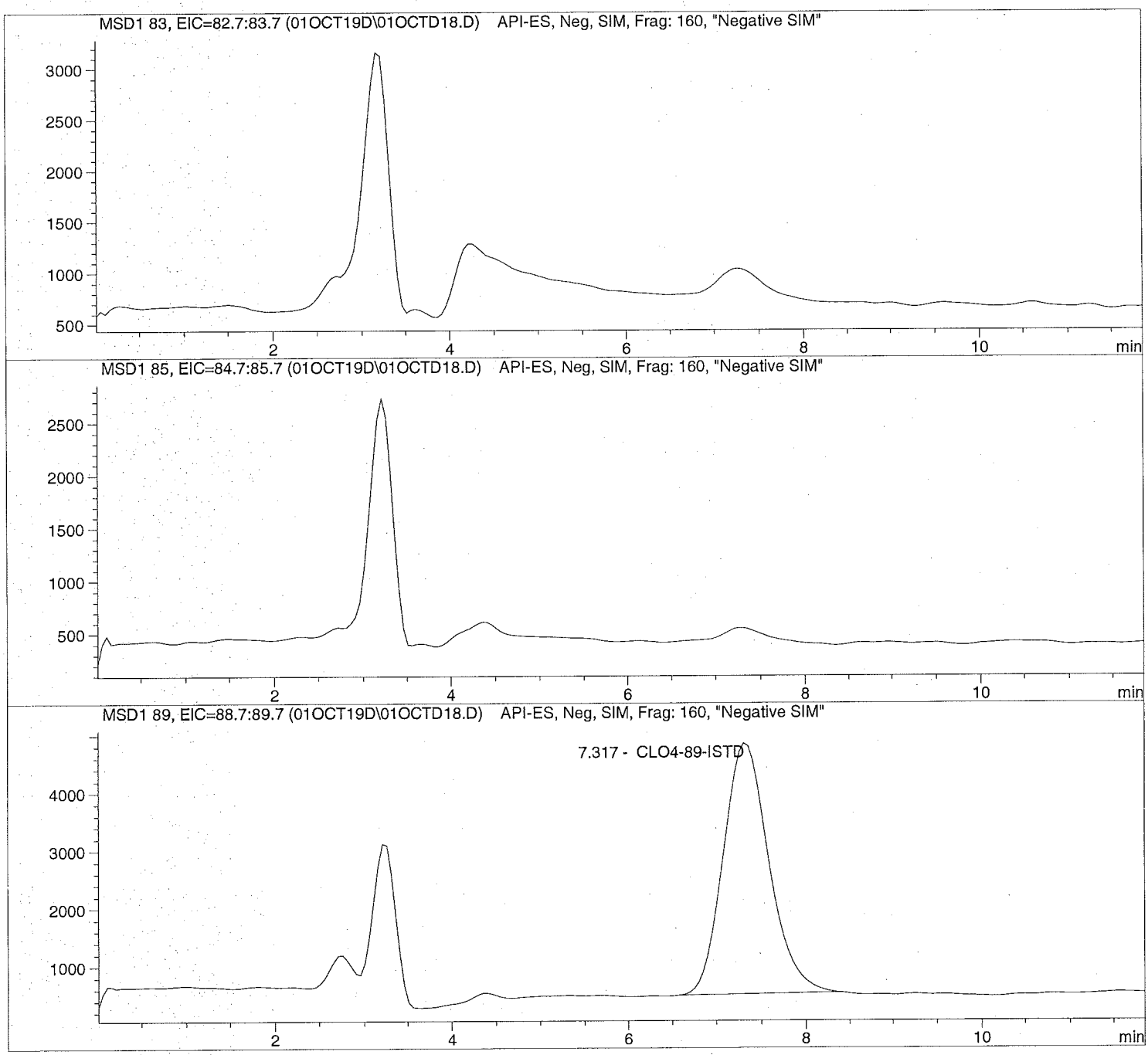
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD18.D Sample Name: 1927596001

Injection Date:	10/01/2019 15:04:19	Seq Line:	18
Sample Name:	1927596001	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD18.D Sample Name: 1927596001

Injection Date:	10/01/2019 15:04:19	Seq Line:	18
Sample Name:	1927596001	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.317	BBA	153001.9	5.0000	CLO4-89-ISTD

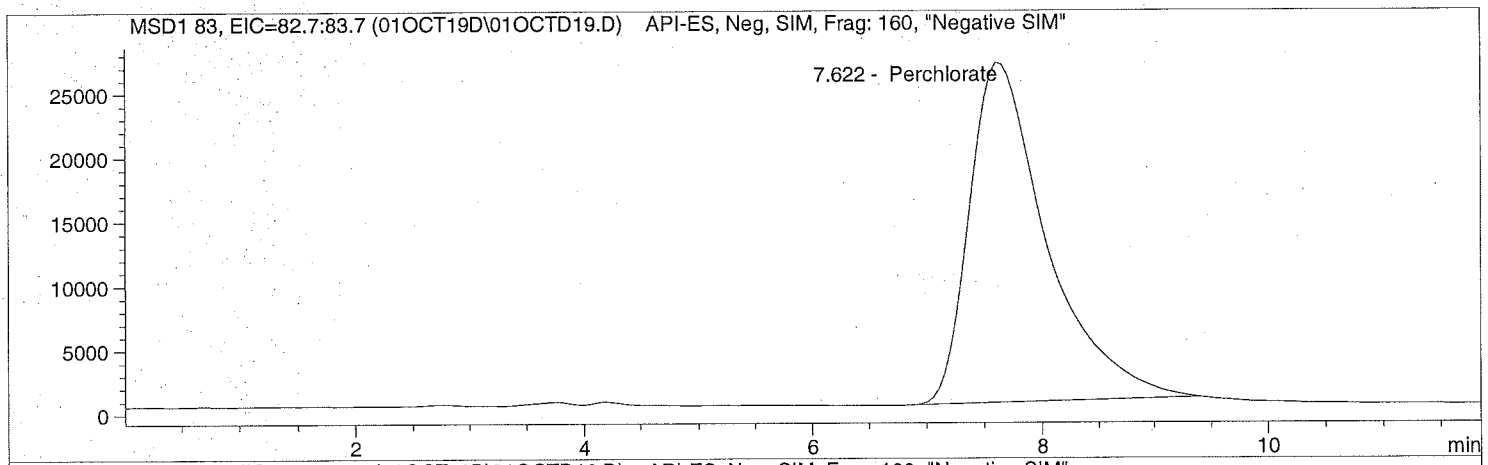
*** End of Report ***

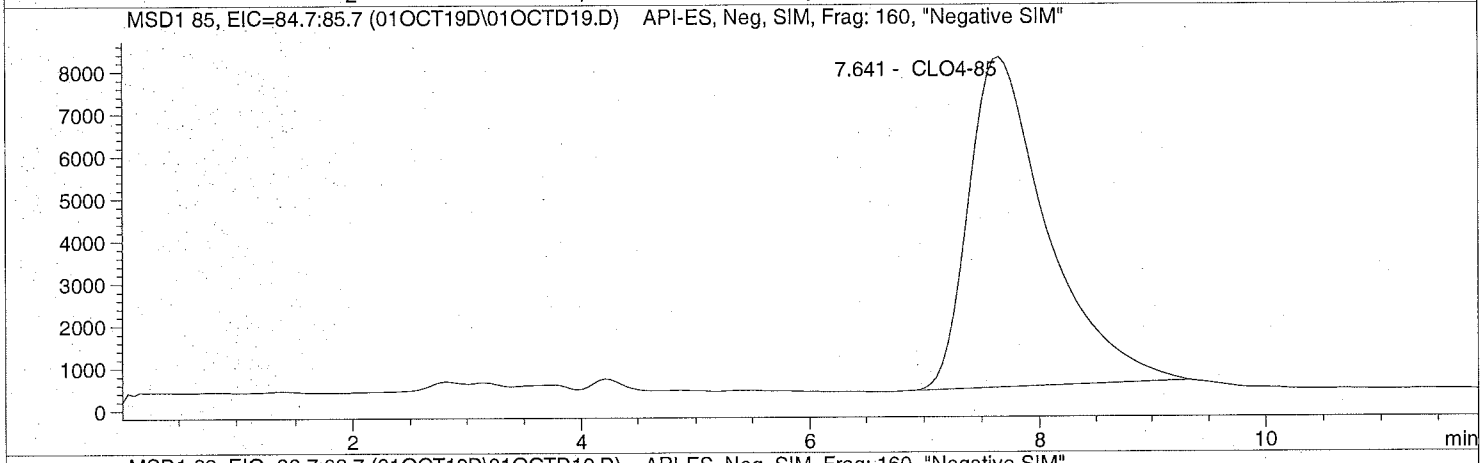
Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD19.D Sample Name: 676594 CCV@25

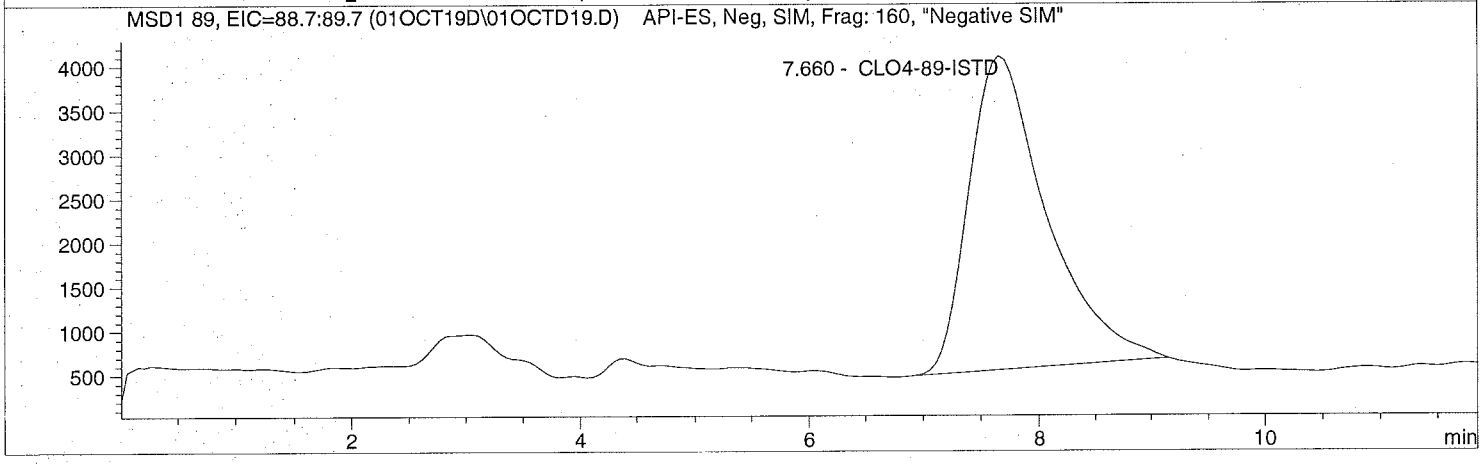
Injection Date:	10/01/2019 15:18:13	Seq Line:	19
Sample Name:	676594 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD19.D Sample Name: 676594 CCV@25

Injection Date:	10/01/2019 15:18:13	Seq Line:	19
Sample Name:	676594 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.622	PBA	1236865.2	25.3082	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.641	PBA	371181.1	24.9437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.660	PBA	166779.7	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
7.750	1	3	1.00000	5.39218e4	1.85454e-5		1	Perchlorate
		4	2.00000	1.32825e5	1.50574e-5			
		5	5.00000	2.76271e5	1.80982e-5			
		6	10.00000	5.61298e5	1.78159e-5			
		7	25.00000	1.51820e6	1.64669e-5			
		8	50.00000	3.31156e6	1.50986e-5			
		9	75.00000	5.23914e6	1.43153e-5			
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1		CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5			
		5	5.00000	2.13407e5	2.34294e-5			
		6	5.00000	2.09246e5	2.38953e-5			
		7	5.00000	2.07403e5	2.41077e-5			
		8	5.00000	2.02929e5	2.46391e-5			
		9	5.00000	1.97933e5	2.52611e-5			
7.778	2	3	1.00000	1.70436e4	5.86732e-5		1	CLO4-85
		4	2.00000	4.20754e4	4.75337e-5			
		5	5.00000	9.24707e4	5.40712e-5			
		6	10.00000	1.68622e5	5.93041e-5			
		7	25.00000	4.63724e5	5.39114e-5			
		8	50.00000	9.95933e5	5.02042e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		9	75.00000	1.58066e6	4.74484e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 3.581 min To 11.899 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 0.5
  - Level 5 : 0.2
  - Level 6 : 0.1
  - Level 7 : 0.04
  - Level 8 : 0.02
  - Level 9 : 0.013333

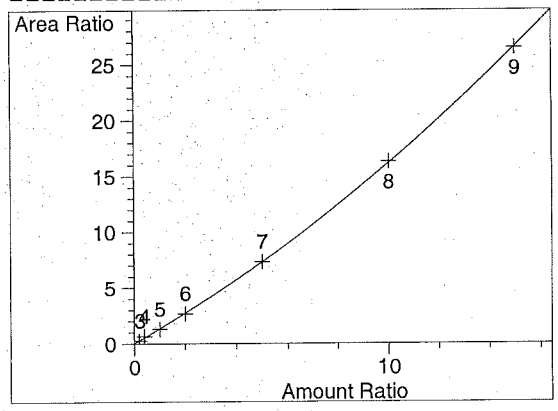
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

Compound: CLO4-85
- Time Window : From 3.601 min To 11.913 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 0.5
  - Level 5 : 0.2
  - Level 6 : 0.1
  - Level 7 : 0.04
  - Level 8 : 0.02
  - Level 9 : 0.013333

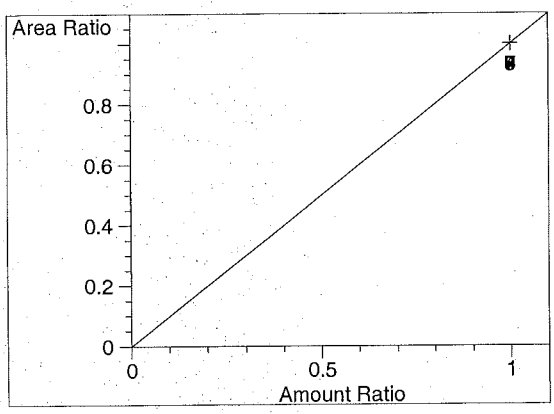
Peak Sum Table

No Entries in table

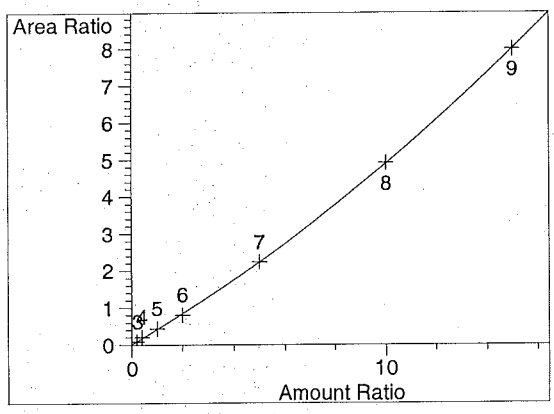
Calibration Curves



Perchlorate at exp. RT: 7.750
MSD1 83, EIC=82.7:83.7
Correlation: 0.99975
Residual Std. Dev.: 0.10284
Formula: $y = ax^2 + bx + c$
a: 3.10463e-2
b: 1.30369
c: 2.19496e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1
Level 8 : 1
Level 9 : 1



CLO4-85 at exp. RT: 7.778
MSD1 85, EIC=84.7:85.7
Correlation: 0.99969
Residual Std. Dev.: 0.02601
Formula: $y = ax^2 + bx + c$
a: 8.85207e-3
b: 3.99283e-1
c: 1.33505e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333

Batch Report: C:\HPCHEM\1\DATA\20SEP19I\20SEP19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\20SEP19I.S

Sequence Table:

Method and Injection Info Part:

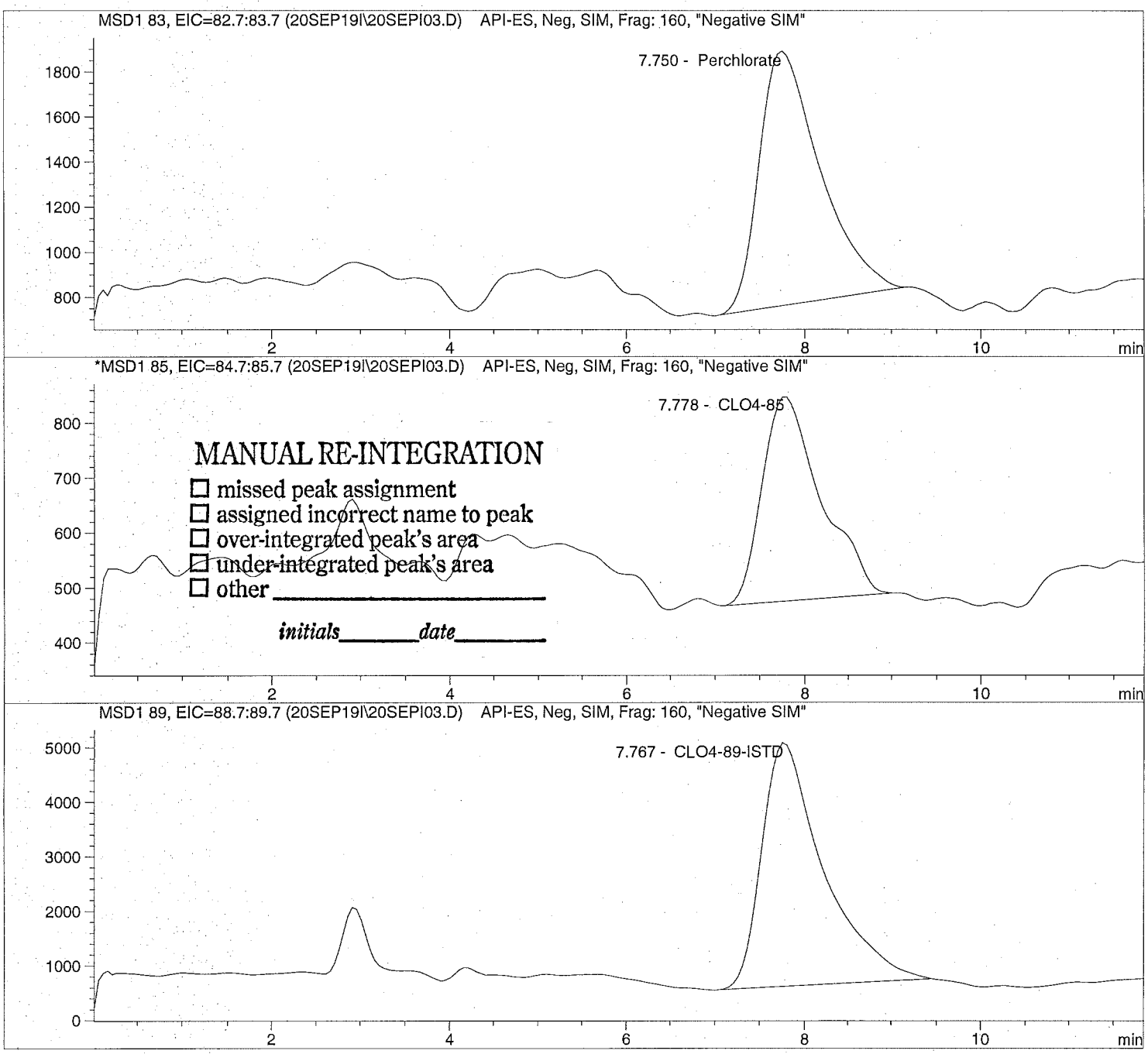
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

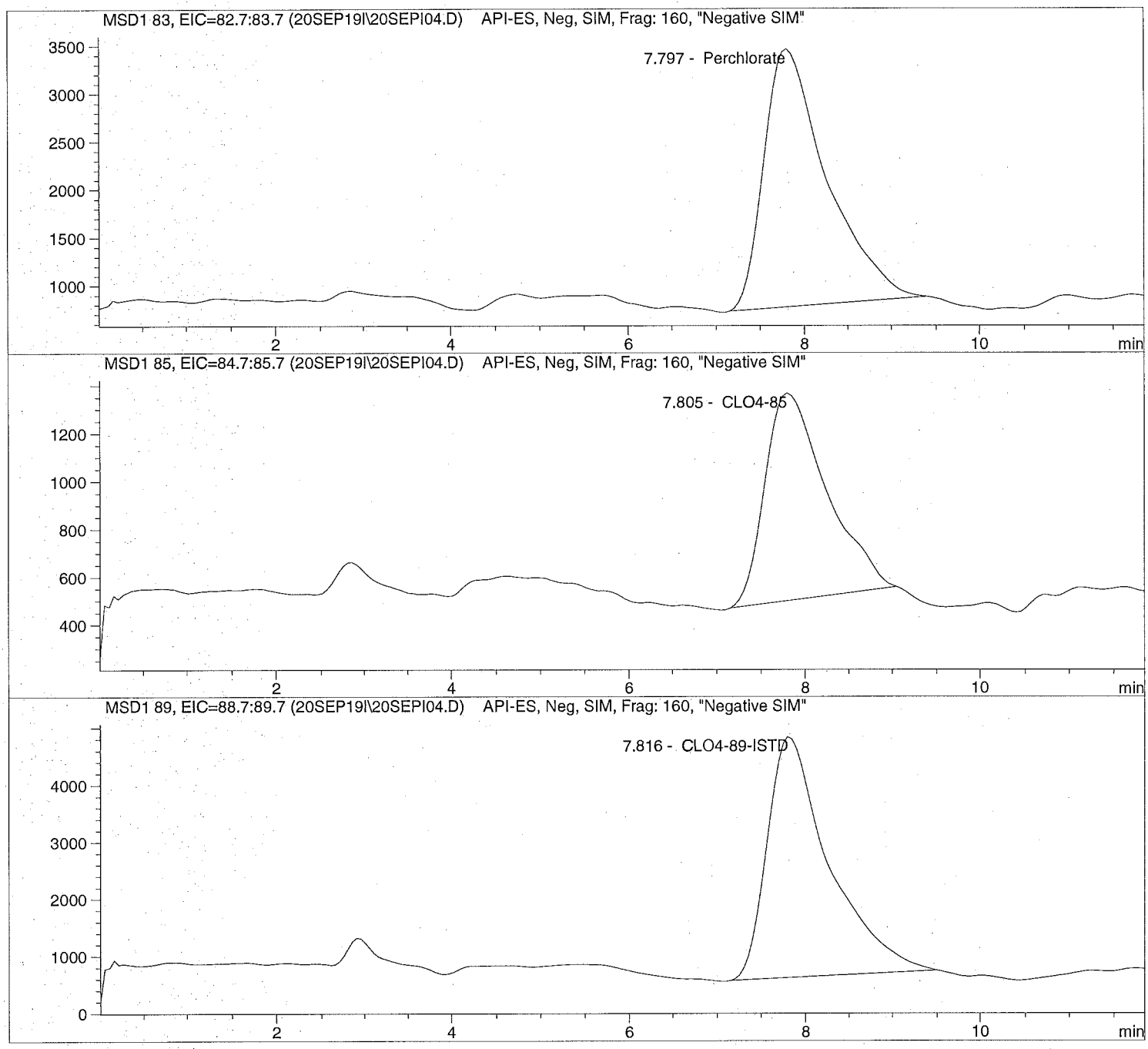
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

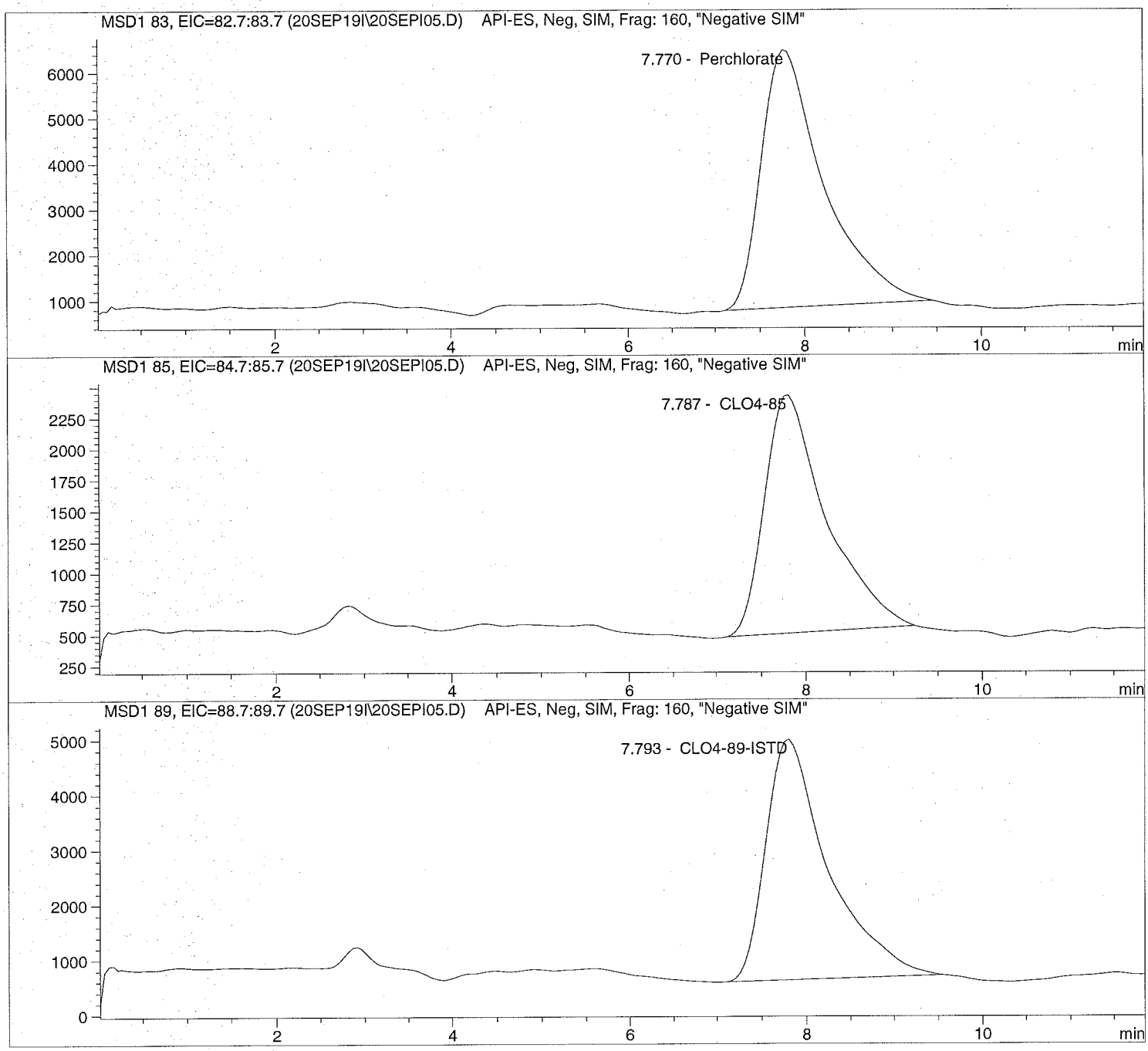
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	9/20/2019 09:51:49	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	9/20/2019 09:51:49	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

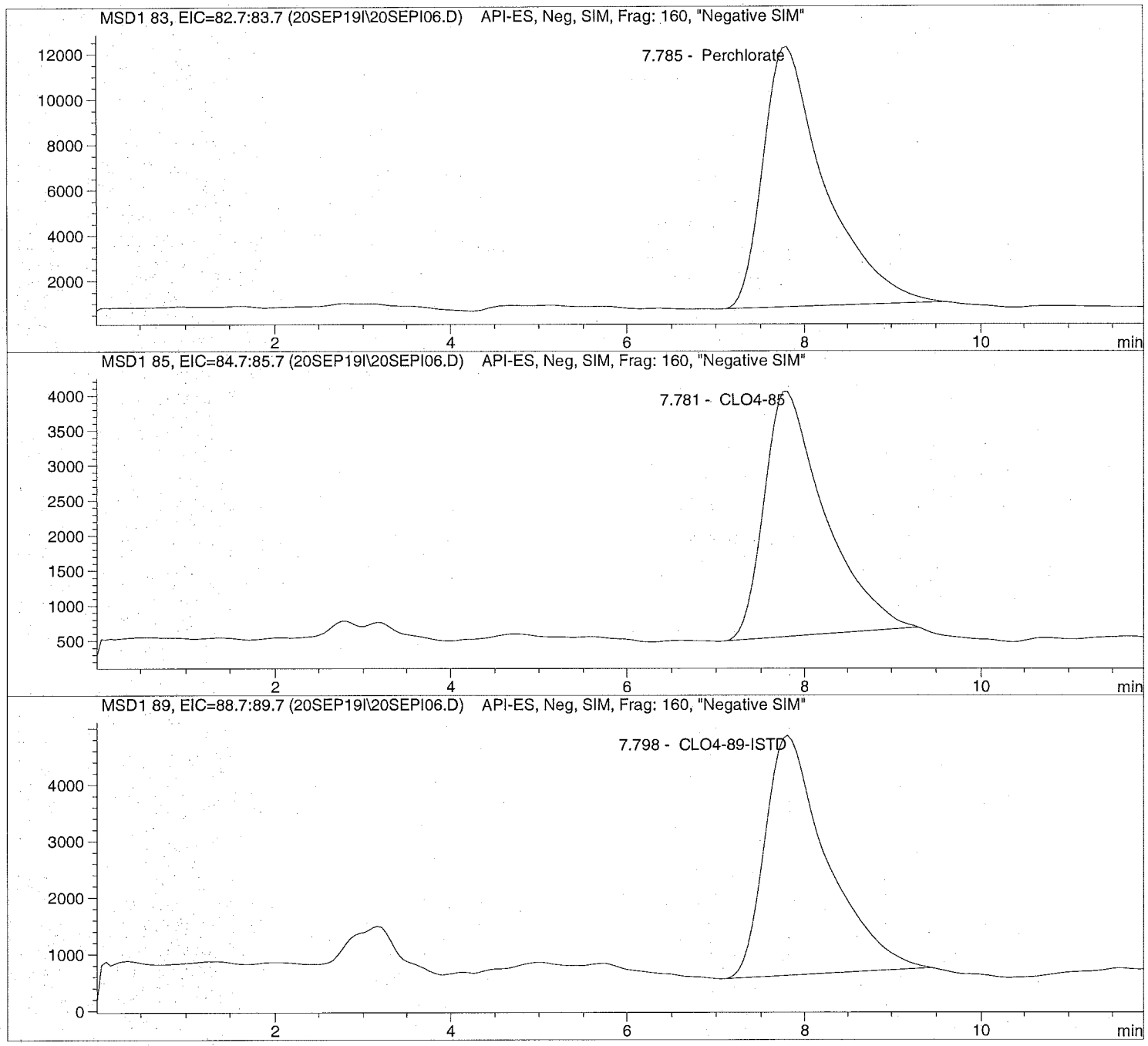
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

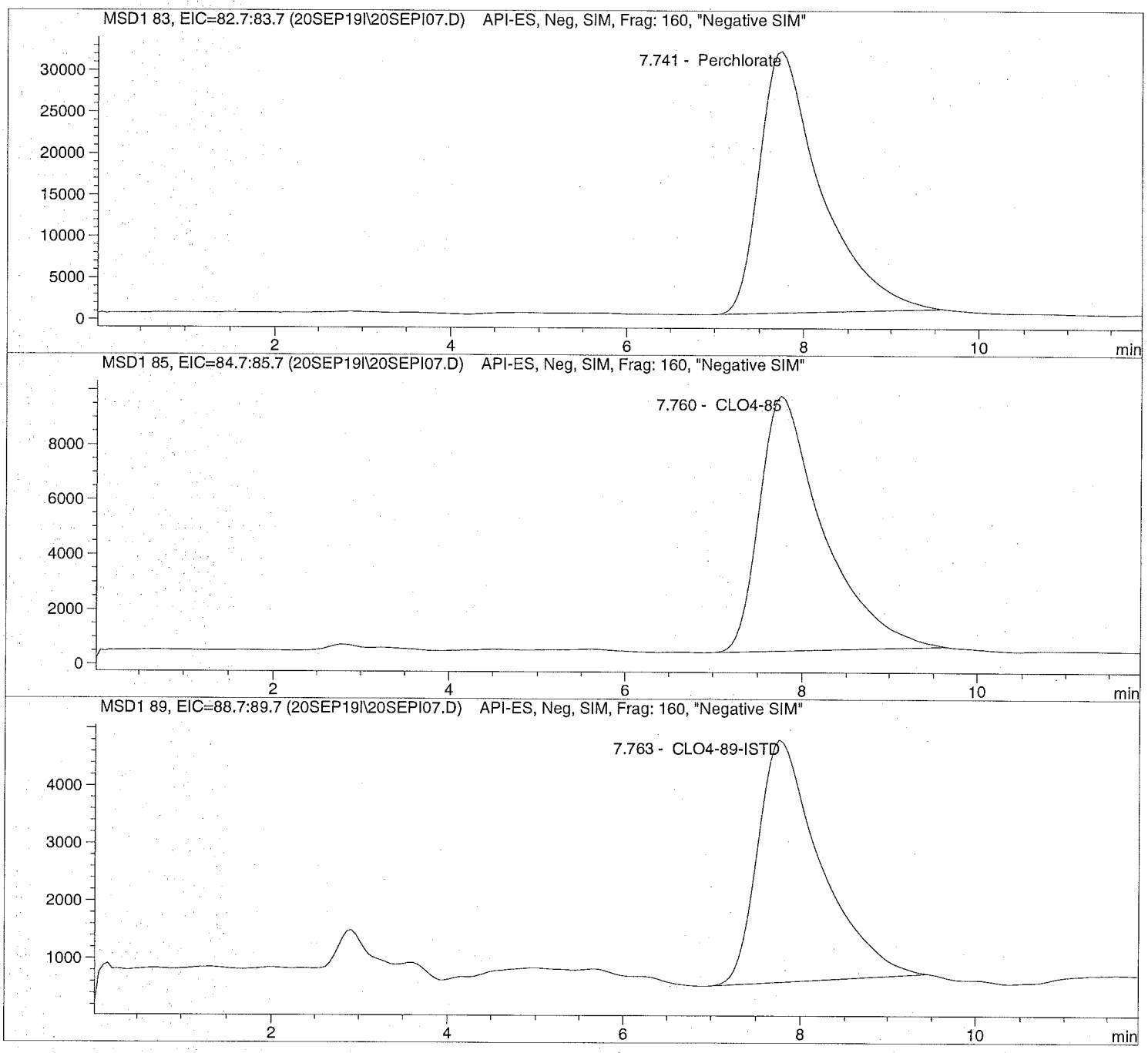
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	9/20/2019 10:19:23	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	9/20/2019 10:19:23	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

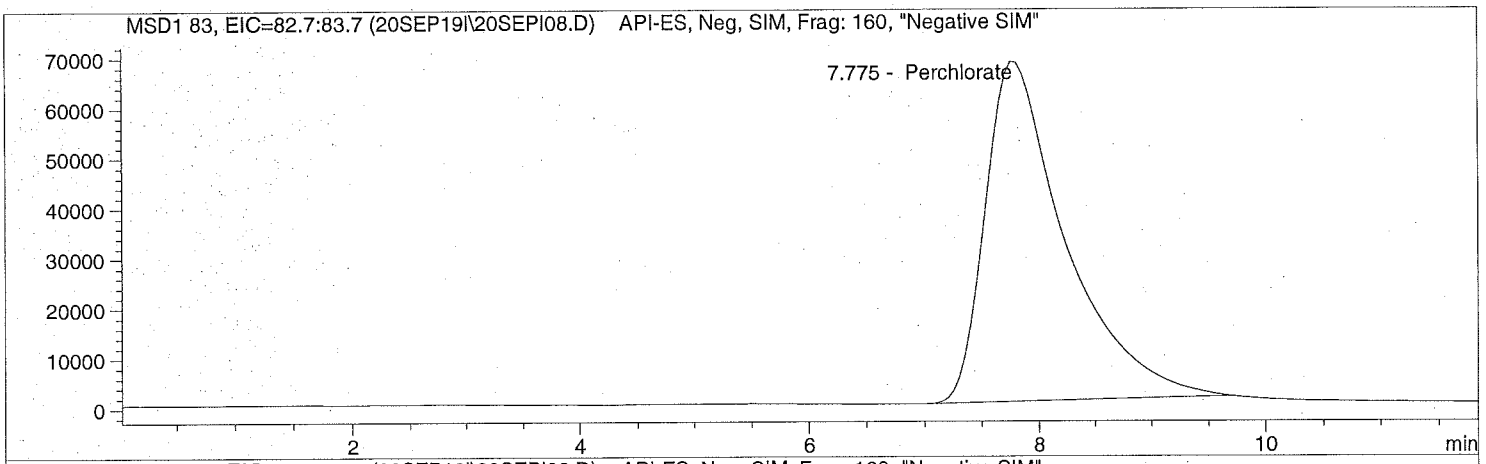
*** End of Report ***

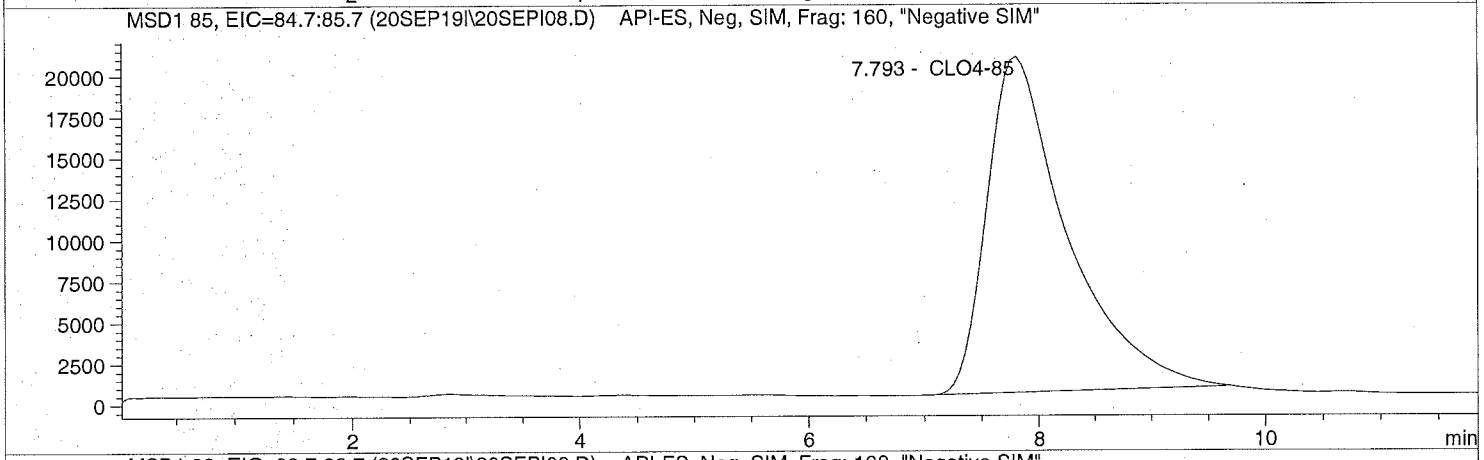
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

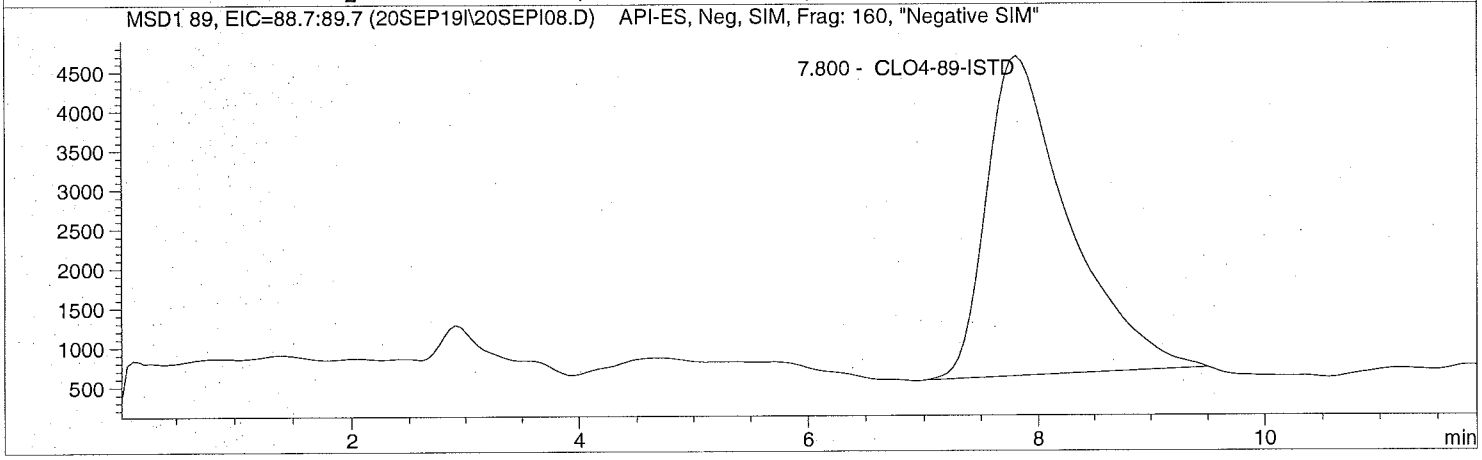
Injection Date:	9/20/2019 10:33:18	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	9/20/2019 10:33:18	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

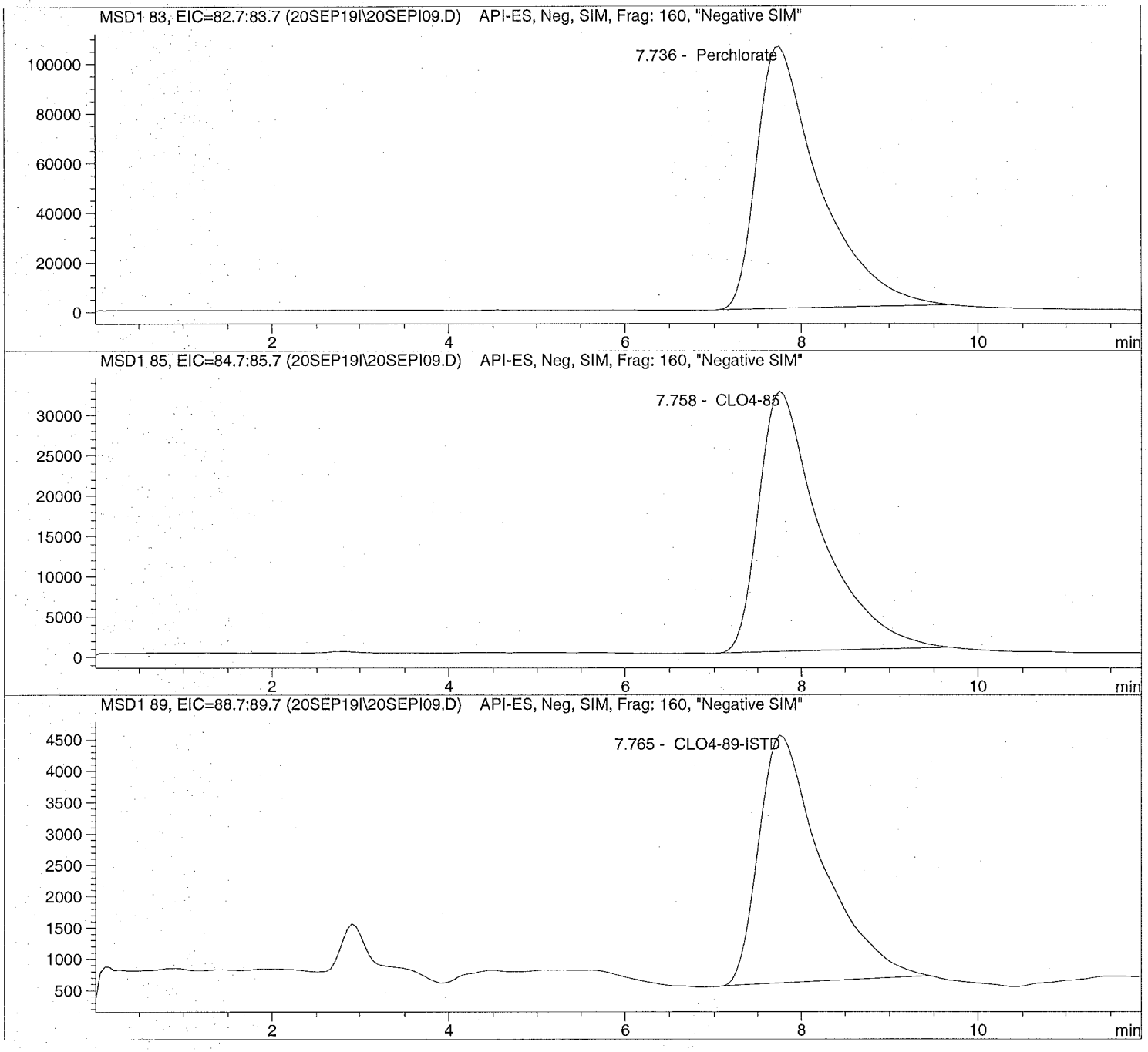
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	9/20/2019 10:47:05	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	9/20/2019 10:47:05	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

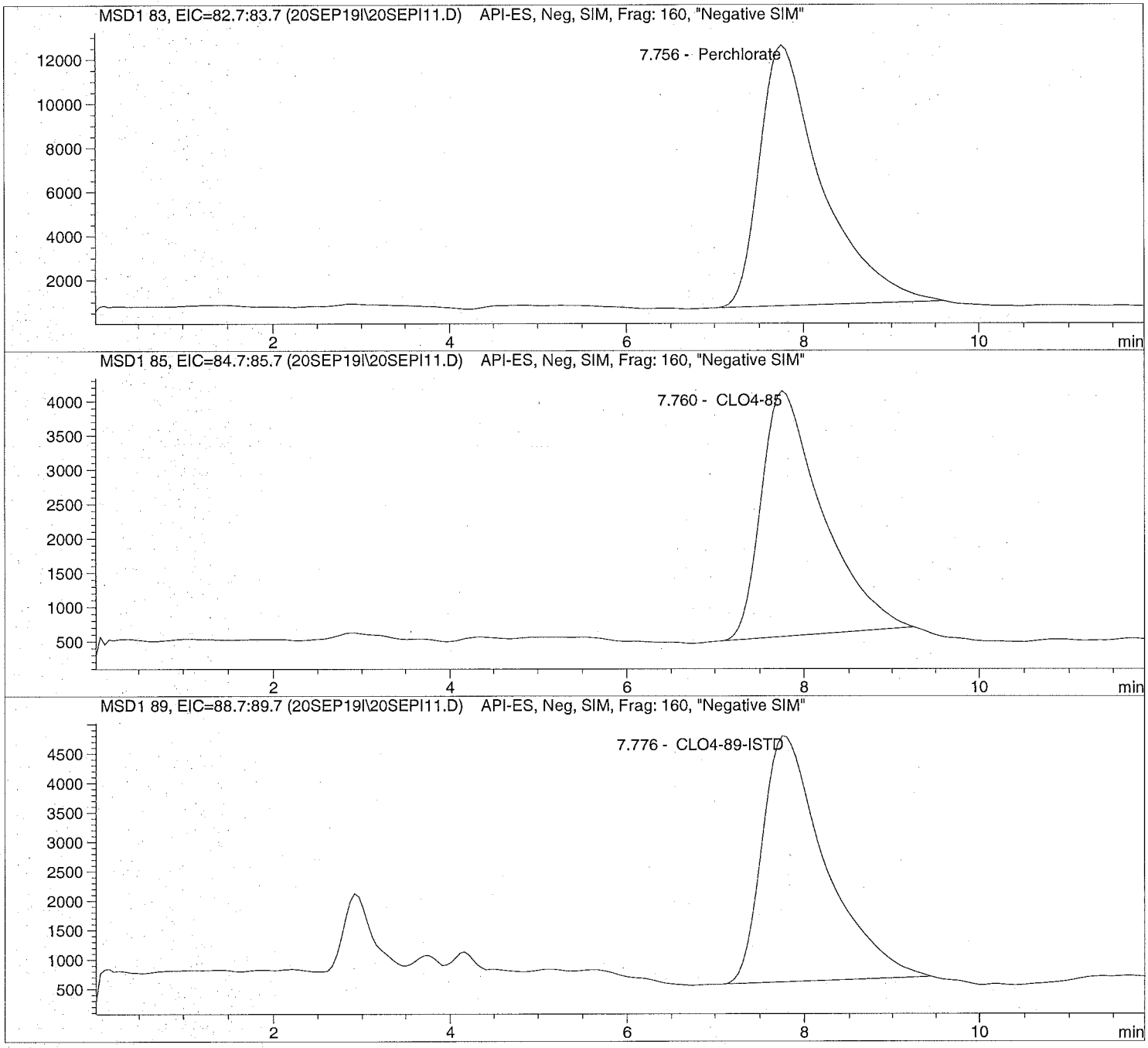
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

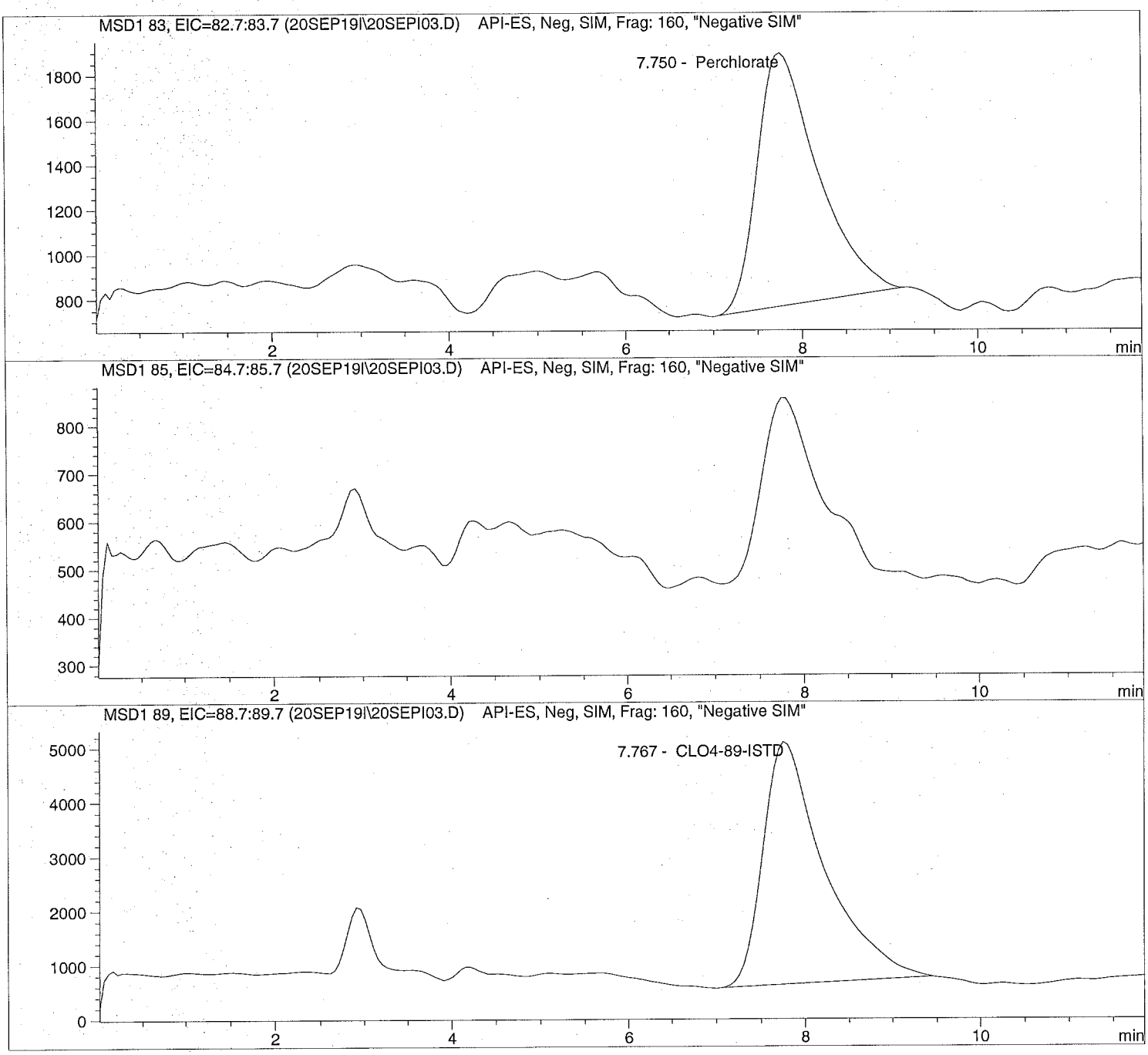
Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

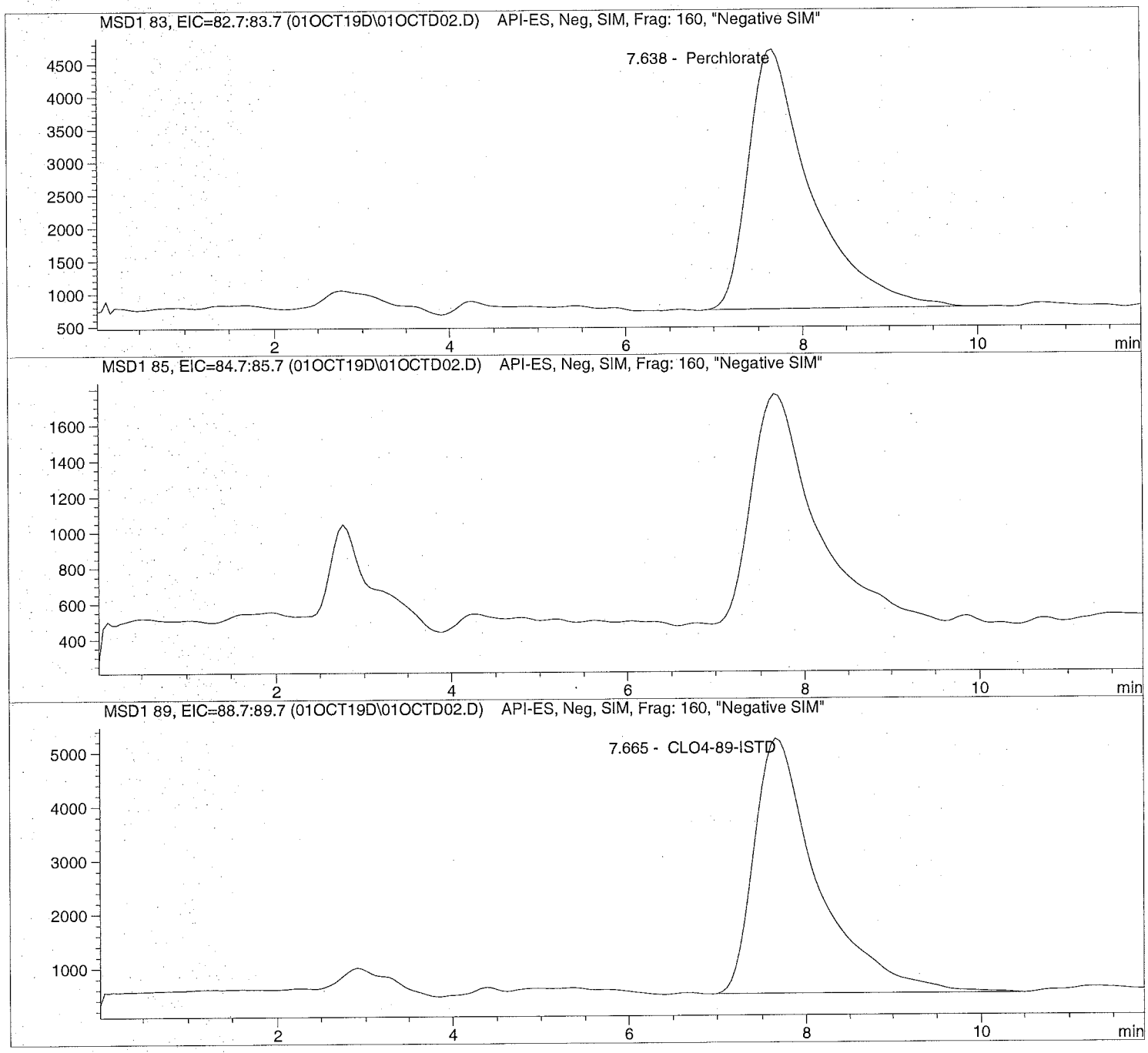
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D Sample Name: 676592 QC@3.0

Injection Date:	10/01/2019 10:56:09	Seq Line:	2
Sample Name:	676592 QC@3.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D Sample Name: 676592 QC@3.0

Injection Date:	10/01/2019 10:56:09	Seq Line:	2
Sample Name:	676592 QC@3.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.638	BB S	195089.7	3.0114	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.665	PB S	238378.3	5.0000	CLO4-89-ISTD

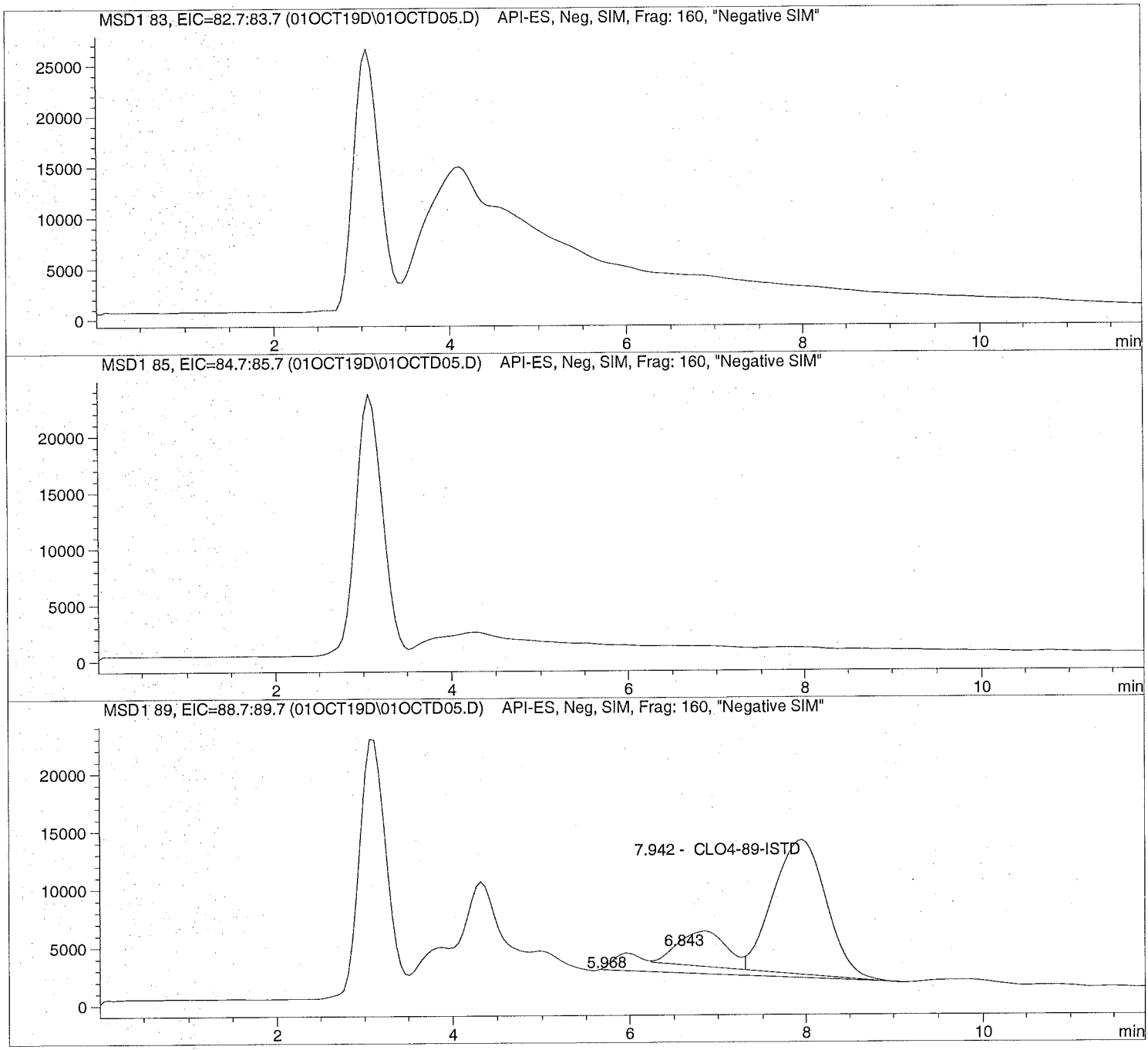
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D Sample Name: 1927220001

Injection Date:	10/01/2019 11:37:35	Seq Line:	5
Sample Name:	1927220001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D Sample Name: 1927220001

Injection Date:	10/01/2019 11:37:35	Seq Line:	5
Sample Name:	1927220001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.968	PB S	100244.2	0.0000	
6.843	BB T	116415.9	0.0000	
7.942	PBAT	488651.6	5.0000	CLO4-89-ISTD

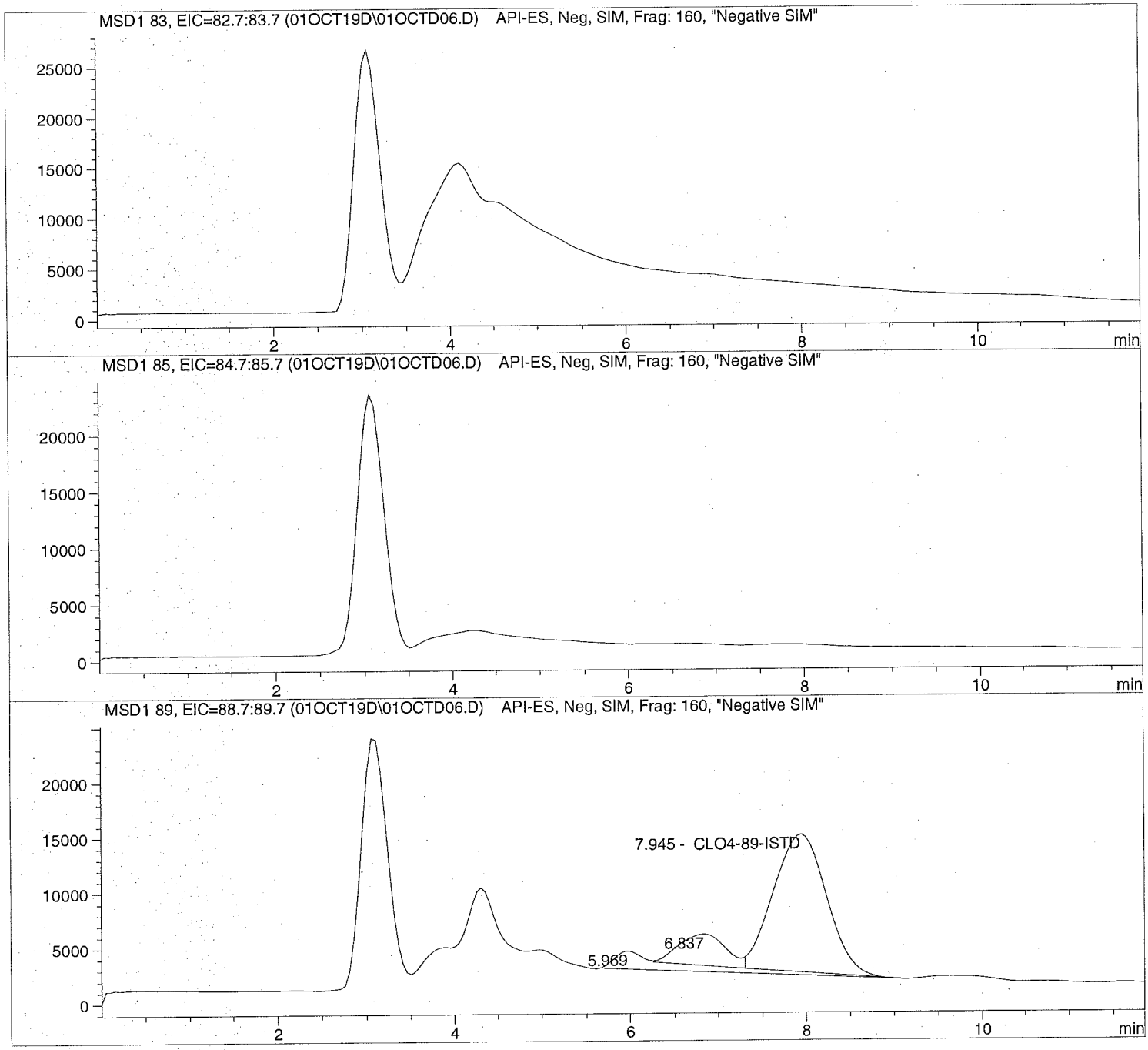
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D Sample Name: 1927220002

Injection Date:	10/01/2019 11:51:24	Seq Line:	6
Sample Name:	1927220002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D Sample Name: 1927220002

Injection Date:	10/01/2019 11:51:24	Seq Line:	6
Sample Name:	1927220002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.969	PB S	94987.9	0.0000	
6.837	BB T	106969.7	0.0000	
7.945	PBAT	520312.7	5.0000	CLO4-89-ISTD

*** End of Report ***

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www.alsglobal.com

September 30, 2019

Analytical Report for Service Request No: K1908781

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

RE: HS19090964

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory September 21, 2019
For your reference, these analyses have been assigned our service request number **K1908781.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS19090964
Sample Matrix: Water

Service Request: K1908781
Date Received: 09/21/2019

CASE NARRATIVE

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

Sample Receipt:

Two water samples were received for analysis at ALS Environmental on 09/21/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 09/30/2019

Chain of Custody

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

K1908781

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12205**

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19090964
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19090964-04**	**16WW58-190918**	**Water**	**18 Sep 2019 14:08**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			27 Sep 2019
2.	**HS19090964-06**	**16WW58-190918-FD**	**Water**	**18 Sep 2019 14:08**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			27 Sep 2019

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

QC Level: DOD IV (DoD Data Package)

HS19090964-04&06 MS/MSD

Relinquished By: _____ Date/Time: 9/20/19 1800.

Received By: _____ Date/Time: 9/21/19 0915

Cooler ID(s): _____ Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 08781

Received: 9-21-19 Opened: 9-21-19 By: NP Unloaded: 9-21-19 By: NP

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.0	0.0	1.1	1.1	0.0	374	12205	1251 0289 7485	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1908781
Project:	HS19090964	**Date Collected:**	09/18/19
Sample Matrix:	Water	**Date Received:**	09/21/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW58-190918	K1908781-001	**4.21**	0.50	0.20	0.07	1	09/26/19 16:43	
16WW58-190918-FD	K1908781-002	**4.27**	0.50	0.20	0.07	1	09/26/19 17:40	
Method Blank	K1908781-MB	ND U	0.50	0.20	0.07	1	09/26/19 15:02	

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1908781
Project	HS19090964	**Date Collected:**	09/18/19
Sample Matrix:	Water	**Date Received:**	09/21/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	LOQ	LOD	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16WW58-190918	K1908781-001DUP	0.50	0.20	0.07	4.21	4.09	4.15	3	10	09/26/19
16WW58-190918-FD	K1908781-002DUP	0.50	0.20	0.07	4.27	4.08	4.17	5	10	09/26/19

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1908781
Project:	HS19090964	**Date Collected:**	09/18/19
Sample Matrix:	Water	**Date Received:**	09/21/19
		Date Analyzed:	09/26/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW58-190918	**Units:**	mg/L
Lab Code:	K1908781-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1908781-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	4.21	27.3	25.0	92	83-117

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1908781
Project:	HS19090964	**Date Collected:**	09/18/19
Sample Matrix:	Water	**Date Received:**	09/21/19
		Date Analyzed:	09/26/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW58-190918-FD	**Units:**	mg/L
Lab Code:	K1908781-002	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1908781-002MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	4.27	27.4	25.0	93	83-117

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1908781
Project:	HS19090964	**Date Analyzed:**	09/26/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	653109

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1908781-LCS	24.8	25.0	99	83-117

Client: ALS Environmental - US **Service Request:** K1908781
Project: HS19090964

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	653109	KQ1913846-09	09/26/19 14:33	25.0	24.0	96	90-110
CCV2	653109	KQ1913846-10	09/26/19 18:08	25.0	23.9	95	90-110
CCV3	653109	KQ1913846-11	09/26/19 22:25	25.0	23.8	95	90-110

Client: ALS Environmental - US **Service Request:**K1908781
Project: HS19090964

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	653109	KQ1913846-12	09/26/19 14:47	0.50	0.20	0.07	ND	U
CCB2	653109	KQ1913846-13	09/26/19 18:23	0.50	0.20	0.07	ND	U
CCB3	653109	KQ1913846-14	09/26/19 22:39	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) KP0878978781, 86B, T1901580

Tier: IV IV I IV

Date Analyzed: 9/26/19

Analyst: BCD

Analysis: TOC/DOC

TOC: 653109
DOC: 653111, 653112, 653113

Run #

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: T1901580-67167d, 64/64d report a high %RPD. However, these samples are less than 5x the MDL

Final Approved by: [signature] Date: 09/30/19

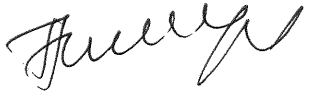
DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653109 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1908780-001	Carbon, Total Organic	N/A		Water	10.90 mg/L	10 mL	10.9 mg/L	1	0.07	0.50			9/26/19 15:46:00	Y	IV
K1908781-001	Carbon, Total Organic	N/A		Water	4.21 mg/L	10 mL	4.21 mg/L	1	0.07	0.50			9/26/19 16:43:00	Y	IV
K1908781-002	Carbon, Total Organic	N/A		Water	4.27 mg/L	10 mL	4.27 mg/L	1	0.07	0.50			9/26/19 17:40:00	Y	IV
KQ1913846-01	Carbon, Total Organic	MS	K1908780-001	Water	32.59 mg/L	10 mL	32.6 mg/L	1	0.07	0.50	87		9/26/19 16:14:00	N	IV
KQ1913846-02	Carbon, Total Organic	MS	K1908781-002	Water	27.42 mg/L	10 mL	27.4 mg/L	1	0.07	0.50	93		9/26/19 18:38:00	N	IV
KQ1913846-03	Carbon, Total Organic	MS	K1908781-001	Water	27.26 mg/L	10 mL	27.3 mg/L	1	0.07	0.50	92		9/26/19 17:11:00	N	IV
KQ1913846-04	Carbon, Total Organic	DUP	K1908781-002	Water	4.08 mg/L	10 mL	4.08 mg/L	1	0.07	0.50		5	9/26/19 17:40:00	N	IV
KQ1913846-05	Carbon, Total Organic	DUP	K1908780-001	Water	10.45 mg/L	10 mL	10.5 mg/L	1	0.07	0.50		4	9/26/19 15:46:00	N	IV
KQ1913846-06	Carbon, Total Organic	DUP	K1908781-001	Water	4.09 mg/L	10 mL	4.09 mg/L	1	0.07	0.50		3	9/26/19 16:43:00	N	IV
KQ1913846-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 15:02:00	N	IV
KQ1913846-08	Carbon, Total Organic	LCS		Water	24.84 mg/L	10 mL	24.8 mg/L	1	0.07	0.50	99		9/26/19 15:17:00	N	IV
KQ1913846-09	Carbon, Total Organic	CCV		Water	24.05 mg/L	10 mL	24.0 mg/L	1					9/26/19 14:33:00	N	IV
KQ1913846-10	Carbon, Total Organic	CCV		Water	23.87 mg/L	10 mL	23.9 mg/L	1					9/26/19 18:08:00	N	IV
KQ1913846-11	Carbon, Total Organic	CCV		Water	23.83 mg/L	10 mL	23.8 mg/L	1					9/26/19 22:25:00	N	IV
KQ1913846-12	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 14:47:00	N	IV
KQ1913846-13	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 18:23:00	N	IV
KQ1913846-14	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 22:39:00	N	IV

09/30/19



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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653111 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1908618-001	Carbon, Dissolved Organic (DOC)	N/A		Water	11.43 mg/L	10 mL	11.4 mg/L	1	0.07	0.50			9/26/19 19:22:00	N	I
KQ1913850-01	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 22:54:00	N	I
KQ1913850-02	Carbon, Dissolved Organic (DOC)	LCS		Water	24.26 mg/L	10 mL	24.3 mg/L	1	0.07	0.50	97		9/26/19 23:09:00	N	I
KQ1913850-03	Carbon, Dissolved Organic (DOC)	MS	T1901580-046	Water	29.38 mg/L	10 mL	29.4 mg/L	1	0.07	0.50	104		9/26/19 22:10:00	N	IV
KQ1913850-04	Carbon, Dissolved Organic (DOC)	DUP	T1901580-060	Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50		1	9/27/19 05:58:00	N	IV
KQ1913850-05	Carbon, Dissolved Organic (DOC)	DUP	T1901580-059	Water	2.32 mg/L	10 mL	2.32 mg/L	1	0.07	0.50		<1	9/27/19 05:30:00	N	IV
KQ1913850-06	Carbon, Dissolved Organic (DOC)	DUP	T1901580-058	Water	2.51 mg/L	10 mL	2.51 mg/L	1	0.07	0.50		<1	9/27/19 05:02:00	N	IV
KQ1913850-07	Carbon, Dissolved Organic (DOC)	DUP	T1901580-057	Water	0.89 mg/L	10 mL	0.89 mg/L	1	0.07	0.50		2	9/27/19 04:34:00	N	IV
KQ1913850-08	Carbon, Dissolved Organic (DOC)	DUP	T1901580-056	Water	2.15 mg/L	10 mL	2.15 mg/L	1	0.07	0.50		<1	9/27/19 04:05:00	N	IV
KQ1913850-09	Carbon, Dissolved Organic (DOC)	DUP	T1901580-055	Water	0.80 mg/L	10 mL	0.80 mg/L	1	0.07	0.50		10	9/27/19 03:37:00	N	IV
KQ1913850-10	Carbon, Dissolved Organic (DOC)	DUP	T1901580-054	Water	1.90 mg/L	10 mL	1.90 mg/L	1	0.07	0.50		3	9/27/19 02:40:00	N	IV
KQ1913850-11	Carbon, Dissolved Organic (DOC)	DUP	T1901580-053	Water	0.80 mg/L	10 mL	0.80 mg/L	1	0.07	0.50		<1	9/27/19 02:12:00	N	IV
KQ1913850-12	Carbon, Dissolved Organic (DOC)	DUP	T1901580-052	Water	1.68 mg/L	10 mL	1.68 mg/L	1	0.07	0.50		2	9/27/19 01:44:00	N	IV
KQ1913850-13	Carbon, Dissolved Organic (DOC)	DUP	T1901580-051	Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50		4	9/27/19 01:16:00	N	IV
KQ1913850-14	Carbon, Dissolved Organic (DOC)	DUP	T1901580-050	Water	3.22 mg/L	10 mL	3.22 mg/L	1	0.07	0.50		<1	9/27/19 00:48:00	N	IV
KQ1913850-15	Carbon, Dissolved Organic (DOC)	DUP	T1901580-049	Water	3.21 mg/L	10 mL	3.21 mg/L	1	0.07	0.50		2	9/27/19 00:19:00	N	IV
KQ1913850-16	Carbon, Dissolved Organic (DOC)	DUP	T1901580-048	Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50		<1	9/26/19 23:51:00	N	IV
KQ1913850-17	Carbon, Dissolved Organic (DOC)	DUP	T1901580-047	Water	3.18 mg/L	10 mL	3.18 mg/L	1	0.07	0.50		2	9/26/19 23:23:00	N	IV
KQ1913850-18	Carbon, Dissolved Organic (DOC)	DUP	T1901580-046	Water	3.31 mg/L	10 mL	3.31 mg/L	1	0.07	0.50		1	9/26/19 21:42:00	N	IV
KQ1913850-19	Carbon, Dissolved Organic (DOC)	DUP	T1901580-045	Water	3.17 mg/L	10 mL	3.17 mg/L	1	0.07	0.50		<1	9/26/19 21:14:00	N	IV
KQ1913850-20	Carbon, Dissolved Organic (DOC)	DUP	T1901580-044	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/26/19 20:46:00	N	IV
KQ1913850-21	Carbon, Dissolved Organic (DOC)	DUP	T1901580-043	Water	2.35 mg/L	10 mL	2.35 mg/L	1	0.07	0.50		2	9/26/19 20:18:00	N	IV
KQ1913850-22	Carbon, Dissolved Organic (DOC)	DUP	T1901580-042	Water	2.69 mg/L	10 mL	2.69 mg/L	1	0.07	0.50		2	9/26/19 19:50:00	N	IV

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

09/30/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653111 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913850-23	Carbon, Dissolved Organic (DOC)	DUP	K1908618-001	Water	11.37 mg/L	10 mL	11.4 mg/L	1	0.07	0.50		<1	9/26/19 19:22:00	N	I
KQ1913850-24	Carbon, Dissolved Organic (DOC)	CCV		Water	23.87 mg/L	10 mL	23.9 mg/L	1					9/26/19 18:08:00	N	I
KQ1913850-25	Carbon, Dissolved Organic (DOC)	CCV		Water	23.83 mg/L	10 mL	23.8 mg/L	1					9/26/19 22:25:00	N	I
KQ1913850-26	Carbon, Dissolved Organic (DOC)	CCV		Water	23.73 mg/L	10 mL	23.7 mg/L	1					9/27/19 03:08:00	N	I
KQ1913850-27	Carbon, Dissolved Organic (DOC)	CCV		Water	23.47 mg/L	10 mL	23.5 mg/L	1					9/27/19 08:05:00	N	I
KQ1913850-28	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 18:23:00	N	I
KQ1913850-29	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 22:39:00	N	I
KQ1913850-30	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 03:22:00	N	I
KQ1913850-31	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 08:20:00	N	I
T1901580-042	Carbon, Dissolved Organic (DOC)	N/A		Water	2.74 mg/L	10 mL	2.74 mg/L	1	0.07	0.50			9/26/19 19:50:00	N	IV
T1901580-043	Carbon, Dissolved Organic (DOC)	N/A		Water	2.39 mg/L	10 mL	2.39 mg/L	1	0.07	0.50			9/26/19 20:18:00	N	IV
T1901580-044	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/26/19 20:46:00	N	IV
T1901580-045	Carbon, Dissolved Organic (DOC)	N/A		Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50			9/26/19 21:14:00	N	IV
T1901580-046	Carbon, Dissolved Organic (DOC)	N/A		Water	3.26 mg/L	10 mL	3.26 mg/L	1	0.07	0.50			9/26/19 21:42:00	N	IV
T1901580-047	Carbon, Dissolved Organic (DOC)	N/A		Water	3.26 mg/L	10 mL	3.26 mg/L	1	0.07	0.50			9/26/19 23:23:00	N	IV
T1901580-048	Carbon, Dissolved Organic (DOC)	N/A		Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50			9/26/19 23:51:00	N	IV
T1901580-049	Carbon, Dissolved Organic (DOC)	N/A		Water	3.14 mg/L	10 mL	3.14 mg/L	1	0.07	0.50			9/27/19 00:19:00	N	IV
T1901580-050	Carbon, Dissolved Organic (DOC)	N/A		Water	3.22 mg/L	10 mL	3.22 mg/L	1	0.07	0.50			9/27/19 00:48:00	N	IV
T1901580-051	Carbon, Dissolved Organic (DOC)	N/A		Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50			9/27/19 01:16:00	N	IV
T1901580-052	Carbon, Dissolved Organic (DOC)	N/A		Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50			9/27/19 01:44:00	N	IV
T1901580-053	Carbon, Dissolved Organic (DOC)	N/A		Water	0.79 mg/L	10 mL	0.79 mg/L	1	0.07	0.50			9/27/19 02:12:00	N	IV
T1901580-054	Carbon, Dissolved Organic (DOC)	N/A		Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			9/27/19 02:40:00	N	IV
T1901580-055	Carbon, Dissolved Organic (DOC)	N/A		Water	0.88 mg/L	10 mL	0.88 mg/L	1	0.07	0.50			9/27/19 03:37:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653111 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
T1901580-056	Carbon, Dissolved Organic (DOC)	N/A		Water	2.14 mg/L	10 mL	2.14 mg/L	1	0.07	0.50			9/27/19 04:05:00	N	IV
T1901580-057	Carbon, Dissolved Organic (DOC)	N/A		Water	0.91 mg/L	10 mL	0.91 mg/L	1	0.07	0.50			9/27/19 04:34:00	N	IV
T1901580-058	Carbon, Dissolved Organic (DOC)	N/A		Water	2.49 mg/L	10 mL	2.49 mg/L	1	0.07	0.50			9/27/19 05:02:00	N	IV
T1901580-059	Carbon, Dissolved Organic (DOC)	N/A		Water	2.32 mg/L	10 mL	2.32 mg/L	1	0.07	0.50			9/27/19 05:30:00	N	IV
T1901580-060	Carbon, Dissolved Organic (DOC)	N/A		Water	2.85 mg/L	10 mL	2.85 mg/L	1	0.07	0.50			9/27/19 05:58:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653112 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913851-01	Carbon, Dissolved Organic (DOC)	MS	T1901580-063	Water	27.05 mg/L	10 mL	27.0 mg/L	1	0.07	0.50	98		9/27/19 07:50:00	N	IV
KQ1913851-02	Carbon, Dissolved Organic (DOC)	DUP	T1901580-080	Water	3.23 mg/L	10 mL	3.23 mg/L	1	0.07	0.50		<1	9/27/19 17:03:00	N	IV
KQ1913851-03	Carbon, Dissolved Organic (DOC)	DUP	T1901580-079	Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50		2	9/27/19 16:35:00	N	IV
KQ1913851-04	Carbon, Dissolved Organic (DOC)	DUP	T1901580-078	Water	2.87 mg/L	10 mL	2.87 mg/L	1	0.07	0.50		<1	9/27/19 16:07:00	N	IV
KQ1913851-05	Carbon, Dissolved Organic (DOC)	DUP	T1901580-077	Water	2.71 mg/L	10 mL	2.71 mg/L	1	0.07	0.50		2	9/27/19 15:39:00	N	IV
KQ1913851-06	Carbon, Dissolved Organic (DOC)	DUP	T1901580-076	Water	0.90 mg/L	10 mL	0.90 mg/L	1	0.07	0.50		2	9/27/19 15:10:00	N	IV
KQ1913851-07	Carbon, Dissolved Organic (DOC)	DUP	T1901580-075	Water	2.23 mg/L	10 mL	2.23 mg/L	1	0.07	0.50		1	9/27/19 14:42:00	N	IV
KQ1913851-08	Carbon, Dissolved Organic (DOC)	DUP	T1901580-074	Water	2.23 mg/L	10 mL	2.23 mg/L	1	0.07	0.50		4	9/27/19 14:14:00	N	IV
KQ1913851-09	Carbon, Dissolved Organic (DOC)	DUP	T1901580-073	Water	0.70 mg/L	10 mL	0.70 mg/L	1	0.07	0.50		2	9/27/19 13:46:00	N	IV
KQ1913851-10	Carbon, Dissolved Organic (DOC)	DUP	T1901580-072	Water	1.76 mg/L	10 mL	1.76 mg/L	1	0.07	0.50		5	9/27/19 13:18:00	N	IV
KQ1913851-11	Carbon, Dissolved Organic (DOC)	DUP	T1901580-071	Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50		<1	9/27/19 12:20:00	N	IV
KQ1913851-12	Carbon, Dissolved Organic (DOC)	DUP	T1901580-070	Water	1.19 mg/L	10 mL	1.19 mg/L	1	0.07	0.50		5	9/27/19 11:52:00	N	IV
KQ1913851-13	Carbon, Dissolved Organic (DOC)	DUP	T1901580-069	Water	0.59 mg/L	10 mL	0.59 mg/L	1	0.07	0.50		2	9/27/19 11:24:00	N	IV
KQ1913851-14	Carbon, Dissolved Organic (DOC)	DUP	T1901580-068	Water	1.01 mg/L	10 mL	1.01 mg/L	1	0.07	0.50		8	9/27/19 10:56:00	N	IV
KQ1913851-15	Carbon, Dissolved Organic (DOC)	DUP	T1901580-067	Water	0.45 mg/L	10 mL	0.45 mg/L J	1	0.07	0.50		16*	9/27/19 10:28:00	N	IV
KQ1913851-16	Carbon, Dissolved Organic (DOC)	DUP	T1901580-066	Water	0.75 mg/L	10 mL	0.75 mg/L	1	0.07	0.50		<1	9/27/19 10:00:00	N	IV
KQ1913851-17	Carbon, Dissolved Organic (DOC)	DUP	T1901580-065	Water	0.46 mg/L	10 mL	0.46 mg/L J	1	0.07	0.50		NC	9/27/19 09:32:00	N	IV
KQ1913851-18	Carbon, Dissolved Organic (DOC)	DUP	T1901580-064	Water	0.61 mg/L	10 mL	0.61 mg/L	1	0.07	0.50		19*	9/27/19 09:04:00	N	IV
KQ1913851-19	Carbon, Dissolved Organic (DOC)	DUP	T1901580-063	Water	2.70 mg/L	10 mL	2.70 mg/L	1	0.07	0.50		2	9/27/19 07:22:00	N	IV
KQ1913851-20	Carbon, Dissolved Organic (DOC)	DUP	T1901580-062	Water	2.80 mg/L	10 mL	2.80 mg/L	1	0.07	0.50		2	9/27/19 06:54:00	N	IV
KQ1913851-21	Carbon, Dissolved Organic (DOC)	DUP	T1901580-061	Water	2.41 mg/L	10 mL	2.41 mg/L	1	0.07	0.50		3	9/27/19 06:26:00	N	IV
KQ1913851-22	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 08:34:00	N	IV
KQ1913851-23	Carbon, Dissolved Organic (DOC)	LCS		Water	24.09 mg/L	10 mL	24.1 mg/L	1	0.07	0.50	96		9/27/19 08:49:00	N	IV

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

09/30/19

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Results Summary

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653112 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913851-24	Carbon, Dissolved Organic (DOC)	CCV		Water	23.73 mg/L	10 mL	23.7 mg/L	1					9/27/19 03:08:00	N	IV
KQ1913851-25	Carbon, Dissolved Organic (DOC)	CCV		Water	23.47 mg/L	10 mL	23.5 mg/L	1					9/27/19 08:05:00	N	IV
KQ1913851-26	Carbon, Dissolved Organic (DOC)	CCV		Water	24.13 mg/L	10 mL	24.1 mg/L	1					9/27/19 12:49:00	N	IV
KQ1913851-27	Carbon, Dissolved Organic (DOC)	CCV		Water	23.64 mg/L	10 mL	23.6 mg/L	1					9/27/19 17:59:00	N	IV
KQ1913851-29	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 03:22:00	N	IV
KQ1913851-30	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 08:20:00	N	IV
KQ1913851-31	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 13:03:00	N	IV
KQ1913851-32	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 18:14:00	N	IV
T1901580-061	Carbon, Dissolved Organic (DOC)	N/A		Water	2.34 mg/L	10 mL	2.34 mg/L	1	0.07	0.50			9/27/19 06:26:00	N	IV
T1901580-062	Carbon, Dissolved Organic (DOC)	N/A		Water	2.85 mg/L	10 mL	2.85 mg/L	1	0.07	0.50			9/27/19 06:54:00	N	IV
T1901580-063	Carbon, Dissolved Organic (DOC)	N/A		Water	2.64 mg/L	10 mL	2.64 mg/L	1	0.07	0.50			9/27/19 07:22:00	N	IV
T1901580-064	Carbon, Dissolved Organic (DOC)	N/A		Water	0.73 mg/L	10 mL	0.73 mg/L	1	0.07	0.50			9/27/19 09:04:00	N	IV
T1901580-065	Carbon, Dissolved Organic (DOC)	N/A		Water	0.46 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 09:32:00	N	IV
T1901580-066	Carbon, Dissolved Organic (DOC)	N/A		Water	0.74 mg/L	10 mL	0.74 mg/L	1	0.07	0.50			9/27/19 10:00:00	N	IV
T1901580-067	Carbon, Dissolved Organic (DOC)	N/A		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			9/27/19 10:28:00	N	IV
T1901580-068	Carbon, Dissolved Organic (DOC)	N/A		Water	0.93 mg/L	10 mL	0.93 mg/L	1	0.07	0.50			9/27/19 10:56:00	N	IV
T1901580-069	Carbon, Dissolved Organic (DOC)	N/A		Water	0.60 mg/L	10 mL	0.60 mg/L	1	0.07	0.50			9/27/19 11:24:00	N	IV
T1901580-070	Carbon, Dissolved Organic (DOC)	N/A		Water	1.12 mg/L	10 mL	1.12 mg/L	1	0.07	0.50			9/27/19 11:52:00	N	IV
T1901580-071	Carbon, Dissolved Organic (DOC)	N/A		Water	0.61 mg/L	10 mL	0.61 mg/L	1	0.07	0.50			9/27/19 12:20:00	N	IV
T1901580-072	Carbon, Dissolved Organic (DOC)	N/A		Water	1.85 mg/L	10 mL	1.85 mg/L	1	0.07	0.50			9/27/19 13:18:00	N	IV
T1901580-073	Carbon, Dissolved Organic (DOC)	N/A		Water	0.71 mg/L	10 mL	0.71 mg/L	1	0.07	0.50			9/27/19 13:46:00	N	IV
T1901580-074	Carbon, Dissolved Organic (DOC)	N/A		Water	2.31 mg/L	10 mL	2.31 mg/L	1	0.07	0.50			9/27/19 14:14:00	N	IV
T1901580-075	Carbon, Dissolved Organic (DOC)	N/A		Water	2.25 mg/L	10 mL	2.25 mg/L	1	0.07	0.50			9/27/19 14:42:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653112 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
T1901580-076	Carbon, Dissolved Organic (DOC)	N/A		Water	0.88 mg/L	10 mL	0.88 mg/L	1	0.07	0.50			9/27/19 15:10:00	N	IV
T1901580-077	Carbon, Dissolved Organic (DOC)	N/A		Water	2.67 mg/L	10 mL	2.67 mg/L	1	0.07	0.50			9/27/19 15:39:00	N	IV
T1901580-078	Carbon, Dissolved Organic (DOC)	N/A		Water	2.85 mg/L	10 mL	2.85 mg/L	1	0.07	0.50			9/27/19 16:07:00	N	IV
T1901580-079	Carbon, Dissolved Organic (DOC)	N/A		Water	3.25 mg/L	10 mL	3.25 mg/L	1	0.07	0.50			9/27/19 16:35:00	N	IV
T1901580-080	Carbon, Dissolved Organic (DOC)	N/A		Water	3.23 mg/L	10 mL	3.23 mg/L	1	0.07	0.50			9/27/19 17:03:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653113 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913852-01	Carbon, Dissolved Organic (DOC)	MS	T1901580-091	Water	28.88 mg/L	10 mL	28.9 mg/L	1	0.07	0.50	103		9/28/19 00:08:00	N	IV
KQ1913852-02	Carbon, Dissolved Organic (DOC)	DUP	T1901580-096	Water	2.98 mg/L	10 mL	2.98 mg/L	1	0.07	0.50		2	9/28/19 02:30:00	N	IV
KQ1913852-03	Carbon, Dissolved Organic (DOC)	DUP	T1901580-095	Water	3.11 mg/L	10 mL	3.11 mg/L	1	0.07	0.50		1	9/28/19 02:02:00	N	IV
KQ1913852-04	Carbon, Dissolved Organic (DOC)	DUP	T1901580-094	Water	2.90 mg/L	10 mL	2.90 mg/L	1	0.07	0.50		<1	9/28/19 01:34:00	N	IV
KQ1913852-05	Carbon, Dissolved Organic (DOC)	DUP	T1901580-093	Water	3.19 mg/L	10 mL	3.19 mg/L	1	0.07	0.50		<1	9/28/19 01:06:00	N	IV
KQ1913852-06	Carbon, Dissolved Organic (DOC)	DUP	T1901580-092	Water	3.01 mg/L	10 mL	3.01 mg/L	1	0.07	0.50		<1	9/28/19 00:38:00	N	IV
KQ1913852-07	Carbon, Dissolved Organic (DOC)	DUP	T1901580-091	Water	3.16 mg/L	10 mL	3.16 mg/L	1	0.07	0.50		<1	9/27/19 23:40:00	N	IV
KQ1913852-08	Carbon, Dissolved Organic (DOC)	DUP	T1901580-090	Water	2.09 mg/L	10 mL	2.09 mg/L	1	0.07	0.50		3	9/27/19 23:12:00	N	IV
KQ1913852-09	Carbon, Dissolved Organic (DOC)	DUP	T1901580-089	Water	2.14 mg/L	10 mL	2.14 mg/L	1	0.07	0.50		2	9/27/19 22:15:00	N	IV
KQ1913852-10	Carbon, Dissolved Organic (DOC)	DUP	T1901580-088	Water	1.95 mg/L	10 mL	1.95 mg/L	1	0.07	0.50		2	9/27/19 21:46:00	N	IV
KQ1913852-11	Carbon, Dissolved Organic (DOC)	DUP	T1901580-087	Water	2.30 mg/L	10 mL	2.30 mg/L	1	0.07	0.50		5	9/27/19 21:18:00	N	IV
KQ1913852-12	Carbon, Dissolved Organic (DOC)	DUP	T1901580-086	Water	1.52 mg/L	10 mL	1.52 mg/L	1	0.07	0.50		<1	9/27/19 20:50:00	N	IV
KQ1913852-13	Carbon, Dissolved Organic (DOC)	DUP	T1901580-085	Water	2.39 mg/L	10 mL	2.39 mg/L	1	0.07	0.50		<1	9/27/19 20:22:00	N	IV
KQ1913852-14	Carbon, Dissolved Organic (DOC)	DUP	T1901580-084	Water	3.30 mg/L	10 mL	3.30 mg/L	1	0.07	0.50		<1	9/27/19 19:54:00	N	IV
KQ1913852-15	Carbon, Dissolved Organic (DOC)	DUP	T1901580-083	Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50		2	9/27/19 19:26:00	N	IV
KQ1913852-16	Carbon, Dissolved Organic (DOC)	DUP	T1901580-082	Water	3.23 mg/L	10 mL	3.23 mg/L	1	0.07	0.50		3	9/27/19 18:58:00	N	IV
KQ1913852-17	Carbon, Dissolved Organic (DOC)	DUP	T1901580-081	Water	3.32 mg/L	10 mL	3.32 mg/L	1	0.07	0.50		1	9/27/19 17:31:00	N	IV
KQ1913852-18	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 18:28:00	N	IV
KQ1913852-19	Carbon, Dissolved Organic (DOC)	LCS		Water	24.35 mg/L	10 mL	24.4 mg/L	1	0.07	0.50	97		9/27/19 18:43:00	N	IV
KQ1913852-20	Carbon, Dissolved Organic (DOC)	CCV		Water	24.13 mg/L	10 mL	24.1 mg/L	1					9/27/19 12:49:00	N	IV
KQ1913852-21	Carbon, Dissolved Organic (DOC)	CCV		Water	23.64 mg/L	10 mL	23.6 mg/L	1					9/27/19 17:59:00	N	IV
KQ1913852-22	Carbon, Dissolved Organic (DOC)	CCV		Water	23.39 mg/L	10 mL	23.4 mg/L	1					9/27/19 22:43:00	N	IV
KQ1913852-23	Carbon, Dissolved Organic (DOC)	CCV		Water	23.31 mg/L	10 mL	23.3 mg/L	1					9/28/19 02:58:00	N	IV

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

09/30/19

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Results Summary

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 653113 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913852-24	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 13:03:00	N	IV
KQ1913852-25	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 18:14:00	N	IV
KQ1913852-26	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/27/19 22:57:00	N	IV
KQ1913852-27	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/28/19 03:13:00	N	IV
T1901580-081	Carbon, Dissolved Organic (DOC)	N/A		Water	3.36 mg/L	10 mL	3.36 mg/L	1	0.07	0.50			9/27/19 17:31:00	N	IV
T1901580-082	Carbon, Dissolved Organic (DOC)	N/A		Water	3.34 mg/L	10 mL	3.34 mg/L	1	0.07	0.50			9/27/19 18:58:00	N	IV
T1901580-083	Carbon, Dissolved Organic (DOC)	N/A		Water	3.34 mg/L	10 mL	3.34 mg/L	1	0.07	0.50			9/27/19 19:26:00	N	IV
T1901580-084	Carbon, Dissolved Organic (DOC)	N/A		Water	3.30 mg/L	10 mL	3.30 mg/L	1	0.07	0.50			9/27/19 19:54:00	N	IV
T1901580-085	Carbon, Dissolved Organic (DOC)	N/A		Water	2.37 mg/L	10 mL	2.37 mg/L	1	0.07	0.50			9/27/19 20:22:00	N	IV
T1901580-086	Carbon, Dissolved Organic (DOC)	N/A		Water	1.51 mg/L	10 mL	1.51 mg/L	1	0.07	0.50			9/27/19 20:50:00	N	IV
T1901580-087	Carbon, Dissolved Organic (DOC)	N/A		Water	2.20 mg/L	10 mL	2.20 mg/L	1	0.07	0.50			9/27/19 21:18:00	N	IV
T1901580-088	Carbon, Dissolved Organic (DOC)	N/A		Water	1.99 mg/L	10 mL	1.99 mg/L	1	0.07	0.50			9/27/19 21:46:00	N	IV
T1901580-089	Carbon, Dissolved Organic (DOC)	N/A		Water	2.17 mg/L	10 mL	2.17 mg/L	1	0.07	0.50			9/27/19 22:15:00	N	IV
T1901580-090	Carbon, Dissolved Organic (DOC)	N/A		Water	2.16 mg/L	10 mL	2.16 mg/L	1	0.07	0.50			9/27/19 23:12:00	N	IV
T1901580-091	Carbon, Dissolved Organic (DOC)	N/A		Water	3.14 mg/L	10 mL	3.14 mg/L	1	0.07	0.50			9/27/19 23:40:00	N	IV
T1901580-092	Carbon, Dissolved Organic (DOC)	N/A		Water	3.00 mg/L	10 mL	3.00 mg/L	1	0.07	0.50			9/28/19 00:38:00	N	IV
T1901580-093	Carbon, Dissolved Organic (DOC)	N/A		Water	3.22 mg/L	10 mL	3.22 mg/L	1	0.07	0.50			9/28/19 01:06:00	N	IV
T1901580-094	Carbon, Dissolved Organic (DOC)	N/A		Water	2.92 mg/L	10 mL	2.92 mg/L	1	0.07	0.50			9/28/19 01:34:00	N	IV
T1901580-095	Carbon, Dissolved Organic (DOC)	N/A		Water	3.14 mg/L	10 mL	3.14 mg/L	1	0.07	0.50			9/28/19 02:02:00	N	IV
T1901580-096	Carbon, Dissolved Organic (DOC)	N/A		Water	3.04 mg/L	10 mL	3.04 mg/L	1	0.07	0.50			9/28/19 02:30:00	N	IV

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

TOC: 653109
DOC: 653111,
653112,
653113

Schedule: 9262019

Version: 5
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/09/26 14:18 - Thursday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1908780-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1908780-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	rb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1908781-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1908781-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	rb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
9	Sample	K1908781-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1908781-002.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
11	Sample	rb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
12	Sample	fb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
13	Sample	k1908618-1 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	T1901580-042.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	T1901580-043.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	T1901580-044.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	T1901580-045.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	T1901580-046.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	T1901580-046.06 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	T1901580-047.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	T1901580-048.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	T1901580-049.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	T1901580-050.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	T1901580-051.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	T1901580-052.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	T1901580-053.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	T1901580-054.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	T1901580-055.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	T1901580-056.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	T1901580-057.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	T1901580-058.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	T1901580-059.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	T1901580-060.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	T1901580-061.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	T1901580-062.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	T1901580-063.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	T1901580-063.05 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

09/30/19

Schedule: 9262019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	T1901580-064.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	T1901580-065.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	T1901580-066.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	T1901580-067.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	T1901580-068.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	T1901580-069.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	T1901580-070.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	T1901580-071.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	T1901580-072.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	T1901580-073.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	T1901580-074.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	T1901580-075.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	T1901580-076.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	T1901580-077.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	T1901580-078.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	T1901580-079.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	T1901580-080.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	T1901580-081.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	T1901580-082.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	T1901580-083.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	T1901580-084.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	T1901580-085.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	T1901580-086.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	T1901580-087.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	T1901580-088.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	T1901580-089.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	T1901580-090.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	T1901580-091.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	T1901580-091.06 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
70	Sample	rb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
71	Sample	T1901580-092.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	T1901580-093.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	T1901580-094.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	T1901580-095.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	T1901580-096.06 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 9262019
Thursday, September 26, 2019 12:37 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/09/28 08:47 - Saturday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	9262019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5)		
Comment:			

09/30/19

Report Results

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/09/26 12:37

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.14	16.79	3.65	49.73	05:25
2	TC Clean	8.74	12.32	3.59	50.04	04:04
3	TC Clean	4.64	8.22	3.58	50.08	03:50
4	TC Clean	3.02	6.49	3.47	50.09	03:49

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/09/26 12:59

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.03	4.58	3.56	49.72	05:13
2	TC Clean	9.28	12.97	3.69	50.07	04:01
3	TC Clean	3.50	7.22	3.72	50.09	03:48

4	TC Clean	2.13	5.64	3.51	50.02	03:54

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/09/26 13:22

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	8.52	11.95	3.43	49.75	05:24
2	TC Clean	5.19	8.77	3.58	50.05	04:05
3	TC Clean	2.80	6.46	3.66	50.09	03:50
4	TC Clean	1.78	5.40	3.62	50.05	03:56

Sample Type: Blank (Creating v1299) — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/09/26 13:44

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.78	14.36	3.58	49.75	05:22
2	TC Clean	5.36	8.94	3.58	50.06	04:01
3	TC Clean	3.23	6.83	3.59	50.06	03:42
4	TC Clean	1.99	5.80	3.81	50.10	03:49
5	Reagent Blank	3.25	6.96	3.71	50.03	05:04
6	Acid Blank	0.92	4.60	3.68	49.92	05:32

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.5217 ppm	0.0000 ppm	0.0000%	2019/09/26 14:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5217	5.2166	12.27	15.92	3.65	50.11	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0485 ppm (PASS)	0.0000 ppm	0%	2019/09/26 14:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0485	240.4846	172.70	176.21	3.51	50.22	10:34

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/26 14:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.98	10.59	3.61	50.25	10:30

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 15:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.25	9.74	3.48	50.20	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.8388 ppm (PASS)	0.0000 ppm	0%	2019/09/26 15:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.8388	248.3883	178.07	181.82	3.75	50.26	10:32

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0992 ppm	0.0000 ppm	0.0000%	2019/09/26 15:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0992	0.9915	9.41	13.18	3.77	50.27	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1908780-001.01	10.6789 ppm	0.3175 ppm	2.9700%	2019/09/26 15:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.9035	109.0346	82.74	86.33	3.58	50.25	10:30
2	TOC	10.4544	104.5443	79.70	83.19	3.49	50.30	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1908780-001.01 ms	32.5859 ppm	0.0000 ppm	0.0000%	2019/09/26 16:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.5859	325.8588	229.92	233.49	3.57	50.32	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	rb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 16:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.30	9.75	3.45	50.27	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC)	CAS_salt_010711	CAS_salt_010711

(v1299) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1908781-001.01	4.1457 ppm	0.0854 ppm	2.0600%	2019/09/26 16:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2061	42.0614	37.28	40.95	3.66	50.30	10:27
2	TOC	4.0853	40.8534	36.46	40.05	3.58	50.27	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1908781-001.01 ms	27.2625 ppm	0.0000 ppm	0.0000%	2019/09/26 17:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.2625	272.6247	193.79	197.44	3.65	50.26	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	rb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 17:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.91	9.51	3.60	50.32	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1908781-002.01	4.1727 ppm	0.1375 ppm	3.3000%	2019/09/26 17:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2699	42.6993	37.72	41.38	3.66	50.30	10:26
2	TOC	4.0755	40.7547	36.40	39.93	3.53	50.31	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8733 ppm	0.0000 ppm	0%	2019/09/26 18:08

							(PASS)				

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8733	238.7329	171.51	175.12	3.61	50.35	10:33

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/26 18:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.49	9.18	3.69	50.28	10:31

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1908781-002.01 ms	27.4195 ppm	0.0000 ppm	0.0000%	2019/09/26 18:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.4195	274.1951	194.86	198.39	3.53	50.32	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	rb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 18:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.39	8.96	3.57	50.28	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	fb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 19:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.15	8.61	3.45	50.24	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	k1908618-1 doc	11.3985 ppm	0.0454 ppm	0.4000%	2019/09/26 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.4306	114.3057	86.32	89.86	3.54	50.20	10:26
2	TOC	11.3663	113.6634	85.89	89.64	3.75	50.18	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	T1901580-042.04 doc	2.7172 ppm	0.0335 ppm	1.2300%	2019/09/26 19:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7409	27.4089	27.34	31.02	3.69	50.16	10:29
2	TOC	2.6935	26.9346	27.02	30.61	3.59	50.17	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	T1901580-043.04 doc	2.3677 ppm	0.0295 ppm	1.2500%	2019/09/26 20:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3885	23.8850	24.95	28.33	3.38	50.14	10:29
2	TOC	2.3468	23.4681	24.66	28.20	3.54	50.16	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	T1901580-044.04 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 20:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.16	9.61	3.45	50.15	10:32
2	TOC	0.0000	0.0000	6.03	9.52	3.49	50.15	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	T1901580-045.04 doc	3.1883 ppm	0.0215 ppm	0.6700%	2019/09/26 21:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2035	32.0348	30.48	34.01	3.54	50.16	10:25
2	TOC	3.1731	31.7313	30.27	33.76	3.49	50.16	10:27

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	T1901580-046.06 doc	3.2843 ppm	0.0334 ppm	1.0200%	2019/09/26 21:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2606	32.6064	30.87	34.29	3.42	50.15	10:28
2	TOC	3.3079	33.0793	31.19	34.58	3.40	50.15	10:24

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	T1901580-046.06 ms doc	29.3793 ppm	0.0000 ppm	0.0000%	2019/09/26 22:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.3793	293.7931	208.16	211.59	3.43	50.16	10:30

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8262 ppm (PASS)	0.0000 ppm	0%	2019/09/26 22:25

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8262	238.2615	171.19	174.87	3.68	50.18	10:34

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

Sample Type: Check Standard --> CCB — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/26 22:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.92	9.64	3.73	50.17	10:34

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/26 22:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.86	8.66	3.81	50.18	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.2630 ppm (PASS)	0.0000 ppm	0%	2019/09/26 23:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.2630	242.6296	174.16	177.74	3.58	50.17	10:31

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	T1901580-047.04 doc	3.2183 ppm	0.0549 ppm	1.7100%	2019/09/26 23:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2571	32.5710	30.84	34.57	3.73	50.19	10:25

2	TOC	3.1795	31.7947	30.32	33.86	3.55	50.20	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	T1901580-048.04 doc	3.1974 ppm	0.0016 ppm	0.0500%	2019/09/26 23:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1985	31.9847	30.44	33.94	3.49	50.20	10:27
2	TOC	3.1963	31.9626	30.43	34.21	3.78	50.19	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	T1901580-049.04 doc	3.1742 ppm	0.0552 ppm	1.7400%	2019/09/27 00:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1351	31.3512	30.01	33.61	3.59	50.20	10:29
2	TOC	3.2132	32.1320	30.54	34.02	3.48	50.21	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	T1901580-050.04 doc	3.2210 ppm	0.0002 ppm	0.0100%	2019/09/27 00:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2212	32.2116	30.60	34.04	3.44	50.22	10:28
2	TOC	3.2209	32.2086	30.60	34.28	3.68	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	T1901580-051.06 doc	1.5612 ppm	0.0449 ppm	2.8800%	2019/09/27 01:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5295	15.2948	19.12	22.66	3.54	50.27	10:31
2	TOC	1.5930	15.9298	19.55	23.09	3.54	50.26	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	26	TOC	T1901580-052.04 doc	1.6600 ppm	0.0227 ppm	1.3700%	2019/09/27 01:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6439	16.4395	19.89	23.34	3.45	50.28	10:27
2	TOC	1.6761	16.7606	20.11	23.70	3.59	50.31	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	T1901580-053.04 doc	0.7946 ppm	0.0035 ppm	0.4500%	2019/09/27 02:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7921	7.9214	14.11	17.59	3.48	50.31	10:28
2	TOC	0.7972	7.9715	14.14	17.60	3.46	50.32	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	T1901580-054.04 doc	1.9312 ppm	0.0381 ppm	1.9700%	2019/09/27 02:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9582	19.5818	22.02	25.65	3.62	50.35	10:28
2	TOC	1.9043	19.0426	21.66	25.32	3.66	50.36	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.7261 ppm (PASS)	0.0000 ppm	0%	2019/09/27 03:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7261	237.2612	170.51	174.03	3.51	50.38	10:30

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

Sample Type: Check Standard --> CCB From Schedule Version 5

			Concentration			Min / Max				

	Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 03:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.61	9.21	3.60	50.39	10:34

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	T1901580-055.04 doc	0.8421 ppm	0.0604 ppm	7.1700%	2019/09/27 03:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8848	8.8481	14.74	18.24	3.51	50.40	10:26
2	TOC	0.7994	7.9936	14.16	17.89	3.73	50.41	10:29

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	T1901580-056.04 doc	2.1449 ppm	0.0139 ppm	0.6500%	2019/09/27 04:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1351	21.3511	23.23	26.69	3.46	50.44	10:31
2	TOC	2.1547	21.5471	23.36	26.88	3.52	50.43	10:27

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	T1901580-057.04 doc	0.9001 ppm	0.0134 ppm	1.4900%	2019/09/27 04:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9096	9.0956	14.91	18.27	3.36	50.47	10:28
2	TOC	0.8906	8.9055	14.78	18.18	3.40	50.48	10:29

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	T1901580-058.04 doc	2.5001 ppm	0.0159 ppm	0.6400%	2019/09/27 05:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4888	24.8883	25.63	29.15	3.52	50.49	10:28
2	TOC	2.5114	25.1137	25.78	29.36	3.58	50.50	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	T1901580-059.04 doc	2.3192 ppm	0.0028 ppm	0.1200%	2019/09/27 05:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3172	23.1720	24.46	28.02	3.56	50.50	10:25
2	TOC	2.3212	23.2118	24.49	28.07	3.58	50.49	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	T1901580-060.04 doc	2.8313 ppm	0.0293 ppm	1.0300%	2019/09/27 05:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8520	28.5197	28.09	31.50	3.41	50.51	10:27
2	TOC	2.8106	28.1058	27.81	31.29	3.48	50.51	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	T1901580-061.04 doc	2.3749 ppm	0.0451 ppm	1.9000%	2019/09/27 06:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3430	23.4298	24.64	28.33	3.70	50.50	10:29
2	TOC	2.4068	24.0677	25.07	28.64	3.57	50.52	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	T1901580-062.04 doc	2.8271 ppm	0.0360 ppm	1.2700%	2019/09/27 06:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8526	28.5256	28.10	31.72	3.62	50.51	10:27
2	TOC	2.8016	28.0159	27.75	31.30	3.55	50.51	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC)	CAS_salt_010711	CAS_salt_010711

(v1299) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	T1901580-063.05 doc	2.6698 ppm	0.0370 ppm	1.3900%	2019/09/27 07:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6437	26.4366	26.68	30.23	3.56	50.52	10:31
2	TOC	2.6960	26.9596	27.03	30.50	3.46	50.50	10:27

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	T1901580-063.05 ms doc	27.0484 ppm	0.0000 ppm	0.0000%	2019/09/27 07:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.0484	270.4841	192.34	195.94	3.60	50.47	10:36

Dilution: 1:10
Blank Contribution: (TC) 8.7330 (IC) (v1299)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.4673 ppm (PASS)	0.0000 ppm	0%	2019/09/27 08:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.4673	234.6728	168.76	172.31	3.55	50.51	10:32

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

Sample Type: Check Standard --> CCB — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 08:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.65	9.15	3.50	50.47	10:28

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/27 08:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.97	8.39	3.41	50.47	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.0856 ppm (PASS)	0.0000 ppm	0%	2019/09/27 08:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.0856	240.8558	172.95	176.60	3.65	50.46	10:30

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

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	T1901580-064.04 doc	0.6699 ppm	0.0892 ppm	13.3100%	2019/09/27 09:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7329	7.3292	13.71	17.28	3.57	50.45	10:28
2	TOC	0.6068	6.0682	12.85	16.36	3.51	50.43	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	T1901580-065.04 doc	0.4597 ppm	0.0005 ppm	0.1100%	2019/09/27 09:32

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	0.4601	4.6008	11.86	15.49	3.63	50.45	10:27
2	TOC	0.4593	4.5935	11.85	15.50	3.65	50.44	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	42	TOC	T1901580-066.04 doc	0.7479 ppm	0.0047 ppm	0.6300%	2019/09/27 10:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7446	7.4456	13.79	17.48	3.70	50.38	10:31
2	TOC	0.7512	7.5119	13.83	17.52	3.69	50.39	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	T1901580-067.04 doc	0.4893 ppm	0.0568 ppm	11.6000%	2019/09/27 10:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5295	5.2947	12.33	15.98	3.65	50.36	10:30
2	TOC	0.4492	4.4918	11.78	15.67	3.89	50.33	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	44	TOC	T1901580-068.05 doc	0.9681 ppm	0.0536 ppm	5.5400%	2019/09/27 10:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9302	9.3018	15.05	18.62	3.57	50.34	10:26
2	TOC	1.0061	10.0605	15.56	19.04	3.48	50.33	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	T1901580-069.05 doc	0.5941 ppm	0.0102 ppm	1.7200%	2019/09/27 11:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6014	6.0136	12.82	16.37	3.56	50.30	10:27
2	TOC	0.5869	5.8693	12.72	16.16	3.45	50.30	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1246	11.2465	16.37	19.94	3.57	50.28	10:28
2	TOC	1.1876	11.8755	16.79	20.41	3.62	50.33	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	47	TOC	T1901580-071.04 doc	0.6137 ppm	0.0026 ppm	0.4200%	2019/09/27 12:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6118	6.1182	12.89	16.56	3.67	50.27	10:31
2	TOC	0.6155	6.1551	12.91	16.44	3.53	50.26	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1317 ppm (PASS)	0.0000 ppm	0%	2019/09/27 12:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1317	241.3169	173.27	176.86	3.60	50.24	10:29

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 13:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.72	9.31	3.59	50.35	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	T1901580-072.04 doc	1.8056 ppm	0.0607 ppm	3.3600%	2019/09/27 13:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8486	18.4858	21.28	24.93	3.65	50.24	10:26
2	TOC	1.7627	17.6269	20.70	24.26	3.57	50.21	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	T1901580-073.04 doc	0.7033 ppm	0.0079 ppm	1.1300%	2019/09/27 13:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7089	7.0891	13.54	17.09	3.54	50.18	10:30
2	TOC	0.6977	6.9771	13.47	17.11	3.65	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	T1901580-074.04 doc	2.2656 ppm	0.0572 ppm	2.5200%	2019/09/27 14:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3060	23.0601	24.39	27.98	3.59	50.20	10:27
2	TOC	2.2251	22.2513	23.84	27.59	3.75	50.17	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	T1901580-075.04 doc	2.2386 ppm	0.0164 ppm	0.7300%	2019/09/27 14:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2502	22.5017	24.01	27.63	3.62	50.17	10:31
2	TOC	2.2270	22.2704	23.85	27.50	3.65	50.22	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	52	TOC	T1901580-076.04 doc	0.8877 ppm	0.0111 ppm	1.2600%	2019/09/27 15:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8798	8.7980	14.70	18.32	3.62	50.24	10:25
2	TOC	0.8956	8.9556	14.81	18.41	3.59	50.22	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	T1901580-077.04 doc	2.6888 ppm	0.0303 ppm	1.1300%	2019/09/27 15:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6674	26.6738	26.84	30.30	3.46	50.18	10:27
2	TOC	2.7103	27.1025	27.13	30.59	3.46	50.17	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	T1901580-078.04 doc	2.8607 ppm	0.0199 ppm	0.7000%	2019/09/27 16:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8467	28.4667	28.06	31.64	3.58	50.22	10:27
2	TOC	2.8748	28.7481	28.25	31.85	3.60	50.19	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	T1901580-079.04 doc	3.2227 ppm	0.0353 ppm	1.1000%	2019/09/27 16:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2477	32.4768	30.78	34.43	3.65	50.16	10:28
2	TOC	3.1977	31.9773	30.44	34.08	3.64	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	T1901580-080.04 doc	3.2299 ppm	0.0018 ppm	0.0500%	2019/09/27 17:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2287	32.2867	30.65	34.08	3.43	50.14	10:28
2	TOC	3.2312	32.3118	30.67	33.98	3.32	50.13	10:27

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	T1901580-081.04 doc	3.3384 ppm	0.0242 ppm	0.7200%	2019/09/27 17:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3555	33.5551	31.51	34.96	3.45	50.23	10:30
2	TOC	3.3213	33.2134	31.28	34.83	3.56	50.20	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6352 ppm (PASS)	0.0000 ppm	0%	2019/09/27 17:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6352	236.3523	169.90	173.64	3.74	50.20	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 18:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.21	8.80	3.59	50.23	10:29

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/27 18:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.89	8.49	3.59	50.26	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.3513 ppm (PASS)	0.0000 ppm	0%	2019/09/27 18:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.3513	243.5135	174.76	178.42	3.66	50.27	10:35

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	59	TOC	T1901580-082.04 doc	3.2832 ppm	0.0765 ppm	2.3300%	2019/09/27 18:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3372	33.3725	31.39	35.07	3.68	50.28	10:29
2	TOC	3.2291	32.2911	30.65	34.20	3.55	50.31	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	T1901580-083.04 doc	3.3769 ppm	0.0504 ppm	1.4900%	2019/09/27 19:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3412	33.4122	31.41	35.07	3.66	50.32	10:28
2	TOC	3.4125	34.1253	31.90	35.30	3.41	50.34	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	T1901580-084.04 doc	3.3003 ppm	0.0028 ppm	0.0900%	2019/09/27 19:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3023	33.0233	31.15	34.58	3.43	50.33	10:28
2	TOC	3.2984	32.9835	31.12	34.58	3.46	50.35	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	T1901580-085.04 doc	2.3832 ppm	0.0165 ppm	0.6900%	2019/09/27 20:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3716	23.7156	24.83	28.49	3.65	50.36	10:27
2	TOC	2.3948	23.9484	24.99	28.58	3.59	50.40	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	T1901580-086.04 doc	1.5178 ppm	0.0042 ppm	0.2700%	2019/09/27 20:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5149	15.1490	19.02	22.55	3.53	50.40	10:25
2	TOC	1.5208	15.2079	19.06	22.59	3.53	50.44	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	T1901580-087.04 doc	2.2527 ppm	0.0718 ppm	3.1900%	2019/09/27 21:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2020	22.0200	23.68	27.22	3.54	50.43	10:27
2	TOC	2.3035	23.0350	24.37	27.91	3.54	50.43	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	T1901580-088.04 doc	1.9667 ppm	0.0290 ppm	1.4700%	2019/09/27 21:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9872	19.8720	22.22	25.89	3.67	50.45	10:27
2	TOC	1.9462	19.4625	21.94	25.47	3.53	50.47	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC)	CAS_salt_010711	CAS_salt_010711

(v1299) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	T1901580-089.04 doc	2.1539 ppm	0.0259 ppm	1.2000%	2019/09/27 22:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1722	21.7224	23.48	26.85	3.37	50.47	10:26
2	TOC	2.1356	21.3556	23.23	26.67	3.44	50.47	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.3857 ppm (PASS)	0.0000 ppm	0%	2019/09/27 22:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.3857	233.8567	168.20	171.82	3.62	50.50	10:28

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/27 22:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.33	8.84	3.51	50.51	10:35

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

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	T1901580-090.04 doc	2.1261 ppm	0.0444 ppm	2.0900%	2019/09/27 23:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1575	21.5751	23.38	26.93	3.55	50.50	10:32
2	TOC	2.0947	20.9475	22.95	26.32	3.37	50.51	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	T1901580-091.06 doc	3.1494 ppm	0.0200 ppm	0.6400%	2019/09/27 23:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1353	31.3527	30.02	33.58	3.57	50.51	10:27
2	TOC	3.1636	31.6356	30.21	33.77	3.56	50.51	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	T1901580-091.06 ms doc	28.8836 ppm	0.0000 ppm	0.0000%	2019/09/28 00:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.8836	288.8358	204.79	208.36	3.57	50.53	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	rb	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/28 00:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.67	9.35	3.69	50.52	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	T1901580-092.06 doc	3.0072 ppm	0.0076 ppm	0.2500%	2019/09/28 00:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0018	30.0180	29.11	32.71	3.60	50.53	10:29
2	TOC	3.0126	30.1255	29.18	32.73	3.55	50.54	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	72	TOC	T1901580-093.04 doc	3.2041 ppm	0.0207 ppm	0.6500%	2019/09/28 01:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2188	32.1880	30.58	34.22	3.64	50.55	10:32
2	TOC	3.1895	31.8948	30.38	34.04	3.65	50.53	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	73	TOC	T1901580-094.04 doc	2.9106 ppm	0.0135 ppm	0.4700%	2019/09/28 01:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9202	29.2018	28.56	32.15	3.59	50.54	10:27
2	TOC	2.9010	29.0103	28.43	32.15	3.72	50.56	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	74	TOC	T1901580-095.04 doc	3.1272 ppm	0.0227 ppm	0.7300%	2019/09/28 02:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1432	31.4323	30.07	33.56	3.49	50.56	10:28
2	TOC	3.1111	31.1111	29.85	33.45	3.59	50.55	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	75	TOC	T1901580-096.06 doc	3.0090 ppm	0.0379 ppm	1.2600%	2019/09/28 02:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0358	30.3583	29.34	32.81	3.47	50.57	10:27
2	TOC	2.9822	29.8220	28.98	32.56	3.58	50.56	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7330 (IC) (v1299)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.3092 ppm	0.0000 ppm	0%	2019/09/28 02:58

							(PASS)			

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.3092	233.0921	167.68	171.31	3.63	50.57	10:30

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

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/28 03:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.36	8.97	3.61	50.55	10:31

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1298	2.2570	1.4920	0.0000	0.0000	0.0000	2019/09/24 13:13	Fusion1 (Fusion1)
v1299	1.0837	0.9200	0.0000	0.0000	0.0000	2019/09/26 14:18	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v30	Calibration curve formula:	TOC: y = 6.788x + 9.463
Ver Creation:	2019/03/05 17:42	r^2 value:	TOC: r^2 = 0.99963
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)

Ver Creation: 2019/02/21 17:57

Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/09/28 03:28

StarLIMS Run: 653109, 653111, 653112, 653113

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-80N

21 % H3PO4: 11-GEN-05-80L

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: BCD	Date Analyzed: 9/26/19
Reviewed By:	Date Reviewed: 09/30/19

HS19090964 8260

ALS WO# HS19090964

FID04 -Logbook

Batch: 26730 **Analyst:** Nosa Izekor

Date: 01-24-2017 **Reviewer:**

Method: RSK 175 ICAL **Laboratory:** Houston

Comments: Target Sequence 170124

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	ICAL1	CALIB_1	01-24-2017 09:06 am	1.00	0.00 mL	0.00 mL	001.D	Liquid	Y	NA
2	ICAL2	CALIB_2	01-24-2017 09:30 am	1.00	0.00 mL	0.00 mL	002.D	Liquid	Y	NA
3	ICAL3	CALIB_3	01-24-2017 09:59 am	1.00	0.00 mL	0.00 mL	003.D	Liquid	Y	NA
4	ICAL4	CALIB_4	01-24-2017 10:15 am	1.00	0.00 mL	0.00 mL	004.D	Liquid	Y	NA
5	ICAL5	CALIB_5	01-24-2017 10:39 am	1.00	0.00 mL	0.00 mL	005.D	Liquid	Y	NA
6	ICAL6	CALIB_6	01-24-2017 10:57 am	1.00	0.00 mL	0.00 mL	006.D	Liquid	Y	NA
7	ICAL7	CALIB_7	01-24-2017 11:13 am	1.00	0.00 mL	0.00 mL	007.D	Liquid	Y	NA
8	ICV	METHSPIKI	01-24-2017 12:05 pm	1.00	0.00 mL	0.00 mL	008.D	Liquid	Y	NA
9	LCS-170124	LCS	01-24-2017 12:24 pm	1.00	0.00 mL	0.00 mL	009.D	Liquid	Y	NA
10	LCSD-170124	LCSD	01-24-2017 12:40 pm	1.00	0.00 mL	0.00 mL	010.D	Liquid	Y	NA
11	MBLK-170124	MBLK	01-24-2017 12:57 pm	1.00	0.00 mL	0.00 mL	011.D	Liquid	Y	NA
12	HS17010778-01	SAMP	01-24-2017 01:14 pm	1.00	0.00 mL	0.00 mL	012.D	Liquid	Y	NA
13	HS17010779-01	SAMP	01-24-2017 01:31 pm	1.00	0.00 mL	0.00 mL	013.D	Liquid	Y	NA
14	HS17010779-01DUP	SAMP	01-24-2017 01:47 pm	1.00	0.00 mL	0.00 mL	014.D	Liquid	Y	NA
15	CCV	CCV	01-24-2017 02:01 pm	1.00	0.00 mL	0.00 mL	015.D	Liquid	Y	NA

Chemical	Value
ICAL STD ID	30010700217
ICV STD ID	30010700610

FORM 3
WATER GASES METHOD SPIKE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090964

Matrix Spike - ENG SC Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
Ethene	16.800	19.106	114	75-125
Methane	9.647	9.591	99	75-125
Ethane	18.043	20.117	111	75-125
Propane	26.463	27.184	103	75-125
N-Butane	34.955	36.314	104	75-125

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS:

FORM 6
GASES INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090964

Instrument ID: FID-4 Calibration Date(s): 01/24/17 01/24/17

Column: RTX-PLOT ID: 0.53 (mm) Calibration Time(s): 0906 1113

LAB FILE ID: RF10: 001 RF25: 002 RF50: 003
RF100: 004 RF250: 005 RF500: 006

COMPOUND	RF10	RF25	RF50	RF100	RF250	RF500
Ethene	590.504	567.359	564.985	527.151	665.282	428.186
Methane	968.912	978.238	1019.699	880.798	960.713	935.006
Ethane	641.274	670.177	658.908	624.082	808.513	821.648
Propane	500	1279	2602	4785	18436	38286
N-Butane	474	1032	2082	3780	18270	42405

FORM 6
GASES INITIAL CALIBRATION DATA

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1909096

Instrument ID: FID-4 Calibration Date(s): 01/24/17 01/24/17

Column: RTX-PLOT ID: 0.53 (mm) Calibration Time(s): 0906 1113

RF1000: 007

COMPOUND	RF1000	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MA
Ethene	756.854	AVRG		585.760435		17.722	
Methane	1081.580	AVRG		974.992337		6.498	
Ethane	811.824	AVRG		719.489678		12.458	
Propane	96632	2ORDR	0.97326263	1.526e-003	-4.56e-009	0.9990955	0
N-Butane	114164	2ORDR	2.40105031	1.857e-003	-5.73e-009	0.9980163	0

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\001.D
Lab Smp Id: ICAL1 Client Smp ID: ICAL1
Inj Date : 24-JAN-2017 09:06
Operator : JA Inst ID: FID-4.i
Smp Info : ICAL1;ICAL1;;;
Misc Info :
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 09:06 Cal File: 001.D
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

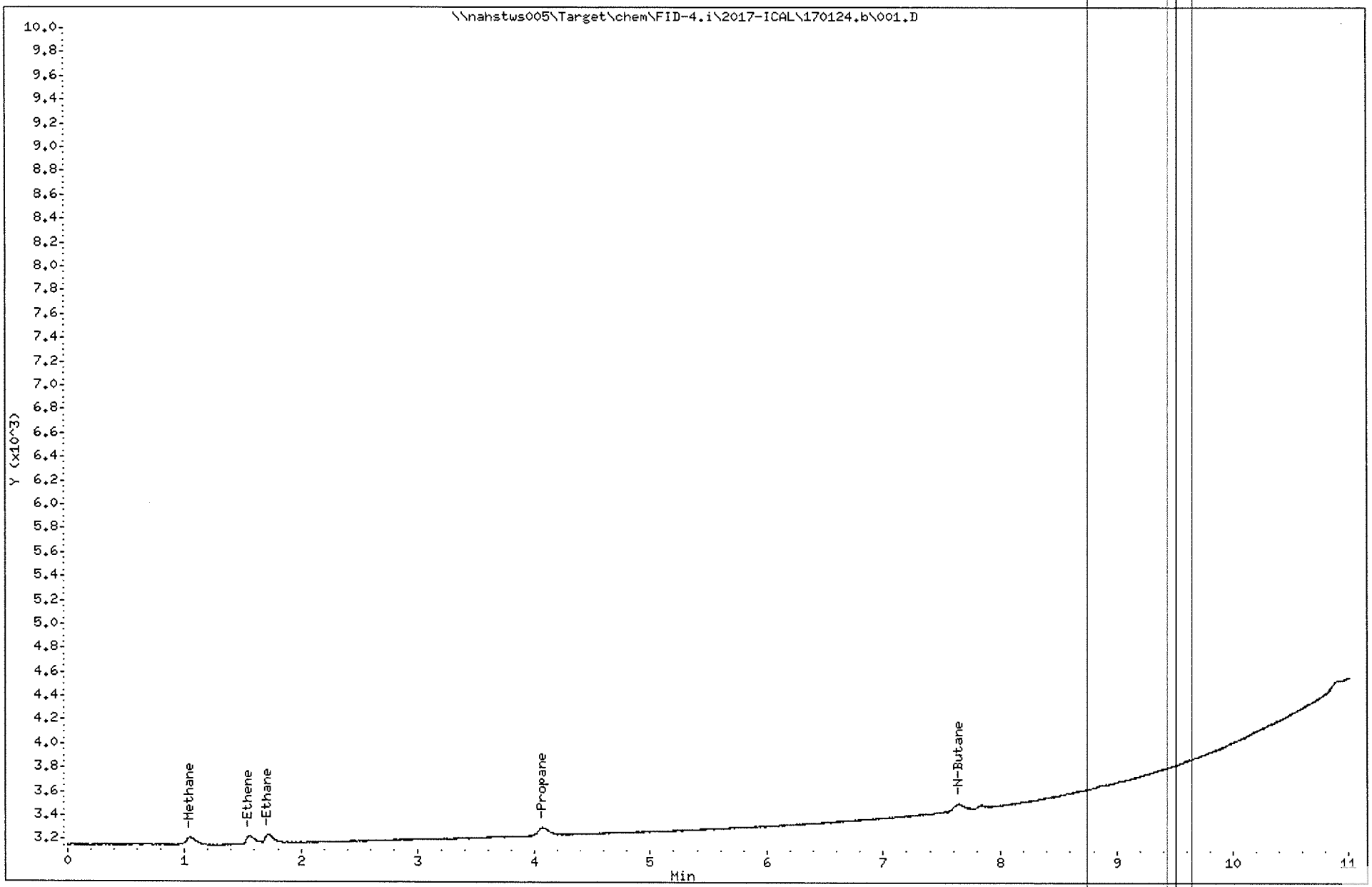
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	ON-COL (ug/L)
1 Methane	1.043	1.026	0.017	374	0.38600	0.383(a)
2 Ethene	1.553	1.553	0.000	398	0.67400	0.679(aM)
3 Ethane	1.713	1.720	-0.007	463	0.72200	0.643(aM)
4 Propane	4.073	4.106	-0.033	500	1.05900	1.735
5 N-Butane	7.640	7.686	-0.046	474	1.39800	3.280(M)

QC Flag Legend

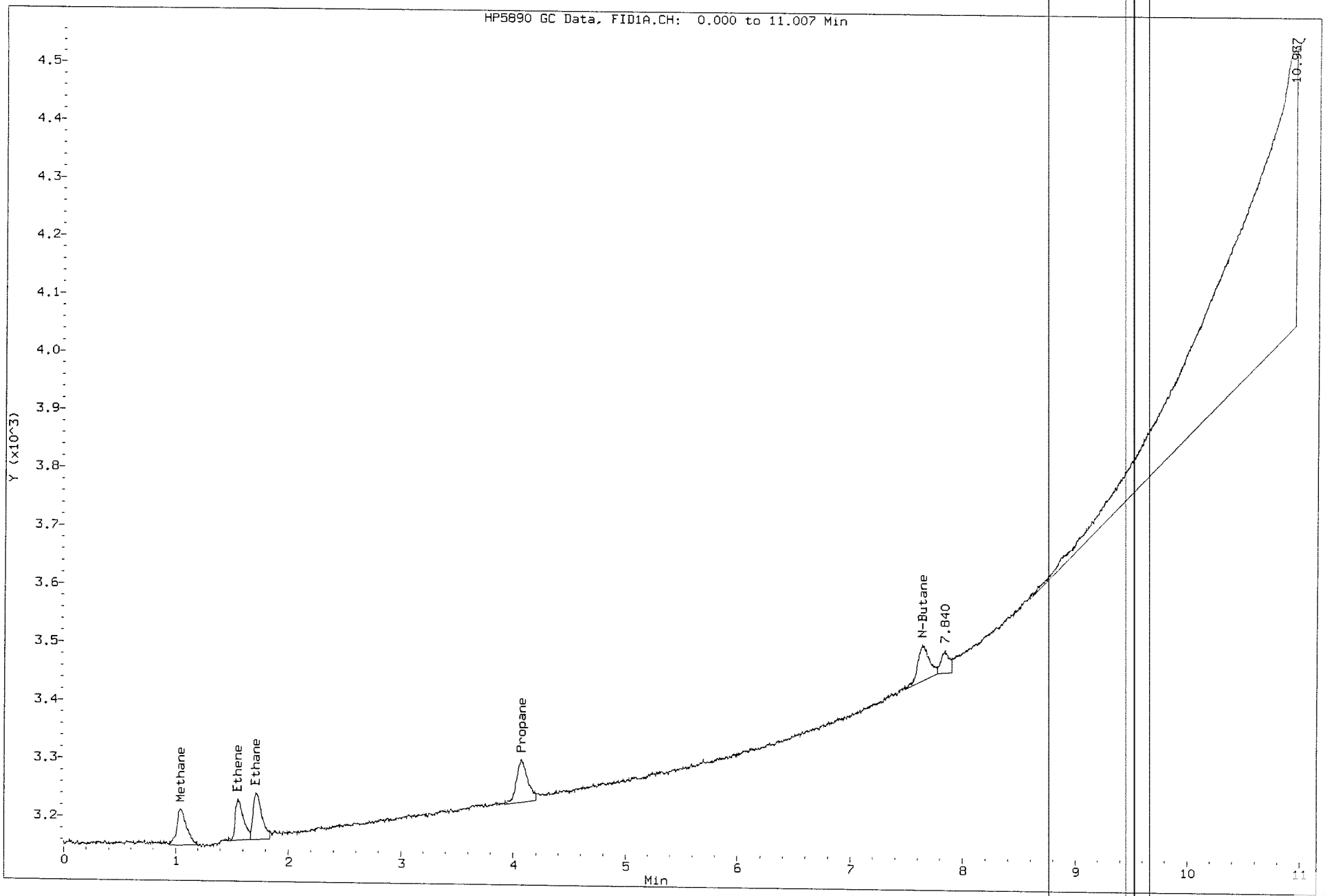
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\001.D
Date : 24-JAN-2017 09:06
Client ID: ICAL1
Sample Info: ICAL1;ICAL1;;;

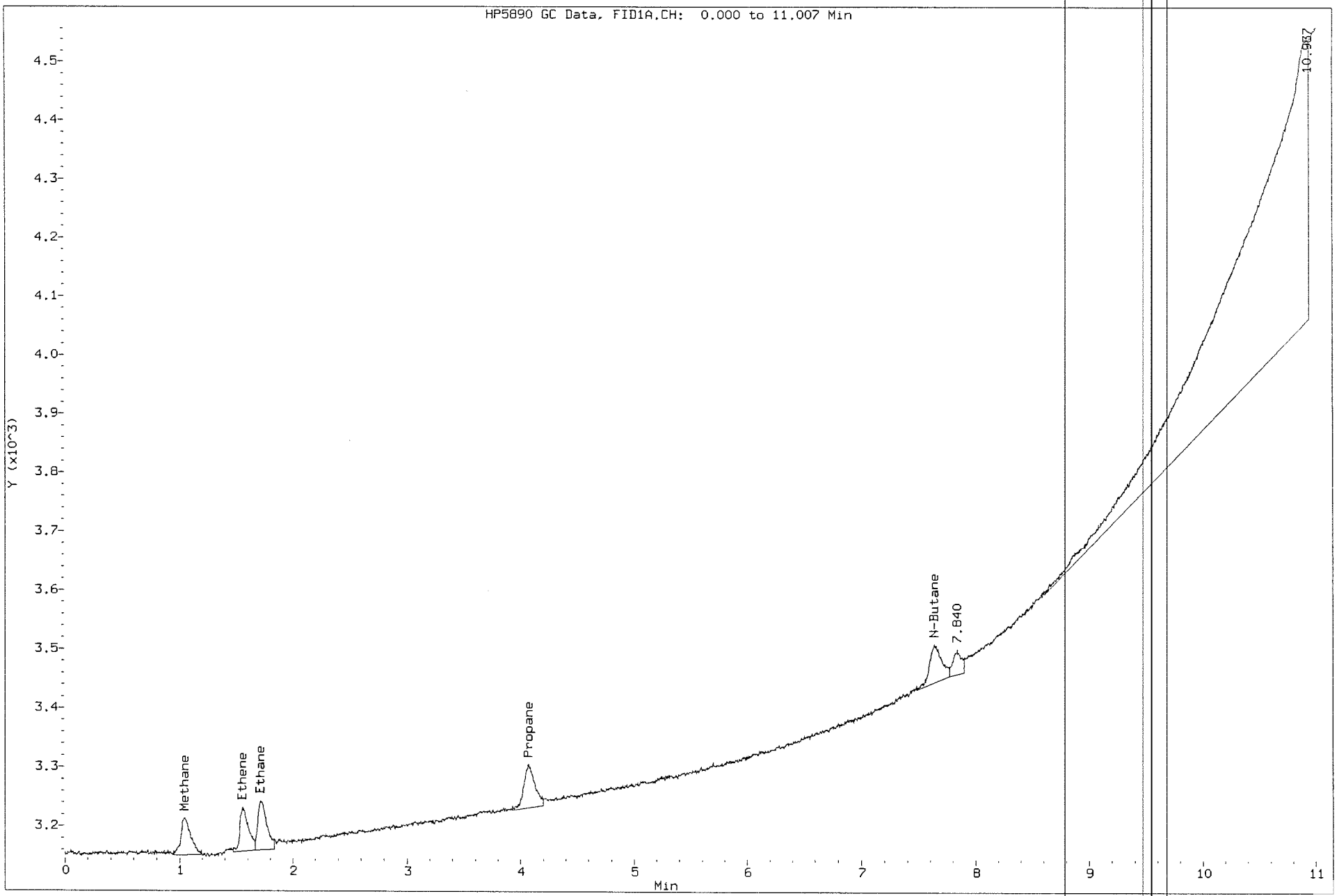
Instrument: FID-4.i
Operator: JA
Column phase: Rtx-PLOT
Column diameter: 0.53



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\001.D
Injection Date: 24-JAN-2017 09:06
Instrument: FID-4.i
Client Sample ID: ICAL1



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\001.D
Injection Date: 24-JAN-2017 09:06
Instrument: FID-4.i
Client Sample ID: ICAL1



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\002.D
Lab Smp Id: ICAL2 Client Smp ID: ICAL2
Inj Date : 24-JAN-2017 09:30
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL2;ICAL2;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 09:30 Cal File: 002.D
Als bottle: 2 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.023	1.026	-0.003	944	0.96500	0.968
2 Ethene	1.560	1.553	0.007	956	1.68500	1.632
3 Ethane	1.723	1.720	0.003	1209	1.80400	1.680
4 Propane	4.123	4.106	0.017	1279	2.64600	2.917
5 N-Butane	7.706	7.686	0.020	1032	3.49600	4.311(M)

QC Flag Legend

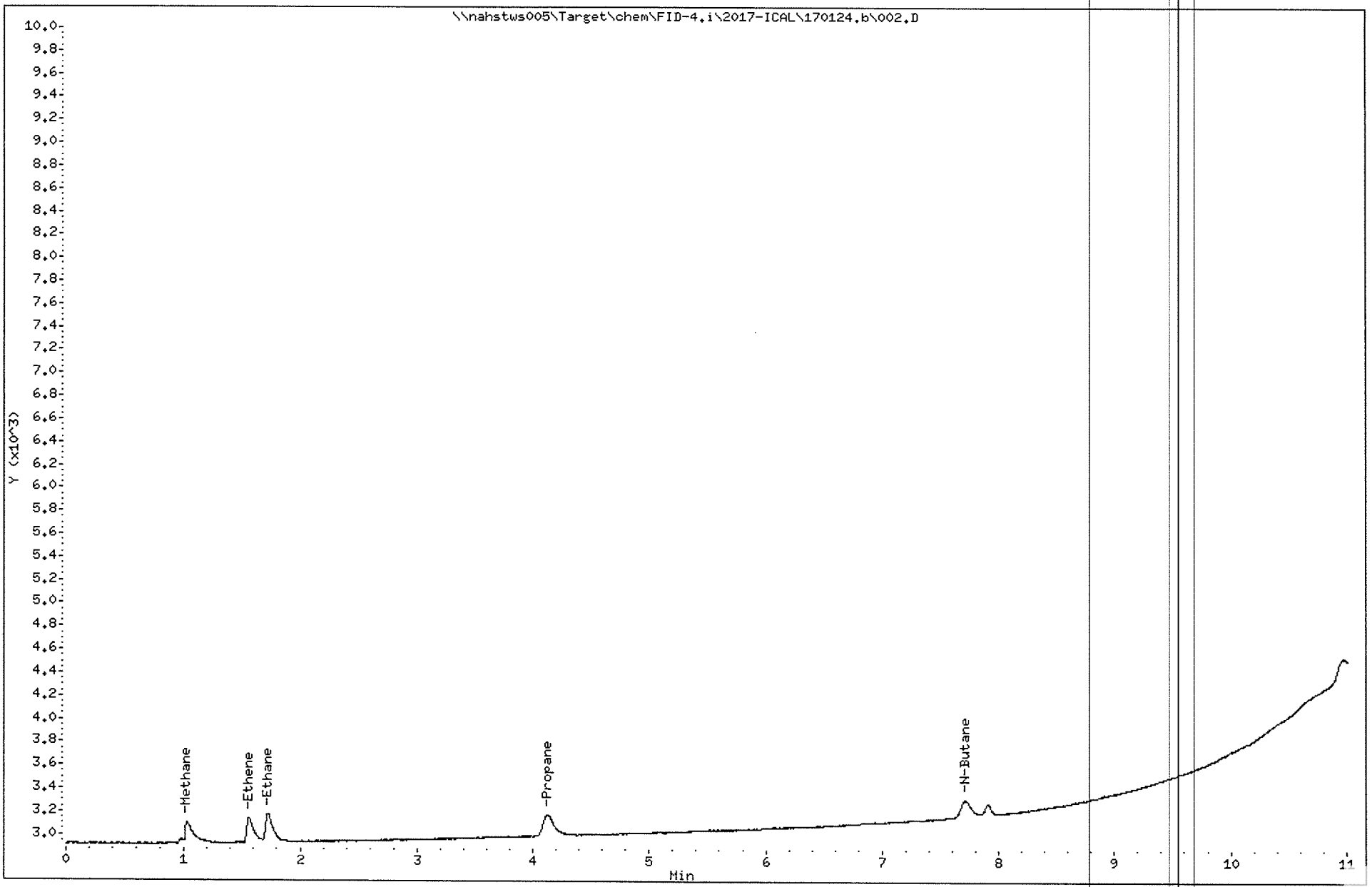
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\002.D
Date : 24-JAN-2017 09:30
Client ID: ICAL2
Sample Info: ICAL2;ICAL2;;;

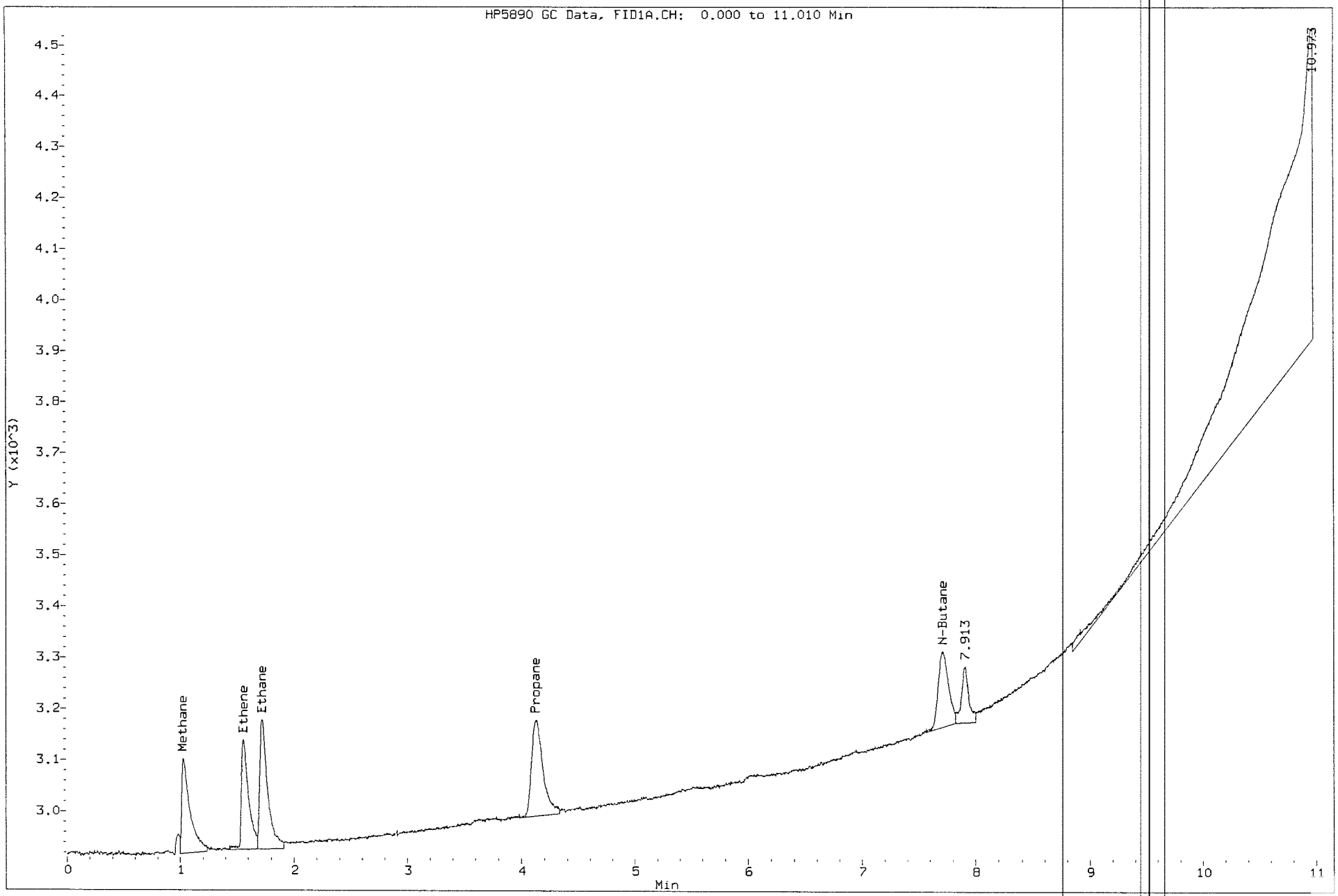
Instrument: FID-4.i

Operator: MA
Column diameter: 0.53

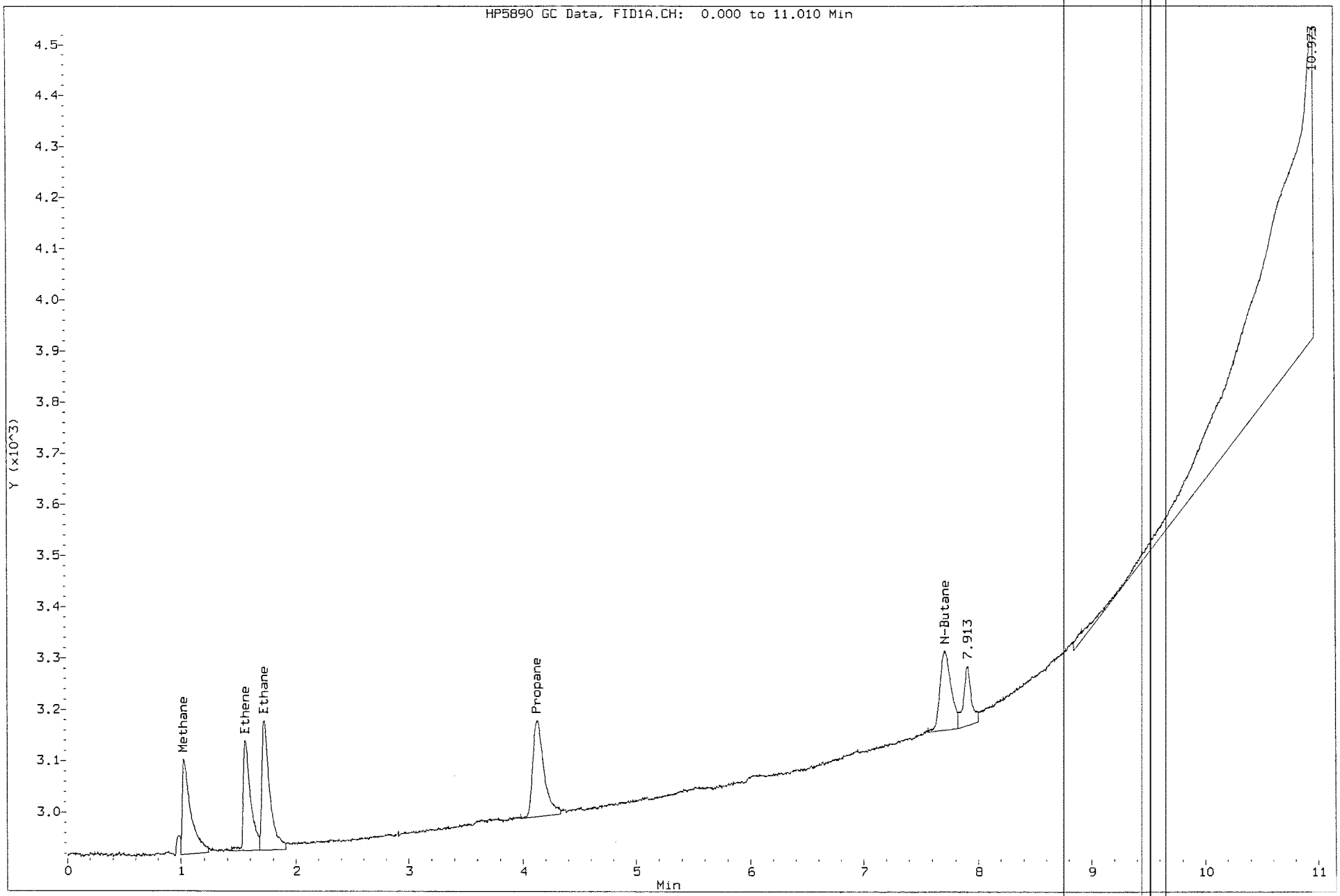
Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\002.D
Injection Date: 24-JAN-2017 09:30
Instrument: FID-4.i
Client Sample ID: ICAL2



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\002.D
Injection Date: 24-JAN-2017 09:30
Instrument: FID-4.i
Client Sample ID: ICAL2



Data File: 003.D
Report Date: 11-Oct-2019 18:19

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\003.D
Lab Smp Id: ICAL3 Client Smp ID: ICAL3
Inj Date : 24-JAN-2017 09:59
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL3;ICAL3;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 09:59 Cal File: 003.D
Als bottle: 3 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

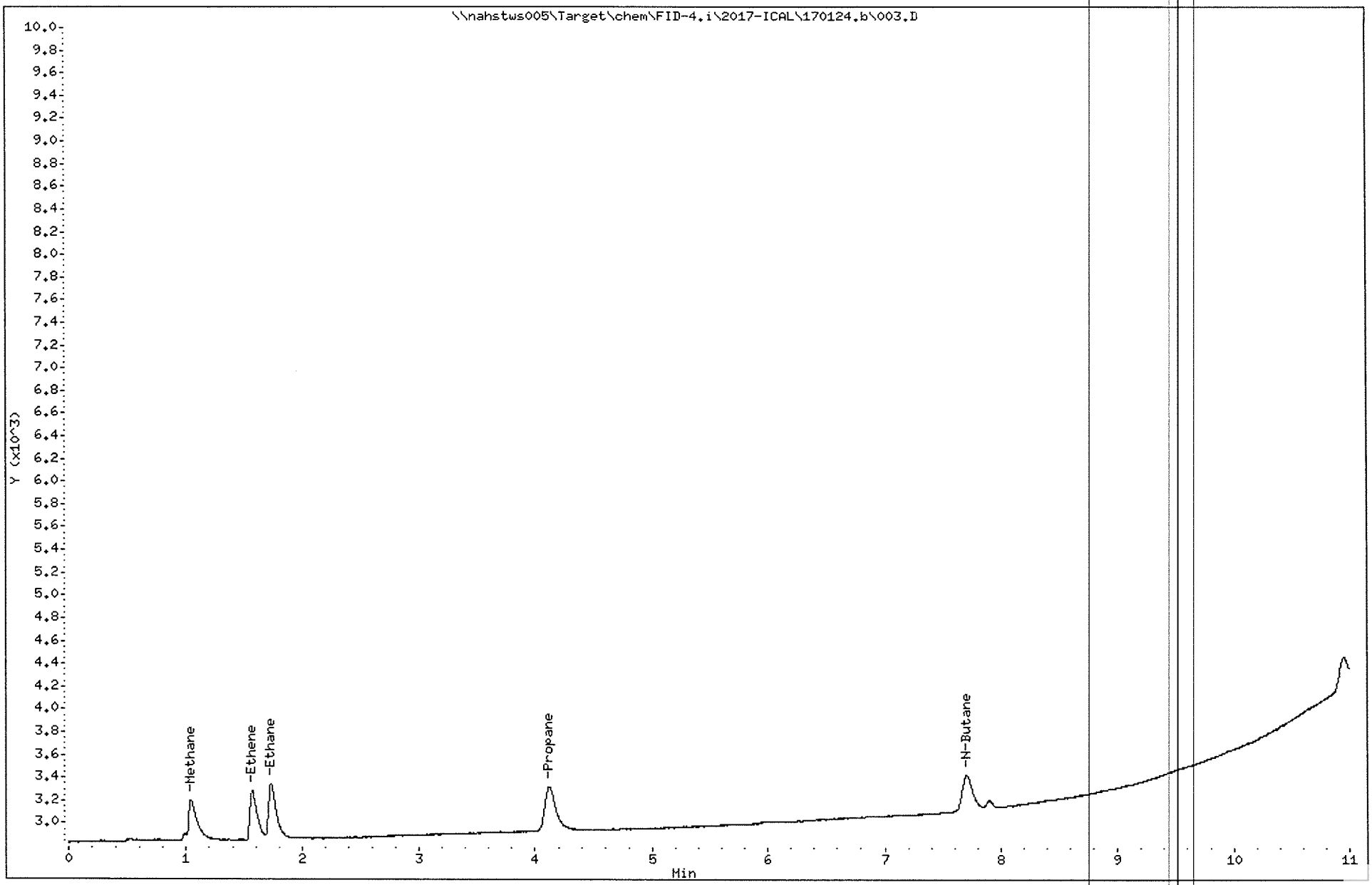
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.043	1.026	0.017	1967	1.92900	2.017
2 Ethene	1.570	1.553	0.017	1904	3.37000	3.250
3 Ethane	1.736	1.720	0.016	2378	3.60900	3.305
4 Propane	4.123	4.106	0.017	2602	5.29300	4.912
5 N-Butane	7.703	7.686	0.017	2082	6.99100	6.242(M)

QC Flag Legend

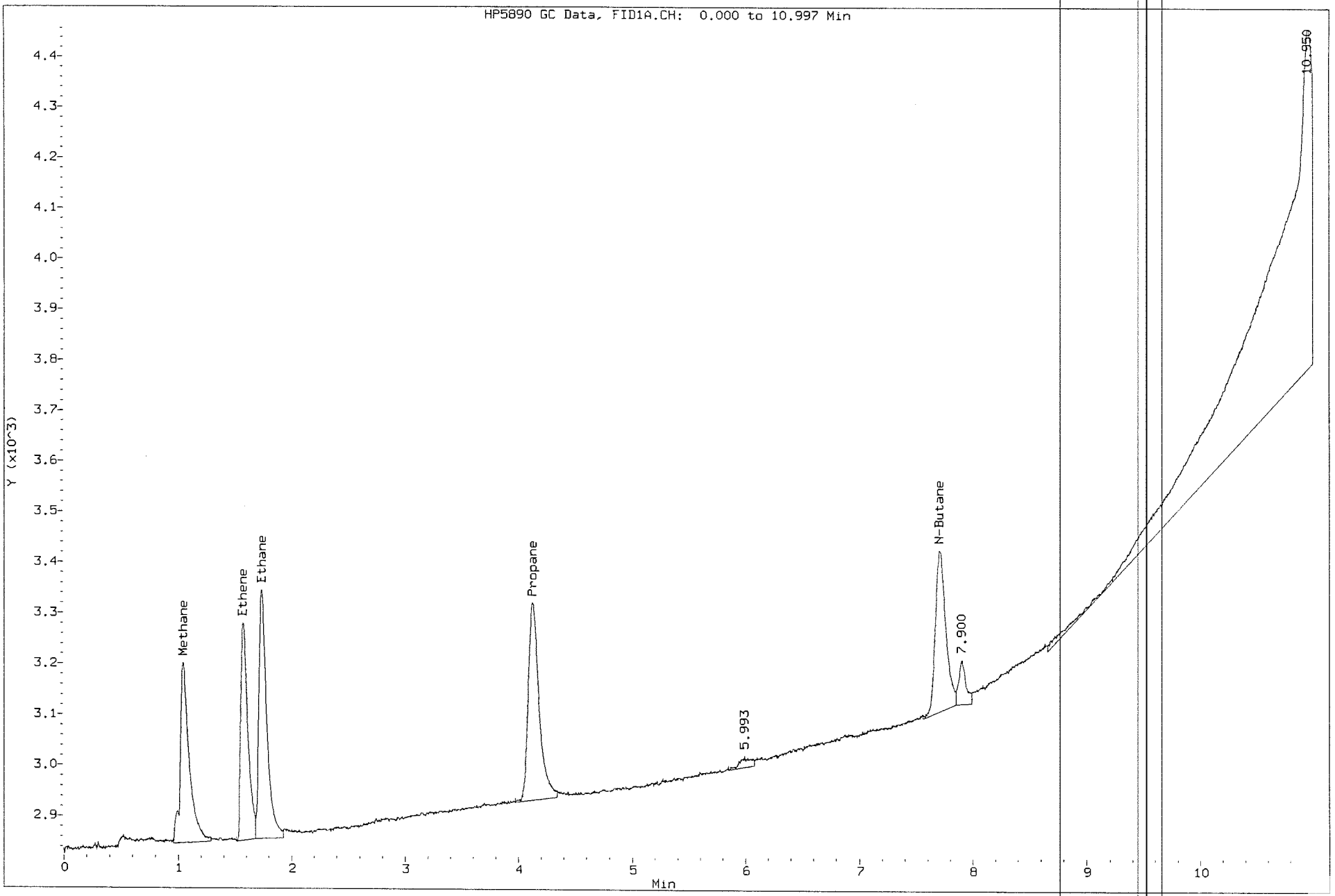
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\003.D
Date : 24-JAN-2017 09:59
Client ID: ICAL3
Sample Info: ICAL3;ICAL3;;;

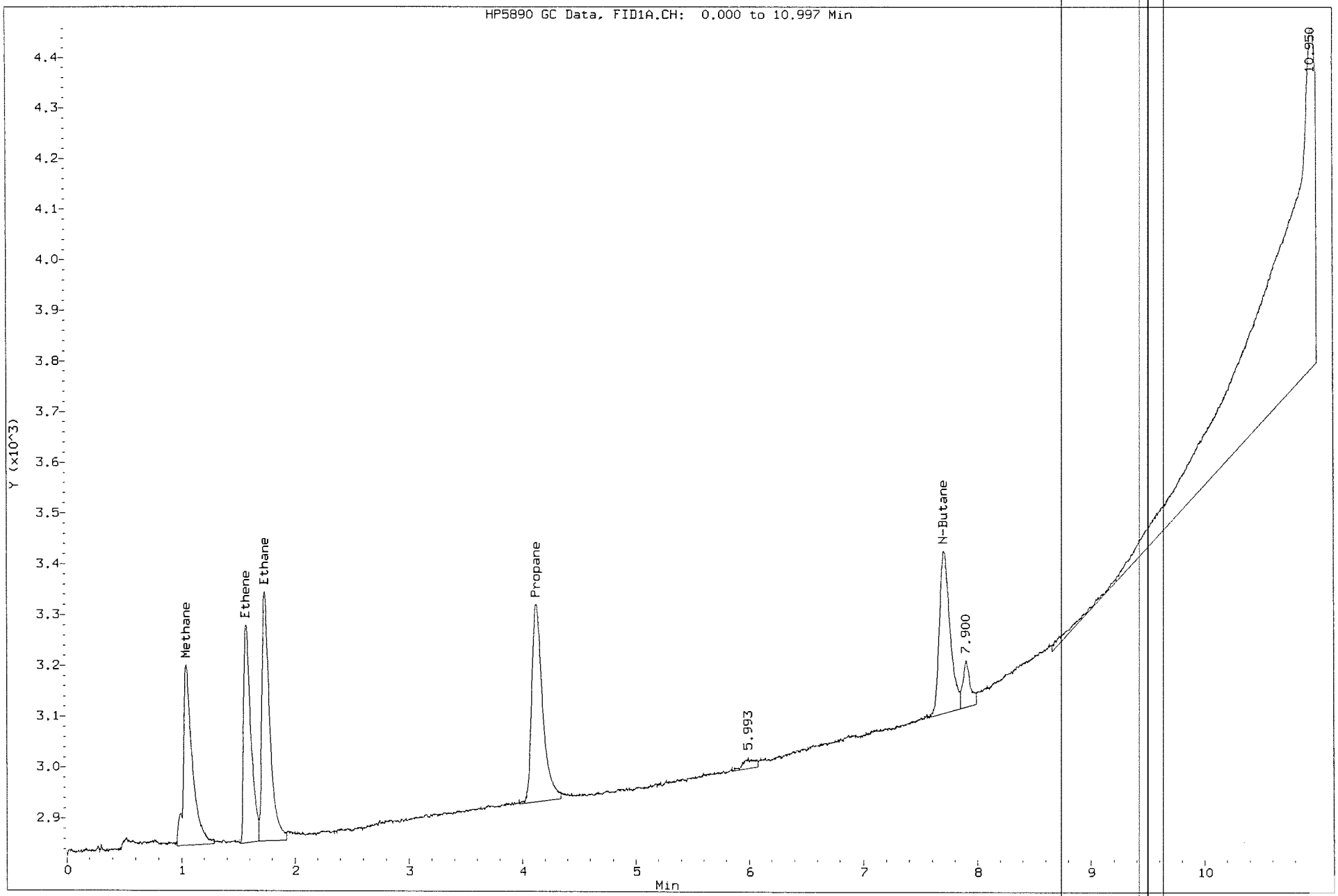
Instrument: FID-4.i
Operator: MA
Column phase: Rtx-PLOT
Column diameter: 0.53



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\003.D
Injection Date: 24-JAN-2017 09:59
Instrument: FID-4.i
Client Sample ID: ICAL3



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\003.D
Injection Date: 24-JAN-2017 09:59
Instrument: FID-4.i
Client Sample ID: ICAL3



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Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\004.D
Lab Smp Id: ICAL4 Client Smp ID: ICAL4
Inj Date : 24-JAN-2017 10:15
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL4;ICAL4;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 4 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.033	1.026	0.007	3399	3.85900	3.486
2 Ethene	1.560	1.553	0.007	3553	6.74000	6.065(M)
3 Ethane	1.726	1.720	0.006	4504	7.21700	6.259(M)
4 Propane	4.120	4.106	0.014	4785	10.5850	8.169
5 N-Butane	7.703	7.686	0.017	3780	13.9820	9.339(M)

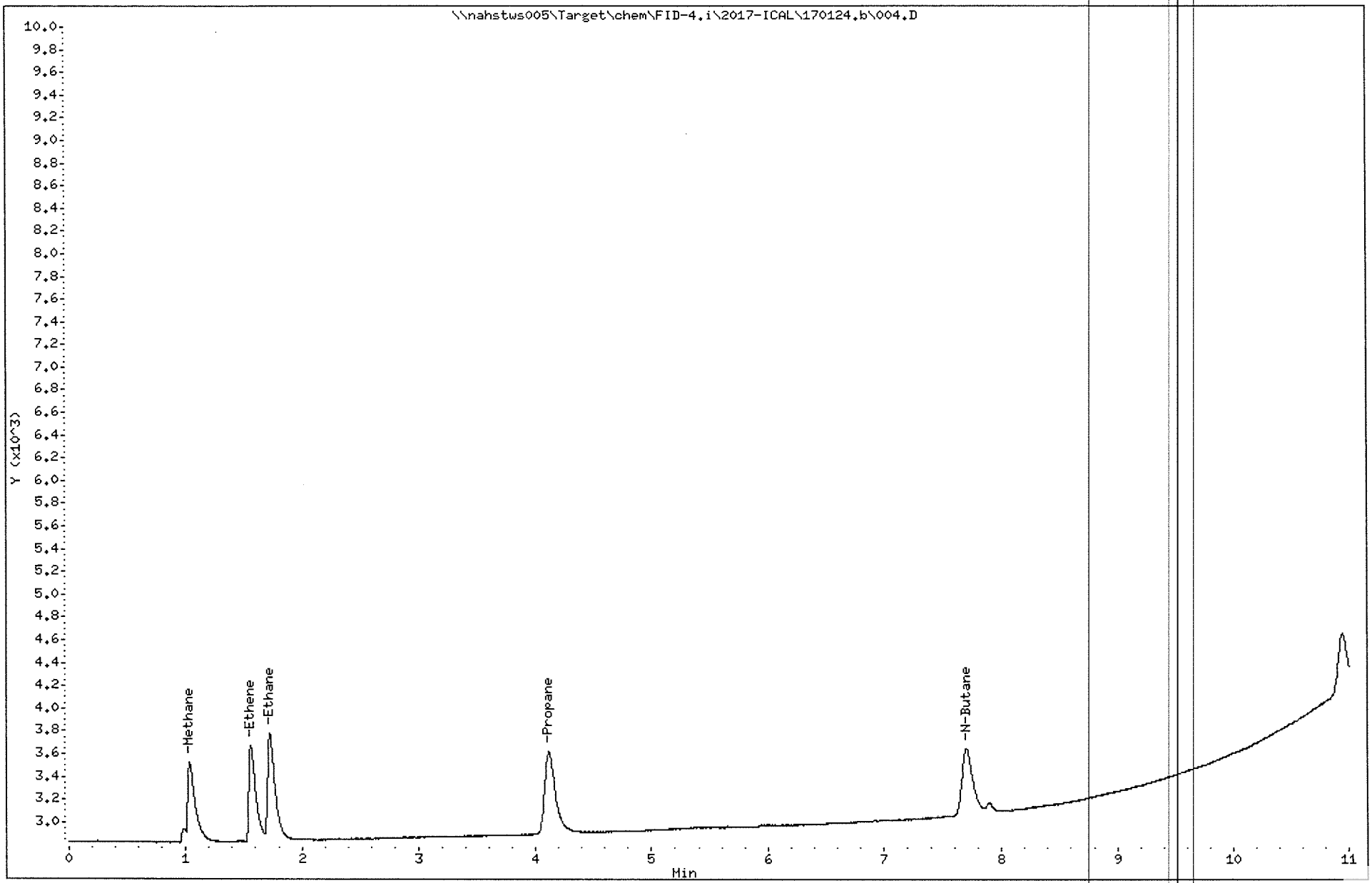
QC Flag Legend

M - Compound response manually integrated.

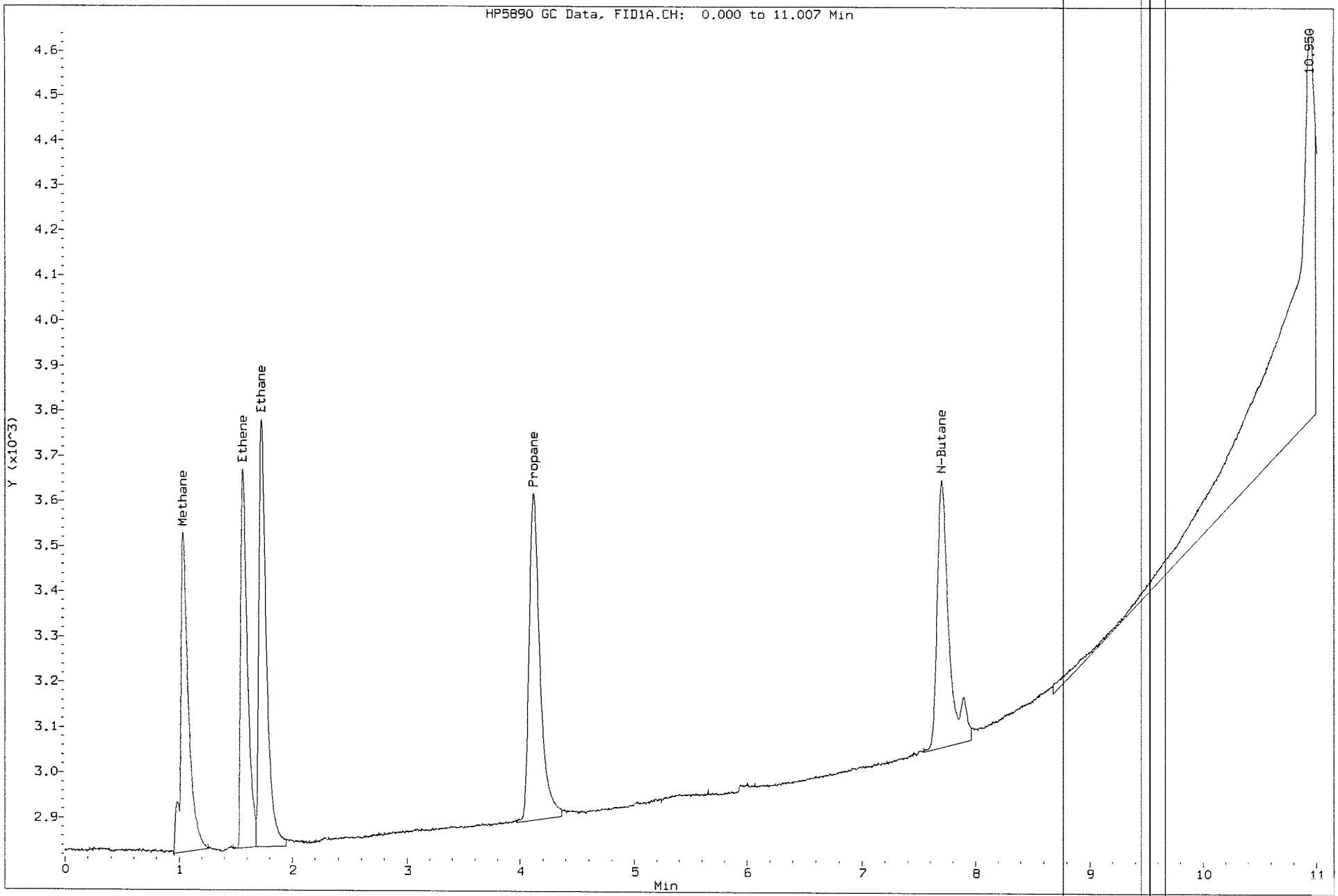
Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\004.D
Date : 24-JAN-2017 10:15
Client ID: ICAL4
Sample Info: ICAL4;ICAL4;;;

Instrument: FID-4.i
Operator: MA
Column diameter: 0.53

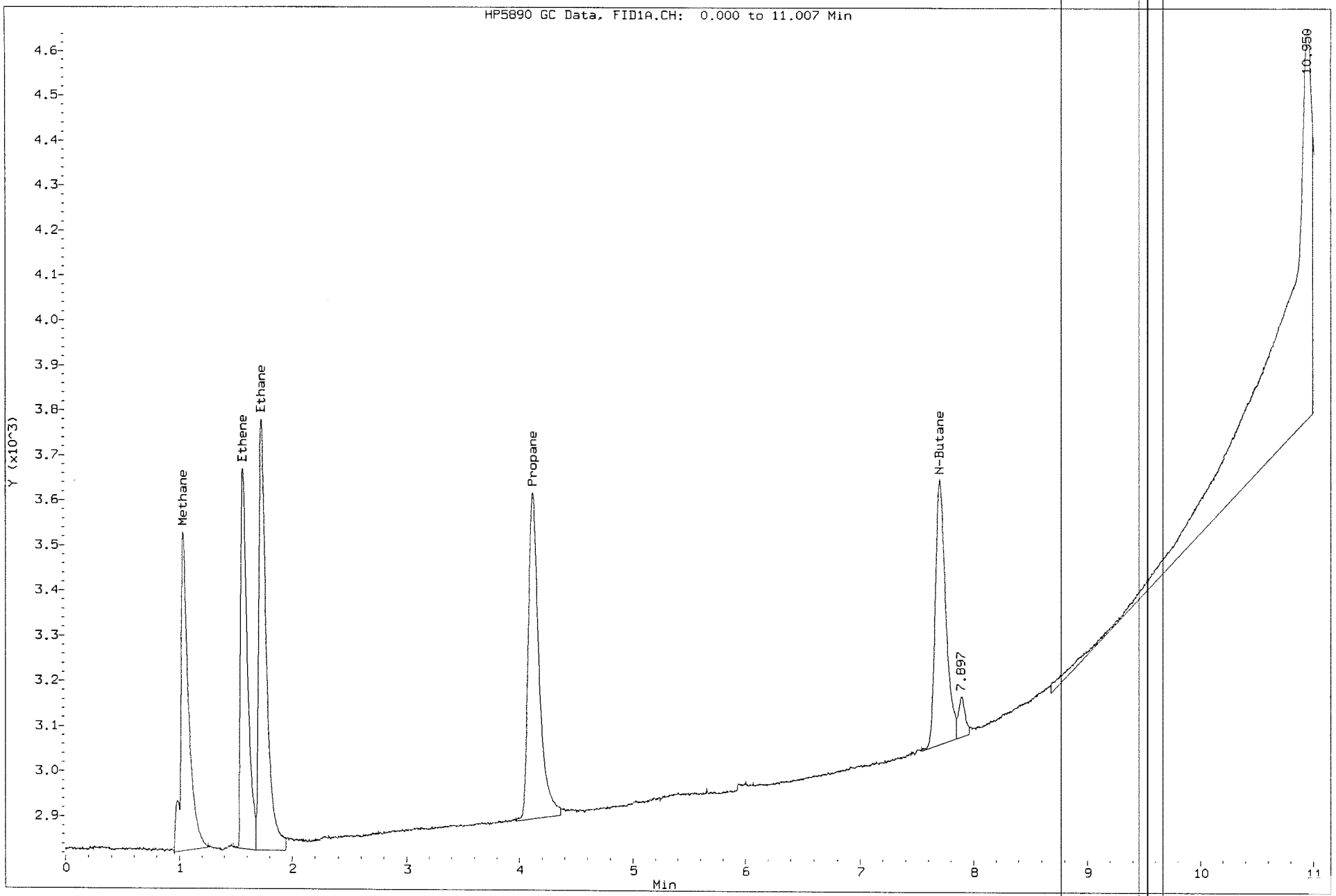
Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\004.D
Injection Date: 24-JAN-2017 10:15
Instrument: FID-4.i
Client Sample ID: ICAL4



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\004.D
Injection Date: 24-JAN-2017 10:15
Instrument: FID-4.i
Client Sample ID: ICAL4



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Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\005.D
Lab Smp Id: ICAL5 Client Smp ID: ICAL5
Inj Date : 24-JAN-2017 10:39
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL5;ICAL5;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 10:39 Cal File: 005.D
Als bottle: 5 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.043	1.026	0.017	9268	9.64700	9.505
2 Ethene	1.570	1.553	0.017	11210	16.8500	19.137
3 Ethane	1.733	1.720	0.013	14588	18.0430	20.275
4 Propane	4.120	4.106	0.014	18436	26.4630	27.554(M)
5 N-Butane	7.700	7.686	0.014	18270	34.9550	34.419(M)

QC Flag Legend

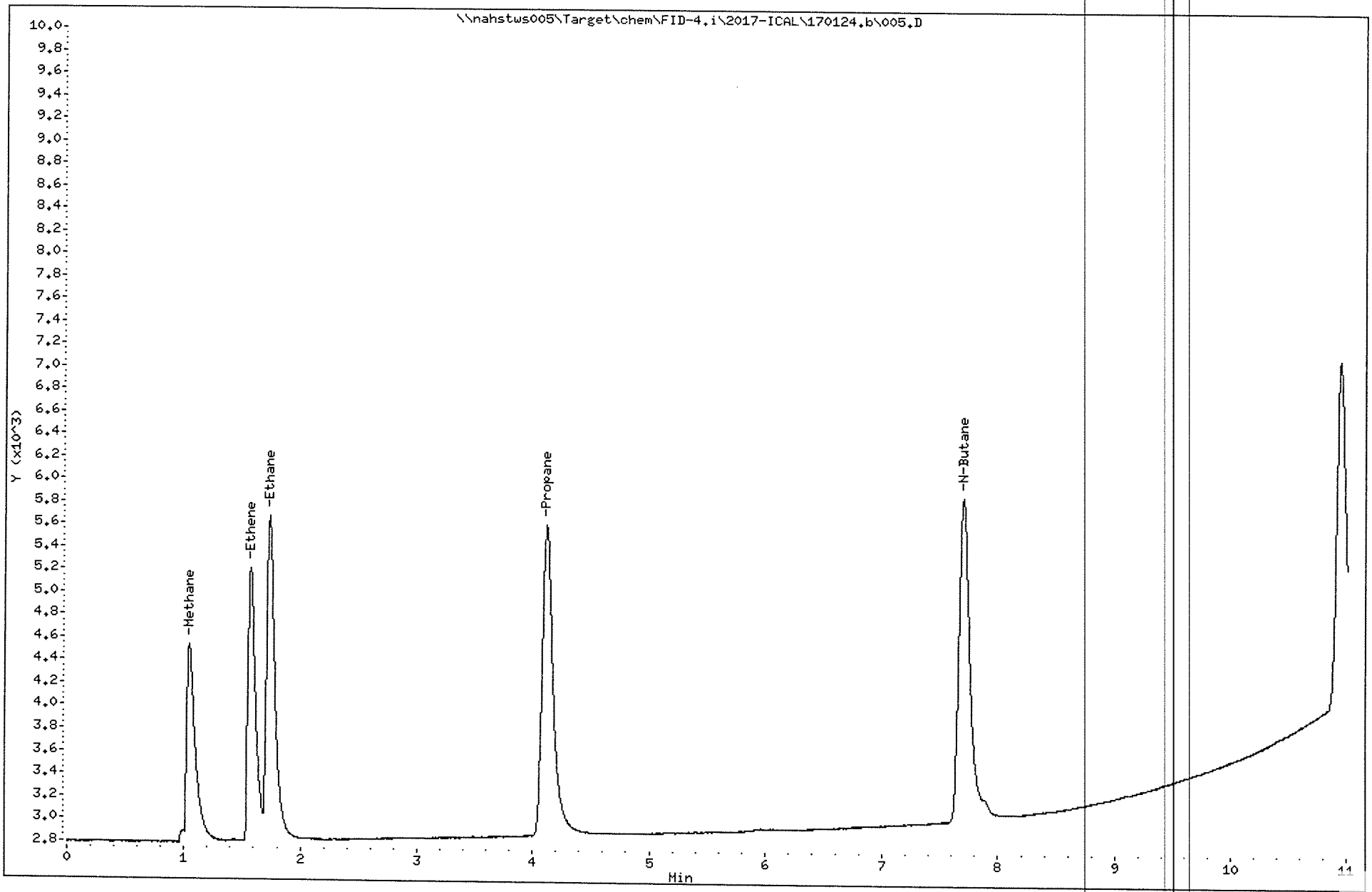
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\005.D
Date : 24-JAN-2017 10:39
Client ID: ICAL5
Sample Info: ICAL5;ICAL5;;;

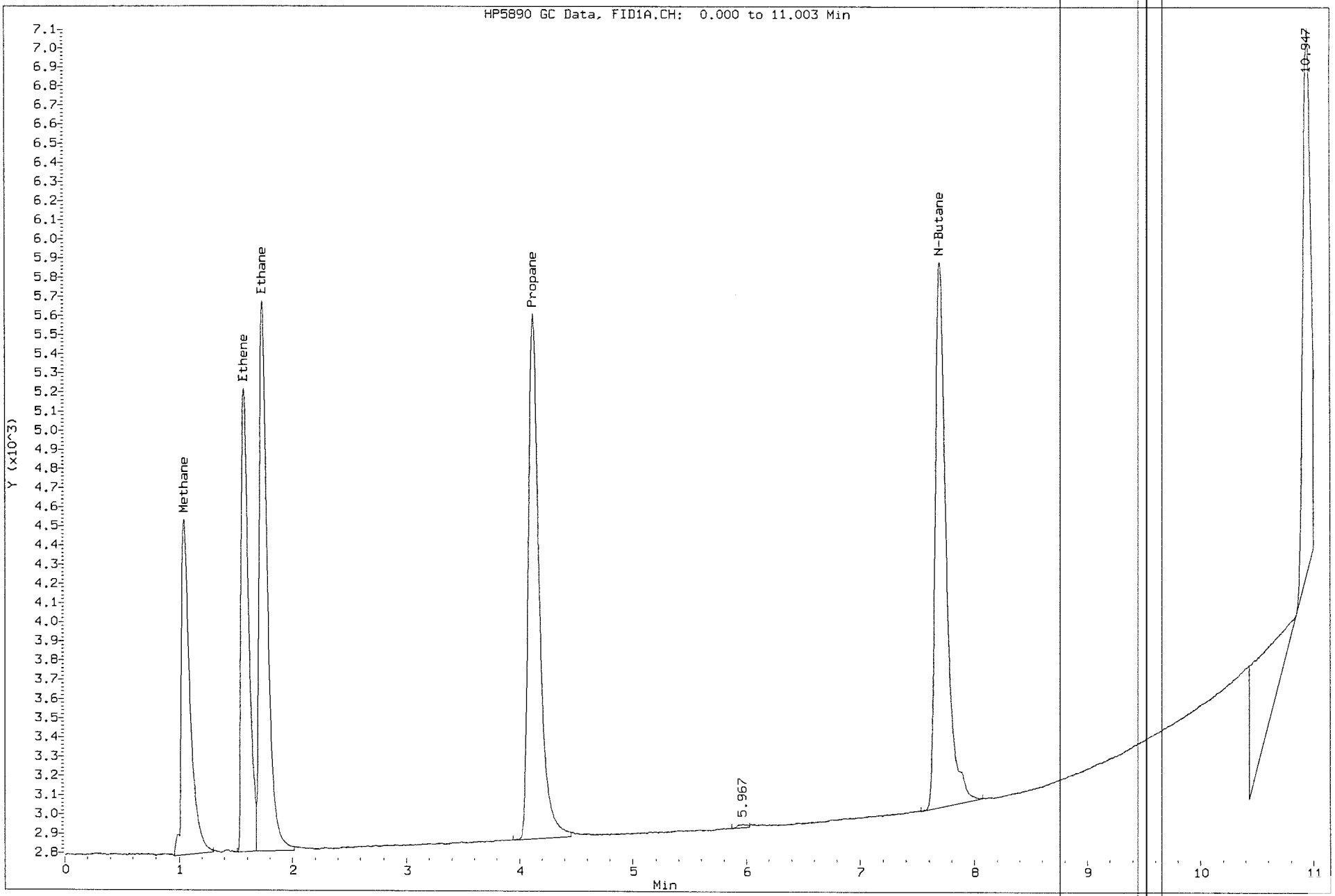
Instrument: FID-4.i

Operator: MA
Column diameter: 0.53

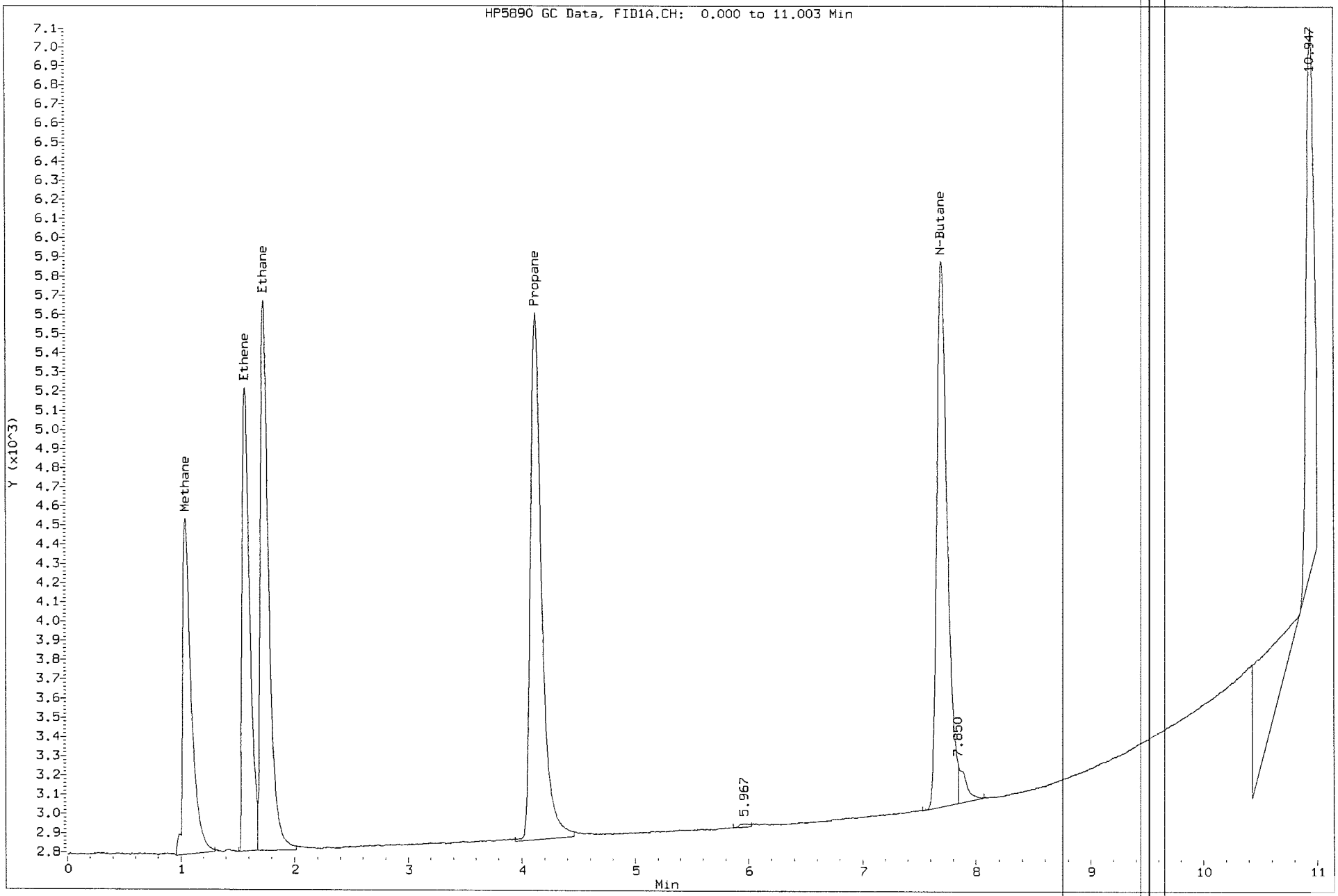
Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\005.D
Injection Date: 24-JAN-2017 10:39
Instrument: FID-4.i
Client Sample ID: ICAL5



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\005.D
Injection Date: 24-JAN-2017 10:39
Instrument: FID-4.i
Client Sample ID: ICAL5



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Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\006.D
Lab Smp Id: ICAL6 Client Smp ID: ICAL6
Inj Date : 24-JAN-2017 10:57
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL6;ICAL6;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 10:57 Cal File: 006.D
Als bottle: 6 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.023	1.026	-0.003	18040	19.2940	18.502(M)
2 Ethene	1.550	1.553	-0.003	23045	53.8200	39.342(M)
3 Ethane	1.716	1.720	-0.004	29650	36.0860	41.209(M)
4 Propane	4.110	4.106	0.004	38286	52.9260	52.709
5 N-Butane	7.696	7.686	0.010	42405	69.9110	70.848(M)

QC Flag Legend

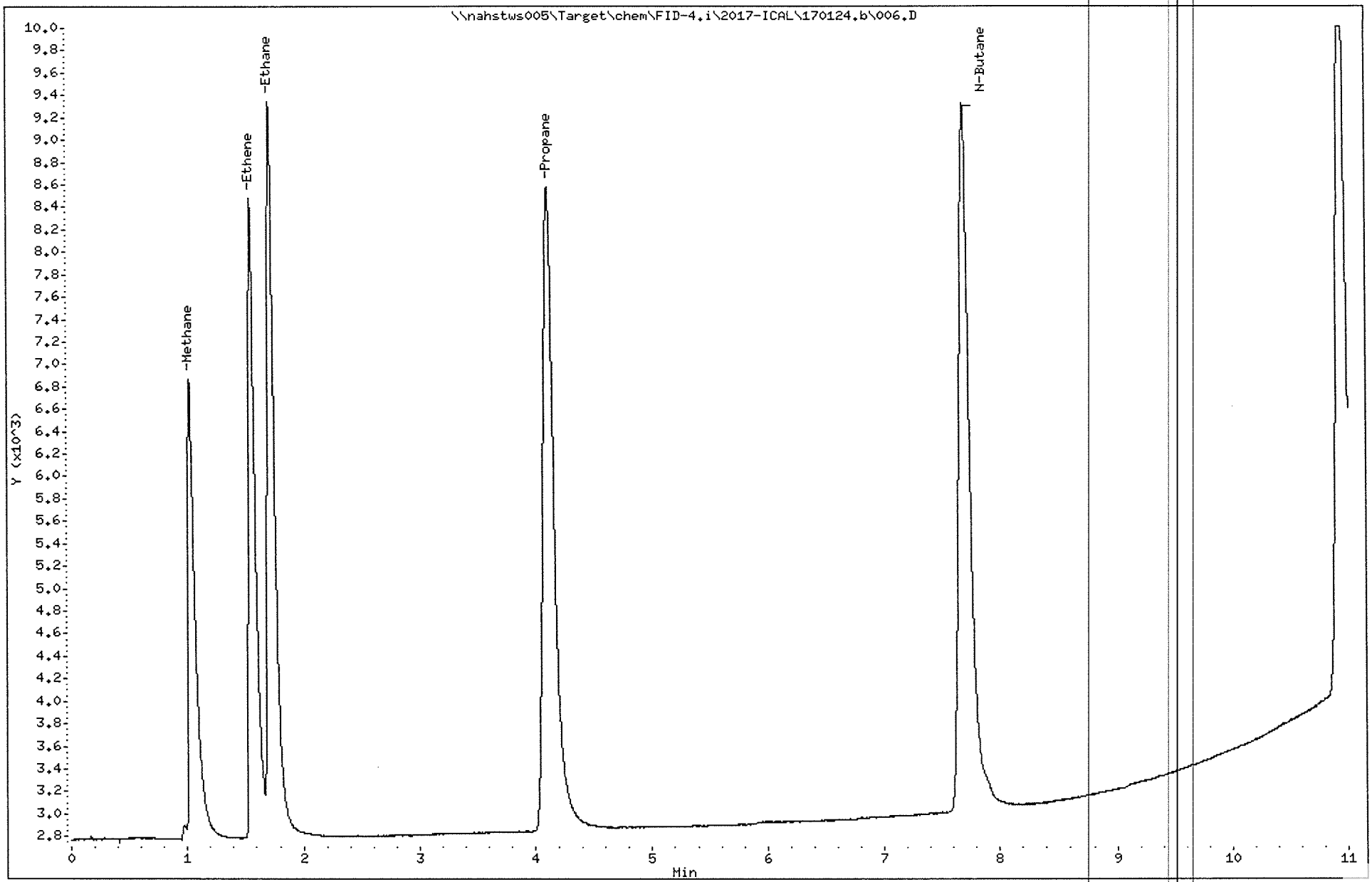
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\006.D
Date : 24-JAN-2017 10:57
Client ID: ICAL6
Sample Info: ICAL6;ICAL6;;;

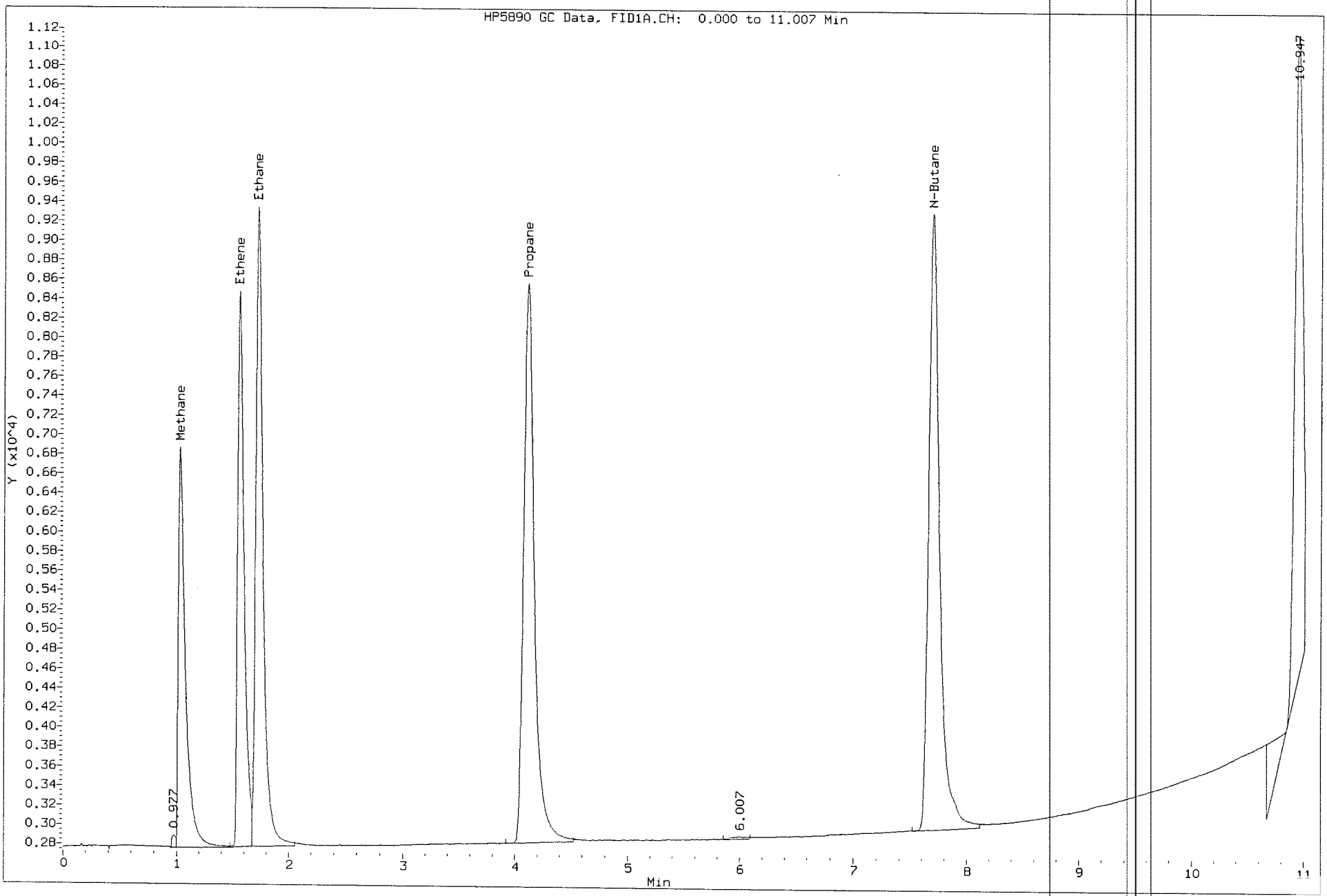
Instrument: FID-4.i

Operator: MA
Column diameter: 0.53

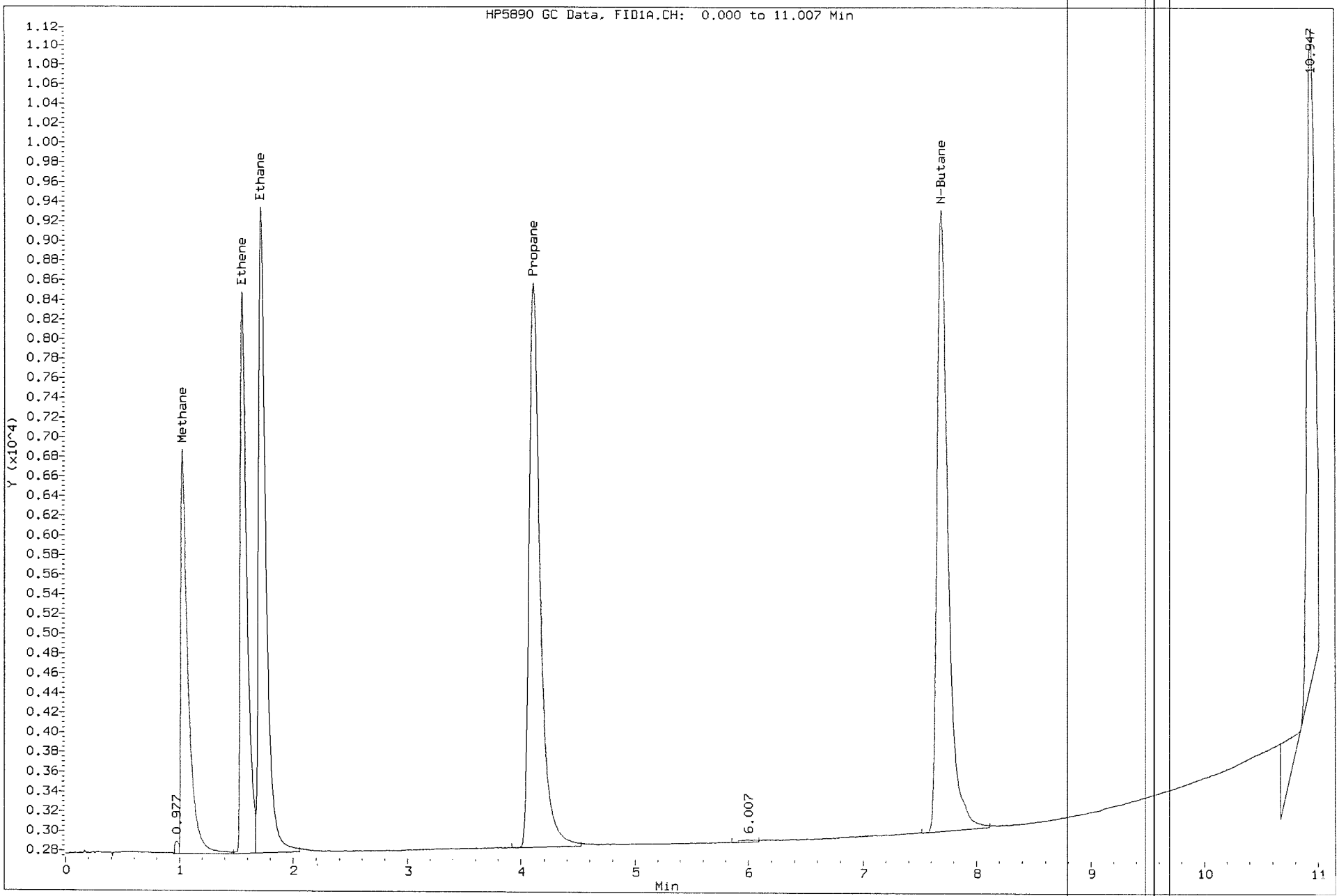
Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\006.D
Injection Date: 24-JAN-2017 10:57
Instrument: FID-4.i
Client Sample ID: ICAL6



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\006.D
Injection Date: 24-JAN-2017 10:57
Instrument: FID-4.i
Client Sample ID: ICAL6



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Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\007.D
Lab Smp Id: ICAL7 Client Smp ID: ICAL7
Inj Date : 24-JAN-2017 11:13
Operator : MA Inst ID: FID-4.i
Smp Info : ICAL7;ICAL7;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 11:13 Cal File: 007.D
Als bottle: 7 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	1.030	1.026	0.004	41736	38.5880	42.806(A)
2 Ethene	1.556	1.553	0.003	51012	67.4000	87.086(AM)
3 Ethane	1.723	1.720	0.003	58591	72.1720	81.434(AM)
4 Propane	4.113	4.106	0.007	96632	105.852	105.852(AM)
5 N-Butane	7.690	7.686	0.004	114164	139.821	139.710

QC Flag Legend

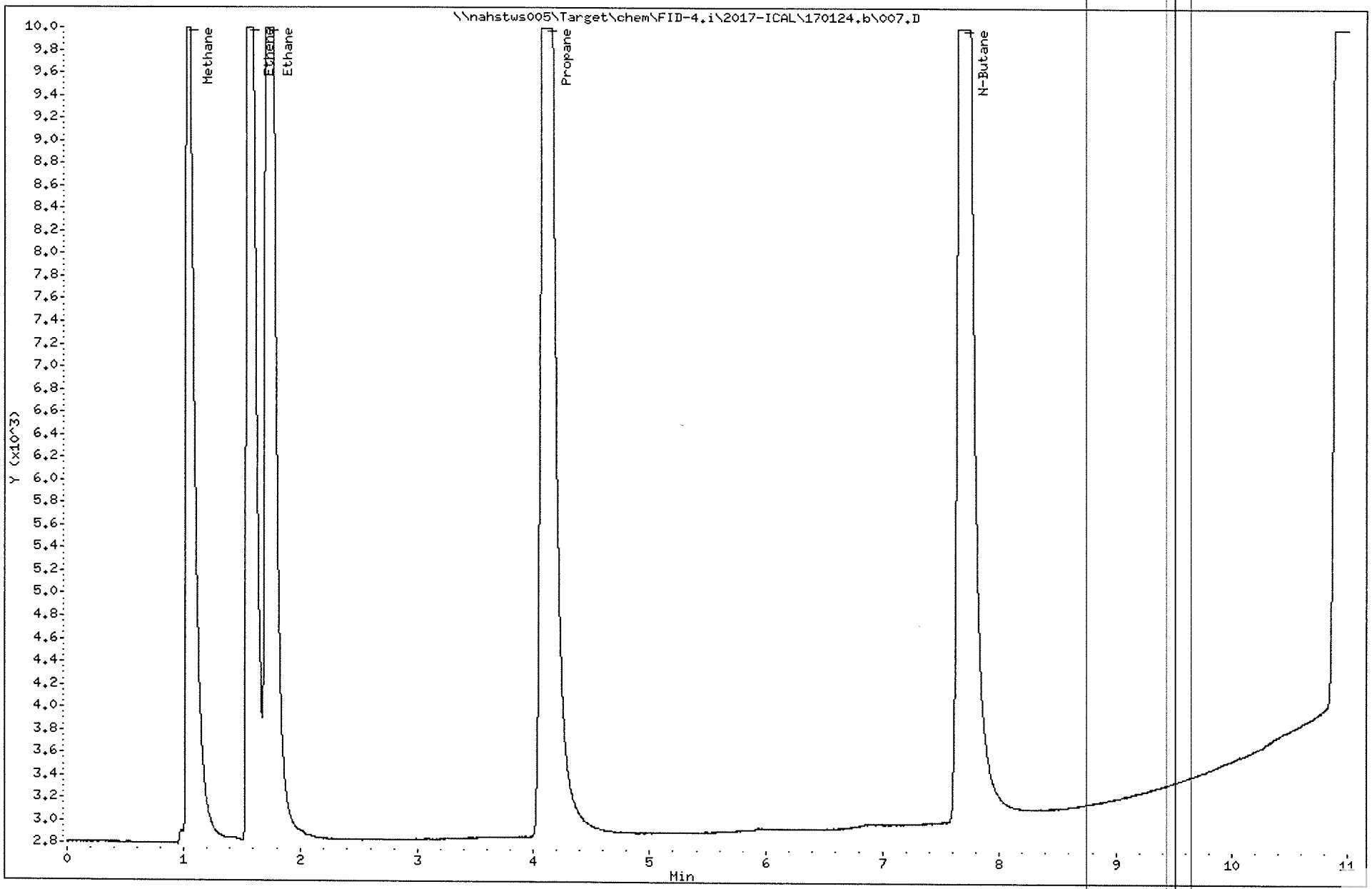
A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\007.D
Date : 24-JAN-2017 11:13
Client ID: ICAL7
Sample Info: ICAL7;ICAL7;;;

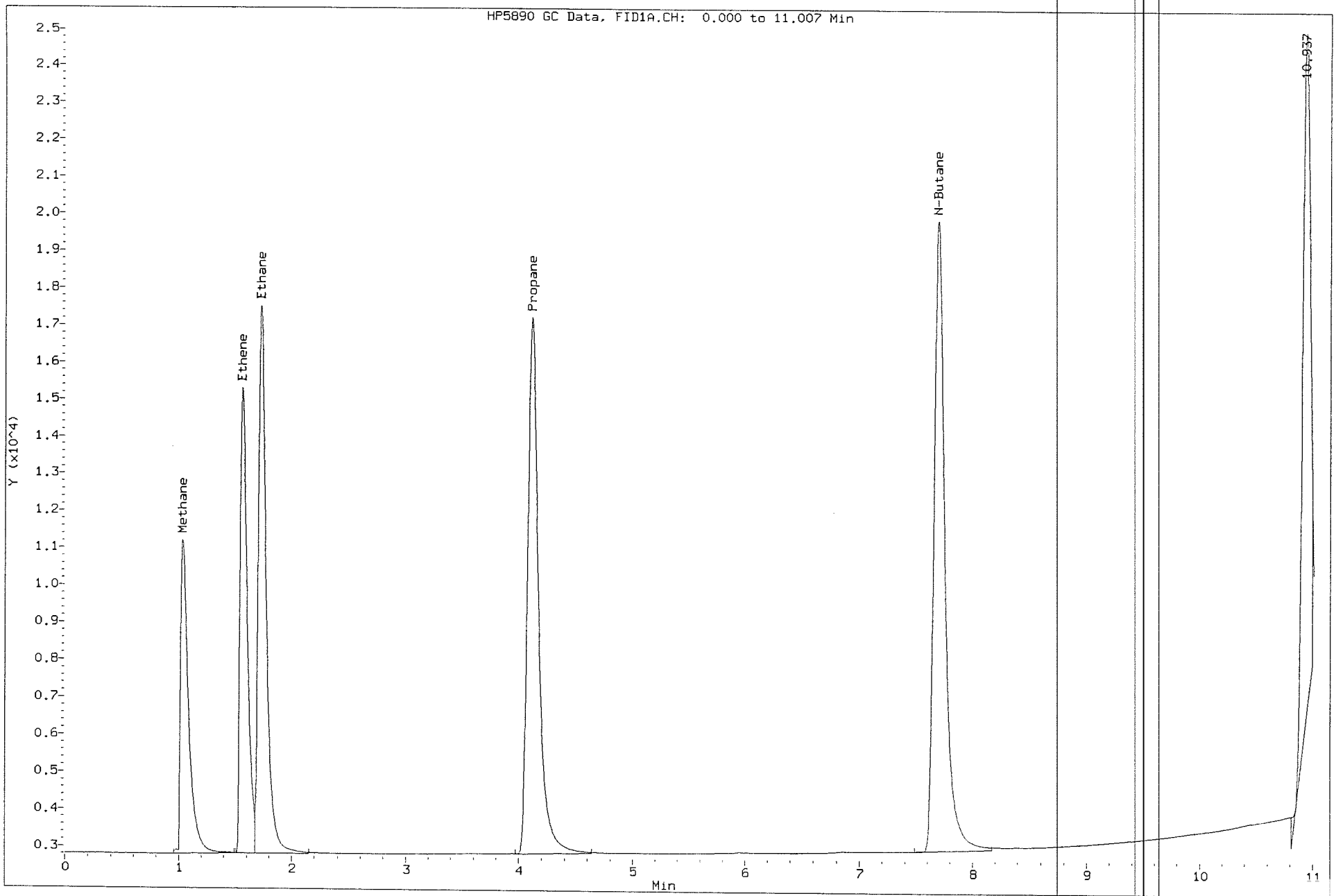
Instrument: FID-4.i

Operator: MA
Column diameter: 0.53

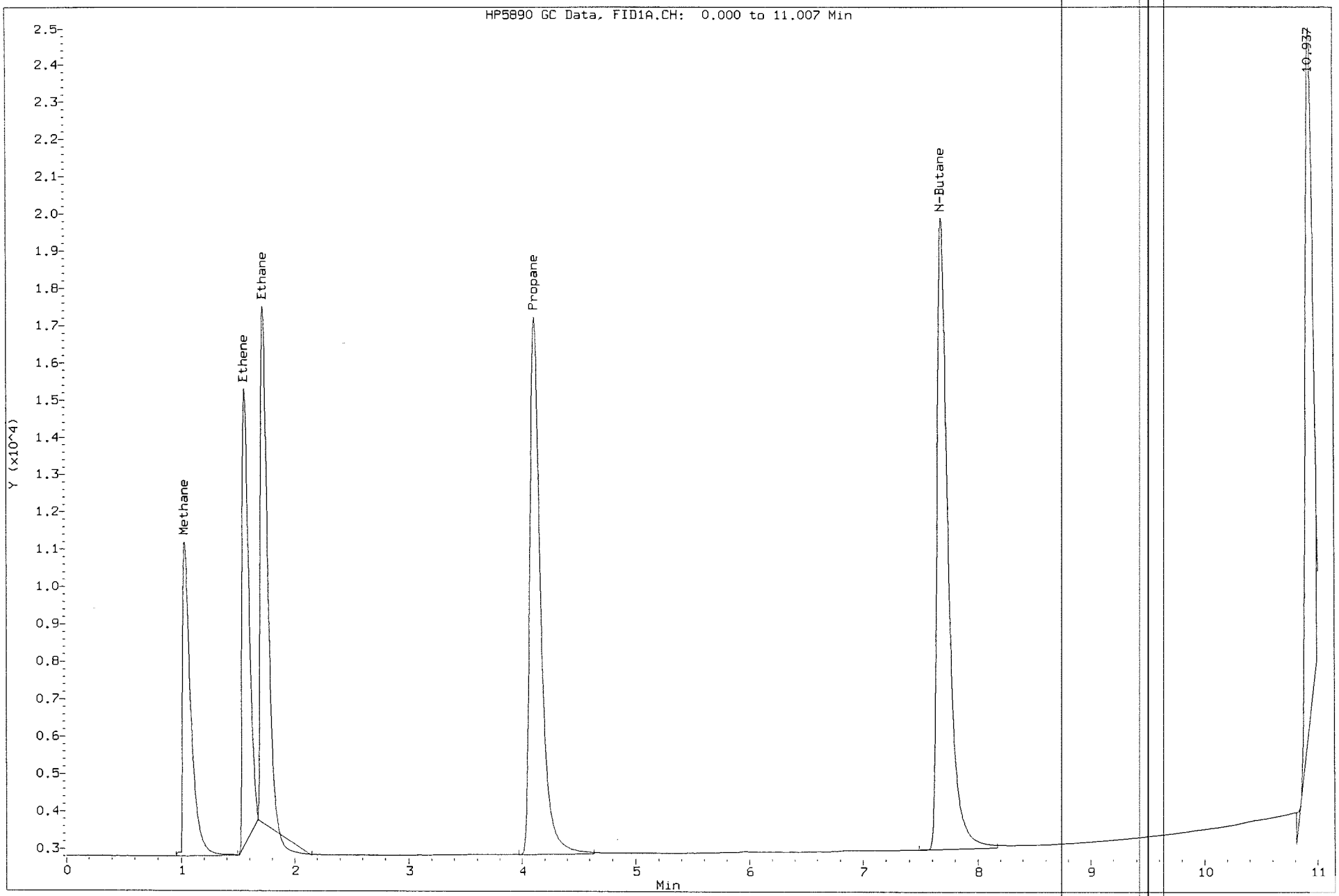
Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\BEFORE\007.D
Injection Date: 24-JAN-2017 11:13
Instrument: FID-4.i
Client Sample ID: ICAL7



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\007.D
Injection Date: 24-JAN-2017 11:13
Instrument: FID-4.i
Client Sample ID: ICAL7



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Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\008.D
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 24-JAN-2017 12:05
Operator : MA Inst ID: FID-4.i
Smp Info : ICV;ICV;;;
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\RSKNI2.m
Meth Date : 22-Aug-2019 16:39 Purvi.lad Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 8 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: stdNI2.sub
Target Version: 4.14

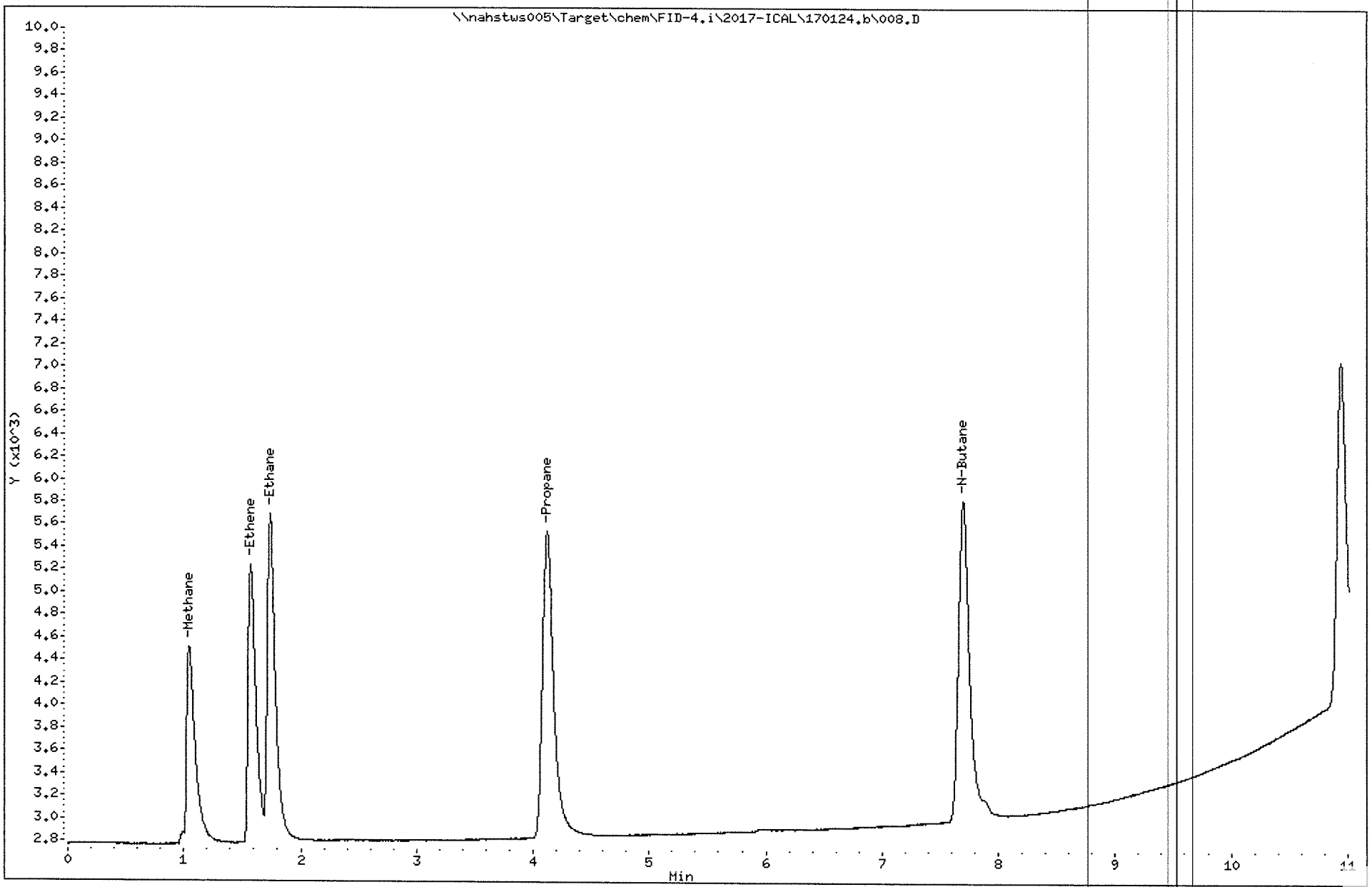
Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	1.046	1.026	0.020	9352	9.59187	9.591
2 Ethene	1.573	1.553	0.020	11192	19.1068	19.106
3 Ethane	1.736	1.720	0.016	14474	20.1170	20.117
4 Propane	4.116	4.106	0.010	18164	27.1844	27.184
5 N-Butane	7.696	7.686	0.010	19425	36.3149	36.314

Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\008.D
Date : 24-JAN-2017 12:05
Client ID: ICV
Sample Info: ICV;ICV;;;

Instrument: FID-4.i
Operator: MA
Column diameter: 0.53

Column phase: Rtx-PLOT



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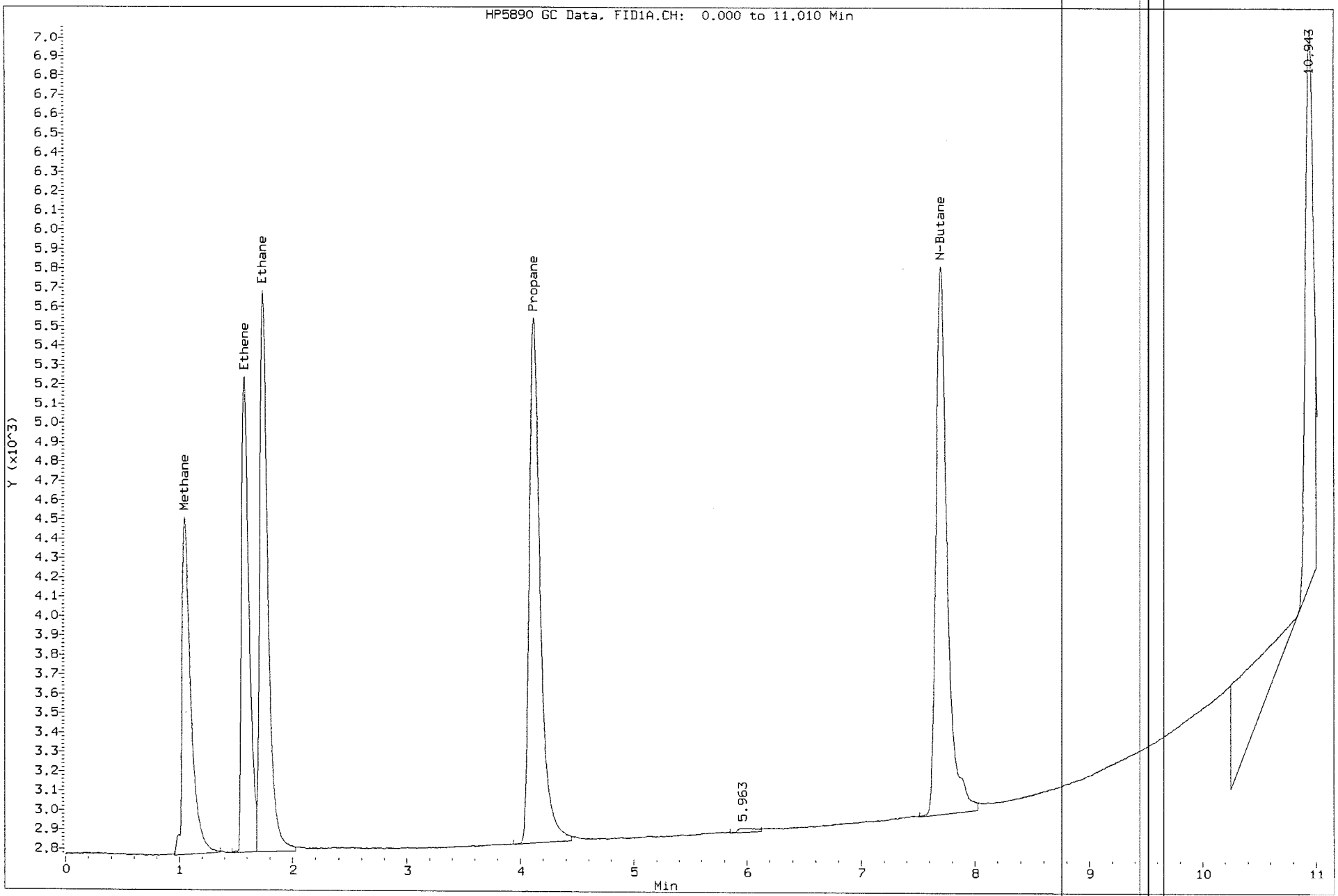
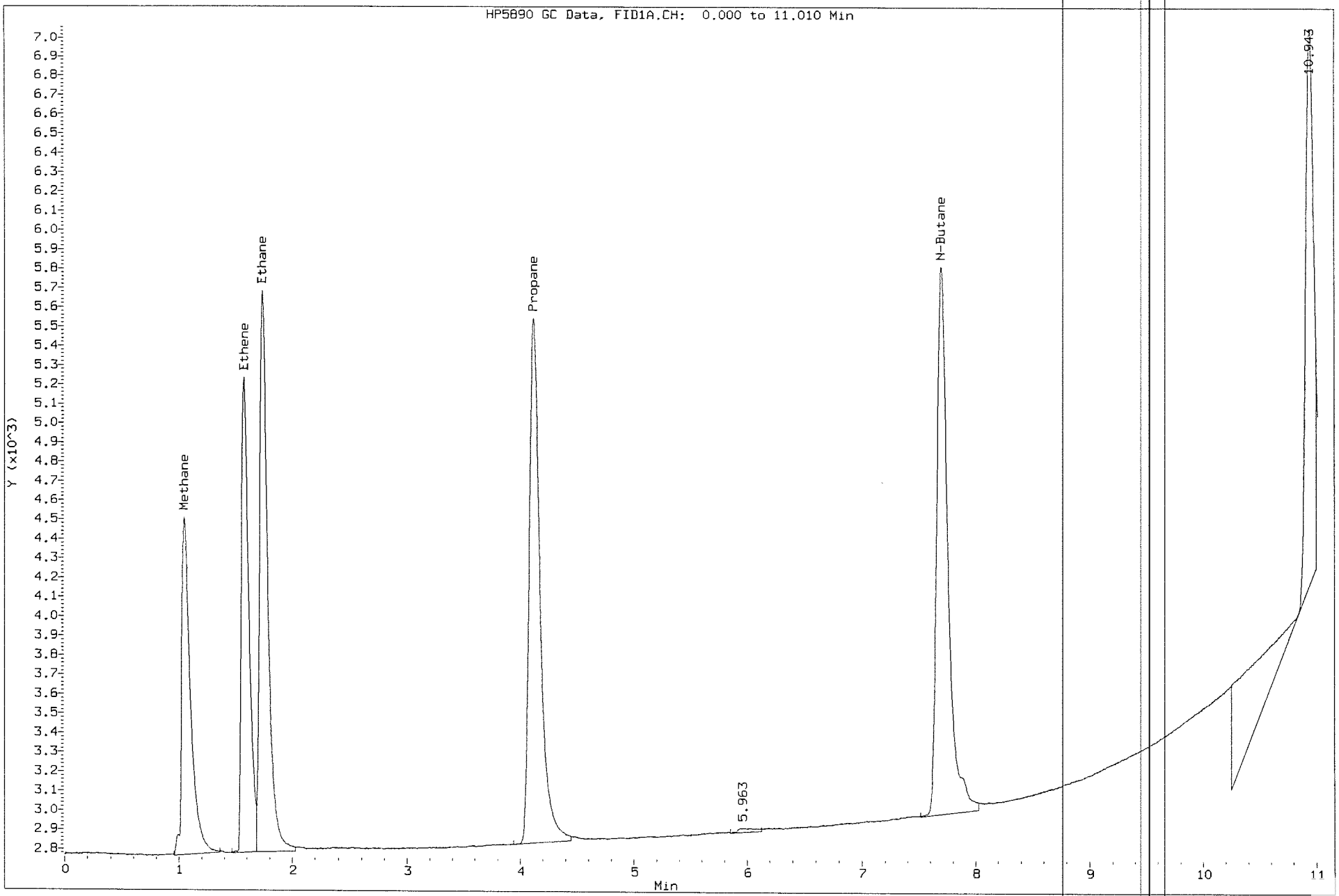
Injection Date: 24-JAN-2017 12:05
Instrument: FID-4.i
Client Sample ID: ICV



Data File: \\nahstws005\Target\chem\FID-4.i\2017-ICAL\170124.b\008.D
Injection Date: 24-JAN-2017 12:05
Instrument: FID-4.i
Client Sample ID: ICV



FID04 -Logbook

Batch: 37666
Date: 09-25-2019
Method: RSK175
Comments: Target sequence 190925

Analyst: Purvi Lad
Reviewer:
Laboratory: Houston

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	RSK-CCV	CCV	09-25-2019 11:40 am	1.00	0.00 mL	0.00 mL	001.D	Liquid	Y	NA
2	LCS-190925	LCS	09-25-2019 12:00 pm	1.00	0.00 mL	0.00 mL	002.D	Liquid	Y	NA
3	LCSD-190925	LCSD	09-25-2019 12:15 pm	1.00	0.00 mL	0.00 mL	003.D	Liquid	Y	NA
4	MBLK-190925	MBLK	09-25-2019 12:26 pm	1.00	0.00 mL	0.00 mL	004.D	Liquid	Y	NA
5	HS19090962-12	SAMP	09-25-2019 12:40 pm	1.00	0.00 mL	0.00 mL	005.D	Liquid	Y	NA
6	HS19090962-12MS	MS	09-25-2019 01:16 pm	1.00	0.00 mL	0.00 mL	006.D	Liquid	Y	NA
7	HS19090962-12MSD	MSD	09-25-2019 01:27 pm	1.00	0.00 mL	0.00 mL	007.D	Liquid	Y	NA
8	HS19090964-04	SAMP	09-25-2019 01:46 pm	1.00	0.00 mL	0.00 mL	008.D	Liquid	Y	NA
9	HS19090964-06	SAMP	09-25-2019 01:58 pm	1.00	0.00 mL	0.00 mL	009.D	Liquid	Y	NA
10	HS19090965-10	SAMP	09-25-2019 02:08 pm	1.00	0.00 mL	0.00 mL	010.D	Liquid	Y	NA
11	RSK-CCV	CCV	09-25-2019 02:17 pm	1.00	0.00 mL	0.00 mL	011.D	Liquid	Y	NA
12	HS19090965-10	SAMP	09-25-2019 02:51 pm	5.00	0.00 mL	0.00 mL	012.D	Liquid	Y	NA
13	HS19091014-02	SAMP	09-25-2019 03:08 pm	1.00	0.00 mL	0.00 mL	013.D	Liquid	Y	NA
14	HS19091014-02	SAMP	09-25-2019 03:26 pm	5.00	0.00 mL	0.00 mL	014.D	Liquid	Y	NA
15	HS19091014-03	SAMP	09-25-2019 03:37 pm	1.00	0.00 mL	0.00 mL	015.D	Liquid	Y	NA
16	RSK-CCV	CCV	09-25-2019 04:24 pm	1.00	0.00 mL	0.00 mL	016.D	Liquid	Y	NA

FORM 2
WATER GASES SURROGATE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090964

	ENG SC SAMPLE NO.	S1 #	S2 #	S3 #	S4 #	S5 #	S6 #	S7 #	S8 #	TOT OUT
01	LCS-190925									0
02	LCSD-190925									0
03	MBLK-190925									0
04	HS19090964-0									0
05	HS19090964-0									0
06										
07										
08										
09										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										

QC LIMITS

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate diluted out

FORM 7B
GASES CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090964

Instrument ID: FID-4 Calibration Date: 09/25/19 Time: 1140

Lab File ID: 001 Init. Calib. Date(s): 01/24/17 01/24/17

Init. Calib. Times: 0906 1113

GC Column: RTX-PLOT ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF250.00 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Ethane	719.48900	613.64518	0.01	14.71	20.00	AVRG
Methane	974.99200	961.64611	0.01	1.37	20.00	AVRG
Ethene	585.76000	534.42136	0.01	8.76	20.00	AVRG

FORM 7B
GASES CALIBRATION VERIFICATION SUMMARY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19090964

Instrument ID: FID-4 Calibration Date: 09/25/19 Time: 1417

Lab File ID: 011 Init. Calib. Date(s): 01/24/17 01/24/17

Init. Calib. Times: 0906 1113

GC Column: RTX-PLOT ID: 0.53 (mm)

COMPOUND	RRF OR AMOUNT	RRF250.00 OR AMOUNT	MIN RRF	%D OR %DRIFT	MAX %D OR %DRIFT	CURV TYPE
Ethane	719.48900	613.64518	0.01	14.71	20.00	AVRG
Methane	974.99200	961.64611	0.01	1.37	20.00	AVRG
Ethene	585.76000	534.42136	0.01	8.76	20.00	AVRG

ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\001.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 25-SEP-2019 11:40
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

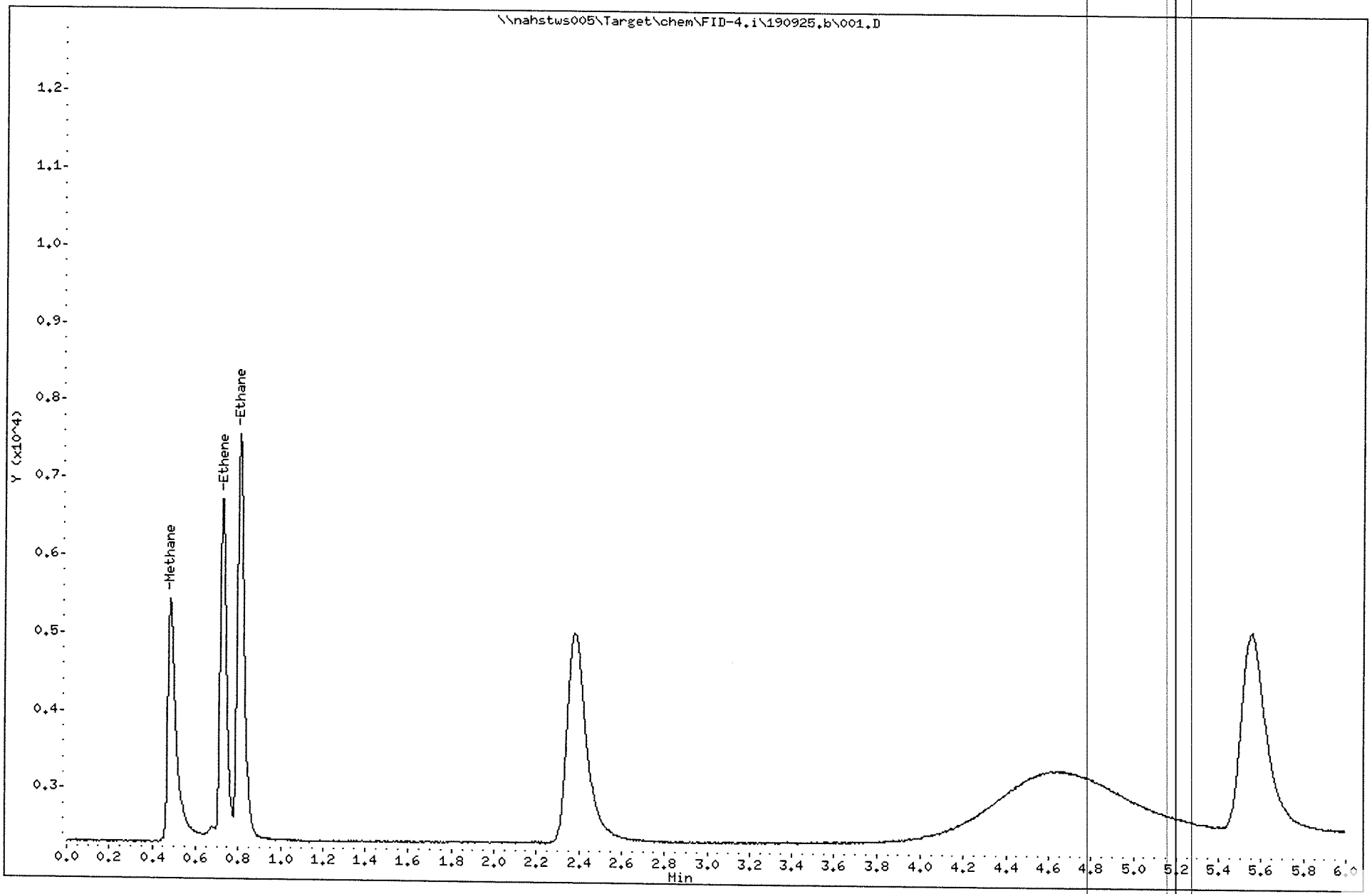
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	0.480	0.480	0.000	9208	9.64700	9.444
2 Ethene	0.726	0.723	0.003	10172	16.8500	17.365
3 Ethane	0.806	0.806	0.000	12703	18.0430	17.655

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\001.D
Date : 25-SEP-2019 11:40
Client ID: RSK-CCV
Sample Info: RSK-CCV;RSK-CCV;2;4

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

Column phase: Rtx-PLOT



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Dissolved Gases Analysis

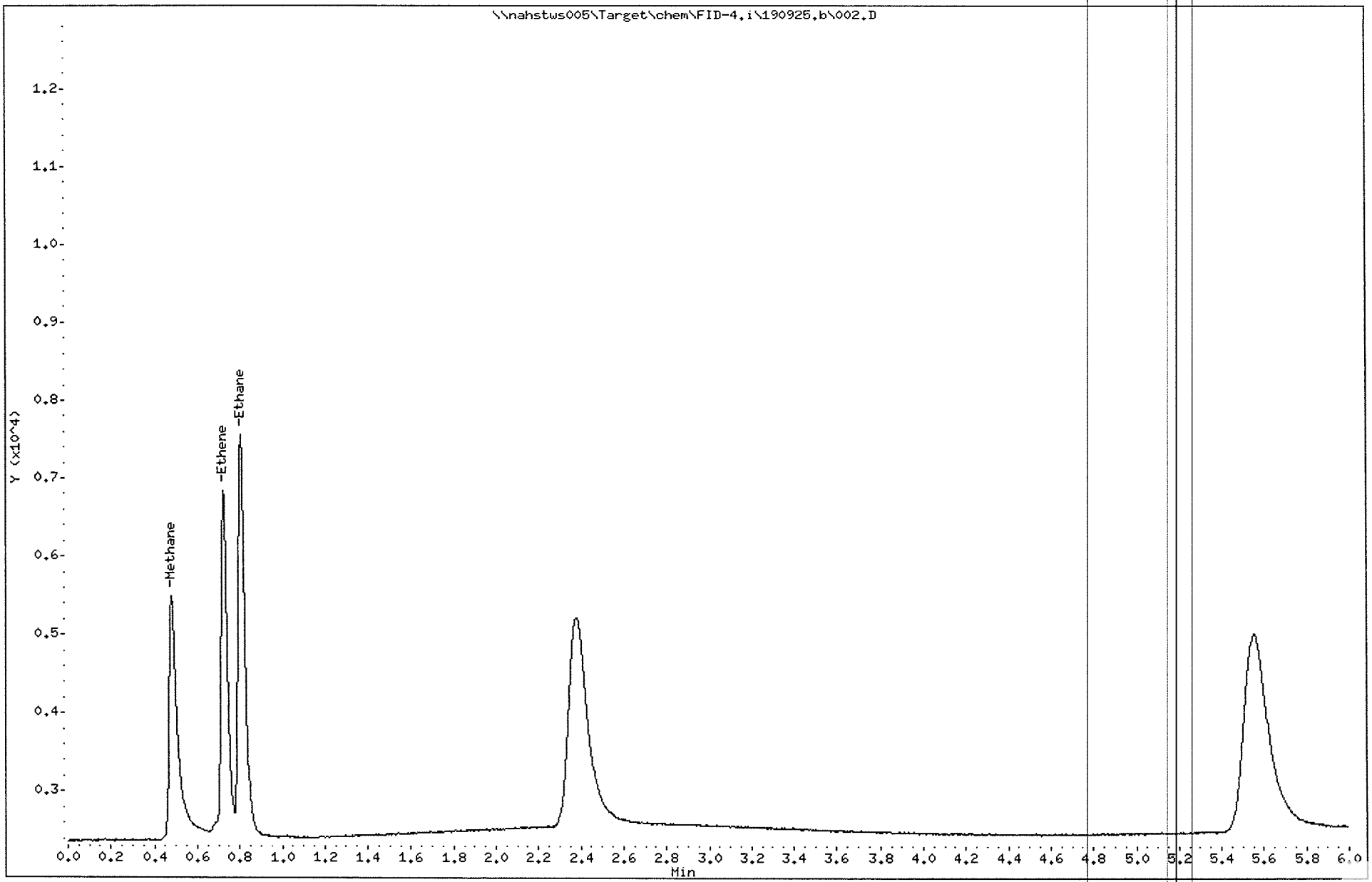
Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\002.D
Lab Smp Id: LCS-190925 Client Smp ID: LCS-190925
Inj Date : 25-SEP-2019 12:00
Operator : PL Inst ID: FID-4.i
Smp Info : LCS-190925;LCS-190925;3;;LCS
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 2 QC Sample: LCS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.480	0.480	0.000	9393	9.63392	9.633
2 Ethene	0.723	0.723	0.000	10140	17.3108	17.310
3 Ethane	0.803	0.806	-0.003	12730	17.6931	17.693

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\002.D
Date : 25-SEP-2019 12:00
Client ID: LCS-190925
Sample Info: LCS-190925;LCS-190925;3;;LCS

Instrument: FID-4.i
Operator: PL
Column phase: Rtx-PLOT
Column diameter: 0.53



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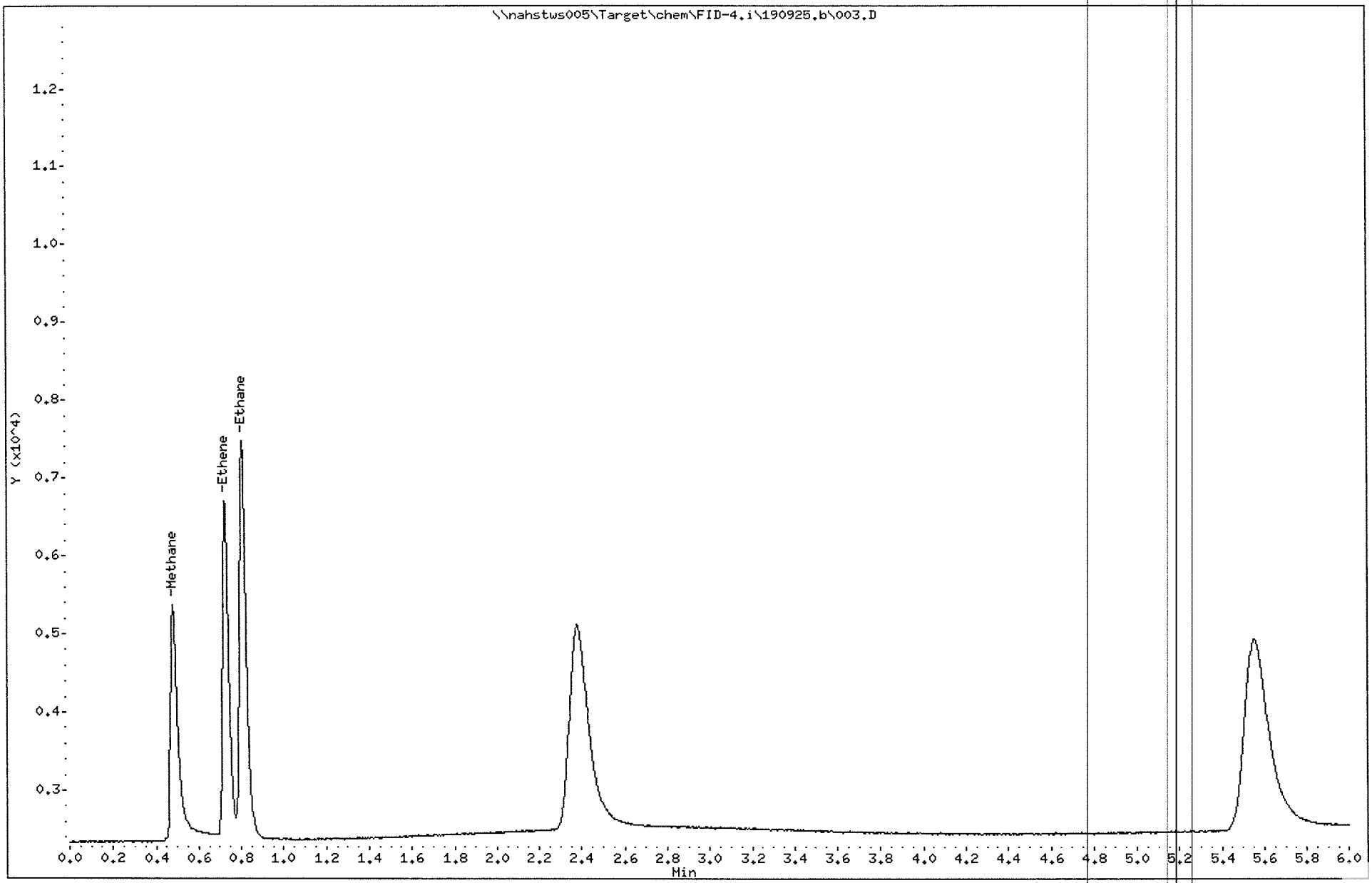
Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\003.D
Lab Smp Id: LCSD-190925 Client Smp ID: LCSD-190925
Inj Date : 25-SEP-2019 12:15
Operator : PL Inst ID: FID-4.i
Smp Info : LCSD-190925;LCSD-190925;3;;LCSD
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 3 QC Sample: LCSD
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.480	0.480	0.000	8270	8.48212	8.482
2 Ethene	0.723	0.723	0.000	9417	16.0765	16.076
3 Ethane	0.806	0.806	0.000	12032	16.7230	16.722

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\003.D
Date : 25-SEP-2019 12:15
Client ID: LCSD-190925
Instrument: FID-4.i
Sample Info: LCSD-190925;LCSD-190925;3;;LCSD
Operator: PL
Column phase: Rtx-PLOT
Column diameter: 0.53



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Dissolved Gases Analysis

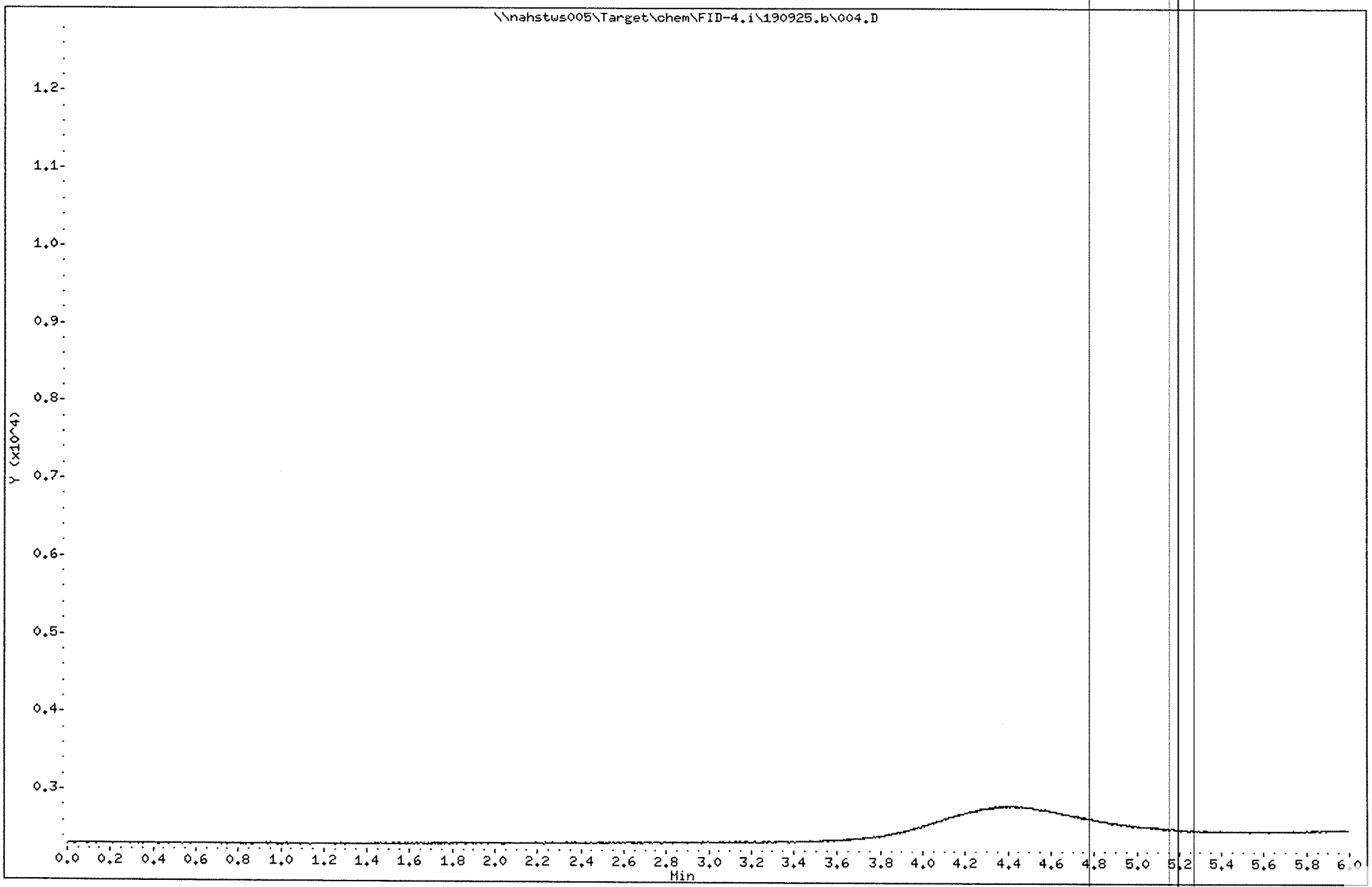
Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\004.D
Lab Smp Id: MBLK-190925 Client Smp ID: MBLK-190925
Inj Date : 25-SEP-2019 12:26
Operator : PL Inst ID: FID-4.i
Smp Info : MBLK-190925; MBLK-190925;3;;BLANK
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 4 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
==========	====	========	========	========	=======	=======

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\004.D
Date : 25-SEP-2019 12:26
Client ID: MBLK-190925
Sample Info: MBLK-190925; MBLK-190925;3;;BLANK

Instrument: FID-4.i
Operator: PL
Column phase: Rtx-PLOT
Column diameter: 0.53



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Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\006.D
Lab Smp Id: HS19090962-12MS Client Smp ID: HS19090962-12MS
Inj Date : 25-SEP-2019 13:16
Operator : PL Inst ID: FID-4.i
Smp Info : HS19090962-12MS; HS19090962-12MS
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 6 QC Sample: MS
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.483	0.480	0.003	9905	10.1591	10.159
2 Ethene	0.723	0.723	0.000	10905	18.6168	18.616(M)
3 Ethane	0.806	0.806	0.000	13166	18.2991	18.299(M)

QC Flag Legend

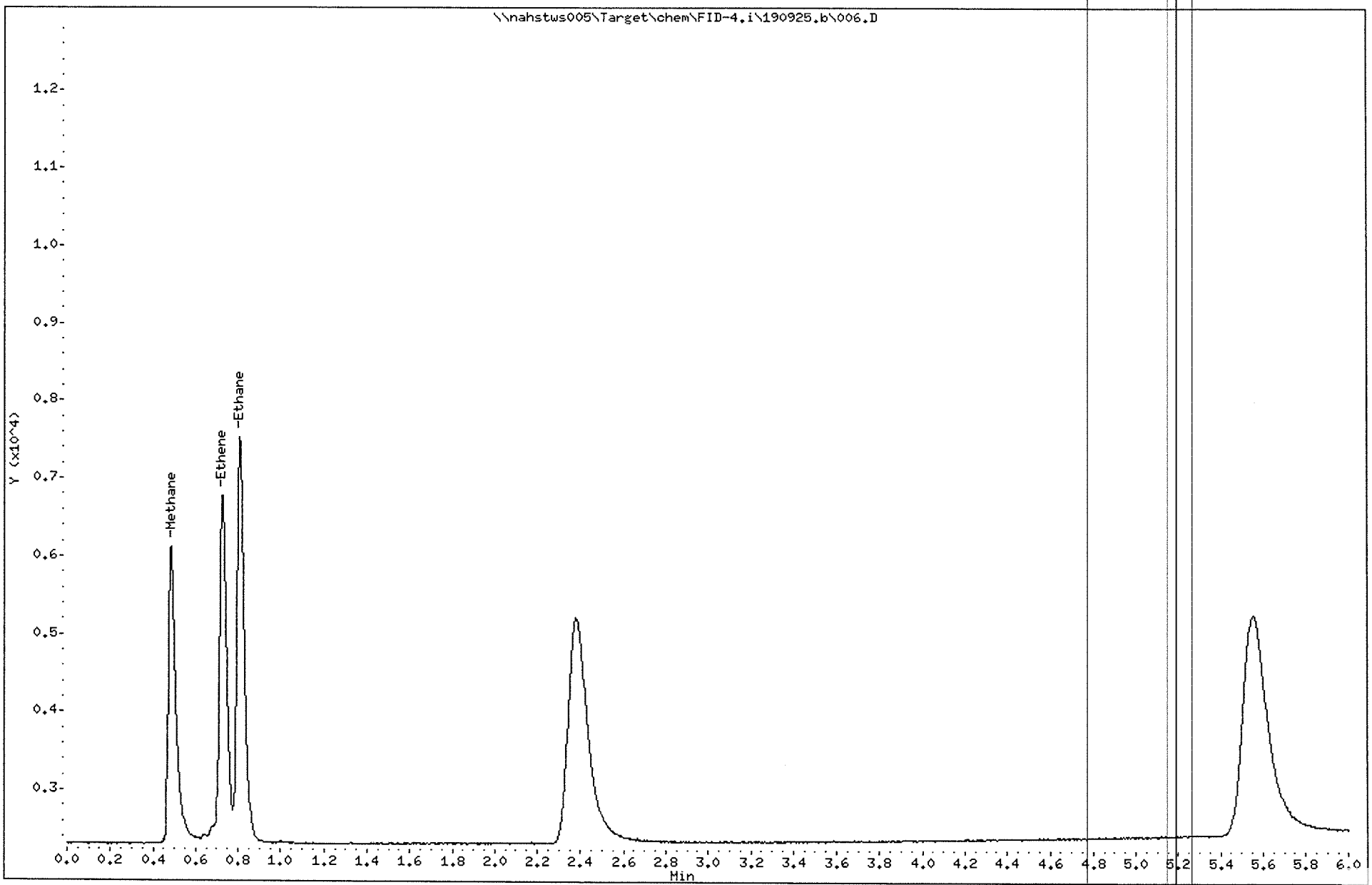
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\006.D
Date : 25-SEP-2019 13:16
Client ID: HS19090962-12MS
Sample Info: HS19090962-12MS; HS19090962-12MS

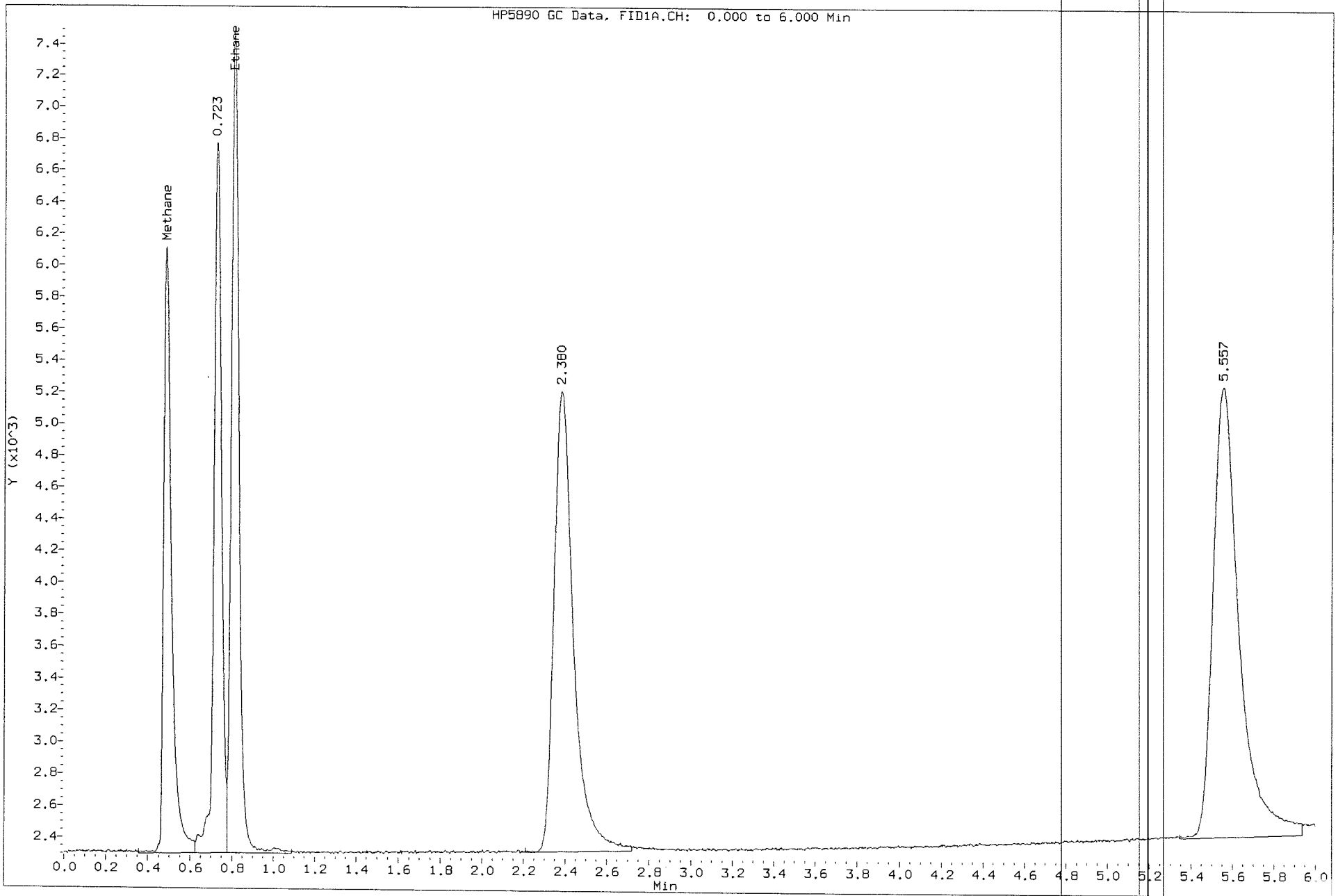
Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

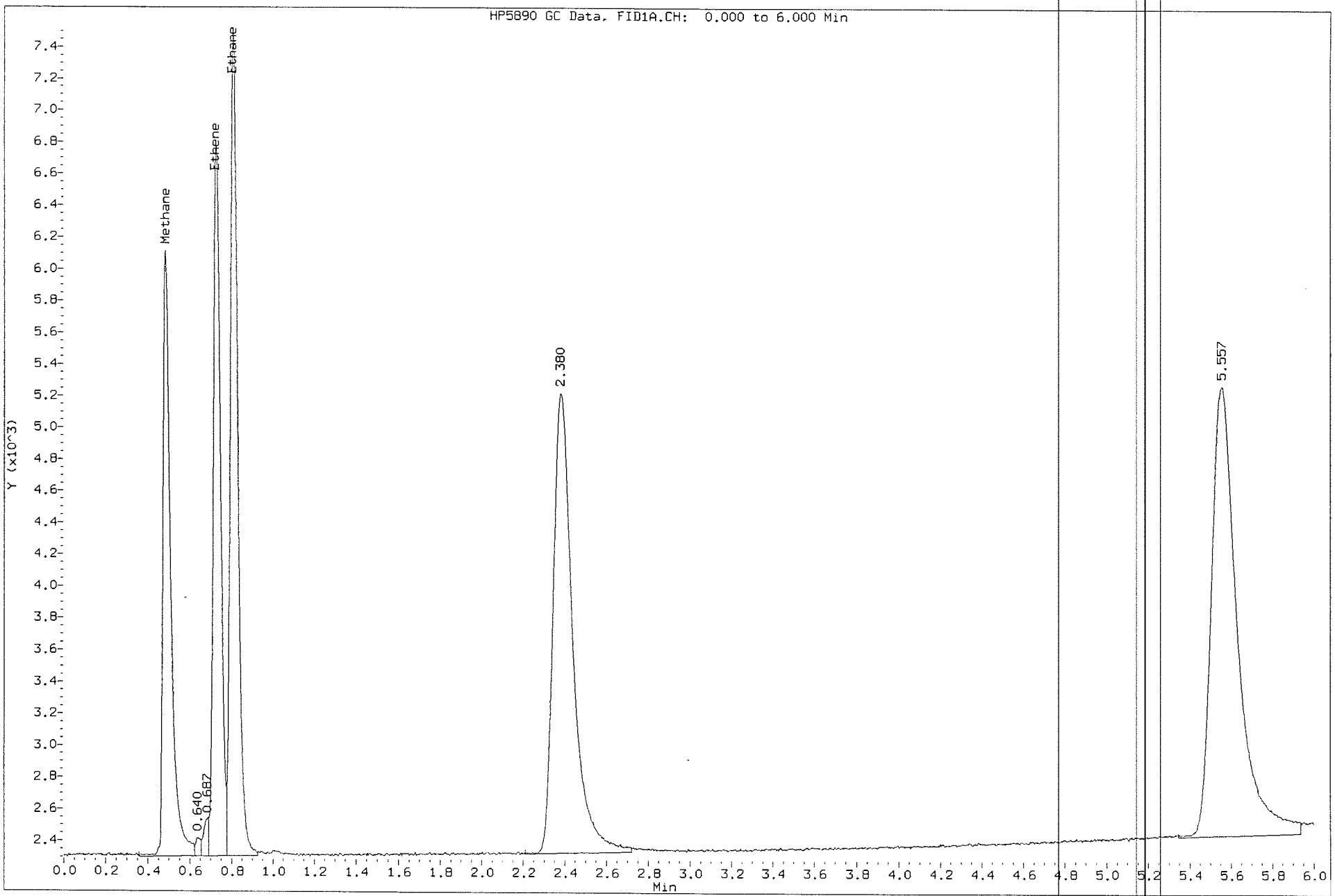
Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\Before\006.D
Injection Date: 25-SEP-2019 13:16
Instrument: FID-4.i
Client Sample ID: HS19090962-12MS



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\006.D
Injection Date: 25-SEP-2019 13:16
Instrument: FID-4.i
Client Sample ID: HS19090962-12MS



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Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\007.D
Lab Smp Id: HS19090962-12MSD Client Smp ID: HS19090962-12MSD
Inj Date : 25-SEP-2019 13:27
Operator : PL Inst ID: FID-4.i
Smp Info : HS19090962-12MSD; HS19090962-12MSD
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 7 QC Sample: MSD
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

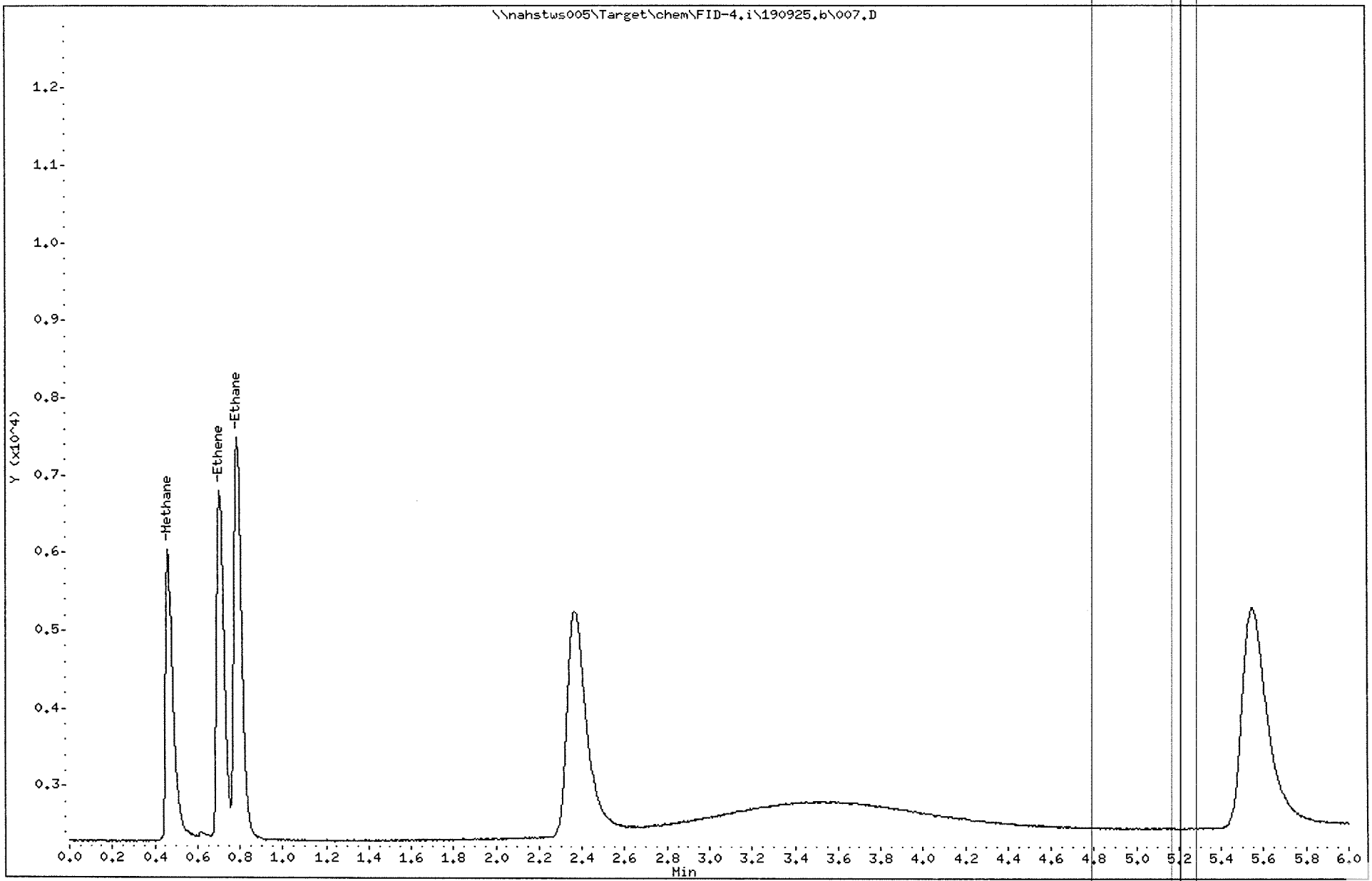
Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	0.463	0.480	-0.017	9443	9.68520	9.685 (M)
2 Ethene	0.706	0.723	-0.017	10914	18.6322	18.632
3 Ethane	0.790	0.806	-0.016	13361	18.5701	18.570

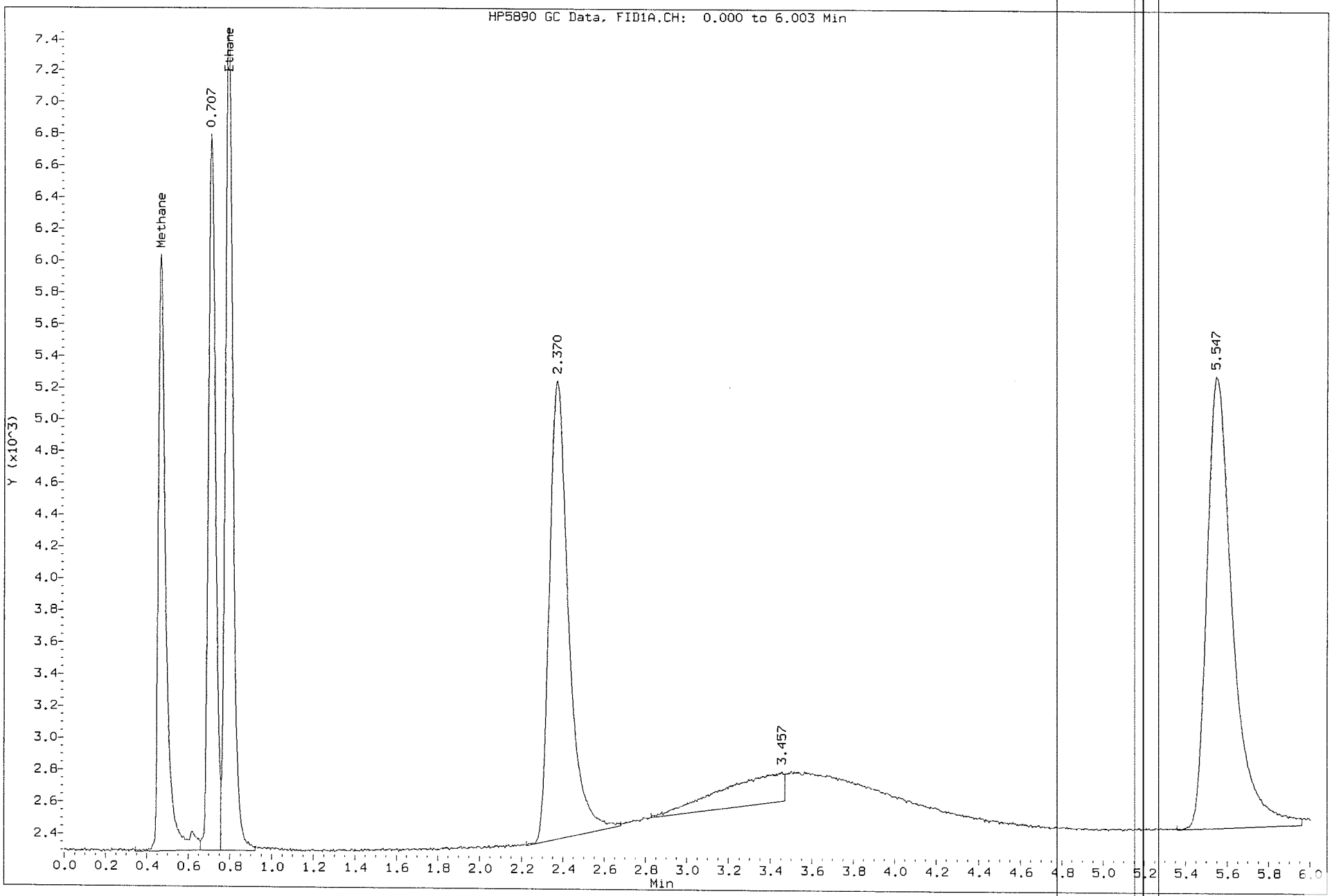
QC Flag Legend

M - Compound response manually integrated.

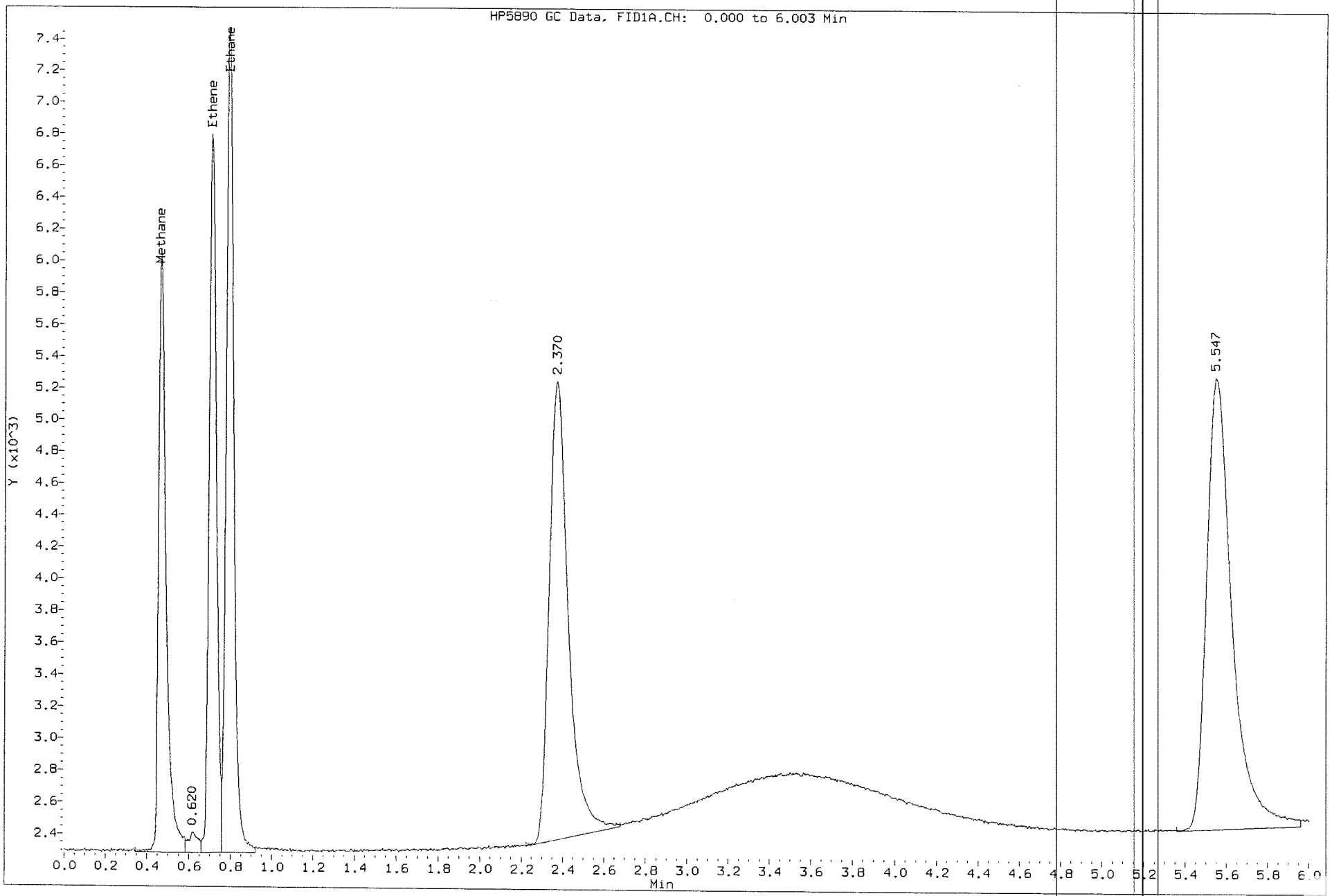
Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\007.D
Date : 25-SEP-2019 13:27
Client ID: HS19090962-12MSD
Instrument: FID-4.i
Sample Info: HS19090962-12MSD; HS19090962-12MSD
Operator: PL
Column phase: Rtx-PLOT
Column diameter: 0.53



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\Before\007.D
Injection Date: 25-SEP-2019 13:27
Instrument: FID-4.i
Client Sample ID: HS19090962-12MSD



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\007.D
Injection Date: 25-SEP-2019 13:27
Instrument: FID-4.i
Client Sample ID: HS19090962-12MSD



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\008.D
Lab Smp Id: HS19090964-04 Client Smp ID: HS19090964-04
Inj Date : 25-SEP-2019 13:46
Operator : PL Inst ID: FID-4.i
Smp Info : HS19090964-04; HS19090964-04
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 8
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)
1 Methane	0.483	0.480	0.003	3529	3.61952	3.619(M)
2 Ethene	0.720	0.723	-0.003	886	1.51256	1.512(M)
3 Ethane	0.820	0.806	0.014	239	0.33218	0.332(aM)

QC Flag Legend

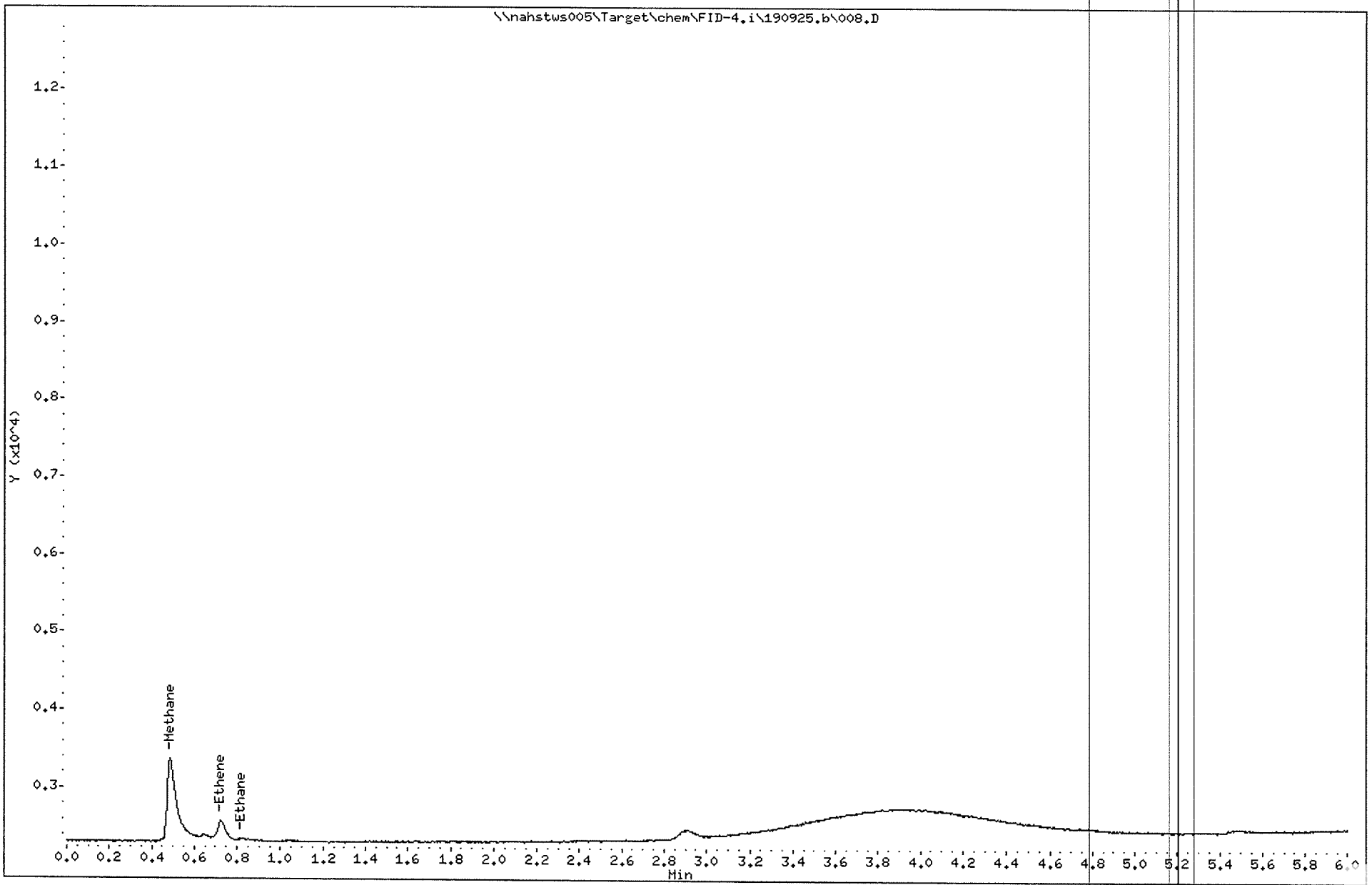
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\008.D
Date : 25-SEP-2019 13:46
Client ID: HS19090964-04
Sample Info: HS19090964-04; HS19090964-04

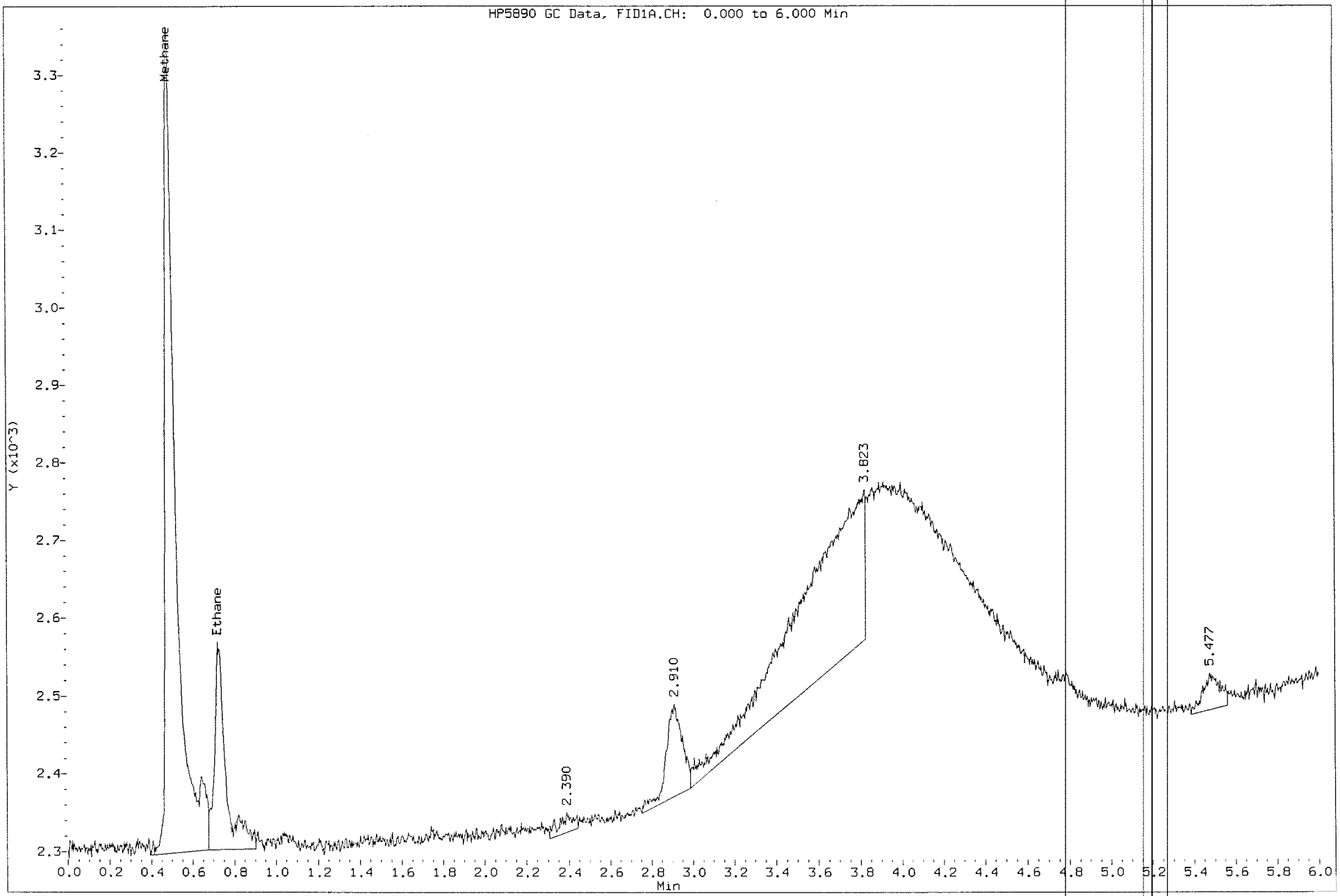
Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

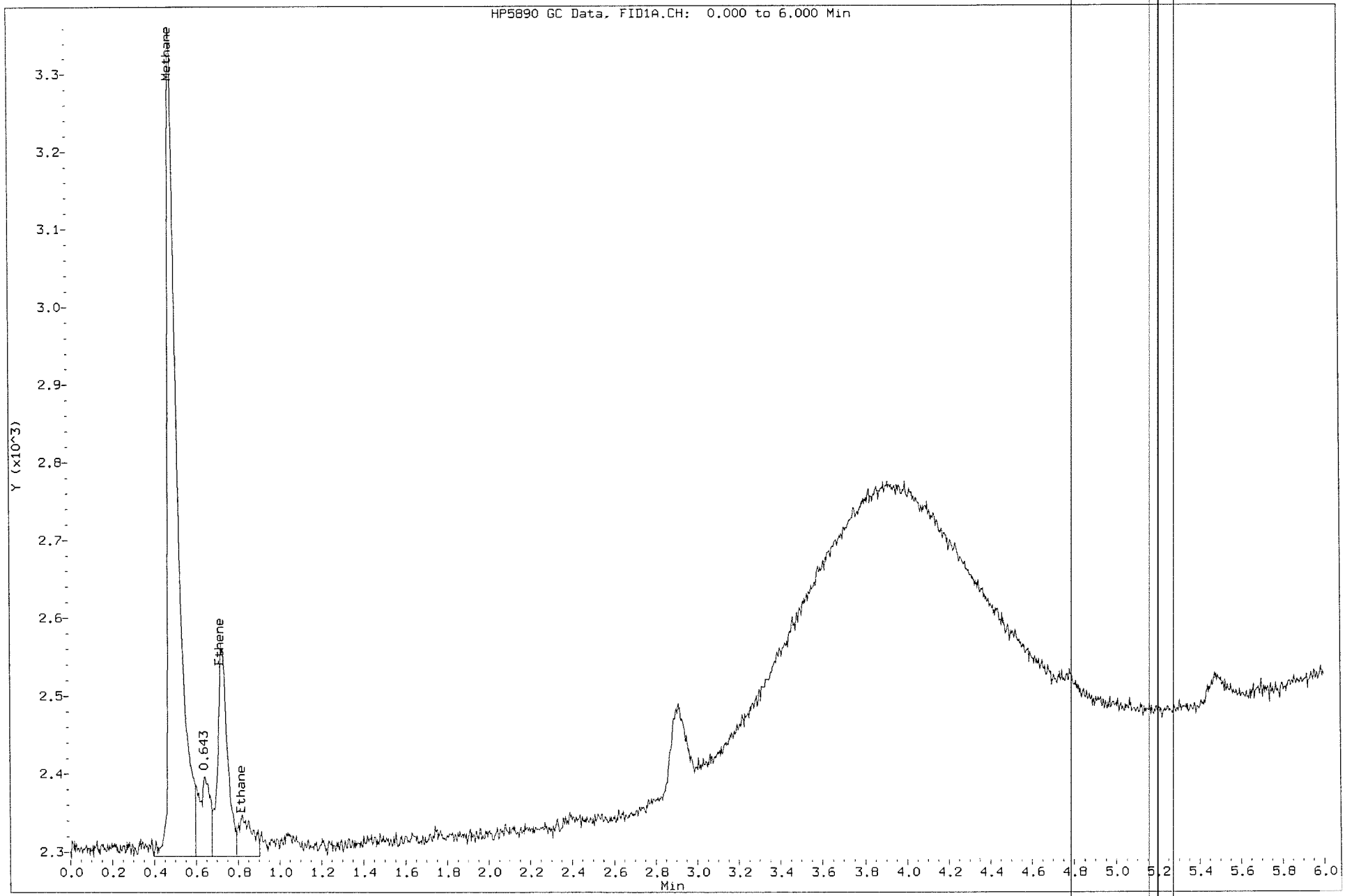
Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\Before\008.D
Injection Date: 25-SEP-2019 13:46
Instrument: FID-4.i
Client Sample ID: HS19090964-04



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\008.D
Injection Date: 25-SEP-2019 13:46
Instrument: FID-4.i
Client Sample ID: HS19090964-04



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\009.D
Lab Smp Id: HS19090964-06 Client Smp ID: HS19090964-06
Inj Date : 25-SEP-2019 13:58
Operator : PL Inst ID: FID-4.i
Smp Info : HS19090964-06; HS19090964-06
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 9
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)
1 Methane	0.483	0.480	0.003	4256	4.36516	4.365
2 Ethene	0.716	0.723	-0.007	837	1.42891	1.428(M)
3 Ethane	0.830	0.806	0.024	229	0.31828	0.318(aM)

QC Flag Legend

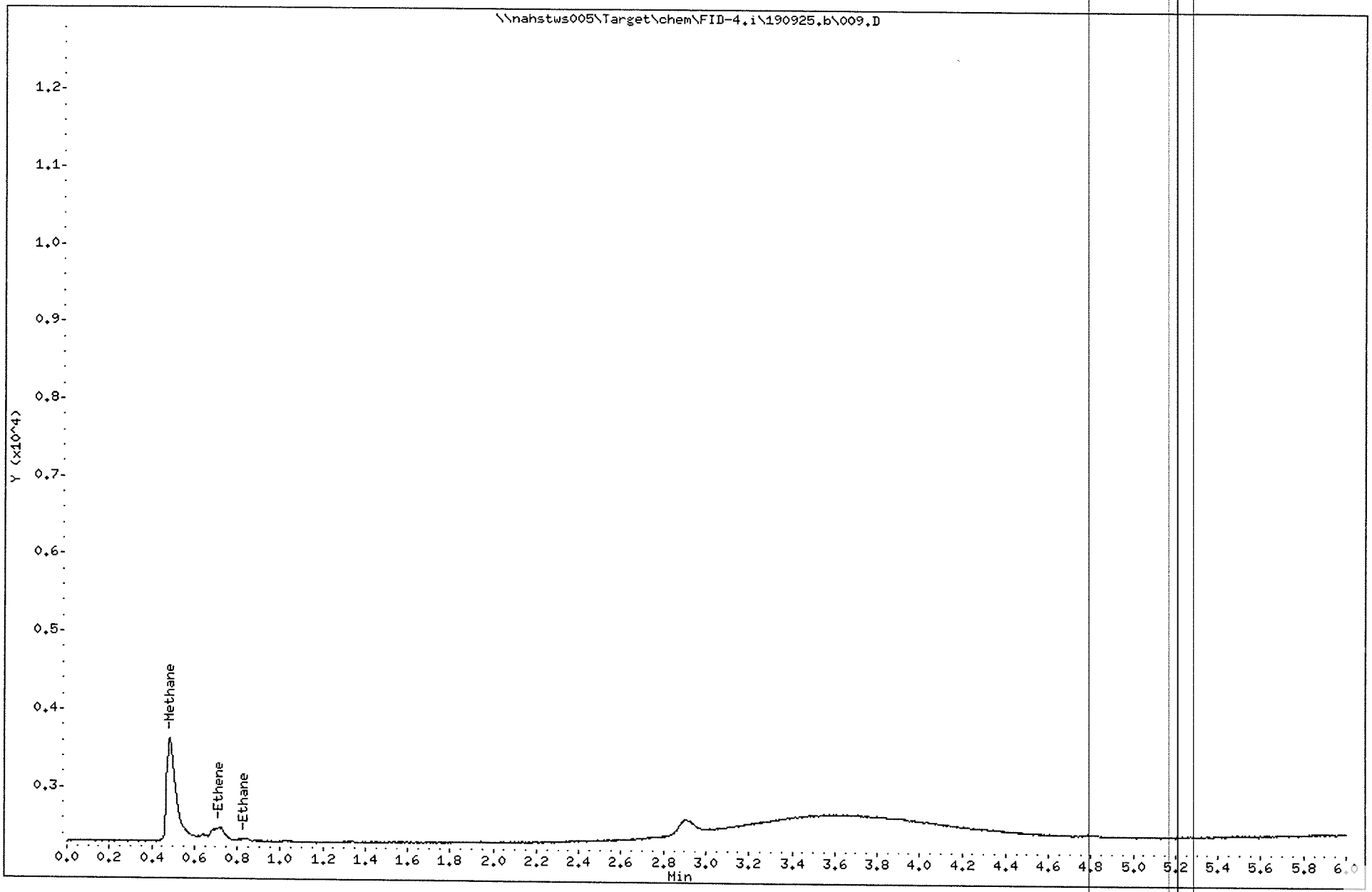
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\009.D
Date : 25-SEP-2019 13:58
Client ID: HS19090964-06
Sample Info: HS19090964-06; HS19090964-06

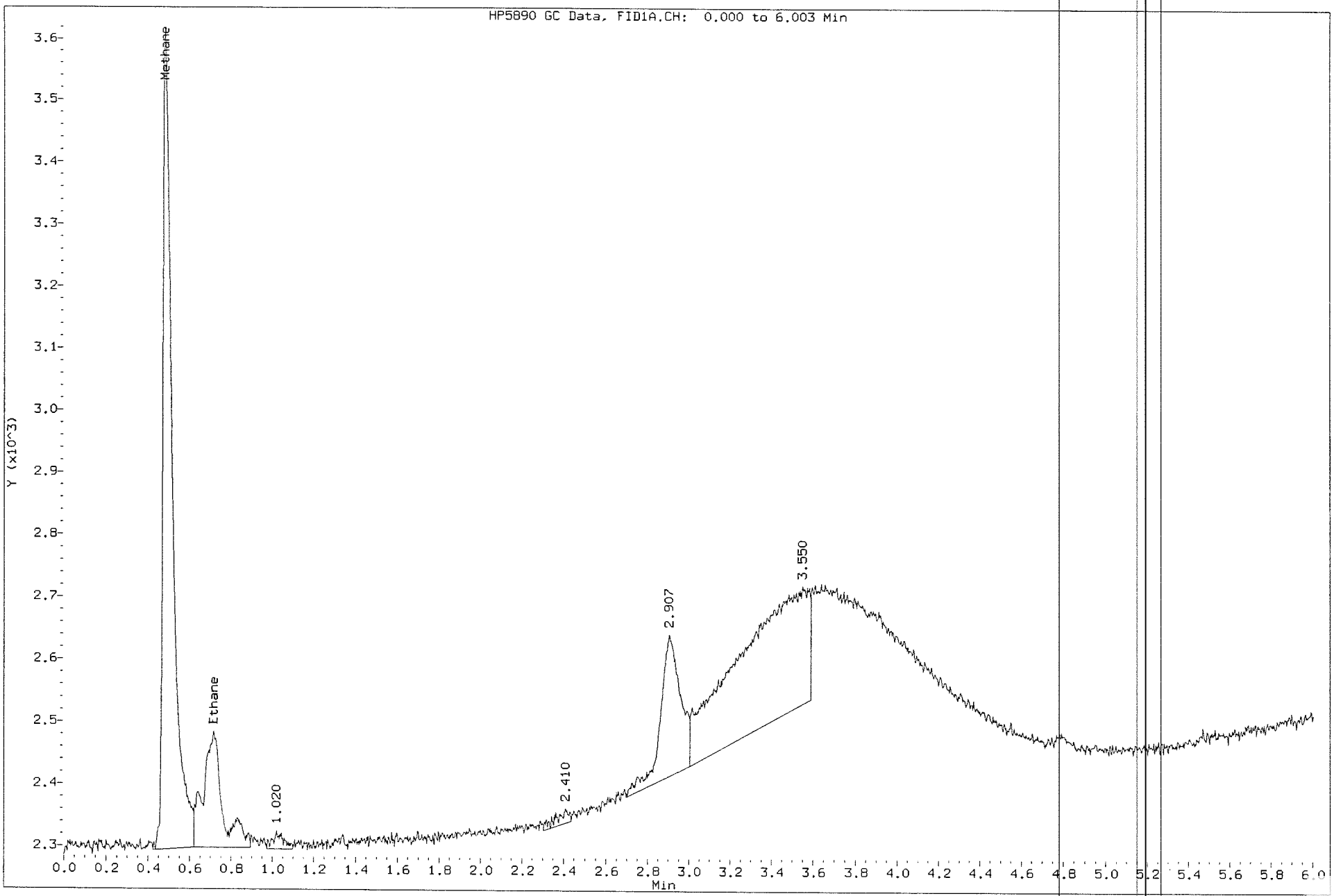
Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

Column phase: Rtx-PLOT



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\Before\009.D
Injection Date: 25-SEP-2019 13:58
Instrument: FID-4.i
Client Sample ID: HS19090964-06



Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\009.D
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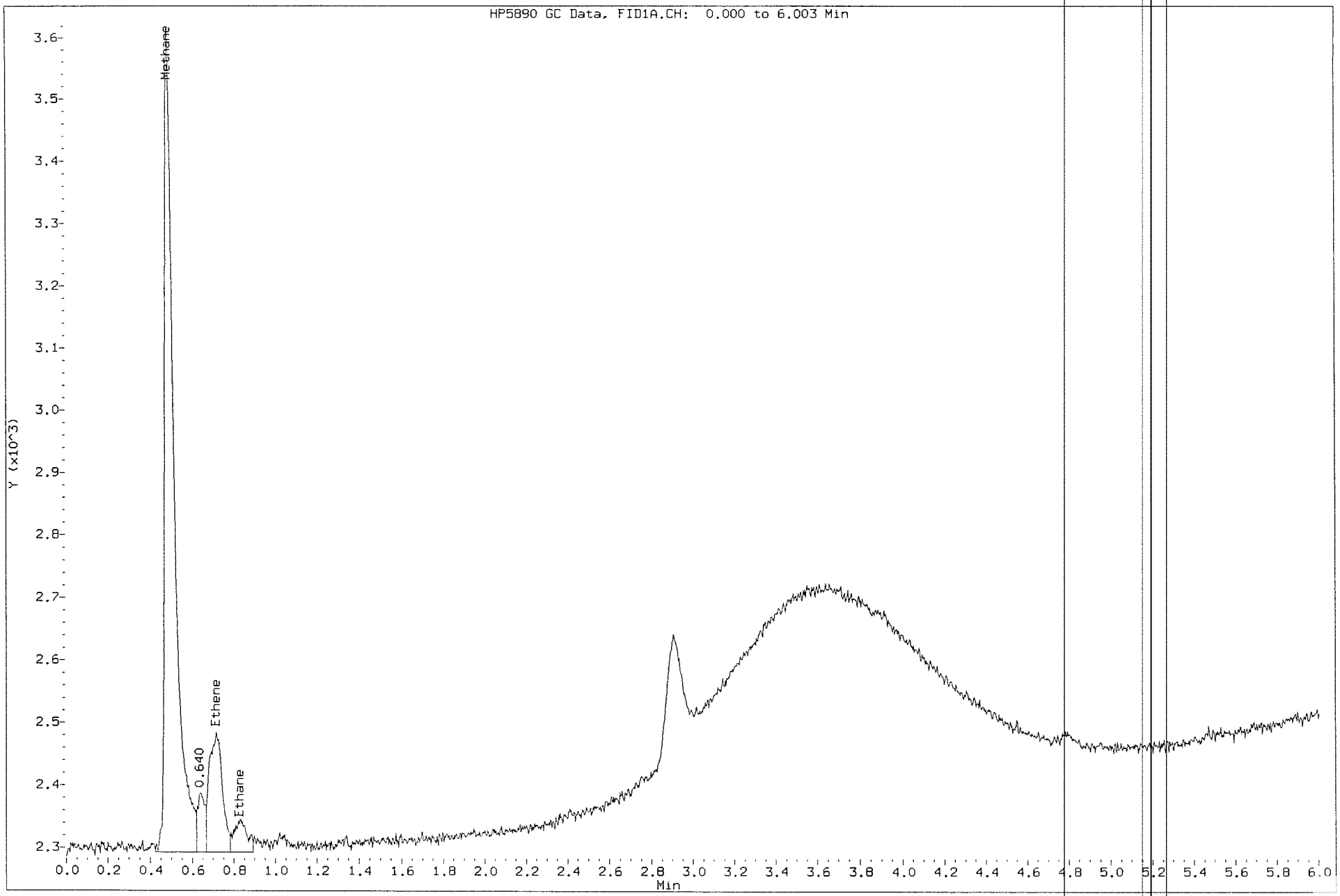
Instrument: FID-4.i
Client Sample ID: HS19090964-06



ALS Laboratory Group

Dissolved Gases Analysis

Data file : \\nahstws005\Target\chem\FID-4.i\190925.b\011.D
Lab Smp Id: RSK-CCV Client Smp ID: RSK-CCV
Inj Date : 25-SEP-2019 14:17
Operator : PL Inst ID: FID-4.i
Smp Info : RSK-CCV;RSK-CCV;2;4
Misc Info : ;1;0;1
Comment :
Method : \\nahstws005\Target\chem\FID-4.i\190925.b\RSKNI3.m
Meth Date : 11-Oct-2019 17:45 FID-4.i Quant Type: ESTD
Cal Date : 24-JAN-2017 10:15 Cal File: 004.D
Als bottle: 11 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: RSK175.sub
Target Version: 4.14

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

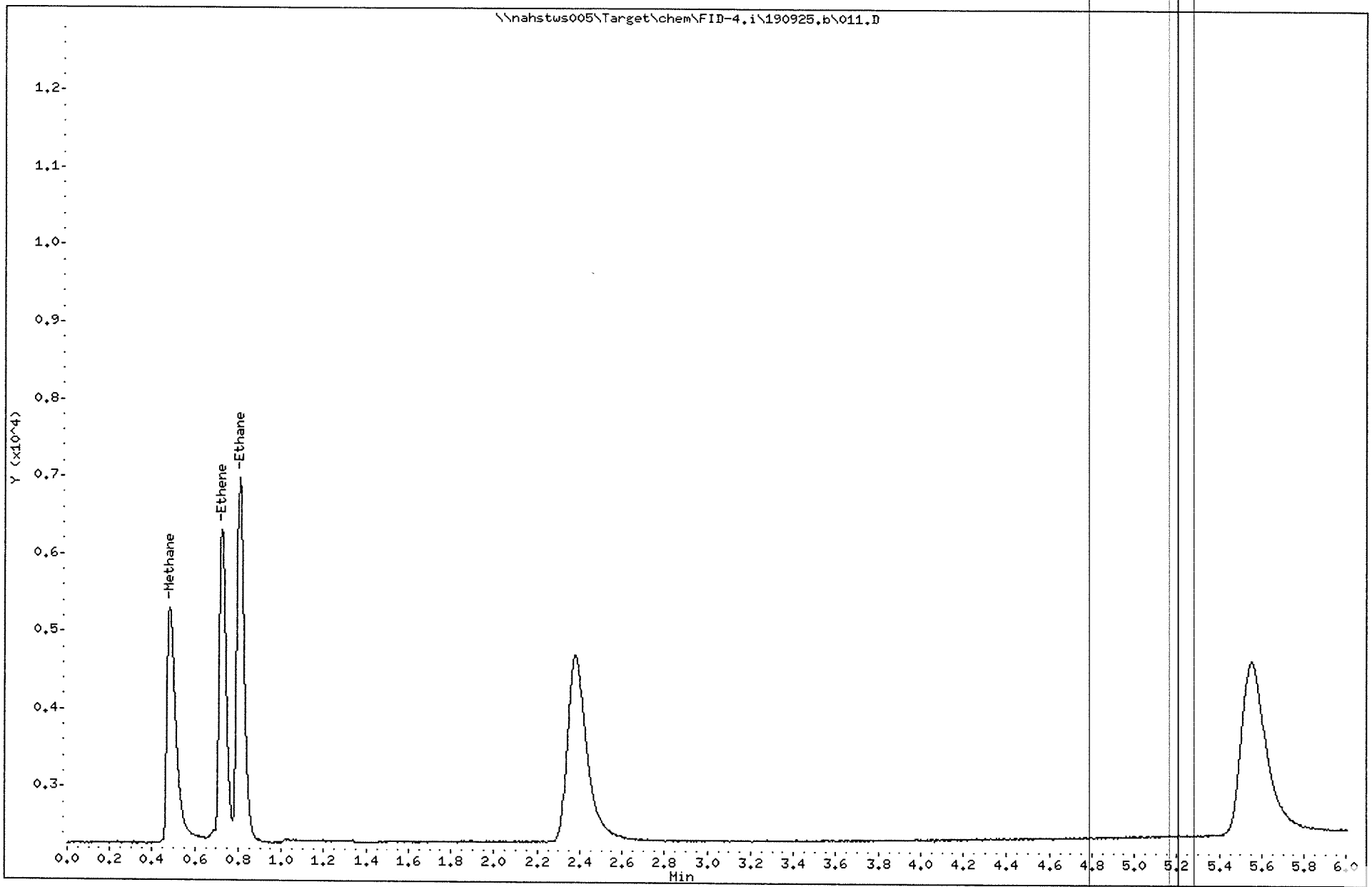
Compounds	RT	EXP RT	DLT RT	RESPONSE	AMOUNTS CAL-AMT (ug/L)	AMOUNTS ON-COL (ug/L)
1 Methane	0.480	0.480	0.000	9277	9.64700	9.514
2 Ethene	0.723	0.723	0.000	9005	16.8500	15.373
3 Ethane	0.806	0.806	0.000	11072	18.0430	15.388

Data File: \\nahstws005\Target\chem\FID-4.i\190925.b\011.D
Date : 25-SEP-2019 14:17
Client ID: RSK-CCV
Sample Info: RSK-CCV;RSK-CCV;2;4

Instrument: FID-4.i

Operator: PL
Column diameter: 0.53

Column phase: Rtx-PLOT

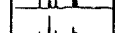
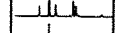
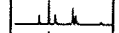
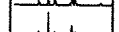
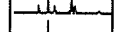
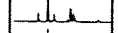
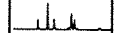


HS19090964 Wet Chem Raw Data

ALS WO# HS19090964

Sequence: 091819
Last Update Operator: alshs.nouser

HS19090964

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	Volume [ul]	Status	Inject Time
	STD1	2970209205	Calibration	GA1	1.0000	1	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:08:06 PM -05:00
	STD2		Calibration	GA2	1.0000	2	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:24:42 PM -05:00
	STD3		Calibration	GA3	1.0000	3	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:41:19 PM -05:00
	STD4		Calibration	GA4	1.0000	4	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:57:54 PM -05:00
	STD5		Calibration	GA5	1.0000	5	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 3:14:30 PM -05:00
	STD6	NO2,F MAX 10PPM	Calibration	GB8	1.0000	6	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:37:32 PM -05:00
	ICV	2970209123	Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:54:07 PM -05:00
	ICB		Unknown	GB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 7:29:52 PM -05:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 11:54:49 AM -05:00
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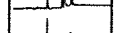
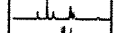
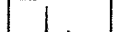
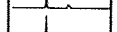
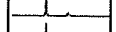
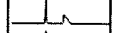
	HS19090964-04		Unknown	GA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 1:01:23 PM -05:00
	HS19090964-06		Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 1:17:59 PM -05:00
	HS19090962-12		Unknown	GA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 1:34:38 PM -05:00
	HS19090962-12MS	man.int.NO3 KMU 9/	Unknown	GB1	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 1:51:13 PM -05:00
	HS19090962-12MSD	man.int.NO3 KMU 9/	Unknown	GB2	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 2:07:48 PM -05:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 3:29:06 PM -05:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 3:45:41 PM -05:00
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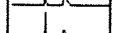
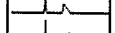
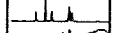
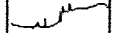
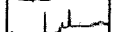
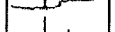
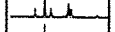
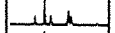
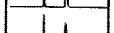
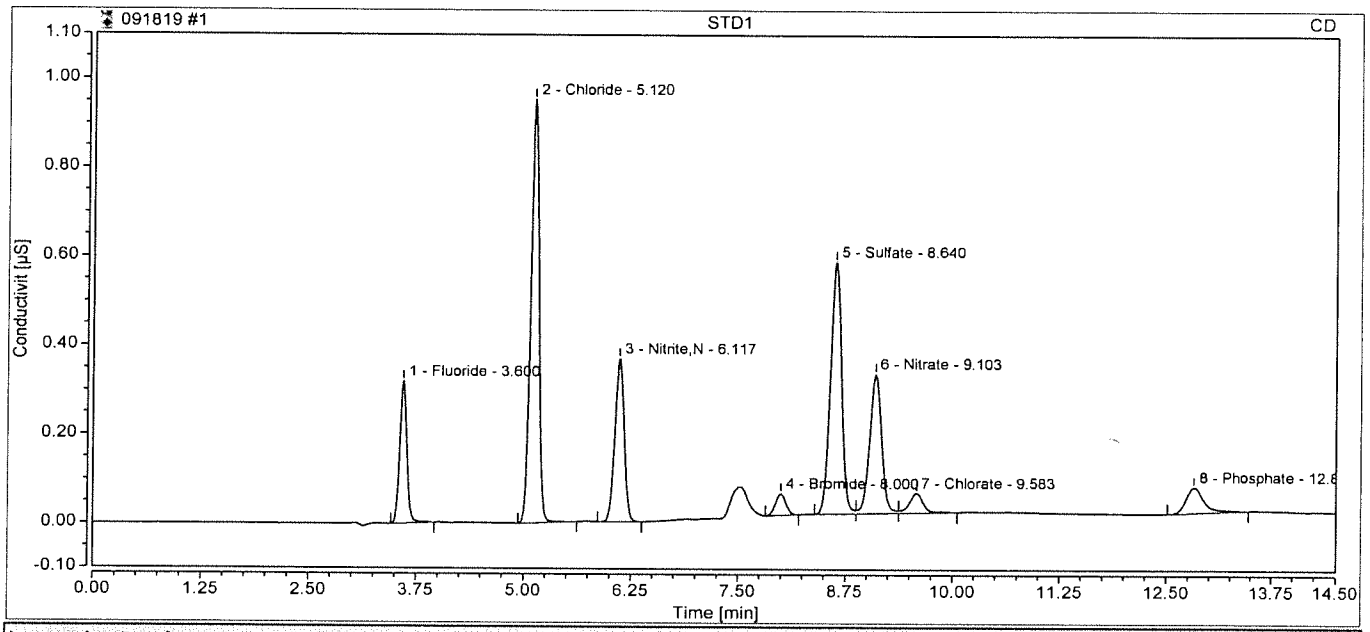
	WLCSW1-092019		Unknown	GB4	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 4:18:52 PM -05:00
	WLCSDW1-092019		Unknown	GB5	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 4:35:31 PM -05:00
	HS19090962-12DF5	9056_W	Unknown	GC2	5.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 5:08:41 PM -05:00
	HS19090962-12MSDF5		Unknown	GC3	5.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 5:25:17 PM -05:00
	HS19090962-12MSDDF5		Unknown	GC4	5.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 5:42:00 PM -05:00
	HS19090962-12DF50		Unknown	GC5	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 5:58:35 PM -05:00
	HS19090962-12MSDF50		Unknown	GC6	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 6:15:11 PM -05:00
	HS19090962-12MSDDF50		Unknown	GC7	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 6:31:46 PM -05:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 6:48:30 PM -05:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/20/2019 7:05:05 PM -05:00

Peak No.	Peak Name	Cal.Type	Eval.Type	Number of Points	Rel.Std.Dev. %	Coeff.of Determination	C0 (Offset)	C1 (Slope)	C2 (Curve)
1	*Fluoride*	*Lin, WithOffset, 1/x*	*Area*	*5*	*10.1532*	*0.99927*	*-0.0056*	*0.3716*	*0.0000*
2	Chloride	Lin, WithOffset, 1/x	Area	6	0.2804	1.00000	-0.0135	0.2355	0.0000
3	Nitrite,N	Lin, WithOffset, 1/x	Area	5	15.1147	0.99824	0.0003	0.5120	0.0000
4	Bromide	Lin, WithOffset, 1/x	Area	6	14.0217	0.99919	-0.0052	0.1009	0.0000
5	Sulfate	Lin, WithOffset, 1/x	Area	6	1.1258	0.99999	-0.0022	0.1717	0.0000
6	Nitrate	Lin, WithOffset, 1/x	Area	6	2.2249	0.99998	-0.0102	0.5876	0.0000
7	Chlorate	Lin, WithOffset, 1/x	Area	6	10.0265	0.99953	-0.0024	0.0944	0.0000
8	Phosphate	Lin, WithOffset, 1/x	Area	6	6.6198	0.99981	-0.0110	0.2321	0.0000
Maximum					**15.1147**	1.00000			
Minimum					0.2804	**0.99824**			

1 STD1

Sample Name:	**STD1**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:08**	*Sample Weight:*	**1.0000**

Run Time:



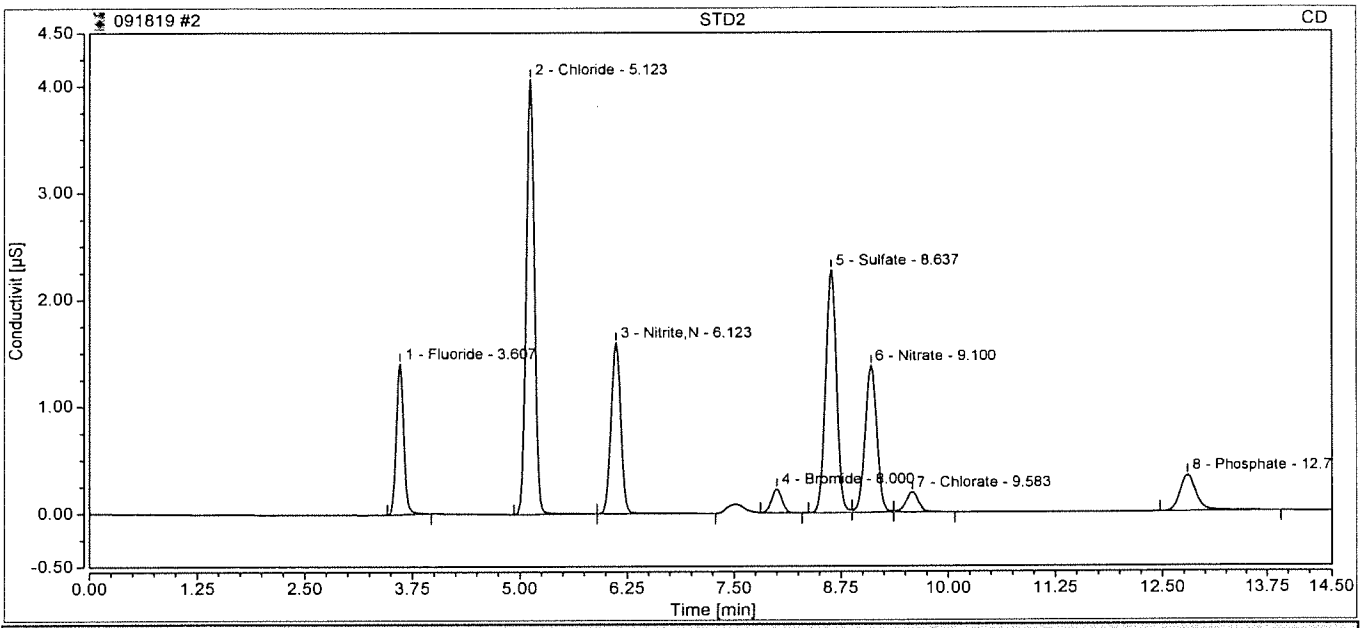
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.031	0.0973	0.0973	1.0000
2	5.12	Chloride	BMB	0.105	0.5026	0.5026	1.0000
3	6.12	Nitrite,N	BMB	0.046	0.0893	0.0893	1.0000
4	8.00	Bromide	BMB	0.007	0.1192	0.1192	1.0000
5	8.64	Sulfate	BM	0.084	0.5042	0.5042	1.0000
6	9.10	Nitrate	M	0.051	0.1034	0.1034	1.0000
7	9.58	Chlorate	MB	0.008	0.1143	0.1143	1.0000
8	12.83	Phosphate	BMB	0.014	0.1085	0.1085	1.0000
Total:			**0.000**	**0.346**		**1.64**	

2 STD2

Sample Name:	**STD2**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:24**	*Sample Weight:*	**1.0000**

Run Time:



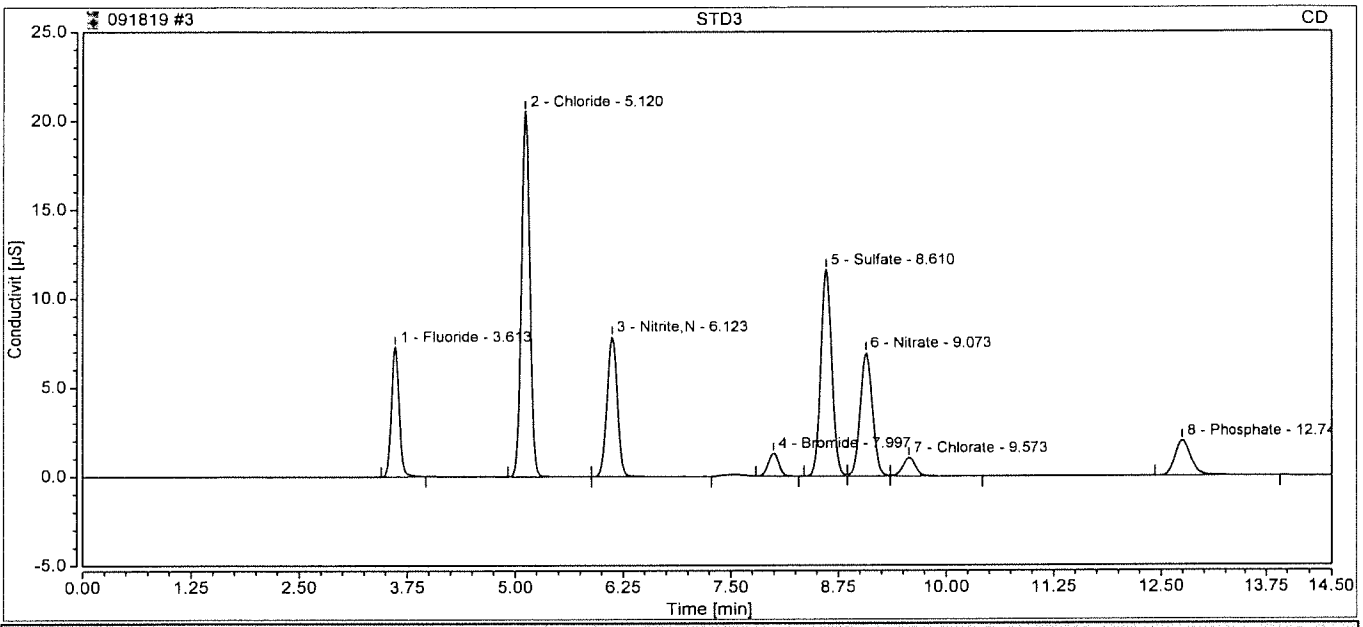
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.140	0.3929	0.3929	1.0000
2	5.12	Chloride	BMB	0.456	1.9918	1.9918	1.0000
3	6.12	Nitrite,N	BMB	0.211	0.4119	0.4119	1.0000
4	8.00	Bromide	BMB	0.031	0.3593	0.3593	1.0000
5	8.64	Sulfate	BM	0.337	1.9733	1.9733	1.0000
6	9.10	Nitrate	M	0.220	0.3917	0.3917	1.0000
7	9.58	Chlorate	MB	0.033	0.3704	0.3704	1.0000
8	12.80	Phosphate	BMB	0.078	0.3841	0.3841	1.0000
Total:			**0.000**	**1.506**		**6.28**	

3 STD3

Sample Name:	**STD3**	*Injection Volume:*	**5.00**
Vial Number:	**GA3**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:41**	*Sample Weight:*	**1.0000**

Run Time:



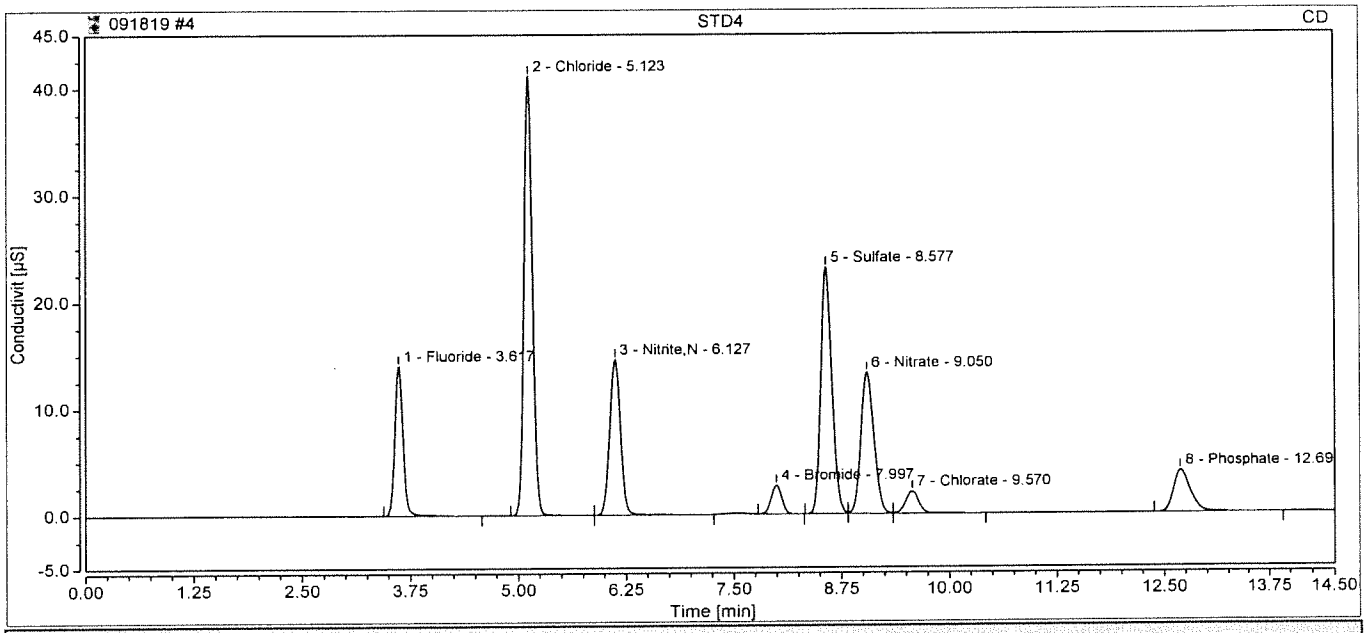
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.758	2.0551	2.0551	1.0000
2	5.12	Chloride	BMB	2.339	9.9888	9.9888	1.0000
3	6.12	Nitrite,N	BMB	1.091	2.1305	2.1305	1.0000
4	8.00	Bromide	BMB	0.182	1.8590	1.8590	1.0000
5	8.61	Sulfate	BM	1.715	10.0007	10.0007	1.0000
6	9.07	Nitrate	M	1.153	1.9792	1.9792	1.0000
7	9.57	Chlorate	MB	0.176	1.8940	1.8940	1.0000
8	12.75	Phosphate	BMB	0.436	1.9269	1.9269	1.0000
Total:			**0.000**	**7.851**		**31.83**	

4 STD4

Sample Name:	**STD4**	*Injection Volume:*	**5.00**
Vial Number:	**GA4**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:57**	*Sample Weight:*	**1.0000**

Run Time:



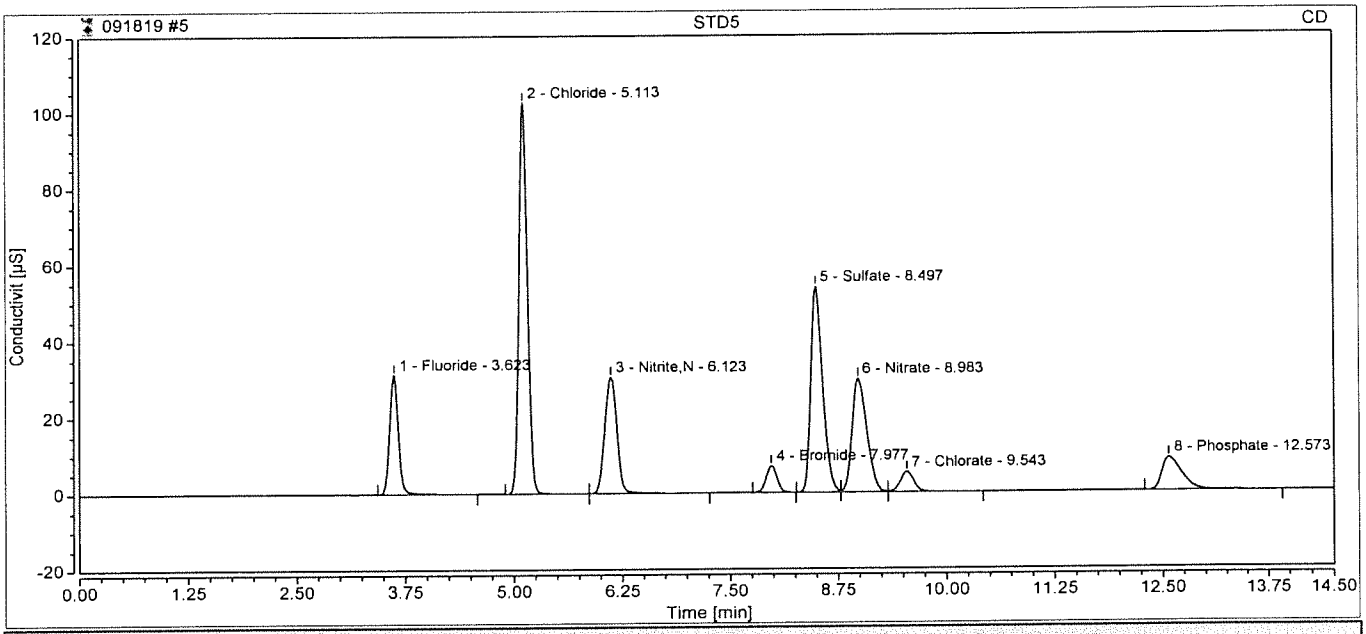
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.535	4.1457	4.1457	1.0000
2	5.12	Chloride	BMB	4.695	19.9948	19.9948	1.0000
3	6.13	Nitrite,N	BMB	2.133	4.1659	4.1659	1.0000
4	8.00	Bromide	BMB	0.385	3.8642	3.8642	1.0000
5	8.58	Sulfate	BM	3.451	20.1082	20.1082	1.0000
6	9.05	Nitrate	M	2.330	3.9823	3.9823	1.0000
7	9.57	Chlorate	MB	0.365	3.8956	3.8956	1.0000
8	12.69	Phosphate	BMB	0.903	3.9395	3.9395	1.0000
Total:			**0.000**	**15.798**		**64.10**	

5 *STD5*

Sample Name:	**STD5**	*Injection Volume:*	**5.00**
Vial Number:	**GA5**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 15:14**	*Sample Weight:*	**1.0000**

Run Time:



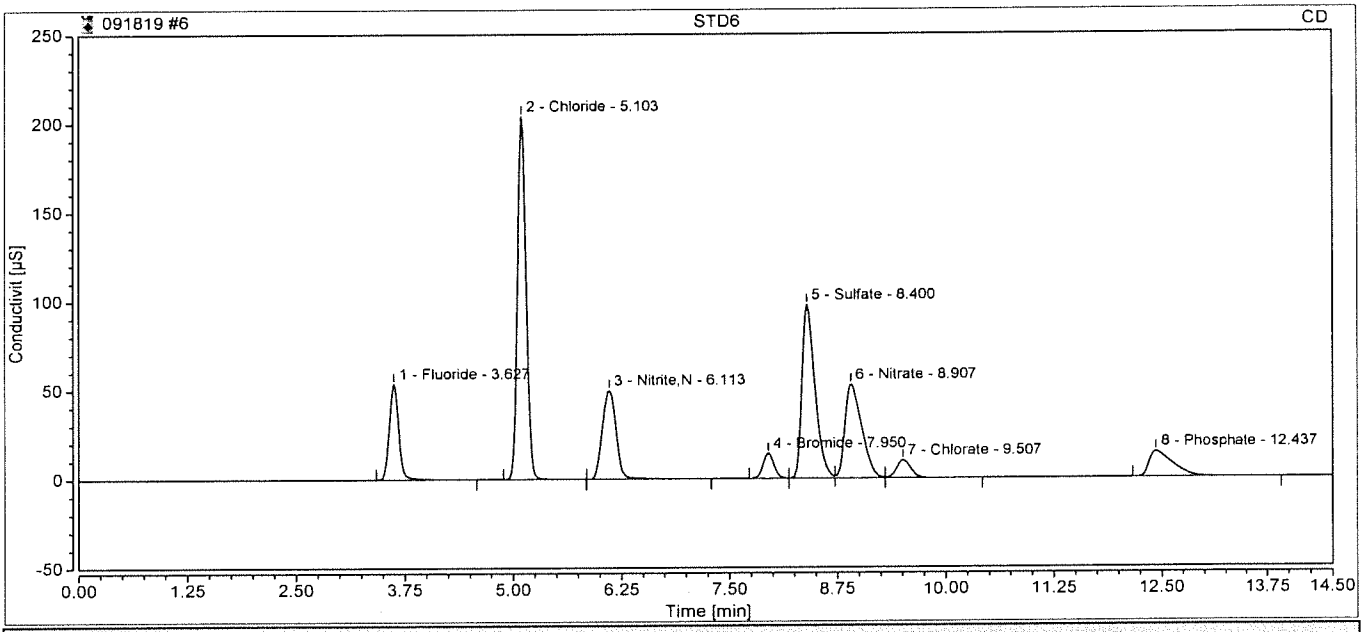
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.639	9.8090	9.8090	1.0000
2	5.11	Chloride	BMB	11.762	49.9996	49.9996	1.0000
3	6.12	Nitrite,N	BMB	4.968	9.7023	9.7023	1.0000
4	7.98	Bromide	BMB	1.001	9.9786	9.9786	1.0000
5	8.50	Sulfate	BM	8.590	50.0271	50.0271	1.0000
6	8.98	Nitrate	M	5.854	9.9805	9.9805	1.0000
7	9.54	Chlorate	MB	0.939	9.9670	9.9670	1.0000
8	12.57	Phosphate	BMB	2.305	9.9803	9.9803	1.0000
Total:			**0.000**	**39.057**		**159.44**	

6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:37**	*Sample Weight:*	**1.0000**

Run Time:



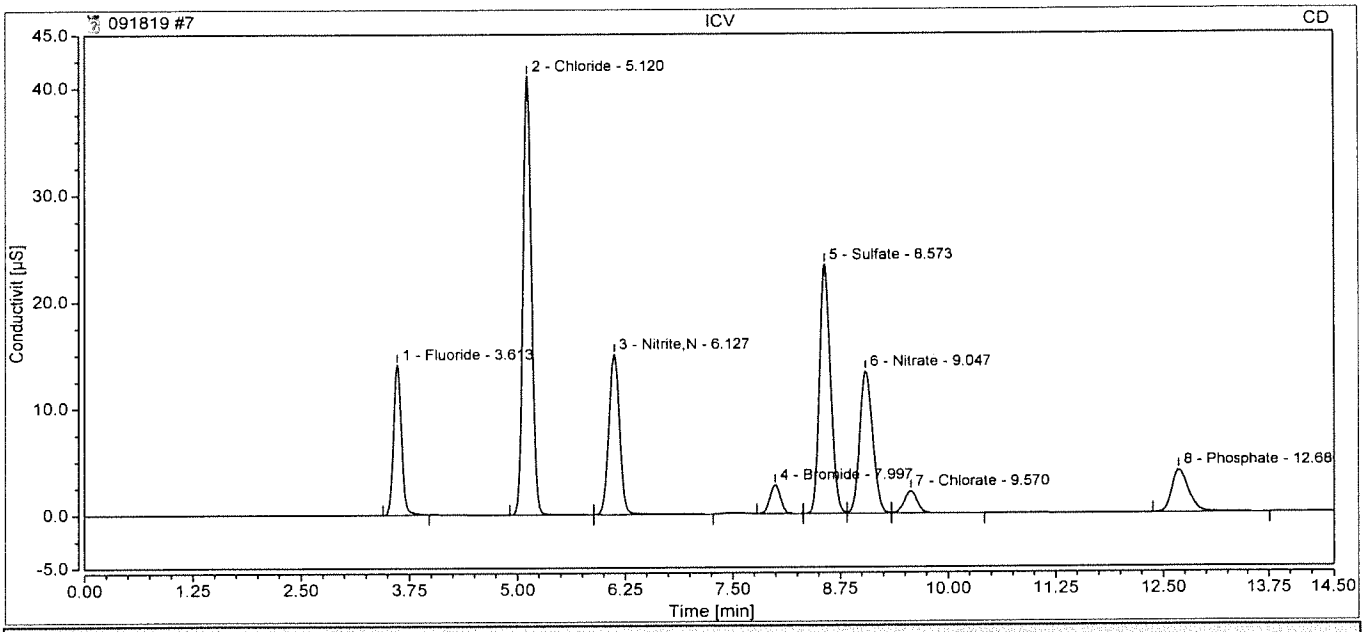
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	6.773	18.2418	18.2418	1.0000
2	5.10	Chloride	BMB	23.542	100.0224	100.0224	1.0000
3	6.11	Nitrite,N	BMB	9.157	17.8850	17.8850	1.0000
4	7.95	Bromide	BM	2.045	20.3197	20.3197	1.0000
5	8.40	Sulfate	M	17.153	99.8863	99.8863	1.0000
6	8.91	Nitrate	M	11.778	20.0629	20.0629	1.0000
7	9.51	Chlorate	MB	1.910	20.2586	20.2586	1.0000
8	12.44	Phosphate	BMB	4.668	20.1606	20.1606	1.0000
Total:			**0.000**	**77.025**		**316.84**	

7 ICV

Sample Name:	**ICV**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:54**	*Sample Weight:*	**1.0000**

Run Time:



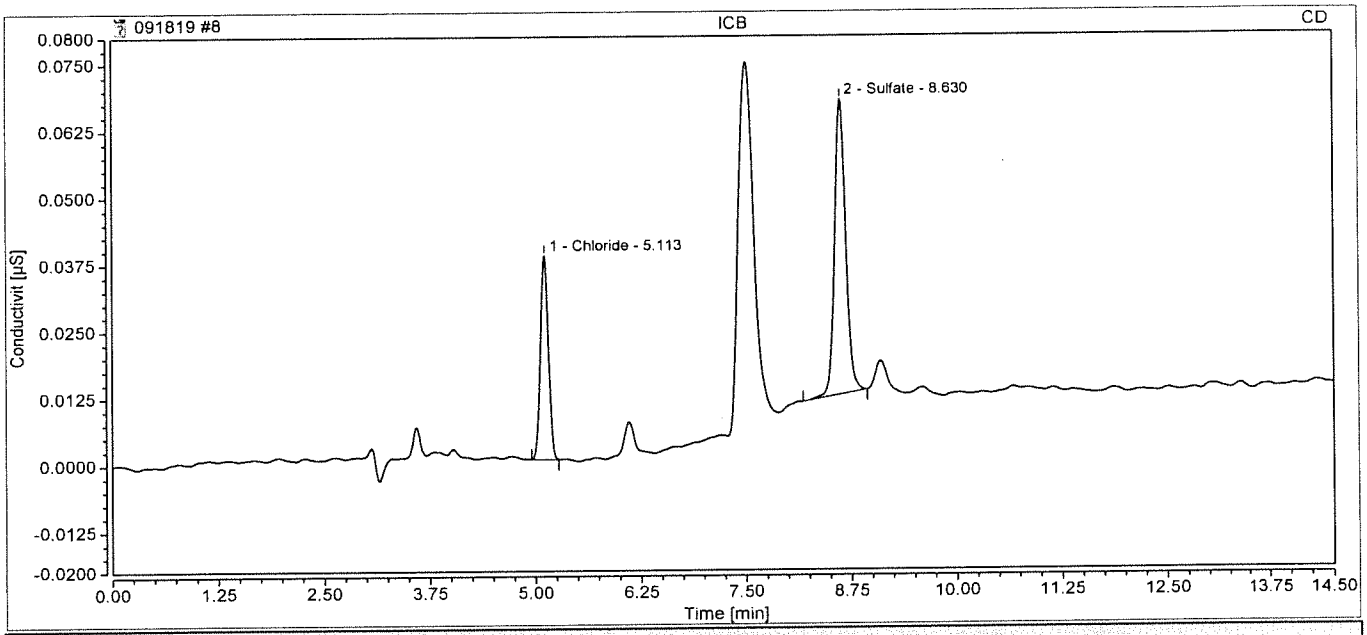
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.495	4.0374	4.0374	1.0000
2	5.12	Chloride	BMB	4.681	19.9333	19.9333	1.0000
3	6.13	Nitrite,N	BMB	2.195	4.2858	4.2858	1.0000
4	8.00	Bromide	BMB	0.384	3.8585	3.8585	1.0000
5	8.57	Sulfate	BM	3.469	20.2132	20.2132	1.0000
6	9.05	Nitrate	M	2.340	3.9993	3.9993	1.0000
7	9.57	Chlorate	MB	0.367	3.9104	3.9104	1.0000
8	12.68	Phosphate	BMB	0.911	3.9732	3.9732	1.0000
Total:			**0.000**	**15.841**		**64.21**	

8 ICB

Sample Name:	**ICB**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 19:29**	*Sample Weight:*	**1.0000**

Run Time:



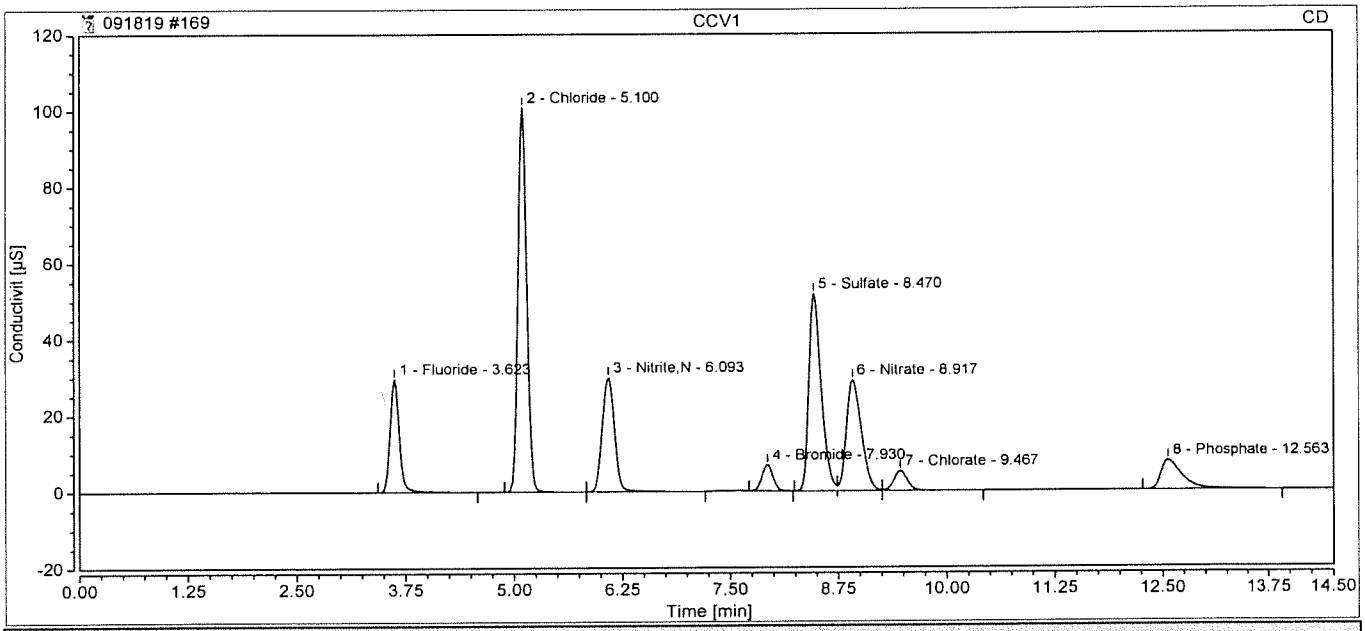
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.11	Chloride	BMB	0.004	0.0748	0.0748	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.63	Sulfate	BMB	0.008	0.0618	0.0618	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.013**		**0.14**	

169 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 11:54**	*Sample Weight:*	**1.0000**

Run Time:



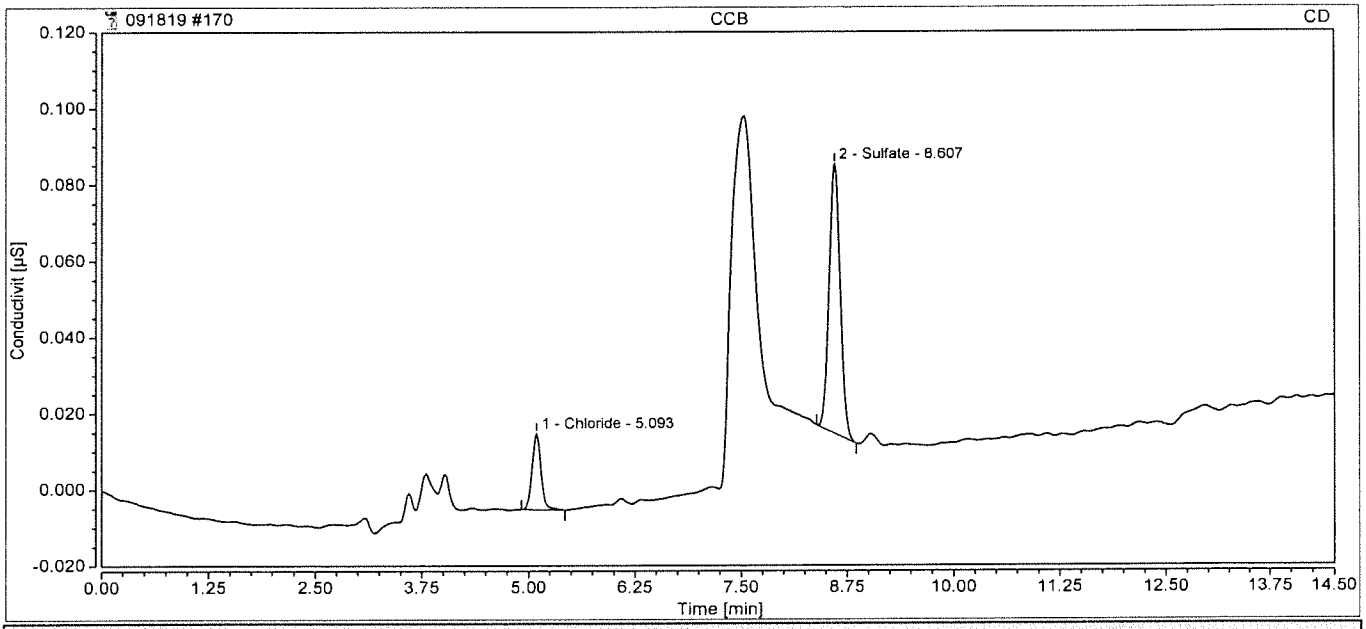
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.639	9.8082	9.8082	1.0000
2	5.10	Chloride	BMB	11.725	49.8435	49.8435	1.0000
3	6.09	Nitrite,N	BMB	4.944	9.6563	9.6563	1.0000
4	7.93	Bromide	BMB	0.987	9.8365	9.8365	1.0000
5	8.47	Sulfate	BM	8.581	49.9789	49.9789	1.0000
6	8.92	Nitrate	M	5.853	9.9791	9.9791	1.0000
7	9.47	Chlorate	MB	0.940	9.9812	9.9812	1.0000
8	12.56	Phosphate	BMB	2.226	9.6394	9.6394	1.0000
Total:			**0.000**	**38.896**		**158.72**	

170 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 12:11**	*Sample Weight:*	**1.0000**

Run Time:



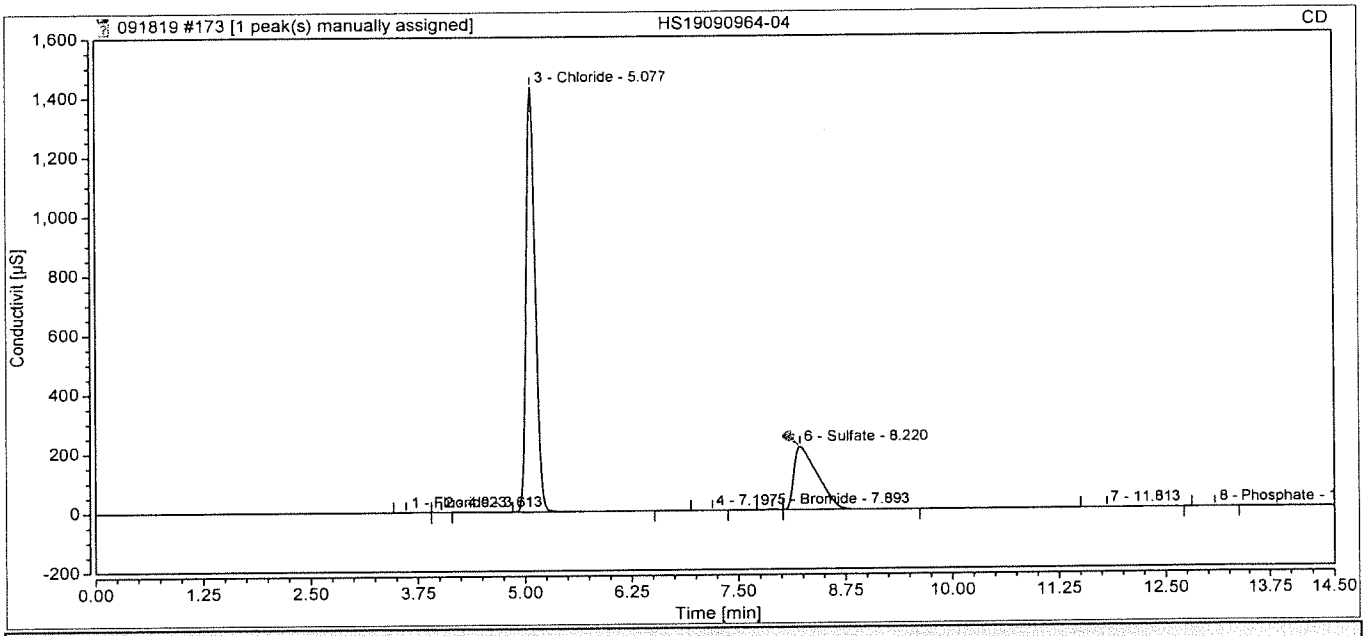
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.09	Chloride	BMB	0.002	0.0677	0.0677	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.61	Sulfate	BMB	0.011	0.0745	0.0745	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.013**		**0.14**	

173 HS19090964-04

Sample Name:	**HS19090964-04**	*Injection Volume:*	**5.00**
Vial Number:	**GA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 13:01**	*Sample Weight:*	**1.0000**

Run Time:



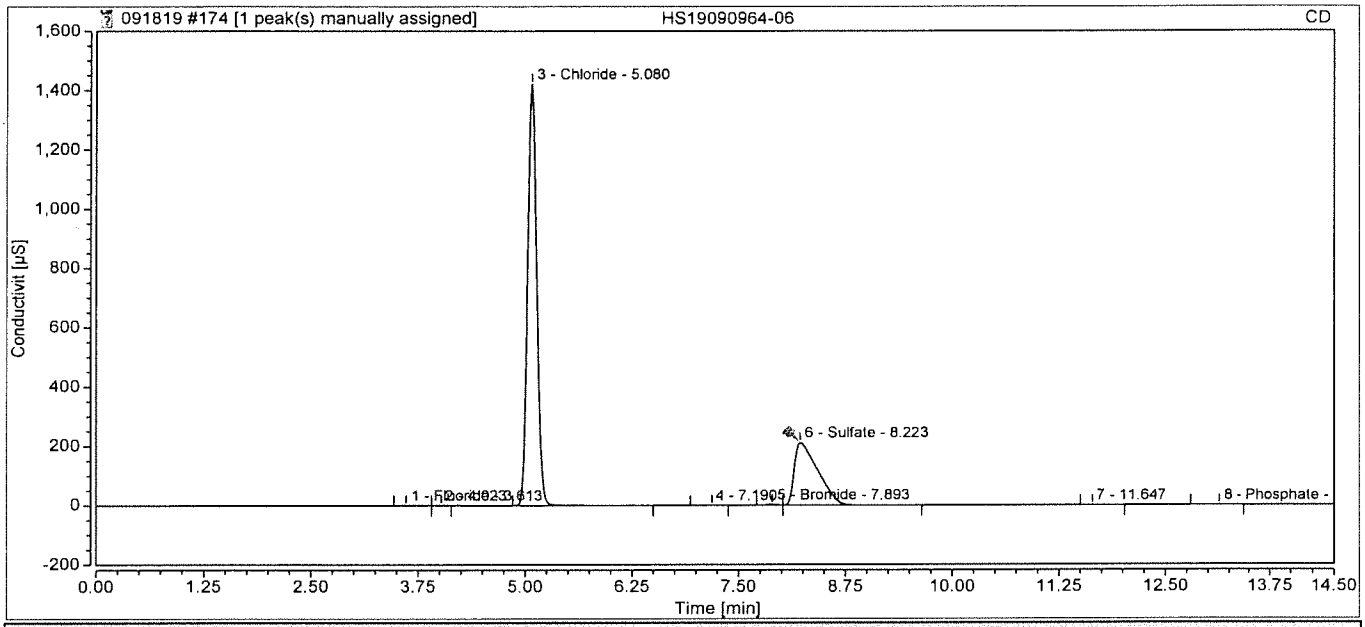
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.034	0.1056	0.1056	1.0000
3	5.08	Chloride	BMB	176.700	750.3727	750.3727	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
5	7.89	Bromide	BM	0.350	3.5224	3.5224	1.0000
6	8.22	Sulfate	MB^	67.409	392.5082	392.5082	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
8	13.08	Phosphate	BMB	0.003	0.0588	0.0588	1.0000
Total:			**0.000**	**244.496**		**1146.57**	

174 HS19090964-06

Sample Name:	**HS19090964-06**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 13:17**	*Sample Weight:*	**1.0000**

Run Time:



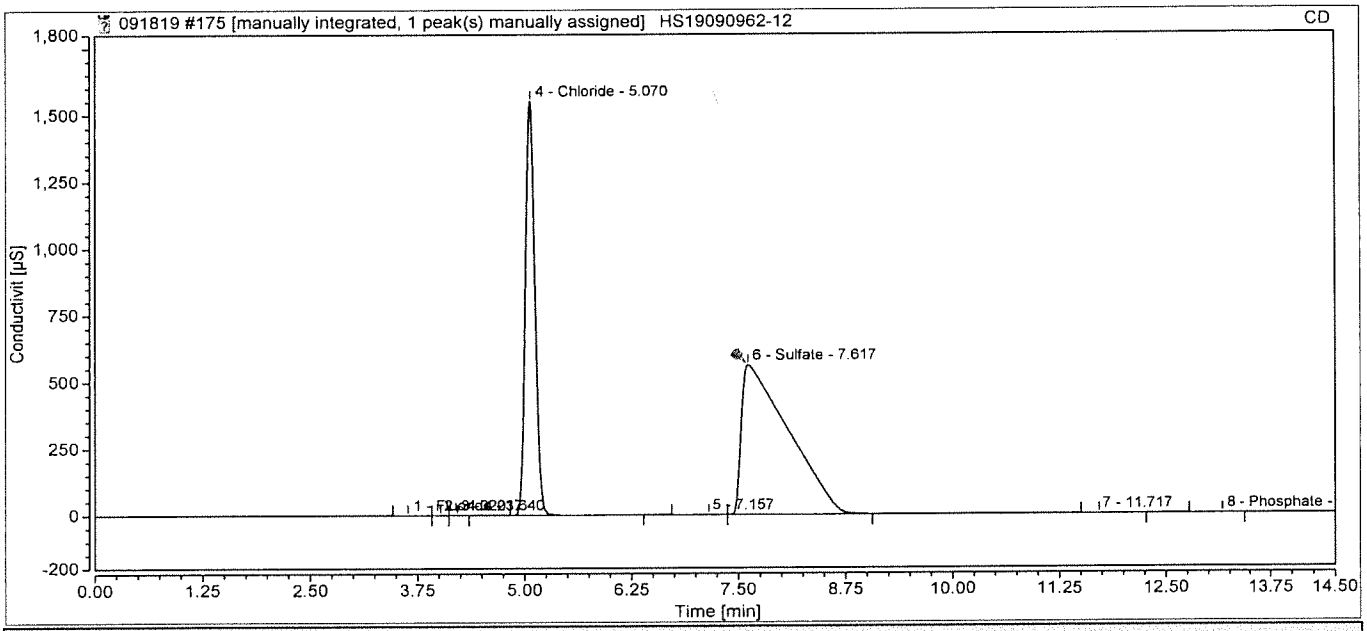
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.030	0.0958	0.0958	1.0000
3	5.08	Chloride	BMB	175.536	745.4286	745.4286	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
5	7.89	Bromide	BM	0.346	3.4773	3.4773	1.0000
6	8.22	Sulfate	MB^	66.818	389.0673	389.0673	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
8	13.13	Phosphate	BMB	0.003	0.0599	0.0599	1.0000
Total:			**0.000**	**242.733**		**1138.13**	

175 HS19090962-12

Sample Name:	**HS19090962-12**	*Injection Volume:*	**5.00**
Vial Number:	**GA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 13:34**	*Sample Weight:*	**1.0000**

Run Time:



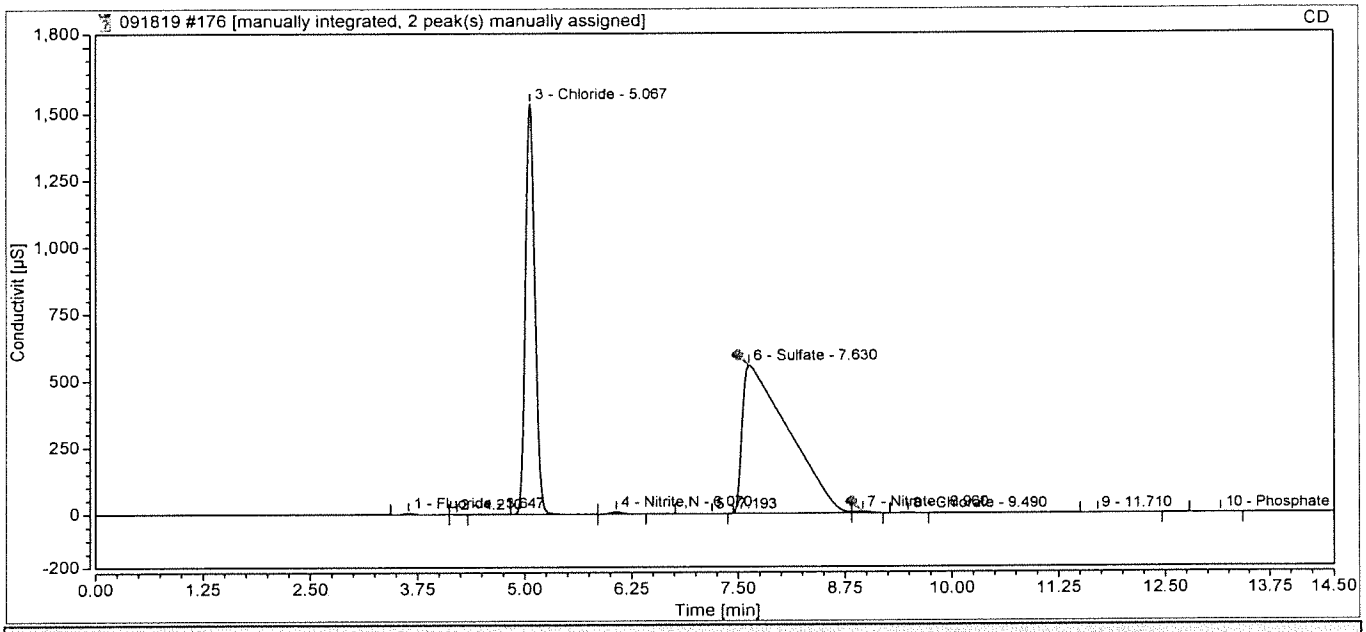
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.64	Fluoride	BMB	0.037	0.1151	0.1151	1.0000
4	5.07	Chloride	BMB	198.541	843.1149	843.1149	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
6	7.62	Sulfate	BMB*^	354.205	2062.3989	2062.3989	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
8	13.16	Phosphate	BMB	0.011	0.0940	0.0940	1.0000
Total:			**0.000**	**552.795**		**2905.72**	

176 HS19090962-12MS

Sample Name:	**HS19090962-12MS**	*Injection Volume:*	**5.00**
Vial Number:	**GB1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 13:51**	*Sample Weight:*	**1.0000**

Run Time:



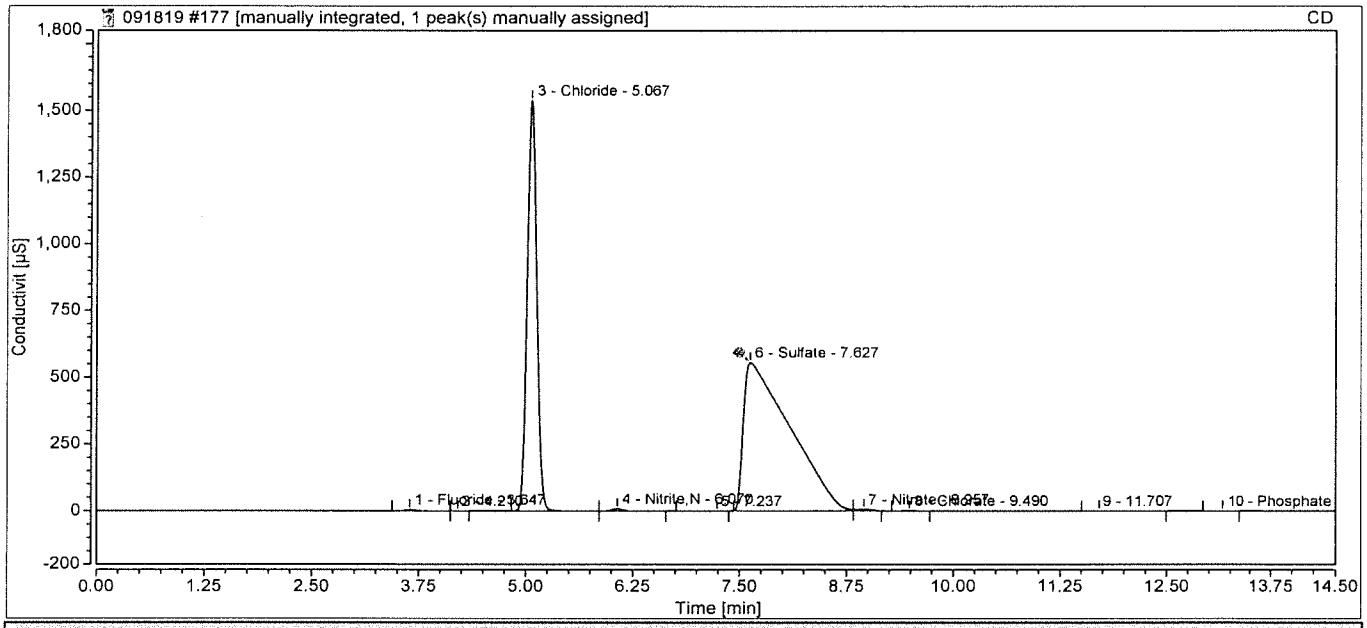
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.65	Fluoride	BMB	0.591	1.6054	1.6054	1.0000
3	5.07	Chloride	BMB	196.329	833.7200	833.7200	1.0000
4	6.07	Nitrite,N	BMB	1.081	2.1110	2.1110	1.0000
6	7.63	Sulfate	BM *^	345.965	2014.4179	2014.4179	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
7	8.96	Nitrate	MB*^	1.163	1.9968	1.9968	1.0000
8	9.49	Chlorate	BMB	0.148	1.5953	1.5953	1.0000
10	13.15	Phosphate	BMB	0.008	0.0841	0.0841	1.0000
Total:			**0.000**	**545.286**		**2855.53**	

177 HS19090962-12MSD

Sample Name:	**HS19090962-12MSD**	*Injection Volume:*	**5.00**
Vial Number:	**GB2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 14:07**	*Sample Weight:*	**1.0000**

Run Time:



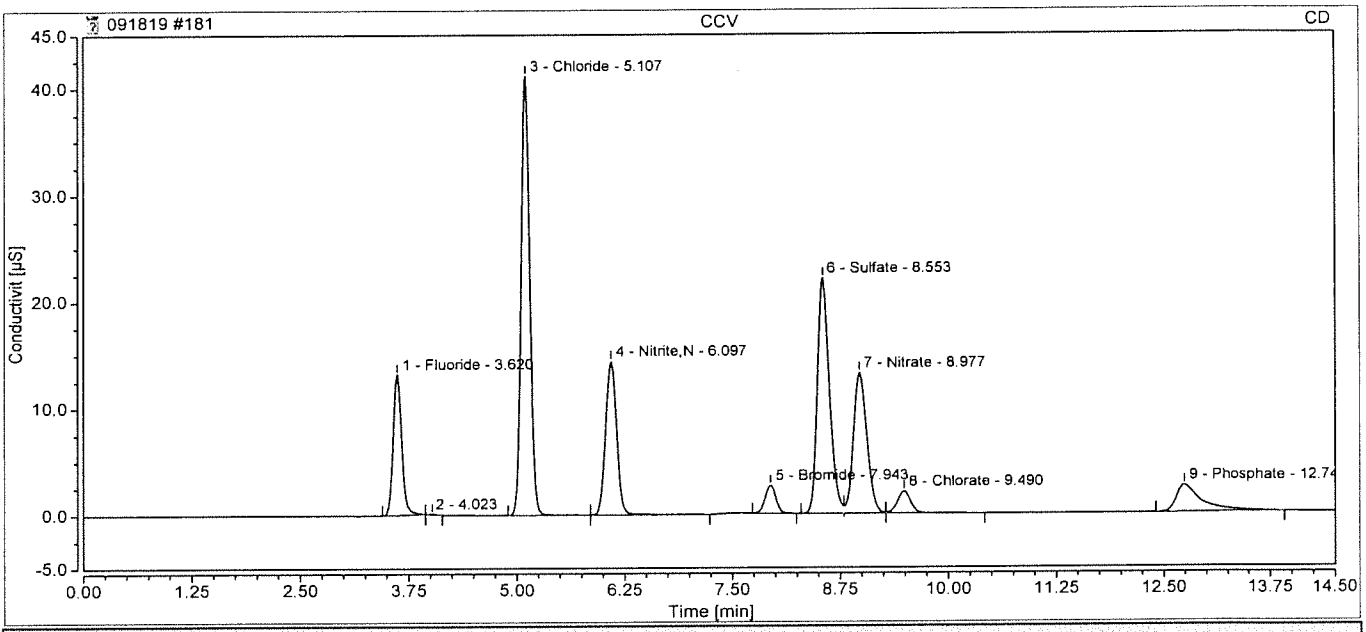
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.65	Fluoride	BMB	0.596	1.6195	1.6195	1.0000
3	5.07	Chloride	BMB	196.858	835.9674	835.9674	1.0000
4	6.07	Nitrite,N	BMB	1.091	2.1307	2.1307	1.0000
6	7.63	Sulfate	BM *^	349.195	2033.2248	2033.2248	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
7	8.96	Nitrate	MB*	1.156	1.9855	1.9855	1.0000
8	9.49	Chlorate	BMB	0.149	1.6036	1.6036	1.0000
10	13.16	Phosphate	BMB	0.008	0.0807	0.0807	1.0000
Total:			**0.000**	**549.054**		**2876.61**	

181 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 15:29**	*Sample Weight:*	**1.0000**

Run Time:



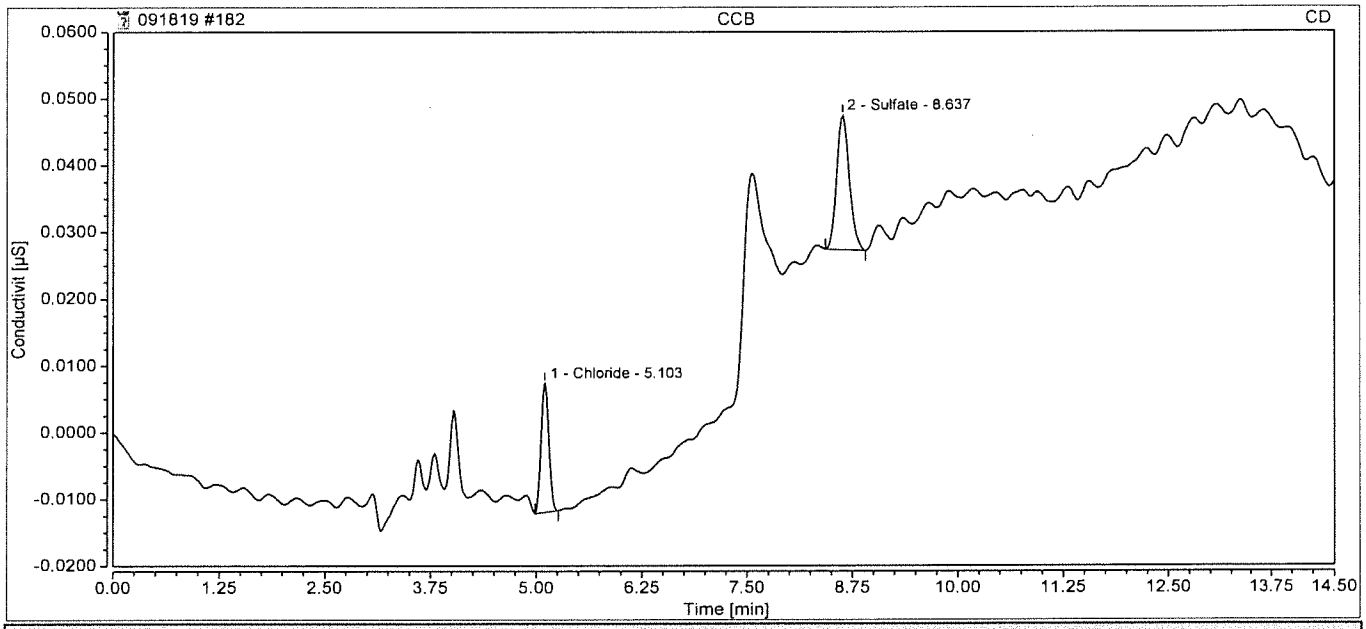
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.502	4.0563	4.0563	1.0000
3	5.11	Chloride	BMB	4.786	20.3783	20.3783	1.0000
4	6.10	Nitrite,N	BMB	2.150	4.1979	4.1979	1.0000
5	7.94	Bromide	BMB	0.379	3.8089	3.8089	1.0000
6	8.55	Sulfate	BM	3.564	20.7661	20.7661	1.0000
7	8.98	Nitrate	M	2.389	4.0836	4.0836	1.0000
8	9.49	Chlorate	MB	0.375	3.9971	3.9971	1.0000
9	12.74	Phosphate	BMB	0.871	3.8027	3.8027	1.0000
Total:			**0.000**	**16.016**		**65.09**	

182 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 15:45**	*Sample Weight:*	**1.0000**

Run Time:



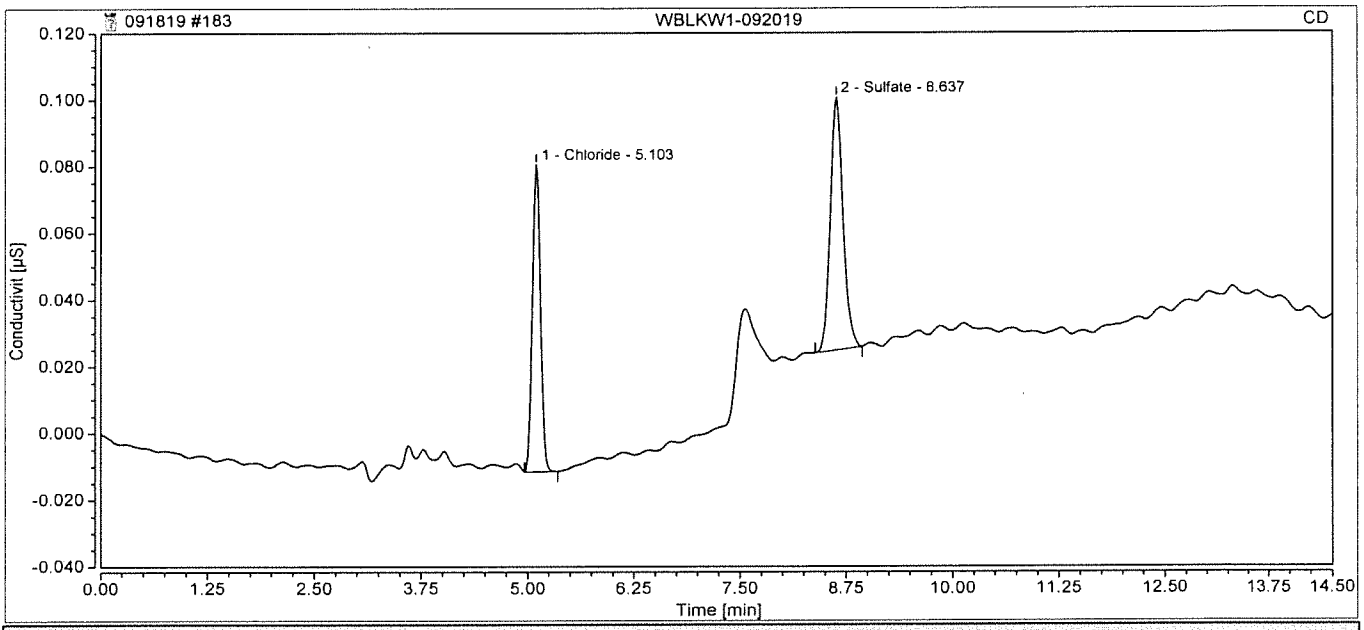
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.002	0.0660	0.0660	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.64	Sulfate	BMB	0.003	0.0330	0.0330	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.006**		**0.10**	

183 WBLKW1-092019

Sample Name:	**WBLKW1-092019**	*Injection Volume:*	**5.00**
Vial Number:	**GB3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 16:02**	*Sample Weight:*	**1.0000**

Run Time:



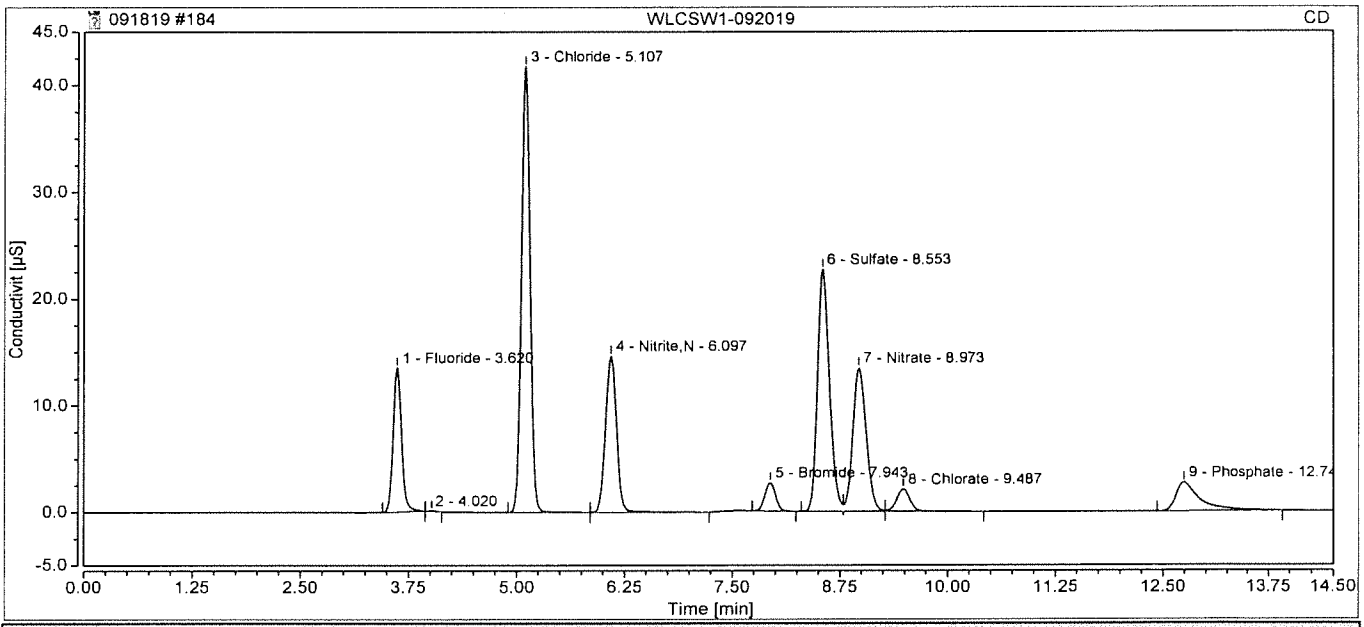
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.010	0.1007	0.1007	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.64	Sulfate	BMB	0.013	0.0892	0.0892	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.023**		**0.19**	

184 WLCSW1-092019

Sample Name:	**WLCSW1-092019**	*Injection Volume:*	**5.00**
Vial Number:	**GB4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 16:18**	*Sample Weight:*	**1.0000**

Run Time:



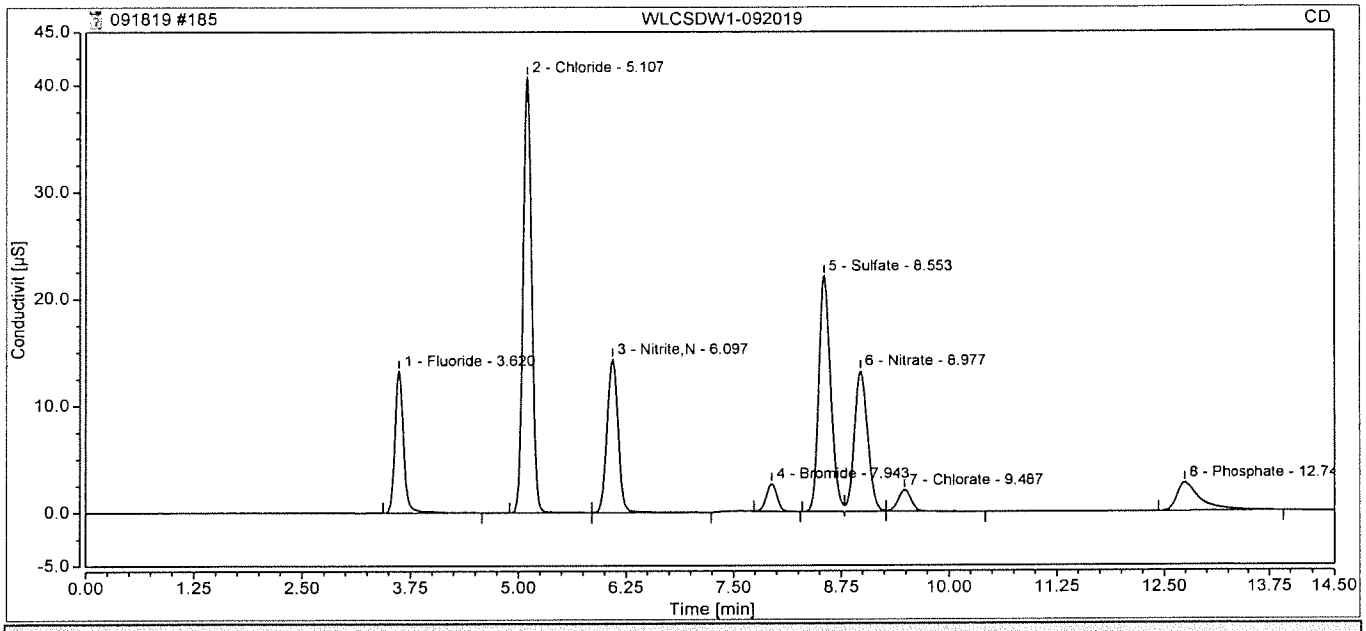
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.529	4.1305	4.1305	1.0000
3	5.11	Chloride	BMB	4.841	20.6139	20.6139	1.0000
4	6.10	Nitrite,N	BMB	2.184	4.2648	4.2648	1.0000
5	7.94	Bromide	BMB	0.384	3.8604	3.8604	1.0000
6	8.55	Sulfate	BM	3.636	21.1844	21.1844	1.0000
7	8.97	Nitrate	M	2.432	4.1573	4.1573	1.0000
8	9.49	Chlorate	MB	0.383	4.0812	4.0812	1.0000
9	12.74	Phosphate	BMB	0.877	3.8251	3.8251	1.0000
Total:			**0.000**	**16.267**		**66.12**	

185 WLCSDW1-092019

Sample Name:	**WLCSDW1-092019**	*Injection Volume:*	**5.00**
Vial Number:	**GB5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/20/2019 16:35**	*Sample Weight:*	**1.0000**

Run Time:



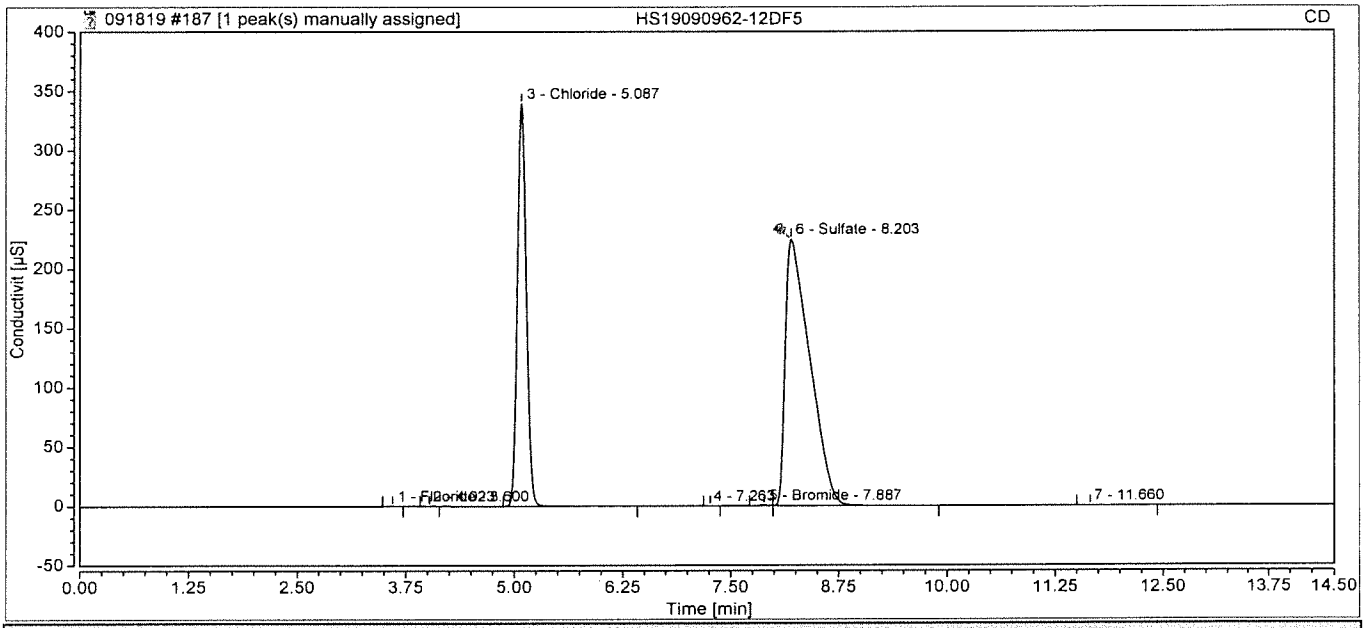
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.544	4.1706	4.1706	1.0000
2	5.11	Chloride	BMB	4.714	20.0751	20.0751	1.0000
3	6.10	Nitrite,N	BMB	2.136	4.1719	4.1719	1.0000
4	7.94	Bromide	BMB	0.375	3.7696	3.7696	1.0000
5	8.55	Sulfate	BM	3.534	20.5876	20.5876	1.0000
6	8.98	Nitrate	M	2.364	4.0409	4.0409	1.0000
7	9.49	Chlorate	MB	0.369	3.9339	3.9339	1.0000
8	12.74	Phosphate	BMB	0.865	3.7751	3.7751	1.0000
Total:			**0.000**	**15.902**		**64.52**	

187 HS19090962-12DF5

Sample Name:	**HS19090962-12DF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**09/20/2019 17:08**	*Sample Weight:*	**1.0000**

Run Time:

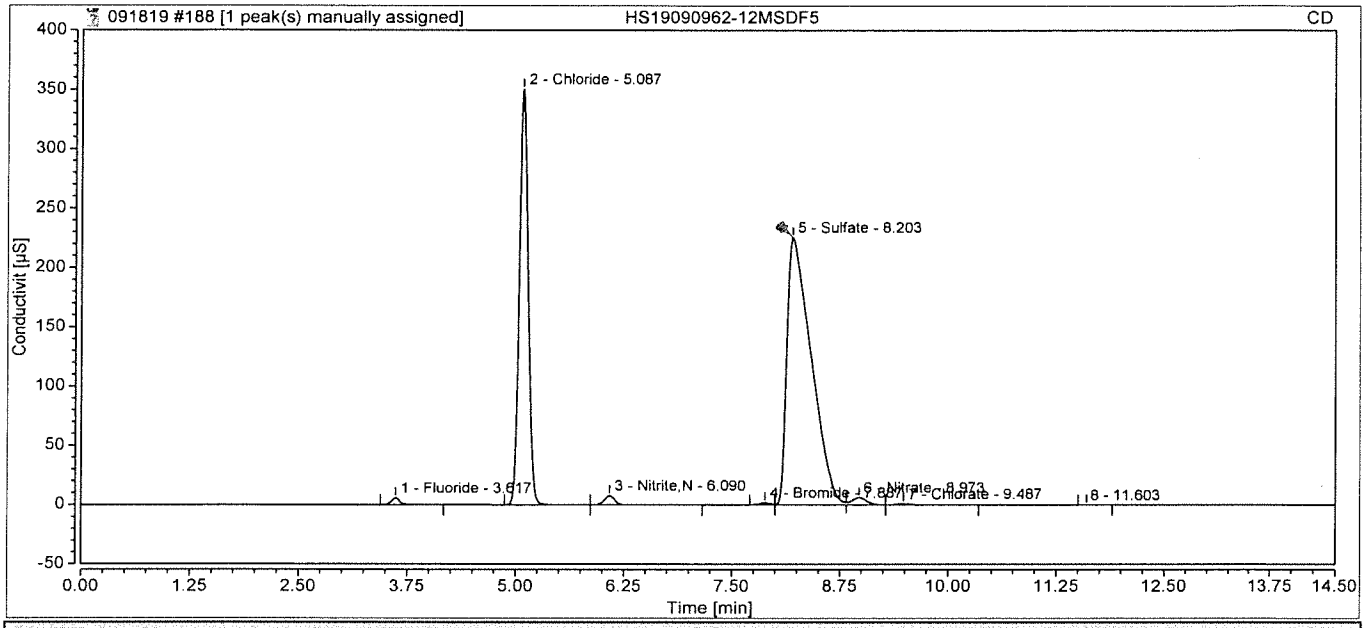


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.007	0.0336	0.1682	5.0000
3	5.09	Chloride	BMB	40.168	170.6214	853.1072	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
5	7.89	Bromide	BM	0.058	0.6315	3.1574	5.0000
6	8.20	Sulfate	MB^	74.003	430.8978	2154.4891	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**114.236**		**3010.92**	

188 HS19090962-12MSDF5

Sample Name:	**HS19090962-12MSDF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**09/20/2019 17:25**	*Sample Weight:*	**1.0000**
Run Time:			

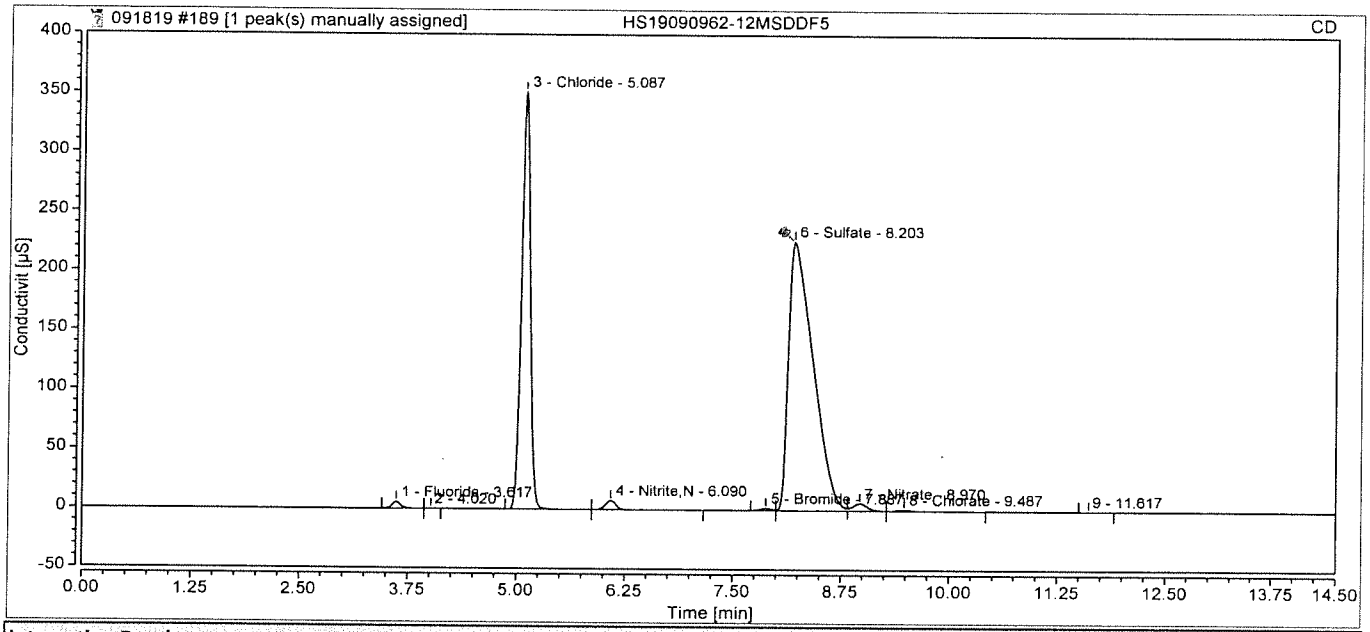


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.655	1.7776	8.8879	5.0000
2	5.09	Chloride	BMB	41.504	176.2955	881.4774	5.0000
3	6.09	Nitrite,N	BMB	1.090	2.1289	10.6446	5.0000
4	7.89	Bromide	BM	0.238	2.4098	12.0492	5.0000
5	8.20	Sulfate	M ^	73.643	428.8036	2144.0181	5.0000
6	8.97	Nitrate	M	1.227	2.1054	10.5272	5.0000
7	9.49	Chlorate	MB	0.182	1.9553	9.7764	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**118.539**		**3077.38**	

189 HS19090962-12MSDDF5

Sample Name:	HS19090962-12MSDDF5	Injection Volume:	5.00
Vial Number:	GC4	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	5.0000
Recording Time:	09/20/2019 17:42	Sample Weight:	1.0000
Run Time:			

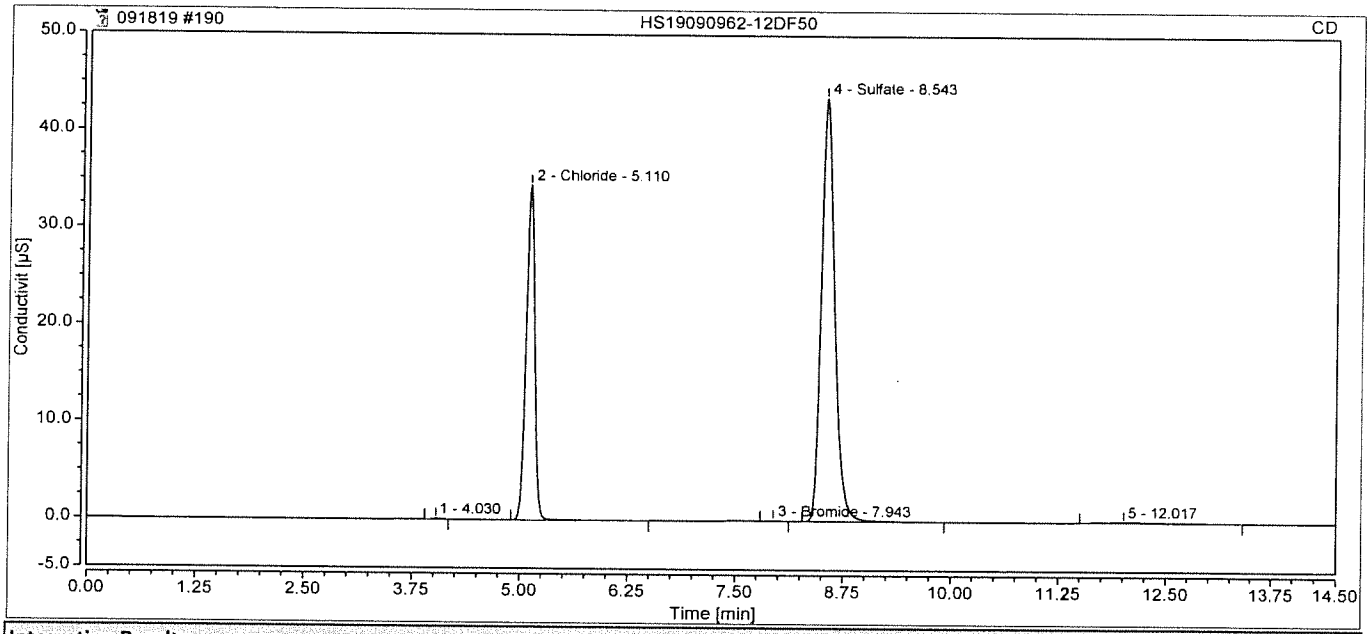


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.637	1.7300	8.6500	5.0000
3	5.09	Chloride	BMB	41.664	176.9721	884.8607	5.0000
4	6.09	Nitrite,N	BMB	1.090	2.1289	10.6446	5.0000
5	7.89	Bromide	BM	0.238	2.4104	12.0519	5.0000
6	8.20	Sulfate	M ^	74.337	432.8479	2164.2396	5.0000
7	8.97	Nitrate	M	1.243	2.1322	10.6608	5.0000
8	9.49	Chlorate	MB	0.184	1.9737	9.8683	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**119.393**		**3100.98**	

190 HS19090962-12DF50

Sample Name:	HS19090962-12DF50	Injection Volume:	5.00
Vial Number:	GC5	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	50.0000
Recording Time:	09/20/2019 17:58	Sample Weight:	1.0000
Run Time:			

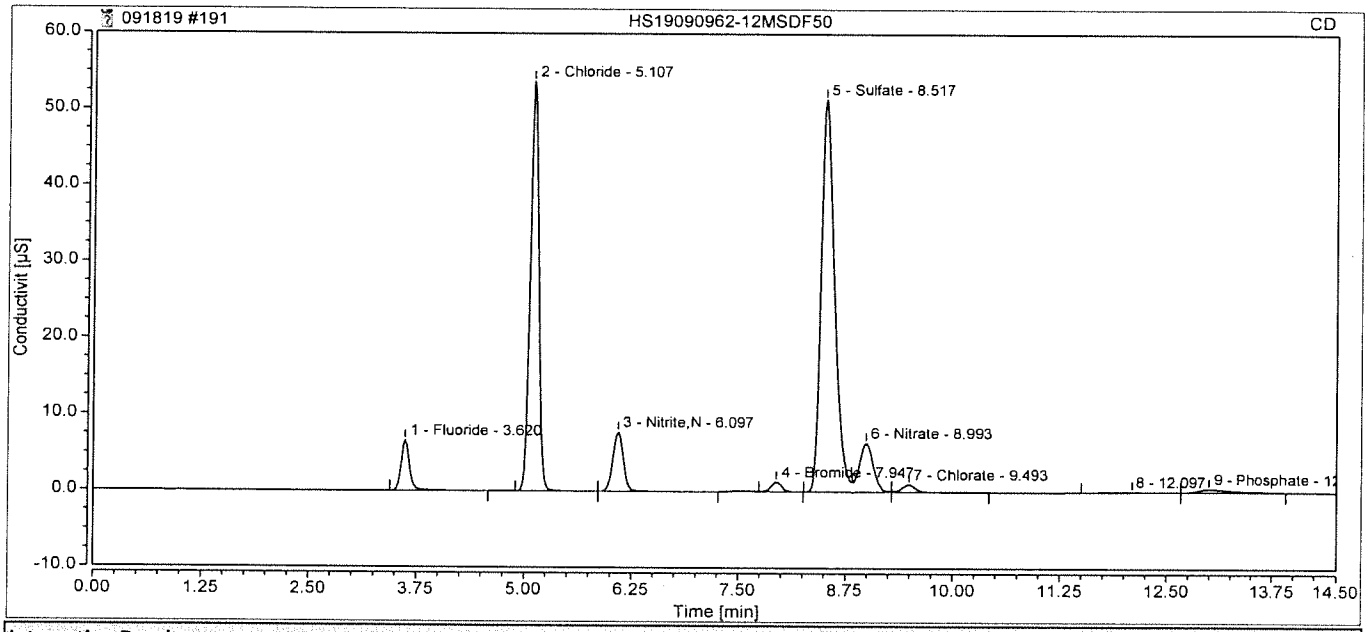


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	50.0000
2	5.11	Chloride	BMB	4.004	17.0596	852.9803	50.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	50.0000
3	7.94	Bromide	BMB	0.005	0.1010	5.0496	50.0000
4	8.54	Sulfate	BMB	7.930	46.1864	2309.3207	50.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	50.0000
Total:			**0.000**	**11.939**		**3167.35**	

191 HS19090962-12MSDF50

Sample Name:	HS19090962-12MSDF50	Injection Volume:	5.00
Vial Number:	GC6	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	50.0000
Recording Time:	09/20/2019 18:15	Sample Weight:	1.0000
Run Time:			



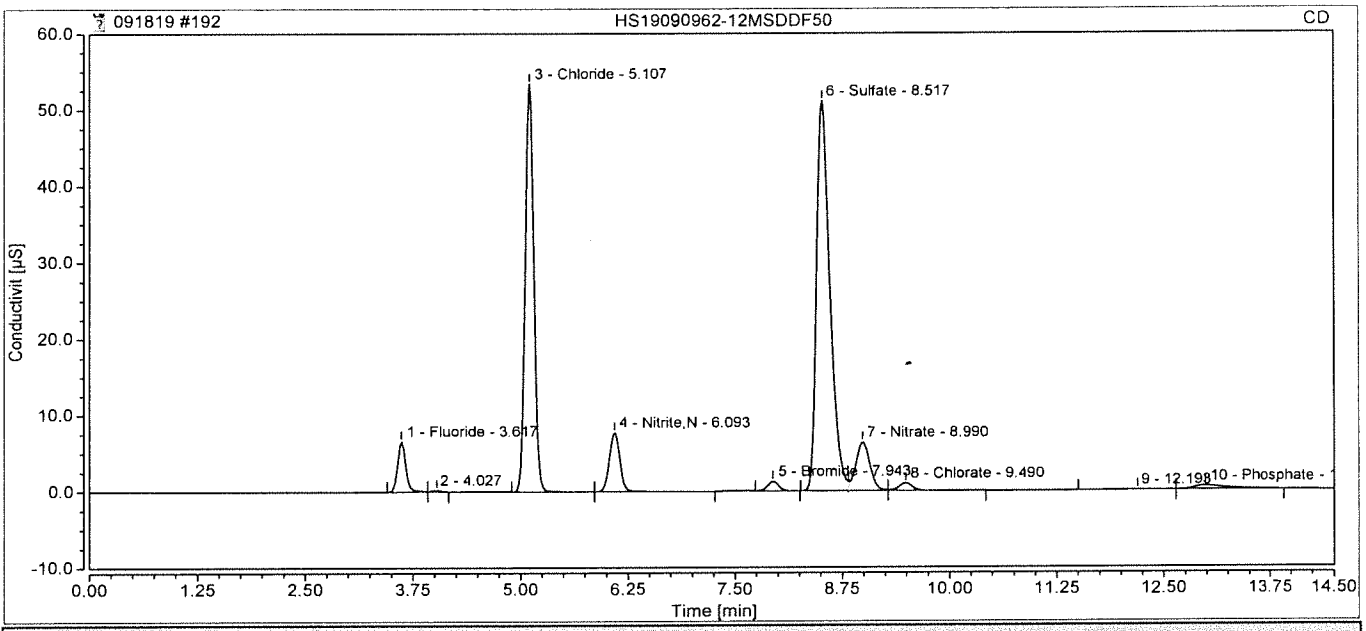
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.751	2.0353	101.7647	50.0000
2	5.11	Chloride	BMB	6.231	26.5142	1325.7080	50.0000
3	6.10	Nitrite,N	BMB	1.096	2.1398	106.9910	50.0000
4	7.95	Bromide	BMB	0.179	1.8263	91.3145	50.0000
5	8.52	Sulfate	BM	9.336	54.3752	2718.7601	50.0000
6	8.99	Nitrate	M	1.202	2.0636	103.1781	50.0000
7	9.49	Chlorate	MB	0.184	1.9706	98.5300	50.0000
9	13.00	Phosphate	BMB	0.203	0.9227	46.1329	50.0000
Total:			**0.000**	**19.182**		**4592.38**	

192 HS19090962-12MSDDF50

Sample Name:	**HS19090962-12MSDDF50**	*Injection Volume:*	**5.00**
Vial Number:	**GC7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**50.0000**
Recording Time:	**09/20/2019 18:31**	*Sample Weight:*	**1.0000**

Run Time:

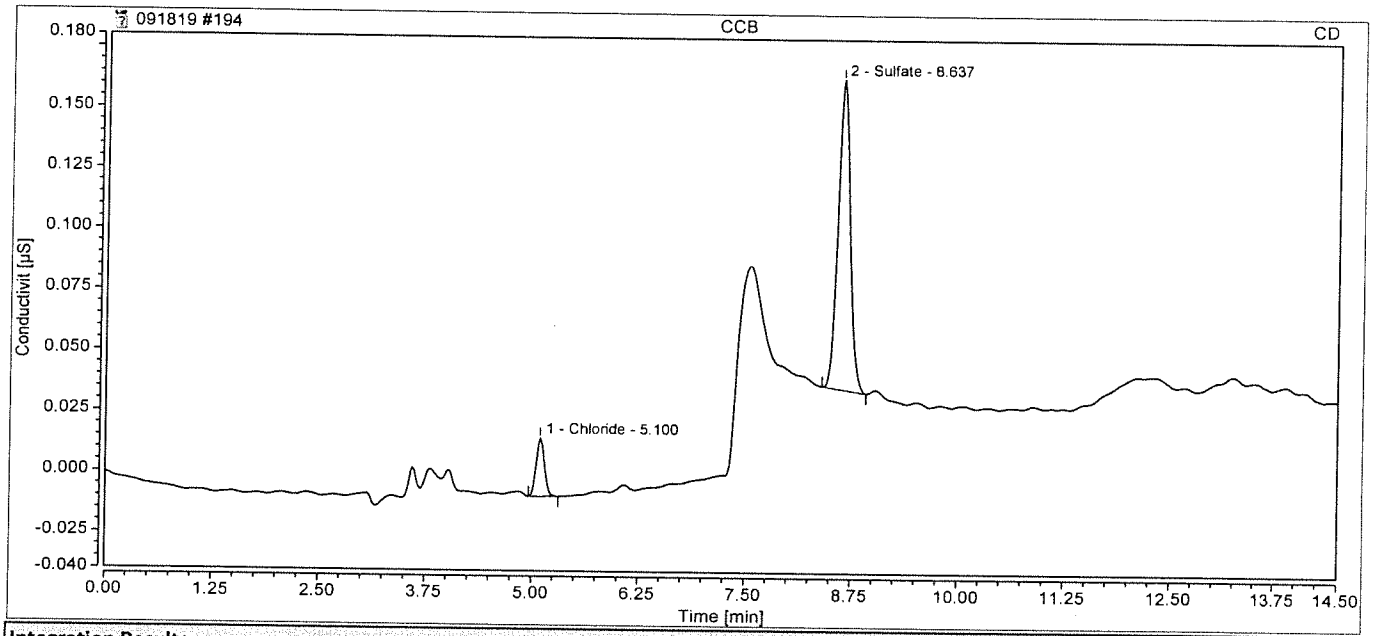


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.716	1.9410	97.0510	50.0000
3	5.11	Chloride	BMB	6.201	26.3883	1319.4157	50.0000
4	6.09	Nitrite,N	BMB	1.092	2.1326	106.6285	50.0000
5	7.94	Bromide	BMB	0.178	1.8158	90.7906	50.0000
6	8.52	Sulfate	BM	9.239	53.8047	2690.2329	50.0000
7	8.99	Nitrate	M	1.190	2.0430	102.1500	50.0000
8	9.49	Chlorate	MB	0.182	1.9583	97.9151	50.0000
10	12.98	Phosphate	BMB	0.229	1.0347	51.7356	50.0000
Total:			**0.000**	**19.027**		**4555.92**	

194 CCB

Sample Name:	CCB	Injection Volume:	5.00
Vial Number:	BA8	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	1.0000
Recording Time:	09/20/2019 19:05	Sample Weight:	1.0000
Run Time:			

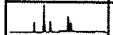
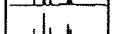
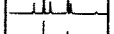
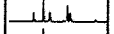
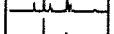
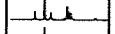
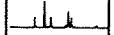
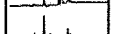
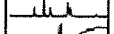
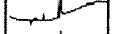


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.003	0.0688	0.0688	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.64	Sulfate	BMB	0.021	0.1347	0.1347	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.024**		**0.20**	

Sequence: 092519
Last Update Operator: alshs.nouser

HS19090964

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	Volume [ul]	Status	Inject Time
	STD1	2970209205	Calibration	GA1	1.0000	1	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:08:06 PM -05:00
	STD2		Calibration	GA2	1.0000	2	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:24:42 PM -05:00
	STD3		Calibration	GA3	1.0000	3	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:41:19 PM -05:00
	STD4		Calibration	GA4	1.0000	4	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:57:54 PM -05:00
	STD5		Calibration	GA5	1.0000	5	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 3:14:30 PM -05:00
	STD6	NO2,F MAX 10PPM	Calibration	GB8	1.0000	6	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:37:32 PM -05:00
	ICV	2970209123	Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:54:07 PM -05:00
	ICB		Unknown	GB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 7:29:52 PM -05:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/25/2019 11:52:16 PM -05:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 12:08:51 AM -05:00
	WBLKW2-092519	9056_W	Unknown	GA1	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 12:25:32 AM -05:00
	WLCSW2-092519		Unknown	GA2	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 12:42:08 AM -05:00
	WLCSDW2-092519	DUE 26TH	Unknown	GA3	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 12:58:47 AM -05:00
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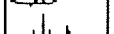
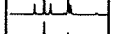
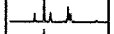
	HS19090511-02DF20		Unknown	GA5	20.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 1:31:59 AM -05:00
	HS19090511-02MSDF20		Unknown	GA6	20.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 1:48:34 AM -05:00
	HS19090511-02MSDDF20		Unknown	GA7	20.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 2:05:13 AM -05:00
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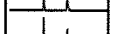
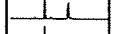
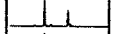
	HS19090511-05DF20		Unknown	GB2	20.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 2:54:58 AM -05:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 3:11:39 AM -05:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 3:28:15 AM -05:00
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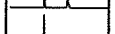
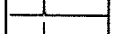
	HS19090511-07DF40		Unknown	GB4	40.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 4:01:27 AM -05:00
	HS19090964-04DF10		Unknown	GB5	10.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 4:18:06 AM -05:00
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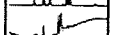
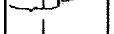
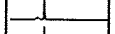
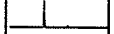
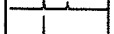
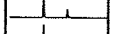
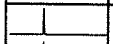
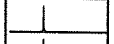
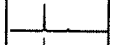
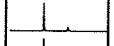
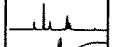
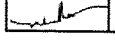
	HS19090847-01DF10		Unknown	GB7	10.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 4:51:18 AM -05:00
	HS19090617-01DF10		Unknown	GB8	10.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 5:07:53 AM -05:00
	HS19090617-02DF50		Unknown	GC1	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 5:24:34 AM -05:00
	HS19090617-03DF20		Unknown	GC2	20.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 5:41:09 AM -05:00
	HS19090617-04DF100		Unknown	GC3	100.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 5:57:44 AM -05:00
	HS19090617-05DF50		Unknown	GC4	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 6:14:19 AM -05:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 6:31:00 AM -05:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 6:47:35 AM -05:00

Sequence: 092519
Last Update Operator: alshs.nouser

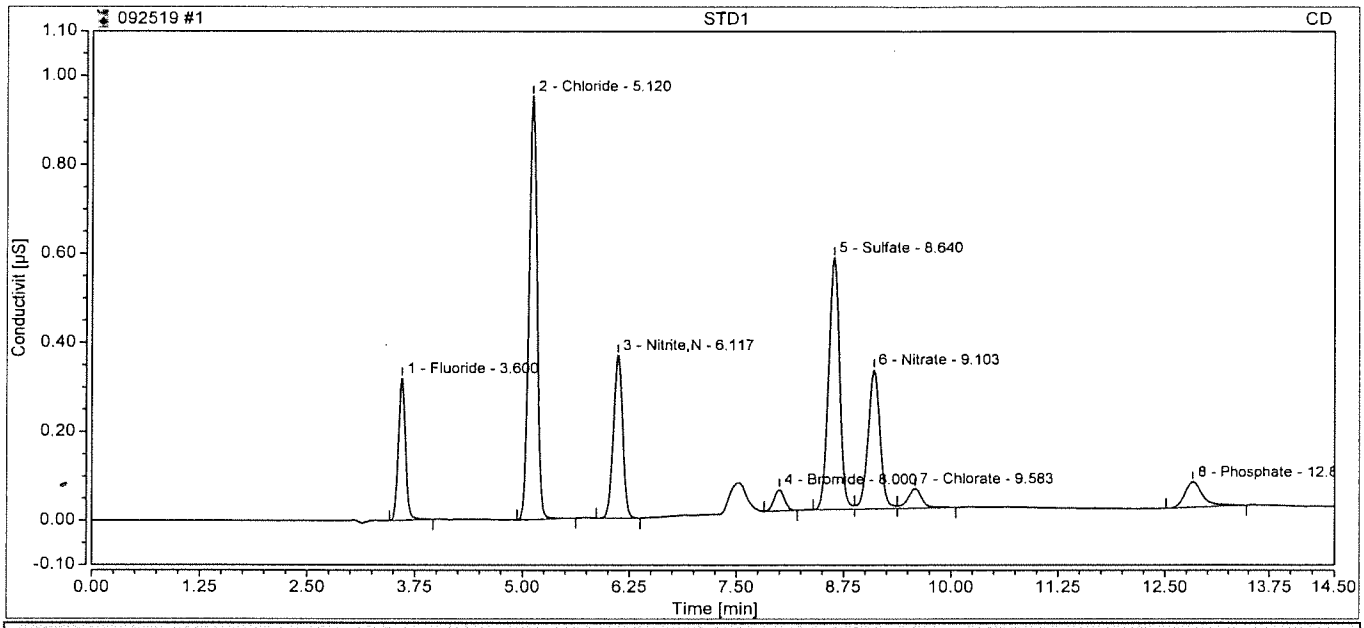
CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	Volume [ul]	Status	Inject Time
	HS19090617-06DF50		Unknown	GC5	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 7:04:11 AM -05:00
	HS19090617-07DF50		Unknown	GC6	50.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 7:20:46 AM -05:00
	HS19090617-08DF20		Unknown	GC7	20.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 7:37:24 AM -05:00
	HS19090617-09DF20		Unknown	GC8	20.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 7:54:00 AM -05:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 10:02:04 AM -05:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	9/26/2019 10:18:40 AM -05:00

Peak No.	Peak Name	Cal.Type	Eval.Type	Number of Points	Rel.Std.Dev. %	Coeff.of Determination	C0 (Offset)	C1 (Slope)	C2 (Curve)
1	*Fluoride*	*Lin, WithOffset, 1/*	*Area*	*5*	*10.1532*	*0.99927*	*-0.0056*	*0.3716*	*0.0000*
2	Chloride	Lin, WithOffset, 1/	Area	6	0.2804	1.00000	-0.0135	0.2355	0.0000
3	Nitrite,N	Lin, WithOffset, 1/	Area	5	15.1147	0.99824	0.0003	0.5120	0.0000
4	Bromide	Lin, WithOffset, 1/	Area	6	14.0217	0.99919	-0.0052	0.1009	0.0000
5	Sulfate	Lin, WithOffset, 1/	Area	6	1.1258	0.99999	-0.0022	0.1717	0.0000
6	Nitrate	Lin, WithOffset, 1/	Area	6	2.2249	0.99998	-0.0102	0.5876	0.0000
7	Chlorate	Lin, WithOffset, 1/	Area	6	10.0265	0.99953	-0.0024	0.0944	0.0000
8	Phosphate	Lin, WithOffset, 1/	Area	6	6.6198	0.99981	-0.0110	0.2321	0.0000
Maximum					**15.1147**	1.00000			
Minimum					0.2804	**0.99824**			

1 STD1

Sample Name:	**STD1**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:08**	*Sample Weight:*	**1.0000**

Run Time:



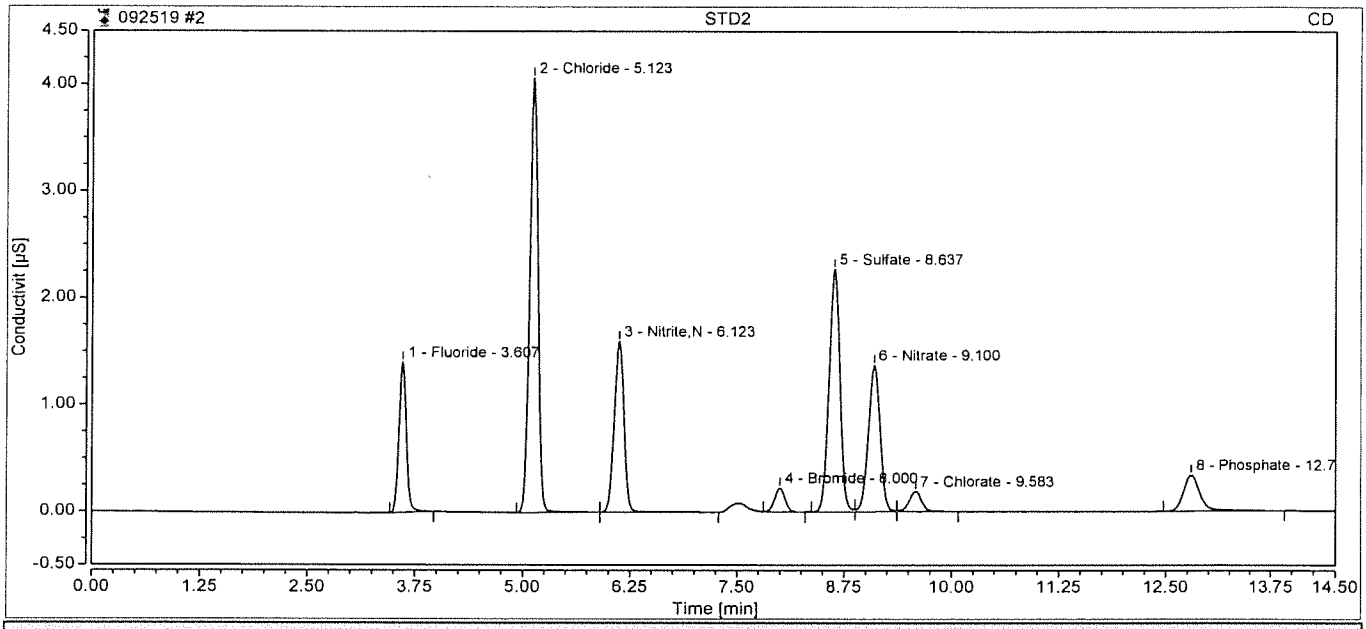
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.031	0.0973	0.0973	1.0000
2	5.12	Chloride	BMB	0.105	0.5026	0.5026	1.0000
3	6.12	Nitrite,N	BMB	0.046	0.0893	0.0893	1.0000
4	8.00	Bromide	BMB	0.007	0.1192	0.1192	1.0000
5	8.64	Sulfate	BM	0.084	0.5042	0.5042	1.0000
6	9.10	Nitrate	M	0.051	0.1034	0.1034	1.0000
7	9.58	Chlorate	MB	0.008	0.1143	0.1143	1.0000
8	12.83	Phosphate	BMB	0.014	0.1085	0.1085	1.0000
Total:			**0.000**	**0.346**		**1.64**	

2 STD2

Sample Name:	**STD2**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:24**	*Sample Weight:*	**1.0000**

Run Time:



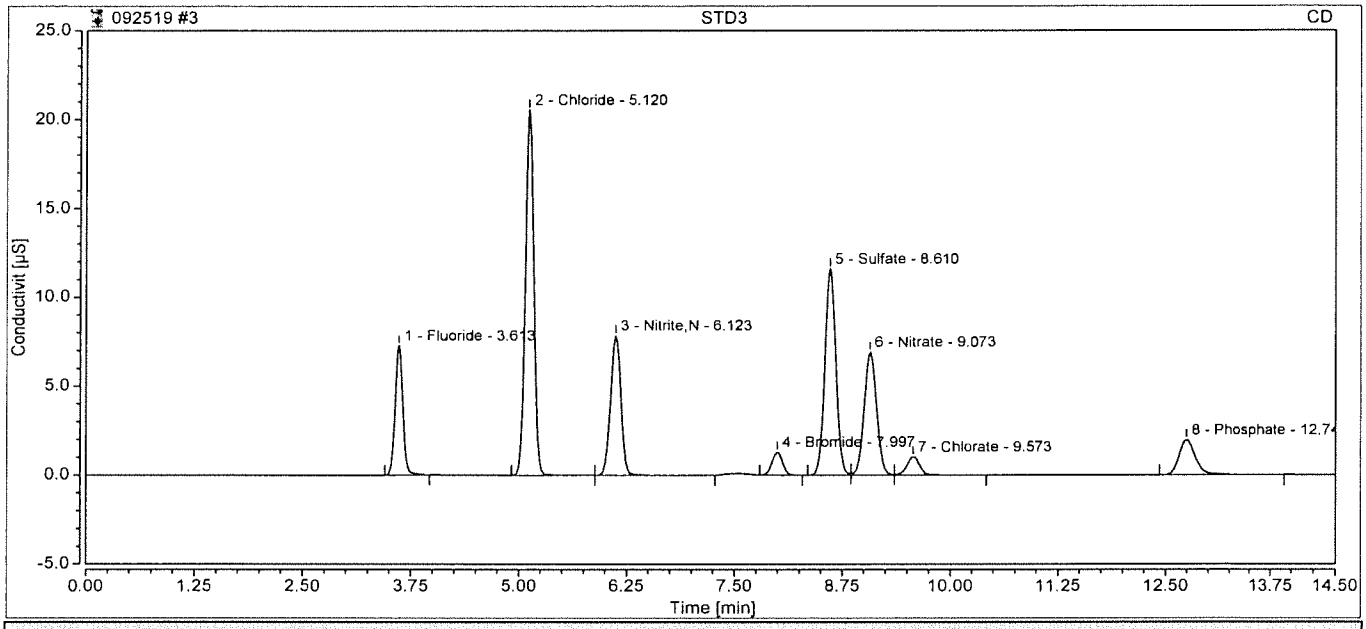
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.140	0.3929	0.3929	1.0000
2	5.12	Chloride	BMB	0.456	1.9918	1.9918	1.0000
3	6.12	Nitrite,N	BMB	0.211	0.4119	0.4119	1.0000
4	8.00	Bromide	BMB	0.031	0.3593	0.3593	1.0000
5	8.64	Sulfate	BM	0.337	1.9733	1.9733	1.0000
6	9.10	Nitrate	M	0.220	0.3917	0.3917	1.0000
7	9.58	Chlorate	MB	0.033	0.3704	0.3704	1.0000
8	12.80	Phosphate	BMB	0.078	0.3841	0.3841	1.0000
Total:			**0.000**	**1.506**		**6.28**	

3 STD3

Sample Name:	**STD3**	*Injection Volume:*	**5.00**
Vial Number:	**GA3**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:41**	*Sample Weight:*	**1.0000**

Run Time:



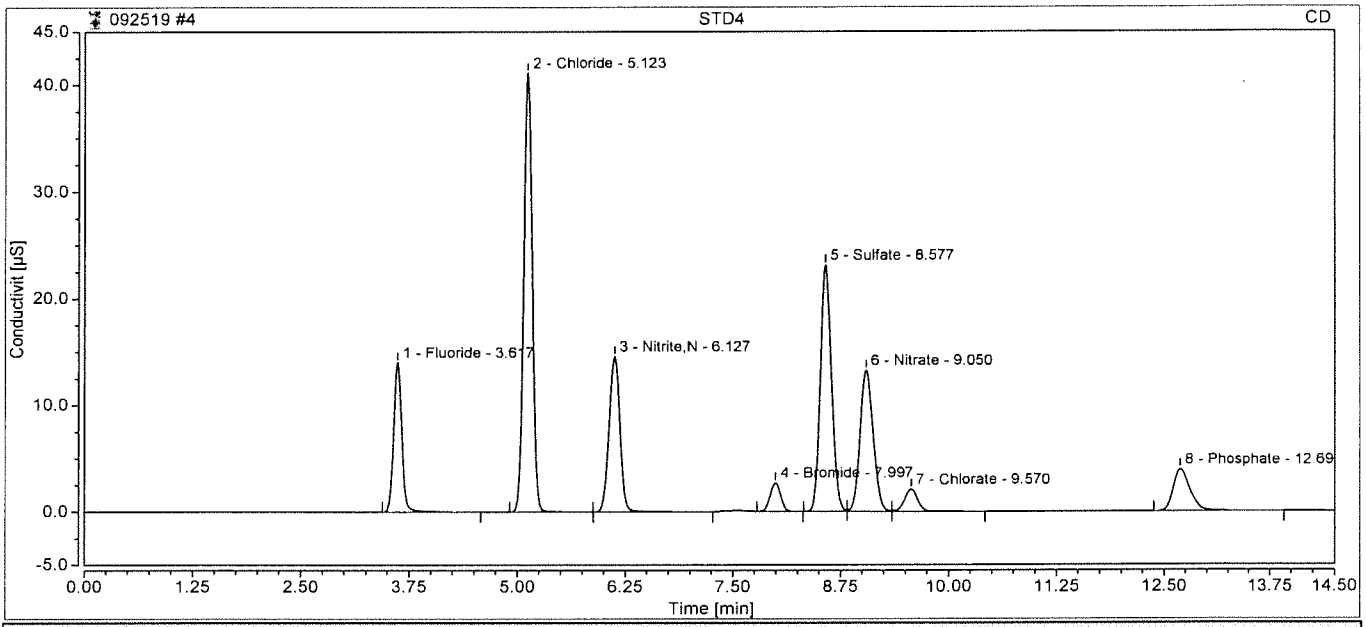
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.758	2.0551	2.0551	1.0000
2	5.12	Chloride	BMB	2.339	9.9888	9.9888	1.0000
3	6.12	Nitrite,N	BMB	1.091	2.1305	2.1305	1.0000
4	8.00	Bromide	BMB	0.182	1.8590	1.8590	1.0000
5	8.61	Sulfate	BM	1.715	10.0007	10.0007	1.0000
6	9.07	Nitrate	M	1.153	1.9792	1.9792	1.0000
7	9.57	Chlorate	MB	0.176	1.8940	1.8940	1.0000
8	12.75	Phosphate	BMB	0.436	1.9269	1.9269	1.0000
Total:			**0.000**	**7.851**		**31.83**	

4 STD4

Sample Name:	**STD4**	*Injection Volume:*	**5.00**
Vial Number:	**GA4**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:57**	*Sample Weight:*	**1.0000**

Run Time:



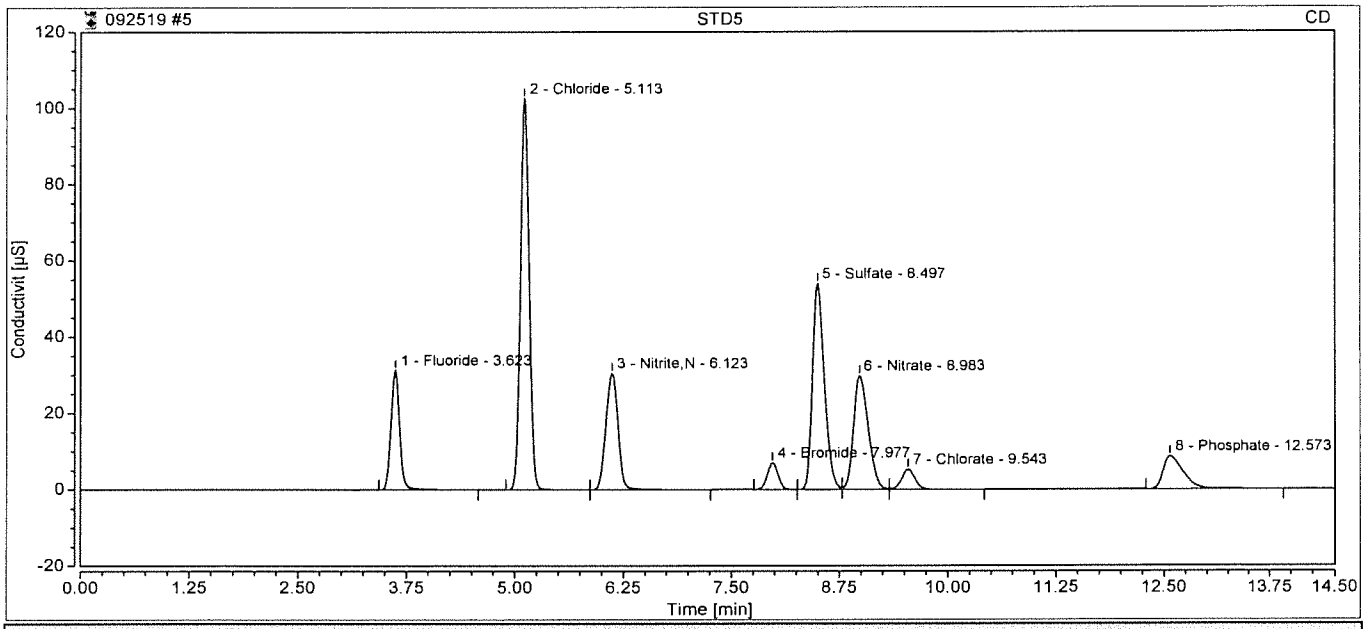
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.535	4.1457	4.1457	1.0000
2	5.12	Chloride	BMB	4.695	19.9948	19.9948	1.0000
3	6.13	Nitrite,N	BMB	2.133	4.1659	4.1659	1.0000
4	8.00	Bromide	BMB	0.385	3.8642	3.8642	1.0000
5	8.58	Sulfate	BM	3.451	20.1082	20.1082	1.0000
6	9.05	Nitrate	M	2.330	3.9823	3.9823	1.0000
7	9.57	Chlorate	MB	0.365	3.8956	3.8956	1.0000
8	12.69	Phosphate	BMB	0.903	3.9395	3.9395	1.0000
Total:			**0.000**	**15.798**		**64.10**	

5 STD5

Sample Name:	**STD5**	*Injection Volume:*	**5.00**
Vial Number:	**GA5**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 15:14**	*Sample Weight:*	**1.0000**

Run Time:



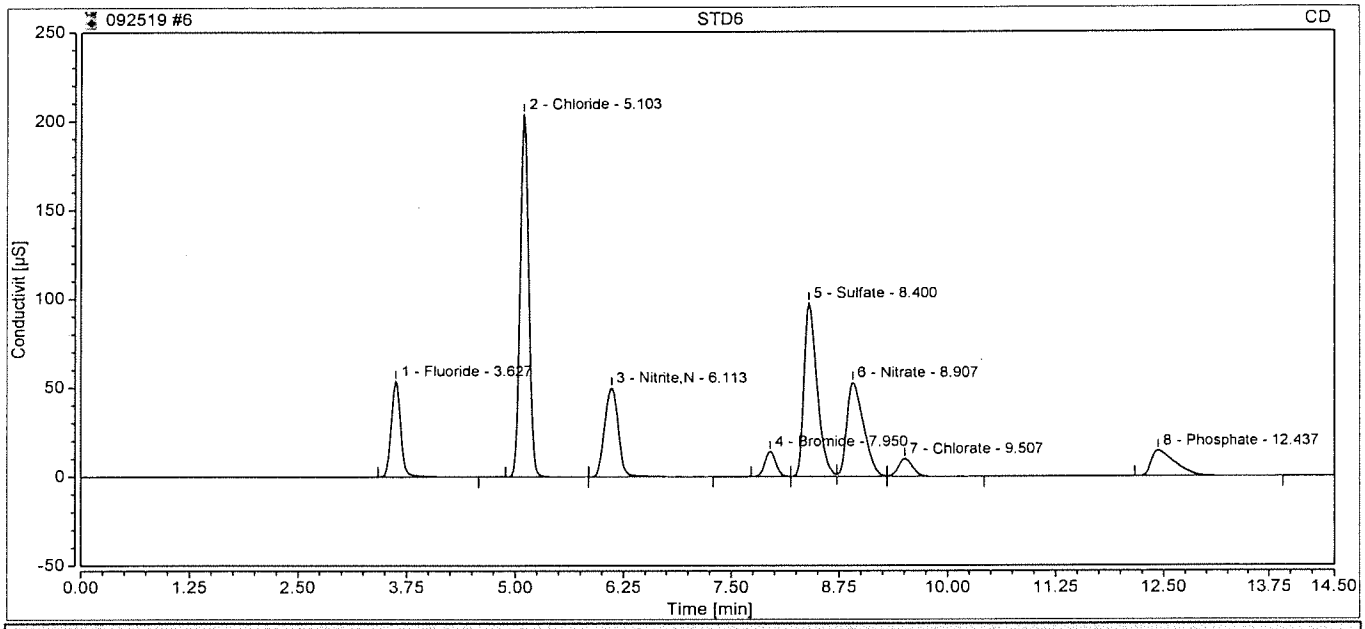
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.639	9.8090	9.8090	1.0000
2	5.11	Chloride	BMB	11.762	49.9996	49.9996	1.0000
3	6.12	Nitrite,N	BMB	4.968	9.7023	9.7023	1.0000
4	7.98	Bromide	BMB	1.001	9.9786	9.9786	1.0000
5	8.50	Sulfate	BM	8.590	50.0271	50.0271	1.0000
6	8.98	Nitrate	M	5.854	9.9805	9.9805	1.0000
7	9.54	Chlorate	MB	0.939	9.9670	9.9670	1.0000
8	12.57	Phosphate	BMB	2.305	9.9803	9.9803	1.0000
Total:			**0.000**	**39.057**		**159.44**	

6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:37**	*Sample Weight:*	**1.0000**

Run Time:



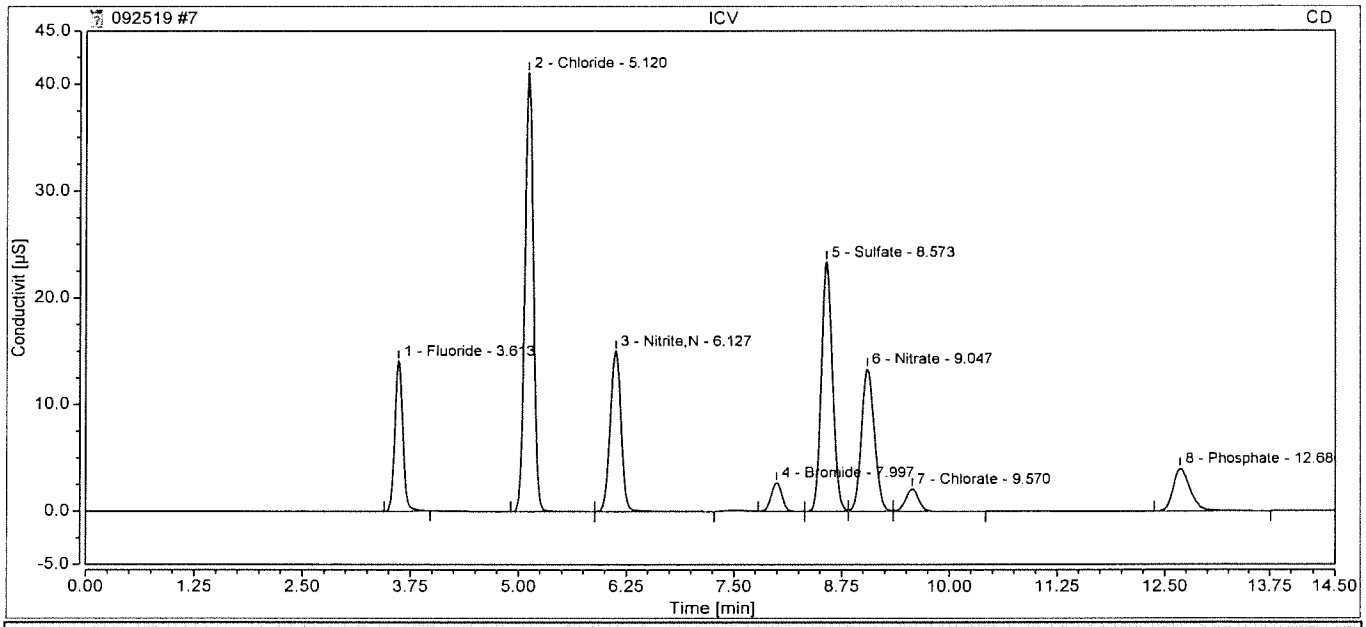
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	6.773	18.2418	18.2418	1.0000
2	5.10	Chloride	BMB	23.542	100.0224	100.0224	1.0000
3	6.11	Nitrite,N	BMB	9.157	17.8850	17.8850	1.0000
4	7.95	Bromide	BM	2.045	20.3197	20.3197	1.0000
5	8.40	Sulfate	M	17.153	99.8863	99.8863	1.0000
6	8.91	Nitrate	M	11.778	20.0629	20.0629	1.0000
7	9.51	Chlorate	MB	1.910	20.2586	20.2586	1.0000
8	12.44	Phosphate	BMB	4.668	20.1606	20.1606	1.0000
Total:			**0.000**	**77.025**		**316.84**	

7 ICV

Sample Name:	**ICV**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:54**	*Sample Weight:*	**1.0000**

Run Time:



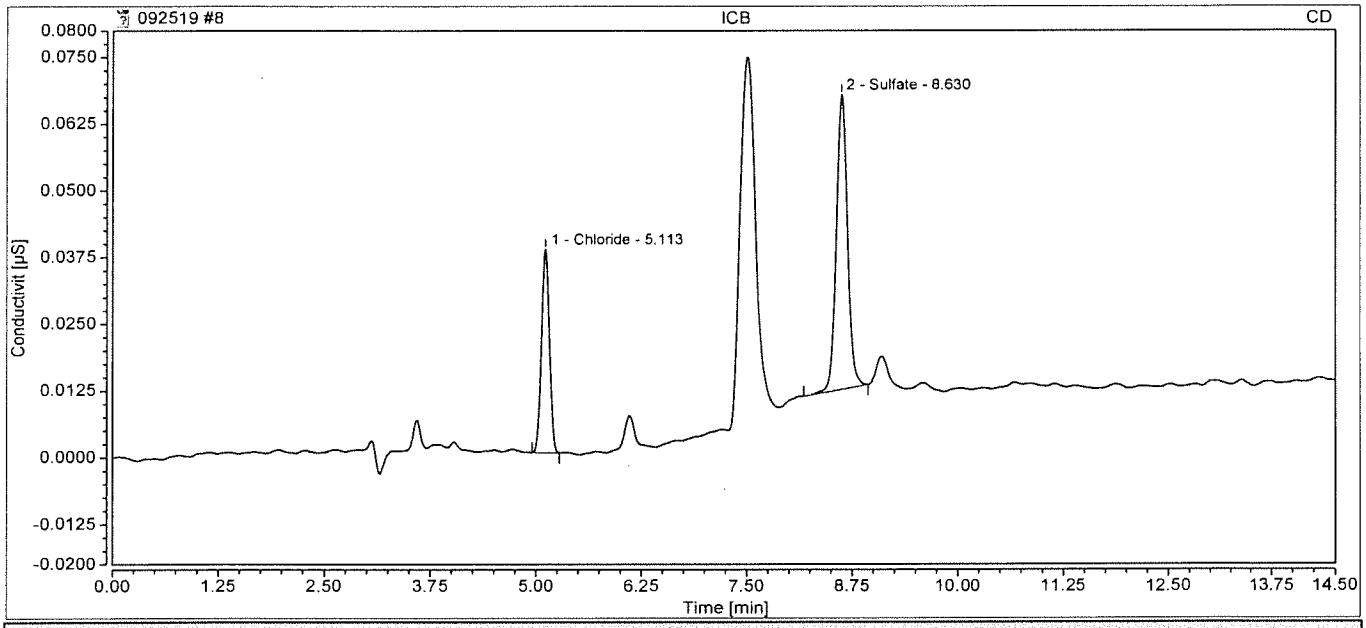
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.495	4.0374	4.0374	1.0000
2	5.12	Chloride	BMB	4.681	19.9333	19.9333	1.0000
3	6.13	Nitrite,N	BMB	2.195	4.2858	4.2858	1.0000
4	8.00	Bromide	BMB	0.384	3.8585	3.8585	1.0000
5	8.57	Sulfate	BM	3.469	20.2132	20.2132	1.0000
6	9.05	Nitrate	M	2.340	3.9993	3.9993	1.0000
7	9.57	Chlorate	MB	0.367	3.9104	3.9104	1.0000
8	12.68	Phosphate	BMB	0.911	3.9732	3.9732	1.0000
Total:			**0.000**	**15.841**		**64.21**	

8 ICB

Sample Name:	**ICB**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 19:29**	*Sample Weight:*	**1.0000**

Run Time:



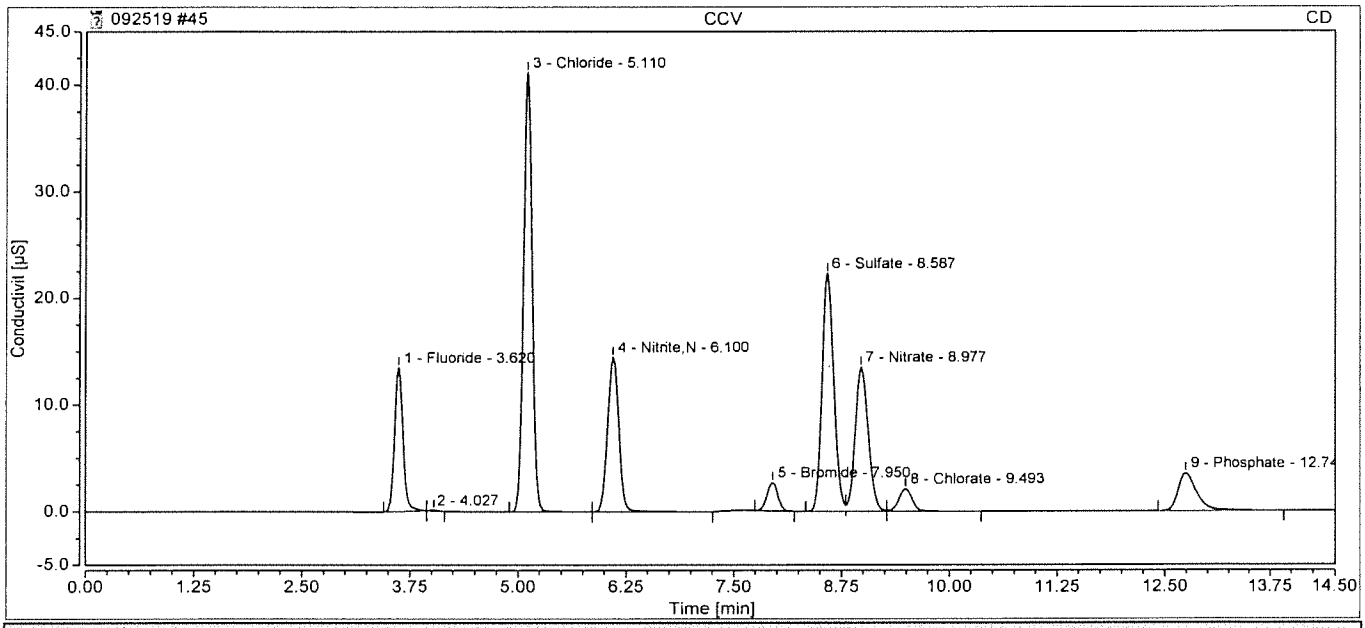
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.11	Chloride	BMB	0.004	0.0748	0.0748	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.63	Sulfate	BMB	0.008	0.0618	0.0618	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.013**		**0.14**	

45 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/25/2019 23:52**	*Sample Weight:*	**1.0000**

Run Time:



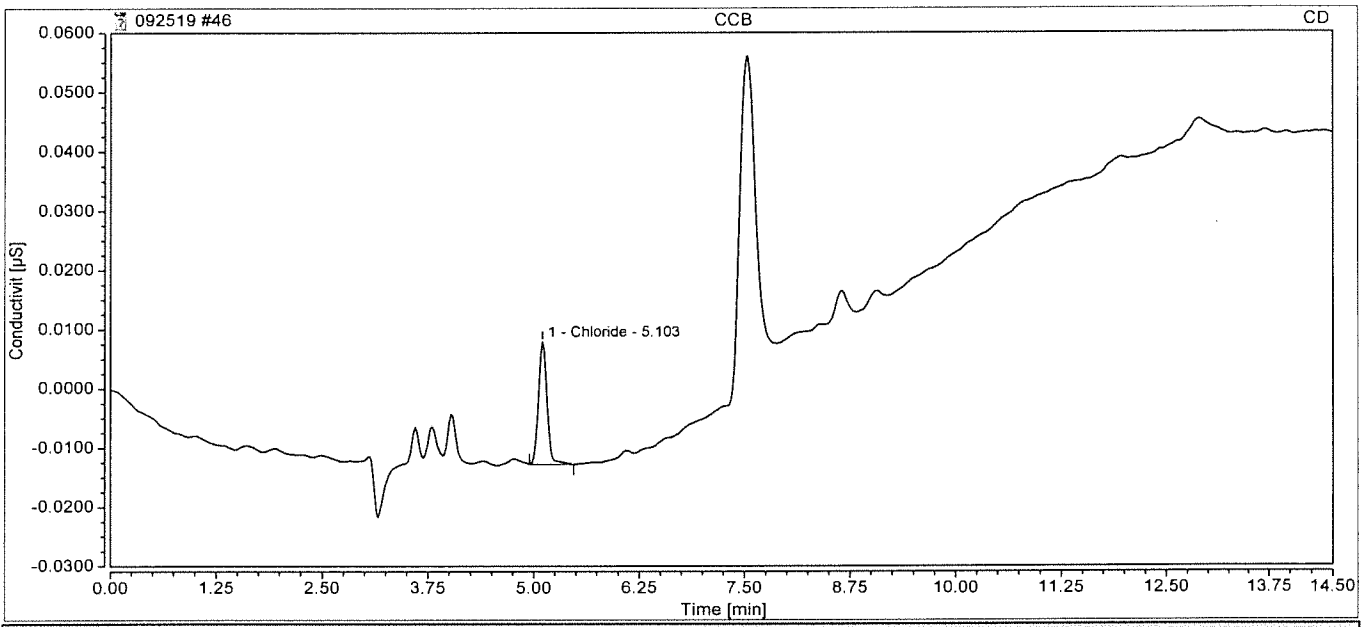
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.521	4.1071	4.1071	1.0000
3	5.11	Chloride	BMB	4.796	20.4234	20.4234	1.0000
4	6.10	Nitrite,N	BMB	2.170	4.2379	4.2379	1.0000
5	7.95	Bromide	BMB	0.384	3.8558	3.8558	1.0000
6	8.59	Sulfate	BM	3.526	20.5418	20.5418	1.0000
7	8.98	Nitrate	M	2.387	4.0803	4.0803	1.0000
8	9.49	Chlorate	MB	0.373	3.9800	3.9800	1.0000
9	12.74	Phosphate	BMB	0.884	3.8555	3.8555	1.0000
Total:			**0.000**	**16.041**		**65.08**	

46 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/26/2019 00:08**	*Sample Weight:*	**1.0000**

Run Time:



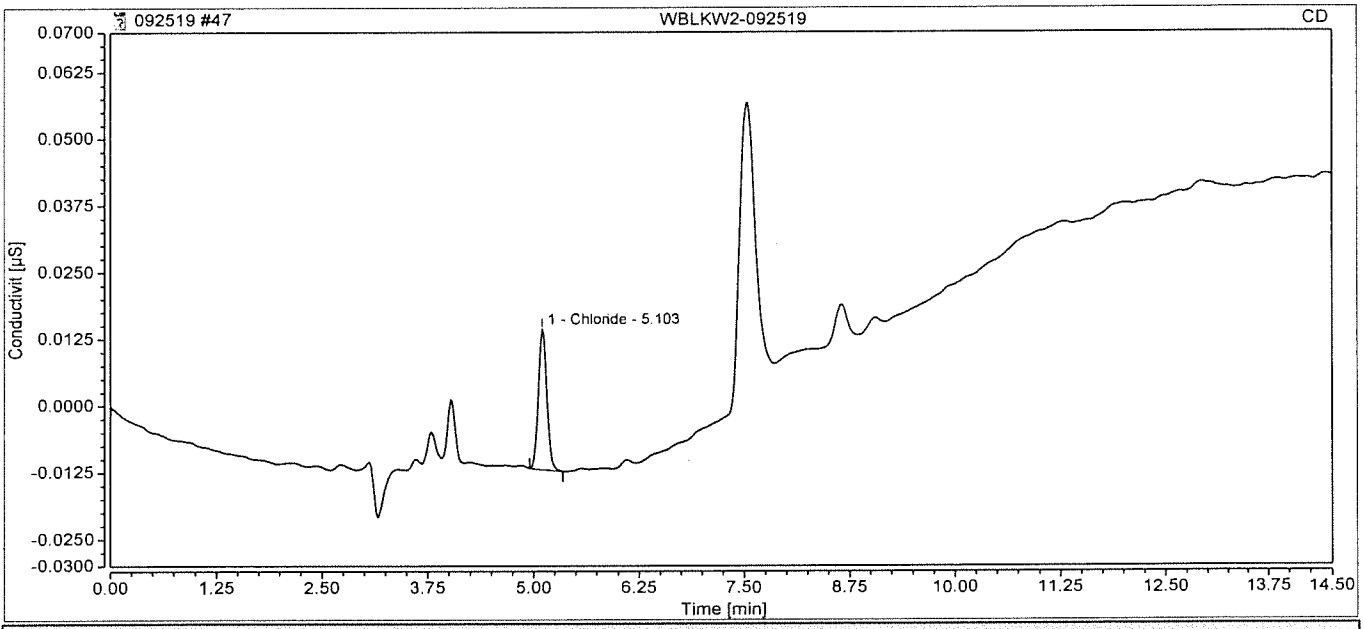
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.002	0.0677	0.0677	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.002**		**0.07**	

47 *WBLKW2-092519*

Sample Name:	**WBLKW2-092519**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/26/2019 00:25**	*Sample Weight:*	**1.0000**

Run Time:



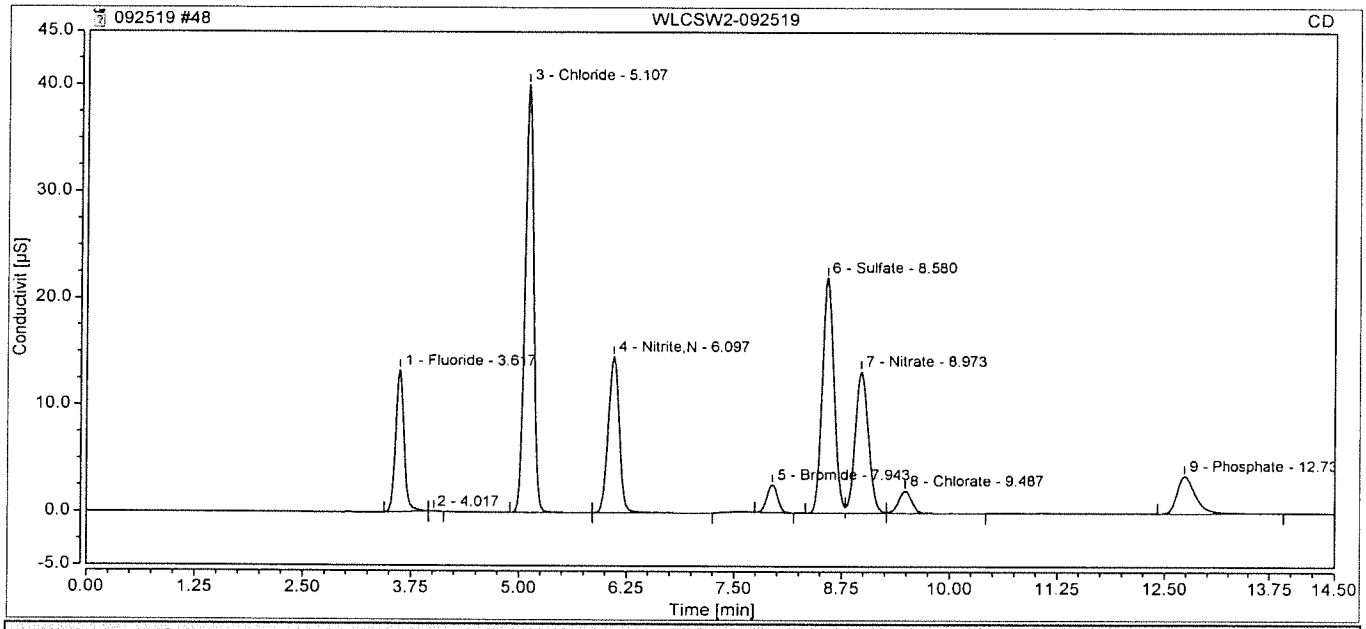
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.003	0.0702	0.0702	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.07**	

48 *WLCSW2-092519*

Sample Name:	**WLCSW2-092519**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/26/2019 00:42**	*Sample Weight:*	**1.0000**

Run Time:

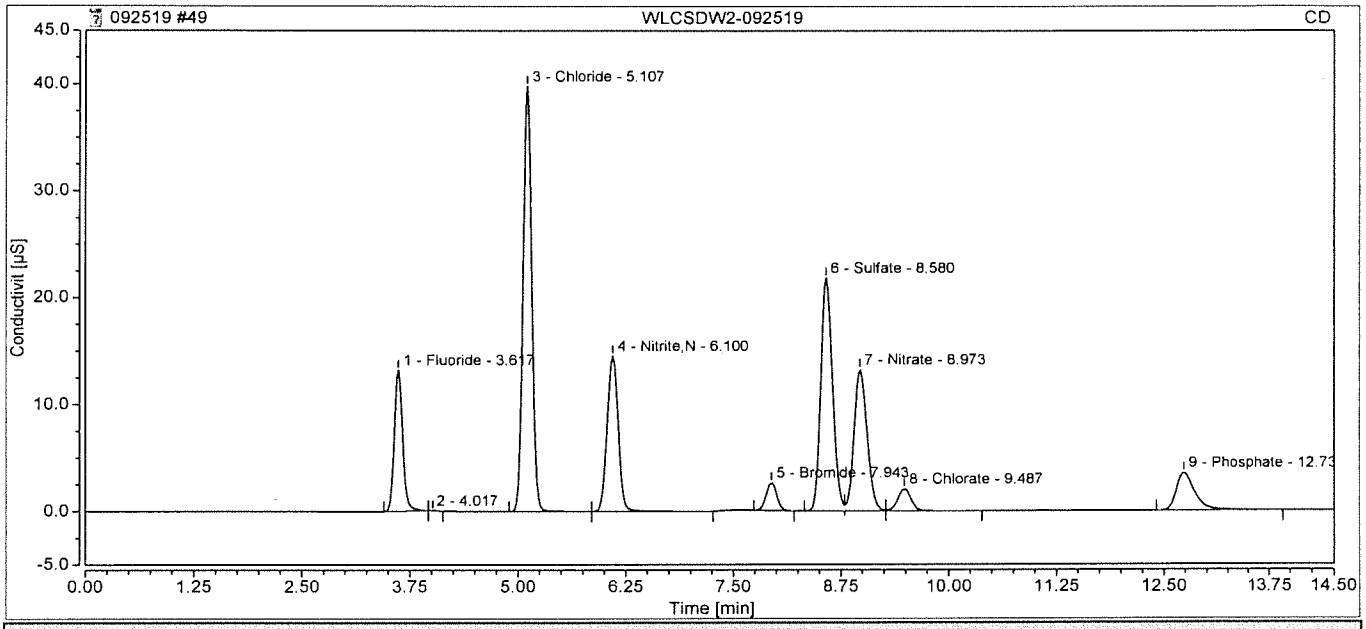


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.491	4.0264	4.0264	1.0000
3	5.11	Chloride	BMB	4.665	19.8667	19.8667	1.0000
4	6.10	Nitrite,N	BMB	2.187	4.2705	4.2705	1.0000
5	7.94	Bromide	BMB	0.375	3.7671	3.7671	1.0000
6	8.58	Sulfate	BM	3.476	20.2496	20.2496	1.0000
7	8.97	Nitrate	M	2.343	4.0047	4.0047	1.0000
8	9.49	Chlorate	MB	0.368	3.9225	3.9225	1.0000
9	12.73	Phosphate	BMB	0.873	3.8076	3.8076	1.0000
Total:			**0.000**	**15.776**		**63.92**	

49 WLCSDW2-092519

Sample Name:	**WLCSDW2-092519**	*Injection Volume:*	**5.00**
Vial Number:	**GA3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/26/2019 00:58**	*Sample Weight:*	**1.0000**
Run Time:			

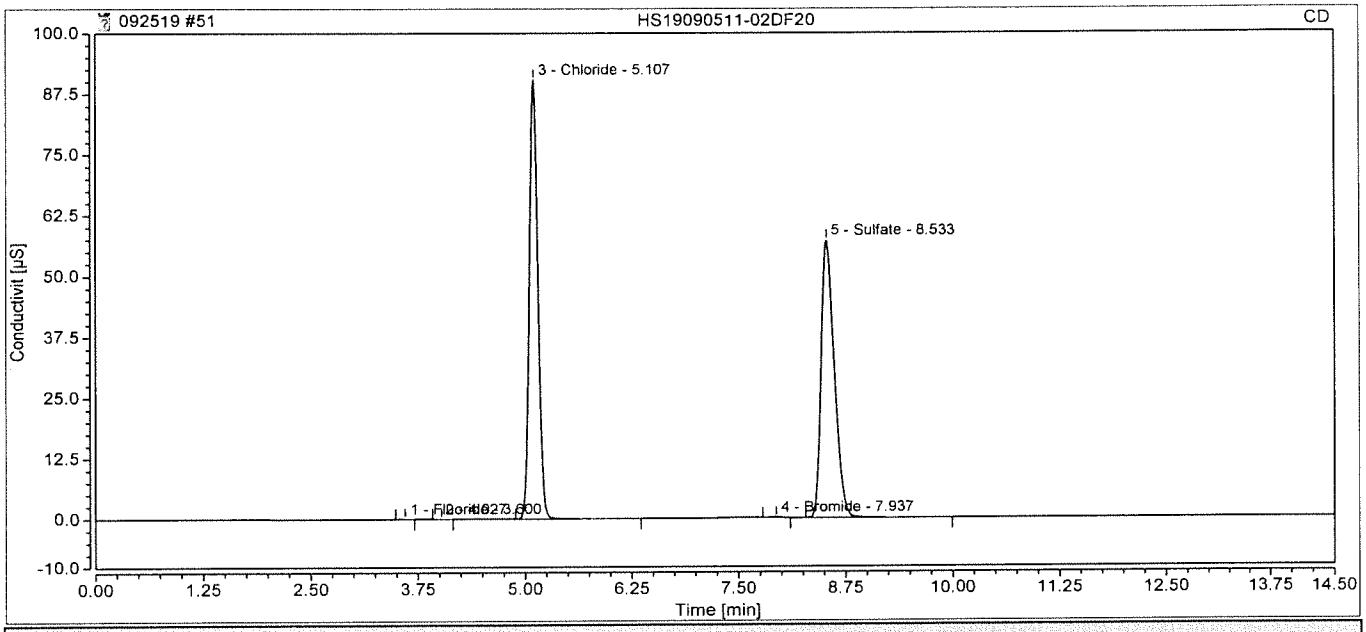


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.482	4.0024	4.0024	1.0000
3	5.11	Chloride	BMB	4.639	19.7553	19.7553	1.0000
4	6.10	Nitrite,N	BMB	2.181	4.2588	4.2588	1.0000
5	7.94	Bromide	BMB	0.375	3.7705	3.7705	1.0000
6	8.58	Sulfate	BM	3.447	20.0814	20.0814	1.0000
7	8.97	Nitrate	M	2.329	3.9821	3.9821	1.0000
8	9.49	Chlorate	MB	0.367	3.9176	3.9176	1.0000
9	12.73	Phosphate	BMB	0.879	3.8371	3.8371	1.0000
Total:			**0.000**	**15.700**		**63.61**	

51 HS19090511-02DF20

Sample Name:	**HS19090511-02DF20**	*Injection Volume:*	**5.00**
Vial Number:	**GA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**20.0000**
Recording Time:	**09/26/2019 01:31**	*Sample Weight:*	**1.0000**
Run Time:			

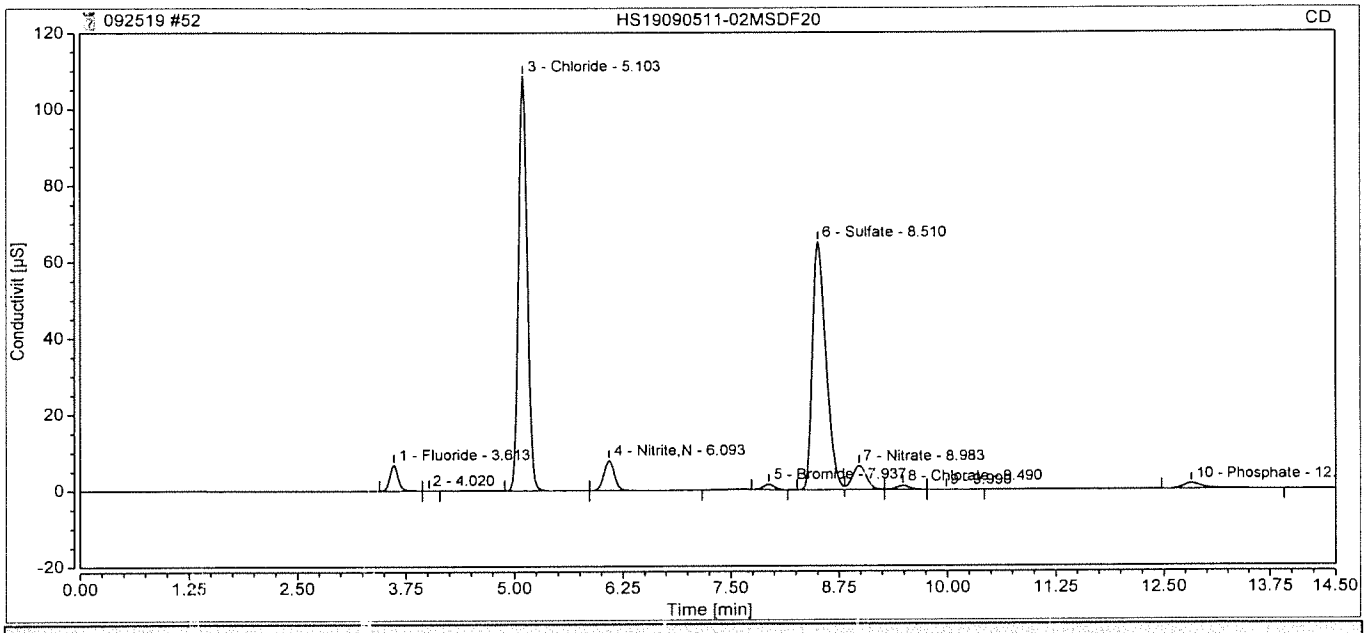


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.005	0.0275	0.5491	20.0000
3	5.11	Chloride	BMB	10.605	45.0899	901.7987	20.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	20.0000
4	7.94	Bromide	BMB	0.017	0.2210	4.4193	20.0000
5	8.53	Sulfate	BMB	10.273	59.8285	1196.5704	20.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	20.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	20.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	20.0000
Total:			**0.000**	**20.900**		**2103.34**	

52 HS19090511-02MSDF20

Sample Name:	**HS19090511-02MSDF20**	*Injection Volume:*	**5.00**
Vial Number:	**GA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**20.0000**
Recording Time:	**09/26/2019 01:48**	*Sample Weight:*	**1.0000**
Run Time:			

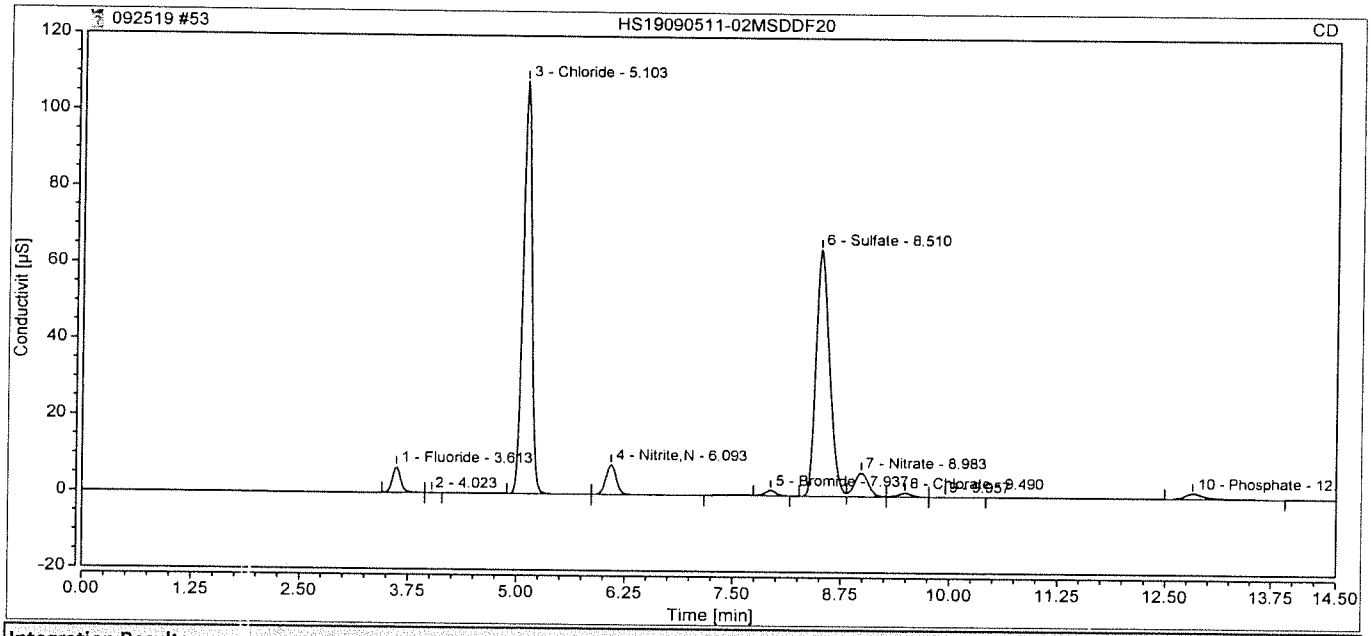


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.743	2.0147	40.2932	20.0000
3	5.10	Chloride	BMB	12.759	54.2373	1084.7461	20.0000
4	6.09	Nitrite,N	BMB	1.107	2.1617	43.2342	20.0000
5	7.94	Bromide	BMB	0.196	1.9931	39.8615	20.0000
6	8.51	Sulfate	BM	11.820	68.8346	1376.6921	20.0000
7	8.98	Nitrate	M	1.165	2.0008	40.0162	20.0000
8	9.49	Chlorate	M	0.175	1.8819	37.6389	20.0000
10	12.82	Phosphate	BMB	0.375	1.6640	33.2803	20.0000
Total:			**0.000**	**28.341**		**2695.76**	

53 *HS19090511-02MSDDF20*

Sample Name:	**HS19090511-02MSDDF20**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**20.0000**
Recording Time:	**09/26/2019 02:05**	*Sample Weight:*	**1.0000**
Run Time:			

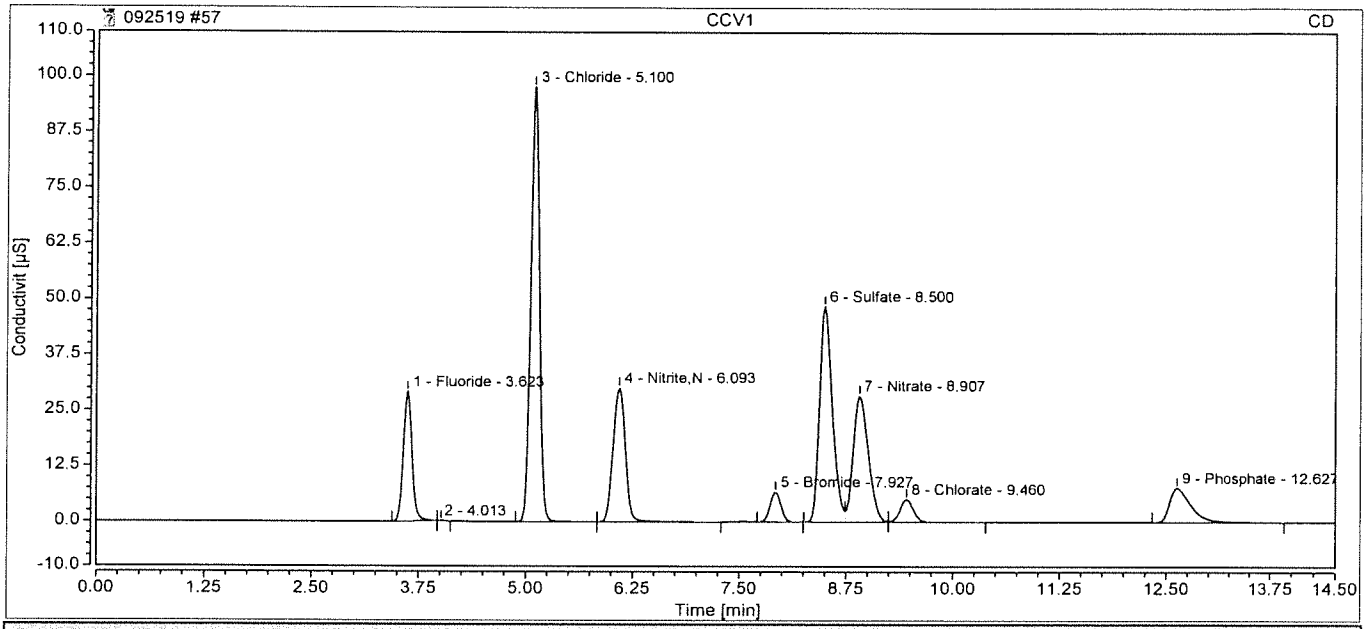


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.735	1.9929	39.8576	20.0000
3	5.10	Chloride	BMB	12.677	53.8861	1077.7227	20.0000
4	6.09	Nitrite,N	BMB	1.100	2.1472	42.9448	20.0000
5	7.94	Bromide	BMB	0.194	1.9781	39.5622	20.0000
6	8.51	Sulfate	BM	11.721	68.2581	1365.1626	20.0000
7	8.98	Nitrate	M	1.156	1.9847	39.6934	20.0000
8	9.49	Chlorate	M	0.175	1.8760	37.5200	20.0000
10	12.82	Phosphate	BMB	0.376	1.6659	33.3184	20.0000
Total:			**0.000**	**28.133**		**2675.78**	

57 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/26/2019 03:11**	*Sample Weight:*	**1.0000**
Run Time:			



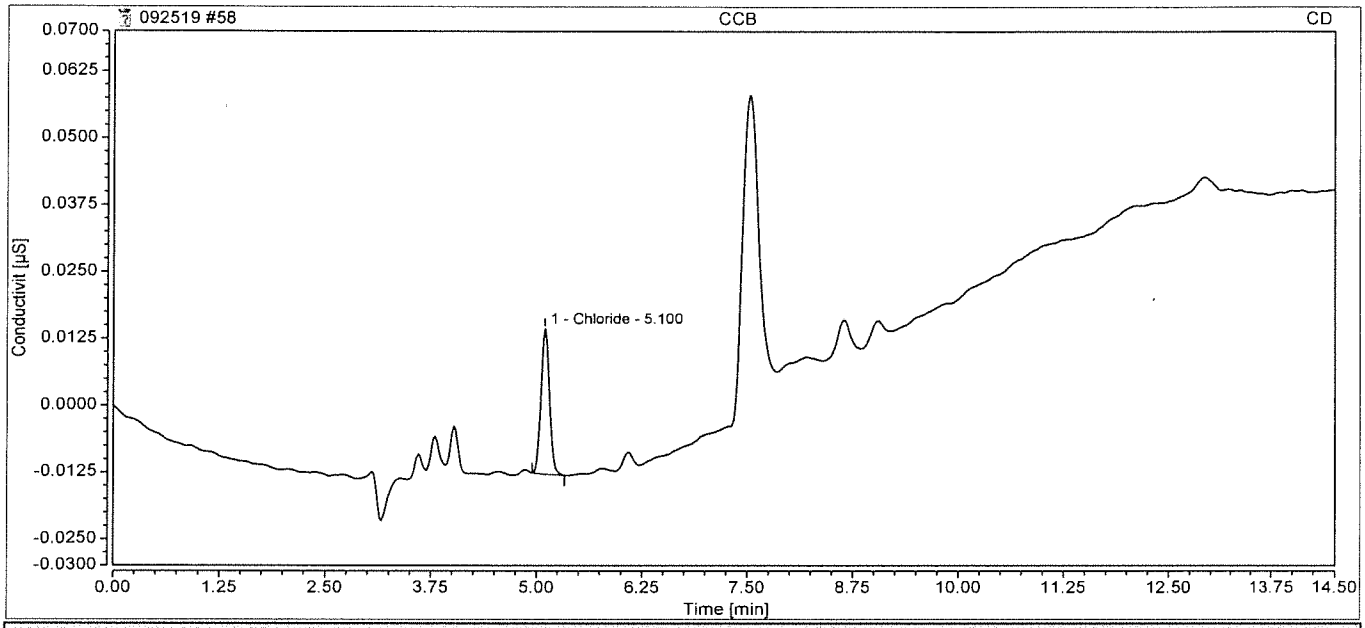
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.476	9.3703	9.3703	1.0000
3	5.10	Chloride	BMB	11.463	48.7317	48.7317	1.0000
4	6.09	Nitrite,N	BMB	5.008	9.7799	9.7799	1.0000
5	7.93	Bromide	BMB	0.984	9.8018	9.8018	1.0000
6	8.50	Sulfate	BM	8.401	48.9283	48.9283	1.0000
7	8.91	Nitrate	M	5.801	9.8913	9.8913	1.0000
8	9.46	Chlorate	MB	0.933	9.9095	9.9095	1.0000
9	12.63	Phosphate	BMB	2.225	9.6335	9.6335	1.0000
Total:			**0.000**	**38.291**		**156.05**	

58 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/26/2019 03:28**	*Sample Weight:*	**1.0000**

Run Time:

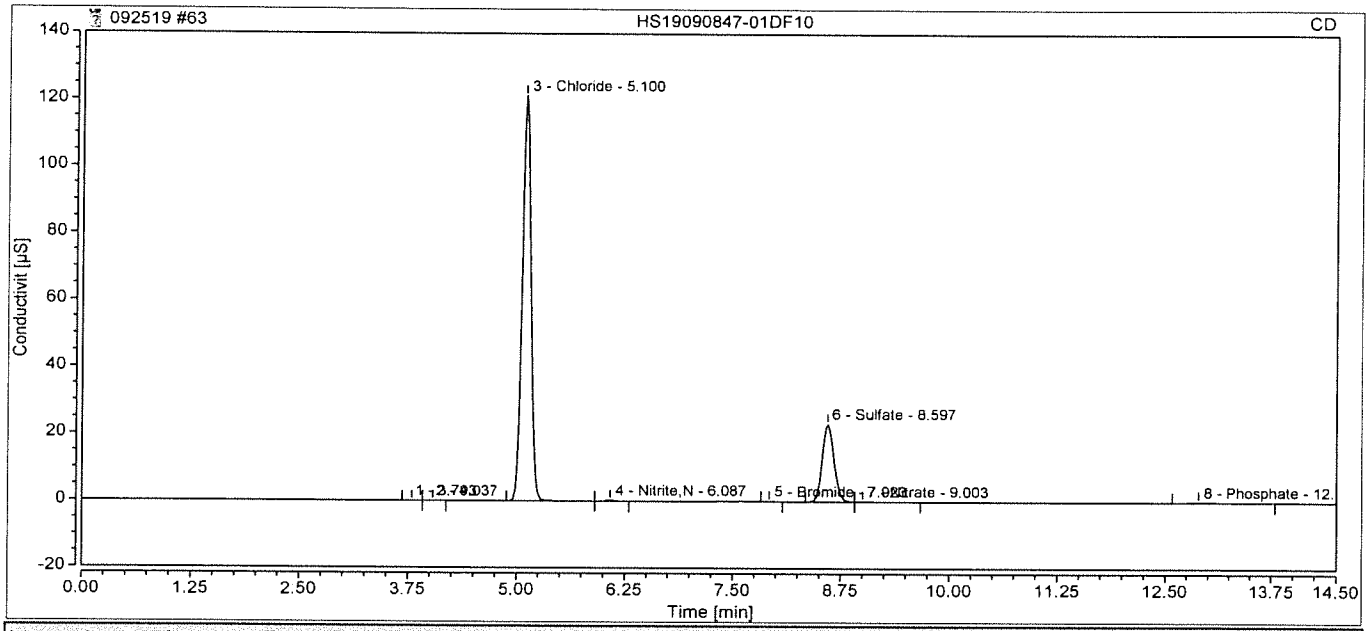


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.003	0.0707	0.0707	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.07**	

63 HS19090847-01DF10

Sample Name:	**HS19090847-01DF10**	*Injection Volume:*	**5.00**
Vial Number:	**GB7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**09/26/2019 04:51**	*Sample Weight:*	**1.0000**
Run Time:			

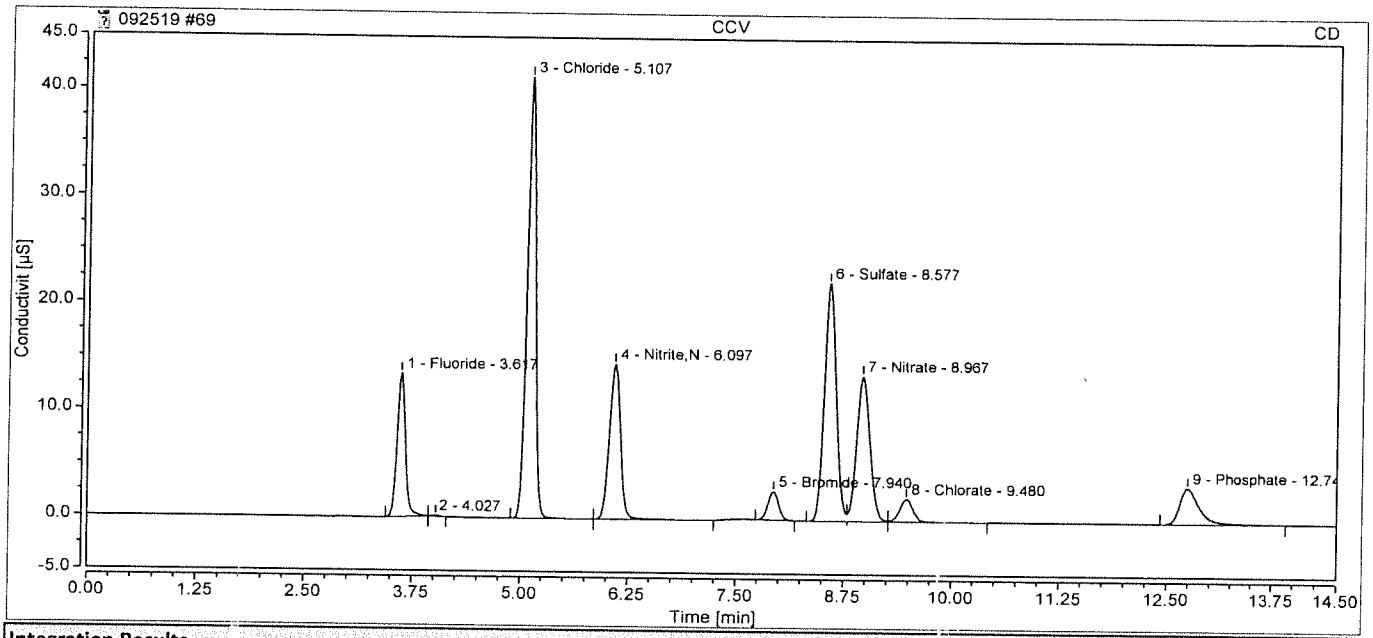


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	10.0000
3	5.10	Chloride	BMB	14.261	60.6132	606.1318	10.0000
4	6.09	Nitrite,N	BMB	0.035	0.0683	0.6830	10.0000
5	7.92	Bromide	BMB	0.003	0.0789	0.7887	10.0000
6	8.60	Sulfate	BM	3.668	21.3695	213.6954	10.0000
7	9.00	Nitrate	MB	0.025	0.0604	0.6039	10.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	10.0000
8	12.89	Phosphate	BMB	0.030	0.1773	1.7731	10.0000
Total:			**0.000**	**18.022**		**823.68**	

69 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/26/2019 06:31**	*Sample Weight:*	**1.0000**
Run Time:			

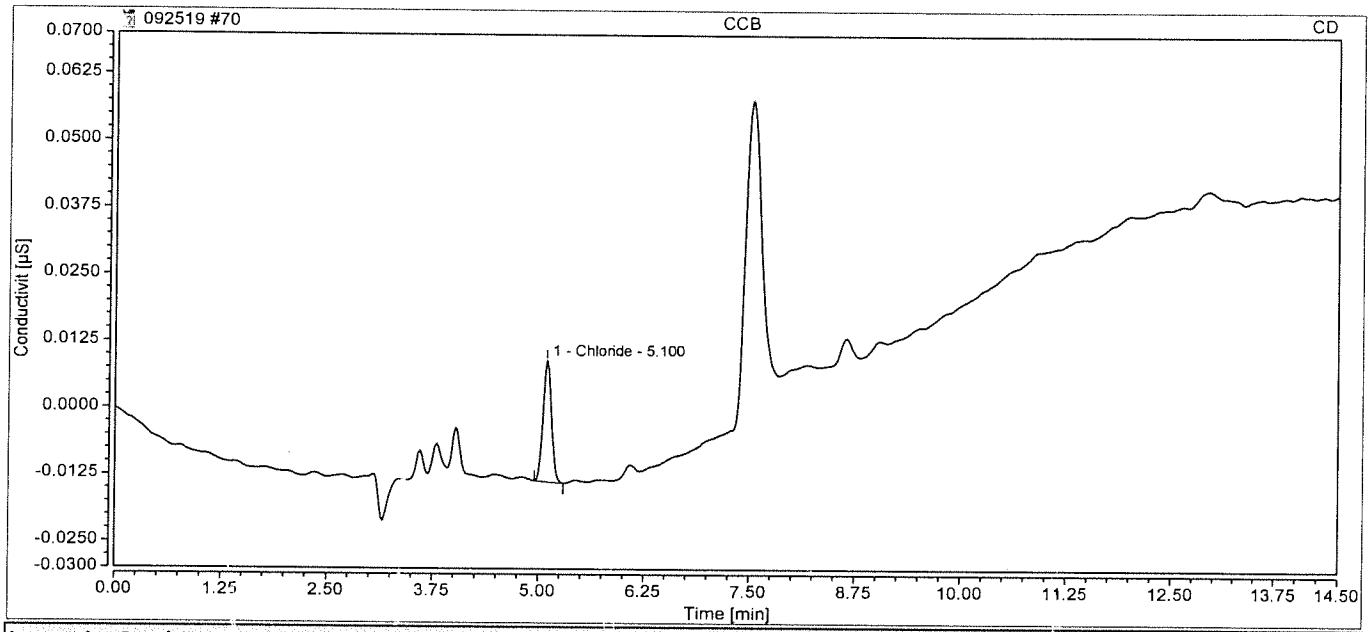


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.518	4.0998	4.0998	1.0000
3	5.11	Chloride	BMB	4.800	20.4387	20.4387	1.0000
4	6.10	Nitrite,N	BMB	2.171	4.2396	4.2396	1.0000
5	7.94	Bromide	BMB	0.384	3.8614	3.8614	1.0000
6	8.58	Sulfate	BM	3.533	20.5826	20.5826	1.0000
7	8.97	Nitrate	M	2.396	4.0953	4.0953	1.0000
8	9.48	Chlorate	MB	0.376	4.0086	4.0086	1.0000
9	12.74	Phosphate	BMB	0.878	3.8306	3.8306	1.0000
Total:			**0.000**	**16.056**		**65.16**	

70 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**09/26/2019 06:47**	*Sample Weight:*	**1.0000**
Run Time:			



Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.10	Chloride	BMB	0.003	0.0684	0.0684	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.07**	

HS19090964

Report Date: 09/21/2019 : 2:51

PC-TitratION PLUS

Calibration Report

Calibration Record # 2158

Calibration Settings

Calibration ID	PH CAL 4-7-10	Date	09/21/2019
Channel	1	Time	2:51 PM
Probe Type	pH	Temperature	295.61 K 22.46 C
Probe ID	PH ELECTRODE	Analysis Type	Single Line Fit

Calibration Results

Slope	-57.900	CorrCoeff	0.9999
Intercept	3.093	Equation: Y = (-57.900) X + (3.093)	

Calibration Validity True Operator

	Result	Minimum	Maximum
Slope	-57.900	-65.00	-53.00
Intercept	3.093	-100.00	100.00
Correlation Coefficient	0.9999	0.99	1.00

Note: "True" means the calibration was within the specified ranges
"False" means the calibration was NOT within the specified ranges

AIK (A) R# 346725

AIK (B) R# 346726

Calibration Data	Standard	Reading
	4.00	178.46
	7.00	-0.24
	10.00	-168.94

PH 4500 (A) R# 346793

PH 4500 (B) R# 346794

PC-TitratION PLUS by Man-Tech Associates, Inc.

CALRPRTLive1.SRW

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PC-TitratION PLUS
Water Analysis Report

Run Number 3622 **Order Number** 20190921-2

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
ICV-PH	9/21/2019	3:25 PM	22.60	-1.00	6.04	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TAP WATER	9/21/2019	3:31 PM	22.70	-1.00	7.91	.00	279.23	279.23	.00	.00	.00	2.66	2.66
WBLKW1-190921	9/21/2019	3:37 PM	22.58	-1.00	5.83	.00	.55	.55	.00	.00	.00	.02	.02
LCS1-190921	9/21/2019	3:45 PM	22.63	-1.00	10.99	560.41	1,081.63	.00	1,042.44	39.19	5.34	10.30	10.30
LCSD1-190921	9/21/2019	3:54 PM	22.72	-1.00	10.99	564.41	1,091.68	.00	1,054.53	37.15	5.38	10.40	10.40
HS19090430-04	9/21/2019	4:02 PM	22.72	-1.00	7.89	.00	619.85	619.85	.00	.00	.00	5.90	5.90
HS19090430-04DUP	9/21/2019	4:09 PM	22.64	-1.00	7.88	.00	621.92	621.92	.00	.00	.00	5.92	5.92
HS19090539-02	9/21/2019	4:17 PM	22.57	-1.00	7.46	.00	995.93	995.93	.00	.00	.00	9.49	9.49
HS19090539-03	9/21/2019	4:27 PM	22.54	-1.00	7.69	.00	1,002.02	1,002.02	.00	.00	.00	9.54	9.54
HS19090539-05	9/21/2019	4:34 PM	22.63	-1.00	7.63	.00	802.51	802.51	.00	.00	.00	7.64	7.64
HS19090539-05DUP	9/21/2019	4:42 PM	22.61	-1.00	7.64	.00	807.96	807.96	.00	.00	.00	7.69	7.69
CCV-PH	9/21/2019	4:45 PM	22.86	-1.00	7.06	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	4:54 PM	22.84	-1.00	10.96	556.73	1,085.02	.00	1,056.59	28.43	5.30	10.33	10.33
DI RINSE	9/21/2019	4:59 PM	22.77	-1.00	5.91	.00	.44	.44	.00	.00	.00	.02	.02
HS19090539-04	9/21/2019	5:07 PM	22.72	-1.00	7.42	.00	1,002.15	1,002.15	.00	.00	.00	9.54	9.54
HS19090539-06	9/21/2019	5:16 PM	22.80	-1.00	7.46	.00	928.25	928.25	.00	.00	.00	8.84	8.84
HS19090539-07	9/21/2019	5:21 PM	22.80	-1.00	5.62	.00	.30	.30	.00	.00	.00	.02	.02
HS19090807-01	9/21/2019	5:28 PM	22.75	-1.00	7.61	.00	343.72	343.72	.00	.00	.00	3.27	3.27
HS19090807-02	9/21/2019	5:34 PM	22.74	-1.00	7.64	.00	316.64	316.64	.00	.00	.00	3.02	3.02
HS19090807-03	9/21/2019	5:41 PM	22.72	-1.00	7.74	.00	313.78	313.78	.00	.00	.00	2.99	2.99
HS19090807-04	9/21/2019	5:47 PM	22.87	-1.00	7.73	.00	340.91	340.91	.00	.00	.00	3.25	3.25
HS19090807-05	9/21/2019	5:52 PM	22.86	-1.00	5.88	.00	.52	.52	.00	.00	.00	.02	.02
HS19090904-01	9/21/2019	5:59 PM	22.77	-1.00	7.76	.00	93.42	93.42	.00	.00	.00	.89	.89
CCV-PH	9/21/2019	6:02 PM	22.72	-1.00	7.06	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	6:10 PM	22.60	-1.00	10.94	552.15	1,086.21	.00	1,068.11	18.10	5.26	10.34	10.34
DI RINSE	9/21/2019	6:15 PM	22.57	-1.00	5.93	.00	.36	.36	.00	.00	.00	.02	.02
HS19090580-02	9/21/2019	6:26 PM	22.52	-1.00	8.24	.00	1,389.15	1,389.15	.00	.00	.00	13.23	13.23

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Run Number 3622 **Order Number** 20190921-2

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS19090580-03	9/21/2019	6:33 PM	22.55	-1.00	7.92	.00	591.10	591.10	.00	.00	.00	5.63	5.63
HS19090580-04	9/21/2019	6:41 PM	22.60	-1.00	7.86	.00	686.16	686.16	.00	.00	.00	6.53	6.53
HS19090835-01DF500	9/21/2019	6:51 PM	22.57	-1.00	11.77	423.52	449.50	.00	51.96	397.54	4.03	4.28	4.28
HS19090835-01DF1000	9/21/2019	6:59 PM	22.54	-1.00	11.56	207.36	225.49	.00	36.26	189.22	1.97	2.15	2.15
HS19090892-01	9/21/2019	7:06 PM	22.42	-1.00	8.67	11.56	290.06	266.94	23.13	.00	.11	2.76	2.76
WBLKW2-190921	9/21/2019	7:11 PM	22.37	-1.00	5.86	.00	.35	.35	.00	.00	.00	.02	.02
WLCS2-190921	9/21/2019	7:20 PM	22.32	-1.00	10.92	548.80	1,083.78	.00	1,069.96	13.82	5.23	10.32	10.32
WLCSD2-190921	9/21/2019	7:30 PM	22.28	-1.00	10.92	546.08	1,092.56	.40	1,092.16	.00	5.20	10.41	10.41
CCV-PH	9/21/2019	7:32 PM	22.22	-1.00	7.06	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	7:41 PM	22.13	-1.00	10.91	551.36	1,093.30	.00	1,083.89	9.41	5.25	10.41	10.41
DI RINSE	9/21/2019	7:46 PM	22.28	-1.00	5.95	.00	.44	.44	.00	.00	.00	.02	.02
HS19090816-04	9/21/2019	7:54 PM	22.28	-1.00	7.51	.00	860.46	860.46	.00	.00	.00	8.19	8.19
HS19090816-04DUP	9/21/2019	8:02 PM	22.23	-1.00	7.46	.00	859.50	859.50	.00	.00	.00	8.19	8.19
HS19090633-01	9/21/2019	8:10 PM	22.16	-1.00	7.82	.00	594.81	594.81	.00	.00	.00	5.66	5.66
HS19090633-02	9/21/2019	8:18 PM	22.13	-1.00	7.66	.00	915.69	915.69	.00	.00	.00	8.72	8.72
HS19090633-03	9/21/2019	8:26 PM	22.10	-1.00	7.89	.00	484.68	484.68	.00	.00	.00	4.62	4.62
HS19090633-04	9/21/2019	8:33 PM	22.03	-1.00	7.58	.00	813.75	813.75	.00	.00	.00	7.75	7.75
HS19090633-05	9/21/2019	8:41 PM	22.08	-1.00	7.51	.00	701.78	701.78	.00	.00	.00	6.68	6.68
HS19090816-01	9/21/2019	8:49 PM	22.20	-1.00	7.56	.00	850.16	850.16	.00	.00	.00	8.10	8.10
HS19090816-02	9/21/2019	8:57 PM	22.14	-1.00	7.46	.00	933.99	933.99	.00	.00	.00	8.90	8.90
CCV-PH	9/21/2019	9:00 PM	22.20	-1.00	7.06	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	9:08 PM	22.13	-1.00	10.88	539.83	1,078.42	.00	1,077.18	1.23	5.14	10.27	10.27
DI RINSE	9/21/2019	9:13 PM	22.10	-1.00	5.92	.00	.53	.53	.00	.00	.00	.02	.02
HS19090816-03	9/21/2019	9:20 PM	22.10	-1.00	7.94	.00	260.19	260.19	.00	.00	.00	2.48	2.48
HS19090805-01	9/21/2019	9:27 PM	22.13	-1.00	8.62	11.58	319.34	296.18	23.16	.00	.11	3.04	3.04
HS19090740-01	9/21/2019	9:35 PM	22.07	-1.00	7.44	.00	656.68	656.68	.00	.00	.00	6.25	6.25
HS19090740-02	9/21/2019	9:42 PM	22.05	-1.00	7.61	.00	639.25	639.25	.00	.00	.00	6.09	6.09
HS19090740-03	9/21/2019	9:49 PM	22.19	-1.00	7.59	.00	584.62	584.62	.00	.00	.00	5.57	5.57
HS19090740-04	9/21/2019	9:56 PM	22.10	-1.00	7.78	.00	588.56	588.56	.00	.00	.00	5.61	5.61
HS19090740-05	9/21/2019	10:04 PM	22.05	-1.00	6.80	.00	761.95	761.95	.00	.00	.00	7.26	7.26

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Run Number 3622 **Order Number** 20190921-2

SampleID	RunDate	RunTime	Temp	cond (uS)	pH	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	mLs @ 8.3	mLs @ 4.5	mLs @ 4.2
HS19090740-05DUP	9/21/2019	10:11 PM	22.00	-1.00	6.79	.00	764.40	764.40	.00	.00	.00	7.28	7.28
HS19090927-01	9/21/2019	10:17 PM	21.99	-1.00	8.09	.00	161.39	161.39	.00	.00	.00	1.54	1.54
CCV-PH	9/21/2019	10:20 PM	22.07	-1.00	7.05	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	10:29 PM	21.99	-1.00	10.86	543.16	1,096.34	10.03	1,086.31	.00	5.17	10.44	10.44
DI RINSE	9/21/2019	10:33 PM	22.02	-1.00	5.87	.00	.41	.41	.00	.00	.00	.02	.02
HS19090885-04	9/21/2019	10:41 PM	22.16	-1.00	7.57	.00	1,021.74	1,021.74	.00	.00	.00	9.73	9.73
HS19090962-12	9/21/2019	10:47 PM	22.10	-1.00	6.41	.00	132.99	132.99	.00	.00	.00	1.27	1.27
HS19090962-12DUP	9/21/2019	10:53 PM	22.03	-1.00	6.39	.00	134.27	134.27	.00	.00	.00	1.28	1.28
HS19090964-04	9/21/2019	10:58 PM	22.00	-1.00	6.55	.00	93.98	93.98	.00	.00	.00	.90	.90
HS19090964-06	9/21/2019	11:04 PM	22.02	-1.00	6.58	.00	106.86	106.86	.00	.00	.00	1.02	1.02
HS19090980-01	9/21/2019	11:11 PM	21.98	-1.00	7.77	.00	328.40	328.40	.00	.00	.00	3.13	3.13
HS19090988-01	9/21/2019	11:17 PM	21.95	-1.00	7.70	.00	341.10	341.10	.00	.00	.00	3.25	3.25
CCV-PH	9/21/2019	11:19 PM	21.93	-1.00	7.05	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CCV-ALK	9/21/2019	11:28 PM	21.83	-1.00	10.86	544.62	1,094.45	5.21	1,089.24	.00	5.19	10.42	10.42
DI RINSE	9/21/2019	11:33 PM	22.05	-1.00	5.92	.00	.49	.49	.00	.00	.00	.02	.02

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F: +1 281 530 5887

October 22, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19101170**

Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 2 sample(s) on Oct 19, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19101170

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19101170-01	16EW07-191018	GW		18-Oct-2019 17:55	19-Oct-2019 09:05	☐
HS19101170-02	16EW05-191018	GW		18-Oct-2019 18:00	19-Oct-2019 09:05	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19101170

WetChemistry by Method SW9056

Batch ID: R348818

Sample ID: 16EW05-191018 (HS19101170-02)

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Bromide)

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW07-191018
Collection Date: 18-Oct-2019 17:55

ANALYTICAL REPORT
WorkOrder:HS19101170
Lab ID:HS19101170-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Bromide	**1.37**		**0.150**	**0.500**	**0.500**	**mg/L**	5	21-Oct-2019 13:46

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

ALS Houston, US Date: 22-Oct-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW05-191018
Collection Date: 18-Oct-2019 18:00

ANALYTICAL REPORT
WorkOrder:HS19101170
Lab ID:HS19101170-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Bromide	**3.92**	J	**1.50**	**5.00**	**5.00**	**mg/L**	50	21-Oct-2019 13:13

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101170

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R348818 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS19101170-01	16EW07-191018	18 Oct 2019 17:55			21 Oct 2019 13:46	5
HS19101170-02	16EW05-191018	18 Oct 2019 18:00			21 Oct 2019 13:13	50

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101170

QC BATCH REPORT

Batch ID: R348818 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-102119** Units: **mg/L** Analysis Date: **21-Oct-2019 12:06**
Client ID: Run ID: **ICS-Integrion_348818** SeqNo: **5307099** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-102119** Units: **mg/L** Analysis Date: **21-Oct-2019 12:23**
Client ID: Run ID: **ICS-Integrion_348818** SeqNo: **5307100** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.796	0.100	4	0	94.9	80 - 120				

LCSD Sample ID: **WLCSDW1-102119** Units: **mg/L** Analysis Date: **21-Oct-2019 12:40**
Client ID: Run ID: **ICS-Integrion_348818** SeqNo: **5307101** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.788	0.100	4	0	94.7	80 - 120	3.796	0.198	20	

MS Sample ID: **HS19101168-01MS** Units: **mg/L** Analysis Date: **21-Oct-2019 16:15**
Client ID: Run ID: **ICS-Integrion_348818** SeqNo: **5307110** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.301	0.200	4	0	82.5	80 - 120				

MSD Sample ID: **HS19101168-01MSD** Units: **mg/L** Analysis Date: **21-Oct-2019 16:32**
Client ID: Run ID: **ICS-Integrion_348818** SeqNo: **5307111** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.298	0.200	4	0	82.4	80 - 120	3.301	0.0909	20	

The following samples were analyzed in this batch: HS19101170-01 HS19101170-02

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19101170**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 22-Oct-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19101170

Date/Time Received: **19-Oct-2019 09:05**
Received by: **AC**

Checklist completed by: *Asad Chaudhry* eSignature 19-Oct-2019 Date

Reviewed by: *RJ Modashia* eSignature 20-Oct-2019 Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.7c C/UC	IR 25	
Cooler(s)/Kit(s):	44696		
Date/Time sample(s) sent to storage:	10/19/2019 11:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID:	LHAAP16-Bromide-ALSHT-191018	TURNAROUND TIME: 24 hr TAT	RUSH: 24 hr TAT	Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY						
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			FedInvoices @aptim.com		
Project Number	501032			Lab Contact	RJ Modashia					
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang		
	PMB 202							4005 Port Chicago Hwy		
City	Marshall	State	TX	City	Houston	State	TX	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656					
Project Manager	Praveen Srivastav									

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Bromide by SW9056
								Containers and Preservative		1-250 ml HDPE, Ice
16EW07-191018	16EW07				GW	10/18/2019	1755	1		1
16EW05-191018	16EW05				GW	10/18/2019	1800	1		1

HS19101170

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] APTIM	10-18-19/1800	A/C. [signature]	10/19/19 09:05

44696 0.7°
+2.5

ALS
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Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Date:
Name:
Company:

CUSTODY SEAL
Time:

Seal Broken By:
Date:

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date:
Time:
Name:
Company:

Seal Broken By:
Date:

RMA:

FedEx
Express

FedEx
TRK# 4809 7836 7947
0221

SATURDAY 12:00F
PRIORITY OVERNIGHT

XO SGRA

77099
TX-US IAH

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October 24, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19101343**

Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 2 sample(s) on Oct 23, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19101343

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19101343-01	16EW06-191022	GW		22-Oct-2019 12:45	23-Oct-2019 08:50	☐
HS19101343-02	16EW08-191022	GW		22-Oct-2019 12:50	23-Oct-2019 08:50	☐

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19101343

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R349016

Sample ID: HS19101360-08MS

- MS and MSD are for an unrelated sample (Bromide)

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW06-191022
Collection Date: 22-Oct-2019 12:45

ANALYTICAL REPORT
WorkOrder:HS19101343
Lab ID:HS19101343-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: A01
Bromide	**2.99**		**0.600**	**2.00**	**2.00**	**mg/L**	20	24-Oct-2019 10:04

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW08-191022
Collection Date: 22-Oct-2019 12:50

ANALYTICAL REPORT
WorkOrder:HS19101343
Lab ID:HS19101343-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: A01
Bromide	**20.6**		**0.150**	**0.500**	**0.500**	**mg/L**	5	24-Oct-2019 08:27

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101343

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R349016 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS19101343-01	16EW06-191022	22 Oct 2019 12:45			24 Oct 2019 10:04	20
HS19101343-02	16EW08-191022	22 Oct 2019 12:50			24 Oct 2019 08:27	5

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101343

QC BATCH REPORT

Batch ID: R349016 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-102319** Units: **mg/L** Analysis Date: **23-Oct-2019 18:20**
Client ID: Run ID: **ICS-Integrion_349016** SeqNo: **5311633** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-102319** Units: **mg/L** Analysis Date: **23-Oct-2019 18:37**
Client ID: Run ID: **ICS-Integrion_349016** SeqNo: **5311634** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.747	0.100	4	0	93.7	80 - 120				

LCSD Sample ID: **WLCSDW1-102319** Units: **mg/L** Analysis Date: **23-Oct-2019 18:53**
Client ID: Run ID: **ICS-Integrion_349016** SeqNo: **5311635** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.742	0.100	4	0	93.6	80 - 120	3.747	0.109	20	

MS Sample ID: **HS19101360-08MS** Units: **mg/L** Analysis Date: **24-Oct-2019 04:35**
Client ID: Run ID: **ICS-Integrion_349016** SeqNo: **5311661** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.772	0.100	2	0.2135	77.9	80 - 120				S

MS Sample ID: **HS19101360-06MS** Units: **mg/L** Analysis Date: **23-Oct-2019 23:52**
Client ID: Run ID: **ICS-Integrion_349016** SeqNo: **5311644** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.804	0.100	2	1.023	89.0	80 - 120				

MSD Sample ID: **HS19101360-08MSD** Units: **mg/L** Analysis Date: **24-Oct-2019 04:51**
Client ID: Run ID: **ICS-Integrion_349016** SeqNo: **5311662** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.778	0.100	2	0.2135	78.2	80 - 120	1.772	0.316	20	S

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101343

QC BATCH REPORT

Batch ID: **R349016 (0)** **Instrument:** **ICS-Integrion** **Method:** **ANIONS BY SW9056A**

MSD Sample ID: **HS19101360-06MSD** Units: **mg/L** Analysis Date: **24-Oct-2019 00:09**
Client ID: Run ID: **ICS-Integrion_349016** SeqNo: **5311645** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.804	0.100	2	1.023	89.0	80 - 120	2.804	0.00357	20	

The following samples were analyzed in this batch: HS19101343-01 HS19101343-02

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19101343**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19101343

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19101343-01	16EW06-191022	Login	10/23/2019 1:07:20 PM	AC	WET356
HS19101343-02	16EW08-191022	Login	10/23/2019 1:07:20 PM	AC	WET356

ALS Houston, US Date: 24-Oct-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19101343

Date/Time Received: **23-Oct-2019 08:50**
Received by: **PMG**

Checklist completed by: *Asad Chaudhry* eSignature 23-Oct-2019 Date

Reviewed by: *RJ Modashia* eSignature 23-Oct-2019 Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.1c UC/C	IR 25	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/23/2019 13:15		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-Bromide-ALSHT-191022 TURNAROUND TIME: 24 hr TAT RUSH: 24 hr TAT Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY						
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com		
Project Number	501032			Lab Contact	RJ Modashia					
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang		
	PMB 202							4005 Port Chicago Hwy		
City	Marshall	State	TX	City	Houston	State	TX	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656					
Project Manager	Praveen Srivastav									

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Bromide by SW9056
								Containers and Preservative		1-250 ml HDPE, Ice
16EW06-191022	16EW06				GW	10/22/2019	1245	1		1
16EW08-191022	16EW08				GW	10/22/2019	1250	1		1

HS19101343

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] APTIM	10-22-19/1400	[signature]	10/23/19 08:50

45189 ulc. 1.10 #25' c/f 0.0'

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45189

CUSTODY SEAL

Date: 10/22/19 Time: 1430
Name: Scott Beesinger
Company: BHMT

Seal Broken By:

Date: 10/23/19

45189 OCT 23 2019

Must Deliver ~~Next Business Day~~
Time and Tempature Sensitive!

45189

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 17OCT19
ACTWGT: 1.00 LB MAN
CAD: 3001307/CAFE3211
DIMS: 19x18x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-16-BQ 68173-RJ

RMA:

FedEx Express

FedEx
TRK# 1251 0290 7620

WED - 23 OCT 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

ID 5121960 22OCT19 GGGA 5660C3/2A3C/05A2

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 19, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19101353**

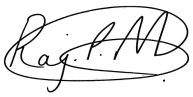
Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 7 sample(s) on Oct 23, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19101353

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19101353-01	16WW22-191022	GW		22-Oct-2019 08:05	23-Oct-2019 08:50	☐
HS19101353-02	16RW12-191022	GW		22-Oct-2019 09:00	23-Oct-2019 08:50	☐
HS19101353-03	16RW12-191022-FD	GW		22-Oct-2019 09:00	23-Oct-2019 08:50	☐
HS19101353-04	16WW39-191022	GW		22-Oct-2019 09:50	23-Oct-2019 08:50	☐
HS19101353-05	16RW11-191022	GW		22-Oct-2019 10:40	23-Oct-2019 08:50	☐
HS19101353-06	16IW20-191022	GW		22-Oct-2019 11:30	23-Oct-2019 08:50	☐
HS19101353-07	16WW12-191022	GW		22-Oct-2019 12:20	23-Oct-2019 08:50	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19101353

Work Order Comments

- Revised to correct the sample ID for HS19101353-03 to 16RW12-191022-FD
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

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

WetChemistry by Method SW9056

Batch ID: R349710

Sample ID: 16WW22-191022 (HS19101353-01MS)

- The MS recovery is unavailable due to sample matrix interference. (Bromide)

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW22-191022
Collection Date: 22-Oct-2019 08:05

ANALYTICAL REPORT
WorkOrder:HS19101353
Lab ID:HS19101353-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.50**		**0.300**	**1.00**	**1.00**	**mg/L**	10	04-Nov-2019 14:10
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	13-Nov-2019 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW12-191022
Collection Date: 22-Oct-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19101353
Lab ID:HS19101353-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.85**		**0.300**	**1.00**	**1.00**	**mg/L**	10	04-Nov-2019 15:00
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	13-Nov-2019 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP-16 WorkOrder:HS19101353
Sample ID: 16RW12-191022-FD Lab ID:HS19101353-03
Collection Date: 22-Oct-2019 09:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.90**		**0.300**	**1.00**	**1.00**	**mg/L**	10	04-Nov-2019 15:17
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	13-Nov-2019 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW39-191022
Collection Date: 22-Oct-2019 09:50

ANALYTICAL REPORT
WorkOrder:HS19101353
Lab ID:HS19101353-04
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.96**		**0.300**	**1.00**	**1.00**	**mg/L**	10	04-Nov-2019 15:33
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	13-Nov-2019 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW11-191022
Collection Date: 22-Oct-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19101353
Lab ID:HS19101353-05
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**213**		**3.00**	**10.0**	**10.0**	**mg/L**	100	04-Nov-2019 16:40
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	13-Nov-2019 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16IW20-191022
Collection Date: 22-Oct-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19101353
Lab ID:HS19101353-06
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.09**		**0.300**	**1.00**	**1.00**	**mg/L**	10	04-Nov-2019 16:06
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	13-Nov-2019 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW12-191022
Collection Date: 22-Oct-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19101353
Lab ID:HS19101353-07
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.56**		**0.300**	**1.00**	**1.00**	**mg/L**	10	04-Nov-2019 16:23
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	13-Nov-2019 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101353

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R349710 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS19101353-01	16WW22-191022	22 Oct 2019 08:05			04 Nov 2019 14:10	10
HS19101353-02	16RW12-191022	22 Oct 2019 09:00			04 Nov 2019 15:00	10
HS19101353-03	16RW12-191022-FD	22 Oct 2019 09:00			04 Nov 2019 15:17	10
HS19101353-04	16WW39-191022	22 Oct 2019 09:50			04 Nov 2019 15:33	10
HS19101353-05	16RW11-191022	22 Oct 2019 10:40			04 Nov 2019 16:40	100
HS19101353-06	16IW20-191022	22 Oct 2019 11:30			04 Nov 2019 16:06	10
HS19101353-07	16WW12-191022	22 Oct 2019 12:20			04 Nov 2019 16:23	10
Batch ID: R350389 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** GW	
HS19101353-01	16WW22-191022	22 Oct 2019 08:05			13 Nov 2019 15:06	1
HS19101353-02	16RW12-191022	22 Oct 2019 09:00			13 Nov 2019 15:06	1
HS19101353-03	16RW12-191022-FD	22 Oct 2019 09:00			13 Nov 2019 15:06	1
HS19101353-04	16WW39-191022	22 Oct 2019 09:50			13 Nov 2019 15:06	1
HS19101353-05	16RW11-191022	22 Oct 2019 10:40			13 Nov 2019 15:06	1
HS19101353-06	16IW20-191022	22 Oct 2019 11:30			13 Nov 2019 15:06	1
HS19101353-07	16WW12-191022	22 Oct 2019 12:20			13 Nov 2019 15:06	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101353

QC BATCH REPORT

Batch ID: R349710 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **WBLKW1-110419** Units: **mg/L** Analysis Date: **04-Nov-2019 11:38**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328162** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-110419** Units: **mg/L** Analysis Date: **04-Nov-2019 11:54**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328163** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.782	0.100	4	0	94.6	80 - 120				

LCSD Sample ID: **WLCSDW1-110419** Units: **mg/L** Analysis Date: **04-Nov-2019 12:11**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328164** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.764	0.100	4	0	94.1	80 - 120	3.782	0.498	20	

MS Sample ID: **HS19101488-01MS** Units: **mg/L** Analysis Date: **04-Nov-2019 17:46**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5329293** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	22.55	1.00	20	4.49	90.3	80 - 120				

MS Sample ID: **HS19110026-01MS** Units: **mg/L** Analysis Date: **04-Nov-2019 12:44**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328166** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	18.58	1.00	20	2.058	82.6	80 - 120				

MS Sample ID: **HS19101353-01MS** Units: **mg/L** Analysis Date: **04-Nov-2019 18:49**
Client ID: **16WW22-191022** Run ID: **ICS-Integrion_349710** SeqNo: **5329296** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100	2	0	0	80 - 120				S U

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101353

QC BATCH REPORT

Batch ID: R349710 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MS Sample ID: **HS19101353-01MS** Units: **mg/L** Analysis Date: **04-Nov-2019 14:27**
Client ID: **16WW22-191022** Run ID: **ICS-Integrion_349710** SeqNo: **5329281** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.34	1.00	20	3.498	89.2	80 - 120				

MSD Sample ID: **HS19110026-01MSD** Units: **mg/L** Analysis Date: **04-Nov-2019 13:01**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328167** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	18.72	1.00	20	2.058	83.3	80 - 120	18.58	0.756	20	

MSD Sample ID: **HS19101488-01MSD** Units: **mg/L** Analysis Date: **04-Nov-2019 18:03**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5329294** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	22.61	1.00	20	4.49	90.6	80 - 120	22.55	0.266	20	

MSD Sample ID: **HS19101353-01MSD** Units: **mg/L** Analysis Date: **04-Nov-2019 19:06**
Client ID: **16WW22-191022** Run ID: **ICS-Integrion_349710** SeqNo: **5329297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100	2	0	0	80 - 120	0	0	20	S U

MSD Sample ID: **HS19101353-01MSD** Units: **mg/L** Analysis Date: **04-Nov-2019 14:43**
Client ID: **16WW22-191022** Run ID: **ICS-Integrion_349710** SeqNo: **5329282** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.41	1.00	20	3.498	89.6	80 - 120	21.34	0.313	20	

The following samples were analyzed in this batch: HS19101353-01, HS19101353-02, HS19101353-03, HS19101353-04, HS19101353-05, HS19101353-06, HS19101353-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19101353**

QUALIFIERS, ACRONYMS, UNITS

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

RIGHT SOLUTIONS | RIGHT PARTNER

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19101353

Date/Time Received: **23-Oct-2019 08:50**
Received by: **PMG**

Checklist completed by: *Asad Chaudhry* eSignature — 23-Oct-2019 Date

Reviewed by: *RJ Modashia* eSignature — 24-Oct-2019 Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.1c C	IR 25
Cooler(s)/Kit(s):	45189	
Date/Time sample(s) sent to storage:	10/23/2019 16:15	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Sx 16WW40-191022 not received (missing).

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

RIGHT SOLUTIONS | RIGHT PARTNER

APTIM

COC ID: LHAAP16-Bayou Barrier-ALSHT-1910-____ TURNAROUND TIME: normal RUSH: Page 1 of ____

PROJECT/CLIENT INFO		LABORATORY		
Facility Name	Longhorn AAP	Lab Name	ALS Laboratories	Fedinvoices @aptim.com
Project Number	501032	Lab Contact	RJ Modashia	
	LHAAP-16	Email	RJ.Modashia@alsglobal.com	Susan.Huang@aptim.com
Address	1203-B East Grand Avenue	Address	10450 Stancliff Rd., Suite 210	Susan Huang
	PMB 202			4005 Port Chicago Hwy
City	Marshall State TX	City	Houston State TX	Concord State CA
Postal Code	75670 Country USA	Postal Code	77099 Country USA	94520 Country USA
Phone Number	713.243.7264	Phone Number	281.575.2279 or 281.530.5656	
Project Manager	Praveen Srivastav			

HS19101353

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

SAMPLE DETAILS

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont	ANALYSIS	Bromide by SW9056 (1-250 ml HDPE, Ice)	TOC by (SW9060) (2X40 ml Vials/H2SO4)
16ww22-191022	LHAAP16				WG	10/22/19	0805	3		X	X
16ww22-191022-MS	LHAAP16				WG	10/22/19	0805	3		X	X
16ww22-191022-MSD	LHAAP16				WG	10/22/19	0805	3		X	X
16RW12-191022	LHAAP16				WG	10/22/19	0900	3		X	X
16RW12-191022-FD	LHAAP16				WG	10/22/19	0900	3		X	X
16WW39-191022	LHAAP16				WG	10/22/19	0950	3		X	X
16RW11-191022	LHAAP16				WG	10/22/19	1040	3		X	X
16IW20-191022	LHAAP16				WG	10/22/19	1130	3		X	X
16WW12-191022	LHAAP16				WG	10/22/19	1220	3		X	X
16WW40-191022	LHAAP16				WG	10/22/19	1310	3		X	X

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Scott Bessinger / BHATE	10/22/19 1430	[signature]	10/23/19 08:50.

OK.
US 189 1.10
#25
c/f 0.0°

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APTIM

LHAAP16-Bayou Barrier-ALSHT-1910-

PROJECT/CLIENT INFO

Liquidity Name: Lonestar AAP
Project Number: 501942
LHAAP16
Address: 1203-B East Canal Avenue
PMB 702
City: Marshall
State: TX
County: USA
Phone Number: 817 243 3264
Project Contact: Praveen Srivastava

LABORATORY

Lab Name: Lab Laboratories
Lab Contact:
Email:
Address: 10150 Yarmouth
City: Houston
Post Office:
County: USA
Phone Number: 281 575 2259

RUSH: Page 1 of

Sustain Huang@aptim.com
Sustain Huang
4005 Port Chicago

SAMPLE DETAILS

ANALYSIS

HS19101353

Aptim Environmental & Infrastructure, Inc.
LHAAP-16

Sample ID	Location	Start Depth	End Depth	Depth Unit	Matrix	Date	Time (24hr)	Qty Cont	Hexavalent Hexavalent	LOC by (SW9056)
16WW22-191022	LHAAP16				WG	10/22/19	0805	3	X	X
16WW22-191022-MS	LHAAP16				WG	10/22/19	0805	3	X	X
16WW22-191022-MSD	LHAAP16				WG	10/22/19	0805	3	X	X
16RW12-191022	LHAAP16				WG	10/22/19	0900	3	X	X
16RW12-191022-FD	LHAAP16				WG	10/22/19	0900	3	X	X
16WW39-191022	LHAAP16				WG	10/22/19	0950	3	X	X
16RW11-191022	LHAAP16				WG	10/22/19	1040	3	X	X
16IW20-191022	LHAAP16				WG	10/22/19	1130	3	X	X
16WW12-191022	LHAAP16				WG	10/22/19	1220	3	X	X
~~16WW40-191022~~	~~LHAAP16~~				WG	10/22/19	1310	3	X	X

collected but not shipped

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Sustain Huang/BHATE	10/22/19 1430		10/23/19 08:50

US 189 1.19

REVISED

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ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45189

CUSTODY SEAL

Date: 10/22/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By:
Date: 10/23/19

45189 OCT 2 3 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

45189

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 170CT19
ACTWGT: 1.00 LB MAN
CAD: 3D0130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-6656
REF: LHAAP-16-BO 68173-RJ

RMA:

FedEx Express

FedEx
TRK# 1251 0290 7620

WED - 23 OCT 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

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www.alsglobal.com

November 13, 2019 **Analytical Report for Service Request No:** K1909995

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

RE: ALS Houston DOD TOC / HS19101353

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 24, 2019
For your reference, these analyses have been assigned our service request number **K1909995.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

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Acronyms

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

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Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

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Case Narrative

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

Service Request: K1909995
Date Received: 10/24/2019

CASE NARRATIVE

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

Sample Receipt:

Seven water samples were received for analysis at ALS Environmental on 10/24/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 11/13/2019

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Chain of Custody

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K1909995

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Houston, TX 77099
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F: +1 281 530 5887
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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12475**

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19101353
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19101353-01**	**16WW22-191022**	**GW**	**22 Oct 2019 08:05**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			06 Nov 2019
2.	**HS19101353-02**	**16RW12-191022**	**GW**	**22 Oct 2019 09:00**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			06 Nov 2019
3.	**HS19101353-03**	**16WW22-191022-FD**	**GW**	**22 Oct 2019 09:00**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			06 Nov 2019
4.	**HS19101353-04**	**16WW39-191022**	**GW**	**22 Oct 2019 09:50**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			06 Nov 2019
5.	**HS19101353-05**	**16RW11-191022**	**GW**	**22 Oct 2019 10:40**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			06 Nov 2019
6.	**HS19101353-06**	**16IW20-191022**	**GW**	**22 Oct 2019 11:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			06 Nov 2019
7.	**HS19101353-07**	**16WW12-191022**	**GW**	**22 Oct 2019 12:20**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			06 Nov 2019

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

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K1909995

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12475**

QC Level: DOD IV (DoD Data Package)

Relinquished By:	Apael Ch	Date/Time:	10/23/19 17:00
Received By:	K Morrow ALS Kelso	Date/Time:	10/24/19 0945
Cooler ID(s):	RED	Temperature(s):	

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PC KL

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request *K19* 09995

Received: 10/24/19 Opened: 10/24/2019 By: [illegible] Unloaded: 10/24/19 By: KL

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.4	-0.3	1.9	2.0	+0.1	360	12475	X	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Votes, Discrepancies, & Resolutions: Did not record tracking number before I threw garbage away. KL

Received triplicate bottles for 16W82-191022.

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General Chemistry

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1909995
Project:	ALS Houston DOD TOC/HS19101353	**Date Collected:**	10/22/19
Sample Matrix:	Water	**Date Received:**	10/24/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW22-191022	K1909995-001	**1.84**	0.50	0.20	0.07	1	10/31/19 02:53	
16RW12-191022	K1909995-002	**1.78**	0.50	0.20	0.07	1	10/31/19 04:15	
16RW12-191022-FD	K1909995-003	**1.91**	0.50	0.20	0.07	1	10/31/19 04:48	
16WW39-191022	K1909995-004	**3.53**	0.50	0.20	0.07	1	10/31/19 05:20	
16RW11-191022	K1909995-005	**3290**	400	160	60	800	11/07/19 21:01	
16IW20-191022	K1909995-006	**38**	10	4	2	20	11/07/19 21:33	
16WW12-191022	K1909995-007	**7.51**	0.50	0.20	0.07	1	11/06/19 06:30	
Method Blank	K1909995-MB1	ND U	0.50	0.20	0.07	1	10/30/19 23:08	
Method Blank	K1909995-MB2	ND U	0.50	0.20	0.07	1	11/06/19 07:36	
Method Blank	K1909995-MB3	ND U	0.50	0.20	0.07	1	11/07/19 20:11	

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1909995
Project	ALS Houston DOD TOC/HS19101353	**Date Collected:**	10/22/19
Sample Matrix:	Water	**Date Received:**	10/24/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	LOQ	LOD	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16WW22-191022	K1909995-001DUP	0.50	0.20	0.07	1.84	1.78	1.81	3	10	10/31/19
16RW12-191022	K1909995-002DUP	0.50	0.20	0.07	1.78	1.83	1.81	3	10	10/31/19
16RW12-191022-FD	K1909995-003DUP	0.50	0.20	0.07	1.91	1.80	1.86	6	10	10/31/19
16WW39-191022	K1909995-004DUP	0.50	0.20	0.07	3.53	3.44	3.49	3	10	10/31/19
16RW11-191022	K1909995-005DUP	400	160	60	3290	3400	3350	3	10	11/07/19
16IW20-191022	K1909995-006DUP	10	4	2	38	38	38.1	<1	10	11/07/19
16WW12-191022	K1909995-007DUP	0.50	0.20	0.07	7.51	7.36	7.43	2	10	11/06/19

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

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

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

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Client:	ALS Environmental - US	**Service Request:**	K1909995
Project:	ALS Houston DOD TOC/HS19101353	**Date Collected:**	10/22/19
Sample Matrix:	Water	**Date Received:**	10/24/19
		Date Analyzed:	10/31/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW22-191022	**Units:**	mg/L
Lab Code:	K1909995-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1909995-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.84	27.0	25.0	101	83-117

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

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

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

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Client:	ALS Environmental - US	**Service Request:**	K1909995
Project:	ALS Houston DOD TOC/HS19101353	**Date Analyzed:**	10/30/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	657830

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1909995-LCS1	24.6	25.0	98	83-117

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Client:	ALS Environmental - US	**Service Request:**	K1909995
Project:	ALS Houston DOD TOC/HS19101353	**Date Analyzed:**	11/06/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	658207

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1909995-LCS2	24.1	25.0	96	83-117

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Client:	ALS Environmental - US	**Service Request:**	K1909995
Project:	ALS Houston DOD TOC/HS19101353	**Date Analyzed:**	11/07/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	658970

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1909995-LCS3	24.4	25.0	98	83-117

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Client: ALS Environmental - US **Service Request:** K1909995
Project: ALS Houston DOD TOC/HS19101353

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	657830	KQ1915964-01	10/30/19 22:34	25.0	24.2	97	90-110
CCV2	657830	KQ1915964-02	10/31/19 03:42	25.0	24.2	97	90-110
CCV3	657830	KQ1915964-03	10/31/19 09:06	25.0	24.7	99	90-110
CCV4	658207	KQ1916154-01	11/05/19 21:27	25.0	23.7	95	90-110
CCV5	658207	KQ1916154-02	11/06/19 07:02	25.0	23.6	94	90-110
CCV6	658207	KQ1916154-03	11/06/19 11:55	25.0	23.7	95	90-110
CCV7	658207	KQ1916154-04	11/06/19 17:49	25.0	23.7	95	90-110
CCV8	658207	KQ1916154-05	11/06/19 22:41	25.0	23.4	94	90-110
CCV9	658970	KQ1916550-01	11/07/19 19:26	25.0	23.9	96	90-110
CCV10	658970	KQ1916550-02	11/08/19 00:15	25.0	23.9	96	90-110
CCV11	658970	KQ1916550-03	11/08/19 05:37	25.0	23.9	96	90-110

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Client: ALS Environmental - US **Service Request:**K1909995
Project: ALS Houston DOD TOC/HS19101353

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	657830	KQ1915964-04	10/30/19 22:51	0.50	0.20	0.07	ND	U
CCB2	657830	KQ1915964-05	10/31/19 03:59	0.50	0.20	0.07	ND	U
CCB3	657830	KQ1915964-06	10/31/19 09:22	0.50	0.20	0.07	ND	U
CCB4	658207	KQ1916154-06	11/05/19 21:44	0.50	0.20	0.07	ND	U
CCB5	658207	KQ1916154-07	11/06/19 07:19	0.50	0.20	0.07	ND	U
CCB6	658207	KQ1916154-08	11/06/19 12:11	0.50	0.20	0.07	ND	U
CCB7	658207	KQ1916154-09	11/06/19 18:06	0.50	0.20	0.07	ND	U
CCB8	658207	KQ1916154-10	11/06/19 22:58	0.50	0.20	0.07	ND	U
CCB9	658970	KQ1916550-04	11/07/19 19:43	0.50	0.20	0.07	ND	U
CCB10	658970	KQ1916550-05	11/08/19 00:31	0.50	0.20	0.07	ND	U
CCB11	658970	KQ1916550-06	11/08/19 05:54	0.50	0.20	0.07	ND	U

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Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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General Chemistry

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T1901809, V815
IV IV

Work Request # Original (_____) K1909800, 9822, 9860, 9892, 9998, 10007, 10066, 10079, 9912, 9995, 9627, 9892, 9913, 9958

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

Date Analyzed: 10/30/19

Analyst: BCD

Analysis: TOC/DOC

Run # TOC: 657829, 657830, DOC: 657831, 657832

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: K1909995-5/6 sent for RA due to being above the calibration curve.
K1909995-7 sent for RA due to previous sample carry over.
K1909892-5/5 dup report a high %RSD. However, these samples are less than 5x the MRL.
T1901809-VH report a high %RSD due to suspected non-homogenous sample.

Final Approved by: [signature] Date: 11/01/19

DQREPORT

C:\Documents and Settings\adam bradbury\My Documents\DATA QUALITY 2 OF 159
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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657829 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909800-002	Carbon, Total Organic	N/A		Water	2.78 mg/L	10 mL	278 mg/L	100	7	50			10/30/19 14:15:00	N
K1909822-004	Carbon, Total Organic	N/A		Water	6.88 mg/L	10 mL	688 mg/L	100	7	50			10/30/19 14:47:00	N
K1909822-005	Carbon, Total Organic	N/A		Water	5.89 mg/L	10 mL	589 mg/L	100	7	50			10/30/19 15:19:00	N
K1909860-026	Carbon, Total Organic	N/A		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			10/30/19 13:59:00	N
K1909892-001	Carbon, Total Organic	N/A		Water	4.52 mg/L	10 mL	4.52 mg/L	1	0.07	0.50			10/30/19 22:02:00	N
K1909892-002	Carbon, Total Organic	N/A		Water	5.21 mg/L	10 mL	5.21 mg/L	1	0.07	0.50			10/30/19 23:41:00	N
K1909892-003	Carbon, Total Organic	N/A		Water	2.41 mg/L	10 mL	2.41 mg/L	1	0.07	0.50			10/31/19 00:13:00	N
K1909892-004	Carbon, Total Organic	N/A		Water	0.96 mg/L	10 mL	0.96 mg/L	1	0.07	0.50			10/31/19 00:45:00	N
K1909892-005	Carbon, Total Organic	N/A		Water	0.38 mg/L	10 mL	0.38 mg/L J	1	0.07	0.50			10/31/19 01:17:00	N
K1909998-001	Carbon, Total Organic	N/A		Water	2.05 mg/L	10 mL	2.05 mg/L	1	0.07	0.50			10/30/19 20:26:00	N
K1910007-001	Carbon, Total Organic	N/A		Water	1.56 mg/L	10 mL	1.56 mg/L	1	0.07	0.50			10/30/19 20:58:00	N
K1910066-001	Carbon, Total Organic	N/A		Water	0.99 mg/L	10 mL	0.99 mg/L	1	0.07	0.50			10/30/19 17:13:00	N
K1910066-002	Carbon, Total Organic	N/A		Water	0.95 mg/L	10 mL	0.95 mg/L	1	0.07	0.50			10/30/19 17:46:00	N
K1910066-003	Carbon, Total Organic	N/A		Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50			10/30/19 18:18:00	N
K1910066-004	Carbon, Total Organic	N/A		Water	0.79 mg/L	10 mL	0.79 mg/L	1	0.07	0.50			10/30/19 18:50:00	N
K1910066-005	Carbon, Total Organic	N/A		Water	0.79 mg/L	10 mL	0.79 mg/L	1	0.07	0.50			10/30/19 19:22:00	N
K1910066-006	Carbon, Total Organic	N/A		Water	1.69 mg/L	10 mL	1.69 mg/L	1	0.07	0.50			10/30/19 15:52:00	N
K1910066-007	Carbon, Total Organic	N/A		Water	0.93 mg/L	10 mL	0.93 mg/L	1	0.07	0.50			10/30/19 19:54:00	N
K1910079-001	Carbon, Total Organic	N/A		Water	7.72 mg/L	10 mL	7.72 mg/L	1	0.07	0.50			10/30/19 21:30:00	N
KQ1915963-01	Carbon, Total Organic	LOQV		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			10/30/19 13:59:00	N
KQ1915963-02	Carbon, Total Organic	LODV		Water	0.08 mg/L	10 mL	0.08 mg/L J	1	0.07	0.50			10/30/19 13:42:00	N
KQ1915963-03	Carbon, Total Organic	CCV		Water	23.90 mg/L	10 mL	23.9 mg/L	1					10/30/19 12:18:00	N
KQ1915963-04	Carbon, Total Organic	CCV		Water	24.15 mg/L	10 mL	24.2 mg/L	1					10/30/19 16:40:00	N
KQ1915963-05	Carbon, Total Organic	CCV		Water	24.21 mg/L	10 mL	24.2 mg/L	1					10/30/19 22:34:00	N
KQ1915963-06	Carbon, Total Organic	CCV		Water	24.18 mg/L	10 mL	24.2 mg/L	1					10/31/19 03:42:00	N
KQ1915963-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 12:35:00	N
KQ1915963-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 16:57:00	N
KQ1915963-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 22:51:00	N
KQ1915963-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 03:59:00	N
KQ1915963-11	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 12:52:00	N
KQ1915963-12	Carbon, Total Organic	LCS		Water	24.60 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	98		10/30/19 13:09:00	N
KQ1915963-13	Carbon, Total Organic	MS	K1910066-006	Water	25.97 mg/L	10 mL	26.0 mg/L	1	0.07	0.50	97		10/30/19 16:24:00	N
KQ1915963-14	Carbon, Total Organic	DUP	K1909800-002	Water	2.71 mg/L	10 mL	271 mg/L	100	7	50		2	10/30/19 14:15:00	N
KQ1915963-16	Carbon, Total Organic	DUP	K1909822-004	Water	7.13 mg/L	10 mL	713 mg/L	100	7	50		3	10/30/19 14:47:00	N
KQ1915963-17	Carbon, Total Organic	DUP	K1909892-001	Water	4.58 mg/L	10 mL	4.58 mg/L	1	0.07	0.50		1	10/30/19 22:02:00	N
KQ1915963-18	Carbon, Total Organic	DUP	K1909892-002	Water	5.21 mg/L	10 mL	5.21 mg/L	1	0.07	0.50		<1	10/30/19 23:41:00	N

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

11/01/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657829 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1915963-19	Carbon, Total Organic	DUP	K1909892-003	Water	2.34 mg/L	10 mL	2.34 mg/L	1	0.07	0.50		3	10/31/19 00:13:00	N
KQ1915963-20	Carbon, Total Organic	DUP	K1909892-004	Water	0.95 mg/L	10 mL	0.95 mg/L	1	0.07	0.50		2	10/31/19 00:45:00	N
KQ1915963-21	Carbon, Total Organic	DUP	K1909892-005	Water	0.34 mg/L	10 mL	0.34 mg/L J	1	0.07	0.50		10	10/31/19 01:17:00	N
KQ1915963-22	Carbon, Total Organic	DUP	K1909822-005	Water	5.88 mg/L	10 mL	588 mg/L	100	7	50		<1	10/30/19 15:19:00	N
KQ1915963-23	Carbon, Total Organic	DUP	K1909998-001	Water	2.08 mg/L	10 mL	2.08 mg/L	1	0.07	0.50		1	10/30/19 20:26:00	N
KQ1915963-24	Carbon, Total Organic	DUP	K1910007-001	Water	1.63 mg/L	10 mL	1.63 mg/L	1	0.07	0.50		4	10/30/19 20:58:00	N
KQ1915963-25	Carbon, Total Organic	DUP	K1910066-001	Water	1.05 mg/L	10 mL	1.05 mg/L	1	0.07	0.50		6	10/30/19 17:13:00	N
KQ1915963-26	Carbon, Total Organic	DUP	K1910066-002	Water	0.92 mg/L	10 mL	0.92 mg/L	1	0.07	0.50		3	10/30/19 17:46:00	N
KQ1915963-27	Carbon, Total Organic	DUP	K1910066-003	Water	0.79 mg/L	10 mL	0.79 mg/L	1	0.07	0.50		5	10/30/19 18:18:00	N
KQ1915963-28	Carbon, Total Organic	DUP	K1910066-004	Water	0.84 mg/L	10 mL	0.84 mg/L	1	0.07	0.50		6	10/30/19 18:50:00	N
KQ1915963-29	Carbon, Total Organic	DUP	K1910066-005	Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50		5	10/30/19 19:22:00	N
KQ1915963-30	Carbon, Total Organic	DUP	K1910066-006	Water	1.63 mg/L	10 mL	1.63 mg/L	1	0.07	0.50		4	10/30/19 15:52:00	N
KQ1915963-31	Carbon, Total Organic	DUP	K1910066-007	Water	1.02 mg/L	10 mL	1.02 mg/L	1	0.07	0.50		9	10/30/19 19:54:00	N
KQ1915963-32	Carbon, Total Organic	DUP	K1910079-001	Water	7.65 mg/L	10 mL	7.65 mg/L	1	0.07	0.50		<1	10/30/19 21:30:00	N

11/01/19

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657830 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909912-001	Carbon, Total Organic	N/A		Ground Water	10.42 mg/L	10 mL	10.4 mg/L	1	0.07	0.50			10/31/19 01:49:00	N
K1909912-002	Carbon, Total Organic	N/A		Ground Water	10.79 mg/L	10 mL	10.8 mg/L	1	0.07	0.50			10/31/19 02:21:00	N
K1909995-001	Carbon, Total Organic	N/A		Water	1.84 mg/L	10 mL	1.84 mg/L	1	0.07	0.50			10/31/19 02:53:00	Y
K1909995-002	Carbon, Total Organic	N/A		Water	1.78 mg/L	10 mL	1.78 mg/L	1	0.07	0.50			10/31/19 04:15:00	N
K1909995-003	Carbon, Total Organic	N/A		Water	1.91 mg/L	10 mL	1.91 mg/L	1	0.07	0.50			10/31/19 04:48:00	N
K1909995-004	Carbon, Total Organic	N/A		Water	3.53 mg/L	10 mL	3.53 mg/L	1	0.07	0.50			10/31/19 05:20:00	N
K1909995-005	Carbon, Total Organic	N/A		Water	82.04 mg/L	10 mL	82.0 mg/L	1	0.07	0.50			10/31/19 05:52:00	N
K1909995-006	Carbon, Total Organic	N/A		Water	82.43 mg/L	10 mL	82.4 mg/L	1	0.07	0.50			10/31/19 06:24:00	N
K1909995-007	Carbon, Total Organic	N/A		Water	12.67 mg/L	10 mL	12.7 mg/L	1	0.07	0.50			10/31/19 06:56:00	N
KQ1915964-01	Carbon, Total Organic	CCV		Ground Water	24.21 mg/L	10 mL	24.2 mg/L	1					10/30/19 22:34:00	N
KQ1915964-02	Carbon, Total Organic	CCV		Ground Water	24.18 mg/L	10 mL	24.2 mg/L	1					10/31/19 03:42:00	N
KQ1915964-03	Carbon, Total Organic	CCV		Ground Water	24.73 mg/L	10 mL	24.7 mg/L	1					10/31/19 09:06:00	N
KQ1915964-04	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 22:51:00	N
KQ1915964-05	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 03:59:00	N
KQ1915964-06	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 09:22:00	N
KQ1915964-07	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 23:08:00	N
KQ1915964-08	Carbon, Total Organic	LCS		Ground Water	24.62 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	98		10/30/19 23:24:00	N
KQ1915964-10	Carbon, Total Organic	DUP	K1909912-001	Ground Water	10.50 mg/L	10 mL	10.5 mg/L	1	0.07	0.50		<1	10/31/19 01:49:00	N
KQ1915964-11	Carbon, Total Organic	DUP	K1909912-002	Ground Water	11.04 mg/L	10 mL	11.0 mg/L	1	0.07	0.50		2	10/31/19 02:21:00	N
KQ1915964-12	Carbon, Total Organic	MS	K1909995-001	Water	26.97 mg/L	10 mL	27.0 mg/L	1	0.07	0.50	101		10/31/19 03:25:00	N
KQ1915964-13	Carbon, Total Organic	DUP	K1909995-002	Water	1.83 mg/L	10 mL	1.83 mg/L	1	0.07	0.50		3	10/31/19 04:15:00	N
KQ1915964-14	Carbon, Total Organic	DUP	K1909995-001	Water	1.78 mg/L	10 mL	1.78 mg/L	1	0.07	0.50		3	10/31/19 02:53:00	N
KQ1915964-15	Carbon, Total Organic	DUP	K1909995-003	Water	1.80 mg/L	10 mL	1.80 mg/L	1	0.07	0.50		6	10/31/19 04:48:00	N
KQ1915964-16	Carbon, Total Organic	DUP	K1909995-004	Water	3.44 mg/L	10 mL	3.44 mg/L	1	0.07	0.50		3	10/31/19 05:20:00	N
KQ1915964-17	Carbon, Total Organic	DUP	K1909995-005	Water	99.72 mg/L	10 mL	99.7 mg/L	1	0.07	0.50		19*	10/31/19 05:52:00	N
KQ1915964-18	Carbon, Total Organic	DUP	K1909995-006	Water	46.55 mg/L	10 mL	46.5 mg/L	1	0.07	0.50		56*	10/31/19 06:24:00	N
KQ1915964-19	Carbon, Total Organic	DUP	K1909995-007	Water	10.81 mg/L	10 mL	10.8 mg/L	1	0.07	0.50		16*	10/31/19 06:56:00	N

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

11/01/19

Printed 11/1/19 13:05

Results Summary

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657831 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909627-002	Carbon, Dissolved Organic (DOC)	N/A		Water	6.72 mg/L	10 mL	67.2 mg/L	10	0.7	5.0			10/31/19 07:45:00	N
K1909892-001	Carbon, Dissolved Organic (DOC)	N/A		Water	3.45 mg/L	10 mL	3.45 mg/L	1	0.07	0.50			10/31/19 16:23:00	N
K1909892-002	Carbon, Dissolved Organic (DOC)	N/A		Water	4.12 mg/L	10 mL	4.12 mg/L	1	0.07	0.50			10/31/19 16:55:00	N
K1909892-003	Carbon, Dissolved Organic (DOC)	N/A		Water	1.74 mg/L	10 mL	1.74 mg/L	1	0.07	0.50			10/31/19 17:28:00	N
K1909892-004	Carbon, Dissolved Organic (DOC)	N/A		Water	0.71 mg/L	10 mL	0.71 mg/L	1	0.07	0.50			10/31/19 18:00:00	N
K1909892-005	Carbon, Dissolved Organic (DOC)	N/A		Water	0.28 mg/L	10 mL	0.28 mg/L J	1	0.07	0.50			10/31/19 18:32:00	N
K1909913-001	Carbon, Dissolved Organic (DOC)	N/A		Water	2.53 mg/L	10 mL	2.53 mg/L	1	0.07	0.50			10/31/19 15:35:00	N
KQ1915965-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.18 mg/L	10 mL	24.2 mg/L	1					10/31/19 03:42:00	N
KQ1915965-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.73 mg/L	10 mL	24.7 mg/L	1					10/31/19 09:06:00	N
KQ1915965-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.07 mg/L	10 mL	24.1 mg/L	1					10/31/19 14:29:00	N
KQ1915965-04	Carbon, Dissolved Organic (DOC)	CCV		Water	23.97 mg/L	10 mL	24.0 mg/L	1					10/31/19 20:08:00	N
KQ1915965-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 03:59:00	N
KQ1915965-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 09:22:00	N
KQ1915965-07	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 14:46:00	N
KQ1915965-08	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 20:25:00	N
KQ1915965-09	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 09:39:00	N
KQ1915965-10	Carbon, Dissolved Organic (DOC)	LCS		Water	24.93 mg/L	10 mL	24.9 mg/L	1	0.07	0.50	100		10/31/19 09:56:00	N
KQ1915965-11	Carbon, Dissolved Organic (DOC)	MS	T1901809-001	Water	29.36 mg/L	10 mL	29.4 mg/L	1	0.07	0.50	101		10/31/19 08:49:00	N
KQ1915965-12	Carbon, Dissolved Organic (DOC)	DUP	K1909627-002	Water	6.34 mg/L	10 mL	63.4 mg/L	10	0.7	5.0		6	10/31/19 07:45:00	N
KQ1915965-13	Carbon, Dissolved Organic (DOC)	DUP	T1901809-010	Water	2.88 mg/L	10 mL	2.88 mg/L	1	0.07	0.50		<1	10/31/19 15:02:00	N
KQ1915965-14	Carbon, Dissolved Organic (DOC)	DUP	T1901809-009	Water	3.47 mg/L	10 mL	3.47 mg/L	1	0.07	0.50		2	10/31/19 13:57:00	N
KQ1915965-15	Carbon, Dissolved Organic (DOC)	DUP	T1901809-008	Water	3.69 mg/L	10 mL	3.69 mg/L	1	0.07	0.50		5	10/31/19 13:25:00	N
KQ1915965-16	Carbon, Dissolved Organic (DOC)	DUP	T1901809-007	Water	3.33 mg/L	10 mL	3.33 mg/L	1	0.07	0.50		<1	10/31/19 12:53:00	N

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

11/01/19

Printed 11/1/19 13:17

Results Summary

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657831 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1915965-17	Carbon, Dissolved Organic (DOC)	DUP	T1901809-006	Water	3.27 mg/L	10 mL	3.27 mg/L	1	0.07	0.50		<1	10/31/19 12:21:00	N
KQ1915965-18	Carbon, Dissolved Organic (DOC)	DUP	T1901809-005	Water	3.06 mg/L	10 mL	3.06 mg/L	1	0.07	0.50		1	10/31/19 11:49:00	N
KQ1915965-19	Carbon, Dissolved Organic (DOC)	DUP	T1901809-004	Water	3.11 mg/L	10 mL	3.11 mg/L	1	0.07	0.50		4	10/31/19 11:17:00	N
KQ1915965-20	Carbon, Dissolved Organic (DOC)	DUP	T1901809-003	Water	3.24 mg/L	10 mL	3.24 mg/L	1	0.07	0.50		4	10/31/19 10:45:00	N
KQ1915965-21	Carbon, Dissolved Organic (DOC)	DUP	T1901809-002	Water	3.32 mg/L	10 mL	3.32 mg/L	1	0.07	0.50		2	10/31/19 10:12:00	N
KQ1915965-22	Carbon, Dissolved Organic (DOC)	DUP	T1901809-001	Water	3.80 mg/L	10 mL	3.80 mg/L	1	0.07	0.50		11*	10/31/19 08:17:00	N
KQ1915965-23	Carbon, Dissolved Organic (DOC)	DUP	K1909892-001	Water	3.38 mg/L	10 mL	3.38 mg/L	1	0.07	0.50		2	10/31/19 16:23:00	N
KQ1915965-24	Carbon, Dissolved Organic (DOC)	DUP	K1909892-002	Water	3.93 mg/L	10 mL	3.93 mg/L	1	0.07	0.50		5	10/31/19 16:55:00	N
KQ1915965-25	Carbon, Dissolved Organic (DOC)	DUP	K1909892-003	Water	1.71 mg/L	10 mL	1.71 mg/L	1	0.07	0.50		1	10/31/19 17:28:00	N
KQ1915965-26	Carbon, Dissolved Organic (DOC)	DUP	K1909892-004	Water	0.71 mg/L	10 mL	0.71 mg/L	1	0.07	0.50		<1	10/31/19 18:00:00	N
KQ1915965-27	Carbon, Dissolved Organic (DOC)	DUP	K1909892-005	Water	0.24 mg/L	10 mL	0.24 mg/L J	1	0.07	0.50		14*	10/31/19 18:32:00	N
KQ1915965-28	Carbon, Dissolved Organic (DOC)	DUP	K1909913-001	Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50		2	10/31/19 15:35:00	N
T1901809-001	Carbon, Dissolved Organic (DOC)	N/A		Water	4.23 mg/L	10 mL	4.23 mg/L	1	0.07	0.50			10/31/19 08:17:00	Y
T1901809-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50			10/31/19 10:12:00	Y
T1901809-003	Carbon, Dissolved Organic (DOC)	N/A		Water	3.36 mg/L	10 mL	3.36 mg/L	1	0.07	0.50			10/31/19 10:45:00	Y
T1901809-004	Carbon, Dissolved Organic (DOC)	N/A		Water	3.23 mg/L	10 mL	3.23 mg/L	1	0.07	0.50			10/31/19 11:17:00	Y
T1901809-005	Carbon, Dissolved Organic (DOC)	N/A		Water	3.02 mg/L	10 mL	3.02 mg/L	1	0.07	0.50			10/31/19 11:49:00	Y
T1901809-006	Carbon, Dissolved Organic (DOC)	N/A		Water	3.30 mg/L	10 mL	3.30 mg/L	1	0.07	0.50			10/31/19 12:21:00	Y
T1901809-007	Carbon, Dissolved Organic (DOC)	N/A		Water	3.34 mg/L	10 mL	3.34 mg/L	1	0.07	0.50			10/31/19 12:53:00	Y
T1901809-008	Carbon, Dissolved Organic (DOC)	N/A		Water	3.50 mg/L	10 mL	3.50 mg/L	1	0.07	0.50			10/31/19 13:25:00	Y
T1901809-009	Carbon, Dissolved Organic (DOC)	N/A		Water	3.55 mg/L	10 mL	3.55 mg/L	1	0.07	0.50			10/31/19 13:57:00	Y
T1901809-010	Carbon, Dissolved Organic (DOC)	N/A		Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50			10/31/19 15:02:00	Y

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

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657832 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909958-001	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 01:50:00	N
K1909958-002	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 02:22:00	N
K1909958-003	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 02:54:00	N
K1909958-004	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 03:26:00	N
K1909958-005	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 03:58:00	N
K1909958-006	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 04:30:00	N
K1909958-007	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 05:02:00	N
K1909958-008	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 05:35:00	N
K1909958-010	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 06:07:00	N
KQ1915967-01	Carbon, Dissolved Organic CCV (DOC)			Water	24.07 mg/L	10 mL	24.1 mg/L	1					10/31/19 14:29:00	N
KQ1915967-02	Carbon, Dissolved Organic CCV (DOC)			Water	23.97 mg/L	10 mL	24.0 mg/L	1					10/31/19 20:08:00	N
KQ1915967-03	Carbon, Dissolved Organic CCV (DOC)			Water	23.98 mg/L	10 mL	24.0 mg/L	1					11/1/19 01:16:00	N
KQ1915967-04	Carbon, Dissolved Organic CCV (DOC)			Water	24.42 mg/L	10 mL	24.4 mg/L	1					11/1/19 06:39:00	N
KQ1915967-05	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 14:46:00	N
KQ1915967-06	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 20:25:00	N
KQ1915967-07	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/1/19 01:33:00	N
KQ1915967-08	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/1/19 06:56:00	N
KQ1915967-09	Carbon, Dissolved Organic MB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 20:41:00	N
KQ1915967-10	Carbon, Dissolved Organic LCS (DOC)			Water	24.45 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		10/31/19 20:58:00	N
KQ1915967-11	Carbon, Dissolved Organic MS (DOC)		T1901815-009	Water	28.44 mg/L	10 mL	28.4 mg/L	1	0.07	0.50	102		11/1/19 01:00:00	N
KQ1915967-12	Carbon, Dissolved Organic DUP (DOC)		T1901815-009	Water	2.84 mg/L	10 mL	2.84 mg/L	1	0.07	0.50		<1	11/1/19 00:28:00	N
KQ1915967-13	Carbon, Dissolved Organic DUP (DOC)		T1901815-008	Water	2.84 mg/L	10 mL	2.84 mg/L	1	0.07	0.50		2	10/31/19 23:56:00	N

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

11/01/19

Printed 11/1/19 13:26

Results Summary

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657832 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1915967-14	Carbon, Dissolved Organic (DOC)	DUP	T1901815-007	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	10/31/19 23:23:00	N
KQ1915967-15	Carbon, Dissolved Organic (DOC)	DUP	T1901815-006	Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50		2	10/31/19 22:51:00	N
KQ1915967-16	Carbon, Dissolved Organic (DOC)	DUP	T1901815-005	Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50		<1	10/31/19 22:19:00	N
KQ1915967-17	Carbon, Dissolved Organic (DOC)	DUP	T1901815-004	Water	2.92 mg/L	10 mL	2.92 mg/L	1	0.07	0.50		<1	10/31/19 21:47:00	N
KQ1915967-18	Carbon, Dissolved Organic (DOC)	DUP	T1901815-003	Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50		3	10/31/19 21:15:00	N
KQ1915967-19	Carbon, Dissolved Organic (DOC)	DUP	T1901815-002	Water	2.83 mg/L	10 mL	2.83 mg/L	1	0.07	0.50		<1	10/31/19 19:36:00	N
KQ1915967-20	Carbon, Dissolved Organic (DOC)	DUP	T1901815-001	Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50		3	10/31/19 19:04:00	N
KQ1915967-21	Carbon, Dissolved Organic (DOC)	DUP	K1909958-001	Ocean Water	0.02 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 01:50:00	N
KQ1915967-22	Carbon, Dissolved Organic (DOC)	DUP	K1909958-005	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 03:58:00	N
KQ1915967-23	Carbon, Dissolved Organic (DOC)	DUP	K1909958-002	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 02:22:00	N
KQ1915967-24	Carbon, Dissolved Organic (DOC)	DUP	K1909958-003	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 02:54:00	N
KQ1915967-25	Carbon, Dissolved Organic (DOC)	DUP	K1909958-004	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 03:26:00	N
KQ1915967-26	Carbon, Dissolved Organic (DOC)	DUP	K1909958-007	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 05:02:00	N
KQ1915967-27	Carbon, Dissolved Organic (DOC)	DUP	K1909958-006	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 04:30:00	N
KQ1915967-28	Carbon, Dissolved Organic (DOC)	DUP	K1909958-008	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 05:35:00	N
KQ1915967-29	Carbon, Dissolved Organic (DOC)	DUP	K1909958-010	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 06:07:00	N
T1901815-001	Carbon, Dissolved Organic (DOC)	N/A		Water	2.74 mg/L	10 mL	2.74 mg/L	1	0.07	0.50			10/31/19 19:04:00	Y
T1901815-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50			10/31/19 19:36:00	Y
T1901815-003	Carbon, Dissolved Organic (DOC)	N/A		Water	2.90 mg/L	10 mL	2.90 mg/L	1	0.07	0.50			10/31/19 21:15:00	Y
T1901815-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.93 mg/L	10 mL	2.93 mg/L	1	0.07	0.50			10/31/19 21:47:00	Y
T1901815-005	Carbon, Dissolved Organic (DOC)	N/A		Water	2.83 mg/L	10 mL	2.83 mg/L	1	0.07	0.50			10/31/19 22:19:00	Y
T1901815-006	Carbon, Dissolved Organic (DOC)	N/A		Water	2.80 mg/L	10 mL	2.80 mg/L	1	0.07	0.50			10/31/19 22:51:00	Y

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

RIGHT SOLUTIONS | RIGHT PARTNER

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657832 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
T1901815-007	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 23:23:00	Y
T1901815-008	Carbon, Dissolved Organic (DOC)	N/A		Water	2.79 mg/L	10 mL	2.79 mg/L	1	0.07	0.50			10/31/19 23:56:00	Y
T1901815-009	Carbon, Dissolved Organic (DOC)	N/A		Water	2.84 mg/L	10 mL	2.84 mg/L	1	0.07	0.50			11/1/19 00:28:00	Y

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

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TOC: 657829, 657830
DOC: 657831, 657832

Schedule: 10302019

Version: 6
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/10/30 11:50 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	LOD	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	LOQ	Extended Reaction 021711 (Extended Reaction 021711)	1
5	Sample	K1909800-002.01 100x	Extended Reaction 021711 (Extended Reaction 021711)	2
6	Sample	K1909822-004.01 100x	Extended Reaction 021711 (Extended Reaction 021711)	2
7	Sample	K1909822-005.01 100x	Extended Reaction 021711 (Extended Reaction 021711)	2
8	Sample	K1910066-006.06	Extended Reaction 021711 (Extended Reaction 021711)	2
9	Sample	K1910066-006.06 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1910066-001.06	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1910066-002.06	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K1910066-003.06	Extended Reaction 021711 (Extended Reaction 021711)	2
13	Sample	K1910066-004.06	Extended Reaction 021711 (Extended Reaction 021711)	2
14	Sample	K1910066-005.06	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	K1910066-007.06	Extended Reaction 021711 (Extended Reaction 021711)	2
16	Sample	K1909998-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	K1910007-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K1910079-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K1909892-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1909892-002.02	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K1909892-003.02	Extended Reaction 021711 (Extended Reaction 021711)	2
23	Sample	K1909892-004.02	Extended Reaction 021711 (Extended Reaction 021711)	2
24	Sample	K1909892-005.02	Extended Reaction 021711 (Extended Reaction 021711)	2
25	Sample	K1909912-001.08	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K1909912-002.08	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K1909995-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K1909995-001.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1909995-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K1909995-003.01	Extended Reaction 021711 (Extended Reaction 021711)	2
31	Sample	K1909995-004.01	Extended Reaction 021711 (Extended Reaction 021711)	2
32	Sample	K1909995-005.01	Extended Reaction 021711 (Extended Reaction 021711)	2
33	Sample	K1909995-006.01	Extended Reaction 021711 (Extended Reaction 021711)	2
34	Sample	K1909995-007.01	Extended Reaction 021711 (Extended Reaction 021711)	2
35	Sample	FB 10/22/19	Extended Reaction 021711 (Extended Reaction 021711)	1
36	Sample	K1909627-002.01 10x doc	Extended Reaction 021711 (Extended Reaction 021711)	2
37	Sample	T1901809-001.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
38	Sample	T1901809-001.05 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

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Schedule: 10302019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
40	Sample	T1901809-002.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
41	Sample	T1901809-003.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
42	Sample	T1901809-004.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
43	Sample	T1901809-005.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
44	Sample	T1901809-006.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
45	Sample	T1901809-007.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
46	Sample	T1901809-008.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
47	Sample	T1901809-009.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	T1901809-010.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
49	Sample	K1909913-001.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
50	Sample	FB 10/25/19	Extended Reaction 021711 (Extended Reaction 021711)	1
51	Sample	K1909892-001.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
52	Sample	K1909892-002.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
53	Sample	K1909892-003.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
54	Sample	K1909892-004.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
55	Sample	K1909892-005.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
56	Sample	T1901815-001.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	T1901815-002.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	T1901815-003.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
60	Sample	T1901815-004.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
61	Sample	T1901815-005.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
62	Sample	T1901815-006.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
63	Sample	T1901815-007.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
64	Sample	T1901815-008.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
65	Sample	T1901815-009.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	T1901815-009.05 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K1909958-001.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K1909958-002.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
69	Sample	K1909958-003.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
70	Sample	K1909958-004.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	K1909958-005.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K1909958-006.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
73	Sample	K1909958-007.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
74	Sample	K1909958-008.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
75	Sample	K1909958-010.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

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Fusion Report - 10302019
Wednesday, October 30, 2019 10:13 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/11/01 09:29 - Friday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	10302019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6)		
Comment:			

Report Results

11/01/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/10/30 10:13

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.91	16.94	4.03	49.70	05:25
2	TC Clean	7.62	11.16	3.54	50.08	04:06
3	TC Clean	2.25	6.02	3.76	50.08	03:50
4	TC Clean	1.93	5.70	3.77	50.07	03:47

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/10/30 10:36

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.27	15.02	3.75	49.55	05:13
2	TC Clean	4.83	8.68	3.85	50.08	04:02
3	TC Clean	2.46	6.27	3.82	50.09	03:56

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4	TC Clean	1.67	5.40	3.72	50.09	03:55

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/10/30 10:58

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.34	14.99	3.64	49.59	05:22
2	TC Clean	4.27	8.05	3.78	50.07	04:01
3	TC Clean	2.14	5.89	3.74	50.08	03:46
4	TC Clean	1.49	5.48	3.99	50.11	03:48

Sample Type: Blank (Creating v1311) — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/10/30 11:28

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.27	14.97	3.70	49.72	05:12
2	TC Clean	5.39	9.01	3.63	50.04	04:04
3	TC Clean	1.96	5.66	3.70	50.12	03:50
4	TC Clean	1.58	5.29	3.70	50.10	03:50
5	Reagent Blank	3.44	7.27	3.83	50.11	05:03
6	Acid Blank	1.26	5.01	3.75	49.56	05:29

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0050 ppm	0.0000 ppm	0.0000%	2019/10/30 12:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0050	0.0504	10.31	14.28	3.97	50.24	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8974 ppm (PASS)	0.0000 ppm	0%	2019/10/30 12:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8974	238.9735	182.52	186.53	4.02	50.27	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/30 12:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.61	11.42	3.81	50.32	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/30 12:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.90	10.65	3.75	50.33	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.6040 ppm (PASS)	0.0000 ppm	0%	2019/10/30 13:09

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Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6040	246.0402	187.58	191.31	3.73	50.35	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0251 ppm	0.0000 ppm	0.0000%	2019/10/30 13:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0251	0.2512	10.46	14.33	3.87	50.35	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	LOD	0.0769 ppm	0.0000 ppm	0.0000%	2019/10/30 13:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0769	0.7686	10.83	14.44	3.61	50.36	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	LOQ	0.5307 ppm	0.0000 ppm	0.0000%	2019/10/30 13:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5307	5.3068	14.08	17.77	3.68	50.41	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1909800-002.01 100x	2.7458 ppm	0.0438 ppm	1.5900%	2019/10/30 14:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7768	27.7675	30.19	33.77	3.58	50.35	12:24
2	TOC	2.7148	27.1483	29.74	33.52	3.78	50.31	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC)	Extended Reaction	Extended Reaction

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(v1311) 021711 (v4) 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1909822-004.01 100x	7.0041 ppm	0.1720 ppm	2.4600%	2019/10/30 14:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.8824	68.8245	59.63	63.37	3.75	50.32	12:26
2	TOC	7.1257	71.2567	61.37	65.03	3.66	50.30	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1909822-005.01 100x	5.8830 ppm	0.0045 ppm	0.0800%	2019/10/30 15:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.8863	58.8625	52.48	56.12	3.64	50.25	12:31
2	TOC	5.8798	58.7984	52.44	56.33	3.90	50.26	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1910066-006.06	1.6603 ppm	0.0439 ppm	2.6400%	2019/10/30 15:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6913	16.9130	22.40	26.22	3.81	50.23	12:26
2	TOC	1.6292	16.2924	21.96	25.73	3.77	50.23	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1910066-006.06 ms	25.9734 ppm	0.0000 ppm	0.0000%	2019/10/30 16:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.9734	259.7345	196.51	200.24	3.73	50.24	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV	0 / infinity	24.1506	0.0000	0%	2019/10/30 16:40

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					021711 [25 ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1506	241.5062	184.33	188.16	3.83	50.26	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/30 16:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.33	11.07	3.75	50.24	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1910066-001.06	1.0238 ppm	0.0428 ppm	4.1800%	2019/10/30 17:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9936	9.9356	17.40	21.16	3.76	50.26	12:29
2	TOC	1.0541	10.5409	17.84	21.49	3.66	50.27	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1910066-002.06	0.9378 ppm	0.0181 ppm	1.9300%	2019/10/30 17:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9506	9.5061	17.09	20.69	3.59	50.29	12:31
2	TOC	0.9249	9.2494	16.91	20.60	3.69	50.33	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1910066-003.06	0.8130 ppm	0.0298 ppm	3.6600%	2019/10/30 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8340	8.3401	16.26	19.88	3.62	50.34	12:28
2	TOC	0.7919	7.9190	15.96	19.73	3.77	50.36	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1910066-004.06	0.8159 ppm	0.0327 ppm	4.0100%	2019/10/30 18:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7927	7.9273	15.96	19.55	3.59	50.41	12:29
2	TOC	0.8390	8.3903	16.29	19.96	3.67	50.44	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1910066-005.06	0.8121 ppm	0.0316 ppm	3.8900%	2019/10/30 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7898	7.8980	15.94	19.66	3.72	50.48	12:26
2	TOC	0.8344	8.3443	16.26	20.01	3.75	50.51	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1910066-007.06	0.9765 ppm	0.0650 ppm	6.6600%	2019/10/30 19:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9305	9.3052	16.95	20.57	3.62	50.50	12:27
2	TOC	1.0224	10.2243	17.61	21.31	3.70	50.54	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1909998-001.01	2.0648 ppm	0.0181 ppm	0.8800%	2019/10/30 20:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0520	20.5196	24.99	28.75	3.76	50.60	12:27

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2	TOC	2.0776	20.7762	25.17	28.91	3.73	50.57	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K1910007-001.01	1.5991 ppm	0.0499 ppm	3.1200%	2019/10/30 20:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5638	15.6383	21.49	25.18	3.69	50.57	12:30
2	TOC	1.6344	16.3440	22.00	25.83	3.83	50.51	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K1910079-001.01	7.6851 ppm	0.0534 ppm	0.7000%	2019/10/30 21:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.7229	77.2286	65.65	69.19	3.54	50.48	12:26
2	TOC	7.6473	76.4727	65.11	68.69	3.58	50.43	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K1909892-001.02	4.5500 ppm	0.0446 ppm	0.9800%	2019/10/30 22:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5185	45.1852	42.68	46.42	3.74	50.42	12:29
2	TOC	4.5816	45.8156	43.13	46.73	3.60	50.43	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.2124 ppm (PASS)	0.0000 ppm	0%	2019/10/30 22:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2124	242.1240	184.77	188.44	3.67	50.42	12:29

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Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/30 22:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.13	10.91	3.77	50.37	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/30 23:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.47	10.06	3.59	50.37	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.6226 ppm (PASS)	0.0000 ppm	0%	2019/10/30 23:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6226	246.2257	187.72	191.45	3.74	50.39	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample From Schedule Version 6

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1909892-002.02	5.2118 ppm	0.0036 ppm	0.0700%	2019/10/30 23:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2093	52.0929	47.63	51.49	3.86	50.36	12:28
2	TOC	5.2143	52.1431	47.66	51.31	3.65	50.34	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1909892-003.02	2.3771 ppm	0.0502 ppm	2.1100%	2019/10/31 00:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4126	24.1261	27.58	31.12	3.54	50.34	12:26
2	TOC	2.3416	23.4162	27.07	30.54	3.47	50.35	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1909892-004.02	0.9562 ppm	0.0103 ppm	1.0700%	2019/10/31 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9634	9.6344	17.18	20.83	3.65	50.33	12:29
2	TOC	0.9489	9.4893	17.08	20.71	3.63	50.35	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1909892-005.02	0.3620 ppm	0.0255 ppm	7.0600%	2019/10/31 01:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3801	3.8006	13.00	16.58	3.57	50.31	12:28
2	TOC	0.3439	3.4394	12.74	16.38	3.64	50.30	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1909912-001.08	10.4580 ppm	0.0581 ppm	0.5600%	2019/10/31 01:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.4169	104.1689	84.97	88.56	3.59	50.31	12:29

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2	TOC	10.4990	104.9904	85.56	89.22	3.66	50.28	12:24

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1909912-002.08	10.9148 ppm	0.1755 ppm	1.6100%	2019/10/31 02:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.7907	107.9066	87.65	91.47	3.82	50.28	12:29
2	TOC	11.0389	110.3890	89.43	92.99	3.56	50.26	12:29

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1909995-001.01	1.8084 ppm	0.0397 ppm	2.2000%	2019/10/31 02:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8365	18.3648	23.44	27.08	3.64	50.28	12:31
2	TOC	1.7803	17.8028	23.04	26.77	3.73	50.24	12:24

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1909995-001.01 ms	26.9727 ppm	0.0000 ppm	0.0000%	2019/10/31 03:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.9727	269.7271	203.68	207.37	3.69	50.22	12:35

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.1830 ppm (PASS)	0.0000 ppm	0%	2019/10/31 03:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1830	241.8298	184.56	188.26	3.69	50.23	12:33

Completion State | **Success Action** | **Method** | **Calibration** | **STD Conc - Pos B**

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Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/31 03:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.48	10.14	3.66	50.21	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1909995-002.01	1.8055 ppm	0.0336 ppm	1.8600%	2019/10/31 04:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7817	17.8167	23.05	26.76	3.70	50.24	12:29
2	TOC	1.8292	18.2923	23.39	27.10	3.71	50.24	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1909995-003.01	1.8575 ppm	0.0768 ppm	4.1400%	2019/10/31 04:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9118	19.1179	23.98	27.67	3.68	50.22	12:31
2	TOC	1.8032	18.0315	23.21	26.91	3.70	50.19	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1909995-004.01	3.4859 ppm	0.0672 ppm	1.9300%	2019/10/31 05:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5333	35.3335	35.61	39.37	3.76	50.21	12:28
2	TOC	3.4384	34.3837	34.93	38.63	3.70	50.17	12:26

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	K1909995-005.01	90.8814 ppm	12.4971 ppm	13.7500%	2019/10/31 05:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	82.0446	820.4456	598.56	602.14	3.58	50.17	12:27
2	TOC	99.7182	997.1818	725.29	740.59	15.31	50.14	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	33	TOC	K1909995-006.01	64.4891 ppm	25.3768 ppm	39.3500%	2019/10/31 06:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	82.4332	824.3324	601.35	612.54	11.19	50.16	12:28
2	TOC	46.5450	465.4501	344.02	348.32	4.30	50.17	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	34	TOC	K1909995-007.01	11.7386 ppm	1.3159 ppm	11.2100%	2019/10/31 06:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.6691	126.6910	101.12	104.92	3.81	50.14	12:29
2	TOC	10.8081	108.0809	87.77	91.50	3.72	50.16	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	35	TOC	FB 10/22/19	1.8617 ppm	0.0000 ppm	0.0000%	2019/10/31 07:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8617	18.6173	23.63	27.38	3.76	50.14	12:30

NR/read in previous runhas 0.

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	36	TOC	K1909627-002.01 10x doc	6.5320 ppm	0.2655 ppm	4.0600%	2019/10/31 07:45

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7197	67.1969	58.46	62.05	3.59	50.17	12:27
2	TOC	6.3443	63.4425	55.77	59.36	3.60	50.21	12:26

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	T1901809-001.05 doc	4.0152 ppm	0.3093 ppm	7.7000%	2019/10/31 08:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2339	42.3388	40.64	44.25	3.62	50.20	12:30
2	TOC	3.7965	37.9652	37.50	41.09	3.59	50.16	12:29

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	T1901809-001.05 ms doc	29.3634 ppm	0.0000 ppm	0.0000%	2019/10/31 08:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.3634	293.6341	220.82	224.53	3.71	50.22	12:31

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.7333 ppm (PASS)	0.0000 ppm	0%	2019/10/31 09:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7333	247.3330	188.51	192.31	3.80	50.31	12:32

Completion State Success - Criteria met. | **Success Action** Do Nothing | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27) | **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB	0 / infinity	0.0000	0.0000	0%	2019/10/31 09:22

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					021711 [0.0 ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	9.95	13.60	3.65	50.23	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/31 09:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.55	12.25	3.70	50.24	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER — From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.9298 ppm (PASS)	0.0000 ppm	0%	2019/10/31 09:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.9298	249.2981	189.92	193.47	3.56	50.26	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	T1901809-002.05 doc	3.3643 ppm	0.0592 ppm	1.7600%	2019/10/31 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4062	34.0616	34.70	38.42	3.72	50.32	12:24
2	TOC	3.3225	33.2248	34.10	37.77	3.67	50.26	12:27

Dilution	Blank Contribution	Method	Calibration

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	T1901809-003.05 doc	3.2974 ppm	0.0852 ppm	2.5800%	2019/10/31 10:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3576	33.5762	34.35	38.00	3.65	50.26	12:29
2	TOC	3.2371	32.3713	33.49	37.30	3.81	50.40	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	T1901809-004.05 doc	3.1700 ppm	0.0902 ppm	2.8500%	2019/10/31 11:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2338	32.3378	33.46	37.05	3.59	50.45	12:28
2	TOC	3.1062	31.0617	32.55	36.25	3.70	50.45	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	T1901809-005.05 doc	3.0399 ppm	0.0236 ppm	0.7800%	2019/10/31 11:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0232	30.2319	31.95	35.78	3.82	50.45	12:29
2	TOC	3.0565	30.5652	32.19	35.84	3.64	50.47	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	T1901809-006.05 doc	3.2827 ppm	0.0232 ppm	0.7100%	2019/10/31 12:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2990	32.9905	33.93	37.51	3.58	50.47	12:29
2	TOC	3.2663	32.6627	33.70	37.16	3.47	50.46	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	T1901809-007.05 doc	3.3363 ppm	0.0081 ppm	0.2400%	2019/10/31 12:53

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3420	33.4200	34.24	37.82	3.58	50.43	12:25
2	TOC	3.3306	33.3057	34.16	37.64	3.48	50.54	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	46	TOC	T1901809-008.05 doc	3.5967 ppm	0.1311 ppm	3.6400%	2019/10/31 13:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5041	35.0406	35.40	38.94	3.54	50.46	12:25
2	TOC	3.6894	36.8941	36.73	40.51	3.78	50.44	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	47	TOC	T1901809-009.05 doc	3.5135 ppm	0.0571 ppm	1.6300%	2019/10/31 13:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5538	35.5385	35.76	39.45	3.69	50.40	12:26
2	TOC	3.4731	34.7310	35.18	38.80	3.62	50.39	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0662 ppm (PASS)	0.0000 ppm	0%	2019/10/31 14:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0662	240.6624	183.73	187.25	3.52	50.37	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

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◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/31 14:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.17	10.83	3.66	50.34	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	T1901809-010.05 doc	3.8690 ppm	0.0129 ppm	0.3300%	2019/10/31 15:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8598	38.5983	37.95	41.64	3.68	50.34	12:26
2	TOC	3.8781	38.7810	38.08	41.81	3.73	50.34	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K1909913-001.02 doc	2.5600 ppm	0.0425 ppm	1.6600%	2019/10/31 15:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5299	25.2990	28.42	31.93	3.51	50.30	12:31
2	TOC	2.5900	25.9001	28.85	32.39	3.54	50.29	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	FB 10/25/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/31 16:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.06	12.62	3.56	50.30	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	51	TOC	K1909892-001.01 doc	3.4160 ppm	0.0464 ppm	1.3600%	2019/10/31 16:23

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

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1	TOC	3.4488	34.4883	35.01	38.59	3.59	50.30	12:28
2	TOC	3.3831	33.8314	34.54	38.20	3.66	50.28	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1909892-002.01 doc	4.0237 ppm	0.1383 ppm	3.4400%	2019/10/31 16:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1215	41.2147	39.83	43.36	3.53	50.30	12:28
2	TOC	3.9259	39.2594	38.43	42.12	3.70	50.30	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K1909892-003.01 doc	1.7260 ppm	0.0157 ppm	0.9100%	2019/10/31 17:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7370	17.3705	22.73	26.39	3.65	50.32	12:29
2	TOC	1.7149	17.1487	22.57	26.26	3.69	50.32	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	K1909892-004.01 doc	0.7056 ppm	0.0009 ppm	0.1300%	2019/10/31 18:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7050	7.0501	15.33	19.05	3.72	50.33	12:26
2	TOC	0.7063	7.0626	15.34	18.99	3.65	50.36	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K1909892-005.01 doc	0.2612 ppm	0.0259 ppm	9.9300%	2019/10/31 18:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2795	2.7950	12.28	15.94	3.66	50.40	12:26
2	TOC	0.2428	2.4282	12.02	15.64	3.62	50.42	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	56	TOC	T1901815-001.05 doc	2.7758 ppm	0.0529 ppm	1.9000%	2019/10/31 19:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7384	27.3840	29.91	33.56	3.65	50.42	12:27
2	TOC	2.8132	28.1315	30.45	33.99	3.55	50.43	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	57	TOC	T1901815-002.05 doc	2.8200 ppm	0.0197 ppm	0.7000%	2019/10/31 19:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8060	28.0604	30.40	34.07	3.67	50.47	12:27
2	TOC	2.8339	28.3393	30.60	34.16	3.56	50.47	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9653 ppm (PASS)	0.0000 ppm	0%	2019/10/31 20:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9653	239.6527	183.00	186.59	3.59	50.47	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/31 20:25

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.16	9.84	3.68	50.48	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

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Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/31 20:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.00	9.61	3.61	50.52	12:35

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER — From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.4549 ppm (PASS)	0.0000 ppm	0%	2019/10/31 20:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4549	244.5493	186.51	190.22	3.71	50.49	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	T1901815-003.05 doc	2.8546 ppm	0.0575 ppm	2.0100%	2019/10/31 21:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8953	28.9530	31.04	34.53	3.49	50.40	12:26
2	TOC	2.8140	28.1399	30.45	34.16	3.70	50.43	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	T1901815-004.05 doc	2.9233 ppm	0.0093 ppm	0.3200%	2019/10/31 21:47

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

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1	TOC	2.9299	29.2989	31.28	34.96	3.68	50.40	12:30
2	TOC	2.9168	29.1678	31.19	34.90	3.71	50.47	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	T1901815-005.05 doc	2.8190 ppm	0.0172 ppm	0.6100%	2019/10/31 22:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8311	28.3114	30.58	34.26	3.68	50.38	12:29
2	TOC	2.8069	28.0688	30.40	34.12	3.72	50.38	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	T1901815-006.05 doc	2.8285 ppm	0.0454 ppm	1.6000%	2019/10/31 22:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7964	27.9642	30.33	34.01	3.68	50.37	12:30
2	TOC	2.8606	28.6057	30.79	34.38	3.59	50.34	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	T1901815-007.05 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/31 23:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.05	10.53	3.47	50.30	12:29
2	TOC	0.0000	0.0000	6.60	10.21	3.61	50.27	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	T1901815-008.05 doc	2.8124 ppm	0.0360 ppm	1.2800%	2019/10/31 23:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7869	27.8693	30.26	33.91	3.65	50.30	12:30
2	TOC	2.8378	28.3784	30.62	34.23	3.60	50.29	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	T1901815-009.05 doc	2.8408 ppm	0.0032 ppm	0.1100%	2019/11/01 00:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8430	28.4300	30.66	34.31	3.65	50.28	12:30
2	TOC	2.8385	28.3854	30.63	34.48	3.85	50.26	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	T1901815-009.05 ms doc	28.4399 ppm	0.0000 ppm	0.0000%	2019/11/01 01:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.4399	284.3988	214.20	217.85	3.66	50.24	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9838 ppm (PASS)	0.0000 ppm	0%	2019/11/01 01:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9838	239.8382	183.14	186.73	3.59	50.25	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/01 01:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.86	10.56	3.70	50.17	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

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Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K1909958-001.01 doc 2x	0.0077 ppm	0.0109 ppm	141.4200%	2019/11/01 01:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.17	14.01	3.84	50.22	12:26
2	TOC	0.0154	0.1536	10.39	14.18	3.79	50.27	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1909958-002.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 02:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.54	13.27	3.72	50.22	12:26
2	TOC	0.0000	0.0000	9.44	13.21	3.77	50.21	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	K1909958-003.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 02:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.84	12.63	3.79	50.21	12:31
2	TOC	0.0000	0.0000	8.33	12.11	3.77	50.17	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K1909958-004.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 03:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.69	12.38	3.69	50.18	12:26
2	TOC	0.0000	0.0000	8.65	12.23	3.58	50.17	12:26

Dilution	Blank Contribution	Method	Calibration

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K1909958-005.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 03:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.69	12.27	3.58	50.17	12:24
2	TOC	0.0000	0.0000	8.95	12.56	3.61	50.15	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1909958-006.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 04:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.23	11.83	3.60	50.14	12:30
2	TOC	0.0000	0.0000	8.76	12.38	3.62	50.12	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K1909958-007.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 05:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.03	12.54	3.51	50.11	12:27
2	TOC	0.0000	0.0000	8.56	12.15	3.59	50.12	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K1909958-008.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 05:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.68	12.28	3.61	50.12	12:28
2	TOC	0.0000	0.0000	8.51	12.25	3.74	50.09	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

		Analysis			Std. Dev.		

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	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	75	TOC	K1909958-010.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 06:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.06	11.59	3.54	50.04	12:29
2	TOC	0.0000	0.0000	8.09	11.76	3.67	49.93	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.4201 ppm (PASS)	0.0000 ppm	0%	2019/11/01 06:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4201	244.2007	186.26	189.82	3.55	49.85	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/01 06:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.31	10.77	3.46	49.81	12:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Meta Data Used in this Report

Blanks

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Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1310	1.4213	1.4340	0.0000	0.0000	0.0000	2019/10/26 13:10	Fusion1 (Fusion1)
v1311	1.1460	1.2580	0.0000	0.0000	0.0000	2019/10/30 12:02	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version: v27
Ver Creation: 2019/03/11 21:51
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC

Calibration curve formula: TOC: y = 7.170x + 11.164
r^2 value: TOC: r^2 = 0.99991

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	10.4100	0.0000		2019/03/11 20:12
0.50 ppm	14.7740	0.5000		2019/03/11 20:28
1.00 ppm	18.0020	1.0000		2019/03/11 20:44
5.00 ppm	47.2310	5.0000		2019/03/11 21:01
10.0 ppm	85.1320	10.0000		2019/03/11 21:17
25.0 ppm	188.5200	25.0000		2019/03/11 21:33
50.0 ppm	370.1610	50.0000		2019/03/11 21:49

Methods

Name: Extended Reaction 021711 (TOC)

Version: v4
Ver Creation: 2019/01/31 11:21
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4

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SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/11/01 07:13

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StarLIMS Run: 657829, 657830, 657831, 657832

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-82B

21 % H3PO4: 11-GEN-05-82A

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: BCD	Date Analyzed: 10/30/19
Reviewed By:	Date Reviewed: 11/01/19

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Work Request # Original ( ) K1910570, K1909958, 9995, K1910215, 1901863

Tier: IV IV IV IV IV

Date Analyzed: 11/5/19

Analyst: BCD

Analysis: TOC/DOC

Run # TOC: 658206 658207 658208 658209

DOC: 658206 658207 658208 658209

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: K1909995-5 Sent for RA due to being above the calibration curve.
K1909995-6 Sent for RA due to previous sample carry over.
K1909955-1MS, 9958-11MS report a low % recovery due to matrix interference from salt water.

Final Approved by: _____ Date: 11/08/19

DQREPORT

©TH 11/08/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658206 **Method/Testcode:** 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1910070-001	Carbon, Total Organic (TOC)	N/A		Pore Water	0.83 mg/L	10 mL	0.83 mg/L	1		0.50			11/5/19 15:52:00	N
K1910070-002	Carbon, Total Organic (TOC)	N/A		Pore Water	0.69 mg/L	10 mL	0.69 mg/L	1		0.50			11/5/19 18:16:00	N
K1910070-003	Carbon, Total Organic (TOC)	N/A		Pore Water	0.63 mg/L	10 mL	0.63 mg/L	1		0.50			11/5/19 19:20:00	N
K1910070-004	Carbon, Total Organic (TOC)	N/A		Pore Water	0.87 mg/L	10 mL	0.87 mg/L	1		0.50			11/5/19 20:24:00	N
K1910070-006	Carbon, Total Organic (TOC)	N/A		Pore Water	0.65 mg/L	10 mL	0.65 mg/L	1		0.50			11/5/19 22:01:00	N
K1910070-007	Carbon, Total Organic (TOC)	N/A		Pore Water	0.55 mg/L	10 mL	0.55 mg/L	1		0.50			11/5/19 23:04:00	N
K1910070-008	Carbon, Total Organic (TOC)	N/A		Pore Water	0.60 mg/L	10 mL	0.60 mg/L	1		0.50			11/6/19 00:08:00	N
K1910070-009	Carbon, Total Organic (TOC)	N/A		Pore Water	0.56 mg/L	10 mL	0.56 mg/L	1		0.50			11/6/19 01:12:00	N
K1910070-010	Carbon, Total Organic (TOC)	N/A		Pore Water	0.55 mg/L	10 mL	0.55 mg/L	1		0.50			11/6/19 02:15:00	N
K1910070-011	Carbon, Total Organic (TOC)	N/A		Pore Water	0.52 mg/L	10 mL	0.52 mg/L	1		0.50			11/6/19 03:19:00	N
K1910070-012	Carbon, Total Organic (TOC)	N/A		Pore Water	0.49 mg/L	10 mL	0.50 mg/L U	1		0.50			11/6/19 04:23:00	N
KQ1916153-01	Carbon, Total Organic (TOC)	CCV		Pore Water	24.12 mg/L	10 mL	24.1 mg/L	1					11/5/19 11:51:00	N
KQ1916153-02	Carbon, Total Organic (TOC)	CCV		Pore Water	23.72 mg/L	10 mL	23.7 mg/L	1					11/5/19 21:27:00	N
KQ1916153-03	Carbon, Total Organic (TOC)	CCV		Pore Water	23.59 mg/L	10 mL	23.6 mg/L	1					11/6/19 07:02:00	N
KQ1916153-04	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 12:07:00	N
KQ1916153-05	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 21:44:00	N
KQ1916153-06	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			11/6/19 07:19:00	N
KQ1916153-07	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 12:24:00	N
KQ1916153-08	Carbon, Total Organic (TOC)	LCS		Pore Water	24.55 mg/L	10 mL	24.6 mg/L	1		0.50	98		11/5/19 13:28:00	N
KQ1916153-09	Carbon, Total Organic (TOC)	MS	K1910070-001	Pore Water	25.83 mg/L	10 mL	25.8 mg/L	1		0.50	100		11/5/19 16:56:00	N
KQ1916153-10	Carbon, Total Organic (TOC)	LODV		Pore Water	0.08 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 14:49:00	N
KQ1916153-11	Carbon, Total Organic (TOC)	MS	K1910070-001	Pore Water	25.78 mg/L	10 mL	25.8 mg/L	1		0.50	100		11/5/19 16:56:00	N
KQ1916153-12	Carbon, Total Organic (TOC)	MS	K1910070-001	Pore Water	25.80 mg/L	10 mL	25.8 mg/L	1		0.50	100		11/5/19 16:56:00	N

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

11/08/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658206 **Method/Testcode:** 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916153-13	Carbon, Total Organic (TOC)	MS	K1910070-001	Pore Water	25.90 mg/L	10 mL	25.9 mg/L	1		0.50	100		11/5/19 16:56:00	N
KQ1916153-14	Carbon, Total Organic (TOC)	DUP	K1910070-003	Pore Water	0.74 mg/L	10 mL	0.74 mg/L	1		0.50		15	11/5/19 19:20:00	N
KQ1916153-15	Carbon, Total Organic (TOC)	TRP	K1910070-003	Pore Water	0.75 mg/L	10 mL	0.75 mg/L	1		0.50		9	11/5/19 19:20:00	N
KQ1916153-16	Carbon, Total Organic (TOC)	QUAD	K1910070-003	Pore Water	0.75 mg/L	10 mL	0.75 mg/L	1		0.50		8	11/5/19 19:20:00	N
KQ1916153-17	Carbon, Total Organic (TOC)	DUP	K1910070-004	Pore Water	0.90 mg/L	10 mL	0.90 mg/L	1		0.50		4	11/5/19 20:24:00	N
KQ1916153-18	Carbon, Total Organic (TOC)	TRP	K1910070-004	Pore Water	0.79 mg/L	10 mL	0.79 mg/L	1		0.50		7	11/5/19 20:24:00	N
KQ1916153-19	Carbon, Total Organic (TOC)	QUAD	K1910070-004	Pore Water	0.75 mg/L	10 mL	0.75 mg/L	1		0.50		9	11/5/19 20:24:00	N
KQ1916153-20	Carbon, Total Organic (TOC)	DUP	K1910070-006	Pore Water	0.63 mg/L	10 mL	0.63 mg/L	1		0.50		3	11/5/19 22:01:00	N
KQ1916153-21	Carbon, Total Organic (TOC)	TRP	K1910070-006	Pore Water	0.64 mg/L	10 mL	0.64 mg/L	1		0.50		2	11/5/19 22:01:00	N
KQ1916153-22	Carbon, Total Organic (TOC)	QUAD	K1910070-006	Pore Water	0.65 mg/L	10 mL	0.65 mg/L	1		0.50		2	11/5/19 22:01:00	N
KQ1916153-23	Carbon, Total Organic (TOC)	DUP	K1910070-007	Pore Water	0.54 mg/L	10 mL	0.54 mg/L	1		0.50		3	11/5/19 23:04:00	N
KQ1916153-24	Carbon, Total Organic (TOC)	TRP	K1910070-007	Pore Water	0.56 mg/L	10 mL	0.56 mg/L	1		0.50		2	11/5/19 23:04:00	N
KQ1916153-25	Carbon, Total Organic (TOC)	QUAD	K1910070-007	Pore Water	0.64 mg/L	10 mL	0.64 mg/L	1		0.50		8	11/5/19 23:04:00	N
KQ1916153-26	Carbon, Total Organic (TOC)	DUP	K1910070-008	Pore Water	0.60 mg/L	10 mL	0.60 mg/L	1		0.50		<1	11/6/19 00:08:00	N
KQ1916153-27	Carbon, Total Organic (TOC)	TRP	K1910070-008	Pore Water	0.57 mg/L	10 mL	0.57 mg/L	1		0.50		2	11/6/19 00:08:00	N
KQ1916153-28	Carbon, Total Organic (TOC)	QUAD	K1910070-008	Pore Water	0.54 mg/L	10 mL	0.54 mg/L	1		0.50		5	11/6/19 00:08:00	N
KQ1916153-29	Carbon, Total Organic (TOC)	DUP	K1910070-009	Pore Water	0.64 mg/L	10 mL	0.64 mg/L	1		0.50		13	11/6/19 01:12:00	N
KQ1916153-30	Carbon, Total Organic (TOC)	TRP	K1910070-009	Pore Water	0.61 mg/L	10 mL	0.61 mg/L	1		0.50		7	11/6/19 01:12:00	N
KQ1916153-31	Carbon, Total Organic (TOC)	QUAD	K1910070-009	Pore Water	0.66 mg/L	10 mL	0.66 mg/L	1		0.50		7	11/6/19 01:12:00	N
KQ1916153-32	Carbon, Total Organic (TOC)	DUP	K1910070-010	Pore Water	0.59 mg/L	10 mL	0.59 mg/L	1		0.50		6	11/6/19 02:15:00	N
KQ1916153-33	Carbon, Total Organic (TOC)	TRP	K1910070-010	Pore Water	0.58 mg/L	10 mL	0.58 mg/L	1		0.50		3	11/6/19 02:15:00	N
KQ1916153-34	Carbon, Total Organic (TOC)	QUAD	K1910070-010	Pore Water	0.58 mg/L	10 mL	0.58 mg/L	1		0.50		3	11/6/19 02:15:00	N
KQ1916153-35	Carbon, Total Organic (TOC)	DUP	K1910070-011	Pore Water	0.56 mg/L	10 mL	0.56 mg/L	1		0.50		6	11/6/19 03:19:00	N

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

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658206 **Method/Testcode:** 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916153-36	Carbon, Total Organic (TOC)	TRP	K1910070-011	Pore Water	0.48 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	11/6/19 03:19:00	N
KQ1916153-37	Carbon, Total Organic (TOC)	QUAD	K1910070-011	Pore Water	0.55 mg/L	10 mL	0.55 mg/L	1		0.50		NC	11/6/19 03:19:00	N
KQ1916153-38	Carbon, Total Organic (TOC)	DUP	K1910070-012	Pore Water	0.53 mg/L	10 mL	0.53 mg/L	1		0.50		NC	11/6/19 04:23:00	N
KQ1916153-39	Carbon, Total Organic (TOC)	TRP	K1910070-012	Pore Water	0.54 mg/L	10 mL	0.54 mg/L	1		0.50		NC	11/6/19 04:23:00	N
KQ1916153-40	Carbon, Total Organic (TOC)	QUAD	K1910070-012	Pore Water	0.55 mg/L	10 mL	0.55 mg/L	1		0.50		NC	11/6/19 04:23:00	N
KQ1916153-41	Carbon, Total Organic (TOC)	DUP	K1910070-001	Pore Water	0.76 mg/L	10 mL	0.76 mg/L	1		0.50		8	11/5/19 15:52:00	N
KQ1916153-42	Carbon, Total Organic (TOC)	TRP	K1910070-001	Pore Water	0.78 mg/L	10 mL	0.78 mg/L	1		0.50		4	11/5/19 15:52:00	N
KQ1916153-43	Carbon, Total Organic (TOC)	QUAD	K1910070-001	Pore Water	0.80 mg/L	10 mL	0.80 mg/L	1		0.50		4	11/5/19 15:52:00	N
KQ1916153-44	Carbon, Total Organic (TOC)	DUP	K1910070-002	Pore Water	0.72 mg/L	10 mL	0.72 mg/L	1		0.50		4	11/5/19 18:16:00	N
KQ1916153-45	Carbon, Total Organic (TOC)	TRP	K1910070-002	Pore Water	0.68 mg/L	10 mL	0.68 mg/L	1		0.50		3	11/5/19 18:16:00	N
KQ1916153-46	Carbon, Total Organic (TOC)	QUAD	K1910070-002	Pore Water	0.71 mg/L	10 mL	0.71 mg/L	1		0.50		3	11/5/19 18:16:00	N
KQ1916153-47	Carbon, Total Organic (TOC)	LODV		Pore Water	0.20 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 14:49:00	N
KQ1916153-48	Carbon, Total Organic (TOC)	LODV		Pore Water	0.19 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 14:49:00	N
KQ1916153-49	Carbon, Total Organic (TOC)	LODV		Pore Water	0.15 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 14:49:00	N
KQ1916153-50	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 12:24:00	N
KQ1916153-51	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 12:24:00	N
KQ1916153-52	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			11/5/19 12:24:00	N
KQ1916153-53	Carbon, Total Organic (TOC)	LCS		Pore Water	24.53 mg/L	10 mL	24.5 mg/L	1		0.50	98		11/5/19 13:28:00	N
KQ1916153-54	Carbon, Total Organic (TOC)	LCS		Pore Water	24.53 mg/L	10 mL	24.5 mg/L	1		0.50	98		11/5/19 13:28:00	N
KQ1916153-55	Carbon, Total Organic (TOC)	LCS		Pore Water	24.52 mg/L	10 mL	24.5 mg/L	1		0.50	98		11/5/19 13:28:00	N

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658207 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909958-001	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 09:14:00	N
K1909958-002	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 09:46:00	N
K1909958-003	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 10:18:00	N
K1909958-004	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 10:51:00	N
K1909958-005	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 11:23:00	N
K1909958-006	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 12:28:00	N
K1909958-007	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 13:00:00	N
K1909958-008	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 13:32:00	N
K1909958-010	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 14:04:00	N
K1909958-011	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 14:36:00	N
K1909958-012	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 15:08:00	N
K1909958-013	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 15:41:00	N
K1909958-014	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 16:13:00	N
K1909958-016	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 16:45:00	N
K1909958-017	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 17:17:00	N
K1909958-018	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 18:56:00	N
K1909995-005	Carbon, Total Organic	N/A		Water	58.59 mg/L	10 mL	2930 mg/L	50	4	25			11/6/19 05:26:00	N
K1909995-006	Carbon, Total Organic	N/A		Water	0.97 mg/L	10 mL	48 mg/L	50	4	25			11/6/19 05:58:00	N
K1909995-007	Carbon, Total Organic	N/A		Water	7.51 mg/L	10 mL	7.51 mg/L	1	0.07	0.50			11/6/19 06:30:00	N
K1910215-001	Carbon, Total Organic	N/A		Water	2.11 mg/L	10 mL	4.2 mg/L	2	0.2	1.0			11/6/19 08:09:00	N
KQ1916154-01	Carbon, Total Organic	CCV		Water	23.72 mg/L	10 mL	23.7 mg/L	1					11/5/19 21:27:00	N
KQ1916154-02	Carbon, Total Organic	CCV		Water	23.59 mg/L	10 mL	23.6 mg/L	1					11/6/19 07:02:00	N
KQ1916154-03	Carbon, Total Organic	CCV		Water	23.70 mg/L	10 mL	23.7 mg/L	1					11/6/19 11:55:00	N
KQ1916154-04	Carbon, Total Organic	CCV		Water	23.66 mg/L	10 mL	23.7 mg/L	1					11/6/19 17:49:00	N
KQ1916154-05	Carbon, Total Organic	CCV		Water	23.40 mg/L	10 mL	23.4 mg/L	1					11/6/19 22:41:00	N

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658207 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916154-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/5/19 21:44:00	N
KQ1916154-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/6/19 07:19:00	N
KQ1916154-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/6/19 12:11:00	N
KQ1916154-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/6/19 18:06:00	N
KQ1916154-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/6/19 22:58:00	N
KQ1916154-11	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/6/19 07:36:00	N
KQ1916154-15	Carbon, Total Organic	LCS		Water	24.06 mg/L	10 mL	24.1 mg/L	1	0.07	0.50	96		11/6/19 07:52:00	N
KQ1916154-19	Carbon, Total Organic	MS	K1910215-001	Water	27.52 mg/L	10 mL	55.0 mg/L	2	0.2	1.0	102		11/6/19 08:41:00	N
KQ1916154-20	Carbon, Total Organic	DUP	K1909995-005	Water	58.43 mg/L	10 mL	2920 mg/L	50	4	25		<1	11/6/19 05:26:00	N
KQ1916154-21	Carbon, Total Organic	DUP	K1909995-006	Water	0.58 mg/L	10 mL	29 mg/L	50	4	25		49*	11/6/19 05:58:00	N
KQ1916154-22	Carbon, Total Organic	DUP	K1909995-007	Water	7.36 mg/L	10 mL	7.36 mg/L	1	0.07	0.50		2	11/6/19 06:30:00	N
KQ1916154-23	Carbon, Total Organic	DUP	K1909958-005	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 11:23:00	N
KQ1916154-24	Carbon, Total Organic	DUP	K1909958-006	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 12:28:00	N
KQ1916154-25	Carbon, Total Organic	DUP	K1909958-007	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 13:00:00	N
KQ1916154-26	Carbon, Total Organic	DUP	K1909958-008	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 13:32:00	N
KQ1916154-27	Carbon, Total Organic	DUP	K1909958-017	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 17:17:00	N
KQ1916154-28	Carbon, Total Organic	DUP	K1909958-016	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 16:45:00	N
KQ1916154-29	Carbon, Total Organic	DUP	K1909958-018	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 18:56:00	N
KQ1916154-30	Carbon, Total Organic	DUP	K1909958-010	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 14:04:00	N
KQ1916154-31	Carbon, Total Organic	DUP	K1909958-011	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 14:36:00	N
KQ1916154-32	Carbon, Total Organic	DUP	K1909958-012	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 15:08:00	N
KQ1916154-33	Carbon, Total Organic	DUP	K1909958-013	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 15:41:00	N
KQ1916154-34	Carbon, Total Organic	DUP	K1909958-014	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 16:13:00	N
KQ1916154-35	Carbon, Total Organic	DUP	K1909958-004	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 10:51:00	N
KQ1916154-36	Carbon, Total Organic	DUP	K1909958-001	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 09:14:00	N
KQ1916154-37	Carbon, Total Organic	DUP	K1909958-002	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 09:46:00	N

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658207 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916154-38	Carbon, Total Organic	DUP	K1909958-003	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 10:18:00	N
KQ1916154-39	Carbon, Total Organic	DUP	K1910215-001	Water	2.10 mg/L	10 mL	4.2 mg/L	2	0.2	1.0		<1	11/6/19 08:09:00	N

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658208 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909958-011	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 19:28:00	N
K1909958-012	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 20:33:00	N
K1909958-013	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 21:05:00	N
K1909958-014	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 21:37:00	N
K1909958-016	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 22:09:00	N
K1909958-017	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 23:15:00	N
K1909958-018	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/6/19 23:47:00	N
K1909958-019	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 00:19:00	N
K1909958-020	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 00:51:00	N
KQ1916155-01	Carbon, Dissolved Organic (DOC)	CCV		Ocean Water	23.66 mg/L	10 mL	23.7 mg/L	1					11/6/19 17:49:00	N
KQ1916155-02	Carbon, Dissolved Organic (DOC)	CCV		Ocean Water	23.40 mg/L	10 mL	23.4 mg/L	1					11/6/19 22:41:00	N
KQ1916155-03	Carbon, Dissolved Organic (DOC)	CCV		Ocean Water	23.33 mg/L	10 mL	23.3 mg/L	1					11/6/19 04:36:00	N
KQ1916155-04	Carbon, Dissolved Organic (DOC)	CCV		Ocean Water	23.69 mg/L	10 mL	23.7 mg/L	1					11/7/19 09:28:00	N
KQ1916155-05	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/6/19 18:06:00	N
KQ1916155-06	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/6/19 22:58:00	N
KQ1916155-07	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/6/19 04:52:00	N
KQ1916155-08	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/7/19 09:45:00	N
KQ1916155-09	Carbon, Dissolved Organic (DOC)	MB		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/6/19 18:22:00	N
KQ1916155-10	Carbon, Dissolved Organic (DOC)	LCS		Ocean Water	24.43 mg/L	10 mL	24.4 mg/L	1	0.07	0.50	98		11/6/19 18:39:00	N
KQ1916155-11	Carbon, Dissolved Organic (DOC)	MS	K1909958-011	Ocean Water	13.71 mg/L	10 mL	27.4 mg/L	2	0.2	1.0	55*		11/6/19 20:00:00	N
KQ1916155-12	Carbon, Dissolved Organic (DOC)	DUP	K1909958-012	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 20:33:00	N

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658208 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916155-13	Carbon, Dissolved Organic (DOC)	DUP	K1909958-011	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 19:28:00	N
KQ1916155-14	Carbon, Dissolved Organic (DOC)	DUP	K1909958-013	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 21:05:00	N
KQ1916155-15	Carbon, Dissolved Organic (DOC)	DUP	K1909958-014	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 21:37:00	N
KQ1916155-16	Carbon, Dissolved Organic (DOC)	DUP	K1909958-017	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 23:15:00	N
KQ1916155-17	Carbon, Dissolved Organic (DOC)	DUP	K1909958-016	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 22:09:00	N
KQ1916155-18	Carbon, Dissolved Organic (DOC)	DUP	K1909958-018	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/6/19 23:47:00	N
KQ1916155-19	Carbon, Dissolved Organic (DOC)	DUP	K1909958-019	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 00:19:00	N
KQ1916155-20	Carbon, Dissolved Organic (DOC)	DUP	K1909958-020	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 00:51:00	N
KQ1916155-21	Carbon, Dissolved Organic (DOC)	DUP	T1901863-009	Water	4.23 mg/L	10 mL	4.23 mg/L	1	0.07	0.50		<1	11/7/19 06:47:00	N
KQ1916155-22	Carbon, Dissolved Organic (DOC)	DUP	T1901863-008	Water	4.04 mg/L	10 mL	4.04 mg/L	1	0.07	0.50		<1	11/7/19 06:15:00	N
KQ1916155-23	Carbon, Dissolved Organic (DOC)	DUP	T1901863-007	Water	4.17 mg/L	10 mL	4.17 mg/L	1	0.07	0.50		<1	11/7/19 04:36:00	N
KQ1916155-24	Carbon, Dissolved Organic (DOC)	DUP	T1901863-006	Water	3.97 mg/L	10 mL	3.97 mg/L	1	0.07	0.50		2	11/7/19 04:04:00	N
KQ1916155-25	Carbon, Dissolved Organic (DOC)	DUP	T1901863-005	Water	4.02 mg/L	10 mL	4.02 mg/L	1	0.07	0.50		<1	11/7/19 03:32:00	N
KQ1916155-26	Carbon, Dissolved Organic (DOC)	DUP	T1901863-004	Water	3.92 mg/L	10 mL	3.92 mg/L	1	0.07	0.50		<1	11/7/19 03:00:00	N
KQ1916155-27	Carbon, Dissolved Organic (DOC)	DUP	T1901863-003	Water	3.91 mg/L	10 mL	3.91 mg/L	1	0.07	0.50		1	11/7/19 02:27:00	N
KQ1916155-28	Carbon, Dissolved Organic (DOC)	DUP	T1901863-002	Water	3.84 mg/L	10 mL	3.84 mg/L	1	0.07	0.50		2	11/7/19 01:55:00	N
KQ1916155-29	Carbon, Dissolved Organic (DOC)	DUP	T1901863-001	Water	3.92 mg/L	10 mL	3.92 mg/L	1	0.07	0.50		1	11/7/19 01:23:00	N
T1901863-001	Carbon, Dissolved Organic (DOC)	N/A		Water	3.97 mg/L	10 mL	3.97 mg/L	1	0.07	0.50			11/7/19 01:23:00	N
T1901863-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.91 mg/L	10 mL	3.91 mg/L	1	0.07	0.50			11/7/19 01:55:00	N
T1901863-003	Carbon, Dissolved Organic (DOC)	N/A		Water	3.96 mg/L	10 mL	3.96 mg/L	1	0.07	0.50			11/7/19 02:27:00	N
T1901863-004	Carbon, Dissolved Organic (DOC)	N/A		Water	3.95 mg/L	10 mL	3.95 mg/L	1	0.07	0.50			11/7/19 03:00:00	N
T1901863-005	Carbon, Dissolved Organic (DOC)	N/A		Water	3.98 mg/L	10 mL	3.98 mg/L	1	0.07	0.50			11/7/19 03:32:00	N
T1901863-006	Carbon, Dissolved Organic (DOC)	N/A		Water	3.90 mg/L	10 mL	3.90 mg/L	1	0.07	0.50			11/7/19 04:04:00	N

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

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658208 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
T1901863-007	Carbon, Dissolved Organic (DOC)	N/A		Water	4.19 mg/L	10 mL	4.19 mg/L	1	0.07	0.50			11/7/19 04:36:00	N
T1901863-008	Carbon, Dissolved Organic (DOC)	N/A		Water	4.06 mg/L	10 mL	4.06 mg/L	1	0.07	0.50			11/7/19 06:15:00	N
T1901863-009	Carbon, Dissolved Organic (DOC)	N/A		Water	4.21 mg/L	10 mL	4.21 mg/L	1	0.07	0.50			11/7/19 06:47:00	N

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

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658209 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909955-001	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 07:19:00	N
K1909955-002	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 08:24:00	N
K1909955-003	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 08:56:00	N
K1909955-004	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 10:02:00	N
K1909955-005	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 10:34:00	N
K1909955-006	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 11:06:00	N
K1909955-007	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 11:39:00	N
K1909955-008	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 12:11:00	N
K1909955-009	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 12:43:00	N
K1909955-010	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 13:15:00	N
K1909955-012	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 13:47:00	N
K1909955-013	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/7/19 14:19:00	N
KQ1916156-01	Carbon, Dissolved Organic (DOC)	CCV		Ocean Water	23.33 mg/L	10 mL	23.3 mg/L	1					11/7/19 04:36:00	N
KQ1916156-02	Carbon, Dissolved Organic (DOC)	CCV		Ocean Water	23.69 mg/L	10 mL	23.7 mg/L	1					11/7/19 09:28:00	N
KQ1916156-03	Carbon, Dissolved Organic (DOC)	CCV		Ocean Water	23.68 mg/L	10 mL	23.7 mg/L	1					11/7/19 14:51:00	N
KQ1916156-04	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/7/19 04:52:00	N
KQ1916156-05	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/7/19 09:45:00	N
KQ1916156-06	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/7/19 15:08:00	N
KQ1916156-07	Carbon, Dissolved Organic (DOC)	MB		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/7/19 05:09:00	N
KQ1916156-08	Carbon, Dissolved Organic (DOC)	LCS		Ocean Water	24.24 mg/L	10 mL	24.2 mg/L	1	0.07	0.50	97		11/7/19 05:26:00	N
KQ1916156-09	Carbon, Dissolved Organic (DOC)	MS	K1909955-001	Ocean Water	14.39 mg/L	10 mL	28.8 mg/L	2	0.2	1.0	58*		11/7/19 07:51:00	N

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

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658209 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916156-10	Carbon, Dissolved Organic (DOC)	DUP	K1909955-007	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 11:39:00	N
KQ1916156-11	Carbon, Dissolved Organic (DOC)	DUP	K1909955-008	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 12:11:00	N
KQ1916156-12	Carbon, Dissolved Organic (DOC)	DUP	K1909955-001	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 07:19:00	N
KQ1916156-13	Carbon, Dissolved Organic (DOC)	DUP	K1909955-002	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 08:24:00	N
KQ1916156-14	Carbon, Dissolved Organic (DOC)	DUP	K1909955-003	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 08:56:00	N
KQ1916156-15	Carbon, Dissolved Organic (DOC)	DUP	K1909955-004	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 10:02:00	N
KQ1916156-16	Carbon, Dissolved Organic (DOC)	DUP	K1909955-005	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 10:34:00	N
KQ1916156-17	Carbon, Dissolved Organic (DOC)	DUP	K1909955-009	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 12:43:00	N
KQ1916156-18	Carbon, Dissolved Organic (DOC)	DUP	K1909955-010	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 13:15:00	N
KQ1916156-19	Carbon, Dissolved Organic (DOC)	DUP	K1909955-012	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 13:47:00	N
KQ1916156-20	Carbon, Dissolved Organic (DOC)	DUP	K1909955-013	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 14:19:00	N
KQ1916156-21	Carbon, Dissolved Organic (DOC)	DUP	K1909955-006	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 11:06:00	N

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

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TOC: 658206, 658207
DOC: 658208, 658209

Schedule: 11052019

Version: 1
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/11/05 09:40 - Tuesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	4
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	4
2	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	LOD	Extended Reaction 021711 (Extended Reaction 021711)	4
4	Sample	K1910070-001.05	Extended Reaction 021711 (Extended Reaction 021711)	4
5	Sample	K1910070-001.05 ms	Extended Reaction 021711 (Extended Reaction 021711)	4
6	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
7	Sample	K1910070-002.05	Extended Reaction 021711 (Extended Reaction 021711)	4
8	Sample	K1910070-003.05	Extended Reaction 021711 (Extended Reaction 021711)	4
9	Sample	K1910070-004.05	Extended Reaction 021711 (Extended Reaction 021711)	4
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1910070-006.05	Extended Reaction 021711 (Extended Reaction 021711)	4
11	Sample	K1910070-007.05	Extended Reaction 021711 (Extended Reaction 021711)	4
12	Sample	K1910070-008.05	Extended Reaction 021711 (Extended Reaction 021711)	4
13	Sample	K1910070-009.05	Extended Reaction 021711 (Extended Reaction 021711)	4
14	Sample	K1910070-010.05	Extended Reaction 021711 (Extended Reaction 021711)	4
15	Sample	K1910070-011.05	Extended Reaction 021711 (Extended Reaction 021711)	4
16	Sample	K1910070-012.05	Extended Reaction 021711 (Extended Reaction 021711)	4
17	Sample	K1909995-005.01 50x	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K1909995-006.01 50x	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K1909995-007.01	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1910215-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K1910215-001.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
23	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
24	Sample	K1909958-001.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
25	Sample	K1909958-002.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K1909958-003.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K1909958-004.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K1909958-005.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1909958-006.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K1909958-007.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
31	Sample	K1909958-008.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
32	Sample	K1909958-010.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
33	Sample	K1909958-011.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
34	Sample	K1909958-012.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
35	Sample	K1909958-013.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
36	Sample	K1909958-014.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
37	Sample	K1909958-016.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
38	Sample	K1909958-017.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

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Schedule: 11052019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
40	Sample	K1909958-018.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
41	Sample	K1909958-011.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
42	Sample	K1909958-011.01 ms doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
43	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
44	Sample	K1909958-012.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
45	Sample	K1909958-013.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
46	Sample	K1909958-014.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
47	Sample	K1909958-016.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	K1909958-017.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
49	Sample	K1909958-018.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
50	Sample	K1909958-019.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
51	Sample	K1909958-020.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
52	Sample	T1901863-001.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
53	Sample	T1901863-002.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
54	Sample	T1901863-003.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
55	Sample	T1901863-004.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
56	Sample	T1901863-005.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	T1901863-006.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	T1901863-007.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
60	Sample	T1901863-008.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
61	Sample	T1901863-009.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
62	Sample	K1909955-001.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
63	Sample	K1909955-001.10 ms doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
64	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
65	Sample	K1909955-002.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	K1909955-003.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K1909955-004.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K1909955-005.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
69	Sample	K1909955-006.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
70	Sample	K1909955-007.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	K1909955-008.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K1909955-009.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
73	Sample	K1909955-010.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
74	Sample	K1909955-012.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
75	Sample	K1909955-013.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

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Fusion Report - 11052019
Tuesday, November 05, 2019 09:55 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/11/07 15:38 - Thursday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11052019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1)		
Comment:			

Report Results

11/08/19

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/11/05 09:55

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.42	19.59	6.17	49.73	05:25
2	TC Clean	15.48	19.29	3.81	50.39	04:06
3	TC Clean	5.36	9.02	3.66	50.25	03:49
4	TC Clean	3.97	7.61	3.64	50.17	03:56

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/11/05 10:17

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.19	4.68	3.49	49.77	05:23
2	TC Clean	9.94	13.51	3.57	50.40	04:03
3	TC Clean	2.93	6.57	3.64	50.15	03:47
4	TC Clean	2.03	5.72	3.70	50.19	03:47

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Sample Type: Clean From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/11/05 10:39

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.92	4.70	3.78	49.59	05:09
2	TC Clean	5.73	9.30	3.57	50.35	04:02
3	TC Clean	2.50	6.26	3.75	50.34	03:45
4	TC Clean	2.11	5.81	3.69	50.28	03:45

Sample Type: Blank (Creating v1314) From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/11/05 11:01

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.97	4.55	3.58	49.64	05:09
2	TC Clean	6.16	9.85	3.69	50.35	04:03
3	TC Clean	2.48	6.18	3.69	50.29	03:47
4	TC Clean	2.43	6.18	3.75	50.23	03:48
5	Reagent Blank	4.43	8.21	3.77	50.29	05:05
6	Acid Blank	1.02	4.69	3.68	49.62	05:26

Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.5614 ppm	0.0000 ppm	0.0000%	2019/11/05 11:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5614	5.6144	14.37	18.18	3.82	50.45	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 1

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	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.1171 ppm (PASS)	0.0000 ppm	0%	2019/11/05 11:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1171	241.1715	184.09	187.88	3.78	50.45	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/05 12:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	8.73	12.40	3.68	50.44	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/05 12:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.02	11.73	3.71	50.45	12:26
2	TOC	0.0000	0.0000	7.89	11.66	3.77	50.44	12:28
3	TOC	0.0000	0.0000	8.09	11.66	3.57	50.43	12:30
4	TOC	0.0000	0.0000	7.98	11.64	3.66	50.45	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.5315 ppm	0.0138 ppm	0.06%	2019/11/05 13:28

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							(PASS)			

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.5513	245.5130	187.20	190.82	3.61	50.41	12:31
C	TOC	25.0 ppm	2	24.5283	245.2829	187.04	190.82	3.78	50.50	12:27
C	TOC	25.0 ppm	3	24.5268	245.2676	187.03	190.73	3.70	50.41	12:26
C	TOC	25.0 ppm	4	24.5195	245.1950	186.98	190.79	3.82	50.42	12:26

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.1329 ppm	0.0000 ppm	0.0000%	2019/11/05 14:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1329	1.3287	11.30	14.92	3.63	50.42	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	LOD	0.1552 ppm	0.0522 ppm	33.6400%	2019/11/05 14:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1479	1.4793	11.40	15.11	3.71	50.40	12:28
2	TOC	0.1874	1.8740	11.69	15.37	3.69	50.40	12:25
3	TOC	0.2008	2.0079	11.78	15.40	3.61	50.38	12:27
4	TOC	0.0845	0.8448	10.95	14.89	3.94	50.37	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1910070-001.05	0.7930 ppm	0.0289 ppm	3.6400%	2019/11/05 15:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8295	8.2950	16.29	19.85	3.56	50.38	12:30
2	TOC	0.7644	7.6437	15.82	19.57	3.75	50.39	12:25
3	TOC	0.7764	7.7636	15.91	19.70	3.79	50.41	12:27
4	TOC	0.8016	8.0160	16.09	19.75	3.66	50.43	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC)	Extended Reaction	Extended Reaction

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(v1314) 021711 (v4) 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1910070-001.05 ms	25.8271 ppm	0.0518 ppm	0.2000%	2019/11/05 16:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.8964	258.9641	196.03	199.64	3.62	50.44	12:30
2	TOC	25.8006	258.0060	195.34	199.06	3.72	50.45	12:28
3	TOC	25.7770	257.7703	195.17	198.79	3.62	50.48	12:28
4	TOC	25.8342	258.3421	195.58	199.29	3.70	50.48	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/05 17:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.53	11.28	3.74	50.48	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1910070-002.05	0.6982 ppm	0.0185 ppm	2.6500%	2019/11/05 18:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6910	6.9101	15.30	18.98	3.68	50.50	12:30
2	TOC	0.7189	7.1890	15.50	19.01	3.51	50.53	12:30
3	TOC	0.6764	6.7636	15.19	18.80	3.61	50.54	12:29
4	TOC	0.7066	7.0663	15.41	19.02	3.61	50.56	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1910070-003.05	0.7175 ppm	0.0574 ppm	8.0000%	2019/11/05 19:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6320	6.3201	14.88	18.48	3.61	50.57	12:32
2	TOC	0.7373	7.3731	15.63	19.15	3.52	50.60	12:28
3	TOC	0.7543	7.5432	15.75	19.30	3.55	50.61	12:26
4	TOC	0.7464	7.4637	15.69	19.28	3.59	50.63	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8730	8.7301	16.60	20.17	3.57	50.64	12:29
2	TOC	0.9044	9.0439	16.83	20.61	3.78	50.64	12:30
3	TOC	0.7941	7.9407	16.04	19.82	3.78	50.66	12:26
4	TOC	0.7474	7.4735	15.70	19.41	3.71	50.67	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.7236 ppm (PASS)	0.0000 ppm	0%	2019/11/05 21:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7236	237.2358	181.27	184.69	3.42	50.69	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/05 21:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.82	10.46	3.64	50.72	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1910070-006.05	0.6407 ppm	0.0109 ppm	1.7000%	2019/11/05 22:01

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6465	6.4652	14.98	18.51	3.53	50.73	12:26
2	TOC	0.6259	6.2588	14.83	18.32	3.49	50.80	12:28
3	TOC	0.6397	6.3968	14.93	18.44	3.51	50.74	12:28
4	TOC	0.6507	6.5070	15.01	18.76	3.75	50.73	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1910070-007.05	0.5704 ppm	0.0444 ppm	7.7800%	2019/11/05 23:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5546	5.5461	14.32	17.93	3.61	50.74	12:28
2	TOC	0.5356	5.3564	14.18	17.86	3.67	50.73	12:25
3	TOC	0.5560	5.5601	14.33	17.95	3.62	50.73	12:27
4	TOC	0.6355	6.3550	14.90	18.38	3.48	50.72	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1910070-008.05	0.5765 ppm	0.0277 ppm	4.8000%	2019/11/06 00:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5960	5.9603	14.62	18.21	3.59	50.72	12:27
2	TOC	0.5977	5.9771	14.63	18.29	3.66	50.71	12:27
3	TOC	0.5741	5.7414	14.46	18.11	3.65	50.70	12:30
4	TOC	0.5383	5.3829	14.20	17.81	3.61	50.70	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1910070-009.05	0.6194 ppm	0.0439 ppm	7.0900%	2019/11/06 01:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5626	5.6256	14.38	18.02	3.65	50.67	12:27
2	TOC	0.6419	6.4192	14.95	18.51	3.56	50.67	12:26
3	TOC	0.6096	6.0956	14.71	18.34	3.63	50.76	12:28
4	TOC	0.6635	6.6353	15.10	18.53	3.43	50.70	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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

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		Type			(ppmC)		
◆	14	TOC	K1910070-010.05	0.5749 ppm	0.0156 ppm	2.7100%	2019/11/06 02:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5518	5.5182	14.30	17.89	3.59	50.70	12:26
2	TOC	0.5859	5.8585	14.54	18.08	3.54	50.70	12:26
3	TOC	0.5799	5.7985	14.50	18.06	3.56	50.72	12:25
4	TOC	0.5822	5.8222	14.52	18.16	3.64	50.72	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K1910070-011.05	0.5266 ppm	0.0355 ppm	6.7400%	2019/11/06 03:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5231	5.2309	14.09	17.67	3.58	50.70	12:28
2	TOC	0.5563	5.5628	14.33	18.09	3.76	50.72	12:31
3	TOC	0.4779	4.7791	13.77	17.54	3.77	50.79	12:29
4	TOC	0.5492	5.4917	14.28	17.92	3.64	50.72	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K1910070-012.05	0.5268 ppm	0.0271 ppm	5.1500%	2019/11/06 04:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4874	4.8739	13.84	17.49	3.65	50.71	12:31
2	TOC	0.5303	5.3034	14.15	17.85	3.71	50.71	12:25
3	TOC	0.5428	5.4276	14.24	17.95	3.71	50.72	12:27
4	TOC	0.5465	5.4652	14.26	18.01	3.75	50.73	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K1909995-005.01 50x	58.5081 ppm	0.1162 ppm	0.2000%	2019/11/06 05:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	58.5902	585.9021	430.45	434.04	3.59	50.73	12:29
2	TOC	58.4259	584.2592	429.27	433.06	3.78	50.73	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

		Analysis			Std. Dev.		

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	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	18	TOC	K1909995-006.01 50x	0.7745 ppm	0.2699 ppm	34.8500%	2019/11/06 05:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9653	9.6533	17.26	21.00	3.74	50.74	12:31
2	TOC	0.5836	5.8362	14.53	18.16	3.63	50.82	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1909995-007.01	7.4337 ppm	0.1045 ppm	1.4100%	2019/11/06 06:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.5076	75.0761	64.18	67.70	3.53	50.73	12:31
2	TOC	7.3598	73.5978	63.11	66.83	3.72	50.74	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.5947 ppm (PASS)	0.0000 ppm	0%	2019/11/06 07:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5947	235.9472	180.34	183.87	3.53	50.74	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/06 07:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.46	10.11	3.66	50.74	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria	Do Nothing	Extended Reaction	Extended Reaction	0 ppmC

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met.	021711 (v4)	021711 (v27)

Sample Type: Sample — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 07:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.82	9.51	3.70	50.72	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER — From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.0602 ppm (PASS)	0.0000 ppm	0%	2019/11/06 07:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.0602	240.6025	183.68	187.32	3.63	50.70	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1910215-001.01	2.1062 ppm	0.0075 ppm	0.3600%	2019/11/06 08:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1115	21.1145	25.48	29.17	3.69	50.71	12:26
2	TOC	2.1009	21.0085	25.41	29.11	3.70	50.57	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1910215-001.01 ms	27.5240 ppm	0.0000 ppm	0.0000%	2019/11/06 08:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.5240	275.2396	207.70	211.22	3.52	50.53	12:34

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 08:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.99	10.47	3.47	50.52	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1909958-001.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 09:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.65	13.16	3.51	50.52	12:28
2	TOC	0.0000	0.0000	9.98	13.81	3.83	50.48	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1909958-002.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 09:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.30	13.14	3.85	50.43	12:29
2	TOC	0.0000	0.0000	9.37	12.94	3.58	50.46	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1909958-003.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 10:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.84	12.34	3.51	50.44	12:26
2	TOC	0.0000	0.0000	8.75	12.32	3.57	50.42	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1909958-004.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 10:51

Rep	Base			Adjusted		Baseline	Pressure	Run

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#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	0.0000	0.0000	8.53	11.91	3.38	50.42	12:26
2	TOC	0.0000	0.0000	8.30	11.99	3.69	50.48	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1909958-005.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 11:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.22	11.75	3.53	50.38	12:26
2	TOC	0.0000	0.0000	8.43	12.05	3.62	50.47	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.6979 ppm (PASS)	0.0000 ppm	0%	2019/11/06 11:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6979	236.9792	181.08	184.67	3.59	50.67	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/06 12:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.70	10.32	3.62	50.72	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

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Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1909958-006.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 12:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.91	11.44	3.53	50.69	12:30
2	TOC	0.0000	0.0000	7.67	11.15	3.49	50.58	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K1909958-007.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 13:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.47	11.16	3.69	50.52	12:28
2	TOC	0.0000	0.0000	7.44	11.07	3.64	50.50	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	K1909958-008.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 13:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.37	11.15	3.78	50.49	12:28
2	TOC	0.0000	0.0000	7.71	11.32	3.61	50.46	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	K1909958-010.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 14:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.27	11.08	3.81	50.46	12:30
2	TOC	0.0000	0.0000	7.77	11.19	3.42	50.43	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	33	TOC	K1909958-011.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 14:36

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

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1	TOC	0.0000	0.0000	7.20	10.72	3.52	50.42	12:30
2	TOC	0.0000	0.0000	7.33	10.98	3.65	50.42	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1909958-012.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 15:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.49	10.97	3.48	50.39	12:30
2	TOC	0.0000	0.0000	6.86	10.36	3.50	50.37	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1909958-013.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 15:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.07	10.73	3.66	50.36	12:31
2	TOC	0.0000	0.0000	7.14	10.84	3.70	50.39	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K1909958-014.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 16:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.04	10.49	3.45	50.39	12:28
2	TOC	0.0000	0.0000	7.00	10.73	3.74	50.41	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1909958-016.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 16:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.02	10.58	3.55	50.41	12:26
2	TOC	0.0000	0.0000	7.19	11.02	3.83	50.43	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1909958-017.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 17:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.36	10.98	3.61	50.44	12:29
2	TOC	0.0000	0.0000	7.37	11.14	3.77	50.44	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.6593 ppm (PASS)	0.0000 ppm	0%	2019/11/06 17:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6593	236.5929	180.81	184.33	3.52	50.43	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/06 18:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.52	10.16	3.64	50.45	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 18:22

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

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1	TOC	0.0000	0.0000	5.80	9.55	3.74	50.46	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER — From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.4252 ppm (PASS)	0.0000 ppm	0%	2019/11/06 18:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4252	244.2523	186.30	189.99	3.69	50.45	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K1909958-018.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 18:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.12	11.77	3.65	50.45	12:26
2	TOC	0.0000	0.0000	7.26	10.88	3.62	50.46	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K1909958-011.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 19:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.42	11.07	3.65	50.48	12:25
2	TOC	0.0000	0.0000	7.16	10.79	3.64	50.48	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K1909958-011.01 ms doc 2x	13.7121 ppm	0.0000 ppm	0.0000%	2019/11/06 20:00

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.7121	137.1210	108.66	112.26	3.59	50.48	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 20:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.11	10.76	3.65	50.50	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1909958-012.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 20:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.45	10.97	3.51	50.48	12:27
2	TOC	0.0000	0.0000	7.03	10.59	3.56	50.57	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1909958-013.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 21:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.30	10.92	3.63	50.49	12:28
2	TOC	0.0000	0.0000	7.28	10.81	3.53	50.52	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1909958-014.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 21:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.54	11.14	3.59	50.50	12:27
2	TOC	0.0000	0.0000	7.93	11.48	3.55	50.52	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC)	Extended Reaction	Extended Reaction

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(v1314) 021711 (v4) 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1909958-016.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 22:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.83	11.38	3.55	50.49	12:29
2	TOC	0.0000	0.0000	7.33	10.92	3.59	50.52	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.3988 ppm (PASS)	0.0000 ppm	0%	2019/11/06 22:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.3988	233.9877	178.94	182.68	3.74	50.56	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/06 22:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.61	10.25	3.64	50.56	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1909958-017.01 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 23:15

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.26	11.80	3.54	50.53	12:28
2	TOC	0.0000	0.0000	8.07	11.65	3.57	50.51	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	K1909958-018.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/06 23:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.14	10.86	3.72	50.52	12:27
2	TOC	0.0000	0.0000	7.33	11.11	3.78	50.54	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1909958-019.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 00:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.80	11.46	3.65	50.55	12:26
2	TOC	0.0000	0.0000	7.77	11.43	3.66	50.52	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1909958-020.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 00:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.01	10.61	3.60	50.50	12:28
2	TOC	0.0000	0.0000	6.97	10.63	3.66	50.52	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	T1901863-001.05 doc	3.9460 ppm	0.0331 ppm	0.8400%	2019/11/07 01:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9694	39.6940	38.80	42.45	3.64	50.55	12:26

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2	TOC	3.9225	39.2254	38.47	42.00	3.53	50.58	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	T1901863-002.05 doc	3.8734 ppm	0.0521 ppm	1.3400%	2019/11/07 01:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9103	39.1026	38.38	41.91	3.53	50.52	12:26
2	TOC	3.8366	38.3663	37.85	41.39	3.54	50.53	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	T1901863-003.05 doc	3.9378 ppm	0.0338 ppm	0.8600%	2019/11/07 02:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9617	39.6173	38.75	42.24	3.49	50.57	12:26
2	TOC	3.9139	39.1389	38.41	41.93	3.52	50.62	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	T1901863-004.05 doc	3.9352 ppm	0.0203 ppm	0.5200%	2019/11/07 03:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9496	39.4959	38.66	42.28	3.62	50.56	12:28
2	TOC	3.9209	39.2086	38.46	42.05	3.59	50.56	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	56	TOC	T1901863-005.05 doc	4.0026 ppm	0.0276 ppm	0.6900%	2019/11/07 03:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9831	39.8306	38.90	42.57	3.66	50.52	12:32
2	TOC	4.0221	40.2211	39.18	42.65	3.47	50.56	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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

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◆	57	TOC	T1901863-006.05 doc	3.9347 ppm	0.0480 ppm	1.2200%	2019/11/07 04:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9008	39.0078	38.31	41.93	3.62	50.55	12:29
2	TOC	3.9687	39.6870	38.80	42.37	3.57	50.53	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.3313 ppm (PASS)	0.0000 ppm	0%	2019/11/07 04:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.3313	233.3127	178.46	181.95	3.49	50.52	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/07 04:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.12	9.70	3.58	50.54	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 05:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.53	9.16	3.64	50.50	12:32

Dilution	Blank Contribution	Method	Calibration

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1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER — From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.2431 ppm (PASS)	0.0000 ppm	0%	2019/11/07 05:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.2431	242.4309	184.99	188.60	3.60	50.53	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	59	TOC	T1901863-007.05 doc	4.1795 ppm	0.0123 ppm	0.2900%	2019/11/07 05:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1882	41.8822	40.37	43.94	3.57	50.52	12:27
2	TOC	4.1708	41.7078	40.25	43.88	3.64	50.48	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	T1901863-008.05 doc	4.0509 ppm	0.0094 ppm	0.2300%	2019/11/07 06:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0575	40.5754	39.44	43.08	3.64	50.43	12:29
2	TOC	4.0443	40.4429	39.34	43.11	3.77	50.51	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	T1901863-009.05 doc	4.2158 ppm	0.0137 ppm	0.3300%	2019/11/07 06:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2061	42.0607	40.50	44.21	3.71	50.55	12:26
2	TOC	4.2255	42.2545	40.64	44.20	3.56	50.50	12:25

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	K1909955-001.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 07:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.37	11.90	3.53	50.51	12:30
2	TOC	0.0000	0.0000	7.86	11.46	3.60	50.61	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	K1909955-001.10 ms doc 2x	14.3921 ppm	0.0000 ppm	0.0000%	2019/11/07 07:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.3921	143.9213	113.54	117.08	3.54	50.51	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 08:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.46	11.24	3.78	50.50	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	K1909955-002.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 08:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.99	11.53	3.54	50.47	12:30
2	TOC	0.0000	0.0000	7.93	11.55	3.62	50.50	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	K1909955-003.10 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 08:56

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.12	10.67	3.55	50.47	12:30
2	TOC	0.0000	0.0000	6.94	10.52	3.57	50.49	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.6886 ppm (PASS)	0.0000 ppm	0%	2019/11/07 09:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6886	236.8857	181.02	184.61	3.59	50.47	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/07 09:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.43	9.92	3.49	50.43	12:36

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 1

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	K1909955-004.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 10:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.41	11.07	3.66	50.40	12:27

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2	TOC	0.0000	0.0000	7.66	11.24	3.58	50.31	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1909955-005.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 10:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.56	11.24	3.68	50.32	12:29
2	TOC	0.0000	0.0000	8.20	11.68	3.49	50.35	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	K1909955-006.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 11:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.48	12.23	3.75	50.32	12:32
2	TOC	0.0000	0.0000	8.94	12.42	3.49	50.35	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K1909955-007.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 11:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.62	11.22	3.60	50.40	12:28
2	TOC	0.0000	0.0000	7.87	11.46	3.59	50.39	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K1909955-008.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 12:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.61	12.13	3.52	50.40	12:31
2	TOC	0.0000	0.0000	8.85	12.34	3.49	50.40	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC)	Extended Reaction	Extended Reaction

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(v1314) 021711 (v4) 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1909955-009.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 12:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.31	11.91	3.60	50.37	12:31
2	TOC	0.0000	0.0000	8.64	12.29	3.64	50.37	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K1909955-010.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 13:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.55	12.14	3.59	50.32	12:27
2	TOC	0.0000	0.0000	8.12	11.88	3.76	50.31	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K1909955-012.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 13:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.36	11.95	3.59	50.30	12:27
2	TOC	0.0000	0.0000	8.38	12.16	3.78	50.27	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	75	TOC	K1909955-013.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 14:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.41	12.01	3.60	50.23	12:29
2	TOC	0.0000	0.0000	8.36	11.94	3.58	50.23	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3433 (IC) (v1314)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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Sample Type: Check Standard --> CCV 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.6840 ppm (PASS)	0.0000 ppm	0%	2019/11/07 14:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6840	236.8397	180.98	184.40	3.41	50.20	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 1

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/07 15:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.26	10.69	3.43	50.20	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1313	1.1747	1.1290	0.0000	0.0000	0.0000	2019/11/02 12:41	Fusion1 (Fusion1)
v1314	1.4780	1.0180	0.0000	0.0000	0.0000	2019/11/05 11:34	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version:	v27	Calibration curve formula:	TOC: y = 7.170x + 11.164
Ver Creation:	2019/03/11 21:51	r^2 value:	TOC: r^2 = 0.99991
Comment:			

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Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	10.4100	0.0000		2019/03/11 20:12
0.50 ppm	14.7740	0.5000		2019/03/11 20:28
1.00 ppm	18.0020	1.0000		2019/03/11 20:44
5.00 ppm	47.2310	5.0000		2019/03/11 21:01
10.0 ppm	85.1320	10.0000		2019/03/11 21:17
25.0 ppm	188.5200	25.0000		2019/03/11 21:33
50.0 ppm	370.1610	50.0000		2019/03/11 21:49

Methods

Name: Extended Reaction 021711 (TOC)

Version: v4
Operator: Fusion1 (Fusion1)
Ver Creation: 2019/01/31 11:21
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

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Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/11/07 15:25

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StarLIMS Run: 658206, 658207, 658208, 658209

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-82E

21 % H3PO4: 11-GEN-05-82G

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: BeP	Date Analyzed: 11/5/19
Reviewed By: [signature]	Date Reviewed: 11/08/19

Method Detection Limit - LOD Verification

ALS - Kelso

Analytical Method:	9060/9060A	Instrument:	Fusion K- TOC-03
Extr./Dig. Method:		Analyst(s):	BCD
Matrix:	Water		
Units:	mg/L		

Analyte	MDL	Sample ID:	K1900530-26		K1902807-14		K1906524-014		K1909860-14	
		Date Analyzed:	3/12/2019		4/10/2019		7/27/2019		11/5/2019	
		Runno	628235		631516		645183		658206	
		Spike Level	Result 1	s/n >3	Result 2	s/n >3	Result 3	s/n >3	Result 4	s/n >3
total organic carbon	0.08	0.16	0.030	y	0.233	y	0.0983	y	0.14790	y
total organic carbon	0.08	0.16	0.021	y	0.18726	y	0.0869	y	0.1874	y'
total organic carbon	0.08	0.16	0.007	y	0.21016	y	0.1085	y	0.2008	y
total organic carbon	0.08	0.16	0.052	y	0.17816	y	0.0506	y	0.0845	y
Supervisor Approval:			TH 03/15/19		TH 04/12/19		IF 07/31/19		TH 11/08/19	

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r.02/24/10

Limit of Quantitation - LOQ Verification

ALS Environmental - Kelso

Analytical Method:	9060/9060A								
Extr./Dig. Method:				Instrument:	Fusion K-TOC-03				
Matrix:	Water			Analyst(s):	BCD				
Units:	mg/L								
	K1902807-14	K1906524-14	K1909860-14						
Analyte	Date Analyzed: / Spike Level	4/10/2019 Result	7/27/2019 Result	10/26/2019 Result	Result	Avg Percent Recovery	Percent RSD	% Rec Limits	% RSD Limits
total organic carbon	0.500	0.582	0.409	0.628		108	21.40	50-150	20
total organic carbon	0.500	0.519	0.442	0.713		112	25.05		
total organic carbon	0.500	0.495	0.396	0.656		103	25.41		
total organic carbon	0.500	0.528	0.411	0.638		105	21.61		
		R-631516	Run: 645183	R-657284		#DIV/0!	#DIV/0!		
						#DIV/0!	#DIV/0!		
Supervisor Approval:		TH 04/12/19	IF 7/31/19	TH 11/08/19					

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Work Request # Original (K19)0995509958,09958,09995,09964,09967,10165,

Tier: IV IV IV IV IV IV

Date Analyzed: 11/7/19

Analyst: HLM for BCD

Analysis: TOC/DOC

TOC: 658970, 658971, DOC: 658972, Run # 658973

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS:

K1909958-20MS, K1909964-1MS, K1909958-14MS, K1909967-1MS all have low % recovery, suggests matrix interference

K1910165-14, 14D have high % RPD, however, sample is less than 5x the MRL

Final Approved by: [signature] Date: 11/12/19

DQREPORT

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658970 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909955-019	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/7/19 23:42	N
K1909955-020	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 00:48	N
K1909958-019	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/7/19 22:05	N
K1909958-020	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/7/19 22:37	N
K1909995-005	Carbon, Total Organic	N/A		Water	4.12 mg/L	10 ml	3290 mg/L	800	60	400			11/7/19 21:01	N
K1909995-006	Carbon, Total Organic	N/A		Water	1.90 mg/L	10 ml	38 mg/L	20	2	10			11/7/19 21:33	N
KQ1916550-01	Carbon, Total Organic	CCV		Water	23.88 mg/L	10 ml	23.9 mg/L	1					11/7/19 19:26	N
KQ1916550-02	Carbon, Total Organic	CCV		Water	23.88 mg/L	10 ml	23.9 mg/L	1					11/8/19 00:15	N
KQ1916550-03	Carbon, Total Organic	CCV		Water	23.92 mg/L	10 ml	23.9 mg/L	1					11/8/19 05:37	N
KQ1916550-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/7/19 19:43	N
KQ1916550-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/8/19 00:31	N
KQ1916550-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/8/19 05:54	N
KQ1916550-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/7/19 20:11	N
KQ1916550-08	Carbon, Total Organic	LCS		Water	24.39 mg/L	10 ml	24.4 mg/L	1	0.07	0.50	98		11/7/19 20:28	N
KQ1916550-09	Carbon, Total Organic	MS	K1909958-020	Ocean Water	14.35 mg/L	10 ml	28.7 mg/L	2	0.2	1.0	57*		11/7/19 23:10	N
KQ1916550-10	Carbon, Total Organic	DUP	K1909995-005	Water	4.26 mg/L	10 ml	3400 mg/L	800	60	400		3	11/7/19 21:01	N
KQ1916550-11	Carbon, Total Organic	DUP	K1909995-006	Water	1.91 mg/L	10 ml	38 mg/L	20	2	10		<1	11/7/19 21:33	N
KQ1916550-12	Carbon, Total Organic	DUP	K1909958-019	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 22:05	N
KQ1916550-13	Carbon, Total Organic	DUP	K1909958-020	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 22:37	N
KQ1916550-14	Carbon, Total Organic	DUP	K1909955-019	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/7/19 23:42	N
KQ1916550-15	Carbon, Total Organic	DUP	K1909955-020	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 00:48	N

11/12/19

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

HCM 11/12/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658971 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909964-001	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 01:20	N
K1909964-002	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 02:25	N
K1909964-003	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 02:57	N
K1909964-004	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 03:29	N
K1909964-005	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 04:01	N
K1909964-006	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 04:33	N
K1909964-008	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 05:05	N
K1909964-009	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 06:44	N
K1909964-010	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 07:16	N
K1909964-011	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 07:48	N
K1909964-012	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 08:20	N
K1909964-014	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 08:52	N
K1909964-015	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 09:24	N
K1909964-016	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 09:56	N
K1909964-017	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 10:29	N
K1909964-018	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 11:34	N
K1909964-019	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 12:07	N
K1909964-020	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 12:39	N
KQ1916552-01	Carbon, Total Organic	CCV		Ocean Water	23.88 mg/L	10 ml	23.9 mg/L	1					11/8/19 00:15	N
KQ1916552-02	Carbon, Total Organic	CCV		Ocean Water	23.92 mg/L	10 ml	23.9 mg/L	1					11/8/19 05:37	N
KQ1916552-03	Carbon, Total Organic	CCV		Ocean Water	23.71 mg/L	10 ml	23.7 mg/L	1					11/8/19 11:01	N

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

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658971 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916552-04	Carbon, Total Organic	CCV		Ocean Water	23.85 mg/L	10 ml	23.8 mg/L	1					11/8/19 16:24	N
KQ1916552-05	Carbon, Total Organic	CCB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/8/19 00:31	N
KQ1916552-06	Carbon, Total Organic	CCB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/8/19 05:54	N
KQ1916552-07	Carbon, Total Organic	CCB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/8/19 11:18	N
KQ1916552-08	Carbon, Total Organic	CCB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/8/19 16:41	N
KQ1916552-09	Carbon, Total Organic	MB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/8/19 06:11	N
KQ1916552-10	Carbon, Total Organic	LCS		Ocean Water	25.15 mg/L	10 ml	25.2 mg/L	1	0.07	0.50	101		11/8/19 06:28	N
KQ1916552-11	Carbon, Total Organic	MS	K1909964-001	Ocean Water	14.94 mg/L	10 ml	29.9 mg/L	2	0.2	1.0	60*		11/8/19 01:52	N
KQ1916552-12	Carbon, Total Organic	DUP	K1909964-001	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 01:20	N
KQ1916552-13	Carbon, Total Organic	DUP	K1909964-002	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 02:25	N
KQ1916552-14	Carbon, Total Organic	DUP	K1909964-003	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 02:57	N
KQ1916552-15	Carbon, Total Organic	DUP	K1909964-004	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 03:29	N
KQ1916552-16	Carbon, Total Organic	DUP	K1909964-005	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 04:01	N
KQ1916552-17	Carbon, Total Organic	DUP	K1909964-006	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 04:33	N
KQ1916552-18	Carbon, Total Organic	DUP	K1909964-008	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 05:05	N
KQ1916552-19	Carbon, Total Organic	DUP	K1909964-009	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 06:44	N
KQ1916552-20	Carbon, Total Organic	DUP	K1909964-010	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 07:16	N
KQ1916552-21	Carbon, Total Organic	DUP	K1909964-011	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 07:48	N
KQ1916552-22	Carbon, Total Organic	DUP	K1909964-012	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 08:20	N
KQ1916552-23	Carbon, Total Organic	DUP	K1909964-014	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 08:52	N
KQ1916552-24	Carbon, Total Organic	DUP	K1909964-015	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 09:24	N

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

HCM 11/12/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658971 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916552-25	Carbon, Total Organic	DUP	K1909964-016	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 09:56	N
KQ1916552-26	Carbon, Total Organic	DUP	K1909964-017	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 10:29	N
KQ1916552-27	Carbon, Total Organic	DUP	K1909964-018	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 11:34	N
KQ1916552-28	Carbon, Total Organic	DUP	K1909964-019	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 12:07	N
KQ1916552-29	Carbon, Total Organic	DUP	K1909964-020	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 12:39	N

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

HLM 11/12/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658972 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909955-014	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 13:11	N
K1909955-015	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 14:16	N
K1909955-016	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 14:48	N
K1909955-018	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 15:20	N
K1909955-019	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 15:52	N
K1909955-020	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 17:31	N
K1909964-001	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 18:03	N
K1909964-002	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 18:35	N
K1909964-003	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 19:07	N
K1909964-004	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 19:39	N
K1909964-005	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 20:12	N
K1909964-006	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 20:44	N
K1909964-008	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 21:16	N
K1909964-009	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 22:21	N
K1909964-010	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 22:54	N
K1909964-011	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 23:26	N
K1909964-012	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/8/19 23:58	N
K1909964-014	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 00:30	N
K1909964-015	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 01:02	N
K1909964-016	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 01:34	N
KQ1916553-01	Carbon, Dissolved Organic (DOC)	CCV		Ocean Water	23.71 mg/L	10 ml	23.7 mg/L	1					11/8/19 11:01	N

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

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658972 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916553-23	Carbon, Dissolved Organic (DOC)	DUP	K1909964-014	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 00:30	N
KQ1916553-24	Carbon, Dissolved Organic (DOC)	DUP	K1909964-015	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 01:02	N
KQ1916553-25	Carbon, Dissolved Organic (DOC)	DUP	K1909964-016	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 01:34	N
KQ1916553-26	Carbon, Dissolved Organic (DOC)	DUP	K1909955-014	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 13:11	N
KQ1916553-27	Carbon, Dissolved Organic (DOC)	DUP	K1909955-015	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 14:16	N
KQ1916553-28	Carbon, Dissolved Organic (DOC)	DUP	K1909955-016	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 14:48	N
KQ1916553-29	Carbon, Dissolved Organic (DOC)	DUP	K1909955-018	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 15:20	N
KQ1916553-30	Carbon, Dissolved Organic (DOC)	DUP	K1909955-019	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 15:52	N
KQ1916553-31	Carbon, Dissolved Organic (DOC)	DUP	K1909955-020	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/8/19 17:31	N

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

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658973 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1909964-017	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 02:06	N
K1909964-018	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 02:38	N
K1909964-019	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 03:10	N
K1909964-020	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 04:49	N
K1909967-001	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 05:21	N
K1909967-002	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 06:27	N
K1909967-003	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 06:59	N
K1909967-004	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 07:31	N
K1909967-006	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 08:03	N
K1909967-007	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 09:08	N
K1909967-008	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 09:40	N
K1909967-009	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 10:12	N
K1909967-010	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 10:45	N
K1909967-012	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 11:17	N
K1910165-007	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 11:49	N
K1910165-008	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.14 mg/L	10 ml	0.3 mg/L J	2	0.2	1.0			11/9/19 12:21	N
K1910165-013	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0			11/9/19 12:53	N
K1910165-014	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.16 mg/L	10 ml	0.3 mg/L J	2	0.2	1.0			11/9/19 13:25	N
KQ1916554-01	Carbon, Dissolved Organic CCV (DOC)			Ocean Water	23.80 mg/L	10 ml	23.8 mg/L	1					11/8/19 21:48	N
KQ1916554-02	Carbon, Dissolved Organic CCV (DOC)			Ocean Water	23.72 mg/L	10 ml	23.7 mg/L	1					11/9/19 03:42	N
KQ1916554-03	Carbon, Dissolved Organic CCV (DOC)			Ocean Water	23.66 mg/L	10 ml	23.7 mg/L	1					11/9/19 08:35	N

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Printed 11/12/19 11:09

Results Summary 11/12/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658973 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916554-04	Carbon, Dissolved Organic (DOC)	CCV		Ocean Water	23.59 mg/L	10 ml	23.6 mg/L	1					11/9/19 13:57	N
KQ1916554-05	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/8/19 22:05	N
KQ1916554-06	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/9/19 03:59	N
KQ1916554-07	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/9/19 08:51	N
KQ1916554-08	Carbon, Dissolved Organic (DOC)	CCB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/9/19 14:14	N
KQ1916554-09	Carbon, Dissolved Organic (DOC)	MB		Ocean Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/9/19 04:16	N
KQ1916554-10	Carbon, Dissolved Organic (DOC)	LCS		Ocean Water	24.40 mg/L	10 ml	24.4 mg/L	1	0.07	0.50	98		11/9/19 04:32	N
KQ1916554-11	Carbon, Dissolved Organic (DOC)	MS	K1909967-001	Ocean Water	14.55 mg/L	10 ml	29.1 mg/L	2	0.2	1.0	58*		11/9/19 05:53	N
KQ1916554-12	Carbon, Dissolved Organic (DOC)	DUP	K1909967-001	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 05:21	N
KQ1916554-13	Carbon, Dissolved Organic (DOC)	DUP	K1909967-002	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 06:27	N
KQ1916554-14	Carbon, Dissolved Organic (DOC)	DUP	K1909967-003	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 06:59	N
KQ1916554-15	Carbon, Dissolved Organic (DOC)	DUP	K1909967-004	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 07:31	N
KQ1916554-16	Carbon, Dissolved Organic (DOC)	DUP	K1909967-006	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 08:03	N
KQ1916554-17	Carbon, Dissolved Organic (DOC)	DUP	K1909967-007	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 09:08	N
KQ1916554-18	Carbon, Dissolved Organic (DOC)	DUP	K1909967-008	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 09:40	N
KQ1916554-19	Carbon, Dissolved Organic (DOC)	DUP	K1909967-009	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 10:12	N
KQ1916554-20	Carbon, Dissolved Organic (DOC)	DUP	K1909967-010	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 10:45	N
KQ1916554-21	Carbon, Dissolved Organic (DOC)	DUP	K1909967-012	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 11:17	N
KQ1916554-22	Carbon, Dissolved Organic (DOC)	DUP	K1909964-020	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 04:49	N
KQ1916554-23	Carbon, Dissolved Organic (DOC)	DUP	K1909964-017	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 02:06	N
KQ1916554-24	Carbon, Dissolved Organic (DOC)	DUP	K1909964-018	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 02:38	N

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

HLM 11/12/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 658973 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
KQ1916554-25	Carbon, Dissolved Organic (DOC)	DUP	K1909964-019	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 03:10	N
KQ1916554-26	Carbon, Dissolved Organic (DOC)	DUP	K1910165-007	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 11:49	N
KQ1916554-27	Carbon, Dissolved Organic (DOC)	DUP	K1910165-008	Ocean Water	0.13 mg/L	10 ml	0.3 mg/L J	2	0.2	1.0		9	11/9/19 12:21	N
KQ1916554-28	Carbon, Dissolved Organic (DOC)	DUP	K1910165-013	Ocean Water	0.00 mg/L	10 ml	1.0 mg/L U	2	0.2	1.0		NC	11/9/19 12:53	N
KQ1916554-29	Carbon, Dissolved Organic (DOC)	DUP	K1910165-014	Ocean Water	0.11 mg/L	10 ml	0.2 mg/L J	2	0.2	1.0	J	35*	11/9/19 13:25	N

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

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	23.883	0.0000	23.8831	23.8831	23.9	11/7/2019
3	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/7/2019
4	mb	1	0.000	0.0000	0.0000	0	<0.5	11/7/2019
5	lcs	1	24.387	0.0000	24.3867	24.3867	24.4	11/7/2019
6	K1909995-005	800	4.115	0.0000	4.1152	3292.16	3292.16	11/7/2019
7	K1909995-005D	800	4.256	0.0000	4.2557	3404.56	3404.6	11/7/2019
8	K1909995-006	20	1.904	0.0000	1.9036	38.072	38	11/7/2019
9	K1909995-006D	20	1.911	0.0000	1.9107	38.214	38.21	11/7/2019
10	K1909958-019	2	0.000	0.0000	0.0000	0	<0.5	11/7/2019
11	K1909958-019D	2	0.000	0.0000	0.0000	0	<0.5	11/7/2019
12	K1909958-020	2	0.000	0.0000	0.0000	0	<0.5	11/7/2019
13	K1909958-020D	2	0.000	0.0000	0.0000	0	<0.5	11/7/2019
14	KQ1916550-09 K1909958-20MS	2	14.350	0.0000	14.3500	28.7	28.70	11/7/2019
15	K1909955-019	2	0.000	0.0000	0.0000	0	<0.5	11/7/2019
16	K1909955-019D	2	0.000	0.0000	0.0000	0	<0.5	11/7/2019
17	ccv	1	23.883	0.0000	23.8830	23.883	23.88	11/8/2019
18	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
19	K1909955-020	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
20	K1909955-020D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
21	ccv	1	23.917	0.0000	23.9165	23.9165	23.92	11/8/2019
22	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: HLM for BCD	Date Analyzed 11/7/19	
Reviewed By: [signature]	Date Reviewed 11/12/19	

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	23.883	0.0000	23.8830	23.883	23.9	11/8/2019
3	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
4	K1909964-001	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
5	K1909964-001D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
6	KQ1916552-11	2	14.938	0.0000	14.9384	29.8768	29.88	11/8/2019
7	K1909964-002	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
8	K1909964-002D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
9	K1909964-003	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
10	K1909964-003D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
11	K1909964-004	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
12	K1909964-004D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
13	K1909964-005	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
14	K1909964-005D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
15	K1909964-006	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
16	K1909964-006D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
17	K1909964-008	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
18	K1909964-008D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
19	ccv	1	23.917	0.0000	23.9165	23.9165	23.9	11/8/2019
20	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
21	mb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
22	lcs	1	25.154	0.0000	25.1535	25.1535	25.2	11/8/2019
23	K1909964-009	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
24	K1909964-009D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
25	K1909964-010	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: HLM for BCD	Date Analyzed 11/7/19	
Reviewed By:	Date Reviewed 11/12/19	

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1909964-010D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
27	K1909964-011	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
28	K1909964-011D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
29	K1909964-012	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
30	K1909964-012D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
31	K1909964-014	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
32	K1909964-014D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
33	K1909964-015	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
34	K1909964-015D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
35	K1909964-016	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
36	K1909964-016D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
37	K1909964-017	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
38	K1909964-017D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
39	ccv	1	23.706	0.0000	23.7056	23.7056	23.7	11/8/2019
40	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
41	K1909964-018	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
42	K1909964-018D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
43	K1909964-019	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
44	K1909964-019D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
45	K1909964-020	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
46	K1909964-020D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
47	ccv	1	23.850	0.0000	23.8499	23.8499	23.8	11/8/2019
48	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: HLM For BCD	Date Analyzed 11/7/19
Reviewed By:	Date Reviewed 11/12/19

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	23.706	0.0000	23.7056	23.7056	23.7	11/8/2019
3	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
4	K1909955-014	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
5	K1909955-014D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
6	KQ1916553-11	2	12.655	0.0000	12.6551	25.3102	25.31	11/8/2019
7	K1909955-015	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
8	K1909955-015D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
9	K1909955-016	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
10	K1909955-016 D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
11	K1909955-018	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
12	K1909955-018D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
13	K1909955-019	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
14	K1909955-019 D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
15	ccv	1	23.850	0.0000	23.8499	23.8499	23.8	11/8/2019
16	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
17	mb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
18	lcs	1	24.611	0.0000	24.6109	24.6109	24.6	11/8/2019
19	K1909955-020	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
20	K1909955-020D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
21	K1909964-001	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
22	K1909964-001D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
23	K1909964-002	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
24	K1909964-002D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
25	K1909964-003	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: HLM for BCD	Date Analyzed 11/7/19	
Reviewed By:	Date Reviewed 11/12/19	

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Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1909964-003D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
27	K1909964-004	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
28	K1909964-004D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
29	K1909964-005	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
30	K1909964-005D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
31	K1909964-006	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
32	K1909964-006D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
33	K1909964-008	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
34	K1909964-008D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
35	ccv	1	23.804	0.0000	23.8036	23.8036	23.8	11/8/2019
36	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
37	K1909964-009	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
38	K1909964-009D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
39	K1909964-010	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
40	K1909964-010D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
41	K1909964-011	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
42	K1909964-011D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
43	K1909964-012	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
44	K1909964-012D	2	0.000	0.0000	0.0000	0	<0.5	11/8/2019
45	K1909964-014	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
46	K1909964-014D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
47	K1909964-015	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
48	K1909964-015D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
49	K1909964-016	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
50	K1909964-016D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019

Analyzed By: HCM for BCD	Date Analyzed 11/7/19
Reviewed By:	Date Reviewed 11/12/19

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	23.721	0.0000	23.7207	23.7207	23.72	11/9/2019
52	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/9/2019
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
76		1		0.0000	0.0000	0	<0.5	

Analyzed By: HCM Gr. BCD	Date Analyzed 11/7/19
Reviewed By: 11/12/19	Date Reviewed 11/12/19

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	23.804	0.0000	23.8036	23.8036	23.8	11/8/2019
3	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/8/2019
4	K1909964-017	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
5	K1909964-017D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
6	K1909964-018	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
7	K1909964-018D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
8	K1909964-019	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
9	K1909964-019D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
10	ccv	1	23.721	0.0000	23.7207	23.7207	23.72	11/9/2019
11	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/9/2019
12	mb	1	0.000	0.0000	0.0000	0	<0.5	11/9/2019
13	lcs	1	24.397	0.0000	24.3973	24.3973	24.40	11/9/2019
14	K1909964-020	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
15	K1909964-020D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
16	K1909967-001	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
17	K1909967-001D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
18	KQ1916554-11 K1909967-005	2	14.548	0.0000	14.5481	29.0962	29.1	11/9/2019
19	K1909967-002	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
20	K1909967-002D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
21	K1909967-003	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
22	K1909967-003D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
23	K1909967-004	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
24	K1909967-004D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
25	K1909967-006	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: HLM for BCD	Date Analyzed 11/7/19		
Reviewed By:	Date Reviewed 11/12/19		

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Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1909967-006D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
27	ccv	1	23.658	0.0000	23.6576	23.6576	23.66	11/9/2019
28	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/9/2019
29	K1909967-007	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
30	K1909967-007D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
31	K1909967-008	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
32	K1909967-008D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
33	K1909967-009	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
34	K1909967-009D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
35	K1909967-010	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
36	K1909967-010D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
37	K1909967-012	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
38	K1909967-012D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
39	K1910165-007	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
40	K1910165-007D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
41	K1910165-008	2	0.140	0.0000	0.1401	0.2802	<0.5	11/9/2019
42	K1910165-008D	2	0.129	0.0000	0.1285	0.257	<0.5	11/9/2019
43	K1910165-013	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
44	K1910165-013D	2	0.000	0.0000	0.0000	0	<0.5	11/9/2019
45	K1910165-014	2	0.160	0.0000	0.1604	0.3208	<0.5	11/9/2019
46	K1910165-014D	2	0.113	0.0000	0.1129	0.2258	<0.5	11/9/2019
47	ccv	1	23.593	0.0000	23.5930	23.593	23.6	11/9/2019
48	ccb	1	0.000	0.0000	0.0000	0	<0.5	11/9/2019
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

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Analyzed By: HLM for BCD	Date Analyzed 11/7/19
Reviewed By:	Date Reviewed 11/12/19

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TOC: 658970, 658971
DOC: 658972, 658973

Schedule: 11072019

Version: 9
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/11/07 20:17 - Thursday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	K1909995-005.01 800x	Extended Reaction 021711 (Extended Reaction 021711)	2
4	Sample	K1909995-006.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
5	Sample	K1909958-019.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
6	Sample	K1909958-020.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
7	Sample	K1909958-020.06 ms 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
8	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
9	Sample	K1909955-019.07 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1909955-020.07 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1909964-001.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K1909964-001.06 ms 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
13	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
14	Sample	K1909964-002.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	K1909964-003.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
16	Sample	K1909964-004.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	K1909964-005.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K1909964-006.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K1909964-008.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1909964-009.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K1909964-010.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
23	Sample	K1909964-011.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
24	Sample	K1909964-012.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
25	Sample	K1909964-014.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K1909964-015.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K1909964-016.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K1909964-017.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1909964-018.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K1909964-019.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
31	Sample	K1909964-020.06 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
32	Sample	K1909955-014.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
33	Sample	K1909955-014.10 ms doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
34	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
35	Sample	K1909955-015.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
36	Sample	K1909955-016.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
37	Sample	K1909955-018.07 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
38	Sample	K1909955-019.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

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Schedule: 11072019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
40	Sample	K1909955-020.10 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
41	Sample	K1909964-001.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
42	Sample	K1909964-002.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
43	Sample	K1909964-003.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
44	Sample	K1909964-004.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
45	Sample	K1909964-005.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
46	Sample	K1909964-006.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
47	Sample	K1909964-008.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	K1909964-009.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
49	Sample	K1909964-010.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
50	Sample	K1909964-011.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
51	Sample	K1909964-012.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
52	Sample	K1909964-014.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
53	Sample	K1909964-015.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
54	Sample	K1909964-016.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
55	Sample	K1909964-017.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
56	Sample	K1909964-018.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	K1909964-019.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	K1909964-020.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
60	Sample	K1909967-001.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
61	Sample	K1909967-001.01 ms doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
62	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
63	Sample	K1909967-002.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
64	Sample	K1909967-003.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
65	Sample	K1909967-004.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	K1909967-006.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K1909967-007.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K1909967-008.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
69	Sample	K1909967-009.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
70	Sample	K1909967-010.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	K1909967-012.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K1910165-007.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
73	Sample	K1910165-008.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
74	Sample	K1910165-013.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
75	Sample	K1910165-014.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

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Schedule: 11072019

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Schedule: 11072019

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Fusion Report - 11072019
Thursday, November 07, 2019 05:25 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/11/09 14:46 - Saturday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11072019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8) Fusion1 (Fusion1) (v9)		
Comment:			

Report Results

11/12/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/07 17:25

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.83	14.65	3.82	49.57	05:20
2	TC Clean	4.91	8.40	3.49	50.07	04:02
3	TC Clean	1.84	5.55	3.71	50.06	03:46
4	TC Clean	1.47	5.19	3.73	50.13	03:48

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/07 17:47

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.62	14.11	3.50	49.70	05:12

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2	TC Clean	4.60	8.20	3.60	50.11	04:03
3	TC Clean	1.99	5.68	3.69	50.08	03:47
4	TC Clean	1.36	5.17	3.81	50.09	03:45

Sample Type: Clean

From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/07 18:09

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.83	14.54	3.71	49.57	05:11
2	TC Clean	3.86	7.48	3.61	50.06	04:04
3	TC Clean	1.51	5.32	3.81	50.18	03:47
4	TC Clean	1.51	5.26	3.75	50.14	03:49

Sample Type: Blank (Creating v1315)

From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/11/07 18:32

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.93	14.72	3.79	49.52	05:12
2	TC Clean	3.33	6.99	3.66	50.14	04:02
3	TC Clean	1.45	5.20	3.74	50.19	03:50
4	TC Clean	1.34	5.11	3.76	50.13	03:48
5	Reagent Blank	2.49	6.23	3.74	50.20	05:07
6	Acid Blank	0.97	4.67	3.70	49.59	05:29

Sample Type: Sample

From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 19:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.76	12.42	3.66	50.39	12:29

Dilution **Blank Contribution** **Method** **Calibration**

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1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8831 ppm (PASS)	0.0000 ppm	0%	2019/11/07 19:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8831	238.8313	182.41	185.93	3.52	50.38	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/07 19:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.06	10.70	3.65	50.36	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 20:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.59	10.07	3.48	50.36	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 9

	Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time

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			(ppm)			(% dev)				
◈	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.3867 ppm (PASS)	0.0000 ppm	0%	2019/11/07 20:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.3867	243.8673	186.02	189.54	3.52	50.37	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample

From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 20:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.43	12.08	3.65	50.39	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1909995-005.01 800x	4.1855 ppm	0.0993 ppm	2.3700%	2019/11/07 21:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1152	41.1523	39.72	43.21	3.49	50.47	12:27
2	TOC	4.2557	42.5567	40.73	44.38	3.65	50.42	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1909995-006.01 20x	1.9072 ppm	0.0050 ppm	0.2600%	2019/11/07 21:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9036	19.0360	23.86	27.36	3.50	50.44	12:28
2	TOC	1.9107	19.1072	23.91	27.46	3.54	50.43	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1909958-019.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 22:05

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.09	11.61	3.52	50.42	12:27
2	TOC	0.0000	0.0000	8.27	11.81	3.53	50.36	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1909958-020.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 22:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.43	10.94	3.51	50.38	12:27
2	TOC	0.0000	0.0000	7.70	11.28	3.58	50.43	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1909958-020.06 ms 2x	14.3500 ppm	0.0000 ppm	0.0000%	2019/11/07 23:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.3500	143.4997	113.11	116.75	3.65	50.30	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 23:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.22	10.83	3.61	50.30	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1909955-019.07 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/07 23:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.94	11.41	3.48	50.28	12:28
2	TOC	0.0000	0.0000	7.84	11.27	3.43	50.26	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8830 ppm (PASS)	0.0000 ppm	0%	2019/11/08 00:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8830	238.8299	182.41	185.89	3.48	50.25	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/08 00:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.64	10.31	3.67	50.27	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1909955-020.07 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 00:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.38	10.88	3.50	50.24	12:27
2	TOC	0.0000	0.0000	7.28	10.72	3.45	50.24	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1909964-001.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 01:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.09	10.66	3.57	50.22	12:29

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2	TOC	0.0000	0.0000	7.26	10.82	3.56	50.20	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1909964-001.06 ms 2x	14.9384 ppm	0.0000 ppm	0.0000%	2019/11/08 01:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.9384	149.3837	117.33	120.86	3.53	50.18	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 02:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.86	11.54	3.68	50.19	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1909964-002.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 02:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.22	10.84	3.62	50.17	12:28
2	TOC	0.0000	0.0000	7.30	10.82	3.52	50.18	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1909964-003.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 02:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.08	10.64	3.56	50.17	12:29
2	TOC	0.0000	0.0000	6.88	10.50	3.61	50.15	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1909964-004.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 03:29

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.73	10.25	3.52	50.14	12:29
2	TOC	0.0000	0.0000	6.96	10.43	3.46	50.16	12:30

Dilution 1:10 | **Blank Contribution** (TC) 10.2136 (IC) (v1315) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1909964-005.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 04:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.82	10.29	3.46	50.14	12:30
2	TOC	0.0000	0.0000	6.97	10.44	3.48	50.13	12:28

Dilution 1:10 | **Blank Contribution** (TC) 10.2136 (IC) (v1315) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1909964-006.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 04:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.74	10.15	3.41	50.12	12:27
2	TOC	0.0000	0.0000	6.87	10.44	3.56	50.09	12:24

Dilution 1:10 | **Blank Contribution** (TC) 10.2136 (IC) (v1315) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1909964-008.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 05:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.71	10.21	3.50	50.11	12:26
2	TOC	0.0000	0.0000	6.67	10.17	3.50	50.17	12:28

Dilution 1:10 | **Blank Contribution** (TC) 10.2136 (IC) (v1315) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9165 ppm (PASS)	0.0000 ppm	0%	2019/11/08 05:37

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

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	Type		#							Time
B	TOC	25 ppm	1	23.9165	239.1646	182.65	186.17	3.52	50.11	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/08 05:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.79	10.33	3.54	50.11	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 06:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.29	9.77	3.48	49.99	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	25.1535 ppm (PASS)	0.0000 ppm	0%	2019/11/08 06:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1535	251.5351	191.52	194.80	3.28	49.89	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

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Sample Type: Sample

From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K1909964-009.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 06:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.18	11.64	3.47	49.80	12:30
2	TOC	0.0000	0.0000	7.82	11.18	3.36	49.78	12:26

Dilution: 1:10

Blank Contribution: (TC) 10.2136 (IC) (v1315)

Method: Extended Reaction 021711 (v4)

Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K1909964-010.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 07:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.51	11.02	3.50	49.76	12:27
2	TOC	0.0000	0.0000	7.40	10.92	3.51	49.72	12:27

Dilution: 1:10

Blank Contribution: (TC) 10.2136 (IC) (v1315)

Method: Extended Reaction 021711 (v4)

Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K1909964-011.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 07:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.24	10.86	3.62	49.73	12:30
2	TOC	0.0000	0.0000	7.56	11.10	3.54	49.69	12:26

Dilution: 1:10

Blank Contribution: (TC) 10.2136 (IC) (v1315)

Method: Extended Reaction 021711 (v4)

Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K1909964-012.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 08:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.48	12.02	3.54	49.70	12:29
2	TOC	0.0000	0.0000	7.33	10.98	3.65	49.68	12:25

Dilution: 1:10

Blank Contribution: (TC) 10.2136 (IC) (v1315)

Method: Extended Reaction 021711 (v4)

Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K1909964-014.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 08:52

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

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1	TOC	0.0000	0.0000	6.88	10.41	3.53	49.88	12:26
2	TOC	0.0000	0.0000	6.95	10.31	3.36	49.97	12:26

Dilution 1:10 **Blank Contribution** (TC) 10.2136 (IC) (v1315) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	26	TOC	K1909964-015.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 09:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.23	10.60	3.37	50.07	12:30
2	TOC	0.0000	0.0000	6.80	10.21	3.41	50.09	12:26

Dilution 1:10 **Blank Contribution** (TC) 10.2136 (IC) (v1315) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	K1909964-016.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 09:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.47	9.82	3.35	50.08	12:31
2	TOC	0.0000	0.0000	6.72	10.10	3.38	50.11	12:27

Dilution 1:10 **Blank Contribution** (TC) 10.2136 (IC) (v1315) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	K1909964-017.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 10:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.47	9.95	3.49	50.08	12:25
2	TOC	0.0000	0.0000	6.67	10.32	3.64	50.09	12:24

Dilution 1:10 **Blank Contribution** (TC) 10.2136 (IC) (v1315) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.7056 ppm (PASS)	0.0000 ppm	0%	2019/11/08 11:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7056	237.0559	181.14	184.69	3.55	50.12	12:28

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Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/08 11:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.31	9.90	3.59	50.10	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1909964-018.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 11:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.65	10.31	3.66	50.10	12:30
2	TOC	0.0000	0.0000	6.72	10.26	3.54	50.10	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K1909964-019.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 12:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.44	9.98	3.54	50.09	12:25
2	TOC	0.0000	0.0000	6.49	10.13	3.65	50.10	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	K1909964-020.06 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 12:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.51	10.05	3.54	50.09	12:30

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2	TOC	0.0000	0.0000	6.53	10.11	3.58	50.08	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1909955-014.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 13:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.45	10.20	3.75	50.06	12:29
2	TOC	0.0000	0.0000	6.60	10.10	3.50	50.09	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1909955-014.10 ms doc 2x	12.6551 ppm	0.0000 ppm	0.0000%	2019/11/08 13:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.6551	126.5505	100.95	104.18	3.22	50.01	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 13:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.33	10.82	3.50	50.02	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1909955-015.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 14:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.16	11.74	3.58	49.99	12:29
2	TOC	0.0000	0.0000	7.77	11.37	3.60	49.98	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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

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◈	36	TOC	K1909955-016.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 14:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.68	11.27	3.59	49.94	12:27
2	TOC	0.0000	0.0000	7.71	11.32	3.61	49.92	12:27

Dilution: 1:10
Blank Contribution: (TC) 10.2136 (IC) (v1315)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1909955-018.07 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 15:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.92	11.46	3.54	49.94	12:29
2	TOC	0.0000	0.0000	7.84	11.52	3.68	49.93	12:26

Dilution: 1:10
Blank Contribution: (TC) 10.2136 (IC) (v1315)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1909955-019.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 15:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.77	11.54	3.77	49.95	12:26
2	TOC	0.0000	0.0000	7.70	11.31	3.61	49.96	12:32

Dilution: 1:10
Blank Contribution: (TC) 10.2136 (IC) (v1315)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8499 ppm (PASS)	0.0000 ppm	0%	2019/11/08 16:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8499	238.4994	182.18	185.63	3.46	49.98	12:30

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)
STD Conc - Pos B: 50 ppmC

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Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/08 16:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.25	9.83	3.58	50.01	12:28

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)
STD Conc - Pos D: 0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 16:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.90	9.40	3.50	50.04	12:30

Dilution: 1:10
Blank Contribution: (TC) 10.2136 (IC) (v1315)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.6109 ppm (PASS)	0.0000 ppm	0%	2019/11/08 17:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6109	246.1085	187.63	191.00	3.36	50.06	12:30

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)
STD Conc - Pos C: 25 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K1909955-020.10 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 17:31

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

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1	TOC	0.0000	0.0000	7.75	11.46	3.71	50.10	12:26
2	TOC	0.0000	0.0000	7.15	10.70	3.55	50.13	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K1909964-001.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 18:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.79	10.25	3.46	50.18	12:27
2	TOC	0.0000	0.0000	6.99	10.38	3.40	50.20	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K1909964-002.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 18:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.15	10.82	3.67	50.25	12:26
2	TOC	0.0000	0.0000	7.18	10.71	3.53	50.30	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1909964-003.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 19:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.30	9.90	3.61	50.27	12:28
2	TOC	0.0000	0.0000	6.34	9.87	3.53	50.23	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1909964-004.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 19:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.32	9.94	3.62	50.25	12:31
2	TOC	0.0000	0.0000	6.67	10.21	3.54	50.24	12:29

Dilution	Blank Contribution	Method	Calibration

RIGHT SOLUTIONS | RIGHT PARTNER

1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1909964-005.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 20:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.90	10.48	3.59	50.23	12:29
2	TOC	0.0000	0.0000	7.03	10.58	3.56	50.26	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1909964-006.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 20:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.37	10.74	3.37	50.19	12:28
2	TOC	0.0000	0.0000	6.99	10.57	3.58	50.16	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1909964-008.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 21:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.64	10.12	3.48	50.17	12:25
2	TOC	0.0000	0.0000	6.54	10.08	3.54	50.15	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8036 ppm (PASS)	0.0000 ppm	0%	2019/11/08 21:48

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8036	238.0363	181.84	185.38	3.54	50.13	12:31

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Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/08 22:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.19	9.80	3.61	50.15	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	K1909964-009.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 22:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.22	10.92	3.71	50.09	12:29
2	TOC	0.0000	0.0000	7.05	10.63	3.58	50.12	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K1909964-010.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 22:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.11	9.55	3.44	50.11	12:29
2	TOC	0.0000	0.0000	6.21	9.74	3.53	50.09	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	K1909964-011.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 23:26

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

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#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	0.0000	0.0000	6.06	9.63	3.57	50.11	12:28
2	TOC	0.0000	0.0000	5.90	9.50	3.60	50.07	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1909964-012.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/08 23:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.08	9.55	3.47	50.11	12:29
2	TOC	0.0000	0.0000	6.08	9.70	3.62	50.06	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1909964-014.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 00:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.00	9.56	3.56	50.08	12:28
2	TOC	0.0000	0.0000	6.14	9.72	3.58	50.07	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K1909964-015.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 01:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.83	11.45	3.62	50.10	12:28
2	TOC	0.0000	0.0000	8.03	11.51	3.48	50.06	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	K1909964-016.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 01:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.65	10.22	3.57	50.06	12:28
2	TOC	0.0000	0.0000	7.22	10.68	3.46	50.11	12:29

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K1909964-017.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 02:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.88	10.35	3.47	50.11	12:28
2	TOC	0.0000	0.0000	6.76	10.38	3.62	50.08	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1909964-018.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 02:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.25	10.77	3.51	50.08	12:29
2	TOC	0.0000	0.0000	7.49	10.68	3.19	50.07	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1909964-019.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 03:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.77	10.30	3.53	50.09	12:30
2	TOC	0.0000	0.0000	6.89	10.37	3.48	50.08	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.7207 ppm (PASS)	0.0000 ppm	0%	2019/11/09 03:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7207	237.2065	181.25	184.91	3.66	50.13	12:31

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Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/09 03:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.12	9.94	3.82	50.12	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 04:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.61	9.20	3.59	50.09	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.3973 ppm (PASS)	0.0000 ppm	0%	2019/11/09 04:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.3973	243.9733	186.10	189.68	3.58	50.08	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample From Schedule Version 9

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1909964-020.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 04:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.24	11.58	3.34	50.12	12:31
2	TOC	0.0000	0.0000	7.01	10.70	3.69	50.10	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	K1909967-001.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 05:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.81	10.53	3.72	50.12	12:28
2	TOC	0.0000	0.0000	6.54	10.33	3.80	50.11	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	61	TOC	K1909967-001.01 ms doc 2x	14.5481 ppm	0.0000 ppm	0.0000%	2019/11/09 05:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.5481	145.4814	114.53	118.17	3.64	50.10	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 06:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.62	11.34	3.72	50.08	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	K1909967-002.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 06:27

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

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1	TOC	0.0000	0.0000	7.44	11.16	3.72	50.09	12:24
2	TOC	0.0000	0.0000	7.40	11.11	3.71	50.10	12:25

Dilution 1:10 **Blank Contribution** (TC) 10.2136 (IC) (v1315) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K1909967-003.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 06:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.65	10.35	3.70	50.13	12:26
2	TOC	0.0000	0.0000	6.67	10.40	3.73	50.10	12:26

Dilution 1:10 **Blank Contribution** (TC) 10.2136 (IC) (v1315) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	65	TOC	K1909967-004.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 07:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.75	11.37	3.62	50.12	12:26
2	TOC	0.0000	0.0000	7.44	11.04	3.60	50.14	12:28

Dilution 1:10 **Blank Contribution** (TC) 10.2136 (IC) (v1315) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	K1909967-006.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 08:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.54	10.11	3.56	50.14	12:27
2	TOC	0.0000	0.0000	6.70	10.27	3.57	50.16	12:25

Dilution 1:10 **Blank Contribution** (TC) 10.2136 (IC) (v1315) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.6576 ppm (PASS)	0.0000 ppm	0%	2019/11/09 08:35

	Base		Rep							Run

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Pos	Analysis Type	ID	#	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Time
B	TOC	25 ppm	1	23.6576	236.5761	180.80	184.36	3.56	50.16	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/09 08:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	5.99	9.62	3.63	50.19	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 9

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	K1909967-007.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 09:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.59	10.16	3.57	50.17	12:26
2	TOC	0.0000	0.0000	6.52	10.04	3.52	50.18	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	68	TOC	K1909967-008.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 09:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.37	9.99	3.62	50.19	12:31
2	TOC	0.0000	0.0000	6.37	9.91	3.55	50.17	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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

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◈	69	TOC	K1909967-009.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.03	10.60	3.57	50.20	12:27
2	TOC	0.0000	0.0000	6.97	10.52	3.55	50.19	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K1909967-010.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 10:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.41	9.89	3.48	50.20	12:30
2	TOC	0.0000	0.0000	6.45	9.97	3.52	50.19	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K1909967-012.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 11:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.43	9.92	3.48	50.17	12:28
2	TOC	0.0000	0.0000	6.73	10.21	3.48	50.19	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1910165-007.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 11:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.06	9.46	3.40	50.19	12:30
2	TOC	0.0000	0.0000	6.00	9.45	3.45	50.21	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2136 (IC) (v1315)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K1910165-008.01 doc 2x	0.1343 ppm	0.0082 ppm	6.1000%	2019/11/09 12:21

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

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#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	0.1401	1.4008	11.22	14.87	3.65	50.18	12:29
2	TOC	0.1285	1.2850	11.14	14.61	3.48	50.19	12:26

Dilution 1:10

Blank Contribution (TC) 10.2136 (IC) (v1315)

Method Extended Reaction 021711 (v4)

Calibration Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K1910165-013.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/09 12:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.73	9.22	3.49	50.19	12:27
2	TOC	0.0000	0.0000	5.61	9.26	3.65	50.19	12:28

Dilution 1:10

Blank Contribution (TC) 10.2136 (IC) (v1315)

Method Extended Reaction 021711 (v4)

Calibration Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	75	TOC	K1910165-014.01 doc 2x	0.1367 ppm	0.0336 ppm	24.6100%	2019/11/09 13:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1604	1.6044	11.36	15.04	3.67	50.21	12:26
2	TOC	0.1129	1.1288	11.02	14.83	3.80	50.19	12:29

Dilution 1:10

Blank Contribution (TC) 10.2136 (IC) (v1315)

Method Extended Reaction 021711 (v4)

Calibration Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711

From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.5930 ppm (PASS)	0.0000 ppm	0%	2019/11/09 13:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5930	235.9304	180.33	183.92	3.59	50.21	12:31

Completion State Success - Criteria met.

Success Action Do Nothing

Method Extended Reaction 021711 (v4)

Calibration Extended Reaction 021711 (v27)

STD Conc - Pos B 50 ppmC

Sample Type: Check Standard --> CCB 021711

From Schedule Version 9

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

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◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/09 14:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	5.95	9.70	3.75	50.18	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1314	1.4780	1.0180	0.0000	0.0000	0.0000	2019/11/05 11:34	Fusion1 (Fusion1)
v1315	0.8297	0.9670	0.0000	0.0000	0.0000	2019/11/07 19:05	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version:	v27	Calibration curve formula:	TOC: y = 7.170x + 11.164
Ver Creation:	2019/03/11 21:51	r^2 value:	TOC: r^2 = 0.99991
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	10.4100	0.0000		2019/03/11 20:12
0.50 ppm	14.7740	0.5000		2019/03/11 20:28
1.00 ppm	18.0020	1.0000		2019/03/11 20:44
5.00 ppm	47.2310	5.0000		2019/03/11 21:01
10.0 ppm	85.1320	10.0000		2019/03/11 21:17
25.0 ppm	188.5200	25.0000		2019/03/11 21:33
50.0 ppm	370.1610	50.0000		2019/03/11 21:49

Methods

Name: Extended Reaction 021711 (TOC)

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Version: v4
Ver Creation: 2019/01/31 11:21
Comment:

Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/11/09 14:31

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StarLIMS Run: 658206, 658207, 658208, 658209

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-82E

21 % H3PO4: 11-GEN-05-82G

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: HLM for BCD	Date Analyzed: 11/7/19
Reviewed By:	Date Reviewed: 11/12/19

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WorkOrder: HS19101488

LHAAP-16

Aptim Environmental & Infrastucture, Inc.

Susan Huang
2500 City West Blvd., Suite 1700
Houston TX 77042

09-Nov-2019

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ALS Group USA, Corp
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  - Acronyms
  - Certifications
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  - SampleReceiptCheckList
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  - HS19101488 ALS Kelso Sub Data K1910079
- HS19101488 Wet Chem Raw Data

HS19101488 LHAAP16 Final

ALS WO# HS19101488

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 06, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19101488**

Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 1 sample(s) on Oct 24, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19101488

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19101488-01	16WW40-191022	GW		22-Oct-2019 13:10	24-Oct-2019 08:43	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19101488

Work Order Comments

- The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

WetChemistry by Method SW9056

Batch ID: R349710

Sample ID: HS19101353-01MS

- MS and MSD are for an unrelated sample (Bromide)

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW40-191022
Collection Date: 22-Oct-2019 13:10

ANALYTICAL REPORT
WorkOrder:HS19101488
Lab ID:HS19101488-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.49**		**0.300**	**1.00**	**1.00**	**mg/L**	10	04-Nov-2019 17:29
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Nov-2019 09:36

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101488

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R349710 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS19101488-01	16WW40-191022	22 Oct 2019 13:10			04 Nov 2019 17:29	10
Batch ID: R349770 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** GW	
HS19101488-01	16WW40-191022	22 Oct 2019 13:10			05 Nov 2019 09:36	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101488

QC BATCH REPORT

Batch ID: R349710 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **WBLKW1-110419** Units: **mg/L** Analysis Date: **04-Nov-2019 11:38**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328162** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-110419** Units: **mg/L** Analysis Date: **04-Nov-2019 11:54**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328163** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.782	0.100	4	0	94.6	80 - 120				

LCSD Sample ID: **WLCSDW1-110419** Units: **mg/L** Analysis Date: **04-Nov-2019 12:11**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328164** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.764	0.100	4	0	94.1	80 - 120	3.782	0.498	20	

MS Sample ID: **HS19101488-01MS** Units: **mg/L** Analysis Date: **04-Nov-2019 17:46**
Client ID: **16WW40-191022** Run ID: **ICS-Integrion_349710** SeqNo: **5329293** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	22.55	1.00	20	4.49	90.3	80 - 120				

MS Sample ID: **HS19110026-01MS** Units: **mg/L** Analysis Date: **04-Nov-2019 12:44**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328166** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	18.58	1.00	20	2.058	82.6	80 - 120				

MS Sample ID: **HS19101353-01MS** Units: **mg/L** Analysis Date: **04-Nov-2019 18:49**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5329296** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100	2	0	0	80 - 120				S U

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101488

QC BATCH REPORT

Batch ID: R349710 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MS Sample ID: **HS19101353-01MS** Units: **mg/L** Analysis Date: **04-Nov-2019 14:27**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5329281** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.34	1.00	20	3.498	89.2	80 - 120				

MSD Sample ID: **HS19110026-01MSD** Units: **mg/L** Analysis Date: **04-Nov-2019 13:01**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328167** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	18.72	1.00	20	2.058	83.3	80 - 120	18.58	0.756	20	

MSD Sample ID: **HS19101488-01MSD** Units: **mg/L** Analysis Date: **04-Nov-2019 18:03**
Client ID: **16WW40-191022** Run ID: **ICS-Integrion_349710** SeqNo: **5329294** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	22.61	1.00	20	4.49	90.6	80 - 120	22.55	0.266	20	

MSD Sample ID: **HS19101353-01MSD** Units: **mg/L** Analysis Date: **04-Nov-2019 19:06**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5329297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100	2	0	0	80 - 120	0	0	20	S U

MSD Sample ID: **HS19101353-01MSD** Units: **mg/L** Analysis Date: **04-Nov-2019 14:43**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5329282** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.41	1.00	20	3.498	89.6	80 - 120	21.34	0.313	20	

The following samples were analyzed in this batch: HS19101488-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19101488**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19101488

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19101488-01	16WW40-191022	Login	10/24/2019 8:08:56 PM	AC	WET385
HS19101488-01	16WW40-191022	Login	10/24/2019 8:08:56 PM	AC	Sub

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19101488

Date/Time Received: **24-Oct-2019 08:43**
Received by: **PMG**

Checklist completed by: *Asad Chaudhry* eSignature — 24-Oct-2019 Date

Reviewed by: *RJ Modashia* eSignature — 25-Oct-2019 Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.5c UC/C	IR 25
Cooler(s)/Kit(s):	45194	
Date/Time sample(s) sent to storage:	10/24/2019 19:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-Bayou Barrier-ALSHT-1910-____ TURNAROUND TIME: normal RUSH: Page 1 of ____

PROJECT/CLIENT INFO

Facility Name	Longhorn AAP
Project Number	501032
	LHAAP-16
Address	1203-B East Grand Avenue
	PMB 202
City	Marshall
State	TX
Country	USA
Postal Code	75670
Phone Number	713.243.7264
Project Manager	Praveen Srivastav

LABORATORY

Lab Name	ALS Laboratories
Lab Contact	RJ Modashia
Email	RJ.Modashia@alsglobal.com
Address	10450 Stancliff Rd., Suite 210
City	Houston
State	TX
Country	USA
Postal Code	77099
Phone Number	281.375.2279 or 281.530.5656

Facilityinvoices@aptim.com

Susan.Huang@aptim.com

Susan Huang

4005 Port Chicago Hwy

Concord		State	CA
94520		Country	USA

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Bromide by SW9056	TOC by (SW9060)
16WW40-191022	LHAAP 16				WG	10/22/19	1310	3		X	X

Containers and Preservative: 1-250 ml HDPE, Ice; 2X40 ml Vials/H2SO4

HS19101488

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Seth Blessing / BHATE	10/23/19 1400	PS	10/24/19 08.43

45194

Temp 4/C 2-5

1/2 #25.

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5867

45194

CUSTODY SEAL

Date: 10/23/19 Time: 1400
Name: Scott Beesinger
Company: BHATS

Seal Broken By:
Date: 10/24/19

45194

Must Deliver Next Business Day
Time and Tempature Sensitive!

45194

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIRONMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 17OCT19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 18x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-16-80 68173-RJ

RMA:

FedEx Express

FedEx

THU - 24 OCT 10:30A

TRK# 1251 0290 7608

PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

ALS Environmental
ALS Group USA, Corp
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www.alsglobal.com

November 04, 2019 **Analytical Report for Service Request No:** K1910079

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

RE: HS19101488

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory October 26, 2019
For your reference, these analyses have been assigned our service request number **K1910079.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

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Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS19101488
Sample Matrix: Water

Service Request: K1910079
Date Received: 10/26/2019

CASE NARRATIVE

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

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 10/26/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 11/04/2019

Chain of Custody

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12485**

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

KL1910079

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19101488
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19101488-01**	**16WW40-191022**	**GW**	**22 Oct 2019 13:10**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			07 Nov 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Lawal Date/Time: 10/25/19 12:00

Received By: Mledersen Date/Time: 10/26/19 0950

Cooler ID(s): Temperature(s):

RIGHT SOLUTIONS | RIGHT PARTNER

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K1910078

Received: 10/26/19 Opened: 10/26/19 By: MP Unloaded: 10/26/19 By: MP

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.1	0.0	0.9	1.0	0.1	362		1251 0291 0740	
						12490		
						12485		

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1910079
Project:	HS19101488	**Date Collected:**	10/22/19
Sample Matrix:	Water	**Date Received:**	10/26/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW40-191022	K1910079-001	**7.72**	0.50	0.20	0.07	1	10/30/19 21:30	
Method Blank	K1910079-MB	ND U	0.50	0.20	0.07	1	10/30/19 12:52	

Client:	ALS Environmental - US	**Service Request:**	K1910079
Project	HS19101488	**Date Collected:**	10/22/19
Sample Matrix:	Water	**Date Received:**	10/26/19
		Date Analyzed:	10/30/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	16WW40-191022	**Units:**	mg/L
Lab Code:	K1910079-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1910079-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	7.72	7.65	7.69	<1	10

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1910079
Project:	HS19101488	**Date Analyzed:**	10/30/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	657829

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1910079-LCS	24.6	25.0	98	83-117

Client: ALS Environmental - US **Service Request:** K1910079
Project: HS19101488

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	657829	KQ1915963-03	10/30/19 12:18	25.0	23.9	96	90-110
CCV2	657829	KQ1915963-04	10/30/19 16:40	25.0	24.2	97	90-110
CCV3	657829	KQ1915963-05	10/30/19 22:34	25.0	24.2	97	90-110
CCV4	657829	KQ1915963-06	10/31/19 03:42	25.0	24.2	97	90-110

Client: ALS Environmental - US **Service Request:**K1910079
Project: HS19101488

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	657829	KQ1915963-07	10/30/19 12:35	0.50	0.20	0.07	ND	U
CCB2	657829	KQ1915963-08	10/30/19 16:57	0.50	0.20	0.07	ND	U
CCB3	657829	KQ1915963-09	10/30/19 22:51	0.50	0.20	0.07	ND	U
CCB4	657829	KQ1915963-10	10/31/19 03:59	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) T190809 IV, V815 IV, K1908800, 9822, 9860, 9892, 9998, 10007, 10066, 10079, 9912, 9995, 9627, 9892, 9913, 9958

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

Date Analyzed: 10/30/19

Analyst: BCD

Analysis: TOC/DOC

Run # TOC: 657829, 657830 & DOC: 657831, 657832

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: K1909995-S/6 sent for RA due to being above the calibration curve.
K1909995-7 sent for RA due to previous sample carry over.
K1909892-S/S dup report a high %RSD. However, these samples are less than 5x the MRL.
T190809-VB report a high %RSD due to suspected non-homogenous sample.

Final Approved by: [signature] Date: 11/01/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657829 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1909800-002	Carbon, Total Organic	N/A		Water	2.78 mg/L	10 mL	278 mg/L	100	7	50			10/30/19 14:15:00	N	II
K1909822-004	Carbon, Total Organic	N/A		Water	6.88 mg/L	10 mL	688 mg/L	100	7	50			10/30/19 14:47:00	N	II
K1909822-005	Carbon, Total Organic	N/A		Water	5.89 mg/L	10 mL	589 mg/L	100	7	50			10/30/19 15:19:00	N	II
K1909860-026	Carbon, Total Organic	N/A		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			10/30/19 13:59:00	N	I
K1909892-001	Carbon, Total Organic	N/A		Water	4.52 mg/L	10 mL	4.52 mg/L	1	0.07	0.50			10/30/19 22:02:00	N	II
K1909892-002	Carbon, Total Organic	N/A		Water	5.21 mg/L	10 mL	5.21 mg/L	1	0.07	0.50			10/30/19 23:41:00	N	II
K1909892-003	Carbon, Total Organic	N/A		Water	2.41 mg/L	10 mL	2.41 mg/L	1	0.07	0.50			10/31/19 00:13:00	N	II
K1909892-004	Carbon, Total Organic	N/A		Water	0.96 mg/L	10 mL	0.96 mg/L	1	0.07	0.50			10/31/19 00:45:00	N	II
K1909892-005	Carbon, Total Organic	N/A		Water	0.38 mg/L	10 mL	0.38 mg/L J	1	0.07	0.50			10/31/19 01:17:00	N	II
K1909998-001	Carbon, Total Organic	N/A		Water	2.05 mg/L	10 mL	2.05 mg/L	1	0.07	0.50			10/30/19 20:26:00	N	II
K1910007-001	Carbon, Total Organic	N/A		Water	1.56 mg/L	10 mL	1.56 mg/L	1	0.07	0.50			10/30/19 20:58:00	N	IV
K1910066-001	Carbon, Total Organic	N/A		Water	0.99 mg/L	10 mL	0.99 mg/L	1	0.07	0.50			10/30/19 17:13:00	N	IV
K1910066-002	Carbon, Total Organic	N/A		Water	0.95 mg/L	10 mL	0.95 mg/L	1	0.07	0.50			10/30/19 17:46:00	N	IV
K1910066-003	Carbon, Total Organic	N/A		Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50			10/30/19 18:18:00	N	IV
K1910066-004	Carbon, Total Organic	N/A		Water	0.79 mg/L	10 mL	0.79 mg/L	1	0.07	0.50			10/30/19 18:50:00	N	IV
K1910066-005	Carbon, Total Organic	N/A		Water	0.79 mg/L	10 mL	0.79 mg/L	1	0.07	0.50			10/30/19 19:22:00	N	IV
K1910066-006	Carbon, Total Organic	N/A		Water	1.69 mg/L	10 mL	1.69 mg/L	1	0.07	0.50			10/30/19 15:52:00	Y	IV
K1910066-007	Carbon, Total Organic	N/A		Water	0.93 mg/L	10 mL	0.93 mg/L	1	0.07	0.50			10/30/19 19:54:00	N	IV
K1910079-001	Carbon, Total Organic	N/A		Water	7.72 mg/L	10 mL	7.72 mg/L	1	0.07	0.50			10/30/19 21:30:00	N	IV
KQ1915963-01	Carbon, Total Organic	LOQV		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			10/30/19 13:59:00	N	I
KQ1915963-02	Carbon, Total Organic	LODV		Water	0.08 mg/L	10 mL	0.08 mg/L J	1	0.07	0.50			10/30/19 13:42:00	N	I
KQ1915963-03	Carbon, Total Organic	CCV		Water	23.90 mg/L	10 mL	23.9 mg/L	1					10/30/19 12:18:00	N	II
KQ1915963-04	Carbon, Total Organic	CCV		Water	24.15 mg/L	10 mL	24.2 mg/L	1					10/30/19 16:40:00	N	II
KQ1915963-05	Carbon, Total Organic	CCV		Water	24.21 mg/L	10 mL	24.2 mg/L	1					10/30/19 22:34:00	N	II
KQ1915963-06	Carbon, Total Organic	CCV		Water	24.18 mg/L	10 mL	24.2 mg/L	1					10/31/19 03:42:00	N	II
KQ1915963-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 12:35:00	N	II
KQ1915963-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 16:57:00	N	II
KQ1915963-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 22:51:00	N	II
KQ1915963-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 03:59:00	N	II
KQ1915963-11	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 12:52:00	N	II
KQ1915963-12	Carbon, Total Organic	LCS		Water	24.60 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	98		10/30/19 13:09:00	N	II
KQ1915963-13	Carbon, Total Organic	MS	K1910066-006	Water	25.97 mg/L	10 mL	26.0 mg/L	1	0.07	0.50	97		10/30/19 16:24:00	N	IV
KQ1915963-14	Carbon, Total Organic	DUP	K1909800-002	Water	2.71 mg/L	10 mL	271 mg/L	100	7	50		2	10/30/19 14:15:00	N	II
KQ1915963-16	Carbon, Total Organic	DUP	K1909822-004	Water	7.13 mg/L	10 mL	713 mg/L	100	7	50		3	10/30/19 14:47:00	N	II
KQ1915963-17	Carbon, Total Organic	DUP	K1909892-001	Water	4.58 mg/L	10 mL	4.58 mg/L	1	0.07	0.50		1	10/30/19 22:02:00	N	II
KQ1915963-18	Carbon, Total Organic	DUP	K1909892-002	Water	5.21 mg/L	10 mL	5.21 mg/L	1	0.07	0.50		<1	10/30/19 23:41:00	N	II

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

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Results Summary

11/01/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657829 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1915963-19	Carbon, Total Organic	DUP	K1909892-003	Water	2.34 mg/L	10 mL	2.34 mg/L	1	0.07	0.50		3	10/31/19 00:13:00	N	II
KQ1915963-20	Carbon, Total Organic	DUP	K1909892-004	Water	0.95 mg/L	10 mL	0.95 mg/L	1	0.07	0.50		2	10/31/19 00:45:00	N	II
KQ1915963-21	Carbon, Total Organic	DUP	K1909892-005	Water	0.34 mg/L	10 mL	0.34 mg/L J	1	0.07	0.50		10	10/31/19 01:17:00	N	II
KQ1915963-22	Carbon, Total Organic	DUP	K1909822-005	Water	5.88 mg/L	10 mL	588 mg/L	100	7	50		<1	10/30/19 15:19:00	N	II
KQ1915963-23	Carbon, Total Organic	DUP	K1909998-001	Water	2.08 mg/L	10 mL	2.08 mg/L	1	0.07	0.50		1	10/30/19 20:26:00	N	II
KQ1915963-24	Carbon, Total Organic	DUP	K1910007-001	Water	1.63 mg/L	10 mL	1.63 mg/L	1	0.07	0.50		4	10/30/19 20:58:00	N	IV
KQ1915963-25	Carbon, Total Organic	DUP	K1910066-001	Water	1.05 mg/L	10 mL	1.05 mg/L	1	0.07	0.50		6	10/30/19 17:13:00	N	IV
KQ1915963-26	Carbon, Total Organic	DUP	K1910066-002	Water	0.92 mg/L	10 mL	0.92 mg/L	1	0.07	0.50		3	10/30/19 17:46:00	N	IV
KQ1915963-27	Carbon, Total Organic	DUP	K1910066-003	Water	0.79 mg/L	10 mL	0.79 mg/L	1	0.07	0.50		5	10/30/19 18:18:00	N	IV
KQ1915963-28	Carbon, Total Organic	DUP	K1910066-004	Water	0.84 mg/L	10 mL	0.84 mg/L	1	0.07	0.50		6	10/30/19 18:50:00	N	IV
KQ1915963-29	Carbon, Total Organic	DUP	K1910066-005	Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50		5	10/30/19 19:22:00	N	IV
KQ1915963-30	Carbon, Total Organic	DUP	K1910066-006	Water	1.63 mg/L	10 mL	1.63 mg/L	1	0.07	0.50		4	10/30/19 15:52:00	N	IV
KQ1915963-31	Carbon, Total Organic	DUP	K1910066-007	Water	1.02 mg/L	10 mL	1.02 mg/L	1	0.07	0.50		9	10/30/19 19:54:00	N	IV
KQ1915963-32	Carbon, Total Organic	DUP	K1910079-001	Water	7.65 mg/L	10 mL	7.65 mg/L	1	0.07	0.50		<1	10/30/19 21:30:00	N	IV

11/01/19

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657830 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1909912-001	Carbon, Total Organic	N/A		Ground Water	10.42 mg/L	10 mL	10.4 mg/L	1	0.07	0.50			10/31/19 01:49:00	N	II
K1909912-002	Carbon, Total Organic	N/A		Ground Water	10.79 mg/L	10 mL	10.8 mg/L	1	0.07	0.50			10/31/19 02:21:00	N	II
K1909995-001	Carbon, Total Organic	N/A		Water	1.84 mg/L	10 mL	1.84 mg/L	1	0.07	0.50			10/31/19 02:53:00	Y	IV
K1909995-002	Carbon, Total Organic	N/A		Water	1.78 mg/L	10 mL	1.78 mg/L	1	0.07	0.50			10/31/19 04:15:00	N	IV
K1909995-003	Carbon, Total Organic	N/A		Water	1.91 mg/L	10 mL	1.91 mg/L	1	0.07	0.50			10/31/19 04:48:00	N	IV
K1909995-004	Carbon, Total Organic	N/A		Water	3.53 mg/L	10 mL	3.53 mg/L	1	0.07	0.50			10/31/19 05:20:00	N	IV
K1909995-005	Carbon, Total Organic	N/A		Water	82.04 mg/L	10 mL	82.0 mg/L	1	0.07	0.50			10/31/19 05:52:00	N	IV
K1909995-006	Carbon, Total Organic	N/A		Water	82.43 mg/L	10 mL	82.4 mg/L	1	0.07	0.50			10/31/19 06:24:00	N	IV
K1909995-007	Carbon, Total Organic	N/A		Water	12.67 mg/L	10 mL	12.7 mg/L	1	0.07	0.50			10/31/19 06:56:00	N	IV
KQ1915964-01	Carbon, Total Organic	CCV		Ground Water	24.21 mg/L	10 mL	24.2 mg/L	1					10/30/19 22:34:00	N	II
KQ1915964-02	Carbon, Total Organic	CCV		Ground Water	24.18 mg/L	10 mL	24.2 mg/L	1					10/31/19 03:42:00	N	II
KQ1915964-03	Carbon, Total Organic	CCV		Ground Water	24.73 mg/L	10 mL	24.7 mg/L	1					10/31/19 09:06:00	N	II
KQ1915964-04	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 22:51:00	N	II
KQ1915964-05	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 03:59:00	N	II
KQ1915964-06	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 09:22:00	N	II
KQ1915964-07	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/30/19 23:08:00	N	II
KQ1915964-08	Carbon, Total Organic	LCS		Ground Water	24.62 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	98		10/30/19 23:24:00	N	II
KQ1915964-10	Carbon, Total Organic	DUP	K1909912-001	Ground Water	10.50 mg/L	10 mL	10.5 mg/L	1	0.07	0.50		<1	10/31/19 01:49:00	N	II
KQ1915964-11	Carbon, Total Organic	DUP	K1909912-002	Ground Water	11.04 mg/L	10 mL	11.0 mg/L	1	0.07	0.50		2	10/31/19 02:21:00	N	II
KQ1915964-12	Carbon, Total Organic	MS	K1909995-001	Water	26.97 mg/L	10 mL	27.0 mg/L	1	0.07	0.50	101		10/31/19 03:25:00	N	IV
KQ1915964-13	Carbon, Total Organic	DUP	K1909995-002	Water	1.83 mg/L	10 mL	1.83 mg/L	1	0.07	0.50		3	10/31/19 04:15:00	N	IV
KQ1915964-14	Carbon, Total Organic	DUP	K1909995-001	Water	1.78 mg/L	10 mL	1.78 mg/L	1	0.07	0.50		3	10/31/19 02:53:00	N	IV
KQ1915964-15	Carbon, Total Organic	DUP	K1909995-003	Water	1.80 mg/L	10 mL	1.80 mg/L	1	0.07	0.50		6	10/31/19 04:48:00	N	IV
KQ1915964-16	Carbon, Total Organic	DUP	K1909995-004	Water	3.44 mg/L	10 mL	3.44 mg/L	1	0.07	0.50		3	10/31/19 05:20:00	N	IV
KQ1915964-17	Carbon, Total Organic	DUP	K1909995-005	Water	99.72 mg/L	10 mL	99.7 mg/L	1	0.07	0.50		19*	10/31/19 05:52:00	N	IV
KQ1915964-18	Carbon, Total Organic	DUP	K1909995-006	Water	46.55 mg/L	10 mL	46.5 mg/L	1	0.07	0.50		56*	10/31/19 06:24:00	N	IV
KQ1915964-19	Carbon, Total Organic	DUP	K1909995-007	Water	10.81 mg/L	10 mL	10.8 mg/L	1	0.07	0.50		16*	10/31/19 06:56:00	N	IV

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

11/01/19

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Results Summary

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657831 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1909627-002	Carbon, Dissolved Organic (DOC)	N/A		Water	6.72 mg/L	10 mL	67.2 mg/L	10	0.7	5.0			10/31/19 07:45:00	N	I
K1909892-001	Carbon, Dissolved Organic (DOC)	N/A		Water	3.45 mg/L	10 mL	3.45 mg/L	1	0.07	0.50			10/31/19 16:23:00	N	II
K1909892-002	Carbon, Dissolved Organic (DOC)	N/A		Water	4.12 mg/L	10 mL	4.12 mg/L	1	0.07	0.50			10/31/19 16:55:00	N	II
K1909892-003	Carbon, Dissolved Organic (DOC)	N/A		Water	1.74 mg/L	10 mL	1.74 mg/L	1	0.07	0.50			10/31/19 17:28:00	N	II
K1909892-004	Carbon, Dissolved Organic (DOC)	N/A		Water	0.71 mg/L	10 mL	0.71 mg/L	1	0.07	0.50			10/31/19 18:00:00	N	II
K1909892-005	Carbon, Dissolved Organic (DOC)	N/A		Water	0.28 mg/L	10 mL	0.28 mg/L J	1	0.07	0.50			10/31/19 18:32:00	N	II
K1909913-001	Carbon, Dissolved Organic (DOC)	N/A		Water	2.53 mg/L	10 mL	2.53 mg/L	1	0.07	0.50			10/31/19 15:35:00	N	II
KQ1915965-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.18 mg/L	10 mL	24.2 mg/L	1					10/31/19 03:42:00	N	I
KQ1915965-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.73 mg/L	10 mL	24.7 mg/L	1					10/31/19 09:06:00	N	I
KQ1915965-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.07 mg/L	10 mL	24.1 mg/L	1					10/31/19 14:29:00	N	I
KQ1915965-04	Carbon, Dissolved Organic (DOC)	CCV		Water	23.97 mg/L	10 mL	24.0 mg/L	1					10/31/19 20:08:00	N	I
KQ1915965-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 03:59:00	N	I
KQ1915965-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 09:22:00	N	I
KQ1915965-07	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 14:46:00	N	I
KQ1915965-08	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 20:25:00	N	I
KQ1915965-09	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 09:39:00	N	I
KQ1915965-10	Carbon, Dissolved Organic (DOC)	LCS		Water	24.93 mg/L	10 mL	24.9 mg/L	1	0.07	0.50	100		10/31/19 09:56:00	N	I
KQ1915965-11	Carbon, Dissolved Organic (DOC)	MS	T1901809-001	Water	29.36 mg/L	10 mL	29.4 mg/L	1	0.07	0.50	101		10/31/19 08:49:00	N	IV
KQ1915965-12	Carbon, Dissolved Organic (DOC)	DUP	K1909627-002	Water	6.34 mg/L	10 mL	63.4 mg/L	10	0.7	5.0		6	10/31/19 07:45:00	N	I
KQ1915965-13	Carbon, Dissolved Organic (DOC)	DUP	T1901809-010	Water	2.88 mg/L	10 mL	2.88 mg/L	1	0.07	0.50		<1	10/31/19 15:02:00	N	IV
KQ1915965-14	Carbon, Dissolved Organic (DOC)	DUP	T1901809-009	Water	3.47 mg/L	10 mL	3.47 mg/L	1	0.07	0.50		2	10/31/19 13:57:00	N	IV
KQ1915965-15	Carbon, Dissolved Organic (DOC)	DUP	T1901809-008	Water	3.69 mg/L	10 mL	3.69 mg/L	1	0.07	0.50		5	10/31/19 13:25:00	N	IV
KQ1915965-16	Carbon, Dissolved Organic (DOC)	DUP	T1901809-007	Water	3.33 mg/L	10 mL	3.33 mg/L	1	0.07	0.50		<1	10/31/19 12:53:00	N	IV

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

11/01/19

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Results Summary

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657831 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1915965-17	Carbon, Dissolved Organic (DOC)	DUP	T1901809-006	Water	3.27 mg/L	10 mL	3.27 mg/L	1	0.07	0.50		<1	10/31/19 12:21:00	N	IV
KQ1915965-18	Carbon, Dissolved Organic (DOC)	DUP	T1901809-005	Water	3.06 mg/L	10 mL	3.06 mg/L	1	0.07	0.50		1	10/31/19 11:49:00	N	IV
KQ1915965-19	Carbon, Dissolved Organic (DOC)	DUP	T1901809-004	Water	3.11 mg/L	10 mL	3.11 mg/L	1	0.07	0.50		4	10/31/19 11:17:00	N	IV
KQ1915965-20	Carbon, Dissolved Organic (DOC)	DUP	T1901809-003	Water	3.24 mg/L	10 mL	3.24 mg/L	1	0.07	0.50		4	10/31/19 10:45:00	N	IV
KQ1915965-21	Carbon, Dissolved Organic (DOC)	DUP	T1901809-002	Water	3.32 mg/L	10 mL	3.32 mg/L	1	0.07	0.50		2	10/31/19 10:12:00	N	IV
KQ1915965-22	Carbon, Dissolved Organic (DOC)	DUP	T1901809-001	Water	3.80 mg/L	10 mL	3.80 mg/L	1	0.07	0.50		11*	10/31/19 08:17:00	N	IV
KQ1915965-23	Carbon, Dissolved Organic (DOC)	DUP	K1909892-001	Water	3.38 mg/L	10 mL	3.38 mg/L	1	0.07	0.50		2	10/31/19 16:23:00	N	II
KQ1915965-24	Carbon, Dissolved Organic (DOC)	DUP	K1909892-002	Water	3.93 mg/L	10 mL	3.93 mg/L	1	0.07	0.50		5	10/31/19 16:55:00	N	II
KQ1915965-25	Carbon, Dissolved Organic (DOC)	DUP	K1909892-003	Water	1.71 mg/L	10 mL	1.71 mg/L	1	0.07	0.50		1	10/31/19 17:28:00	N	II
KQ1915965-26	Carbon, Dissolved Organic (DOC)	DUP	K1909892-004	Water	0.71 mg/L	10 mL	0.71 mg/L	1	0.07	0.50		<1	10/31/19 18:00:00	N	II
KQ1915965-27	Carbon, Dissolved Organic (DOC)	DUP	K1909892-005	Water	0.24 mg/L	10 mL	0.24 mg/L J	1	0.07	0.50		14*	10/31/19 18:32:00	N	II
KQ1915965-28	Carbon, Dissolved Organic (DOC)	DUP	K1909913-001	Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50		2	10/31/19 15:35:00	N	II
T1901809-001	Carbon, Dissolved Organic (DOC)	N/A		Water	4.23 mg/L	10 mL	4.23 mg/L	1	0.07	0.50			10/31/19 08:17:00	Y	IV
T1901809-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50			10/31/19 10:12:00	Y	IV
T1901809-003	Carbon, Dissolved Organic (DOC)	N/A		Water	3.36 mg/L	10 mL	3.36 mg/L	1	0.07	0.50			10/31/19 10:45:00	Y	IV
T1901809-004	Carbon, Dissolved Organic (DOC)	N/A		Water	3.23 mg/L	10 mL	3.23 mg/L	1	0.07	0.50			10/31/19 11:17:00	Y	IV
T1901809-005	Carbon, Dissolved Organic (DOC)	N/A		Water	3.02 mg/L	10 mL	3.02 mg/L	1	0.07	0.50			10/31/19 11:49:00	Y	IV
T1901809-006	Carbon, Dissolved Organic (DOC)	N/A		Water	3.30 mg/L	10 mL	3.30 mg/L	1	0.07	0.50			10/31/19 12:21:00	Y	IV
T1901809-007	Carbon, Dissolved Organic (DOC)	N/A		Water	3.34 mg/L	10 mL	3.34 mg/L	1	0.07	0.50			10/31/19 12:53:00	Y	IV
T1901809-008	Carbon, Dissolved Organic (DOC)	N/A		Water	3.50 mg/L	10 mL	3.50 mg/L	1	0.07	0.50			10/31/19 13:25:00	Y	IV
T1901809-009	Carbon, Dissolved Organic (DOC)	N/A		Water	3.55 mg/L	10 mL	3.55 mg/L	1	0.07	0.50			10/31/19 13:57:00	Y	IV
T1901809-010	Carbon, Dissolved Organic (DOC)	N/A		Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50			10/31/19 15:02:00	Y	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657832 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1909958-001	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 01:50:00	N	IV
K1909958-002	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 02:22:00	N	IV
K1909958-003	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 02:54:00	N	IV
K1909958-004	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 03:26:00	N	IV
K1909958-005	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 03:58:00	N	IV
K1909958-006	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 04:30:00	N	IV
K1909958-007	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 05:02:00	N	IV
K1909958-008	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 05:35:00	N	IV
K1909958-010	Carbon, Dissolved Organic (DOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/1/19 06:07:00	N	IV
KQ1915967-01	Carbon, Dissolved Organic CCV (DOC)			Water	24.07 mg/L	10 mL	24.1 mg/L	1					10/31/19 14:29:00	N	IV
KQ1915967-02	Carbon, Dissolved Organic CCV (DOC)			Water	23.97 mg/L	10 mL	24.0 mg/L	1					10/31/19 20:08:00	N	IV
KQ1915967-03	Carbon, Dissolved Organic CCV (DOC)			Water	23.98 mg/L	10 mL	24.0 mg/L	1					11/1/19 01:16:00	N	IV
KQ1915967-04	Carbon, Dissolved Organic CCV (DOC)			Water	24.42 mg/L	10 mL	24.4 mg/L	1					11/1/19 06:39:00	N	IV
KQ1915967-05	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 14:46:00	N	IV
KQ1915967-06	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 20:25:00	N	IV
KQ1915967-07	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/1/19 01:33:00	N	IV
KQ1915967-08	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/1/19 06:56:00	N	IV
KQ1915967-09	Carbon, Dissolved Organic MB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 20:41:00	N	IV
KQ1915967-10	Carbon, Dissolved Organic LCS (DOC)			Water	24.45 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		10/31/19 20:58:00	N	IV
KQ1915967-11	Carbon, Dissolved Organic MS (DOC)		T1901815-009	Water	28.44 mg/L	10 mL	28.4 mg/L	1	0.07	0.50	102		11/1/19 01:00:00	N	IV
KQ1915967-12	Carbon, Dissolved Organic DUP (DOC)		T1901815-009	Water	2.84 mg/L	10 mL	2.84 mg/L	1	0.07	0.50		<1	11/1/19 00:28:00	N	IV
KQ1915967-13	Carbon, Dissolved Organic DUP (DOC)		T1901815-008	Water	2.84 mg/L	10 mL	2.84 mg/L	1	0.07	0.50		2	10/31/19 23:56:00	N	IV

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

11/01/19

Printed 11/1/19 13:26

Results Summary

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657832 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1915967-14	Carbon, Dissolved Organic (DOC)	DUP	T1901815-007	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	10/31/19 23:23:00	N	IV
KQ1915967-15	Carbon, Dissolved Organic (DOC)	DUP	T1901815-006	Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50		2	10/31/19 22:51:00	N	IV
KQ1915967-16	Carbon, Dissolved Organic (DOC)	DUP	T1901815-005	Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50		<1	10/31/19 22:19:00	N	IV
KQ1915967-17	Carbon, Dissolved Organic (DOC)	DUP	T1901815-004	Water	2.92 mg/L	10 mL	2.92 mg/L	1	0.07	0.50		<1	10/31/19 21:47:00	N	IV
KQ1915967-18	Carbon, Dissolved Organic (DOC)	DUP	T1901815-003	Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50		3	10/31/19 21:15:00	N	IV
KQ1915967-19	Carbon, Dissolved Organic (DOC)	DUP	T1901815-002	Water	2.83 mg/L	10 mL	2.83 mg/L	1	0.07	0.50		<1	10/31/19 19:36:00	N	IV
KQ1915967-20	Carbon, Dissolved Organic (DOC)	DUP	T1901815-001	Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50		3	10/31/19 19:04:00	N	IV
KQ1915967-21	Carbon, Dissolved Organic (DOC)	DUP	K1909958-001	Ocean Water	0.02 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 01:50:00	N	IV
KQ1915967-22	Carbon, Dissolved Organic (DOC)	DUP	K1909958-005	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 03:58:00	N	IV
KQ1915967-23	Carbon, Dissolved Organic (DOC)	DUP	K1909958-002	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 02:22:00	N	IV
KQ1915967-24	Carbon, Dissolved Organic (DOC)	DUP	K1909958-003	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 02:54:00	N	IV
KQ1915967-25	Carbon, Dissolved Organic (DOC)	DUP	K1909958-004	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 03:26:00	N	IV
KQ1915967-26	Carbon, Dissolved Organic (DOC)	DUP	K1909958-007	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 05:02:00	N	IV
KQ1915967-27	Carbon, Dissolved Organic (DOC)	DUP	K1909958-006	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 04:30:00	N	IV
KQ1915967-28	Carbon, Dissolved Organic (DOC)	DUP	K1909958-008	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 05:35:00	N	IV
KQ1915967-29	Carbon, Dissolved Organic (DOC)	DUP	K1909958-010	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/1/19 06:07:00	N	IV
T1901815-001	Carbon, Dissolved Organic (DOC)	N/A		Water	2.74 mg/L	10 mL	2.74 mg/L	1	0.07	0.50			10/31/19 19:04:00	Y	IV
T1901815-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.81 mg/L	10 mL	2.81 mg/L	1	0.07	0.50			10/31/19 19:36:00	Y	IV
T1901815-003	Carbon, Dissolved Organic (DOC)	N/A		Water	2.90 mg/L	10 mL	2.90 mg/L	1	0.07	0.50			10/31/19 21:15:00	Y	IV
T1901815-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.93 mg/L	10 mL	2.93 mg/L	1	0.07	0.50			10/31/19 21:47:00	Y	IV
T1901815-005	Carbon, Dissolved Organic (DOC)	N/A		Water	2.83 mg/L	10 mL	2.83 mg/L	1	0.07	0.50			10/31/19 22:19:00	Y	IV
T1901815-006	Carbon, Dissolved Organic (DOC)	N/A		Water	2.80 mg/L	10 mL	2.80 mg/L	1	0.07	0.50			10/31/19 22:51:00	Y	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 657832 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
T1901815-007	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			10/31/19 23:23:00	Y	IV
T1901815-008	Carbon, Dissolved Organic (DOC)	N/A		Water	2.79 mg/L	10 mL	2.79 mg/L	1	0.07	0.50			10/31/19 23:56:00	Y	IV
T1901815-009	Carbon, Dissolved Organic (DOC)	N/A		Water	2.84 mg/L	10 mL	2.84 mg/L	1	0.07	0.50			11/1/19 00:28:00	Y	IV

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

TOC: 657829, 657830
DOC: 657831, 657832

Schedule: 10302019

Version: 6
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/10/30 11:50 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	LOD	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	LOQ	Extended Reaction 021711 (Extended Reaction 021711)	1
5	Sample	K1909800-002.01 100x	Extended Reaction 021711 (Extended Reaction 021711)	2
6	Sample	K1909822-004.01 100x	Extended Reaction 021711 (Extended Reaction 021711)	2
7	Sample	K1909822-005.01 100x	Extended Reaction 021711 (Extended Reaction 021711)	2
8	Sample	K1910066-006.06	Extended Reaction 021711 (Extended Reaction 021711)	2
9	Sample	K1910066-006.06 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1910066-001.06	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1910066-002.06	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K1910066-003.06	Extended Reaction 021711 (Extended Reaction 021711)	2
13	Sample	K1910066-004.06	Extended Reaction 021711 (Extended Reaction 021711)	2
14	Sample	K1910066-005.06	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	K1910066-007.06	Extended Reaction 021711 (Extended Reaction 021711)	2
16	Sample	K1909998-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	K1910007-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K1910079-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K1909892-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1909892-002.02	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K1909892-003.02	Extended Reaction 021711 (Extended Reaction 021711)	2
23	Sample	K1909892-004.02	Extended Reaction 021711 (Extended Reaction 021711)	2
24	Sample	K1909892-005.02	Extended Reaction 021711 (Extended Reaction 021711)	2
25	Sample	K1909912-001.08	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K1909912-002.08	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K1909995-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K1909995-001.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1909995-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K1909995-003.01	Extended Reaction 021711 (Extended Reaction 021711)	2
31	Sample	K1909995-004.01	Extended Reaction 021711 (Extended Reaction 021711)	2
32	Sample	K1909995-005.01	Extended Reaction 021711 (Extended Reaction 021711)	2
33	Sample	K1909995-006.01	Extended Reaction 021711 (Extended Reaction 021711)	2
34	Sample	K1909995-007.01	Extended Reaction 021711 (Extended Reaction 021711)	2
35	Sample	FB 10/22/19	Extended Reaction 021711 (Extended Reaction 021711)	1
36	Sample	K1909627-002.01 10x doc	Extended Reaction 021711 (Extended Reaction 021711)	2
37	Sample	T1901809-001.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
38	Sample	T1901809-001.05 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

11/01/19

Schedule: 10302019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
40	Sample	T1901809-002.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
41	Sample	T1901809-003.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
42	Sample	T1901809-004.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
43	Sample	T1901809-005.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
44	Sample	T1901809-006.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
45	Sample	T1901809-007.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
46	Sample	T1901809-008.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
47	Sample	T1901809-009.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	T1901809-010.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
49	Sample	K1909913-001.02 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
50	Sample	FB 10/25/19	Extended Reaction 021711 (Extended Reaction 021711)	1
51	Sample	K1909892-001.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
52	Sample	K1909892-002.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
53	Sample	K1909892-003.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
54	Sample	K1909892-004.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
55	Sample	K1909892-005.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
56	Sample	T1901815-001.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	T1901815-002.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	T1901815-003.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
60	Sample	T1901815-004.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
61	Sample	T1901815-005.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
62	Sample	T1901815-006.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
63	Sample	T1901815-007.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
64	Sample	T1901815-008.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
65	Sample	T1901815-009.05 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	T1901815-009.05 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K1909958-001.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K1909958-002.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
69	Sample	K1909958-003.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
70	Sample	K1909958-004.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	K1909958-005.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K1909958-006.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
73	Sample	K1909958-007.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
74	Sample	K1909958-008.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
75	Sample	K1909958-010.01 doc 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

Fusion Report - 10302019
Wednesday, October 30, 2019 10:13 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/11/01 09:29 - Friday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	10302019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6)		
Comment:			

Report Results

11/01/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/10/30 10:13

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.91	16.94	4.03	49.70	05:25
2	TC Clean	7.62	11.16	3.54	50.08	04:06
3	TC Clean	2.25	6.02	3.76	50.08	03:50
4	TC Clean	1.93	5.70	3.77	50.07	03:47

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/10/30 10:36

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.27	15.02	3.75	49.55	05:13
2	TC Clean	4.83	8.68	3.85	50.08	04:02
3	TC Clean	2.46	6.27	3.82	50.09	03:56

4	TC Clean	1.67	5.40	3.72	50.09	03:55

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/10/30 10:58

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.34	14.99	3.64	49.59	05:22
2	TC Clean	4.27	8.05	3.78	50.07	04:01
3	TC Clean	2.14	5.89	3.74	50.08	03:46
4	TC Clean	1.49	5.48	3.99	50.11	03:48

Sample Type: Blank (Creating v1311) — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/10/30 11:28

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.27	14.97	3.70	49.72	05:12
2	TC Clean	5.39	9.01	3.63	50.04	04:04
3	TC Clean	1.96	5.66	3.70	50.12	03:50
4	TC Clean	1.58	5.29	3.70	50.10	03:50
5	Reagent Blank	3.44	7.27	3.83	50.11	05:03
6	Acid Blank	1.26	5.01	3.75	49.56	05:29

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0050 ppm	0.0000 ppm	0.0000%	2019/10/30 12:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0050	0.0504	10.31	14.28	3.97	50.24	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8974 ppm (PASS)	0.0000 ppm	0%	2019/10/30 12:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8974	238.9735	182.52	186.53	4.02	50.27	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/30 12:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.61	11.42	3.81	50.32	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/30 12:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.90	10.65	3.75	50.33	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.6040 ppm (PASS)	0.0000 ppm	0%	2019/10/30 13:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6040	246.0402	187.58	191.31	3.73	50.35	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0251 ppm	0.0000 ppm	0.0000%	2019/10/30 13:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0251	0.2512	10.46	14.33	3.87	50.35	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	LOD	0.0769 ppm	0.0000 ppm	0.0000%	2019/10/30 13:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0769	0.7686	10.83	14.44	3.61	50.36	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	LOQ	0.5307 ppm	0.0000 ppm	0.0000%	2019/10/30 13:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5307	5.3068	14.08	17.77	3.68	50.41	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1909800-002.01 100x	2.7458 ppm	0.0438 ppm	1.5900%	2019/10/30 14:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7768	27.7675	30.19	33.77	3.58	50.35	12:24
2	TOC	2.7148	27.1483	29.74	33.52	3.78	50.31	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC)	Extended Reaction	Extended Reaction

(v1311) 021711 (v4) 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1909822-004.01 100x	7.0041 ppm	0.1720 ppm	2.4600%	2019/10/30 14:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.8824	68.8245	59.63	63.37	3.75	50.32	12:26
2	TOC	7.1257	71.2567	61.37	65.03	3.66	50.30	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1909822-005.01 100x	5.8830 ppm	0.0045 ppm	0.0800%	2019/10/30 15:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.8863	58.8625	52.48	56.12	3.64	50.25	12:31
2	TOC	5.8798	58.7984	52.44	56.33	3.90	50.26	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1910066-006.06	1.6603 ppm	0.0439 ppm	2.6400%	2019/10/30 15:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6913	16.9130	22.40	26.22	3.81	50.23	12:26
2	TOC	1.6292	16.2924	21.96	25.73	3.77	50.23	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1910066-006.06 ms	25.9734 ppm	0.0000 ppm	0.0000%	2019/10/30 16:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.9734	259.7345	196.51	200.24	3.73	50.24	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV	0 / infinity	24.1506	0.0000	0%	2019/10/30 16:40

					021711 [25 ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1506	241.5062	184.33	188.16	3.83	50.26	12:31

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)
STD Conc - Pos B: 50 ppmC

Sample Type: Check Standard --> CCB 021711 — From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/30 16:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.33	11.07	3.75	50.24	12:32

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)
STD Conc - Pos D: 0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1910066-001.06	1.0238 ppm	0.0428 ppm	4.1800%	2019/10/30 17:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9936	9.9356	17.40	21.16	3.76	50.26	12:29
2	TOC	1.0541	10.5409	17.84	21.49	3.66	50.27	12:28

Dilution: 1:10
Blank Contribution: (TC) 10.2769 (IC) (v1311)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1910066-002.06	0.9378 ppm	0.0181 ppm	1.9300%	2019/10/30 17:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9506	9.5061	17.09	20.69	3.59	50.29	12:31
2	TOC	0.9249	9.2494	16.91	20.60	3.69	50.33	12:27

Dilution: 1:10
Blank Contribution: (TC) 10.2769 (IC) (v1311)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1910066-003.06	0.8130 ppm	0.0298 ppm	3.6600%	2019/10/30 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8340	8.3401	16.26	19.88	3.62	50.34	12:28
2	TOC	0.7919	7.9190	15.96	19.73	3.77	50.36	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1910066-004.06	0.8159 ppm	0.0327 ppm	4.0100%	2019/10/30 18:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7927	7.9273	15.96	19.55	3.59	50.41	12:29
2	TOC	0.8390	8.3903	16.29	19.96	3.67	50.44	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1910066-005.06	0.8121 ppm	0.0316 ppm	3.8900%	2019/10/30 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7898	7.8980	15.94	19.66	3.72	50.48	12:26
2	TOC	0.8344	8.3443	16.26	20.01	3.75	50.51	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1910066-007.06	0.9765 ppm	0.0650 ppm	6.6600%	2019/10/30 19:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9305	9.3052	16.95	20.57	3.62	50.50	12:27
2	TOC	1.0224	10.2243	17.61	21.31	3.70	50.54	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1909998-001.01	2.0648 ppm	0.0181 ppm	0.8800%	2019/10/30 20:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0520	20.5196	24.99	28.75	3.76	50.60	12:27

2	TOC	2.0776	20.7762	25.17	28.91	3.73	50.57	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K1910007-001.01	1.5991 ppm	0.0499 ppm	3.1200%	2019/10/30 20:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5638	15.6383	21.49	25.18	3.69	50.57	12:30
2	TOC	1.6344	16.3440	22.00	25.83	3.83	50.51	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K1910079-001.01	7.6851 ppm	0.0534 ppm	0.7000%	2019/10/30 21:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.7229	77.2286	65.65	69.19	3.54	50.48	12:26
2	TOC	7.6473	76.4727	65.11	68.69	3.58	50.43	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K1909892-001.02	4.5500 ppm	0.0446 ppm	0.9800%	2019/10/30 22:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5185	45.1852	42.68	46.42	3.74	50.42	12:29
2	TOC	4.5816	45.8156	43.13	46.73	3.60	50.43	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.2124 ppm (PASS)	0.0000 ppm	0%	2019/10/30 22:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2124	242.1240	184.77	188.44	3.67	50.42	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/30 22:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.13	10.91	3.77	50.37	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/30 23:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.47	10.06	3.59	50.37	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.6226 ppm (PASS)	0.0000 ppm	0%	2019/10/30 23:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6226	246.2257	187.72	191.45	3.74	50.39	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K1909892-002.02	5.2118 ppm	0.0036 ppm	0.0700%	2019/10/30 23:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2093	52.0929	47.63	51.49	3.86	50.36	12:28
2	TOC	5.2143	52.1431	47.66	51.31	3.65	50.34	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K1909892-003.02	2.3771 ppm	0.0502 ppm	2.1100%	2019/10/31 00:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4126	24.1261	27.58	31.12	3.54	50.34	12:26
2	TOC	2.3416	23.4162	27.07	30.54	3.47	50.35	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K1909892-004.02	0.9562 ppm	0.0103 ppm	1.0700%	2019/10/31 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9634	9.6344	17.18	20.83	3.65	50.33	12:29
2	TOC	0.9489	9.4893	17.08	20.71	3.63	50.35	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K1909892-005.02	0.3620 ppm	0.0255 ppm	7.0600%	2019/10/31 01:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3801	3.8006	13.00	16.58	3.57	50.31	12:28
2	TOC	0.3439	3.4394	12.74	16.38	3.64	50.30	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K1909912-001.08	10.4580 ppm	0.0581 ppm	0.5600%	2019/10/31 01:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.4169	104.1689	84.97	88.56	3.59	50.31	12:29

2	TOC	10.4990	104.9904	85.56	89.22	3.66	50.28	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1909912-002.08	10.9148 ppm	0.1755 ppm	1.6100%	2019/10/31 02:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.7907	107.9066	87.65	91.47	3.82	50.28	12:29
2	TOC	11.0389	110.3890	89.43	92.99	3.56	50.26	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1909995-001.01	1.8084 ppm	0.0397 ppm	2.2000%	2019/10/31 02:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8365	18.3648	23.44	27.08	3.64	50.28	12:31
2	TOC	1.7803	17.8028	23.04	26.77	3.73	50.24	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1909995-001.01 ms	26.9727 ppm	0.0000 ppm	0.0000%	2019/10/31 03:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.9727	269.7271	203.68	207.37	3.69	50.22	12:35

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.1830 ppm (PASS)	0.0000 ppm	0%	2019/10/31 03:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1830	241.8298	184.56	188.26	3.69	50.23	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B

Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/31 03:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.48	10.14	3.66	50.21	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1909995-002.01	1.8055 ppm	0.0336 ppm	1.8600%	2019/10/31 04:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7817	17.8167	23.05	26.76	3.70	50.24	12:29
2	TOC	1.8292	18.2923	23.39	27.10	3.71	50.24	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1909995-003.01	1.8575 ppm	0.0768 ppm	4.1400%	2019/10/31 04:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9118	19.1179	23.98	27.67	3.68	50.22	12:31
2	TOC	1.8032	18.0315	23.21	26.91	3.70	50.19	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1909995-004.01	3.4859 ppm	0.0672 ppm	1.9300%	2019/10/31 05:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5333	35.3335	35.61	39.37	3.76	50.21	12:28
2	TOC	3.4384	34.3837	34.93	38.63	3.70	50.17	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	K1909995-005.01	90.8814 ppm	12.4971 ppm	13.7500%	2019/10/31 05:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	82.0446	820.4456	598.56	602.14	3.58	50.17	12:27
2	TOC	99.7182	997.1818	725.29	740.59	15.31	50.14	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	33	TOC	K1909995-006.01	64.4891 ppm	25.3768 ppm	39.3500%	2019/10/31 06:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	82.4332	824.3324	601.35	612.54	11.19	50.16	12:28
2	TOC	46.5450	465.4501	344.02	348.32	4.30	50.17	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	34	TOC	K1909995-007.01	11.7386 ppm	1.3159 ppm	11.2100%	2019/10/31 06:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.6691	126.6910	101.12	104.92	3.81	50.14	12:29
2	TOC	10.8081	108.0809	87.77	91.50	3.72	50.16	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	35	TOC	FB 10/22/19	1.8617 ppm	0.0000 ppm	0.0000%	2019/10/31 07:29

NR/read in previous runs as 0.

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8617	18.6173	23.63	27.38	3.76	50.14	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	36	TOC	K1909627-002.01 10x doc	6.5320 ppm	0.2655 ppm	4.0600%	2019/10/31 07:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7197	67.1969	58.46	62.05	3.59	50.17	12:27
2	TOC	6.3443	63.4425	55.77	59.36	3.60	50.21	12:26

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	T1901809-001.05 doc	4.0152 ppm	0.3093 ppm	7.7000%	2019/10/31 08:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2339	42.3388	40.64	44.25	3.62	50.20	12:30
2	TOC	3.7965	37.9652	37.50	41.09	3.59	50.16	12:29

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	T1901809-001.05 ms doc	29.3634 ppm	0.0000 ppm	0.0000%	2019/10/31 08:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.3634	293.6341	220.82	224.53	3.71	50.22	12:31

Dilution 1:10 | **Blank Contribution** (TC) 10.2769 (IC) (v1311) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.7333 ppm (PASS)	0.0000 ppm	0%	2019/10/31 09:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7333	247.3330	188.51	192.31	3.80	50.31	12:32

Completion State Success - Criteria met. | **Success Action** Do Nothing | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27) | **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB	0 / infinity	0.0000	0.0000	0%	2019/10/31 09:22

					021711 [0.0 ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	9.95	13.60	3.65	50.23	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/31 09:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.55	12.25	3.70	50.24	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER — From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.9298 ppm (PASS)	0.0000 ppm	0%	2019/10/31 09:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.9298	249.2981	189.92	193.47	3.56	50.26	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	T1901809-002.05 doc	3.3643 ppm	0.0592 ppm	1.7600%	2019/10/31 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4062	34.0616	34.70	38.42	3.72	50.32	12:24
2	TOC	3.3225	33.2248	34.10	37.77	3.67	50.26	12:27

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	T1901809-003.05 doc	3.2974 ppm	0.0852 ppm	2.5800%	2019/10/31 10:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3576	33.5762	34.35	38.00	3.65	50.26	12:29
2	TOC	3.2371	32.3713	33.49	37.30	3.81	50.40	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	T1901809-004.05 doc	3.1700 ppm	0.0902 ppm	2.8500%	2019/10/31 11:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2338	32.3378	33.46	37.05	3.59	50.45	12:28
2	TOC	3.1062	31.0617	32.55	36.25	3.70	50.45	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	T1901809-005.05 doc	3.0399 ppm	0.0236 ppm	0.7800%	2019/10/31 11:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0232	30.2319	31.95	35.78	3.82	50.45	12:29
2	TOC	3.0565	30.5652	32.19	35.84	3.64	50.47	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	T1901809-006.05 doc	3.2827 ppm	0.0232 ppm	0.7100%	2019/10/31 12:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2990	32.9905	33.93	37.51	3.58	50.47	12:29
2	TOC	3.2663	32.6627	33.70	37.16	3.47	50.46	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	T1901809-007.05 doc	3.3363 ppm	0.0081 ppm	0.2400%	2019/10/31 12:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3420	33.4200	34.24	37.82	3.58	50.43	12:25
2	TOC	3.3306	33.3057	34.16	37.64	3.48	50.54	12:27

Dilution: 1:10
Blank Contribution: (TC) 10.2769 (IC) (v1311)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	46	TOC	T1901809-008.05 doc	3.5967 ppm	0.1311 ppm	3.6400%	2019/10/31 13:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5041	35.0406	35.40	38.94	3.54	50.46	12:25
2	TOC	3.6894	36.8941	36.73	40.51	3.78	50.44	12:26

Dilution: 1:10
Blank Contribution: (TC) 10.2769 (IC) (v1311)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	47	TOC	T1901809-009.05 doc	3.5135 ppm	0.0571 ppm	1.6300%	2019/10/31 13:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5538	35.5385	35.76	39.45	3.69	50.40	12:26
2	TOC	3.4731	34.7310	35.18	38.80	3.62	50.39	12:24

Dilution: 1:10
Blank Contribution: (TC) 10.2769 (IC) (v1311)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.0662 ppm (PASS)	0.0000 ppm	0%	2019/10/31 14:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0662	240.6624	183.73	187.25	3.52	50.37	12:30

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)
STD Conc - Pos B: 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/31 14:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.17	10.83	3.66	50.34	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	T1901809-010.05 doc	3.8690 ppm	0.0129 ppm	0.3300%	2019/10/31 15:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8598	38.5983	37.95	41.64	3.68	50.34	12:26
2	TOC	3.8781	38.7810	38.08	41.81	3.73	50.34	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K1909913-001.02 doc	2.5600 ppm	0.0425 ppm	1.6600%	2019/10/31 15:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5299	25.2990	28.42	31.93	3.51	50.30	12:31
2	TOC	2.5900	25.9001	28.85	32.39	3.54	50.29	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	FB 10/25/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/31 16:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.06	12.62	3.56	50.30	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	51	TOC	K1909892-001.01 doc	3.4160 ppm	0.0464 ppm	1.3600%	2019/10/31 16:23

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

1	TOC	3.4488	34.4883	35.01	38.59	3.59	50.30	12:28
2	TOC	3.3831	33.8314	34.54	38.20	3.66	50.28	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1909892-002.01 doc	4.0237 ppm	0.1383 ppm	3.4400%	2019/10/31 16:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1215	41.2147	39.83	43.36	3.53	50.30	12:28
2	TOC	3.9259	39.2594	38.43	42.12	3.70	50.30	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K1909892-003.01 doc	1.7260 ppm	0.0157 ppm	0.9100%	2019/10/31 17:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7370	17.3705	22.73	26.39	3.65	50.32	12:29
2	TOC	1.7149	17.1487	22.57	26.26	3.69	50.32	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	K1909892-004.01 doc	0.7056 ppm	0.0009 ppm	0.1300%	2019/10/31 18:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7050	7.0501	15.33	19.05	3.72	50.33	12:26
2	TOC	0.7063	7.0626	15.34	18.99	3.65	50.36	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K1909892-005.01 doc	0.2612 ppm	0.0259 ppm	9.9300%	2019/10/31 18:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2795	2.7950	12.28	15.94	3.66	50.40	12:26
2	TOC	0.2428	2.4282	12.02	15.64	3.62	50.42	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	56	TOC	T1901815-001.05 doc	2.7758 ppm	0.0529 ppm	1.9000%	2019/10/31 19:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7384	27.3840	29.91	33.56	3.65	50.42	12:27
2	TOC	2.8132	28.1315	30.45	33.99	3.55	50.43	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	57	TOC	T1901815-002.05 doc	2.8200 ppm	0.0197 ppm	0.7000%	2019/10/31 19:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8060	28.0604	30.40	34.07	3.67	50.47	12:27
2	TOC	2.8339	28.3393	30.60	34.16	3.56	50.47	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9653 ppm (PASS)	0.0000 ppm	0%	2019/10/31 20:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9653	239.6527	183.00	186.59	3.59	50.47	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/31 20:25

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.16	9.84	3.68	50.48	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/31 20:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.00	9.61	3.61	50.52	12:35

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER — From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.4549 ppm (PASS)	0.0000 ppm	0%	2019/10/31 20:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4549	244.5493	186.51	190.22	3.71	50.49	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	59	TOC	T1901815-003.05 doc	2.8546 ppm	0.0575 ppm	2.0100%	2019/10/31 21:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8953	28.9530	31.04	34.53	3.49	50.40	12:26
2	TOC	2.8140	28.1399	30.45	34.16	3.70	50.43	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	T1901815-004.05 doc	2.9233 ppm	0.0093 ppm	0.3200%	2019/10/31 21:47

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

1	TOC	2.9299	29.2989	31.28	34.96	3.68	50.40	12:30
2	TOC	2.9168	29.1678	31.19	34.90	3.71	50.47	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	T1901815-005.05 doc	2.8190 ppm	0.0172 ppm	0.6100%	2019/10/31 22:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8311	28.3114	30.58	34.26	3.68	50.38	12:29
2	TOC	2.8069	28.0688	30.40	34.12	3.72	50.38	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	T1901815-006.05 doc	2.8285 ppm	0.0454 ppm	1.6000%	2019/10/31 22:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7964	27.9642	30.33	34.01	3.68	50.37	12:30
2	TOC	2.8606	28.6057	30.79	34.38	3.59	50.34	12:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	T1901815-007.05 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/31 23:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.05	10.53	3.47	50.30	12:29
2	TOC	0.0000	0.0000	6.60	10.21	3.61	50.27	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	T1901815-008.05 doc	2.8124 ppm	0.0360 ppm	1.2800%	2019/10/31 23:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7869	27.8693	30.26	33.91	3.65	50.30	12:30
2	TOC	2.8378	28.3784	30.62	34.23	3.60	50.29	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	T1901815-009.05 doc	2.8408 ppm	0.0032 ppm	0.1100%	2019/11/01 00:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8430	28.4300	30.66	34.31	3.65	50.28	12:30
2	TOC	2.8385	28.3854	30.63	34.48	3.85	50.26	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	T1901815-009.05 ms doc	28.4399 ppm	0.0000 ppm	0.0000%	2019/11/01 01:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.4399	284.3988	214.20	217.85	3.66	50.24	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9838 ppm (PASS)	0.0000 ppm	0%	2019/11/01 01:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9838	239.8382	183.14	186.73	3.59	50.25	12:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/01 01:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.86	10.56	3.70	50.17	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K1909958-001.01 doc 2x	0.0077 ppm	0.0109 ppm	141.4200%	2019/11/01 01:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.17	14.01	3.84	50.22	12:26
2	TOC	0.0154	0.1536	10.39	14.18	3.79	50.27	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1909958-002.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 02:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.54	13.27	3.72	50.22	12:26
2	TOC	0.0000	0.0000	9.44	13.21	3.77	50.21	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	K1909958-003.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 02:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.84	12.63	3.79	50.21	12:31
2	TOC	0.0000	0.0000	8.33	12.11	3.77	50.17	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K1909958-004.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 03:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.69	12.38	3.69	50.18	12:26
2	TOC	0.0000	0.0000	8.65	12.23	3.58	50.17	12:26

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K1909958-005.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 03:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.69	12.27	3.58	50.17	12:24
2	TOC	0.0000	0.0000	8.95	12.56	3.61	50.15	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1909958-006.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 04:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.23	11.83	3.60	50.14	12:30
2	TOC	0.0000	0.0000	8.76	12.38	3.62	50.12	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K1909958-007.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 05:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.03	12.54	3.51	50.11	12:27
2	TOC	0.0000	0.0000	8.56	12.15	3.59	50.12	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K1909958-008.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 05:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.68	12.28	3.61	50.12	12:28
2	TOC	0.0000	0.0000	8.51	12.25	3.74	50.09	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	75	TOC	K1909958-010.01 doc 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/01 06:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.06	11.59	3.54	50.04	12:29
2	TOC	0.0000	0.0000	8.09	11.76	3.67	49.93	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.2769 (IC) (v1311)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.4201 ppm (PASS)	0.0000 ppm	0%	2019/11/01 06:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4201	244.2007	186.26	189.82	3.55	49.85	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/01 06:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.31	10.77	3.46	49.81	12:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1310	1.4213	1.4340	0.0000	0.0000	0.0000	2019/10/26 13:10	Fusion1 (Fusion1)
v1311	1.1460	1.2580	0.0000	0.0000	0.0000	2019/10/30 12:02	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version: v27
Ver Creation: 2019/03/11 21:51
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC

Calibration curve formula: TOC: y = 7.170x + 11.164
r^2 value: TOC: r^2 = 0.99991

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	10.4100	0.0000		2019/03/11 20:12
0.50 ppm	14.7740	0.5000		2019/03/11 20:28
1.00 ppm	18.0020	1.0000		2019/03/11 20:44
5.00 ppm	47.2310	5.0000		2019/03/11 21:01
10.0 ppm	85.1320	10.0000		2019/03/11 21:17
25.0 ppm	188.5200	25.0000		2019/03/11 21:33
50.0 ppm	370.1610	50.0000		2019/03/11 21:49

Methods

Name: Extended Reaction 021711 (TOC)

Version: v4
Ver Creation: 2019/01/31 11:21
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4

SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/11/01 07:13

StarLIMS Run: 657829, 657830, 657831, 657832

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-82B

21 % H3PO4: 11-GEN-05-82A

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: BCD	Date Analyzed: 10/30/19
Reviewed By:	Date Reviewed: 11/01/19

HS19101488 Wet Chem Raw Data

ALS WO# HS19101488

Sequence: 110419
Last Update Operator: alshs.nouser

HS19101488

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	Volume [ul]	Status	Inject Time
	STD1	2970209205	Calibration	GA1	1.0000	1	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:08:06 PM -05:00
	STD2		Calibration	GA2	1.0000	2	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:24:42 PM -05:00
	STD3		Calibration	GA3	1.0000	3	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:41:19 PM -05:00
	STD4		Calibration	GA4	1.0000	4	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:57:54 PM -05:00
	STD5		Calibration	GA5	1.0000	5	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 3:14:30 PM -05:00
	STD6	F, NO2 MAX 10PPM	Calibration	GB8	1.0000	6	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:37:32 PM -05:00
	ICV	2970209123	Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:54:07 PM -05:00
	ICB		Unknown	GB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 7:29:52 PM -05:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 10:52:21 AM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 11:08:56 AM -06:00
	WBLKW1-110419		Unknown	BB1	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 11:38:18 AM -06:00
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	WLCSDW1-110419		Unknown	BB3	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 12:11:33 PM -06:00
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	HS19110026-01MSDF10		Unknown	BB5	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 12:44:45 PM -06:00
	HS19110026-01MSDDF10		Unknown	BB6	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 1:01:20 PM -06:00
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	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 1:34:33 PM -06:00
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	HS19101353-05DF100		Unknown	BD6	100.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 4:40:08 PM -06:00
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	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 5:13:21 PM -06:00
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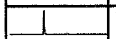
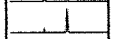
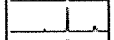
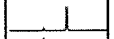
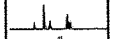
Sequence: 110419
Last Update Operator: alshs.nouser

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	Volume [ul]	Status	Inject Time
	HS19101774-01DF10		Unknown	BD7	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 7:22:45 PM -06:00
	HS19101441-03DF50		Unknown	BD8	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 7:39:20 PM -06:00
	HS19101441-04DF50		Unknown	BE1	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 7:55:56 PM -06:00
	HS19101441-05DF50		Unknown	BE2	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 8:12:31 PM -06:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 8:29:06 PM -06:00
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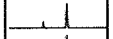
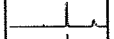
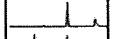
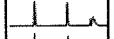
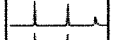
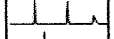
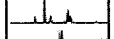
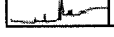
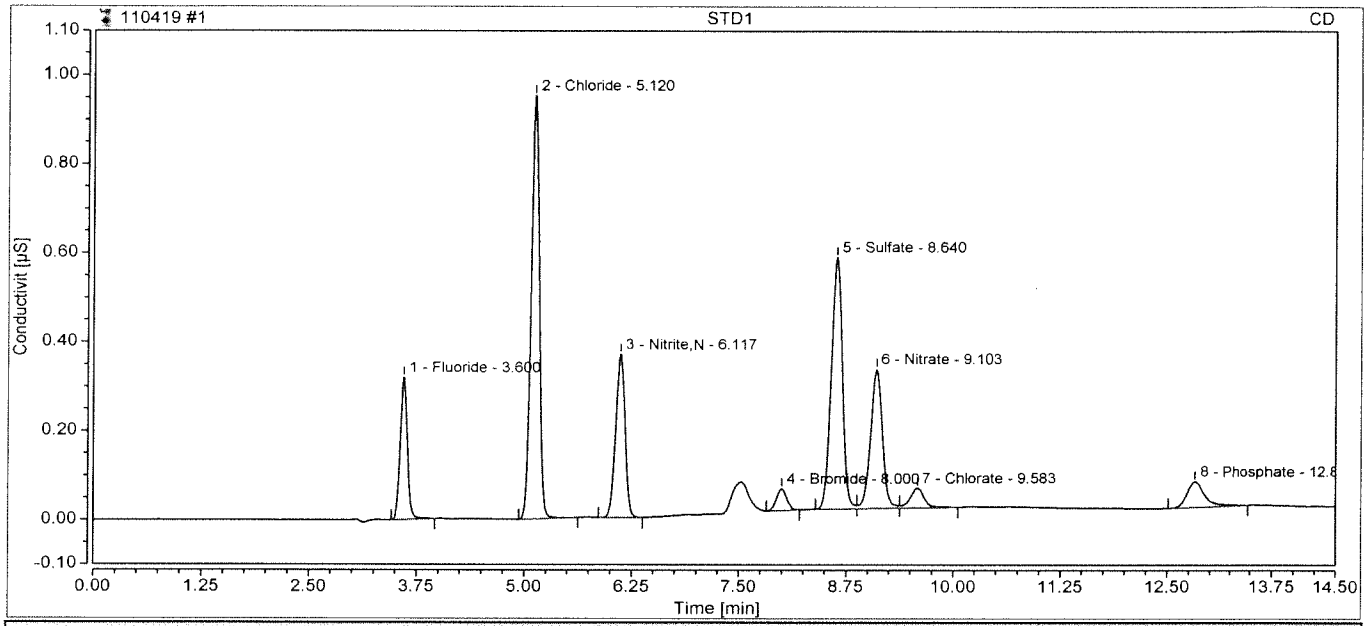
	HS19101441-07DF10		Unknown	BE3	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 9:02:17 PM -06:00
	HS19101532-09DF50		Unknown	BE4	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 9:18:51 PM -06:00
	HS19101532-09DF200		Unknown	BE5	200.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 9:35:26 PM -06:00
	HS19101532-10DF50		Unknown	BE6	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 9:52:02 PM -06:00
	HS19101532-10DF200		Unknown	BE7	200.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 10:08:36 PM -06:00
	HS19101532-11DF50	high F	Unknown	BE8	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 10:25:11 PM -06:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/4/2019 11:48:12 PM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/5/2019 12:04:47 AM -06:00

Peak No.	Peak Name	Cal.Type	Eval.Type	Number of Points	Rel.Std.Dev. %	Coeff.of Determination	C0 (Offset)	C1 (Slope)	C2 (Curve)
1	*Fluoride*	*Lin, WithOffset, 1/x*	*Area*	*5*	*10.1532*	*0.99927*	*-0.0056*	*0.3716*	*0.0000*
2	Chloride	Lin, WithOffset, 1/x	Area	6	0.2804	1.00000	-0.0135	0.2355	0.0000
3	Nitrite,N	Lin, WithOffset, 1/x	Area	5	15.1147	0.99824	0.0003	0.5120	0.0000
4	Bromide	Lin, WithOffset, 1/x	Area	6	14.0217	0.99919	-0.0052	0.1009	0.0000
5	Sulfate	Lin, WithOffset, 1/x	Area	6	1.1258	0.99999	-0.0022	0.1717	0.0000
6	Nitrate	Lin, WithOffset, 1/x	Area	6	2.2249	0.99998	-0.0102	0.5876	0.0000
7	Chlorate	Lin, WithOffset, 1/x	Area	6	10.0265	0.99953	-0.0024	0.0944	0.0000
8	Phosphate	Lin, WithOffset, 1/x	Area	6	6.6198	0.99981	-0.0110	0.2321	0.0000
Maximum					15.1147	1.00000			
Minimum					0.2804	0.99824			

1 STD1

Sample Name:	**STD1**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:08**	*Sample Weight:*	**1.0000**

Run Time:



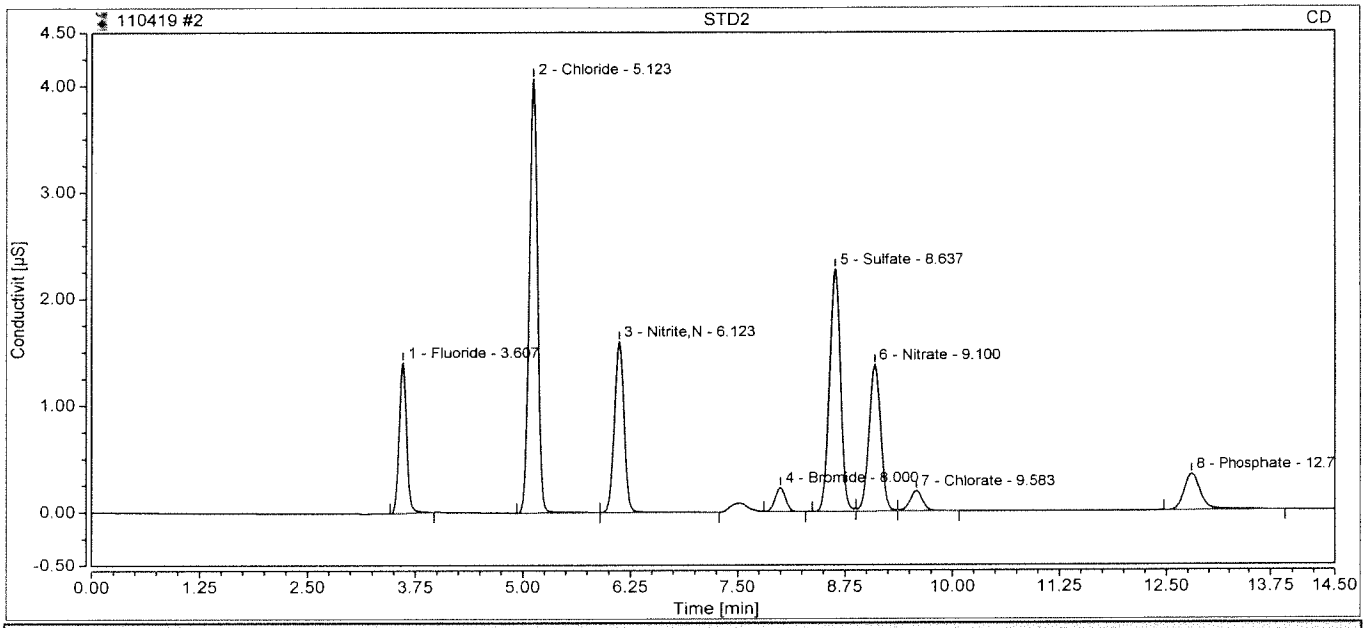
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.031	0.0973	0.0973	1.0000
2	5.12	Chloride	BMB	0.105	0.5026	0.5026	1.0000
3	6.12	Nitrite,N	BMB	0.046	0.0893	0.0893	1.0000
4	8.00	Bromide	BMB	0.007	0.1192	0.1192	1.0000
5	8.64	Sulfate	BM	0.084	0.5042	0.5042	1.0000
6	9.10	Nitrate	M	0.051	0.1034	0.1034	1.0000
7	9.58	Chlorate	MB	0.008	0.1143	0.1143	1.0000
8	12.83	Phosphate	BMB	0.014	0.1085	0.1085	1.0000
Total:			**0.000**	**0.346**		**1.64**	

2 STD2

Sample Name:	**STD2**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:24**	*Sample Weight:*	**1.0000**

Run Time:



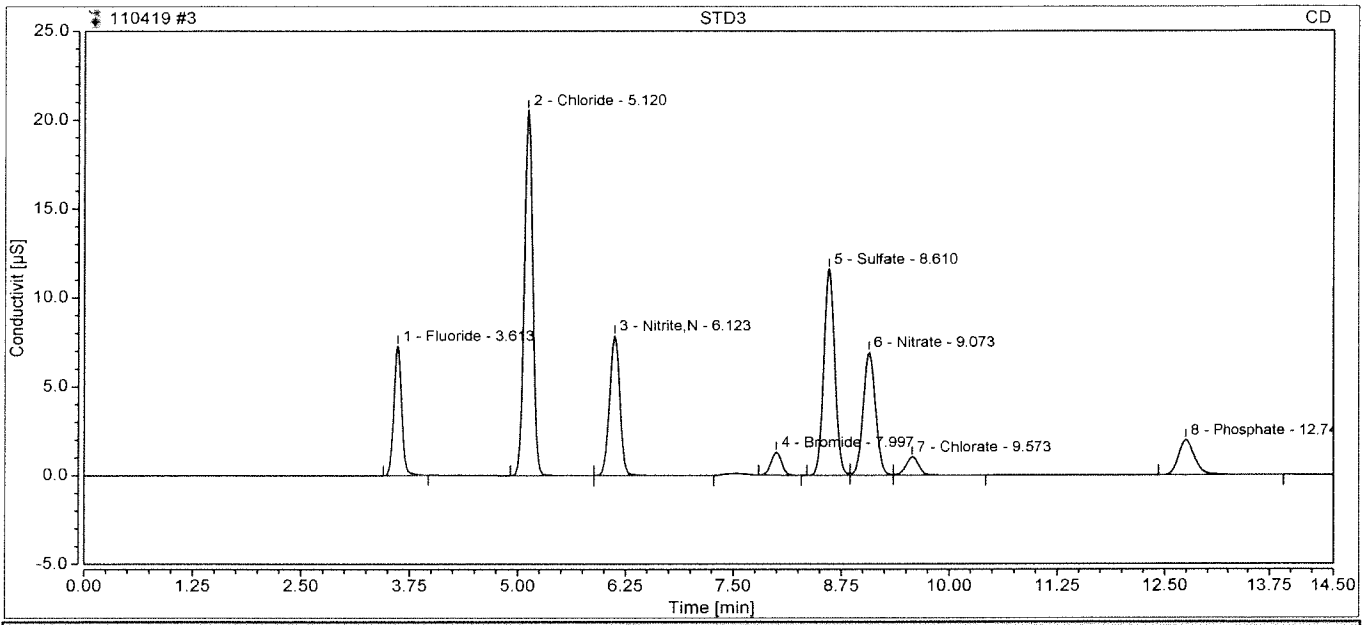
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.140	0.3929	0.3929	1.0000
2	5.12	Chloride	BMB	0.456	1.9918	1.9918	1.0000
3	6.12	Nitrite,N	BMB	0.211	0.4119	0.4119	1.0000
4	8.00	Bromide	BMB	0.031	0.3593	0.3593	1.0000
5	8.64	Sulfate	BM	0.337	1.9733	1.9733	1.0000
6	9.10	Nitrate	M	0.220	0.3917	0.3917	1.0000
7	9.58	Chlorate	MB	0.033	0.3704	0.3704	1.0000
8	12.80	Phosphate	BMB	0.078	0.3841	0.3841	1.0000
Total:			**0.000**	**1.506**		**6.28**	

3 STD3

Sample Name:	**STD3**	*Injection Volume:*	**5.00**
Vial Number:	**GA3**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:41**	*Sample Weight:*	**1.0000**

Run Time:



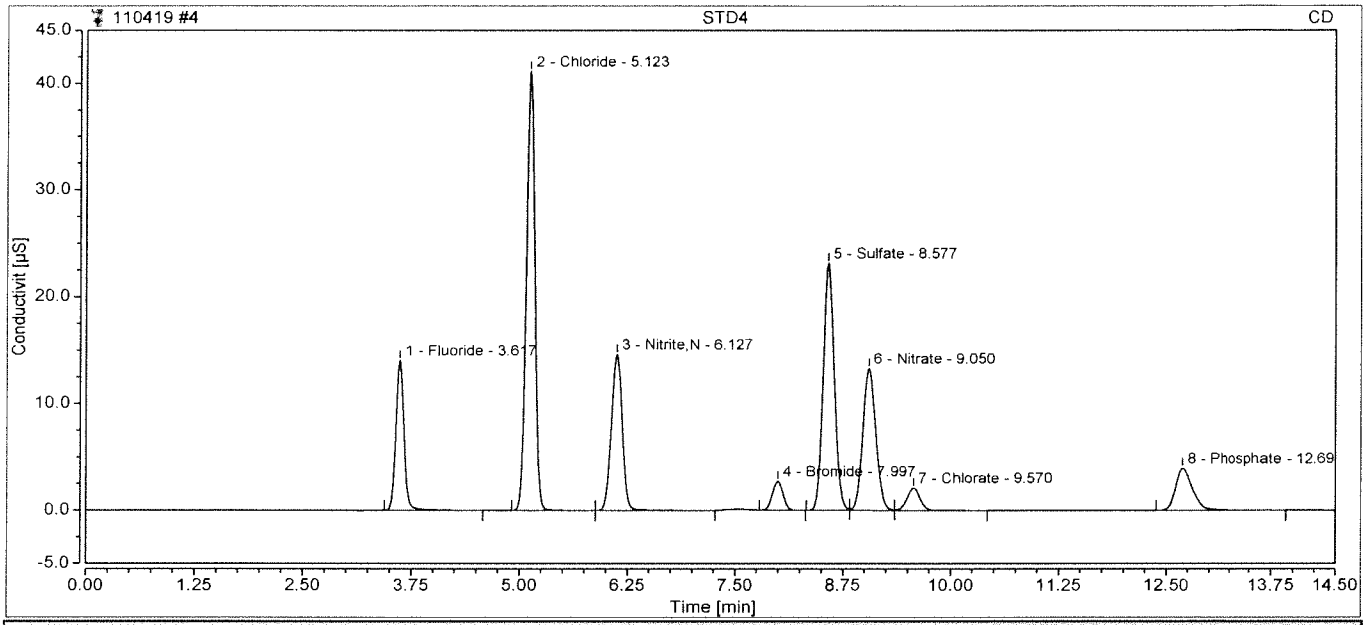
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.758	2.0551	2.0551	1.0000
2	5.12	Chloride	BMB	2.339	9.9888	9.9888	1.0000
3	6.12	Nitrite,N	BMB	1.091	2.1305	2.1305	1.0000
4	8.00	Bromide	BMB	0.182	1.8590	1.8590	1.0000
5	8.61	Sulfate	BM	1.715	10.0007	10.0007	1.0000
6	9.07	Nitrate	M	1.153	1.9792	1.9792	1.0000
7	9.57	Chlorate	MB	0.176	1.8940	1.8940	1.0000
8	12.75	Phosphate	BMB	0.436	1.9269	1.9269	1.0000
Total:			**0.000**	**7.851**		**31.83**	

4 STD4

Sample Name:	**STD4**	*Injection Volume:*	**5.00**
Vial Number:	**GA4**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:57**	*Sample Weight:*	**1.0000**

Run Time:



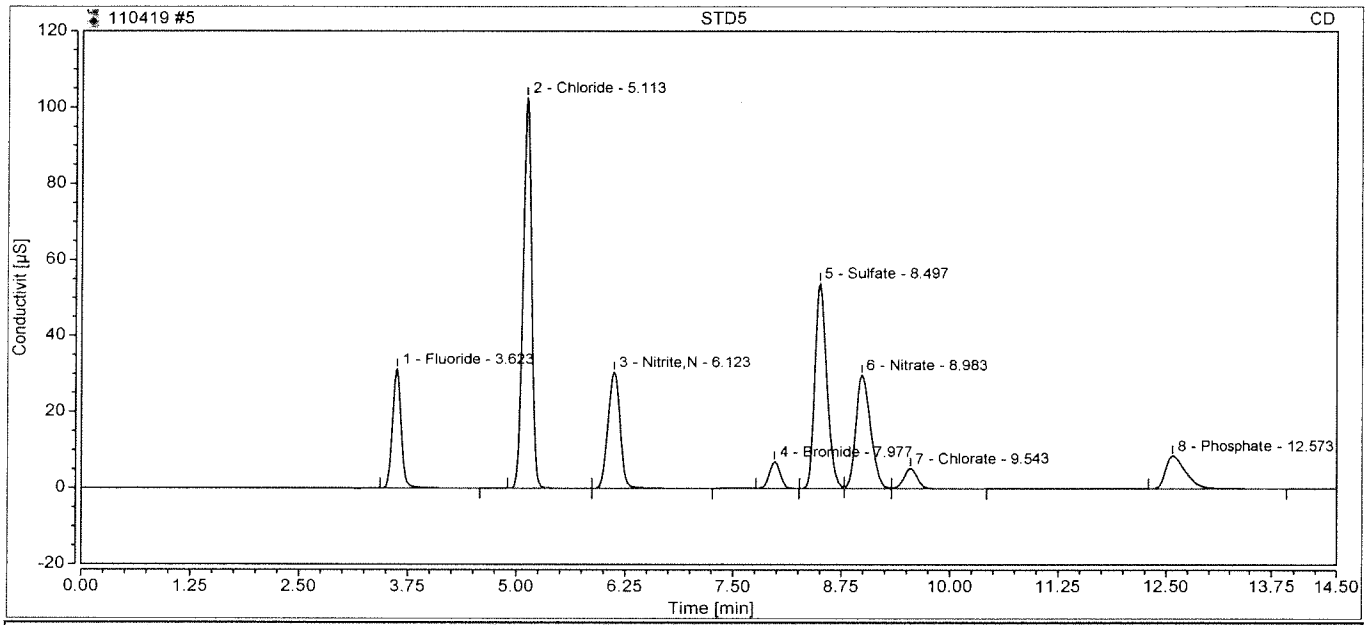
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.535	4.1457	4.1457	1.0000
2	5.12	Chloride	BMB	4.695	19.9948	19.9948	1.0000
3	6.13	Nitrite,N	BMB	2.133	4.1659	4.1659	1.0000
4	8.00	Bromide	BMB	0.385	3.8642	3.8642	1.0000
5	8.58	Sulfate	BM	3.451	20.1082	20.1082	1.0000
6	9.05	Nitrate	M	2.330	3.9823	3.9823	1.0000
7	9.57	Chlorate	MB	0.365	3.8956	3.8956	1.0000
8	12.69	Phosphate	BMB	0.903	3.9395	3.9395	1.0000
Total:			**0.000**	**15.798**		**64.10**	

5 STD5

Sample Name:	**STD5**	*Injection Volume:*	**5.00**
Vial Number:	**GA5**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 15:14**	*Sample Weight:*	**1.0000**

Run Time:



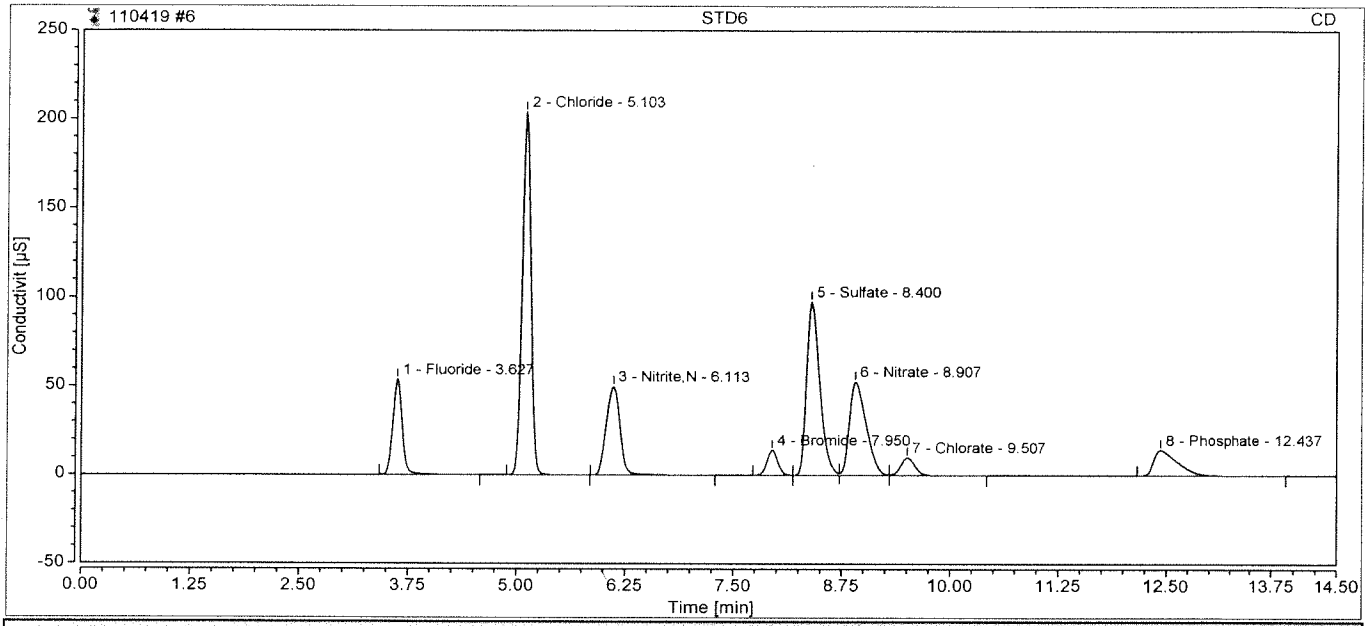
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.639	9.8090	9.8090	1.0000
2	5.11	Chloride	BMB	11.762	49.9996	49.9996	1.0000
3	6.12	Nitrite,N	BMB	4.968	9.7023	9.7023	1.0000
4	7.98	Bromide	BMB	1.001	9.9786	9.9786	1.0000
5	8.50	Sulfate	BM	8.590	50.0271	50.0271	1.0000
6	8.98	Nitrate	M	5.854	9.9805	9.9805	1.0000
7	9.54	Chlorate	MB	0.939	9.9670	9.9670	1.0000
8	12.57	Phosphate	BMB	2.305	9.9803	9.9803	1.0000
Total:			**0.000**	**39.057**		**159.44**	

6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:37**	*Sample Weight:*	**1.0000**

Run Time:



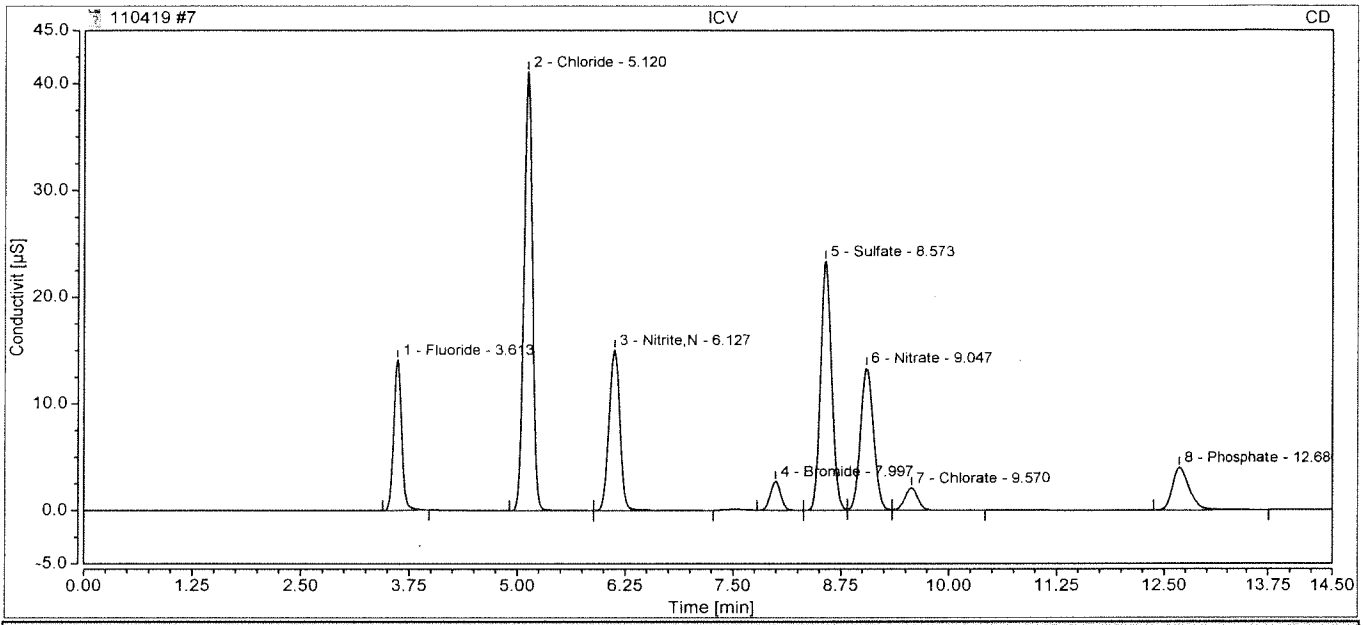
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	6.773	18.2418	18.2418	1.0000
2	5.10	Chloride	BMB	23.542	100.0224	100.0224	1.0000
3	6.11	Nitrite,N	BMB	9.157	17.8850	17.8850	1.0000
4	7.95	Bromide	BM	2.045	20.3197	20.3197	1.0000
5	8.40	Sulfate	M	17.153	99.8863	99.8863	1.0000
6	8.91	Nitrate	M	11.778	20.0629	20.0629	1.0000
7	9.51	Chlorate	MB	1.910	20.2586	20.2586	1.0000
8	12.44	Phosphate	BMB	4.668	20.1606	20.1606	1.0000
Total:			**0.000**	**77.025**		**316.84**	

7 ICV

Sample Name:	**ICV**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:54**	*Sample Weight:*	**1.0000**

Run Time:



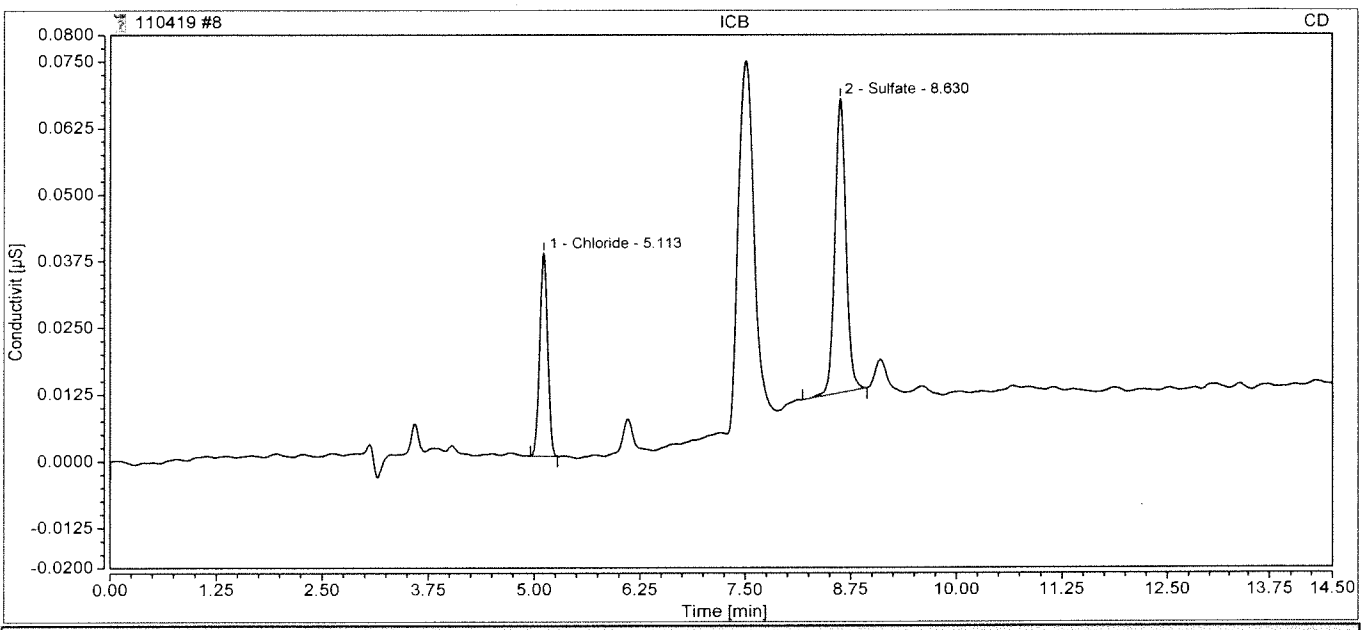
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.495	4.0374	4.0374	1.0000
2	5.12	Chloride	BMB	4.681	19.9333	19.9333	1.0000
3	6.13	Nitrite,N	BMB	2.195	4.2858	4.2858	1.0000
4	8.00	Bromide	BMB	0.384	3.8585	3.8585	1.0000
5	8.57	Sulfate	BM	3.469	20.2132	20.2132	1.0000
6	9.05	Nitrate	M	2.340	3.9993	3.9993	1.0000
7	9.57	Chlorate	MB	0.367	3.9104	3.9104	1.0000
8	12.68	Phosphate	BMB	0.911	3.9732	3.9732	1.0000
Total:			**0.000**	**15.841**		**64.21**	

8 ICB

Sample Name:	**ICB**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 19:29**	*Sample Weight:*	**1.0000**

Run Time:



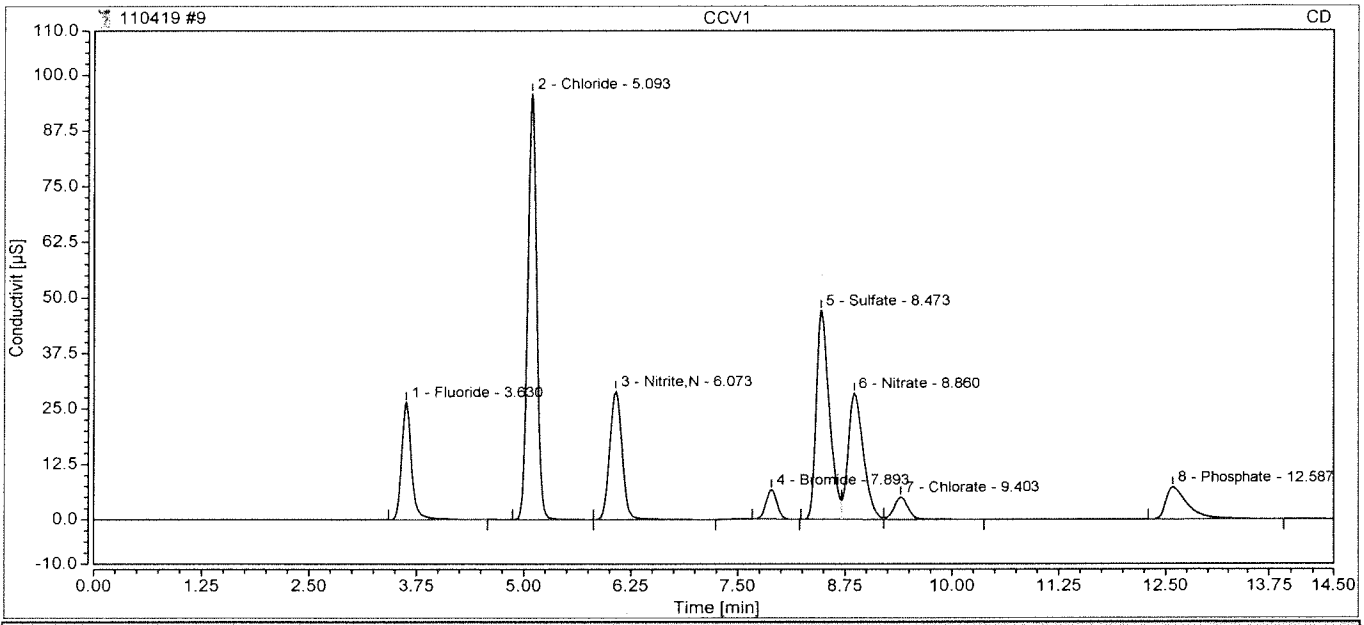
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.11	Chloride	BMB	0.004	0.0748	0.0748	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.63	Sulfate	BMB	0.008	0.0618	0.0618	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.013**		**0.14**	

9 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 10:52**	*Sample Weight:*	**1.0000**

Run Time:



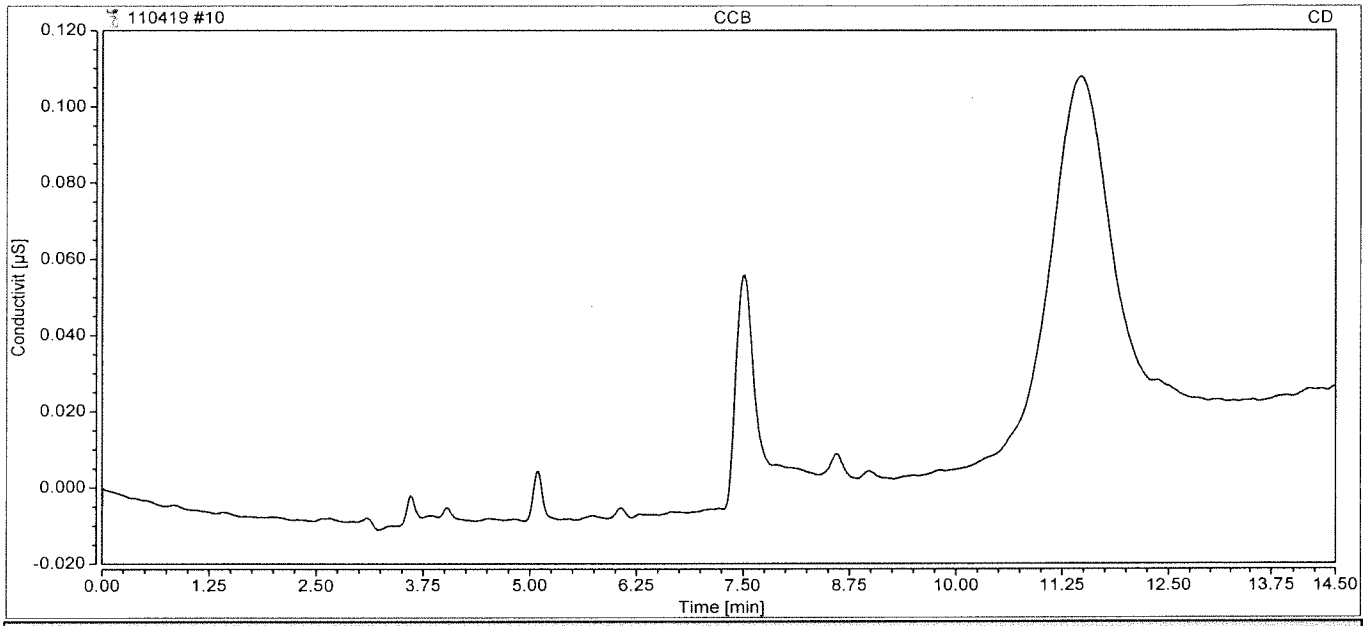
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	3.581	9.6532	9.6532	1.0000
2	5.09	Chloride	BMB	11.675	49.6339	49.6339	1.0000
3	6.07	Nitrite,N	BMB	4.908	9.5860	9.5860	1.0000
4	7.89	Bromide	BMB	0.980	9.7661	9.7661	1.0000
5	8.47	Sulfate	BM	8.355	48.6631	48.6631	1.0000
6	8.86	Nitrate	M	5.948	10.1401	10.1401	1.0000
7	9.40	Chlorate	MB	0.947	10.0576	10.0576	1.0000
8	12.59	Phosphate	BMB	2.143	9.2813	9.2813	1.0000
Total:			**0.000**	**38.538**		**156.78**	

10 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 11:08**	*Sample Weight:*	**1.0000**

Run Time:



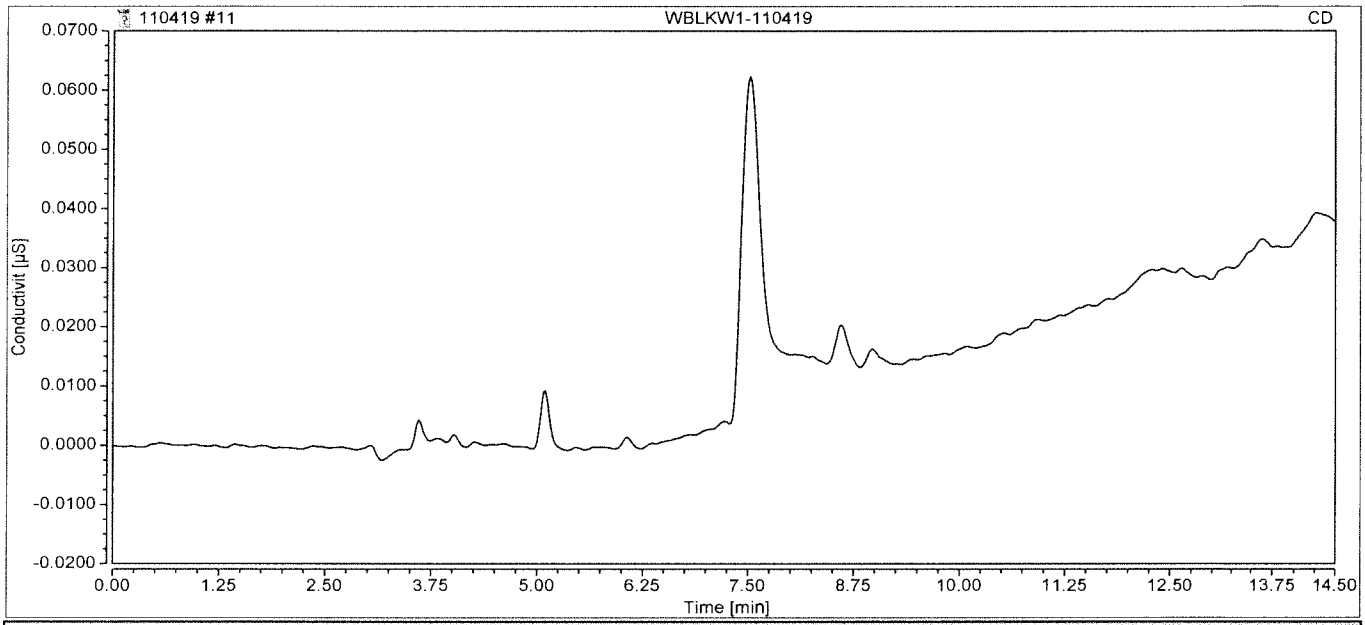
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

11 WBLKW1-110419

Sample Name:	**WBLKW1-110419**	*Injection Volume:*	**5.00**
Vial Number:	**BB1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 11:38**	*Sample Weight:*	**1.0000**

Run Time:



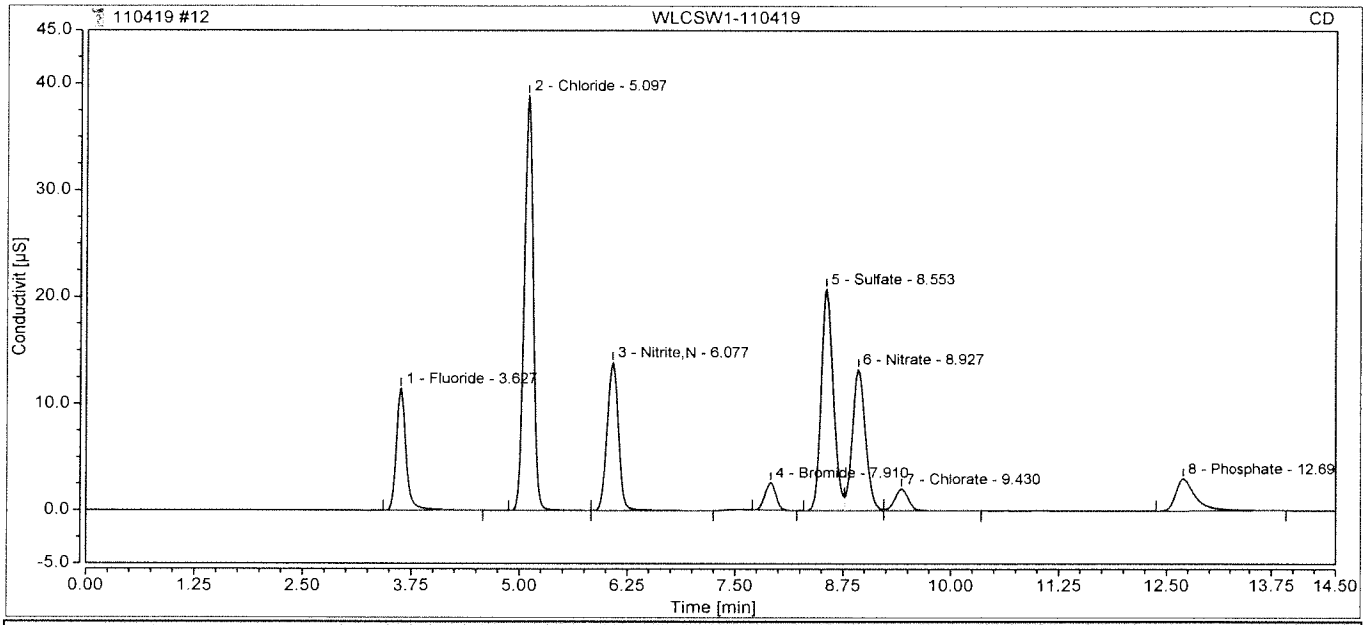
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

12 WLCSW1-110419

Sample Name:	**WLCSW1-110419**	*Injection Volume:*	**5.00**
Vial Number:	**BB2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 11:54**	*Sample Weight:*	**1.0000**

Run Time:



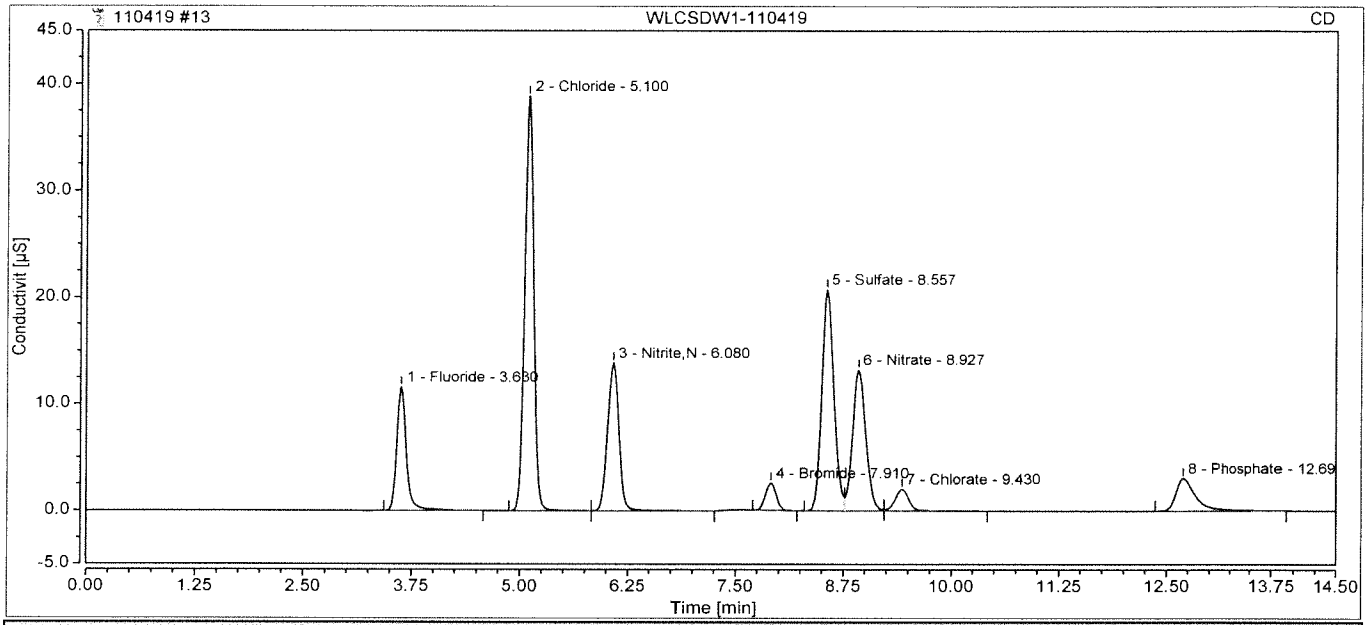
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.493	4.0342	4.0342	1.0000
2	5.10	Chloride	BMB	4.700	20.0131	20.0131	1.0000
3	6.08	Nitrite,N	BMB	2.128	4.1550	4.1550	1.0000
4	7.91	Bromide	BMB	0.376	3.7823	3.7823	1.0000
5	8.55	Sulfate	BM	3.377	19.6783	19.6783	1.0000
6	8.93	Nitrate	M	2.362	4.0370	4.0370	1.0000
7	9.43	Chlorate	MB	0.374	3.9920	3.9920	1.0000
8	12.69	Phosphate	BMB	0.819	3.5757	3.5757	1.0000
Total:			**0.000**	**15.630**		**63.27**	

13 WLCSDW1-110419

Sample Name:	**WLCSDW1-110419**	*Injection Volume:*	**5.00**
Vial Number:	**BB3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 12:11**	*Sample Weight:*	**1.0000**

Run Time:



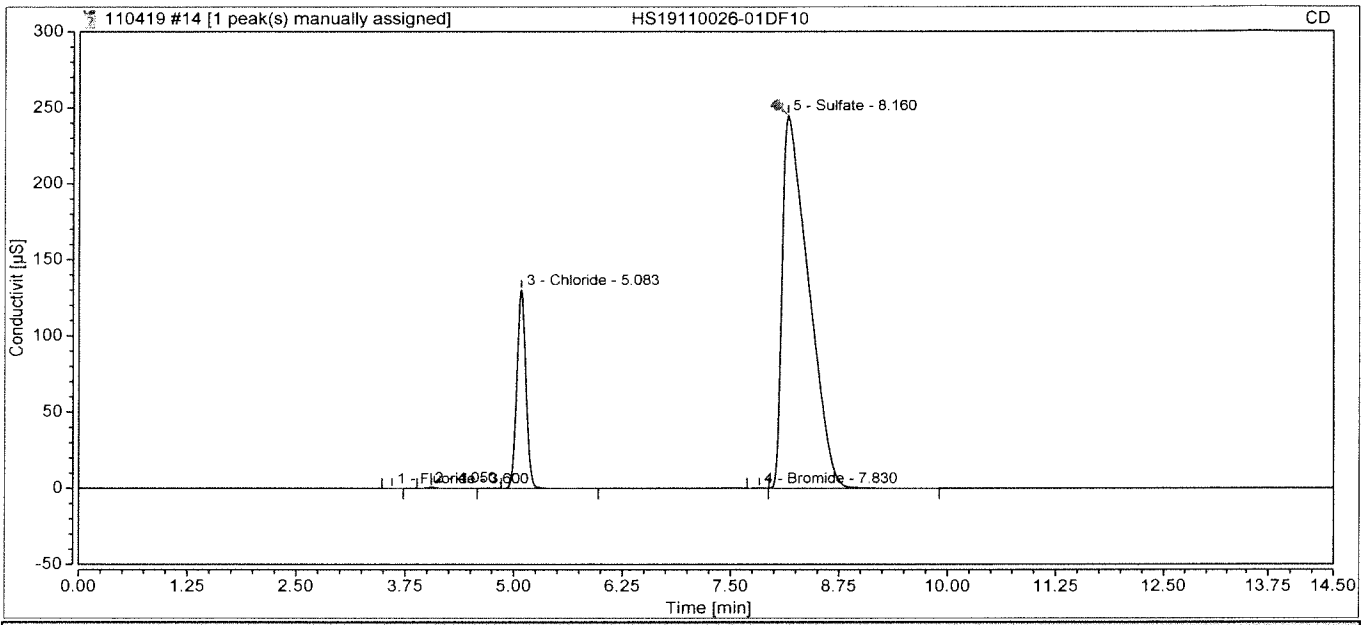
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.495	4.0376	4.0376	1.0000
2	5.10	Chloride	BMB	4.693	19.9861	19.9861	1.0000
3	6.08	Nitrite,N	BMB	2.122	4.1442	4.1442	1.0000
4	7.91	Bromide	BMB	0.374	3.7635	3.7635	1.0000
5	8.56	Sulfate	BM	3.373	19.6505	19.6505	1.0000
6	8.93	Nitrate	M	2.356	4.0276	4.0276	1.0000
7	9.43	Chlorate	MB	0.373	3.9730	3.9730	1.0000
8	12.69	Phosphate	BMB	0.829	3.6204	3.6204	1.0000
Total:			**0.000**	**15.615**		**63.20**	

14 HS19110026-01DF10

Sample Name:	**HS19110026-01DF10**	*Injection Volume:*	**5.00**
Vial Number:	**BB4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**11/04/2019 12:28**	*Sample Weight:*	**1.0000**

Run Time:



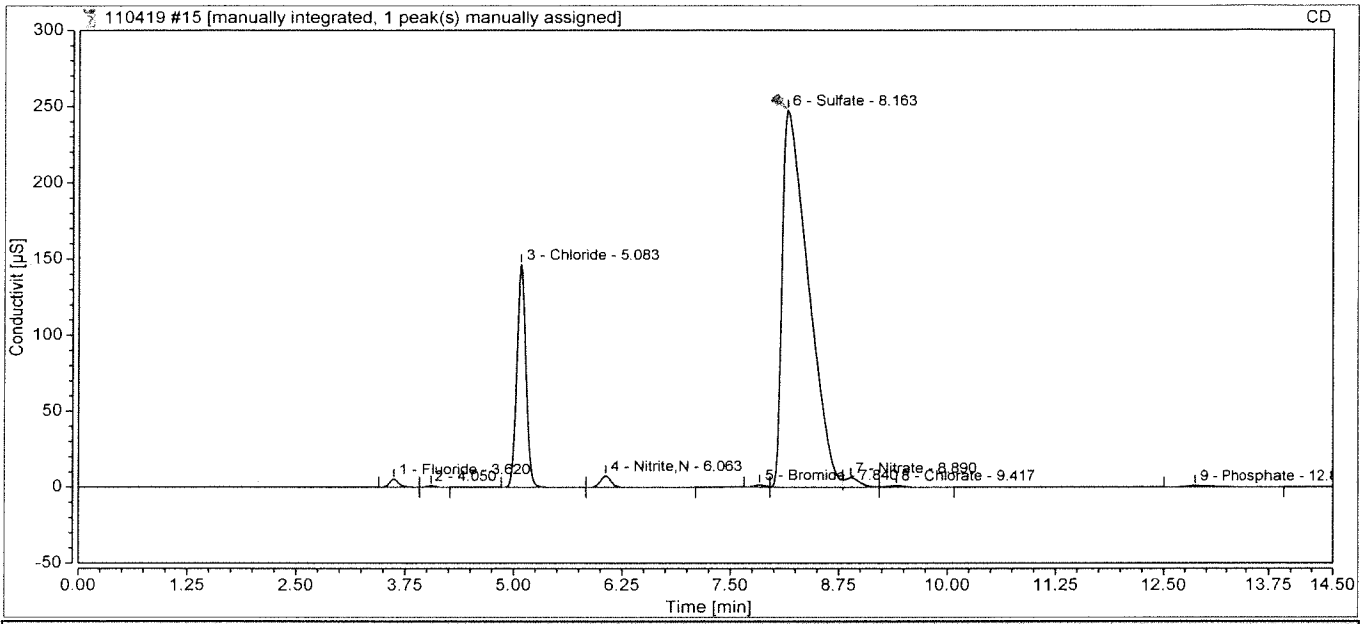
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.003	0.0231	0.2313	10.0000
3	5.08	Chloride	BMB	15.829	67.2731	672.7310	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
4	7.83	Bromide	BMB	0.016	0.2058	2.0577	10.0000
5	8.16	Sulfate	BMB^	85.965	500.5491	5005.4909	10.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**101.813**		**5680.51**	

15 HS19110026-01MSDF10

Sample Name:	**HS19110026-01MSDF10**	*Injection Volume:*	**5.00**
Vial Number:	**BB5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**11/04/2019 12:44**	*Sample Weight:*	**1.0000**

Run Time:



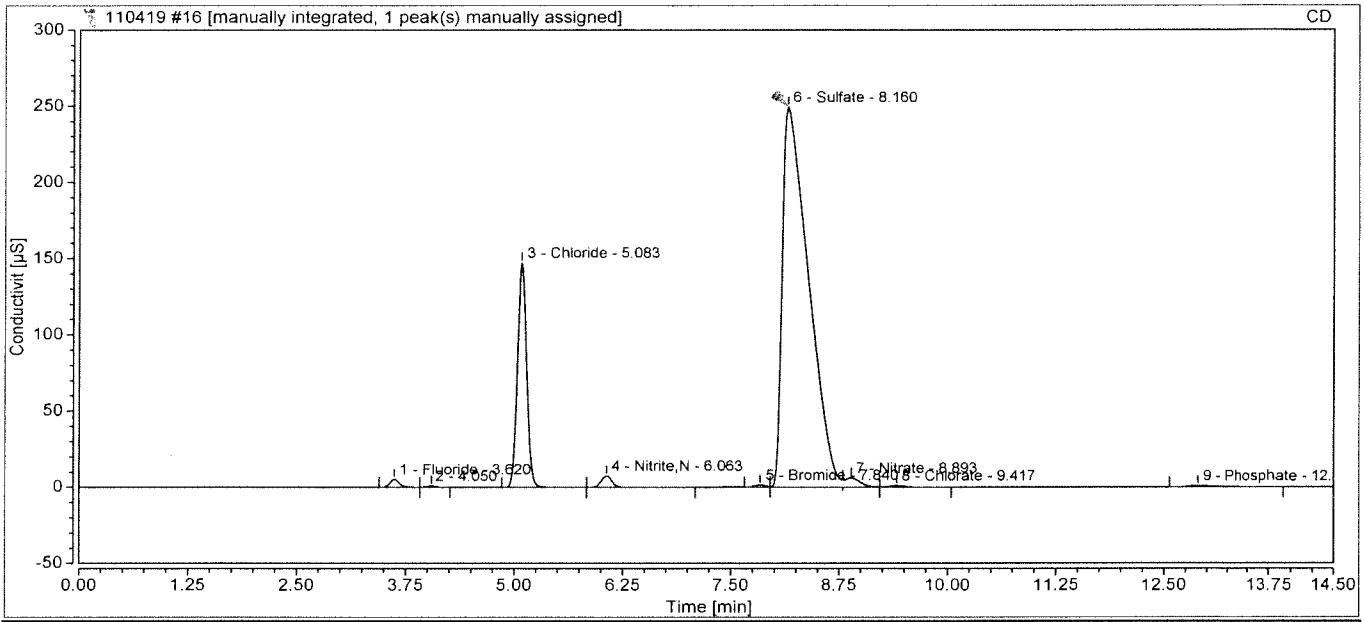
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.651	1.7660	17.6596	10.0000
3	5.08	Chloride	BMB	17.853	75.8658	758.6579	10.0000
4	6.06	Nitrite,N	BMB	1.058	2.0658	20.6576	10.0000
5	7.84	Bromide	BM *	0.182	1.8578	18.5778	10.0000
6	8.16	Sulfate	M *^	86.103	501.3509	5013.5088	10.0000
7	8.89	Nitrate	M *	1.222	2.0972	20.9723	10.0000
8	9.42	Chlorate	MB*	0.188	2.0182	20.1820	10.0000
9	12.87	Phosphate	BMB	0.299	1.3368	13.3682	10.0000
Total:			**0.000**	**107.556**		**5883.58**	

16 HS19110026-01MSDDF10

Sample Name:	**HS19110026-01MSDDF10**	*Injection Volume:*	**5.00**
Vial Number:	**BB6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**11/04/2019 13:01**	*Sample Weight:*	**1.0000**

Run Time:



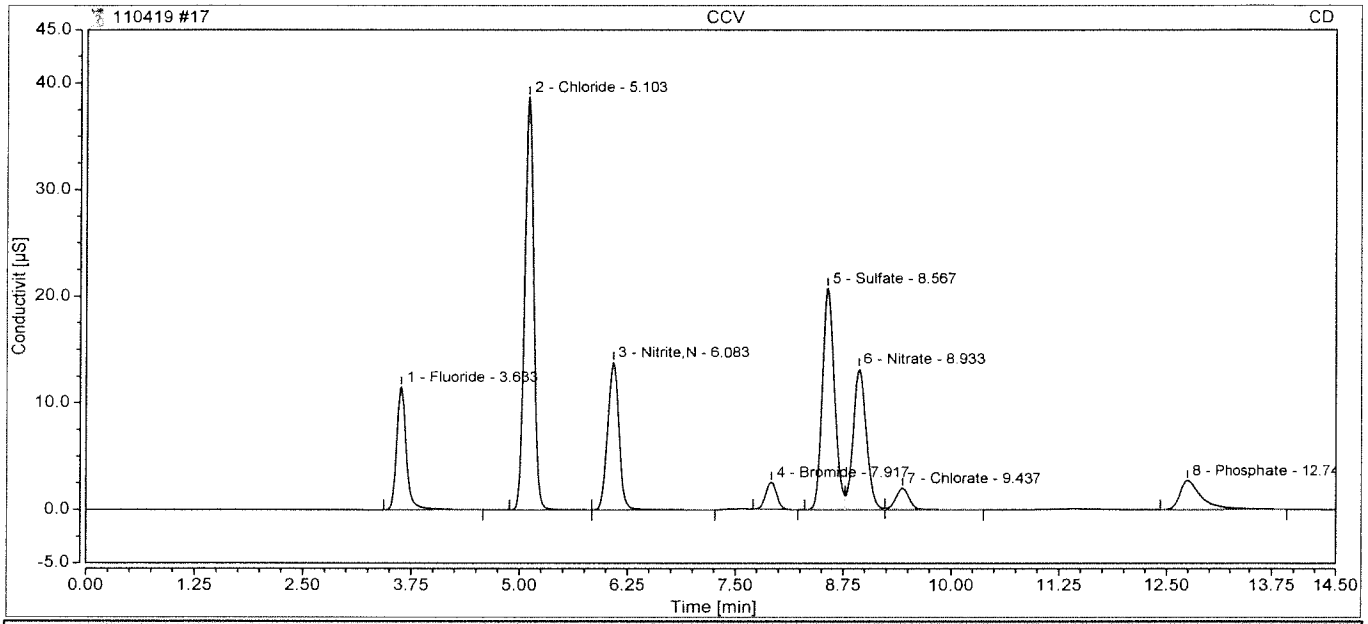
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.661	1.7927	17.9269	10.0000
3	5.08	Chloride	BMB	17.964	76.3377	763.3768	10.0000
4	6.06	Nitrite,N	BMB	1.068	2.0852	20.8524	10.0000
5	7.84	Bromide	BM *	0.184	1.8719	18.7191	10.0000
6	8.16	Sulfate	M *^	87.044	506.8315	5068.3150	10.0000
7	8.89	Nitrate	M *	1.241	2.1301	21.3009	10.0000
8	9.42	Chlorate	MB*	0.189	2.0298	20.2975	10.0000
9	12.90	Phosphate	BMB	0.301	1.3466	13.4661	10.0000
Total:			**0.000**	**108.652**		**5944.25**	

17 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 13:17**	*Sample Weight:*	**1.0000**

Run Time:



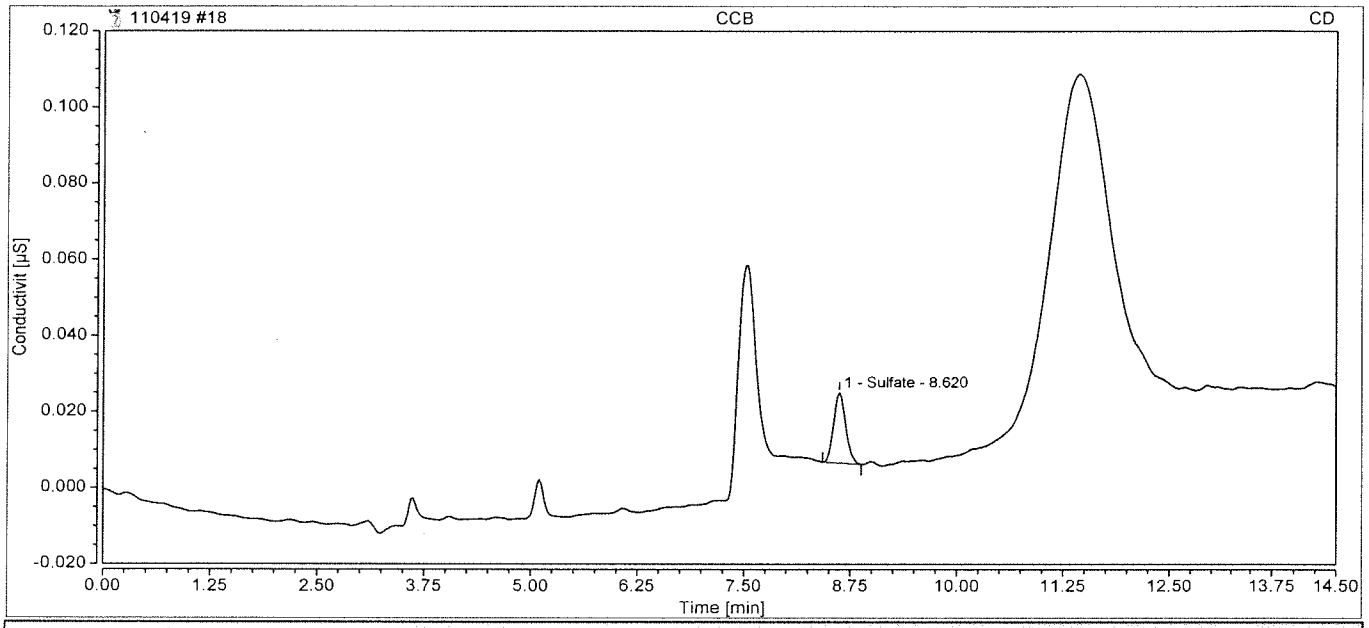
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.490	4.0248	4.0248	1.0000
2	5.10	Chloride	BMB	4.691	19.9769	19.9769	1.0000
3	6.08	Nitrite,N	BMB	2.121	4.1413	4.1413	1.0000
4	7.92	Bromide	BMB	0.374	3.7591	3.7591	1.0000
5	8.57	Sulfate	BM	3.388	19.7403	19.7403	1.0000
6	8.93	Nitrate	M	2.356	4.0273	4.0273	1.0000
7	9.44	Chlorate	MB	0.376	4.0056	4.0056	1.0000
8	12.74	Phosphate	BMB	0.815	3.5590	3.5590	1.0000
Total:			**0.000**	**15.611**		**63.23**	

18 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 13:34**	*Sample Weight:*	**1.0000**

Run Time:



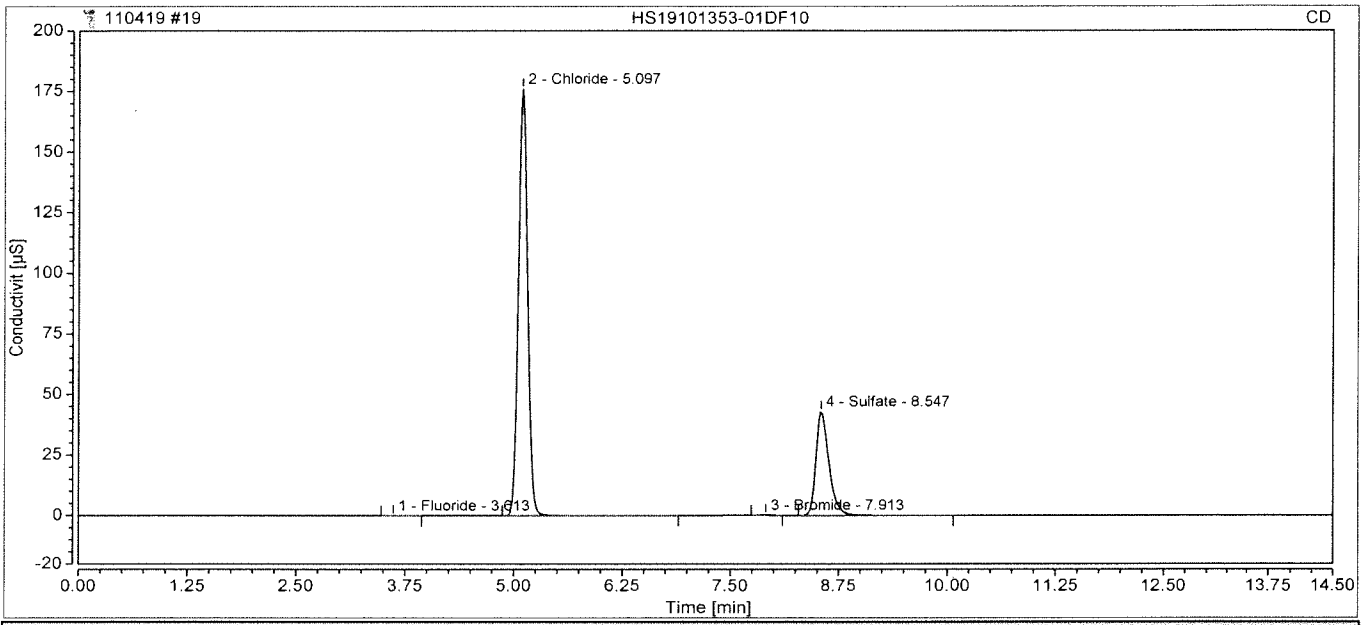
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
1	8.62	Sulfate	BMB	0.003	0.0304	0.0304	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.03**	

19 HS19101353-01DF10

Sample Name:	**HS19101353-01DF10**	*Injection Volume:*	**5.00**
Vial Number:	**BB7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**11/04/2019 14:10**	*Sample Weight:*	**1.0000**

Run Time:



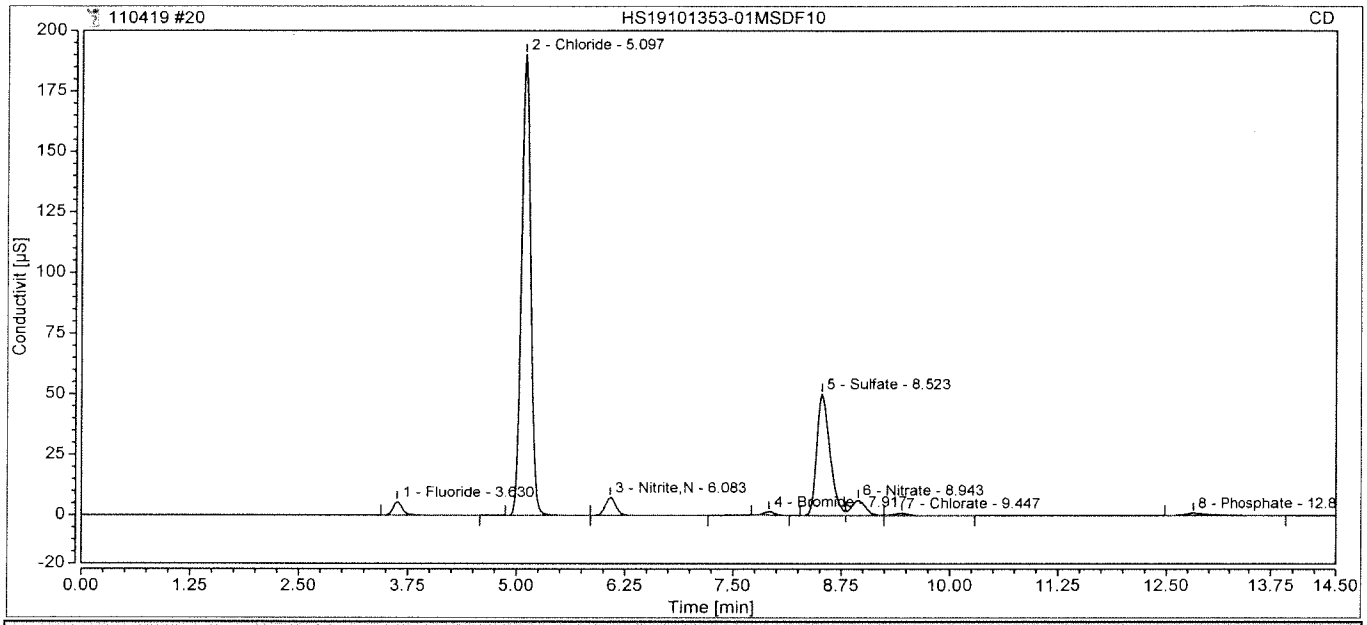
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.005	0.0275	0.2746	10.0000
2	5.10	Chloride	BMB	21.657	92.0200	920.2001	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
3	7.91	Bromide	BMB	0.030	0.3498	3.4981	10.0000
4	8.55	Sulfate	BMB	7.507	43.7208	437.2081	10.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**29.199**		**1361.18**	

20 HS19101353-01MSDF10

Sample Name:	**HS19101353-01MSDF10**	*Injection Volume:*	**5.00**
Vial Number:	**BB8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**11/04/2019 14:27**	*Sample Weight:*	**1.0000**

Run Time:



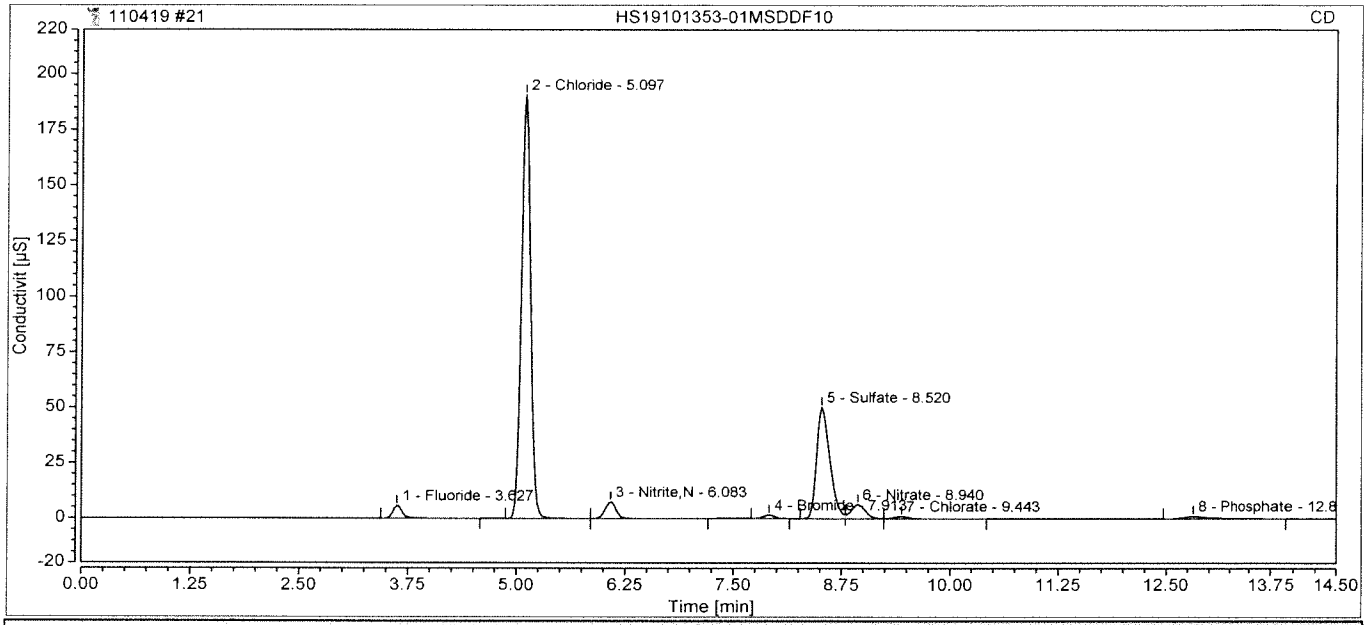
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	0.721	1.9545	19.5445	10.0000
2	5.10	Chloride	BMB	23.407	99.4513	994.5128	10.0000
3	6.08	Nitrite,N	BMB	1.063	2.0746	20.7458	10.0000
4	7.92	Bromide	BMB	0.210	2.1345	21.3452	10.0000
5	8.52	Sulfate	BM	8.898	51.8241	518.2414	10.0000
6	8.94	Nitrate	M	1.184	2.0325	20.3246	10.0000
7	9.45	Chlorate	MB	0.178	1.9131	19.1315	10.0000
8	12.81	Phosphate	BMB	0.333	1.4814	14.8140	10.0000
Total:			**0.000**	**35.994**		**1628.66**	

21 HS19101353-01MSDDF10

Sample Name:	**HS19101353-01MSDDF10**	*Injection Volume:*	**5.00**
Vial Number:	**BC1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**11/04/2019 14:43**	*Sample Weight:*	**1.0000**

Run Time:



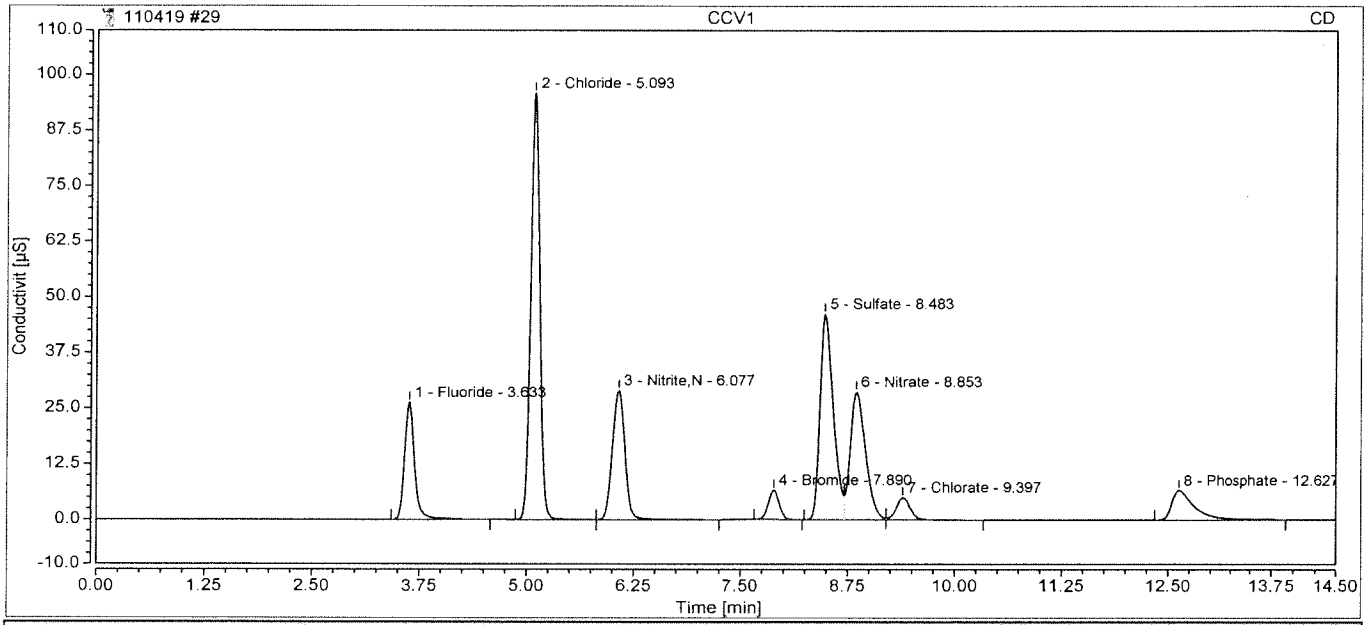
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	0.727	1.9726	19.7260	10.0000
2	5.10	Chloride	BMB	23.461	99.6782	996.7816	10.0000
3	6.08	Nitrite,N	BMB	1.064	2.0784	20.7841	10.0000
4	7.91	Bromide	BMB	0.211	2.1412	21.4124	10.0000
5	8.52	Sulfate	BM	8.914	51.9139	519.1387	10.0000
6	8.94	Nitrate	M	1.189	2.0403	20.4034	10.0000
7	9.44	Chlorate	MB	0.182	1.9503	19.5029	10.0000
8	12.81	Phosphate	BMB	0.339	1.5081	15.0808	10.0000
Total:			**0.000**	**36.087**		**1632.83**	

29 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 16:56**	*Sample Weight:*	**1.0000**

Run Time:



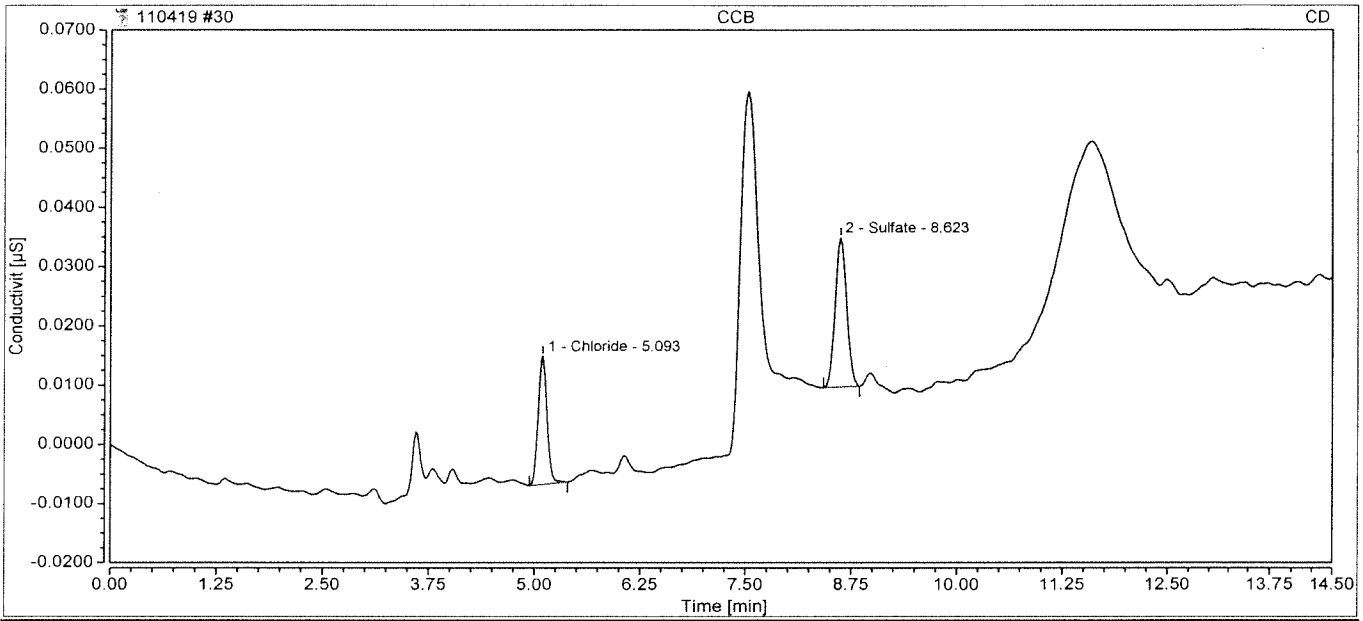
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	3.579	9.6470	9.6470	1.0000
2	5.09	Chloride	BMB	11.654	49.5415	49.5415	1.0000
3	6.08	Nitrite,N	BMB	4.919	9.6070	9.6070	1.0000
4	7.89	Bromide	BMB	0.977	9.7405	9.7405	1.0000
5	8.48	Sulfate	BM	8.310	48.3995	48.3995	1.0000
6	8.85	Nitrate	M	5.988	10.2094	10.2094	1.0000
7	9.40	Chlorate	MB	0.948	10.0625	10.0625	1.0000
8	12.63	Phosphate	BMB	2.073	8.9815	8.9815	1.0000
Total:			**0.000**	**38.449**		**156.19**	

30 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 17:13**	*Sample Weight:*	**1.0000**

Run Time:



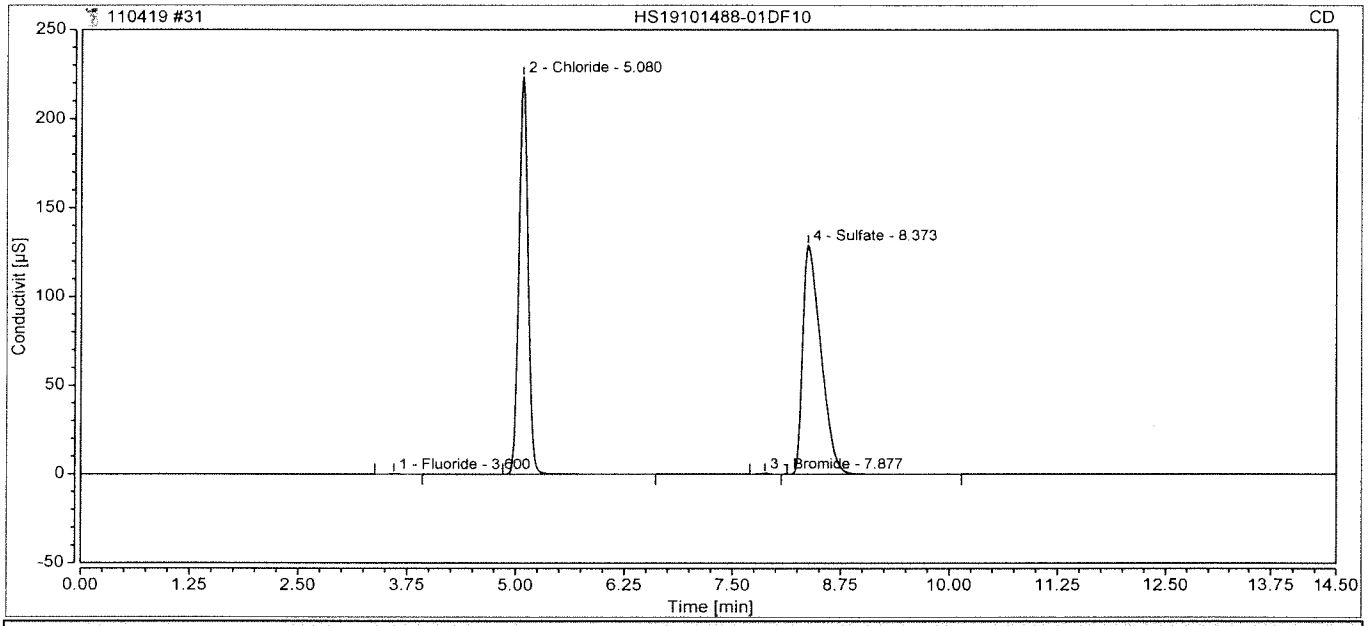
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.09	Chloride	BMB	0.003	0.0683	0.0683	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.62	Sulfate	BMB	0.004	0.0359	0.0359	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.007**		**0.10**	

31 HS19101488-01DF10

Sample Name:	**HS19101488-01DF10**	*Injection Volume:*	**5.00**
Vial Number:	**BC8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**11/04/2019 17:29**	*Sample Weight:*	**1.0000**

Run Time:



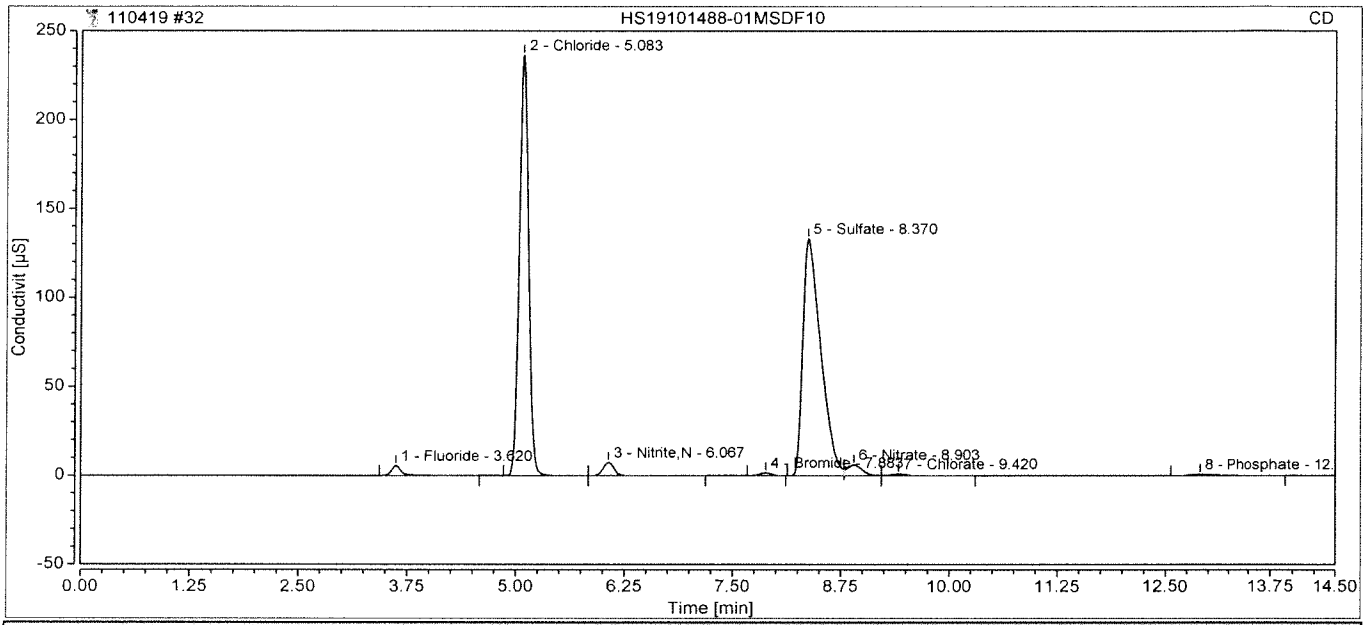
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.004	0.0265	0.2647	10.0000
2	5.08	Chloride	BMB	27.427	116.5177	1165.1766	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
3	7.88	Bromide	BMB	0.040	0.4490	4.4898	10.0000
4	8.37	Sulfate	BMB	31.354	182.5761	1825.7609	10.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**58.825**		**2995.69**	

32 HS19101488-01MSDF10

Sample Name:	**HS19101488-01MSDF10**	*Injection Volume:*	**5.00**
Vial Number:	**BD1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**11/04/2019 17:46**	*Sample Weight:*	**1.0000**

Run Time:



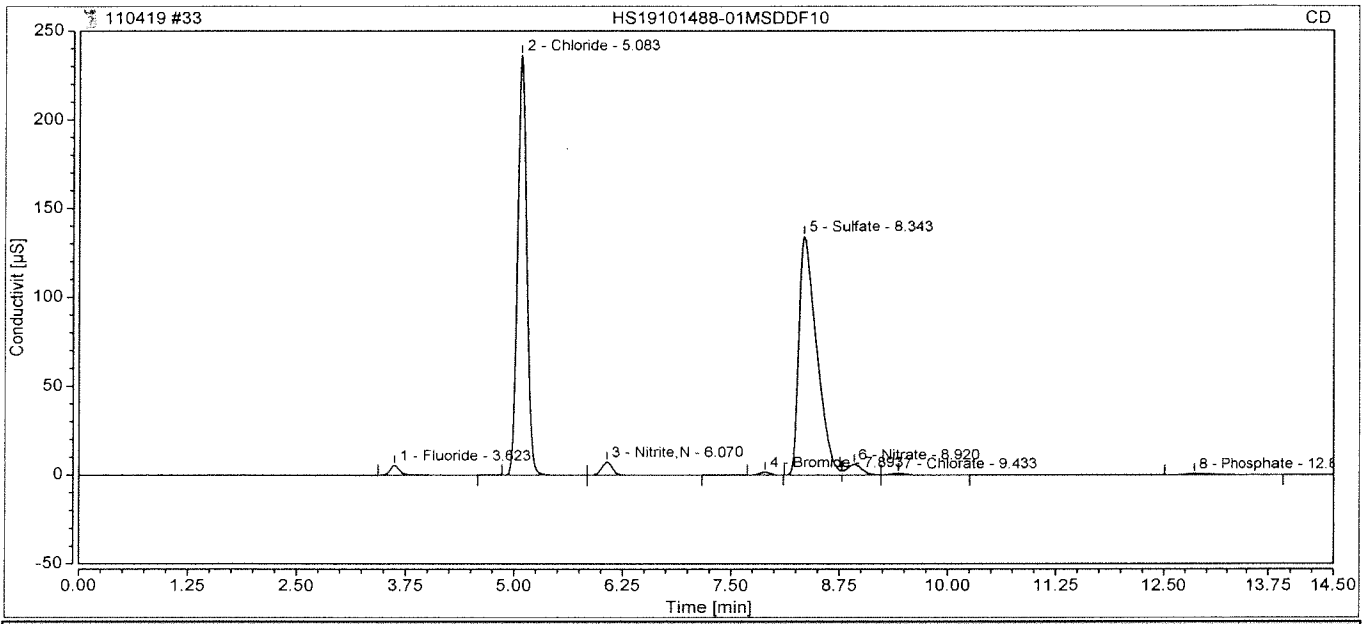
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.713	1.9334	19.3345	10.0000
2	5.08	Chloride	BMB	29.064	123.4709	1234.7094	10.0000
3	6.07	Nitrite,N	BMB	1.065	2.0802	20.8022	10.0000
4	7.88	Bromide	BMB	0.222	2.2552	22.5516	10.0000
5	8.37	Sulfate	BM	32.068	186.7307	1867.3075	10.0000
6	8.90	Nitrate	M	1.228	2.1083	21.0829	10.0000
7	9.42	Chlorate	MB	0.192	2.0559	20.5589	10.0000
8	12.90	Phosphate	BMB	0.281	1.2601	12.6010	10.0000
Total:			**0.000**	**64.834**		**3218.95**	

33 HS19101488-01MSDDF10

Sample Name:	**HS19101488-01MSDDF10**	*Injection Volume:*	**5.00**
Vial Number:	**BD2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**10.0000**
Recording Time:	**11/04/2019 18:03**	*Sample Weight:*	**1.0000**

Run Time:



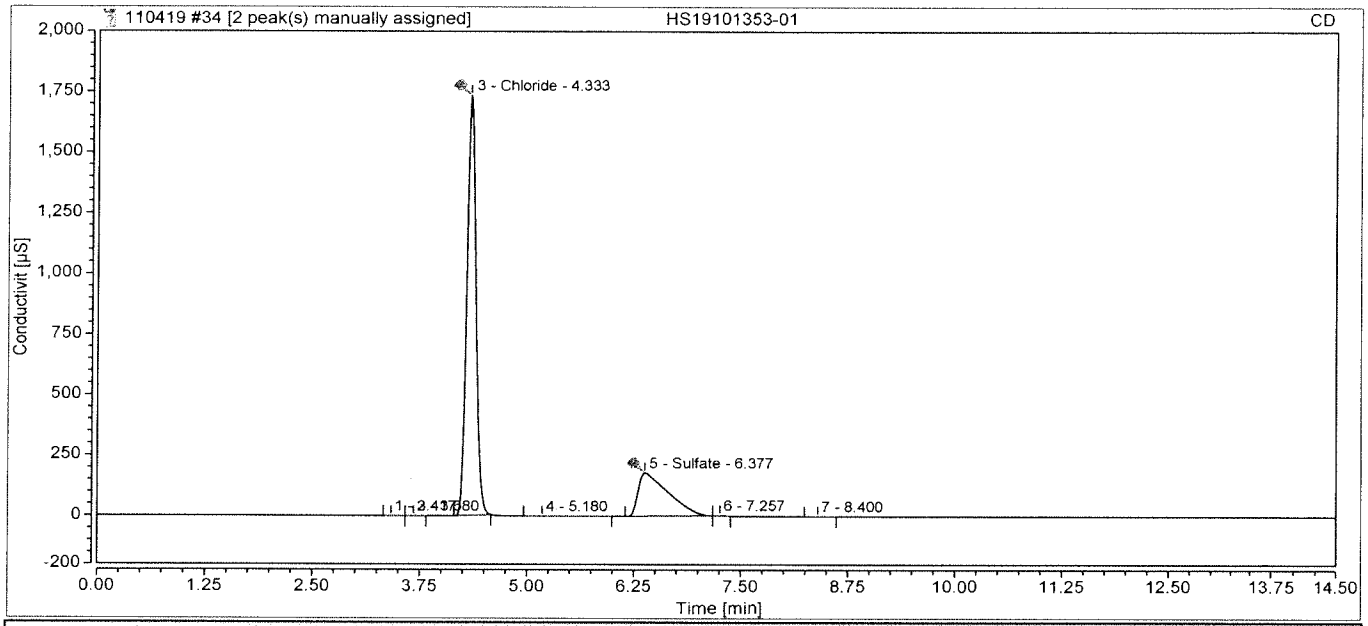
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.715	1.9397	19.3974	10.0000
2	5.08	Chloride	BMB	29.095	123.6004	1236.0043	10.0000
3	6.07	Nitrite,N	BMB	1.068	2.0845	20.8450	10.0000
4	7.89	Bromide	BMB	0.223	2.2612	22.6122	10.0000
5	8.34	Sulfate	BM	32.043	186.5837	1865.8368	10.0000
6	8.92	Nitrate	M	1.224	2.1002	21.0020	10.0000
7	9.43	Chlorate	MB	0.187	2.0029	20.0286	10.0000
8	12.85	Phosphate	BMB	0.287	1.2848	12.8485	10.0000
Total:			**0.000**	**64.841**		**3218.57**	

34 HS19101353-01

Sample Name:	**HS19101353-01**	*Injection Volume:*	**5.00**
Vial Number:	**BD3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 18:32**	*Sample Weight:*	**1.0000**

Run Time:



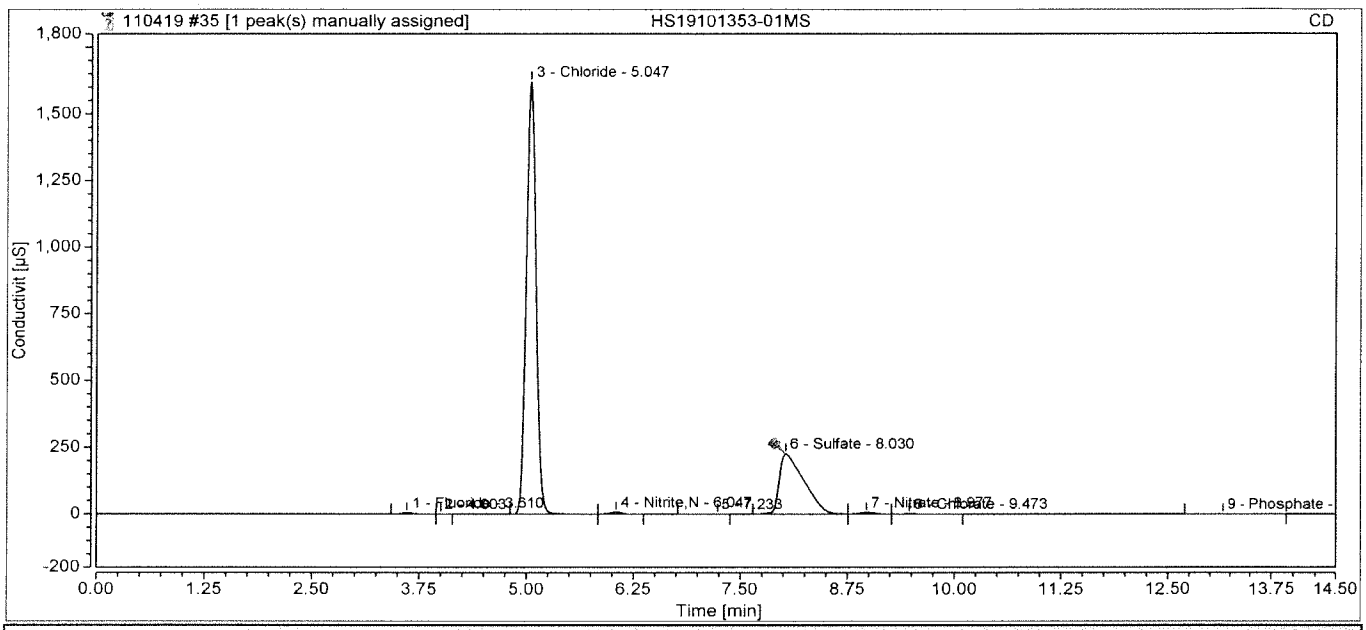
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
3	4.33	Chloride	BMB^	213.524	906.7367	906.7367	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
5	6.38	Sulfate	BMB^	72.633	422.9245	422.9245	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**286.158**		**1329.66**	

35 HS19101353-01MS

Sample Name:	**HS19101353-01MS**	*Injection Volume:*	**5.00**
Vial Number:	**BD4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 18:49**	*Sample Weight:*	**1.0000**

Run Time:



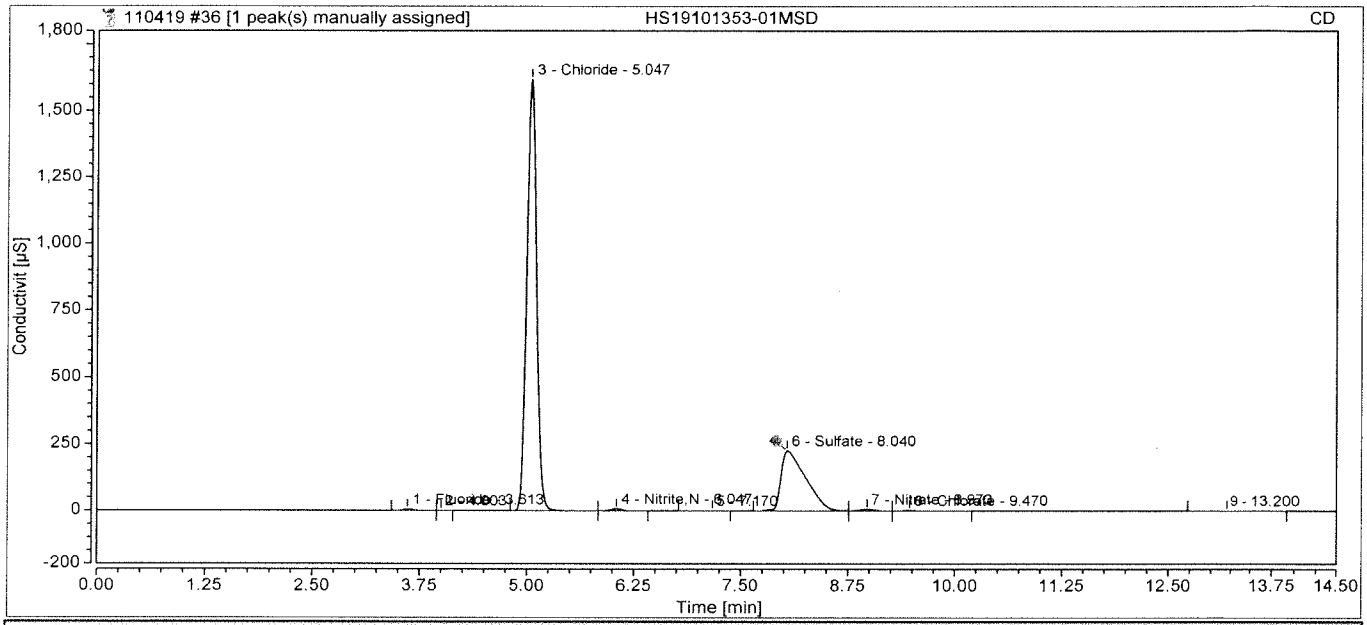
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.677	1.8374	1.8374	1.0000
3	5.05	Chloride	BMB	213.335	905.9324	905.9324	1.0000
4	6.05	Nitrite,N	BMB	1.031	2.0134	2.0134	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
6	8.03	Sulfate	BM ^	74.557	434.1250	434.1250	1.0000
7	8.98	Nitrate	M	1.165	1.9997	1.9997	1.0000
8	9.47	Chlorate	MB	0.181	1.9402	1.9402	1.0000
9	13.16	Phosphate	BMB	0.116	0.5494	0.5494	1.0000
Total:			**0.000**	**291.062**		**1348.40**	

36 HS19101353-01MSD

Sample Name:	**HS19101353-01MSD**	*Injection Volume:*	**5.00**
Vial Number:	**BD5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 19:06**	*Sample Weight:*	**1.0000**

Run Time:



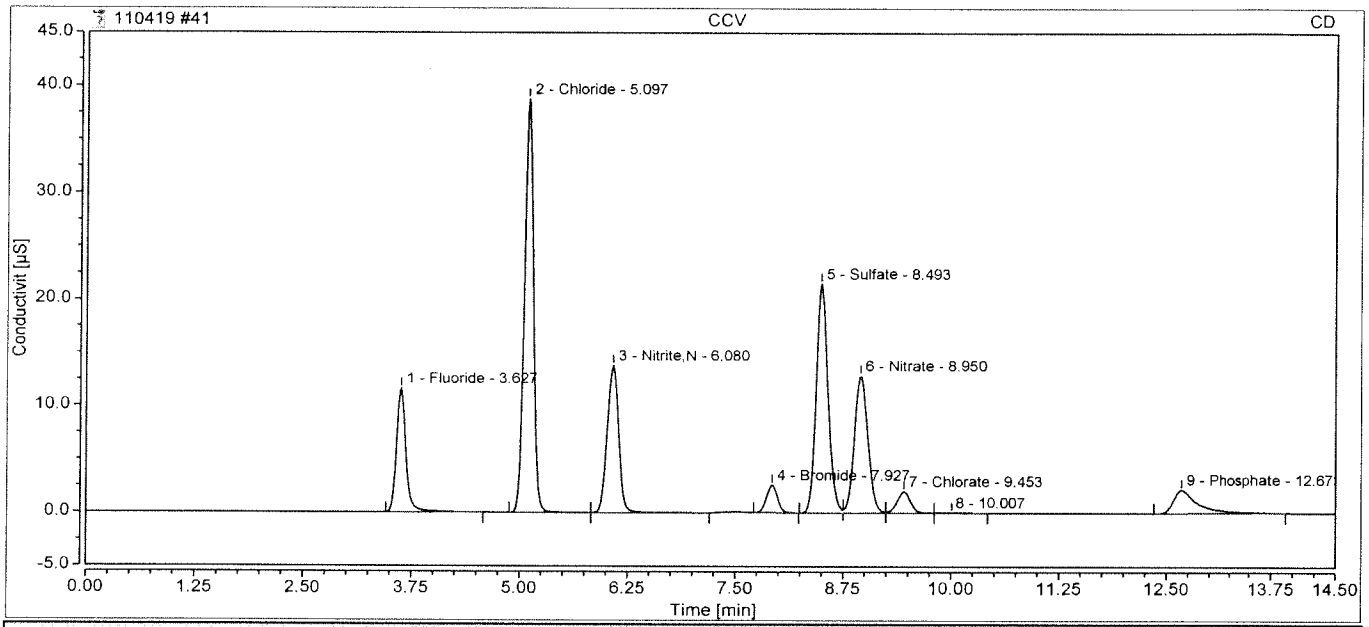
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.680	1.8462	1.8462	1.0000
3	5.05	Chloride	BMB	212.959	904.3360	904.3360	1.0000
4	6.05	Nitrite,N	BMB	1.043	2.0357	2.0357	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
6	8.04	Sulfate	BM ^	74.648	434.6533	434.6533	1.0000
7	8.97	Nitrate	M	1.183	2.0301	2.0301	1.0000
8	9.47	Chlorate	MB	0.200	2.1422	2.1422	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**290.712**		**1347.04**	

41 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 20:29**	*Sample Weight:*	**1.0000**

Run Time:



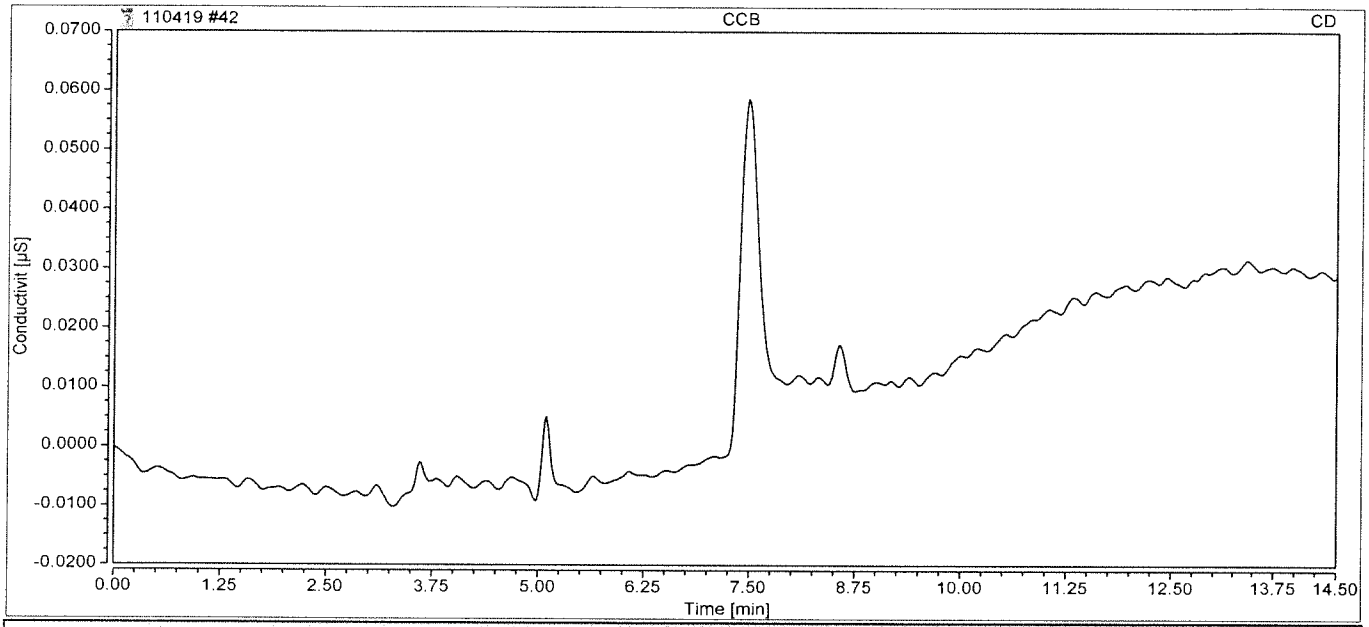
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.486	4.0136	4.0136	1.0000
2	5.10	Chloride	BMB	4.680	19.9285	19.9285	1.0000
3	6.08	Nitrite,N	BMB	2.120	4.1395	4.1395	1.0000
4	7.93	Bromide	BMB	0.378	3.8037	3.8037	1.0000
5	8.49	Sulfate	BM	3.397	19.7928	19.7928	1.0000
6	8.95	Nitrate	M	2.331	3.9841	3.9841	1.0000
7	9.45	Chlorate	M	0.366	3.9015	3.9015	1.0000
9	12.67	Phosphate	BMB	0.754	3.2956	3.2956	1.0000
Total:			**0.000**	**15.511**		**62.86**	

42 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/04/2019 20:45**	*Sample Weight:*	**1.0000**

Run Time:



Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.000**		**0.00**	

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October 29, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19101603**

Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 2 sample(s) on Oct 26, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19101603

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19101603-01	16EW07-191025	GW		25-Oct-2019 09:30	26-Oct-2019 10:35	☐
HS19101603-02	16EW05-191025	GW		25-Oct-2019 09:40	26-Oct-2019 10:35	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19101603

WetChemistry by Method SW9056

Batch ID: R349311

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

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: LHAAP-16 WorkOrder:HS19101603
Sample ID: 16EW07-191025 Lab ID:HS19101603-01
Collection Date: 25-Oct-2019 09:30 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Bromide	**2.79**		**0.150**	**0.500**	**0.500**	**mg/L**	5	28-Oct-2019 19:39

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

Client: Aptim Environmental & Infrastucture, Inc.
ANALYTICAL REPORT
Project: LHAAP-16 WorkOrder:HS19101603
Sample ID: 16EW05-191025 Lab ID:HS19101603-02
Collection Date: 25-Oct-2019 09:40 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.93**		**0.300**	**1.00**	**1.00**	**mg/L**	10	29-Oct-2019 09:46

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101603

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R349311 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS19101603-01	16EW07-191025	25 Oct 2019 09:30			28 Oct 2019 19:39	5
HS19101603-02	16EW05-191025	25 Oct 2019 09:40			29 Oct 2019 09:46	10

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101603

QC BATCH REPORT

Batch ID: R349311 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-102819** Units: **mg/L** Analysis Date: **28-Oct-2019 13:43**
Client ID: Run ID: **ICS-Integrion_349311** SeqNo: **5318356** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-102819** Units: **mg/L** Analysis Date: **28-Oct-2019 14:00**
Client ID: Run ID: **ICS-Integrion_349311** SeqNo: **5318357** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.675	0.100	4	0	91.9	80 - 120				

LCSD Sample ID: **WLCSDW1-102819** Units: **mg/L** Analysis Date: **28-Oct-2019 14:16**
Client ID: Run ID: **ICS-Integrion_349311** SeqNo: **5318358** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.687	0.100	4	0	92.2	80 - 120	3.675	0.321	20	

MS Sample ID: **HS19101295-06MS** Units: **mg/L** Analysis Date: **28-Oct-2019 18:16**
Client ID: Run ID: **ICS-Integrion_349311** SeqNo: **5318362** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	89.2	5.00	100	4.815	84.4	80 - 120				

MS Sample ID: **HS19101055-01MS** Units: **mg/L** Analysis Date: **29-Oct-2019 02:01**
Client ID: Run ID: **ICS-Integrion_349311** SeqNo: **5318385** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	914.8	50.0	1000	54.9	86.0	80 - 120				

MSD Sample ID: **HS19101295-06MSD** Units: **mg/L** Analysis Date: **28-Oct-2019 18:32**
Client ID: Run ID: **ICS-Integrion_349311** SeqNo: **5318363** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	88.58	5.00	100	4.815	83.8	80 - 120	89.2	0.703	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19101603

QC BATCH REPORT

Batch ID: **R349311 (0)** **Instrument:** **ICS-Integrion** **Method:** **ANIONS BY SW9056A**

MSD Sample ID: **HS19101055-01MSD** Units: **mg/L** Analysis Date: **29-Oct-2019 02:17**
Client ID: Run ID: **ICS-Integrion_349311** SeqNo: **5318386** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	924	50.0	1000	54.9	86.9	80 - 120	914.8	0.995	20	

The following samples were analyzed in this batch: HS19101603-01 HS19101603-02

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19101603**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19101603

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19101603-01	16EW07-191025	Login	10/26/2019 12:58:04 PM	AC	WET383
HS19101603-02	16EW05-191025	Login	10/26/2019 12:58:04 PM	AC	WET383

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19101603

Date/Time Received: **26-Oct-2019 10:35**
Received by: **AC**

Checklist completed by: *Asad Chaudhry* eSignature — 26-Oct-2019 Date

Reviewed by: *Corey Grandits* eSignature — 28-Oct-2019 Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.9c UC/C	IR 25
Cooler(s)/Kit(s):	45141	
Date/Time sample(s) sent to storage:	10/26/2019 13:00	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-Bromide-ALSHT-191025 TURNAROUND TIME: 24 hr TAT RUSH: 24 hr TAT

PROJECT/CLIENT INFO				LABORATORY					
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com	
Project Number	501032			Lab Contact	RJ Modashia				
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang	
	PMB 202							4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX	Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656				
Project Manager	Praveen Srivastav								

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS: Containers and Preservative — 1-250 ml HDPE, Ice: Bromide by SW9056
16EW07-191025	16EW07				GW	10/25/2019	930	1	1
16EW05-191025	16EW05				GW	10/25/2019	940	1	1

HS19101603

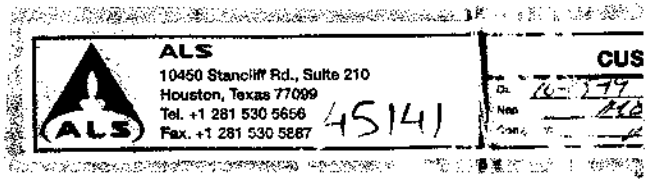
Aptim Environmental & Infrastucture, Inc.

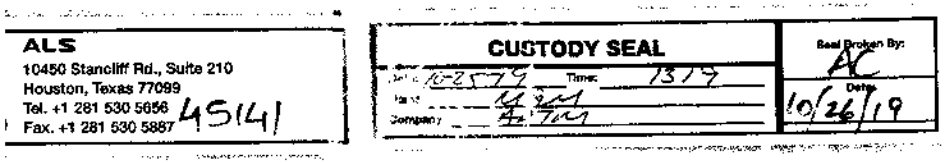
LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
24HR TAT	[illegible] APTIM	10/25/19 1182	AC ALS	10/26/19 10:35

c/c 0.9 18.25 CF0.0

415141


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
45141
CUS
TODY SEAL
Time: 1317
Seal Broken By:
AC
Date:
10/26/19


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
45141
CUSTODY SEAL
Time: 1317
Seal Broken By:
AC
Date:
10/26/19

FedEx
TRK# 0221 4809 7837 9138
SATURDAY 12:00P
PRIORITY OVERNIGHT
XO SGRA
77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 04, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19110026**

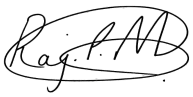
Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 3 sample(s) on Nov 01, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19110026

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110026-01	16EW06-Event2-191031	GW		31-Oct-2019 09:35	01-Nov-2019 09:10	☐
HS19110026-02	16EW05-Event2-191031	GW		31-Oct-2019 09:45	01-Nov-2019 09:10	☐
HS19110026-03	16EW07-Event2-191031	GW		31-Oct-2019 09:46	01-Nov-2019 09:10	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19110026

Work Order Comments

- Revised to update the sample IDs
- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

WetChemistry by Method SW9056

Batch ID: R349710

Sample ID: 16WW06-Event2-191031 (HS19110026-01)

- The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for analyte(s): (Bromide)

WetChemistry by Method SM5310B

Batch ID: R349693

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

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW06-Event2-191031
Collection Date: 31-Oct-2019 09:35

ANALYTICAL REPORT
WorkOrder:HS19110026
Lab ID:HS19110026-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**27.0**		**2.50**	**5.00**	**5.00**	**mg/L**	5	02-Nov-2019 01:22
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.06**		**0.300**	**1.00**	**1.00**	**mg/L**	10	04-Nov-2019 12:28

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW05-Event2-191031
Collection Date: 31-Oct-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19110026
Lab ID:HS19110026-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**30.6**		**2.50**	**5.00**	**5.00**	**mg/L**	5	02-Nov-2019 01:36

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW07-Event2-191031
Collection Date: 31-Oct-2019 09:46

ANALYTICAL REPORT
WorkOrder:HS19110026
Lab ID:HS19110026-03
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**21.0**		**2.50**	**5.00**	**5.00**	**mg/L**	5	02-Nov-2019 01:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19110026

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R349693 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** GW	
HS19110026-01	16EW06-Event2-191031	31 Oct 2019 09:35			02 Nov 2019 01:22	5
HS19110026-02	16EW05-Event2-191031	31 Oct 2019 09:45			02 Nov 2019 01:36	5
HS19110026-03	16EW07-Event2-191031	31 Oct 2019 09:46			02 Nov 2019 01:49	5
Batch ID: R349710 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS19110026-01	16EW06-Event2-191031	31 Oct 2019 09:35			04 Nov 2019 12:28	10

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19110026

QC BATCH REPORT

Batch ID: R349693 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-110119** Units: **mg/L** Analysis Date: **01-Nov-2019 22:39**
Client ID: Run ID: **TOC_02_349693** SeqNo: **5327194** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-110119** Units: **mg/L** Analysis Date: **01-Nov-2019 22:52**
Client ID: Run ID: **TOC_02_349693** SeqNo: **5327195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	8.761	1.00	10	0	87.6	85 - 115				

LCSD Sample ID: **WLCSDW1-110119** Units: **mg/L** Analysis Date: **01-Nov-2019 23:05**
Client ID: Run ID: **TOC_02_349693** SeqNo: **5327196** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.237	1.00	10	0	92.4	85 - 115	8.761	5.29	20	

MS Sample ID: **HS19101287-04MS** Units: **mg/L** Analysis Date: **02-Nov-2019 00:40**
Client ID: Run ID: **TOC_02_349693** SeqNo: **5327203** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	12.67	1.00	10	3.051	96.2	80 - 120				

The following samples were analyzed in this batch: HS19110026-01 HS19110026-02 HS19110026-03

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19110026

QC BATCH REPORT

Batch ID: R349710 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **WBLKW1-110419** Units: **mg/L** Analysis Date: **04-Nov-2019 11:38**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328162** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-110419** Units: **mg/L** Analysis Date: **04-Nov-2019 11:54**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328163** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.782	0.100	4	0	94.6	80 - 120				

LCSD Sample ID: **WLCSDW1-110419** Units: **mg/L** Analysis Date: **04-Nov-2019 12:11**
Client ID: Run ID: **ICS-Integrion_349710** SeqNo: **5328164** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.764	0.100	4	0	94.1	80 - 120	3.782	0.498	20	

MS Sample ID: **HS19110026-01MS** Units: **mg/L** Analysis Date: **04-Nov-2019 12:44**
Client ID: **16EW06-Event2-191031** Run ID: **ICS-Integrion_349710** SeqNo: **5328166** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	18.58	1.00	20	2.058	82.6	80 - 120				

MSD Sample ID: **HS19110026-01MSD** Units: **mg/L** Analysis Date: **04-Nov-2019 13:01**
Client ID: **16EW06-Event2-191031** Run ID: **ICS-Integrion_349710** SeqNo: **5328167** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	18.72	1.00	20	2.058	83.3	80 - 120	18.58	0.756	20	

The following samples were analyzed in this batch: HS19110026-01

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19110026**

QUALIFIERS, ACRONYMS, UNITS

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

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

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19110026

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19110026-01	16EW06-Event2-191031	Login	11/1/2019 12:24:21 PM	AC	WET078
HS19110026-01	16EW06-Event2-191031	Login	11/1/2019 12:24:21 PM	AC	Sub

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19110026
Date/Time Received: **01-Nov-2019 09:10**
Received by: **AC**

Checklist completed by: *Asad Chaudhry* eSignature 1-Nov-2019 Date
Reviewed by: *RJ Modashia* eSignature 1-Nov-2019 Date

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

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.3c U/C	IR 25
Cooler(s)/Kit(s):	45261	
Date/Time sample(s) sent to storage:	11/01/2019 12:30	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

RIGHT SOLUTIONS | RIGHT PARTNER

APTIM

COC ID: LHAAP16-Bromide-Event3-19

TURNAROUND TIME: normal

RUSH: Page 1 of

HS19110026

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

PROJECT/CLIENT INFO

Facility Name	Longhorn AAP
Project Number	501032
	LHAAP-16
Address	1203-B East Grand Avenue
	PMB 202
City	Marshall
State	TX
Postal Code	75670
Country	USA
Phone Number	713.243.7264
Project Manager	Praveen Srivastav

LABORATORY

Lab Name	ALS Laboratories
Lab Contact	RJ Modashia
Email	RJ.Modashia@alsglobal.c
Address	10450 Stancliff Rd., Suite
City	Houston
State	
Postal Code	77099
Coun	
Phone Number	281.575.2279 or 281.530

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Bromide by SW9056	TOC by SM5310 C
								Containers and Preservative		1-250 ml HDPE, Ice	
16EW06-Event2-191031	LHAAP16				WG	10/31/19	0935	3		X	X
16EW05-Event2-191031	LHAAP16				WG	10/31/19	0945	2			X
16EW07-Event2-191031	LHAAP16				WG	10/31/19	0946	2			X

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
24 HR. TAT ON ALL PARAMETERS	[signature] / BHATE	10/31/19 1100	AC ALS	11/01/19 09:10

U/C
0.3
IR#25
CFO
45261

RIGHT SOLUTIONS | RIGHT PARTNER

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45261

CUSTODY SEAL

Date: 10/31/19 Time: 1100
Name: Scott Beesinger
Company: BHATH

Seal Broken By: YM
Date: 11/01/19

45261

Must Deliver Next Business Day
Time and Tempature Sensitive!

45261

ORIGIN ID:SGRA (903) 930-6193
ATT: SCOTT BEESINGER
APTIM ENVIRONMENTAL & INFRAST. INC
1203-B EAST GRAND AVE PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 19FEB19
ACTWGT: 1.00 LB MAN
CAD: 300139/CAFE3211
DIMS: 19x18x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16 - BD 63880 - CG

RMA:

FedEx Express

FedEx
TRK# 0221 4809 7830 9602

FRI - 01 NOV 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID 779552 310CT19 GGGA 56AC3/2A3C/05A2

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 07, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19110217**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 2 sample(s) on Nov 06, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19110217

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110217-01	16EW07-191105	Groundwater		05-Nov-2019 07:50	06-Nov-2019 08:45	☐
HS19110217-02	16EW05-191105	Groundwater		05-Nov-2019 07:55	06-Nov-2019 08:45	☐

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19110217

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R350019

Sample ID: 16EW05-191105 (HS19110217-02)

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Bromide)

Sample ID: HS19101702-01MS

- MS and MSD are for an unrelated sample (Bromide)

WetChemistry by Method SM5310B

Batch ID: R349957

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW07-191105
Collection Date: 05-Nov-2019 07:50

ANALYTICAL REPORT
WorkOrder:HS19110217
Lab ID:HS19110217-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**32.6**		**0.500**	**1.00**	**1.00**	**mg/L**	1	06-Nov-2019 22:02
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.96**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Nov-2019 12:38

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW05-191105
Collection Date: 05-Nov-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19110217
Lab ID:HS19110217-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**21.1**		**0.500**	**1.00**	**1.00**	**mg/L**	1	06-Nov-2019 22:15
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.82**		**0.600**	**2.00**	**2.00**	**mg/L**	20	06-Nov-2019 13:37

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110217

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R349957 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS19110217-01	16EW07-191105	05 Nov 2019 07:50			06 Nov 2019 22:02	1
HS19110217-02	16EW05-191105	05 Nov 2019 07:55			06 Nov 2019 22:15	1
Batch ID: R350019 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19110217-01	16EW07-191105	05 Nov 2019 07:50			06 Nov 2019 12:38	10
HS19110217-02	16EW05-191105	05 Nov 2019 07:55			06 Nov 2019 13:37	20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110217

QC BATCH REPORT

Batch ID: R349957 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-110619** Units: **mg/L** Analysis Date: **06-Nov-2019 21:22**
Client ID: Run ID: **TOC_02_349957** SeqNo: **5333085** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-110619** Units: **mg/L** Analysis Date: **06-Nov-2019 21:36**
Client ID: Run ID: **TOC_02_349957** SeqNo: **5333086** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	8.901	1.00	10	0	89.0	85 - 115				

LCSD Sample ID: **WLCSDW1-110619** Units: **mg/L** Analysis Date: **06-Nov-2019 21:49**
Client ID: Run ID: **TOC_02_349957** SeqNo: **5333087** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.134	1.00	10	0	91.3	85 - 115	8.901	2.58	20	

MS Sample ID: **HS19101647-04MS** Units: **mg/L** Analysis Date: **06-Nov-2019 23:28**
Client ID: Run ID: **TOC_02_349957** SeqNo: **5333094** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	24.62	1.00	10	15.24	93.8	80 - 120				

The following samples were analyzed in this batch: HS19110217-01 HS19110217-02

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110217

QC BATCH REPORT

Batch ID: R350019 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-110619** Units: **mg/L** Analysis Date: **06-Nov-2019 05:51**
Client ID: Run ID: **ICS-Integrion_350019** SeqNo: **5334158** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-110619** Units: **mg/L** Analysis Date: **06-Nov-2019 06:07**
Client ID: Run ID: **ICS-Integrion_350019** SeqNo: **5334159** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.751	0.100	4	0	93.8	80 - 120				

LCSD Sample ID: **WLCSDW1-110619** Units: **mg/L** Analysis Date: **06-Nov-2019 06:24**
Client ID: Run ID: **ICS-Integrion_350019** SeqNo: **5334160** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.736	0.100	4	0	93.4	80 - 120	3.751	0.419	20	

MS Sample ID: **HS19101702-01MS** Units: **mg/L** Analysis Date: **06-Nov-2019 19:21**
Client ID: Run ID: **ICS-Integrion_350019** SeqNo: **5334172** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.554	0.100	2	1.061	24.6	80 - 120				S

MSD Sample ID: **HS19101702-01MSD** Units: **mg/L** Analysis Date: **06-Nov-2019 19:38**
Client ID: Run ID: **ICS-Integrion_350019** SeqNo: **5334173** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.619	0.100	2	1.061	27.9	80 - 120	1.554	4.11	20	S

The following samples were analyzed in this batch: HS19110217-01 HS19110217-02

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS19110217**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19110217

Date/Time Received: **06-Nov-2019 08:45**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature — 6-Nov-2019 Date

Reviewed by: *RJ Modashia* eSignature — 6-Nov-2019 Date

Matrices: **Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.9c U/C	IR25	
Cooler(s)/Kit(s):	Blue		
Date/Time sample(s) sent to storage:	11/6/19 11:50		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-Bromide-ALSHT-191105 TURNAROUND TIME: 24 hr TAT RUSH: 24 hr TAT

PROJECT/CLIENT INFO				LABORATORY					
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com	
Project Number	501032			Lab Contact	RJ Modashia				
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang	
	PMB 202							4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX	Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281 530.5656				
Project Manager	Praveen Srivastav								

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	Containers and Preservative # Of Cont.	ANALYSIS	1-250 ml HDPE, Ice: Bromide by SW9056	2-40ml Amber VOA H2SO4: TOC
16EW07-191105	16EW07				GW	11/5/2019	750	3		1	2
16EW05-191105	16EW05				GW	11/5/2019	755	3		1	2

HS19110217

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] APTIM	11-05-19/1500	[signature] ALS	11/6/19 08:45

Blue ice
c 8°
-1 25°
c 1f-6.6°

TX – US

S
0 Stancliff Rd., Suite 210
ton, Texas 77099
1 281 530 5656
+1 281 530 5887

Blue

CUSTODY SEAL

Date: 11-05-19 Time: 1505
Name:
Company:

Seal Broken By: SM
Date: 11/06/19

Blue

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Blue

CUSTODY SEAL

Date: 11-05-19 Time: 1505
Name:
Company:

Seal Broken By: SM
Date: 11/06/19

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

Blue

ORIGIN ID:SGRA (903) 930-6193
MIKE HART NE2
APTIM ENVIRONMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 16SEP19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

10 CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP – 17 80 67599 – RJ

RMA:

FedEx Express

E

FedEx
TRK# 0221 4809 7837 9734

WED - 06 NOV 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FTO 162786 86NOV19 GGGA 56AC1/F330/86A2

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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F: +1 281 530 5887

November 08, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19110304**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 1 sample(s) on Nov 07, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19110304

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110304-01	16EW08-191106	Groundwater		06-Nov-2019 13:20	07-Nov-2019 08:43	☐

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19110304

CASE NARRATIVE

WetChemistry by Method SM5310B

Batch ID: R350058

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

WetChemistry by Method SW9056

Batch ID: R350041

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW08-191106
Collection Date: 06-Nov-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19110304
Lab ID:HS19110304-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**64.0**		**2.50**	**5.00**	**5.00**	**mg/L**	5	08-Nov-2019 11:51
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**41.8**		**0.300**	**1.00**	**1.00**	**mg/L**	10	07-Nov-2019 16:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110304

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R350041 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19110304-01	16EW08-191106	06 Nov 2019 13:20			07 Nov 2019 16:02	10
Batch ID: R350058 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS19110304-01	16EW08-191106	06 Nov 2019 13:20			08 Nov 2019 11:51	5

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110304

QC BATCH REPORT

Batch ID: R350041 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-110719** Units: **mg/L** Analysis Date: **07-Nov-2019 10:59**
Client ID: Run ID: **ICS-Integrion_350041** SeqNo: **5334686** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-110719** Units: **mg/L** Analysis Date: **07-Nov-2019 11:15**
Client ID: Run ID: **ICS-Integrion_350041** SeqNo: **5334687** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.728	0.100	4	0	93.2	80 - 120				

LCSD Sample ID: **WLCSDW1-110719** Units: **mg/L** Analysis Date: **07-Nov-2019 11:32**
Client ID: Run ID: **ICS-Integrion_350041** SeqNo: **5334688** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.721	0.100	4	0	93.0	80 - 120	3.728	0.201	20	

MS Sample ID: **HS19110285-07MS** Units: **mg/L** Analysis Date: **07-Nov-2019 15:29**
Client ID: Run ID: **ICS-Integrion_350041** SeqNo: **5334692** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.683	0.100	2	0	84.2	80 - 120				

MSD Sample ID: **HS19110285-07MSD** Units: **mg/L** Analysis Date: **07-Nov-2019 15:45**
Client ID: Run ID: **ICS-Integrion_350041** SeqNo: **5334693** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.698	0.100	2	0	84.9	80 - 120	1.683	0.84	20	

The following samples were analyzed in this batch: HS19110304-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110304

QC BATCH REPORT

Batch ID: R350058 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW2-110719** Units: **mg/L** Analysis Date: **07-Nov-2019 17:29**
Client ID: Run ID: **TOC_02_350058** SeqNo: **5335814** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW2-110719** Units: **mg/L** Analysis Date: **07-Nov-2019 17:52**
Client ID: Run ID: **TOC_02_350058** SeqNo: **5335815** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	8.952	1.00	10	0	89.5	85 - 115				

LCSD Sample ID: **WLCSDW2-110719** Units: **mg/L** Analysis Date: **07-Nov-2019 18:05**
Client ID: Run ID: **TOC_02_350058** SeqNo: **5335816** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	8.804	1.00	10	0	88.0	85 - 115	8.952	1.67	20	

MS Sample ID: **HS19110263-01MS** Units: **mg/L** Analysis Date: **07-Nov-2019 19:42**
Client ID: Run ID: **TOC_02_350058** SeqNo: **5335823** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	16.71	1.00	10	7.599	91.1	80 - 120				

The following samples were analyzed in this batch: HS19110304-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS19110304**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19110304

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19110304-01	16EW08-191106	Login	11/7/2019 1:18:49 PM	NDR	WET188
HS19110304-01	16EW08-191106	Login	11/7/2019 1:18:49 PM	NDR	WET188

ALS Houston, US Date: 08-Nov-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19110304

Date/Time Received: **07-Nov-2019 08:43**
Received by: **PMG**

Checklist completed by: *Nilesh D. Ranchod* eSignature 7-Nov-2019 Date

Reviewed by: *RJ Modashia* eSignature 7-Nov-2019 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.7c U/C	IR25	
Cooler(s)/Kit(s):	42926		
Date/Time sample(s) sent to storage:	11/07/2019 14:00		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-Bromide-ALSHT-191106 **TURNAROUND TIME:** 24 hr TAT **RUSH:** 24 hr TAT Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY						
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories				Fedinvoices @aptim.com	
Project Number	501032			Lab Contact	RJ Modashia					
	LHAAP-16			Email	RJ.Modashia@alsglobal.com				Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210				Susan Huang	
	PMB 202								4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX		Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA		94520	Country USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656					
Project Manager	Praveen Srivastav									

SAMPLE DETAILS / **ANALYSIS REQUESTED**

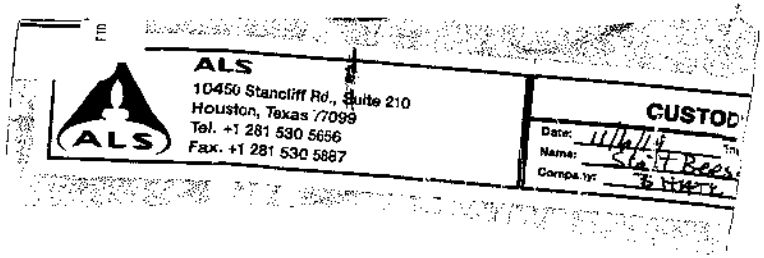
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Bromide by SW9056 (1-250 ml HDPE, Ice)	TOC (2-40ml Amber VOA H2SO4)
16EW08-191106	16EW08				GW	11/6/2019	1320	3		1	2

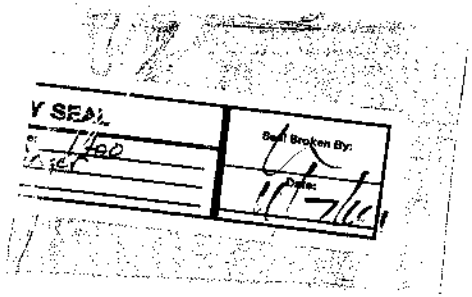
HS19110304

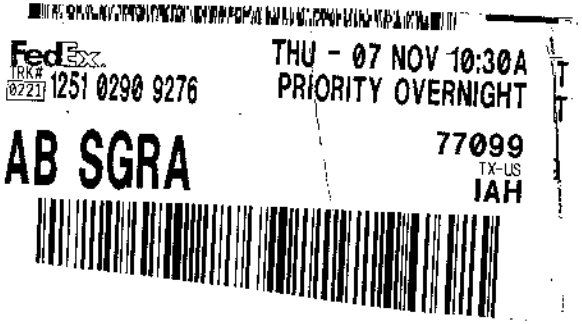
Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] APTIM	11-6-19/1340	[signature] ALS.	11/7/19 08:43.

42926 o/c. 0.7° 1 2' c/f 0.0°


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTOD
Date:
Name:
Compa.ny:


Seal Broken By:
Date:


FedEx
TRK# 0221 1251 0290 9276
THU - 07 NOV 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US
IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 12, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19110484**

Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 1 sample(s) on Nov 09, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19110484

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110484-01	16EW06-191108	GW		08-Nov-2019 11:30	09-Nov-2019 08:50	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19110484

WetChemistry by Method SM5310B

Batch ID: R350290

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

WetChemistry by Method SW9056

Batch ID: R350289

Sample ID: 16EW06-191108 (HS19110484-01)

- The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for analyte(s): (Bromide)

Sample ID: 16EW06-191108 (HS19110484-01MS)

- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Bromide)

Sample ID: 16EW06-191108 (HS19110484-01MSD)

- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Bromide)

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW06-191108
Collection Date: 08-Nov-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19110484
Lab ID:HS19110484-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**28.1**		**2.50**	**5.00**	**5.00**	**mg/L**	5	12-Nov-2019 10:54
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.60**	J	**1.50**	**5.00**	**5.00**	**mg/L**	50	12-Nov-2019 12:55

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19110484

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R350289 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS19110484-01	16EW06-191108	08 Nov 2019 11:30			12 Nov 2019 12:55	50
Batch ID: R350290 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** GW	
HS19110484-01	16EW06-191108	08 Nov 2019 11:30			12 Nov 2019 10:54	5

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19110484

QC BATCH REPORT

Batch ID: R350289 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-111119** Units: **mg/L** Analysis Date: **12-Nov-2019 04:37**
Client ID: Run ID: **ICS-Integrion_350289** SeqNo: **5340193** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW2-111119** Units: **mg/L** Analysis Date: **12-Nov-2019 04:53**
Client ID: Run ID: **ICS-Integrion_350289** SeqNo: **5340194** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.76	0.100	4	0	94.0	80 - 120				

LCSD Sample ID: **WLCSDW2-111119** Units: **mg/L** Analysis Date: **12-Nov-2019 05:10**
Client ID: Run ID: **ICS-Integrion_350289** SeqNo: **5340195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.764	0.100	4	0	94.1	80 - 120	3.76	0.117	20	

MS Sample ID: **HS19110484-01MS** Units: **mg/L** Analysis Date: **12-Nov-2019 13:11**
Client ID: **16EW06-191108** Run ID: **ICS-Integrion_350289** SeqNo: **5340204** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	88.02	5.00	100	4.605	83.4	80 - 120				

MS Sample ID: **HS19110484-01MS** Units: **mg/L** Analysis Date: **12-Nov-2019 11:48**
Client ID: **16EW06-191108** Run ID: **ICS-Integrion_350289** SeqNo: **5340201** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	26.05	2.00	40	1.956	60.2	80 - 120				S

MSD Sample ID: **HS19110484-01MSD** Units: **mg/L** Analysis Date: **12-Nov-2019 12:04**
Client ID: **16EW06-191108** Run ID: **ICS-Integrion_350289** SeqNo: **5340202** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	27.42	2.00	40	1.956	63.7	80 - 120	26.05	5.11	20	S

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19110484

QC BATCH REPORT

Batch ID: **R350289 (0)** **Instrument:** **ICS-Integrion** **Method:** **ANIONS BY SW9056A**

MSD Sample ID: **HS19110484-01MSD** Units: **mg/L** Analysis Date: **12-Nov-2019 13:28**
Client ID: **16EW06-191108** Run ID: **ICS-Integrion_350289** SeqNo: **5340205** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	87.36	5.00	100	4.605	82.8	80 - 120	88.02	0.753	20	

The following samples were analyzed in this batch: HS19110484-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19110484

QC BATCH REPORT

Batch ID: R350290 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-111219** Units: **mg/L** Analysis Date: **12-Nov-2019 10:14**
Client ID: Run ID: **TOC_02_350290** SeqNo: **5340224** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-111219** Units: **mg/L** Analysis Date: **12-Nov-2019 10:27**
Client ID: Run ID: **TOC_02_350290** SeqNo: **5340225** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.697	1.00	10	0	97.0	85 - 115				

LCSD Sample ID: **WLCSDW1-111219** Units: **mg/L** Analysis Date: **12-Nov-2019 10:41**
Client ID: Run ID: **TOC_02_350290** SeqNo: **5340226** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.477	1.00	10	0	94.8	85 - 115	9.697	2.29	20	

MS Sample ID: **HS19110484-01MS** Units: **mg/L** Analysis Date: **12-Nov-2019 11:36**
Client ID: **16EW06-191108** Run ID: **TOC_02_350290** SeqNo: **5340229** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	76.75	5.00	50	28.11	97.3	80 - 120				

MSD Sample ID: **HS19110484-01MSD** Units: **mg/L** Analysis Date: **12-Nov-2019 11:49**
Client ID: **16EW06-191108** Run ID: **TOC_02_350290** SeqNo: **5340230** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	76.8	5.00	50	28.11	97.4	80 - 120	76.75	0.0651	20	

The following samples were analyzed in this batch: HS19110484-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19110484**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19110484

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19110484-01	16EW06-191108	Login	11/9/2019 12:41:00 PM	AC	WET126
HS19110484-01	16EW06-191108	Login	11/9/2019 12:41:00 PM	AC	WET126

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19110484
Date/Time Received: **09-Nov-2019 08:50**
Received by: **JRM**

Checklist completed by: *Asad Chaudhry* eSignature 9-Nov-2019 Date
Reviewed by: *RJ Modashia* eSignature 11-Nov-2019 Date

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

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.5c/1.0c U/C	IR 11	
Cooler(s)/Kit(s):	45458		
Date/Time sample(s) sent to storage:	11/09/2019 12:45		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-Bromide-ALSHT-191108 TURNAROUND TIME: 24 hr TAT RUSH: 24 hr TAT Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY					
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com	
Project Number	501032			Lab Contact	RJ Modashia				
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang	
	PMB 202							4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX	Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country USA
Phone Number	713.243.7264			Phone Number	281 575.2279 or 281.530.5656				
Project Manager	Praveen Srivastav								

SAMPLE DETAILS								ANALYSIS REQUESTED										
								Containers and Preservative		1-250 ml HDPE, Ice	2-40ml Amber VOA H2SO4							
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Bromide by SW9056	TOC							
16EW06-191108	16EW06				GW	11/8/2019	1130	3		1	2							

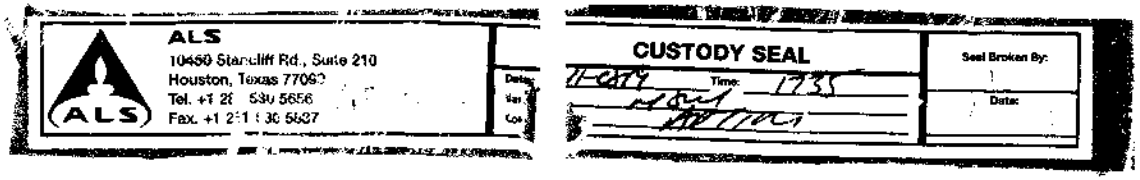
HS19110484

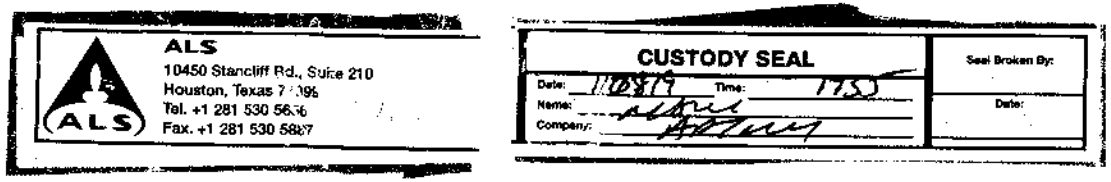
Aptim Environmental & Infrastucture, Inc.

LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature]	11/8/19 1130	J.M / ALS	11/09/19 08:50

o/c 1.5 IR#11 CF-0.5 45458


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5627
CUSTODY SEAL
Time: 1735
Seal Broken By:
Date:


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5627
CUSTODY SEAL
Date: 110819
Time: 1735
Name:
Company:
Seal Broken By:
Date:

FedEx
TRK# 0221 4380 9534 1058
SATURDAY 12:00P
PRIORITY OVERNIGHT
XO SGRA
77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 14, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19110619**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 1 sample(s) on Nov 13, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19110619

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110619-01	16EW05-191111	Groundwater		11-Nov-2019 10:30	13-Nov-2019 09:39	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant
Work Order: HS19110619

WetChemistry by Method SW9056

Batch ID: R350457

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

WetChemistry by Method SM5310B

Batch ID: R350442

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW05-191111
Collection Date: 11-Nov-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19110619
Lab ID:HS19110619-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**31.0**		**2.50**	**5.00**	**5.00**	**mg/L**	5	13-Nov-2019 18:51
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.78**		**0.600**	**2.00**	**2.00**	**mg/L**	20	13-Nov-2019 15:08

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110619

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R350442 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS19110619-01	16EW05-191111	11 Nov 2019 10:30			13 Nov 2019 18:51	5
Batch ID: R350457 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19110619-01	16EW05-191111	11 Nov 2019 10:30			13 Nov 2019 15:08	20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110619

QC BATCH REPORT

Batch ID: R350442 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW2-111319** Units: **mg/L** Analysis Date: **13-Nov-2019 16:43**
Client ID: Run ID: **TOC_02_350442** SeqNo: **5343303** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW2-111319** Units: **mg/L** Analysis Date: **13-Nov-2019 20:02**
Client ID: Run ID: **TOC_02_350442** SeqNo: **5343312** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.619	1.00	10	0	96.2	85 - 115				

LCSD Sample ID: **WLCSDW2-111319** Units: **mg/L** Analysis Date: **13-Nov-2019 17:10**
Client ID: Run ID: **TOC_02_350442** SeqNo: **5343304** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.131	1.00	10	0	91.3	85 - 115	9.619	5.21	20	

MS Sample ID: **HS19110430-01MS** Units: **mg/L** Analysis Date: **13-Nov-2019 18:38**
Client ID: Run ID: **TOC_02_350442** SeqNo: **5343306** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	21.28	1.00	10	11.24	100	80 - 120				

The following samples were analyzed in this batch: HS19110619-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110619

QC BATCH REPORT

Batch ID: R350457 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-111319** Units: **mg/L** Analysis Date: **13-Nov-2019 14:02**
Client ID: Run ID: **ICS-Integrion_350457** SeqNo: **5343626** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-111319** Units: **mg/L** Analysis Date: **13-Nov-2019 14:18**
Client ID: Run ID: **ICS-Integrion_350457** SeqNo: **5343627** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.754	0.100	4	0	93.9	80 - 120				

LCSD Sample ID: **WLCSDW1-111319** Units: **mg/L** Analysis Date: **13-Nov-2019 14:35**
Client ID: Run ID: **ICS-Integrion_350457** SeqNo: **5343628** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.72	0.100	4	0	93.0	80 - 120	3.754	0.91	20	

MS Sample ID: **HS19110644-07MS** Units: **mg/L** Analysis Date: **13-Nov-2019 20:57**
Client ID: Run ID: **ICS-Integrion_350457** SeqNo: **5343645** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.03	0.100	2	0.343	84.3	80 - 120				

MS Sample ID: **HS19110621-01MS** Units: **mg/L** Analysis Date: **13-Nov-2019 16:14**
Client ID: Run ID: **ICS-Integrion_350457** SeqNo: **5343633** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	5.094	0.200	4	1.48	90.4	80 - 120				

MSD Sample ID: **HS19110644-07MSD** Units: **mg/L** Analysis Date: **13-Nov-2019 21:14**
Client ID: Run ID: **ICS-Integrion_350457** SeqNo: **5343646** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.032	0.100	2	0.343	84.4	80 - 120	2.03	0.103	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110619

QC BATCH REPORT

Batch ID: R350457 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19110621-01MSD** Units: **mg/L** Analysis Date: **13-Nov-2019 16:31**
Client ID: Run ID: **ICS-Integrion_350457** SeqNo: **5343634** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	5.051	0.200	4	1.48	89.3	80 - 120	5.094	0.84	20	

The following samples were analyzed in this batch: HS19110619-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS19110619**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19110619

Date/Time Received: **13-Nov-2019 09:39**
Received by: **NDD**

Checklist completed by: *Paresh M. Giga* eSignature — 13-Nov-2019 Date

Reviewed by: *RJ Modashia* eSignature — 13-Nov-2019 Date

Matrices: **GW**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.2c U/C	IR25	
Cooler(s)/Kit(s):	Blue		
Date/Time sample(s) sent to storage:	11/13/19 12:05		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-Bromide-ALSHT-191111 TURNAROUND TIME: 24 hr TAT RUSH: 24 hr TAT Page 1 of 1

PROJECT/CLIENT INFO				LABORATORY						
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories				FedInvoices@aptim.com	
Project Number	501032			Lab Contact	RJ Modashia					
	LHAAP-16			Email	RJ.Modashia@alsglobal.com				Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210				Susan Huang	
	PMB 202								4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX		Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA		94520	Country USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656					
Project Manager	Praveen Srivastav									

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	Bromide by SW9056 (1-250 ml HDPE, Ice)	TOC (2-40ml Amber VOA H2SO4)
16EW05-191111	16EW05				GW	11/11/2019	1030	3	1	2

HS19110619
Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] APTIM	11-12-19/1330	NU	11/13/19 9.39

BMW 444484 NP
1-2 U/C 1.0
1K # 25
C/K 0

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687

CUSTODY SEAL
Date: 11-13-19 Time: 1340
Name:
Company:

Seal Broken By:
Date: 11/13/19

BMW

NOV 13 2019

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687

CUSTODY SEAL
Date: 11-13-19 Time: 1340
Name:
Company:

Seal Broken By:
Date: 11/13/19

...ver Next Business Day
Time and Tempature Sensitive!

BMW

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 30OCT18
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP - 37 - BO 61933 - RJ

RMA:

FedEx Express

FedEx
TRK# (0221) 4380 9534 1025

WED - 13 NOV 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 27, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19110634**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 5 sample(s) on Nov 13, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19110634

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110634-01	16EW01-191111	Groundwater		11-Nov-2019 12:42	13-Nov-2019 09:39	☐
HS19110634-02	16EW04-191111	Groundwater		11-Nov-2019 13:33	13-Nov-2019 09:39	☐
HS19110634-03	16EW03-191111	Groundwater		11-Nov-2019 14:18	13-Nov-2019 09:39	☐
HS19110634-04	16EW02-191111	Groundwater		11-Nov-2019 14:55	13-Nov-2019 09:39	☐
HS19110634-05	16EW04-191111-FD	Groundwater		11-Nov-2019 13:33	13-Nov-2019 09:39	☐

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19110634

CASE NARRATIVE

Work Order Comments

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

WetChemistry by Method SW9056

Batch ID: R351461

Sample ID: HS19111269-02MS

- MS and MSD are for an unrelated sample (Bromide)

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW01-191111
Collection Date: 11-Nov-2019 12:42

ANALYTICAL REPORT
WorkOrder:HS19110634
Lab ID:HS19110634-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.33**		**0.300**	**1.00**	**1.00**	**mg/L**	10	25-Nov-2019 22:59
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	22-Nov-2019 15:11

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW04-191111
Collection Date: 11-Nov-2019 13:33

ANALYTICAL REPORT
WorkOrder:HS19110634
Lab ID:HS19110634-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.48**		**0.300**	**1.00**	**1.00**	**mg/L**	10	25-Nov-2019 23:15
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	22-Nov-2019 15:11

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW03-191111
Collection Date: 11-Nov-2019 14:18

ANALYTICAL REPORT
WorkOrder:HS19110634
Lab ID:HS19110634-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**5.30**		**0.300**	**1.00**	**1.00**	**mg/L**	10	25-Nov-2019 23:32
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	22-Nov-2019 15:11

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW02-191111
Collection Date: 11-Nov-2019 14:55

ANALYTICAL REPORT
WorkOrder:HS19110634
Lab ID:HS19110634-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.74**		**0.300**	**1.00**	**1.00**	**mg/L**	10	25-Nov-2019 23:48
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	22-Nov-2019 15:11

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 16EW04-191111-FD
Collection Date: 11-Nov-2019 13:33

ANALYTICAL REPORT
WorkOrder:HS19110634
Lab ID:HS19110634-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.54**		**0.300**	**1.00**	**1.00**	**mg/L**	10	26-Nov-2019 00:05
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	22-Nov-2019 15:11

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110634

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R351131 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS19110634-01	16EW01-191111	11 Nov 2019 12:42			22 Nov 2019 15:11	1
HS19110634-02	16EW04-191111	11 Nov 2019 13:33			22 Nov 2019 15:11	1
HS19110634-03	16EW03-191111	11 Nov 2019 14:18			22 Nov 2019 15:11	1
HS19110634-04	16EW02-191111	11 Nov 2019 14:55			22 Nov 2019 15:11	1
HS19110634-05	16EW04-191111-FD	11 Nov 2019 13:33			22 Nov 2019 15:11	1
Batch ID: R351461 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19110634-01	16EW01-191111	11 Nov 2019 12:42			25 Nov 2019 22:59	10
HS19110634-02	16EW04-191111	11 Nov 2019 13:33			25 Nov 2019 23:15	10
HS19110634-03	16EW03-191111	11 Nov 2019 14:18			25 Nov 2019 23:32	10
HS19110634-04	16EW02-191111	11 Nov 2019 14:55			25 Nov 2019 23:48	10
HS19110634-05	16EW04-191111-FD	11 Nov 2019 13:33			26 Nov 2019 00:05	10

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110634

QC BATCH REPORT

Batch ID: R351461 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-112519** Units: **mg/L** Analysis Date: **25-Nov-2019 17:13**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364933** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-112519** Units: **mg/L** Analysis Date: **25-Nov-2019 17:30**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364934** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.722	0.100	4	0	93.0	80 - 120				

LCSD Sample ID: **WLCSDW1-112519** Units: **mg/L** Analysis Date: **25-Nov-2019 17:46**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364935** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.736	0.100	4	0	93.4	80 - 120	3.722	0.365	20	

MS Sample ID: **HS19111269-02MS** Units: **mg/L** Analysis Date: **25-Nov-2019 19:39**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364937** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.736	0.100	2	0.1866	77.5	80 - 120				S

MS Sample ID: **HS19111080-07MS** Units: **mg/L** Analysis Date: **26-Nov-2019 02:51**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364958** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	12.99	0.500	10	3.988	90.0	80 - 120				

MSD Sample ID: **HS19111269-02MSD** Units: **mg/L** Analysis Date: **25-Nov-2019 19:56**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364938** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.74	0.100	2	0.1866	77.7	80 - 120	1.736	0.236	20	S

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19110634

QC BATCH REPORT

Batch ID: R351461 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19111080-07MSD** Units: **mg/L** Analysis Date: **26-Nov-2019 03:08**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364959** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	12.92	0.500	10	3.988	89.4	80 - 120	12.99	0.502	20	

The following samples were analyzed in this batch: HS19110634-01 HS19110634-02 HS19110634-03 HS19110634-04 HS19110634-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: **HS19110634**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 27-Nov-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19110634
Date/Time Received: **13-Nov-2019 09:39**
Received by: **NDR**

Checklist completed by: *Paresh M. Giga* eSignature — 13-Nov-2019 Date
Reviewed by: *RJ Modashia* eSignature — 14-Nov-2019 Date

Matrices: **GW**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.2c U/C	IR25
Cooler(s)/Kit(s):	Blue	
Date/Time sample(s) sent to storage:	11/13/19 14:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Extra sample received.
16EW04-191111-FD
Logged in with analysis per RJ

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: 16NOV2019-MP-191111-ALS

TURNAROUND TIME: Standard

RUSH:

PROJECT/CLIENT INFO

Facility Name	Longhorn AAP
Project Number	501032
	LHAAP-16
Address	1203-B East Grand Avenue
	PMB 202
City	Marshall
State	TX
Postal Code	75670
Country	USA
Phone Number	713.243.7264
Project Manager	Praveen Srivastav

LABORATORY

Lab Name	ALS Laboratories
Lab Contact	RJ Modashia
Email	RJ.Modashia@alsglobal.com
Address	10450 Stancliff Rd., Suite 210
City	Houston
State	TX
Postal Code	77099
Country	USA
Phone Number	281.575.2279 or 281.530.5656

FedInvoices @aptim.com

Susan.Huang@aptim.com

Susan Huang

4005 Port Chicago Hwy

Concord

State CA

94520

Country USA

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS: TOC by SM5310 (Containers and Preservative: 2-40ml Amber VOA H2SO4)	Bromide by SW9056 (1-250 ml/ Cool to 6 deg C)
16EW01-191111	16EW01	24.61	24.75	FT	GW	11/11/2019	1242	3	2	1
16EW04-191111	16EW04	7.49	7.65	FT	GW	11/11/2019	1333	3	2	1
16EW03-191111	16EW03	12.3	12.3	FT	GW	11/11/2019	1418	3	2	1
16EW02-191111	16EW02	22.4	22.5	FT	GW	11/11/2019	1455	3	2	1

HS19110634

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plan

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] APTM	11/12/19 1830	NK	11/13/19 9:39

Bruce
4/C 1.2

44489 ND
4/C ~~1.0~~
1/2 # 25 C/L A

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Bmc

CUSTODY SEAL
Date: 11-13-19 Time: 1340
Name: [illegible]
Company: [illegible]

Seal Broken By: [illegible]
Date: 11/13/19

Bmc NOV 13 2019

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Bmc

CUSTODY SEAL
Date: 11-13-19 Time: 1340
Name: [illegible]
Company: [illegible]

Seal Broken By: [illegible]
Date: 11/13/19

10:30 A 1025

...ver Next Business Day
Time and Tempature Sensitive!

Bmc

ALS

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 30OCT18
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-37-BO 61933-RJ

RMA:

FedEx Express

E

FedEx
TRK# 0221 4380 9534 1025

WED - 13 NOV 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

November 22, 2019

Analytical Report for Service Request No: K1910765

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

RE: HS19110634

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory November 14, 2019
For your reference, these analyses have been assigned our service request number **K1910765.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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www.alsglobal.com

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Acronyms
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    General Chemistry

Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS19110634
Sample Matrix: Ground Water

Service Request: K1910765
Date Received: 11/14/2019

CASE NARRATIVE

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

Sample Receipt:

Five ground water samples were received for analysis at ALS Environmental on 11/14/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 11/22/2019

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

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

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12619**

RJ 9107765

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:		**INVOICE INFORMATION:**	
Company:	ALS Houston	**Company:**	ALS Houston
Contact:	RJ Modashia	**Contact:**	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210	**Address:**	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656	**Phone:**	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com	**Reference:**	HS19110634
Alternate Contact:		**TSR:**	Sonia West
Email:			

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19110634-01**	**16EW01-191111**	**Groundwater**	**11 Nov 2019 12:42**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			21 Nov 2019
2.	**HS19110634-02**	**16EW04-191111**	**Groundwater**	**11 Nov 2019 13:33**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			21 Nov 2019
3.	**HS19110634-03**	**16EW03-191111**	**Groundwater**	**11 Nov 2019 14:18**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			21 Nov 2019
4.	**HS19110634-04**	**16EW02-191111**	**Groundwater**	**11 Nov 2019 14:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			21 Nov 2019
5.	**HS19110634-05**	**16EW04-191111-FD**	**Groundwater**	**11 Nov 2019 13:33**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			21 Nov 2019

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

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12619**

Relinquished By: [signature] Date/Time: 11/13/19 1800.

Received By: [signature] ALS 11/14/19 Date/Time: 11-14-19 0940

Cooler ID(s): Temperature(s):

PC KL

Cooler Receipt and Preservation Form

Client ALS- Houston Service Request *K19* 107165

Received: 11-14-19 Opened: 11-14-19 By: KM Unloaded: 11-14-19 By: KM

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number NA	Filed
-0.5	-0.5	4.5	4.5	0	371		1251 0291 7686	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1910765
Project:	HS19110634	**Date Collected:**	11/11/19
Sample Matrix:	Ground Water	**Date Received:**	11/14/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16EW01-191111	K1910765-001	**9.06**	0.50	0.20	0.07	1	11/17/19 00:29	
16EW04-191111	K1910765-002	**13.6**	0.50	0.20	0.07	1	11/17/19 00:58	
16EW03-191111	K1910765-003	**22.6**	0.50	0.20	0.07	1	11/17/19 01:26	
16EW02-191111	K1910765-004	**10.3**	0.50	0.20	0.07	1	11/17/19 01:54	
16EW04-191111-FD	K1910765-005	**15.3**	0.50	0.20	0.07	1	11/21/19 07:31	
Method Blank	K1910765-MB1	ND U	0.50	0.20	0.07	1	11/16/19 19:16	
Method Blank	K1910765-MB2	ND U	0.50	0.20	0.07	1	11/20/19 23:26	

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1910765
Project	HS19110634	**Date Collected:**	11/11/19
Sample Matrix:	Ground Water	**Date Received:**	11/14/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	LOQ	LOD	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16EW01-191111	K1910765-001DUP	0.50	0.20	0.07	9.06	8.90	8.98	2	10	11/17/19
16EW04-191111	K1910765-002DUP	0.50	0.20	0.07	13.6	13.4	13.5	1	10	11/17/19
16EW03-191111	K1910765-003DUP	0.50	0.20	0.07	22.6	22.7	22.7	<1	10	11/17/19
16EW02-191111	K1910765-004DUP	0.50	0.20	0.07	10.3	9.87	10.1	4	10	11/17/19
16EW04-191111-FD	K1910765-005DUP	0.50	0.20	0.07	15.3	15.2	15.2	<1	10	11/21/19

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1910765
Project:	HS19110634	**Date Analyzed:**	11/16/19
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	660115

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1910765-LCS1	24.6	25.0	98	83-117

Client:	ALS Environmental - US	**Service Request:**	K1910765
Project:	HS19110634	**Date Analyzed:**	11/20/19
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	660506

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1910765-LCS2	24.5	25.0	98	83-117

Client: ALS Environmental - US **Service Request:** K1910765
Project: HS19110634

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	660115	KQ1916991-01	11/16/19 23:04	25.0	23.9	95	90-110
CCV2	660115	KQ1916991-02	11/17/19 03:33	25.0	23.7	95	90-110
CCV3	660506	KQ1917163-01	11/20/19 16:58	25.0	23.6	94	90-110
CCV4	660506	KQ1917163-02	11/20/19 22:52	25.0	23.8	95	90-110
CCV5	660506	KQ1917163-03	11/21/19 03:45	25.0	23.6	94	90-110
CCV6	660506	KQ1917163-04	11/21/19 08:36	25.0	23.5	94	90-110

Client: ALS Environmental - US **Service Request:**K1910765
Project: HS19110634

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	660115	KQ1916991-03	11/16/19 23:18	0.50	0.20	0.07	ND	U
CCB2	660115	KQ1916991-04	11/17/19 03:48	0.50	0.20	0.07	ND	U
CCB3	660506	KQ1917163-05	11/20/19 17:15	0.50	0.20	0.07	ND	U
CCB4	660506	KQ1917163-06	11/20/19 23:09	0.50	0.20	0.07	ND	U
CCB5	660506	KQ1917163-07	11/21/19 04:02	0.50	0.20	0.07	ND	U
CCB6	660506	KQ1917163-08	11/21/19 08:52	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
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General Chemistry

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Work Request # Original (K19)0895, 160, 169, 187, 278, 332, 415, 473, 545, 547, 731, 473, 483, 561, 572, 576, 599, 254, 299, 760, 765

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

Date Analyzed: 11/15/19

Analyst: BCP/BCP for HLM

Run # TOC: 660112, 660117, 660114, 660115

Analysis: TOC/DOC

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: K19|0160-3MS reports a low %Recovery due to suspected matrix interference.
K19|0187-3/3d, 278-2/2d, 473-5/5d, 561-2/2d, 254-3/3d, 254-7/7d report a high %RSD. However, these samples are less than 5x the MRL.

Final Approved by: _____ Date: 11/19/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660112 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910095-017	Carbon, Total Organic	N/A		Water	4.92 mg/L	10 mL	246 mg/L	50	4	25			11/15/19 15:25:00	N	II
K1910095-018	Carbon, Total Organic	N/A		Water	5.97 mg/L	10 mL	298 mg/L	50	4	25			11/15/19 15:53:00	N	II
K1910160-001	Carbon, Total Organic	N/A		Water	1.69 mg/L	10 mL	1.69 mg/L	1	0.07	0.50			11/15/19 16:36:00	N	IV
K1910160-002	Carbon, Total Organic	N/A		Water	1.38 mg/L	10 mL	1.38 mg/L	1	0.07	0.50			11/15/19 17:04:00	N	IV
K1910160-003	Carbon, Total Organic	N/A		Water	1.23 mg/L	10 mL	1.23 mg/L	1	0.07	0.50			11/15/19 17:32:00	N	IV
K1910169-001	Carbon, Total Organic	N/A		Ground Water	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50			11/15/19 18:44:00	N	II
K1910169-002	Carbon, Total Organic	N/A		Ground Water	3.51 mg/L	10 mL	3.51 mg/L	1	0.07	0.50			11/15/19 19:12:00	N	II
K1910169-003	Carbon, Total Organic	N/A		Ground Water	3.55 mg/L	10 mL	3.55 mg/L	1	0.07	0.50			11/15/19 19:40:00	N	II
K1910187-001	Carbon, Total Organic	N/A		Water	2.41 mg/L	10 mL	2.41 mg/L	1	0.07	0.50			11/15/19 20:08:00	N	I
K1910187-002	Carbon, Total Organic	N/A		Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50			11/15/19 20:36:00	N	I
K1910187-003	Carbon, Total Organic	N/A		Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50			11/15/19 21:04:00	N	I
K1910278-001	Carbon, Total Organic	N/A		Ground Water	3.33 mg/L	10 mL	3.33 mg/L	1	0.07	0.50			11/15/19 22:57:00	N	II
K1910278-002	Carbon, Total Organic	N/A		Ground Water	0.34 mg/L	10 mL	0.34 mg/L J	1	0.07	0.50			11/16/19 00:23:00	N	II
K1910332-001	Carbon, Total Organic	N/A		Drinking Water	0.37 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/15/19 21:32:00	N	I
K1910415-001	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/15/19 22:00:00	N	II
K1910473-001	Carbon, Total Organic	N/A		Ground Water	6.20 mg/L	10 mL	6.20 mg/L	1	0.07	0.50			11/16/19 00:51:00	N	II
K1910473-002	Carbon, Total Organic	N/A		Ground Water	6.32 mg/L	10 mL	6.32 mg/L	1	0.07	0.50			11/16/19 01:19:00	N	II
K1910473-003	Carbon, Total Organic	N/A		Ground Water	0.34 mg/L	10 mL	0.34 mg/L J	1	0.07	0.50			11/16/19 01:48:00	N	II
K1910545-001	Carbon, Total Organic	N/A		Water	1.83 mg/L	10 mL	1.83 mg/L	1	0.07	0.50			11/15/19 22:28:00	N	II
KQ1916988-01	Carbon, Total Organic	CCV		Water	24.50 mg/L	10 mL	24.5 mg/L	1					11/15/19 14:11:00	N	II
KQ1916988-02	Carbon, Total Organic	CCV		Water	24.74 mg/L	10 mL	24.7 mg/L	1					11/15/19 18:14:00	N	II
KQ1916988-03	Carbon, Total Organic	CCV		Water	24.27 mg/L	10 mL	24.3 mg/L	1					11/15/19 23:25:00	N	II
KQ1916988-04	Carbon, Total Organic	CCV		Water	24.63 mg/L	10 mL	24.6 mg/L	1					11/16/19 04:08:00	N	II
KQ1916988-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/15/19 14:26:00	N	II
KQ1916988-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/15/19 18:29:00	N	II
KQ1916988-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/15/19 23:39:00	N	II
KQ1916988-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 04:23:00	N	II
KQ1916988-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/15/19 14:41:00	N	II
KQ1916988-10	Carbon, Total Organic	LCS		Water	25.27 mg/L	10 mL	25.3 mg/L	1	0.07	0.50	101		11/15/19 14:56:00	N	II
KQ1916988-11	Carbon, Total Organic	MS	K1910160-003	Water	21.53 mg/L	10 mL	21.5 mg/L	1	0.07	0.50	81*		11/15/19 18:00:00	N	IV
KQ1916988-12	Carbon, Total Organic	DUP	K1910095-017	Water	4.97 mg/L	10 mL	249 mg/L	50	4	25		1	11/15/19 15:25:00	N	II

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

11/19/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660112 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1916988-13	Carbon, Total Organic	DUP	K1910095-018	Water	6.04 mg/L	10 mL	302 mg/L	50	4	25		1	11/15/19 15:53:00	N	II
KQ1916988-15	Carbon, Total Organic	DUP	K1910160-002	Water	1.32 mg/L	10 mL	1.32 mg/L	1	0.07	0.50		5	11/15/19 17:04:00	N	IV
KQ1916988-16	Carbon, Total Organic	DUP	K1910160-001	Water	1.57 mg/L	10 mL	1.57 mg/L	1	0.07	0.50		7	11/15/19 16:36:00	N	IV
KQ1916988-17	Carbon, Total Organic	DUP	K1910160-003	Water	1.20 mg/L	10 mL	1.20 mg/L	1	0.07	0.50		2	11/15/19 17:32:00	N	IV
KQ1916988-18	Carbon, Total Organic	DUP	K1910169-001	Ground Water	1.78 mg/L	10 mL	1.78 mg/L	1	0.07	0.50		<1	11/15/19 18:44:00	N	II
KQ1916988-19	Carbon, Total Organic	DUP	K1910169-002	Ground Water	3.57 mg/L	10 mL	3.57 mg/L	1	0.07	0.50		2	11/15/19 19:12:00	N	II
KQ1916988-20	Carbon, Total Organic	DUP	K1910169-003	Ground Water	3.50 mg/L	10 mL	3.50 mg/L	1	0.07	0.50		2	11/15/19 19:40:00	N	II
KQ1916988-21	Carbon, Total Organic	DUP	K1910187-001	Water	2.39 mg/L	10 mL	2.39 mg/L	1	0.07	0.50		<1	11/15/19 20:08:00	N	I
KQ1916988-22	Carbon, Total Organic	DUP	K1910187-002	Water	0.50 mg/L	10 mL	0.50 mg/L	1	0.07	0.50		2	11/15/19 20:36:00	N	I
KQ1916988-23	Carbon, Total Organic	DUP	K1910187-003	Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50		11*	11/15/19 21:04:00	N	I
KQ1916988-24	Carbon, Total Organic	DUP	K1910278-001	Ground Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50		4	11/15/19 22:57:00	N	II
KQ1916988-25	Carbon, Total Organic	DUP	K1910278-002	Ground Water	0.24 mg/L	10 mL	0.24 mg/L J	1	0.07	0.50		37*	11/16/19 00:23:00	N	II
KQ1916988-26	Carbon, Total Organic	DUP	K1910332-001	Drinking Water	0.42 mg/L	10 mL	0.42 mg/L J	1	0.07	0.50		NC	11/15/19 21:32:00	N	I
KQ1916988-28	Carbon, Total Organic	DUP	K1910473-001	Ground Water	6.24 mg/L	10 mL	6.24 mg/L	1	0.07	0.50		<1	11/16/19 00:51:00	N	II
KQ1916988-29	Carbon, Total Organic	DUP	K1910473-002	Ground Water	6.33 mg/L	10 mL	6.33 mg/L	1	0.07	0.50		<1	11/16/19 01:19:00	N	II
KQ1916988-30	Carbon, Total Organic	DUP	K1910473-003	Ground Water	0.37 mg/L	10 mL	0.37 mg/L J	1	0.07	0.50		7	11/16/19 01:48:00	N	II
KQ1916988-31	Carbon, Total Organic	DUP	K1910545-001	Water	1.88 mg/L	10 mL	1.88 mg/L	1	0.07	0.50		3	11/15/19 22:28:00	N	II
KQ1916988-32	Carbon, Total Organic	DUP	K1910415-001	Ocean Water	0.02 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/15/19 22:00:00	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660113 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910147-001	Carbon, Total Organic	N/A		Water	2.61 mg/L	10 mL	2.61 mg/L	1	0.07	0.50			11/16/19 12:53:00	N	IV
K1910331-001	Carbon, Total Organic	N/A		Water	8.66 mg/L	10 mL	866 mg/L	100	7	50			11/16/19 05:34:00	N	II
K1910331-002	Carbon, Total Organic	N/A		Water	9.22 mg/L	10 mL	922 mg/L	100	7	50			11/16/19 06:02:00	N	II
K1910331-003	Carbon, Total Organic	N/A		Water	7.00 mg/L	10 mL	700 mg/L	100	7	50			11/16/19 06:30:00	N	II
K1910473-004	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 02:16:00	N	II
K1910473-005	Carbon, Total Organic	N/A		Ground Water	0.74 mg/L	10 mL	0.74 mg/L	1	0.07	0.50			11/16/19 02:44:00	N	II
K1910473-006	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 03:12:00	N	II
K1910483-001	Carbon, Total Organic	N/A		Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50			11/16/19 03:40:00	N	II
K1910483-003	Carbon, Total Organic	N/A		Water	2.42 mg/L	10 mL	2.42 mg/L	1	0.07	0.50			11/16/19 04:38:00	N	II
K1910561-001	Carbon, Total Organic	N/A		Surface Water	12.22 mg/L	10 mL	122 mg/L	10	0.7	5.0			11/16/19 06:58:00	N	II
K1910561-002	Carbon, Total Organic	N/A		Surface Water	1.49 mg/L	10 mL	1.49 mg/L	1	0.07	0.50			11/16/19 07:26:00	N	II
K1910561-003	Carbon, Total Organic	N/A		Surface Water	4.36 mg/L	10 mL	8.7 mg/L	2	0.2	1.0			11/16/19 07:54:00	N	II
K1910572-001	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 08:22:00	N	II
K1910572-002	Carbon, Total Organic	N/A		Surface Water	0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 10:05:00	N	II
K1910572-003	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 10:33:00	N	II
K1910572-004	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 11:01:00	N	II
K1910572-005	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 11:29:00	N	II
K1910572-006	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 11:57:00	N	II
K1910572-008	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 12:25:00	N	II
K1910576-001	Carbon, Total Organic	N/A		Water	20.04 mg/L	10 mL	20.0 mg/L	1	0.07	0.50			11/16/19 05:06:00	N	IV
KQ1916989-01	Carbon, Total Organic	CCV		Ground Water	24.27 mg/L	10 mL	24.3 mg/L	1					11/15/19 23:25:00	N	II
KQ1916989-02	Carbon, Total Organic	CCV		Ground Water	24.63 mg/L	10 mL	24.6 mg/L	1					11/16/19 04:08:00	N	II
KQ1916989-03	Carbon, Total Organic	CCV		Ground Water	24.21 mg/L	10 mL	24.2 mg/L	1					11/16/19 09:05:00	N	II
KQ1916989-04	Carbon, Total Organic	CCV		Ground Water	23.71 mg/L	10 mL	23.7 mg/L	1					11/16/19 13:50:00	N	II
KQ1916989-05	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/15/19 23:39:00	N	II
KQ1916989-06	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 04:23:00	N	II

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

11/19/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660113 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1916989-07	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 09:19:00	N	II
KQ1916989-08	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 14:04:00	N	II
KQ1916989-09	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/15/19 23:54:00	N	II
KQ1916989-10	Carbon, Total Organic	LCS		Ground Water	24.76 mg/L	10 mL	24.8 mg/L	1	0.07	0.50	99		11/16/19 00:09:00	N	II
KQ1916989-11	Carbon, Total Organic	MS	K1910572-001	Surface Water	25.02 mg/L	10 mL	25.0 mg/L	1	0.07	0.50	100		11/16/19 08:50:00	N	II
KQ1916989-12	Carbon, Total Organic	DUP	K1910147-001	Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50		<1	11/16/19 12:53:00	N	IV
KQ1916989-13	Carbon, Total Organic	DUP	K1910331-001	Water	8.72 mg/L	10 mL	872 mg/L	100	7	50		<1	11/16/19 05:34:00	N	II
KQ1916989-14	Carbon, Total Organic	DUP	K1910331-002	Water	9.19 mg/L	10 mL	919 mg/L	100	7	50		<1	11/16/19 06:02:00	N	II
KQ1916989-15	Carbon, Total Organic	DUP	K1910473-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/16/19 02:16:00	N	II
KQ1916989-16	Carbon, Total Organic	DUP	K1910473-005	Ground Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50		18*	11/16/19 02:44:00	N	II
KQ1916989-17	Carbon, Total Organic	DUP	K1910473-006	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/16/19 03:12:00	N	II
KQ1916989-18	Carbon, Total Organic	DUP	K1910483-003	Water	2.37 mg/L	10 mL	2.37 mg/L	1	0.07	0.50		2	11/16/19 04:38:00	N	II
KQ1916989-19	Carbon, Total Organic	DUP	K1910483-001	Water	3.31 mg/L	10 mL	3.31 mg/L	1	0.07	0.50		3	11/16/19 03:40:00	N	II
KQ1916989-20	Carbon, Total Organic	DUP	K1910331-003	Water	6.84 mg/L	10 mL	684 mg/L	100	7	50		2	11/16/19 06:30:00	N	II
KQ1916989-21	Carbon, Total Organic	DUP	K1910561-001	Surface Water	12.17 mg/L	10 mL	122 mg/L	10	0.7	5.0		<1	11/16/19 06:58:00	N	II
KQ1916989-22	Carbon, Total Organic	DUP	K1910561-002	Surface Water	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50		15*	11/16/19 07:26:00	N	II
KQ1916989-23	Carbon, Total Organic	DUP	K1910561-003	Surface Water	4.18 mg/L	10 mL	8.4 mg/L	2	0.2	1.0		4	11/16/19 07:54:00	N	II
KQ1916989-24	Carbon, Total Organic	DUP	K1910572-002	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/16/19 10:05:00	N	II
KQ1916989-25	Carbon, Total Organic	DUP	K1910572-003	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/16/19 10:33:00	N	II
KQ1916989-26	Carbon, Total Organic	DUP	K1910572-004	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/16/19 11:01:00	N	II
KQ1916989-27	Carbon, Total Organic	DUP	K1910572-005	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/16/19 11:29:00	N	II
KQ1916989-28	Carbon, Total Organic	DUP	K1910572-006	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/16/19 11:57:00	N	II
KQ1916989-29	Carbon, Total Organic	DUP	K1910572-008	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/16/19 12:25:00	N	II
KQ1916989-30	Carbon, Total Organic	DUP	K1910572-001	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/16/19 08:22:00	N	II
KQ1916989-31	Carbon, Total Organic	DUP	K1910576-001	Water	19.96 mg/L	10 mL	20.0 mg/L	1	0.07	0.50		<1	11/16/19 05:06:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660114 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910147-002	Carbon, Total Organic	N/A		Water	2.64 mg/L	10 mL	2.64 mg/L	1	0.07	0.50			11/16/19 13:22:00	N	IV
K1910147-006	Carbon, Total Organic	N/A		Water	3.06 mg/L	10 mL	3.06 mg/L	1	0.07	0.50			11/16/19 14:19:00	N	IV
K1910147-007	Carbon, Total Organic	N/A		Water	4.59 mg/L	10 mL	4.59 mg/L	1	0.07	0.50			11/16/19 14:47:00	N	IV
K1910199-001	Carbon, Total Organic	N/A		Water	1.80 mg/L	10 mL	1.80 mg/L	1	0.07	0.50			11/16/19 15:15:00	N	IV
K1910199-002	Carbon, Total Organic	N/A		Water	1.52 mg/L	10 mL	1.52 mg/L	1	0.07	0.50			11/16/19 15:43:00	N	IV
K1910199-003	Carbon, Total Organic	N/A		Water	1.23 mg/L	10 mL	1.23 mg/L	1	0.07	0.50			11/16/19 16:12:00	N	IV
K1910199-004	Carbon, Total Organic	N/A		Water	1.40 mg/L	10 mL	1.40 mg/L	1	0.07	0.50			11/16/19 16:40:00	N	IV
K1910199-007	Carbon, Total Organic	N/A		Water	1.93 mg/L	10 mL	1.93 mg/L	1	0.07	0.50			11/16/19 17:08:00	N	IV
K1910199-008	Carbon, Total Organic	N/A		Water	1.89 mg/L	10 mL	1.89 mg/L	1	0.07	0.50			11/16/19 17:36:00	N	IV
K1910199-010	Carbon, Total Organic	N/A		Water	1.51 mg/L	10 mL	1.51 mg/L	1	0.07	0.50			11/16/19 18:04:00	N	IV
K1910254-002	Carbon, Total Organic	N/A		Water	1.73 mg/L	10 mL	1.73 mg/L	1	0.07	0.50			11/16/19 19:46:00	N	IV
K1910254-003	Carbon, Total Organic	N/A		Water	0.99 mg/L	10 mL	0.99 mg/L	1	0.07	0.50			11/16/19 20:14:00	N	IV
K1910254-004	Carbon, Total Organic	N/A		Water	2.33 mg/L	10 mL	2.33 mg/L	1	0.07	0.50			11/16/19 20:42:00	Y	IV
K1910254-005	Carbon, Total Organic	N/A		Water	1.15 mg/L	10 mL	1.15 mg/L	1	0.07	0.50			11/16/19 21:39:00	N	IV
K1910254-006	Carbon, Total Organic	N/A		Water	28.09 mg/L	10 mL	28.1 mg/L	1	0.07	0.50			11/16/19 22:08:00	N	IV
K1910254-007	Carbon, Total Organic	N/A		Water	2.13 mg/L	10 mL	2.13 mg/L	1	0.07	0.50			11/16/19 22:36:00	N	IV
KQ1916990-01	Carbon, Total Organic	CCV		Water	24.21 mg/L	10 mL	24.2149 mg/L	1					11/16/19 09:05:00	N	IV
KQ1916990-02	Carbon, Total Organic	CCV		Water	23.71 mg/L	10 mL	23.7056 mg/L	1					11/16/19 13:50:00	N	IV
KQ1916990-03	Carbon, Total Organic	CCV		Water	23.93 mg/L	10 mL	23.9330 mg/L	1					11/16/19 18:47:00	N	IV
KQ1916990-04	Carbon, Total Organic	CCV		Water	23.87 mg/L	10 mL	23.8729 mg/L	1					11/16/19 23:04:00	N	IV
KQ1916990-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 09:19:00	N	IV
KQ1916990-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 14:04:00	N	IV
KQ1916990-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 19:02:00	N	IV
KQ1916990-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 23:18:00	N	IV
KQ1916990-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 09:34:00	N	IV
KQ1916990-10	Carbon, Total Organic	LCS		Water	24.43 mg/L	10 mL	24.4 mg/L	1	0.07	0.50			11/16/19 09:49:00	N	IV
KQ1916990-11	Carbon, Total Organic	DUP	K1910147-002	Water	2.62 mg/L	10 mL	2.62 mg/L	1	0.07	0.50		<1	11/16/19 13:22:00	N	IV
KQ1916990-12	Carbon, Total Organic	DUP	K1910147-006	Water	2.99 mg/L	10 mL	2.99 mg/L	1	0.07	0.50		2	11/16/19 14:19:00	N	IV
KQ1916990-13	Carbon, Total Organic	DUP	K1910147-007	Water	4.39 mg/L	10 mL	4.39 mg/L	1	0.07	0.50		5	11/16/19 14:47:00	N	IV
KQ1916990-14	Carbon, Total Organic	DUP	K1910199-002	Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50		<1	11/16/19 15:43:00	N	IV
KQ1916990-15	Carbon, Total Organic	DUP	K1910199-003	Water	1.24 mg/L	10 mL	1.24 mg/L	1	0.07	0.50		1	11/16/19 16:12:00	N	IV
KQ1916990-16	Carbon, Total Organic	DUP	K1910199-004	Water	1.38 mg/L	10 mL	1.38 mg/L	1	0.07	0.50		1	11/16/19 16:40:00	N	IV
KQ1916990-17	Carbon, Total Organic	DUP	K1910199-007	Water	1.86 mg/L	10 mL	1.86 mg/L	1	0.07	0.50		4	11/16/19 17:08:00	N	IV
KQ1916990-18	Carbon, Total Organic	DUP	K1910199-008	Water	1.89 mg/L	10 mL	1.89 mg/L	1	0.07	0.50		<1	11/16/19 17:36:00	N	IV
KQ1916990-19	Carbon, Total Organic	DUP	K1910199-001	Water	1.83 mg/L	10 mL	1.83 mg/L	1	0.07	0.50		2	11/16/19 15:15:00	N	IV
KQ1916990-20	Carbon, Total Organic	DUP	K1910199-010	Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50		5	11/16/19 18:04:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660114 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1916990-22	Carbon, Total Organic	DUP	K1910254-002	Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50		8	11/16/19 19:46:00	N	IV
KQ1916990-23	Carbon, Total Organic	DUP	K1910254-003	Water	1.11 mg/L	10 mL	1.11 mg/L	1	0.07	0.50		11*	11/16/19 20:14:00	N	IV
KQ1916990-24	Carbon, Total Organic	DUP	K1910254-004	Water	2.30 mg/L	10 mL	2.30 mg/L	1	0.07	0.50		1	11/16/19 20:42:00	N	IV
KQ1916990-25	Carbon, Total Organic	DUP	K1910254-005	Water	1.11 mg/L	10 mL	1.11 mg/L	1	0.07	0.50		3	11/16/19 21:39:00	N	IV
KQ1916990-26	Carbon, Total Organic	DUP	K1910254-006	Water	28.17 mg/L	10 mL	28.2 mg/L	1	0.07	0.50		<1	11/16/19 22:08:00	N	IV
KQ1916990-27	Carbon, Total Organic	DUP	K1910254-007	Water	1.84 mg/L	10 mL	1.84 mg/L	1	0.07	0.50		14*	11/16/19 22:36:00	N	IV
KQ1916990-28	Carbon, Total Organic	MS	K1910254-004	Water	27.79 mg/L	10 mL	27.8 mg/L	1	0.07	0.50			11/16/19 21:10:00	N	IV

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660115 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910254-008	Carbon, Total Organic	N/A		Water	1.45 mg/L	10 mL	1.45 mg/L	1	0.07	0.50			11/16/19 23:33:00	N	IV
K1910299-001	Carbon, Total Organic	N/A		Water	7.30 mg/L	10 mL	7.30 mg/L	1	0.07	0.50			11/17/19 00:01:00	N	IV
K1910760-001	Carbon, Total Organic	N/A		Water	1.23 mg/L	10 mL	1.23 mg/L	1	0.07	0.50			11/17/19 02:22:00	N	IV
K1910765-001	Carbon, Total Organic	N/A		Ground Water	9.06 mg/L	10 mL	9.06 mg/L	1	0.07	0.50			11/17/19 00:29:00	N	IV
K1910765-002	Carbon, Total Organic	N/A		Ground Water	13.64 mg/L	10 mL	13.6 mg/L	1	0.07	0.50			11/17/19 00:58:00	N	IV
K1910765-003	Carbon, Total Organic	N/A		Ground Water	22.60 mg/L	10 mL	22.6 mg/L	1	0.07	0.50			11/17/19 01:26:00	N	IV
K1910765-004	Carbon, Total Organic	N/A		Ground Water	10.31 mg/L	10 mL	10.3 mg/L	1	0.07	0.50			11/17/19 01:54:00	N	IV
KQ1916991-01	Carbon, Total Organic	CCV		Water	23.87 mg/L	10 mL	23.9 mg/L	1					11/16/19 23:04:00	N	IV
KQ1916991-02	Carbon, Total Organic	CCV		Water	23.67 mg/L	10 mL	23.7 mg/L	1					11/17/19 03:33:00	N	IV
KQ1916991-03	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 23:18:00	N	IV
KQ1916991-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/17/19 03:48:00	N	IV
KQ1916991-05	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/16/19 19:16:00	N	IV
KQ1916991-06	Carbon, Total Organic	LCS		Water	24.59 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	98		11/16/19 19:31:00	N	IV
KQ1916991-07	Carbon, Total Organic	MS	K1910760-001	Water	25.85 mg/L	10 mL	25.8 mg/L	1	0.07	0.50	98		11/17/19 02:50:00	N	IV
KQ1916991-08	Carbon, Total Organic	DUP	K1910254-008	Water	1.42 mg/L	10 mL	1.42 mg/L	1	0.07	0.50		2	11/16/19 23:33:00	N	IV
KQ1916991-09	Carbon, Total Organic	DUP	K1910299-001	Water	7.01 mg/L	10 mL	7.01 mg/L	1	0.07	0.50		4	11/17/19 00:01:00	N	IV
KQ1916991-10	Carbon, Total Organic	DUP	K1910760-001	Water	1.12 mg/L	10 mL	1.12 mg/L	1	0.07	0.50		10	11/17/19 02:22:00	N	IV
KQ1916991-11	Carbon, Total Organic	DUP	K1910765-002	Ground Water	13.45 mg/L	10 mL	13.4 mg/L	1	0.07	0.50		1	11/17/19 00:58:00	N	IV
KQ1916991-12	Carbon, Total Organic	DUP	K1910765-001	Ground Water	8.90 mg/L	10 mL	8.90 mg/L	1	0.07	0.50		2	11/17/19 00:29:00	N	IV
KQ1916991-13	Carbon, Total Organic	DUP	K1910765-003	Ground Water	22.72 mg/L	10 mL	22.7 mg/L	1	0.07	0.50		<1	11/17/19 01:26:00	N	IV
KQ1916991-14	Carbon, Total Organic	DUP	K1910765-004	Ground Water	9.87 mg/L	10 mL	9.87 mg/L	1	0.07	0.50		4	11/17/19 01:54:00	N	IV

11/19/19

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TOC660112
660113
660114
660115

Schedule: 11152019

Version: 15
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/11/16 10:07 - Saturday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1910095-017.08 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1910095-018.08 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1910157-001.02 25x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1910160-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1910160-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1910160-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1910160-003.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1910169-001.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1910169-002.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1910169-003.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1910187-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1910187-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1910187-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1910332-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1910415-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1910545-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1910278-001.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1910278-002.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1910473-001.13	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1910473-002.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1910473-003.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1910473-004.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1910473-005.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1910473-006.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1910483-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1910483-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1910576-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1910331-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1910331-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1910331-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1910561-001.15 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1910561-002.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1910561-003.14 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1910572-001.16	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1910572-001.16 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

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Schedule: 11152019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1910572-002.16	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1910572-003.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1910572-004.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1910572-005.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1910572-006.16	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1910572-008.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1910147-001.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1910147-002.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1910147-006.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1910147-007.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1910199-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1910199-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1910199-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1910199-004.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1910199-007.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1910199-008.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1910199-010.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1910254-001.04	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	K1910254-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1910254-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	K1910254-004.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K1910254-004.04 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
63	Sample	rb	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
64	Sample	K1910254-005.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1910254-006.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K1910254-007.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	K1910254-008.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K1910299-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	K1910765-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
70	Sample	K1910765-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
71	Sample	K1910765-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	K1910765-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	K1910760-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K1910760-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
75	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 11152019
Friday, November 15, 2019 12:08 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/11/19 09:11 - Tuesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11152019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8) Fusion1 (Fusion1) (v10) Fusion1 (Fusion1) (v11) Fusion1 (Fusion1) (v13) Fusion1 (Fusion1) (v14) Fusion1 (Fusion1) (v15)		
Comment:			

Report Results

11/19/19

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/11/15 12:08

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.76	16.22	3.46	49.69	05:27
2	TC Clean	5.39	8.81	3.42	49.82	07:17
3	TC Clean	1.94	5.58	3.64	49.82	07:04
4	TC Clean	1.93	5.53	3.60	49.84	07:02

Sample Type: Clean — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/11/15 12:40

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.80	4.46	3.66	49.66	05:16

2	TC Clean	4.24	7.86	3.62	50.13	04:06
3	TC Clean	1.75	5.37	3.62	50.25	03:46
4	TC Clean	1.62	5.16	3.54	50.24	03:48

Sample Type: Clean From Schedule Version 6

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/15 13:02

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.95	4.19	3.25	49.74	05:11
2	TC Clean	4.91	8.40	3.49	50.60	04:00
3	TC Clean	2.28	5.87	3.59	50.40	03:47
4	TC Clean	1.86	5.44	3.58	50.34	03:44

Sample Type: Blank (Creating v1320) From Schedule Version 7

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/11/15 13:23

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	7.01	10.68	3.68	49.53	05:10
2	TC Clean	3.98	7.63	3.65	50.07	03:58
3	TC Clean	1.76	5.38	3.62	50.26	03:47
4	TC Clean	1.43	5.09	3.66	50.10	03:52
5	Reagent Blank	6.99	10.63	3.64	50.08	05:07
6	Acid Blank	1.76	5.53	3.77	49.64	05:30

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.4469 ppm	0.0000 ppm	0.0000%	2019/11/15 13:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4469	4.4691	12.02	15.81	3.79	50.10	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5004 ppm (PASS)	0.0000 ppm	0%	2019/11/15 14:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5004	245.0044	175.77	179.74	3.97	50.15	10:31

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

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/15 14:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.77	12.50	3.73	50.15	10:33

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

Sample Type: Sample — From Schedule Version 10

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/15 14:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.28	11.96	3.68	50.14	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.2718 ppm (PASS)	0.0000 ppm	0%	2019/11/15 14:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.2718	252.7180	181.01	184.83	3.83	50.15	10:29

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

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.2494 ppm	0.0000 ppm	0.0000%	2019/11/15 15:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2494	2.4936	10.68	14.48	3.81	50.15	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K1910095-017.08 50x	4.9489 ppm	0.0367 ppm	0.7400%	2019/11/15 15:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.9229	49.2294	42.40	46.05	3.65	50.14	10:27
2	TOC	4.9748	49.7480	42.75	46.46	3.71	50.16	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K1910095-018.08 50x	6.0030 ppm	0.0514 ppm	0.8600%	2019/11/15 15:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.9667	59.6670	49.48	53.06	3.57	50.17	10:29
2	TOC	6.0393	60.3933	49.98	53.65	3.67	50.17	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	K1910157-001.02 25x	4.0567 ppm	0.0000 ppm	0.0000%	2019/11/15 16:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0567	40.5670	36.52	40.26	3.74	50.21	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1910160-001.02	1.6341 ppm	0.0855 ppm	5.2300%	2019/11/15 16:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6946	16.9457	20.48	23.99	3.50	50.21	10:28
2	TOC	1.5736	15.7362	19.66	23.40	3.74	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1910160-002.02	1.3500 ppm	0.0433 ppm	3.2100%	2019/11/15 17:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3806	13.8063	18.35	22.02	3.67	50.22	10:27
2	TOC	1.3193	13.1934	17.94	21.58	3.64	50.22	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1910160-003.01	1.2163 ppm	0.0172 ppm	1.4100%	2019/11/15 17:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2284	12.2845	17.32	20.91	3.59	50.23	10:31
2	TOC	1.2041	12.0414	17.16	20.75	3.59	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1910160-003.01 ms	21.5289 ppm	0.0000 ppm	0.0000%	2019/11/15 18:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.5289	215.2886	155.12	158.72	3.60	50.22	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.7429 ppm (PASS)	0.0000 ppm	0%	2019/11/15 18:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7429	247.4293	177.42	181.03	3.61	50.24	10:31

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

Sample Type: Check Standard --> CCB From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/15 18:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.97	11.50	3.53	50.27	10:31

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

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1910169-001.08	1.7747 ppm	0.0073 ppm	0.4100%	2019/11/15 18:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7696	17.6955	20.99	24.65	3.66	50.27	10:25
2	TOC	1.7799	17.7987	21.06	24.79	3.73	50.24	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1910169-002.08	3.5395 ppm	0.0386 ppm	1.0900%	2019/11/15 19:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5122	35.1220	32.82	36.70	3.88	50.26	10:26
2	TOC	3.5669	35.6686	33.19	36.76	3.56	50.26	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1910169-003.08	3.5263 ppm	0.0377 ppm	1.0700%	2019/11/15 19:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5530	35.5301	33.10	36.72	3.62	50.26	10:27
2	TOC	3.4997	34.9968	32.74	36.33	3.59	50.26	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1910187-001.03	2.3984 ppm	0.0130 ppm	0.5400%	2019/11/15 20:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4076	24.0760	25.32	29.11	3.78	50.30	10:30
2	TOC	2.3892	23.8918	25.20	28.77	3.57	50.28	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1910187-002.03	0.5055 ppm	0.0070 ppm	1.3800%	2019/11/15 20:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5104	5.1041	12.45	16.08	3.63	50.26	10:28
2	TOC	0.5005	5.0054	12.38	16.05	3.67	50.27	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1910187-003.03	0.5422 ppm	0.0431 ppm	7.9500%	2019/11/15 21:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5117	5.1173	12.46	16.08	3.62	50.26	10:31
2	TOC	0.5727	5.7273	12.87	16.45	3.58	50.26	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1910332-001.01	0.3940 ppm	0.0384 ppm	9.7600%	2019/11/15 21:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3668	3.6677	11.47	15.05	3.58	50.27	10:27
2	TOC	0.4211	4.2113	11.84	15.41	3.57	50.27	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1910415-001.01	0.0098 ppm	0.0106 ppm	108.2500%	2019/11/15 22:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0023	0.0230	9.00	12.60	3.60	50.25	10:27
2	TOC	0.0173	0.1733	9.10	12.69	3.59	50.29	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1910545-001.01	1.8523 ppm	0.0385 ppm	2.0800%	2019/11/15 22:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8251	18.2509	21.37	25.07	3.69	50.27	10:32
2	TOC	1.8796	18.7960	21.74	25.24	3.50	50.25	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1910278-001.08	3.2661 ppm	0.0957 ppm	2.9300%	2019/11/15 22:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3338	33.3380	31.61	35.17	3.56	50.28	10:26
2	TOC	3.1984	31.9841	30.69	34.18	3.49	50.25	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2686 ppm (PASS)	0.0000 ppm	0%	2019/11/15 23:25

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

	Type		#							Time
B	TOC	25 ppm	1	24.2686	242.6855	174.20	177.87	3.67	50.24	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/15 23:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.87	10.59	3.72	50.23	10:32

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

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/15 23:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.26	9.99	3.73	50.23	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.7580 ppm (PASS)	0.0000 ppm	0%	2019/11/16 00:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7580	247.5795	177.52	181.15	3.63	50.25	10:34

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

Sample Type: Sample From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1910278-002.08	0.2897 ppm	0.0752 ppm	25.9600%	2019/11/16 00:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3429	3.4291	11.31	14.96	3.65	50.23	10:29
2	TOC	0.2365	2.3654	10.59	14.37	3.78	50.25	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1910473-001.13	6.2195 ppm	0.0283 ppm	0.4600%	2019/11/16 00:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.1995	61.9947	51.06	54.70	3.64	50.20	10:28
2	TOC	6.2395	62.3954	51.34	55.03	3.69	50.22	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1910473-002.12	6.3251 ppm	0.0117 ppm	0.1800%	2019/11/16 01:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.3169	63.1688	51.86	55.39	3.52	50.22	10:27
2	TOC	6.3334	63.3338	51.97	55.71	3.74	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1910473-003.12	0.3568 ppm	0.0176 ppm	4.9300%	2019/11/16 01:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3444	3.4438	11.32	15.12	3.80	50.20	10:28
2	TOC	0.3693	3.6928	11.49	15.22	3.74	50.22	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1910473-004.12	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 02:16

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

1	TOC	0.0000	0.0000	7.93	11.60	3.67	50.20	10:28
2	TOC	0.0000	0.0000	7.22	10.80	3.58	50.21	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1910473-005.12	0.6764 ppm	0.0841 ppm	12.4300%	2019/11/16 02:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7358	7.3581	13.98	17.62	3.64	50.18	10:30
2	TOC	0.6169	6.1692	13.17	16.93	3.76	50.18	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1910473-006.12	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 03:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.73	10.39	3.66	50.20	10:31
2	TOC	0.0000	0.0000	6.66	10.44	3.78	50.19	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1910483-001.01	3.3577 ppm	0.0669 ppm	1.9900%	2019/11/16 03:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4050	34.0495	32.10	35.66	3.56	50.21	10:31
2	TOC	3.3104	33.1037	31.45	35.28	3.83	50.22	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6323 ppm (PASS)	0.0000 ppm	0%	2019/11/16 04:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6323	246.3229	176.66	180.34	3.68	50.21	10:30

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

Sample Type: Check Standard --> CCB — From Schedule Version 11

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/16 04:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.45	10.17	3.71	50.24	10:30

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

Sample Type: Sample — From Schedule Version 11

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1910483-003.01	2.3901 ppm	0.0355 ppm	1.4900%	2019/11/16 04:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4153	24.1526	25.38	28.86	3.48	50.20	10:28
2	TOC	2.3650	23.6502	25.04	28.74	3.70	50.23	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1910576-001.01	20.0038 ppm	0.0575 ppm	0.2900%	2019/11/16 05:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	20.0445	200.4446	145.04	148.74	3.70	50.22	10:30
2	TOC	19.9631	199.6314	144.49	148.32	3.83	50.23	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1910331-001.01 100x	8.6865 ppm	0.0435 ppm	0.5000%	2019/11/16 05:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.6557	86.5574	67.74	71.55	3.81	50.23	10:27

2	TOC	8.7173	87.1732	68.16	71.92	3.77	50.20	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1910331-002.01 100x	9.2041 ppm	0.0188 ppm	0.2000%	2019/11/16 06:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.2173	92.1732	71.55	75.19	3.64	50.19	10:28
2	TOC	9.1908	91.9080	71.37	75.00	3.63	50.18	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1910331-003.01 100x	6.9189 ppm	0.1166 ppm	1.6800%	2019/11/16 06:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.0013	70.0133	56.51	60.25	3.74	50.23	10:26
2	TOC	6.8365	68.3648	55.39	59.06	3.67	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1910561-001.15 10x	12.1977 ppm	0.0334 ppm	0.2700%	2019/11/16 06:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.2213	122.2132	91.94	95.61	3.67	50.22	10:30
2	TOC	12.1740	121.7403	91.62	95.40	3.78	50.21	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample From Schedule Version 13

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1910561-002.15	1.3849 ppm	0.1446 ppm	10.4400%	2019/11/16 07:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4871	14.8714	19.08	22.85	3.78	50.22	10:26
2	TOC	1.2827	12.8266	17.69	21.42	3.73	50.23	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC)	CAS_salt_010711	CAS_salt_010711

(v1320) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K1910561-003.14 2x	4.2701 ppm	0.1282 ppm	3.0000%	2019/11/16 07:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3608	43.6077	38.58	42.30	3.72	50.20	10:28
2	TOC	4.1794	41.7942	37.35	40.99	3.63	50.21	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1910572-001.16	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 08:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.22	10.80	3.57	50.25	10:28
2	TOC	0.0000	0.0000	6.60	10.17	3.57	50.28	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1910572-001.16 ms	25.0218 ppm	0.0000 ppm	0.0000%	2019/11/16 08:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.0218	250.2182	178.83	182.43	3.60	50.26	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 13

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2149 ppm (PASS)	0.0000 ppm	0%	2019/11/16 09:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2149	242.1493	173.83	177.36	3.53	50.24	10:31

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

Sample Type: Check Standard --> CCB From Schedule Version 13

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/16 09:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.62	10.33	3.71	50.28	10:31

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

Sample Type: Sample From Schedule Version 13

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 09:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.12	9.77	3.65	50.22	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 13

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.4262 ppm (PASS)	0.0000 ppm	0%	2019/11/16 09:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4262	244.2619	175.27	178.87	3.61	50.21	10:33

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

Sample Type: Sample From Schedule Version 14

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K1910572-002.16	0.0031 ppm	0.0044 ppm	141.4200%	2019/11/16 10:05

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

1	TOC	0.0063	0.0628	9.02	12.56	3.53	50.19	10:26
2	TOC	0.0000	0.0000	8.21	11.78	3.57	50.21	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample

From Schedule Version 15

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	K1910572-003.15	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 10:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.12	10.60	3.48	50.21	10:27
2	TOC	0.0000	0.0000	7.16	10.64	3.49	50.21	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	42	TOC	K1910572-004.15	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 11:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.62	10.19	3.57	50.23	10:28
2	TOC	0.0000	0.0000	6.68	10.42	3.74	50.24	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	K1910572-005.15	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 11:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.56	10.22	3.66	50.27	10:29
2	TOC	0.0000	0.0000	6.90	10.35	3.45	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	44	TOC	K1910572-006.16	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 11:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.22	11.93	3.70	50.25	10:30
2	TOC	0.0000	0.0000	8.40	12.04	3.64	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1910572-008.15	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 12:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.44	11.97	3.53	50.25	10:27
2	TOC	0.0000	0.0000	8.27	11.78	3.51	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1910147-001.05	2.6001 ppm	0.0141 ppm	0.5400%	2019/11/16 12:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6100	26.1001	26.70	30.36	3.66	50.25	10:31
2	TOC	2.5901	25.9013	26.56	30.27	3.71	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1910147-002.05	2.6326 ppm	0.0141 ppm	0.5300%	2019/11/16 13:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6426	26.4257	26.92	30.45	3.53	50.24	10:30
2	TOC	2.6227	26.2268	26.78	30.30	3.52	50.28	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 15

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.7056 ppm (PASS)	0.0000 ppm	0%	2019/11/16 13:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7056	237.0564	170.38	173.90	3.53	50.25	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria	Do Nothing	CAS_salt_010711	CAS_salt_010711	50 ppmC

met.	(v4)	(v30)

Sample Type: Check Standard --> CCB From Schedule Version 15

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/16 14:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.11	9.76	3.65	50.27	10:35

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

Sample Type: Sample From Schedule Version 15

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1910147-006.04	3.0222 ppm	0.0485 ppm	1.6100%	2019/11/16 14:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0565	30.5654	29.73	33.30	3.57	50.30	10:30
2	TOC	2.9879	29.8789	29.26	32.89	3.63	50.27	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	K1910147-007.04	4.4869 ppm	0.1435 ppm	3.2000%	2019/11/16 14:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5884	45.8838	40.13	43.86	3.74	50.25	10:26
2	TOC	4.3854	43.8537	38.75	42.61	3.86	50.27	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1910199-001.04	1.8117 ppm	0.0221 ppm	1.2200%	2019/11/16 15:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7961	17.9607	21.17	24.95	3.77	50.27	10:26
2	TOC	1.8273	18.2730	21.39	25.08	3.70	50.32	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1910199-002.04	1.5258 ppm	0.0105 ppm	0.6900%	2019/11/16 15:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5184	15.1837	19.29	22.78	3.49	50.25	10:29
2	TOC	1.5333	15.3325	19.39	22.89	3.50	50.24	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1910199-003.04	1.2318 ppm	0.0092 ppm	0.7400%	2019/11/16 16:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2254	12.2535	17.30	20.69	3.39	50.26	10:27
2	TOC	1.2383	12.3832	17.39	20.92	3.53	50.29	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K1910199-004.04	1.3880 ppm	0.0127 ppm	0.9200%	2019/11/16 16:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3970	13.9698	18.46	22.10	3.63	50.25	10:25
2	TOC	1.3790	13.7901	18.34	21.88	3.54	50.24	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	K1910199-007.04	1.8976 ppm	0.0515 ppm	2.7100%	2019/11/16 17:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9340	19.3396	22.11	25.67	3.56	50.25	10:30
2	TOC	1.8612	18.6119	21.62	25.11	3.50	50.22	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K1910199-008.04	1.8928 ppm	0.0022 ppm	0.1200%	2019/11/16 17:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8943	18.9433	21.84	25.41	3.57	50.24	10:28
2	TOC	1.8912	18.9124	21.82	25.38	3.56	50.23	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1910199-010.04	1.5466 ppm	0.0566 ppm	3.6600%	2019/11/16 18:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5066	15.0659	19.21	22.81	3.60	50.25	10:29
2	TOC	1.5866	15.8658	19.75	23.11	3.36	50.25	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1910254-001.04	2.0643 ppm	0.0000 ppm	0.0000%	2019/11/16 18:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0643	20.6434	22.99	26.69	3.70	50.28	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 15

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9330 ppm (PASS)	0.0000 ppm	0%	2019/11/16 18:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9330	239.3296	171.92	175.42	3.50	50.25	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 15

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm	0.0000 ppm	0%	2019/11/16 19:02

							(PASS)			

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.78	9.45	3.66	50.24	10:34

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

Sample Type: Sample — From Schedule Version 15

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 19:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.29	8.80	3.51	50.26	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 15

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.5930 ppm (PASS)	0.0000 ppm	0%	2019/11/16 19:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.5930	245.9295	176.40	179.86	3.46	50.26	10:31

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

Sample Type: Sample — From Schedule Version 15

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1910254-002.04	1.6585 ppm	0.0964 ppm	5.8100%	2019/11/16 19:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7267	17.2668	20.70	24.27	3.57	50.28	10:30
2	TOC	1.5904	15.9041	19.78	23.42	3.64	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC)	CAS_salt_010711	CAS_salt_010711

(v1320) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	K1910254-003.04	1.0469 ppm	0.0839 ppm	8.0100%	2019/11/16 20:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9876	9.8758	15.69	19.40	3.72	50.25	10:29
2	TOC	1.1062	11.0617	16.49	20.11	3.61	50.24	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	61	TOC	K1910254-004.04	2.3140 ppm	0.0238 ppm	1.0300%	2019/11/16 20:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3308	23.3084	24.80	28.50	3.69	50.24	10:30
2	TOC	2.2973	22.9725	24.58	27.88	3.30	50.26	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	K1910254-004.04 ms	27.7911 ppm	0.0000 ppm	0.0000%	2019/11/16 21:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.7911	277.9114	197.63	201.14	3.51	50.25	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	rb	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/16 21:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.64	9.30	3.66	50.26	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	K1910254-005.04	1.1292 ppm	0.0235 ppm	2.0800%	2019/11/16 21:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1458	11.4580	16.76	20.42	3.66	50.25	10:26
2	TOC	1.1125	11.1251	16.53	20.33	3.79	50.24	10:27

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	K1910254-006.04	28.1311 ppm	0.0561 ppm	0.2000%	2019/11/16 22:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.0914	280.9138	199.67	203.23	3.56	50.25	10:25
2	TOC	28.1708	281.7079	200.20	204.08	3.88	50.24	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	K1910254-007.04	1.9818 ppm	0.2031 ppm	10.2500%	2019/11/16 22:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1255	21.2548	23.41	27.00	3.59	50.28	10:27
2	TOC	1.8382	18.3820	21.46	24.95	3.49	50.25	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 15

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8729 ppm (PASS)	0.0000 ppm	0%	2019/11/16 23:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8729	238.7285	171.51	175.00	3.49	50.24	10:33

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

Sample Type: Check Standard --> CCB From Schedule Version 15

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/16 23:18

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

	Type									
D	TOC	0 ppm	1	0.0000	0.0000	6.38	9.91	3.53	50.26	10:30

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

Sample Type: Sample

From Schedule Version 15

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K1910254-008.04	1.4375 ppm	0.0190 ppm	1.3200%	2019/11/16 23:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4509	14.5090	18.83	22.51	3.68	50.25	10:28
2	TOC	1.4241	14.2409	18.65	22.21	3.56	50.31	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1910299-001.03	7.1545 ppm	0.2045 ppm	2.8600%	2019/11/17 00:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.2991	72.9907	58.53	62.07	3.54	50.24	10:30
2	TOC	7.0099	70.0988	56.57	60.19	3.63	50.26	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	K1910765-001.01	8.9810 ppm	0.1088 ppm	1.2100%	2019/11/17 00:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0579	90.5792	70.47	73.94	3.47	50.27	10:31
2	TOC	8.9041	89.0412	69.42	73.00	3.58	50.23	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K1910765-002.01	13.5412 ppm	0.1337 ppm	0.9900%	2019/11/17 00:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.6357	136.3574	101.54	105.14	3.60	50.23	10:28
2	TOC	13.4467	134.4673	100.26	104.04	3.78	50.25	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	71	TOC	K1910765-003.01	22.6620 ppm	0.0885 ppm	0.3900%	2019/11/17 01:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	22.5994	225.9944	162.39	166.08	3.69	50.23	10:26
2	TOC	22.7247	227.2466	163.24	166.80	3.56	50.12	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	72	TOC	K1910765-004.01	10.0901 ppm	0.3055 ppm	3.0300%	2019/11/17 01:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.3062	103.0616	78.94	82.74	3.80	50.11	10:30
2	TOC	9.8741	98.7407	76.01	79.77	3.76	50.16	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	73	TOC	K1910760-001.01	1.1733 ppm	0.0796 ppm	6.7800%	2019/11/17 02:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2296	12.2963	17.33	20.90	3.57	50.08	10:28
2	TOC	1.1171	11.1707	16.57	20.17	3.61	50.20	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	74	TOC	K1910760-001.01 ms	25.8462 ppm	0.0000 ppm	0.0000%	2019/11/17 02:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.8462	258.4622	184.42	187.91	3.49	50.11	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	75	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/17 03:05

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	0.0000	0.0000	6.30	9.69	3.39	50.09	10:28
2	TOC	0.0000	0.0000	5.64	9.26	3.62	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9824 (IC) (v1320)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 15

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6725 ppm (PASS)	0.0000 ppm	0%	2019/11/17 03:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6725	236.7250	170.15	173.77	3.62	50.15	10:35

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

Sample Type: Check Standard --> CCB From Schedule Version 15

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/17 03:48

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.73	9.31	3.58	50.18	10:30

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1319	0.9217	1.0210	0.0000	0.0000	0.0000	2019/11/13 13:58	Fusion1 (Fusion1)
v1320	2.3307	1.7570	0.0000	0.0000	0.0000	2019/11/15 13:57	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v30	Calibration curve formula:	TOC: y = 6.788x + 9.463
Ver Creation:	2019/03/05 17:42	r^2 value:	TOC: r^2 = 0.99963
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version:	v4	Operator:	Fusion1 (Fusion1)
Ver Creation:	2019/02/21 17:57		
Comment:			

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min

SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/11/17 04:03

StarLIMS Run: 660112, 660113, 660114, 660115

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-83A

21 % H3PO4: 11-GEN-05-82G

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: BK	Date Analyzed: 11/15/19
Reviewed By:	Date Reviewed: 11/19/19

Work Request # Original ( ) K9/0407,425,566,461,254,378,381,401,407,415,566,617,157,432,464,759,765,837,838

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

Date Analyzed: 11/9/19

Analyst: BCD

Analysis: TOC/DOC

Run # DOC: 660502, 660507, TOC: 660505, 660506

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: K9/0407-9/9d, 407-11/11d, 407-15/15d, 407-2/2d, 407-3/3d, 381-1/1d and 407-13/13d report a high %RSD. However, these samples are less than 5x the MRL.

Final Approved by: [signature] Date: 11/21/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660502 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910407-001	Carbon, Dissolved Organic (DOC)	N/A		Water	1.04 mg/L	10 mL	1.04 mg/L	1	0.07	0.50			11/19/19 16:45:00	N	II
K1910407-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.34 mg/L	10 mL	0.34 mg/L J	1	0.07	0.50			11/19/19 17:17:00	N	II
K1910407-003	Carbon, Dissolved Organic (DOC)	N/A		Water	0.17 mg/L	10 mL	0.17 mg/L J	1	0.07	0.50			11/19/19 17:49:00	N	II
K1910407-004	Carbon, Dissolved Organic (DOC)	N/A		Water	0.05 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 18:21:00	N	II
K1910407-005	Carbon, Dissolved Organic (DOC)	N/A		Water	0.47 mg/L	10 mL	0.47 mg/L J	1	0.07	0.50			11/19/19 19:27:00	N	II
K1910407-006	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 19:59:00	N	II
K1910407-007	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 20:31:00	N	II
K1910407-008	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 21:03:00	N	II
K1910407-009	Carbon, Dissolved Organic (DOC)	N/A		Water	0.25 mg/L	10 mL	0.25 mg/L J	1	0.07	0.50			11/19/19 21:35:00	N	II
K1910407-010	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 22:07:00	N	II
K1910407-011	Carbon, Dissolved Organic (DOC)	N/A		Water	0.43 mg/L	10 mL	0.43 mg/L J	1	0.07	0.50			11/19/19 22:39:00	N	II
K1910407-012	Carbon, Dissolved Organic (DOC)	N/A		Water	1.03 mg/L	10 mL	1.03 mg/L	1	0.07	0.50			11/19/19 23:11:00	N	II
K1910407-013	Carbon, Dissolved Organic (DOC)	N/A		Water	0.27 mg/L	10 mL	0.27 mg/L J	1	0.07	0.50			11/19/19 23:44:00	N	II
K1910407-014	Carbon, Dissolved Organic (DOC)	N/A		Water	0.02 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 00:16:00	N	II
K1910407-015	Carbon, Dissolved Organic (DOC)	N/A		Water	0.25 mg/L	10 mL	0.25 mg/L J	1	0.07	0.50			11/20/19 01:54:00	N	II
K1910425-009	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.95 mg/L	10 mL	0.95 mg/L	1	0.07	0.50			11/20/19 02:26:00	N	II
K1910425-010	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50			11/20/19 02:58:00	N	II
K1910425-011	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.96 mg/L	10 mL	0.96 mg/L	1	0.07	0.50			11/20/19 03:30:00	N	II
K1910425-012	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.76 mg/L	10 mL	0.76 mg/L	1	0.07	0.50			11/20/19 04:03:00	N	II
K1910566-002	Carbon, Dissolved Organic	N/A		Water	3.32 mg/L	10 mL	3.32 mg/L	1	0.07	0.50			11/19/19 15:40:00	N	II
KQ1917160-01	Carbon, Dissolved Organic	CCV		Water	23.87 mg/L	10 mL	23.9 mg/L	1					11/19/19 14:16:00	N	II
KQ1917160-01	Carbon, Dissolved Organic (DOC)	CCV		Water	23.87 mg/L	10 mL	23.9 mg/L	1					11/19/19 14:16:00	N	II
KQ1917160-02	Carbon, Dissolved Organic	CCV		Water	23.81 mg/L	10 mL	23.8 mg/L	1					11/19/19 18:54:00	N	II
KQ1917160-02	Carbon, Dissolved Organic (DOC)	CCV		Water	23.81 mg/L	10 mL	23.8 mg/L	1					11/19/19 18:54:00	N	II
KQ1917160-03	Carbon, Dissolved Organic	CCV		Water	23.75 mg/L	10 mL	23.8 mg/L	1					11/20/19 00:48:00	N	II

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

Printed 11/21/19 13:24

Results Summary

11/21/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660502 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917160-03	Carbon, Dissolved Organic (DOC)	CCV		Water	23.75 mg/L	10 mL	23.8 mg/L	1					11/20/19 00:48:00	N	II
KQ1917160-04	Carbon, Dissolved Organic	CCV		Water	23.93 mg/L	10 mL	23.9 mg/L	1					11/20/19 05:55:00	N	II
KQ1917160-04	Carbon, Dissolved Organic (DOC)	CCV		Water	23.93 mg/L	10 mL	23.9 mg/L	1					11/20/19 05:55:00	N	II
KQ1917160-05	Carbon, Dissolved Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 14:33:00	N	II
KQ1917160-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 14:33:00	N	II
KQ1917160-06	Carbon, Dissolved Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 19:10:00	N	II
KQ1917160-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 19:10:00	N	II
KQ1917160-07	Carbon, Dissolved Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 01:04:00	N	II
KQ1917160-07	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 01:04:00	N	II
KQ1917160-08	Carbon, Dissolved Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 06:12:00	N	II
KQ1917160-08	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 06:12:00	N	II
KQ1917160-09	Carbon, Dissolved Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 14:50:00	N	II
KQ1917160-09	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/19/19 14:50:00	N	II
KQ1917160-10	Carbon, Dissolved Organic	LCS		Water	24.74 mg/L	10 mL	24.7 mg/L	1	0.07	0.50	99		11/19/19 15:06:00	N	II
KQ1917160-10	Carbon, Dissolved Organic (DOC)	LCS		Water	24.74 mg/L	10 mL	24.7 mg/L	1	0.07	0.50	99		11/19/19 15:06:00	N	II
KQ1917160-11	Carbon, Dissolved Organic	MS	K1910566-002	Water	28.89 mg/L	10 mL	28.9 mg/L	1	0.07	0.50	102		11/19/19 16:12:00	N	II
KQ1917160-12	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	3.32 mg/L	10 mL	3.32 mg/L	1	0.07	0.50			11/19/19 15:40:00	N	II
KQ1917160-13	Carbon, Dissolved Organic (DOC)	MS	KQ1917160-12	Surface Water	28.89 mg/L	10 mL	28.9 mg/L	1	0.07	0.50	102		11/19/19 16:12:00	N	II
KQ1917160-14	Carbon, Dissolved Organic	DUP	K1910566-002	Water	3.44 mg/L	10 mL	3.44 mg/L	1	0.07	0.50		4	11/19/19 15:40:00	N	II
KQ1917160-15	Carbon, Dissolved Organic (DOC)	DUP	K1910407-007	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/19/19 20:31:00	N	II
KQ1917160-16	Carbon, Dissolved Organic (DOC)	DUP	K1910407-008	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/19/19 21:03:00	N	II
KQ1917160-17	Carbon, Dissolved Organic (DOC)	DUP	K1910407-009	Water	0.20 mg/L	10 mL	0.20 mg/L J	1	0.07	0.50		19*	11/19/19 21:35:00	N	II
KQ1917160-18	Carbon, Dissolved Organic (DOC)	DUP	K1910407-010	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/19/19 22:07:00	N	II
KQ1917160-19	Carbon, Dissolved Organic (DOC)	DUP	K1910407-011	Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50		19*	11/19/19 22:39:00	N	II
KQ1917160-20	Carbon, Dissolved Organic (DOC)	DUP	K1910407-012	Water	1.01 mg/L	10 mL	1.01 mg/L	1	0.07	0.50		2	11/19/19 23:11:00	N	II
KQ1917160-21	Carbon, Dissolved Organic (DOC)	DUP	K1910407-013	Water	0.26 mg/L	10 mL	0.26 mg/L J	1	0.07	0.50		6	11/19/19 23:44:00	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660502 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917160-22	Carbon, Dissolved Organic (DOC)	DUP	K1910407-014	Water	0.03 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 00:16:00	N	II
KQ1917160-23	Carbon, Dissolved Organic (DOC)	DUP	K1910407-015	Water	0.12 mg/L	10 mL	0.12 mg/L J	1	0.07	0.50		67*	11/20/19 01:54:00	N	II
KQ1917160-24	Carbon, Dissolved Organic (DOC)	DUP	K1910425-009	Surface Water	0.95 mg/L	10 mL	0.95 mg/L	1	0.07	0.50		<1	11/20/19 02:26:00	N	II
KQ1917160-25	Carbon, Dissolved Organic (DOC)	DUP	K1910425-010	Surface Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50		3	11/20/19 02:58:00	N	II
KQ1917160-26	Carbon, Dissolved Organic (DOC)	DUP	K1910407-001	Water	1.08 mg/L	10 mL	1.08 mg/L	1	0.07	0.50		4	11/19/19 16:45:00	N	II
KQ1917160-27	Carbon, Dissolved Organic (DOC)	DUP	K1910425-011	Surface Water	1.01 mg/L	10 mL	1.01 mg/L	1	0.07	0.50		5	11/20/19 03:30:00	N	II
KQ1917160-28	Carbon, Dissolved Organic (DOC)	DUP	K1910425-012	Surface Water	0.74 mg/L	10 mL	0.74 mg/L	1	0.07	0.50		2	11/20/19 04:03:00	N	II
KQ1917160-29	Carbon, Dissolved Organic (DOC)	DUP	K1910407-002	Water	0.38 mg/L	10 mL	0.38 mg/L J	1	0.07	0.50		11*	11/19/19 17:17:00	N	II
KQ1917160-30	Carbon, Dissolved Organic (DOC)	DUP	K1910407-003	Water	0.12 mg/L	10 mL	0.12 mg/L J	1	0.07	0.50		39*	11/19/19 17:49:00	N	II
KQ1917160-31	Carbon, Dissolved Organic (DOC)	DUP	K1910407-004	Water	0.05 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/19/19 18:21:00	N	II
KQ1917160-32	Carbon, Dissolved Organic (DOC)	DUP	K1910407-005	Water	0.47 mg/L	10 mL	0.47 mg/L J	1	0.07	0.50		<1	11/19/19 19:27:00	N	II
KQ1917160-33	Carbon, Dissolved Organic (DOC)	DUP	K1910407-006	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/19/19 19:59:00	N	II
KQ1917160-34	Carbon, Dissolved Organic (DOC)	DUP	KQ1917160-12	Surface Water	3.44 mg/L	10 mL	3.44 mg/L	1	0.07	0.50		4	11/19/19 15:40:00	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660507 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910461-001	Carbon, Dissolved Organic (DOC)	N/A		Effluent	0.87 mg/L	10 mL	0.87 mg/L	1	0.07	0.50			11/20/19 05:07:00	N	II
K1910461-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.99 mg/L	10 mL	0.99 mg/L	1	0.07	0.50			11/20/19 04:35:00	N	II
KQ1917161-01	Carbon, Dissolved Organic (DOC)	CCV		Water	23.75 mg/L	10 mL	23.8 mg/L	1					11/20/19 00:48:00	N	II
KQ1917161-02	Carbon, Dissolved Organic (DOC)	CCV		Water	23.93 mg/L	10 mL	23.9 mg/L	1					11/20/19 05:55:00	N	II
KQ1917161-03	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 01:04:00	N	II
KQ1917161-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 06:12:00	N	II
KQ1917161-05	Carbon, Dissolved Organic (DOC)	MS	K1910461-001	Effluent	26.37 mg/L	10 mL	26.4 mg/L	1	0.07	0.50	102		11/20/19 05:39:00	N	II
KQ1917161-06	Carbon, Dissolved Organic (DOC)	DUP	K1910461-002	Water	1.02 mg/L	10 mL	1.02 mg/L	1	0.07	0.50		3	11/20/19 04:35:00	N	II
KQ1917161-07	Carbon, Dissolved Organic (DOC)	DUP	K1910461-001	Effluent	0.95 mg/L	10 mL	0.95 mg/L	1	0.07	0.50		8	11/20/19 05:07:00	N	II
KQ1917161-08	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 01:21:00	N	II
KQ1917161-09	Carbon, Dissolved Organic (DOC)	LCS		Water	24.63 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	99		11/20/19 01:38:00	N	II

11/21/19

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660505 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910254-001	Carbon, Total Organic	N/A		Water	1.73 mg/L	10 mL	1.73 mg/L	1	0.07	0.50			11/20/19 10:46:00	N	IV
K1910378-001	Carbon, Total Organic	N/A		Ground Water	19.65 mg/L	10 mL	19.7 mg/L	1	0.07	0.50			11/20/19 08:05:00	N	II
K1910381-001	Carbon, Total Organic	N/A		Water	1.05 mg/L	10 mL	1.05 mg/L	1	0.07	0.50			11/20/19 08:37:00	N	II
K1910401-001	Carbon, Total Organic	N/A		Water	13.82 mg/L	10 mL	13.8 mg/L	1	0.07	0.50			11/20/19 09:10:00	N	II
K1910401-002	Carbon, Total Organic	N/A		Water	12.19 mg/L	10 mL	12.2 mg/L	1	0.07	0.50			11/20/19 09:42:00	N	II
K1910407-001	Carbon, Total Organic	N/A		Water	1.06 mg/L	10 mL	1.06 mg/L	1	0.07	0.50			11/20/19 12:41:00	N	II
K1910407-002	Carbon, Total Organic	N/A		Water	0.27 mg/L	10 mL	0.27 mg/L J	1	0.07	0.50			11/20/19 13:13:00	N	II
K1910407-003	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 13:45:00	N	II
K1910407-004	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 14:17:00	N	II
K1910407-005	Carbon, Total Organic	N/A		Water	0.31 mg/L	10 mL	0.31 mg/L J	1	0.07	0.50			11/20/19 14:49:00	N	II
K1910407-006	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 15:22:00	N	II
K1910407-007	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 15:54:00	N	II
K1910407-008	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 16:26:00	N	II
K1910407-009	Carbon, Total Organic	N/A		Water	0.12 mg/L	10 mL	0.12 mg/L J	1	0.07	0.50			11/20/19 17:31:00	N	II
K1910407-010	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 18:04:00	N	II
K1910407-011	Carbon, Total Organic	N/A		Water	0.36 mg/L	10 mL	0.36 mg/L J	1	0.07	0.50			11/20/19 18:36:00	N	II
K1910415-001	Carbon, Total Organic	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0			11/20/19 10:14:00	N	II
K1910566-001	Carbon, Total Organic	N/A		Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50			11/20/19 06:29:00	N	II
K1910617-001	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 07:01:00	N	I
K1910617-002	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 07:33:00	N	I
KQ1917162-01	Carbon, Total Organic	CCV		Water	23.93 mg/L	10 mL	23.9 mg/L	1					11/20/19 05:55:00	N	II
KQ1917162-01	Carbon, Total Organic	CCV		Water	23.93 mg/L	10 mL	23.9 mg/L	1					11/20/19 05:55:00	N	II
KQ1917162-02	Carbon, Total Organic	CCV		Water	23.73 mg/L	10 mL	23.7 mg/L	1					11/20/19 11:34:00	N	II
KQ1917162-02	Carbon, Total Organic	CCV		Water	23.73 mg/L	10 mL	23.7 mg/L	1					11/20/19 11:34:00	N	II
KQ1917162-03	Carbon, Total Organic	CCV		Water	23.60 mg/L	10 mL	23.6 mg/L	1					11/20/19 16:58:00	N	II
KQ1917162-03	Carbon, Total Organic	CCV		Water	23.60 mg/L	10 mL	23.6 mg/L	1					11/20/19 16:58:00	N	II
KQ1917162-04	Carbon, Total Organic	CCV		Water	23.85 mg/L	10 mL	23.8 mg/L	1					11/20/19 22:52:00	N	II
KQ1917162-04	Carbon, Total Organic	CCV		Water	23.85 mg/L	10 mL	23.8 mg/L	1					11/20/19 22:52:00	N	II
KQ1917162-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 06:12:00	N	II
KQ1917162-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 06:12:00	N	II
KQ1917162-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 11:51:00	N	II
KQ1917162-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 11:51:00	N	II
KQ1917162-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 17:15:00	N	II
KQ1917162-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 17:15:00	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660505 **Method/Testcode:** 415.1/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917162-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 23:09:00	N	II
KQ1917162-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 23:09:00	N	II
KQ1917162-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 12:08:00	N	II
KQ1917162-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 12:08:00	N	II
KQ1917162-10	Carbon, Total Organic	LCS		Water	24.45 mg/L	10 mL	24.4 mg/L	1	0.07	0.50	98		11/20/19 12:24:00	N	II
KQ1917162-10	Carbon, Total Organic	LCS		Water	24.45 mg/L	10 mL	24.4 mg/L	1	0.07	0.50	98		11/20/19 12:24:00	N	II
KQ1917162-11	Carbon, Total Organic	MS	K1910407-001	Water	26.58 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	102		11/20/19 11:18:00	N	II
KQ1917162-12	Carbon, Total Organic	DUP	K1910401-002	Water	12.14 mg/L	10 mL	12.1 mg/L	1	0.07	0.50		<1	11/20/19 09:42:00	N	II
KQ1917162-13	Carbon, Total Organic	DUP	K1910415-001	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2	0.2	1.0		NC	11/20/19 10:14:00	N	II
KQ1917162-14	Carbon, Total Organic	DUP	K1910617-001	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 07:01:00	N	I
KQ1917162-15	Carbon, Total Organic	DUP	K1910617-002	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 07:33:00	N	I
KQ1917162-16	Carbon, Total Organic	DUP	K1910401-001	Water	13.86 mg/L	10 mL	13.9 mg/L	1	0.07	0.50		<1	11/20/19 09:10:00	N	II
KQ1917162-17	Carbon, Total Organic	DUP	K1910566-001	Water	3.03 mg/L	10 mL	3.03 mg/L	1	0.07	0.50		6	11/20/19 06:29:00	N	II
KQ1917162-18	Carbon, Total Organic	DUP	K1910407-008	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 16:26:00	N	II
KQ1917162-19	Carbon, Total Organic	DUP	K1910407-009	Water	0.16 mg/L	10 mL	0.16 mg/L J	1	0.07	0.50		23*	11/20/19 17:31:00	N	II
KQ1917162-20	Carbon, Total Organic	DUP	K1910407-010	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 18:04:00	N	II
KQ1917162-21	Carbon, Total Organic	DUP	K1910407-011	Water	0.41 mg/L	10 mL	0.41 mg/L J	1	0.07	0.50		13*	11/20/19 18:36:00	N	II
KQ1917162-22	Carbon, Total Organic	DUP	K1910254-001	Water	1.68 mg/L	10 mL	1.68 mg/L	1	0.07	0.50		3	11/20/19 10:46:00	N	IV
KQ1917162-23	Carbon, Total Organic	DUP	K1910407-001	Water	1.07 mg/L	10 mL	1.07 mg/L	1	0.07	0.50		1	11/20/19 12:41:00	N	II
KQ1917162-24	Carbon, Total Organic	DUP	K1910407-002	Water	0.28 mg/L	10 mL	0.28 mg/L J	1	0.07	0.50		3	11/20/19 13:13:00	N	II
KQ1917162-25	Carbon, Total Organic	DUP	K1910407-003	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 13:45:00	N	II
KQ1917162-26	Carbon, Total Organic	DUP	K1910407-004	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 14:17:00	N	II
KQ1917162-27	Carbon, Total Organic	DUP	K1910407-005	Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50		3	11/20/19 14:49:00	N	II
KQ1917162-28	Carbon, Total Organic	DUP	K1910407-006	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 15:22:00	N	II
KQ1917162-29	Carbon, Total Organic	DUP	K1910407-007	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 15:54:00	N	II
KQ1917162-30	Carbon, Total Organic	DUP	K1910381-001	Water	0.91 mg/L	10 mL	0.91 mg/L	1	0.07	0.50		14*	11/20/19 08:37:00	N	II
KQ1917162-31	Carbon, Total Organic	DUP	K1910378-001	Ground Water	19.66 mg/L	10 mL	19.7 mg/L	1	0.07	0.50		<1	11/20/19 08:05:00	N	II
KQ1917162-32	Carbon, Total Organic	N/A		Water	1.06 mg/L	10 mL	1.06 mg/L	1	0.07	0.50			11/20/19 12:41:00	N	II
KQ1917162-33	Carbon, Total Organic	MS	KQ1917162-32	Water	26.58 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	102		11/20/19 11:18:00	N	II
KQ1917162-34	Carbon, Total Organic	DUP	KQ1917162-32	Water	1.07 mg/L	10 mL	1.07 mg/L	1	0.07	0.50		1	11/20/19 12:41:00	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660506 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910157-001	Carbon, Total Organic	N/A		Water	3.09 mg/L	10 mL	77 mg/L	25	2	13			11/21/19 06:59:00	N	II
K1910407-012	Carbon, Total Organic	N/A		Water	1.00 mg/L	10 mL	1.00 mg/L	1	0.07	0.50			11/20/19 19:08:00	N	II
K1910407-013	Carbon, Total Organic	N/A		Water	0.11 mg/L	10 mL	0.11 mg/L J	1	0.07	0.50			11/20/19 19:40:00	N	II
K1910407-014	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 20:12:00	N	II
K1910407-015	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 20:44:00	N	II
K1910432-001	Carbon, Total Organic	N/A		Ground Water	8.76 mg/L	10 mL	8.76 mg/L	1	0.07	0.50			11/20/19 21:16:00	N	I
K1910432-002	Carbon, Total Organic	N/A		Ground Water	15.03 mg/L	10 mL	15.0 mg/L	1	0.07	0.50			11/20/19 21:48:00	N	I
K1910432-003	Carbon, Total Organic	N/A		Ground Water	20.33 mg/L	10 mL	20.3 mg/L	1	0.07	0.50			11/20/19 22:20:00	N	I
K1910432-004	Carbon, Total Organic	N/A		Ground Water	23.61 mg/L	10 mL	23.6 mg/L	1	0.07	0.50			11/21/19 00:00:00	N	I
K1910432-005	Carbon, Total Organic	N/A		Ground Water	26.51 mg/L	10 mL	26.5 mg/L	1	0.07	0.50			11/21/19 00:32:00	N	I
K1910464-002	Carbon, Total Organic	N/A		Water	6.75 mg/L	10 mL	6.75 mg/L	1	0.07	0.50			11/21/19 01:04:00	N	II
K1910759-001	Carbon, Total Organic	N/A		Ground Water	1.01 mg/L	10 mL	1.01 mg/L	1	0.07	0.50			11/21/19 01:36:00	N	IV
K1910759-002	Carbon, Total Organic	N/A		Ground Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50			11/21/19 02:41:00	N	IV
K1910759-003	Carbon, Total Organic	N/A		Ground Water	1.63 mg/L	10 mL	1.63 mg/L	1	0.07	0.50			11/21/19 03:13:00	N	IV
K1910759-004	Carbon, Total Organic	N/A		Ground Water	1.49 mg/L	10 mL	1.49 mg/L	1	0.07	0.50			11/21/19 04:18:00	N	IV
K1910759-005	Carbon, Total Organic	N/A		Ground Water	1.11 mg/L	10 mL	1.11 mg/L	1	0.07	0.50			11/21/19 04:51:00	N	IV
K1910759-006	Carbon, Total Organic	N/A		Ground Water	1.19 mg/L	10 mL	1.19 mg/L	1	0.07	0.50			11/21/19 05:23:00	N	IV
K1910765-005	Carbon, Total Organic	N/A		Ground Water	15.32 mg/L	10 mL	15.3 mg/L	1	0.07	0.50			11/21/19 07:31:00	N	IV
K1910837-001	Carbon, Total Organic	N/A		Water	1.66 mg/L	10 mL	1.66 mg/L	1	0.07	0.50			11/21/19 05:55:00	N	II
K1910838-001	Carbon, Total Organic	N/A		Water	2.52 mg/L	10 mL	2.52 mg/L	1	0.07	0.50			11/21/19 06:27:00	N	II
KQ1917163-01	Carbon, Total Organic	CCV		Water	23.60 mg/L	10 mL	23.6 mg/L	1					11/20/19 16:58:00	N	II
KQ1917163-02	Carbon, Total Organic	CCV		Water	23.85 mg/L	10 mL	23.8 mg/L	1					11/20/19 22:52:00	N	II
KQ1917163-03	Carbon, Total Organic	CCV		Water	23.61 mg/L	10 mL	23.6 mg/L	1					11/21/19 03:45:00	N	II
KQ1917163-04	Carbon, Total Organic	CCV		Water	23.55 mg/L	10 mL	23.5 mg/L	1					11/21/19 08:36:00	N	II
KQ1917163-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 17:15:00	N	II
KQ1917163-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 23:09:00	N	II
KQ1917163-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/21/19 04:02:00	N	II
KQ1917163-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/21/19 08:52:00	N	II
KQ1917163-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			11/20/19 23:26:00	N	II
KQ1917163-10	Carbon, Total Organic	LCS		Water	24.50 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		11/20/19 23:43:00	N	II

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

Printed 11/21/19 14:20

Results Summary

11/21/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 660506 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917163-11	Carbon, Total Organic	MS	K1910759-001	Ground Water	26.00 mg/L	10 mL	26.0 mg/L	1	0.07	0.50	100		11/21/19 02:08:00	N	IV
KQ1917163-12	Carbon, Total Organic	DUP	K1910157-001	Water	3.18 mg/L	10 mL	80 mg/L	25	2	13		3	11/21/19 06:59:00	N	II
KQ1917163-13	Carbon, Total Organic	DUP	K1910407-012	Water	1.05 mg/L	10 mL	1.05 mg/L	1	0.07	0.50		5	11/20/19 19:08:00	N	II
KQ1917163-14	Carbon, Total Organic	DUP	K1910407-013	Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50		53*	11/20/19 19:40:00	N	II
KQ1917163-15	Carbon, Total Organic	DUP	K1910407-014	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 20:12:00	N	II
KQ1917163-16	Carbon, Total Organic	DUP	K1910407-015	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	11/20/19 20:44:00	N	II
KQ1917163-17	Carbon, Total Organic	DUP	K1910432-001	Ground Water	8.62 mg/L	10 mL	8.62 mg/L	1	0.07	0.50		2	11/20/19 21:16:00	N	I
KQ1917163-18	Carbon, Total Organic	DUP	K1910432-002	Ground Water	15.11 mg/L	10 mL	15.1 mg/L	1	0.07	0.50		<1	11/20/19 21:48:00	N	I
KQ1917163-19	Carbon, Total Organic	DUP	K1910432-003	Ground Water	20.30 mg/L	10 mL	20.3 mg/L	1	0.07	0.50		<1	11/20/19 22:20:00	N	I
KQ1917163-20	Carbon, Total Organic	DUP	K1910432-004	Ground Water	23.33 mg/L	10 mL	23.3 mg/L	1	0.07	0.50		1	11/21/19 00:00:00	N	I
KQ1917163-21	Carbon, Total Organic	DUP	K1910432-005	Ground Water	26.73 mg/L	10 mL	26.7 mg/L	1	0.07	0.50		<1	11/21/19 00:32:00	N	I
KQ1917163-22	Carbon, Total Organic	DUP	K1910464-002	Water	6.63 mg/L	10 mL	6.63 mg/L	1	0.07	0.50		2	11/21/19 01:04:00	N	II
KQ1917163-23	Carbon, Total Organic	DUP	K1910759-002	Ground Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50		<1	11/21/19 02:41:00	N	IV
KQ1917163-24	Carbon, Total Organic	DUP	K1910759-001	Ground Water	1.06 mg/L	10 mL	1.06 mg/L	1	0.07	0.50		4	11/21/19 01:36:00	N	IV
KQ1917163-25	Carbon, Total Organic	DUP	K1910759-003	Ground Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50		3	11/21/19 03:13:00	N	IV
KQ1917163-26	Carbon, Total Organic	DUP	K1910759-004	Ground Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50		3	11/21/19 04:18:00	N	IV
KQ1917163-27	Carbon, Total Organic	DUP	K1910759-005	Ground Water	1.05 mg/L	10 mL	1.05 mg/L	1	0.07	0.50		6	11/21/19 04:51:00	N	IV
KQ1917163-28	Carbon, Total Organic	DUP	K1910759-006	Ground Water	1.15 mg/L	10 mL	1.15 mg/L	1	0.07	0.50		4	11/21/19 05:23:00	N	IV
KQ1917163-29	Carbon, Total Organic	DUP	K1910765-005	Ground Water	15.18 mg/L	10 mL	15.2 mg/L	1	0.07	0.50		<1	11/21/19 07:31:00	N	IV
KQ1917163-30	Carbon, Total Organic	DUP	K1910837-001	Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50		1	11/21/19 05:55:00	N	II
KQ1917163-31	Carbon, Total Organic	DUP	K1910838-001	Water	2.51 mg/L	10 mL	2.51 mg/L	1	0.07	0.50		<1	11/21/19 06:27:00	N	II

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

DOC: 660502, 660507
TOC: 660505, 660506

Schedule: 11192019

Version: 7
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/11/19 15:46 - Tuesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	K1910566-002.10 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
4	Sample	K1910566-002.10 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
5	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
6	Sample	K1910407-001.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
7	Sample	K1910407-002.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
8	Sample	K1910407-003.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
9	Sample	K1910407-004.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1910407-005.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K1910407-006.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K1910407-007.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
13	Sample	K1910407-008.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
14	Sample	K1910407-009.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
15	Sample	K1910407-010.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
16	Sample	K1910407-011.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	K1910407-012.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K1910407-013.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K1910407-014.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K1910407-015.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K1910425-009.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
23	Sample	K1910425-010.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
24	Sample	K1910425-011.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
25	Sample	K1910425-012.01 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K1910461-002.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K1910461-001.03 doc	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K1910461-001.03 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1910566-001.08	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K1910617-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
31	Sample	K1910617-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
32	Sample	K1910378-001.08	Extended Reaction 021711 (Extended Reaction 021711)	2
33	Sample	K1910381-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
34	Sample	K1910401-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
35	Sample	K1910401-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
36	Sample	K1910415-001.01 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
37	Sample	K1910254-001.05	Extended Reaction 021711 (Extended Reaction 021711)	2
38	Sample	K1910407-001.02 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

11/21/19

Schedule: 11192019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
40	Sample	K1910407-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
41	Sample	K1910407-002.02	Extended Reaction 021711 (Extended Reaction 021711)	2
42	Sample	K1910407-003.02	Extended Reaction 021711 (Extended Reaction 021711)	2
43	Sample	K1910407-004.02	Extended Reaction 021711 (Extended Reaction 021711)	2
44	Sample	K1910407-005.02	Extended Reaction 021711 (Extended Reaction 021711)	2
45	Sample	K1910407-006.02	Extended Reaction 021711 (Extended Reaction 021711)	2
46	Sample	K1910407-007.02	Extended Reaction 021711 (Extended Reaction 021711)	2
47	Sample	K1910407-008.02	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	K1910407-009.02	Extended Reaction 021711 (Extended Reaction 021711)	2
49	Sample	K1910407-010.02	Extended Reaction 021711 (Extended Reaction 021711)	2
50	Sample	K1910407-011.02	Extended Reaction 021711 (Extended Reaction 021711)	2
51	Sample	K1910407-012.02	Extended Reaction 021711 (Extended Reaction 021711)	2
52	Sample	K1910407-013.02	Extended Reaction 021711 (Extended Reaction 021711)	2
53	Sample	K1910407-014.02	Extended Reaction 021711 (Extended Reaction 021711)	2
54	Sample	K1910407-015.02	Extended Reaction 021711 (Extended Reaction 021711)	2
55	Sample	K1910432-001.03	Extended Reaction 021711 (Extended Reaction 021711)	2
56	Sample	K1910432-002.03	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	K1910432-003.03	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	K1910432-004.03	Extended Reaction 021711 (Extended Reaction 021711)	2
60	Sample	K1910432-005.03	Extended Reaction 021711 (Extended Reaction 021711)	2
61	Sample	K1910464-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
62	Sample	K1910759-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
63	Sample	K1910759-001.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
64	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
65	Sample	K1910759-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	K1910759-003.01	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K1910759-004.01	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K1910759-005.01	Extended Reaction 021711 (Extended Reaction 021711)	2
69	Sample	K1910759-006.01	Extended Reaction 021711 (Extended Reaction 021711)	2
70	Sample	K1910837-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	K1910838-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K1910157-001.02 25x	Extended Reaction 021711 (Extended Reaction 021711)	2
73	Sample	K1910765-005.01	Extended Reaction 021711 (Extended Reaction 021711)	2
74	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

Fusion Report - 11192019
Tuesday, November 19, 2019 12:16 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/11/21 09:12 - Thursday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11192019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7)		
Comment:			

Report Results

11/21/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/11/19 12:16

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.35	19.58	6.23	49.65	05:24
2	TC Clean	15.07	18.91	3.83	50.08	04:04
3	TC Clean	3.36	7.06	3.69	50.09	03:49
4	TC Clean	2.42	6.19	3.77	50.10	03:56

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/11/19 12:38

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.15	16.05	3.91	49.53	05:23
2	TC Clean	5.62	9.39	3.77	50.09	04:06

3	TC Clean	2.90	6.43	3.53	50.12	03:59
4	TC Clean	2.13	5.68	3.55	50.12	03:55

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/11/19 13:04

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.14	15.79	3.65	49.66	05:24
2	TC Clean	6.47	10.27	3.80	50.11	04:06
3	TC Clean	2.92	6.53	3.60	50.08	03:47
4	TC Clean	1.89	5.57	3.68	50.12	03:48

Sample Type: Blank (Creating v1321) — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/11/19 13:26

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.20	4.89	3.69	49.52	05:21
2	TC Clean	5.17	8.92	3.75	50.09	04:06
3	TC Clean	2.42	6.06	3.64	50.12	03:48
4	TC Clean	1.68	5.44	3.76	50.05	03:46
5	Reagent Blank	4.91	8.53	3.62	50.10	05:06
6	Acid Blank	1.51	5.17	3.66	49.70	05:28

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.4462 ppm	0.0000 ppm	0.0000%	2019/11/19 13:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4462	4.4616	13.57	17.37	3.80	50.26	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8685 ppm (PASS)	0.0000 ppm	0%	2019/11/19 14:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8685	238.6848	182.31	185.93	3.62	50.28	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/19 14:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	9.51	13.09	3.58	50.32	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/19 14:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.19	11.78	3.59	50.28	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 6

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.7443 ppm (PASS)	0.0000 ppm	0%	2019/11/19 15:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7443	247.4432	188.59	192.17	3.59	50.27	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0850 ppm	0.0000 ppm	0.0000%	2019/11/19 15:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0850	0.8495	10.98	14.63	3.65	50.29	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1910566-002.10 doc	3.3789 ppm	0.0902 ppm	2.6700%	2019/11/19 15:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3151	33.1509	34.14	37.82	3.67	50.32	12:31
2	TOC	3.4427	34.4270	35.06	38.69	3.63	50.29	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1910566-002.10 ms doc	28.8933 ppm	0.0000 ppm	0.0000%	2019/11/19 16:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.8933	288.9328	217.55	221.30	3.75	50.32	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/19 16:29

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

1	TOC	0.0000	0.0000	8.94	12.67	3.74	50.33	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1910407-001.01 doc	1.0567 ppm	0.0297 ppm	2.8100%	2019/11/19 16:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0357	10.3568	17.80	21.42	3.62	50.35	12:30
2	TOC	1.0777	10.7766	18.10	21.73	3.63	50.33	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1910407-002.01 doc	0.3628 ppm	0.0293 ppm	8.0700%	2019/11/19 17:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3421	3.4212	12.83	16.56	3.73	50.35	12:25
2	TOC	0.3835	3.8354	13.12	16.85	3.72	50.33	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1910407-003.01 doc	0.1462 ppm	0.0398 ppm	27.2600%	2019/11/19 17:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1743	1.7435	11.62	15.17	3.54	50.37	12:30
2	TOC	0.1180	1.1800	11.22	14.92	3.70	50.35	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1910407-004.01 doc	0.0523 ppm	0.0022 ppm	4.1500%	2019/11/19 18:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0539	0.5385	10.76	14.34	3.58	50.40	12:27
2	TOC	0.0508	0.5078	10.74	14.41	3.67	50.39	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8078 ppm (PASS)	0.0000 ppm	0%	2019/11/19 18:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8078	238.0782	181.87	185.48	3.61	50.39	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/19 19:10

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	8.08	11.77	3.68	50.40	12:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1910407-005.01 doc	0.4734 ppm	0.0010 ppm	0.2100%	2019/11/19 19:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4741	4.7406	13.77	17.46	3.69	50.41	12:25
2	TOC	0.4727	4.7266	13.76	17.54	3.78	50.40	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1910407-006.01 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/19 19:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.23	14.02	3.79	50.38	12:30
2	TOC	0.0000	0.0000	10.20	13.97	3.77	50.45	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1910407-007.01 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/19 20:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.09	12.87	3.78	50.40	12:27
2	TOC	0.0000	0.0000	8.75	12.49	3.74	50.40	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1910407-008.01 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/19 21:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.11	12.90	3.80	50.39	12:29
2	TOC	0.0000	0.0000	9.39	13.13	3.74	50.39	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1910407-009.01 doc	0.2241 ppm	0.0300 ppm	13.3800%	2019/11/19 21:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2453	2.4533	12.13	15.68	3.55	50.33	12:27
2	TOC	0.2029	2.0294	11.83	15.49	3.66	50.35	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1910407-010.01 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/19 22:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.96	11.43	3.46	50.32	12:28
2	TOC	0.0000	0.0000	8.22	11.93	3.71	50.29	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1910407-011.01 doc	0.4763 ppm	0.0623 ppm	13.0900%	2019/11/19 22:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4322	4.3222	13.47	17.04	3.56	50.27	12:29
2	TOC	0.5204	5.2036	14.11	17.69	3.58	50.28	12:27

Dilution 1:10 | **Blank Contribution** (TC) 10.3749 (IC) (v1321) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1910407-012.01 doc	1.0186 ppm	0.0153 ppm	1.5000%	2019/11/19 23:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0294	10.2940	17.76	21.19	3.43	50.26	12:30
2	TOC	1.0078	10.0779	17.60	21.03	3.42	50.24	12:31

Dilution 1:10 | **Blank Contribution** (TC) 10.3749 (IC) (v1321) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1910407-013.01 doc	0.2658 ppm	0.0110 ppm	4.1500%	2019/11/19 23:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2736	2.7365	12.34	15.87	3.53	50.23	12:27
2	TOC	0.2580	2.5803	12.23	15.77	3.54	50.22	12:27

Dilution 1:10 | **Blank Contribution** (TC) 10.3749 (IC) (v1321) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1910407-014.01 doc	0.0256 ppm	0.0023 ppm	8.8600%	2019/11/20 00:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0240	0.2400	10.55	14.11	3.56	50.21	12:27
2	TOC	0.0272	0.2721	10.57	14.23	3.66	50.22	12:32

Dilution 1:10 | **Blank Contribution** (TC) 10.3749 (IC) (v1321) | **Method** Extended Reaction 021711 (v4) | **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.7504 ppm (PASS)	0.0000 ppm	0%	2019/11/20 00:48

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

	Type		#							Time
B	TOC	25 ppm	1	23.7504	237.5036	181.46	185.01	3.55	50.20	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/20 01:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.35	10.98	3.63	50.17	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 01:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.15	10.65	3.50	50.20	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.6336 ppm (PASS)	0.0000 ppm	0%	2019/11/20 01:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6336	246.3359	187.79	191.19	3.39	50.19	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K1910407-015.01 doc	0.1853 ppm	0.0879 ppm	47.4200%	2019/11/20 01:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2474	2.4743	12.15	15.74	3.60	50.15	12:27
2	TOC	0.1232	1.2316	11.26	14.77	3.51	50.15	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K1910425-009.01 doc	0.9495 ppm	0.0034 ppm	0.3500%	2019/11/20 02:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9519	9.5186	17.20	20.61	3.41	50.15	12:27
2	TOC	0.9471	9.4712	17.17	20.72	3.55	50.14	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K1910425-010.01 doc	0.5284 ppm	0.0119 ppm	2.2600%	2019/11/20 02:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5199	5.1994	14.10	17.70	3.60	50.14	12:31
2	TOC	0.5368	5.3682	14.22	17.74	3.51	50.16	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K1910425-011.01 doc	0.9867 ppm	0.0340 ppm	3.4500%	2019/11/20 03:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9626	9.6260	17.28	20.91	3.63	50.15	12:27
2	TOC	1.0107	10.1072	17.62	21.25	3.63	50.17	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K1910425-012.01 doc	0.7528 ppm	0.0119 ppm	1.5900%	2019/11/20 04:03

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

1	TOC	0.7612	7.6121	15.83	19.46	3.62	50.15	12:30
2	TOC	0.7443	7.4434	15.71	19.30	3.59	50.12	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	26	TOC	K1910461-002.04 doc	1.0037 ppm	0.0183 ppm	1.8300%	2019/11/20 04:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9908	9.9077	17.48	20.99	3.51	50.10	12:28
2	TOC	1.0167	10.1671	17.66	21.10	3.44	50.10	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	K1910461-001.03 doc	0.9093 ppm	0.0518 ppm	5.6900%	2019/11/20 05:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8726	8.7265	16.63	20.21	3.58	50.09	12:30
2	TOC	0.9459	9.4586	17.16	20.58	3.43	50.15	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	K1910461-001.03 ms doc	26.3715 ppm	0.0000 ppm	0.0000%	2019/11/20 05:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.3715	263.7148	199.47	202.99	3.53	50.11	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9275 ppm (PASS)	0.0000 ppm	0%	2019/11/20 05:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9275	239.2748	182.73	186.31	3.58	50.10	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/20 06:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.73	11.34	3.61	50.10	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1910566-001.08	2.9436 ppm	0.1200 ppm	4.0800%	2019/11/20 06:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8588	28.5876	30.87	34.52	3.65	50.11	12:29
2	TOC	3.0285	30.2849	32.09	35.70	3.61	50.11	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1910617-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 07:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.37	10.95	3.58	50.08	12:28
2	TOC	0.0000	0.0000	7.66	11.32	3.66	50.07	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1910617-002.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 07:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.85	10.43	3.59	50.07	12:29

2	TOC	0.0000	0.0000	7.94	11.55	3.61	50.08	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1910378-001.08	19.6572 ppm	0.0035 ppm	0.0200%	2019/11/20 08:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	19.6547	196.5474	151.30	154.78	3.47	50.06	12:25
2	TOC	19.6596	196.5962	151.34	154.85	3.51	50.06	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1910381-001.01	0.9788 ppm	0.0939 ppm	9.5900%	2019/11/20 08:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0452	10.4516	17.87	21.41	3.55	50.14	12:26
2	TOC	0.9124	9.1239	16.92	20.56	3.64	50.11	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1910401-001.01	13.8407 ppm	0.0255 ppm	0.1800%	2019/11/20 09:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.8226	138.2261	109.49	113.05	3.56	50.14	12:26
2	TOC	13.8587	138.5873	109.75	113.30	3.55	50.14	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1910401-002.01	12.1641 ppm	0.0398 ppm	0.3300%	2019/11/20 09:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.1923	121.9227	97.80	101.19	3.39	50.18	12:28
2	TOC	12.1359	121.3593	97.39	100.90	3.51	50.20	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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

◆	36	TOC	K1910415-001.01 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 10:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.60	12.26	3.66	50.22	12:24
2	TOC	0.0000	0.0000	8.23	11.87	3.64	50.22	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	37	TOC	K1910254-001.05	1.7054 ppm	0.0394 ppm	2.3100%	2019/11/20 10:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7333	17.3328	22.80	26.36	3.55	50.22	12:26
2	TOC	1.6775	16.7749	22.40	26.06	3.66	50.21	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	38	TOC	K1910407-001.02 ms	26.5836 ppm	0.0000 ppm	0.0000%	2019/11/20 11:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.5836	265.8361	200.99	204.49	3.50	50.24	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.7272 ppm (PASS)	0.0000 ppm	0%	2019/11/20 11:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7272	237.2721	181.30	184.90	3.60	50.27	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/20 11:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.06	10.60	3.54	50.27	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 12:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.25	9.91	3.66	50.29	12:35

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.4498 ppm (PASS)	0.0000 ppm	0%	2019/11/20 12:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4498	244.4977	186.48	190.12	3.65	50.28	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K1910407-001.02	1.0674 ppm	0.0096 ppm	0.9000%	2019/11/20 12:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0606	10.6064	17.98	21.56	3.58	50.27	12:25
2	TOC	1.0742	10.7417	18.08	21.58	3.50	50.26	12:25

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K1910407-002.02	0.2728 ppm	0.0063 ppm	2.3100%	2019/11/20 13:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2683	2.6835	12.30	15.98	3.68	50.26	12:24
2	TOC	0.2773	2.7727	12.36	15.83	3.47	50.24	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K1910407-003.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 13:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.96	13.59	3.62	50.24	12:29
2	TOC	0.0000	0.0000	10.02	13.45	3.43	50.24	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1910407-004.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 14:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.82	13.51	3.69	50.23	12:29
2	TOC	0.0000	0.0000	10.22	13.71	3.50	50.28	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1910407-005.02	0.3080 ppm	0.0065 ppm	2.1100%	2019/11/20 14:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3126	3.1256	12.62	16.26	3.64	50.23	12:29
2	TOC	0.3034	3.0335	12.55	16.25	3.70	50.22	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1910407-006.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 15:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.41	12.92	3.51	50.24	12:28
2	TOC	0.0000	0.0000	9.34	12.91	3.57	50.22	12:32

Dilution: 1:10
Blank Contribution: (TC) 10.3749 (IC) (v1321)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	46	TOC	K1910407-007.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 15:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.98	11.60	3.62	50.25	12:28
2	TOC	0.0000	0.0000	7.87	11.52	3.66	50.26	12:30

Dilution: 1:10
Blank Contribution: (TC) 10.3749 (IC) (v1321)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	47	TOC	K1910407-008.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 16:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.32	11.95	3.63	50.30	12:29
2	TOC	0.0000	0.0000	8.49	12.08	3.59	50.35	12:31

Dilution: 1:10
Blank Contribution: (TC) 10.3749 (IC) (v1321)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.5990 ppm (PASS)	0.0000 ppm	0%	2019/11/20 16:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5990	235.9904	180.38	183.84	3.47	50.35	12:32

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v27)
STD Conc - Pos B: 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/20 17:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.76	10.46	3.70	50.36	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample

From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	K1910407-009.02	0.1397 ppm	0.0232 ppm	16.5900%	2019/11/20 17:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1233	1.2330	11.26	14.92	3.66	50.32	12:27
2	TOC	0.1561	1.5608	11.49	15.24	3.74	50.31	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K1910407-010.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 18:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.08	10.63	3.54	50.31	12:29
2	TOC	0.0000	0.0000	7.32	10.75	3.44	50.36	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	K1910407-011.02	0.3881 ppm	0.0347 ppm	8.9400%	2019/11/20 18:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3636	3.6360	12.98	16.39	3.40	50.34	12:28
2	TOC	0.4127	4.1269	13.33	16.85	3.52	50.28	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	51	TOC	K1910407-012.02	1.0268 ppm	0.0368 ppm	3.5800%	2019/11/20 19:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0008	10.0081	17.55	21.05	3.50	50.26	12:26
2	TOC	1.0528	10.5283	17.92	21.50	3.57	50.29	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1910407-013.02	0.1464 ppm	0.0551 ppm	37.6600%	2019/11/20 19:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1074	1.0740	11.14	14.63	3.48	50.24	12:34
2	TOC	0.1854	1.8537	11.70	15.25	3.54	50.23	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K1910407-014.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 20:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.62	13.19	3.57	50.22	12:28
2	TOC	0.0000	0.0000	9.69	13.33	3.64	50.22	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	K1910407-015.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 20:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.75	13.32	3.57	50.23	12:30
2	TOC	0.0000	0.0000	9.71	13.51	3.80	50.22	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K1910432-001.03	8.6884 ppm	0.1011 ppm	1.1600%	2019/11/20 21:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.7599	87.5992	73.19	76.87	3.69	50.19	12:26
2	TOC	8.6170	86.1696	72.16	75.86	3.70	50.18	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC)	Extended Reaction	Extended Reaction

(v1321) 021711 (v4) 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1910432-002.03	15.0661 ppm	0.0563 ppm	0.3700%	2019/11/20 21:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.0263	150.2633	118.12	121.55	3.43	50.17	12:27
2	TOC	15.1060	151.0596	118.69	122.17	3.48	50.15	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1910432-003.03	20.3168 ppm	0.0184 ppm	0.0900%	2019/11/20 22:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	20.3299	203.2988	156.15	159.56	3.42	50.14	12:28
2	TOC	20.3038	203.0380	155.96	159.49	3.53	50.15	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.8483 ppm (PASS)	0.0000 ppm	0%	2019/11/20 22:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8483	238.4826	182.16	185.69	3.52	50.14	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/20 23:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.60	10.29	3.68	50.17	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/20 23:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.78	9.37	3.59	50.10	12:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.4997 ppm (PASS)	0.0000 ppm	0%	2019/11/20 23:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4997	244.9970	186.83	190.47	3.63	50.12	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1910432-004.03	23.4712 ppm	0.1981 ppm	0.8400%	2019/11/21 00:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	23.6113	236.1134	179.68	183.22	3.54	50.11	12:26
2	TOC	23.3312	233.3116	177.67	181.23	3.57	50.10	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	K1910432-005.03	26.6166 ppm	0.1567 ppm	0.5900%	2019/11/21 00:32

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	26.5058	265.0578	200.43	203.98	3.55	50.10	12:29
2	TOC	26.7274	267.2739	202.02	205.65	3.63	50.08	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	61	TOC	K1910464-002.01	6.6893 ppm	0.0832 ppm	1.2400%	2019/11/21 01:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7481	67.4814	58.76	62.55	3.79	50.06	12:26
2	TOC	6.6304	66.3043	57.92	61.57	3.66	50.04	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	K1910759-001.01	1.0334 ppm	0.0306 ppm	2.9600%	2019/11/21 01:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0118	10.1183	17.63	21.28	3.65	50.04	12:26
2	TOC	1.0551	10.5507	17.94	21.44	3.50	50.02	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	K1910759-001.01 ms	26.0016 ppm	0.0000 ppm	0.0000%	2019/11/21 02:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.0016	260.0162	196.81	200.52	3.70	50.03	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/21 02:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.97	10.59	3.62	50.07	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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

◆	65	TOC	K1910759-002.01	0.8346 ppm	0.0004 ppm	0.0500%	2019/11/21 02:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8349	8.3485	16.36	19.91	3.55	50.05	12:28
2	TOC	0.8343	8.3429	16.36	19.89	3.53	50.10	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	K1910759-003.01	1.6060 ppm	0.0289 ppm	1.8000%	2019/11/21 03:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6265	16.2645	22.04	25.72	3.68	50.10	12:30
2	TOC	1.5856	15.8559	21.74	25.49	3.75	50.04	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.6066 ppm (PASS)	0.0000 ppm	0%	2019/11/21 03:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6066	236.0657	180.43	184.01	3.58	50.06	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/21 04:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.15	9.95	3.80	50.06	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	K1910759-004.01	1.5096 ppm	0.0341 ppm	2.2600%	2019/11/21 04:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4855	14.8545	21.03	24.73	3.70	50.08	12:27
2	TOC	1.5337	15.3371	21.37	24.95	3.58	50.04	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	68	TOC	K1910759-005.01	1.0800 ppm	0.0452 ppm	4.1800%	2019/11/21 04:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1120	11.1197	18.35	21.93	3.58	50.03	12:25
2	TOC	1.0481	10.4809	17.89	21.55	3.66	50.04	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	69	TOC	K1910759-006.01	1.1674 ppm	0.0315 ppm	2.6900%	2019/11/21 05:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1896	11.8965	18.90	22.57	3.67	50.01	12:30
2	TOC	1.1452	11.4516	18.59	22.17	3.59	50.02	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	70	TOC	K1910837-001.01	1.6524 ppm	0.0164 ppm	0.9900%	2019/11/21 05:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6640	16.6397	22.31	25.89	3.59	50.07	12:29
2	TOC	1.6408	16.4082	22.14	25.69	3.55	50.07	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	71	TOC	K1910838-001.01	2.5144 ppm	0.0110 ppm	0.4400%	2019/11/21 06:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5222	25.2223	28.46	32.00	3.54	50.06	12:25
2	TOC	2.5066	25.0661	28.35	31.91	3.56	50.04	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	72	TOC	K1910157-001.02 25x	3.1366 ppm	0.0614 ppm	1.9600%	2019/11/21 06:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0932	30.9320	32.55	36.29	3.73	50.04	12:30
2	TOC	3.1801	31.8008	33.18	36.83	3.65	50.08	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	73	TOC	K1910765-005.01	15.2500 ppm	0.1025 ppm	0.6700%	2019/11/21 07:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.3224	153.2241	120.24	123.86	3.61	50.04	12:28
2	TOC	15.1775	151.7751	119.20	122.83	3.63	50.07	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	74	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/21 08:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.59	10.23	3.63	50.01	12:28
2	TOC	0.0000	0.0000	6.47	10.16	3.69	50.02	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3749 (IC) (v1321)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.5480 ppm (PASS)	0.0000 ppm	0%	2019/11/21 08:36

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

	Type		#							Time
B	TOC	25 ppm	1	23.5480	235.4799	180.01	183.60	3.59	50.05	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/21 08:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.36	10.02	3.66	50.03	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1320	2.3307	1.7570	0.0000	0.0000	0.0000	2019/11/15 13:57	Fusion1 (Fusion1)
v1321	1.6360	1.5100	0.0000	0.0000	0.0000	2019/11/19 13:59	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version:	v27	Calibration curve formula:	TOC: y = 7.170x + 11.164
Ver Creation:	2019/03/11 21:51	r^2 value:	TOC: r^2 = 0.99991
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	10.4100	0.0000		2019/03/11 20:12

0.50 ppm	14.7740	0.5000		2019/03/11 20:28
1.00 ppm	18.0020	1.0000		2019/03/11 20:44
5.00 ppm	47.2310	5.0000		2019/03/11 21:01
10.0 ppm	85.1320	10.0000		2019/03/11 21:17
25.0 ppm	188.5200	25.0000		2019/03/11 21:33
50.0 ppm	370.1610	50.0000		2019/03/11 21:49

Methods

Name: Extended Reaction 021711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)
Ver Creation: 2019/01/31 11:21
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/11/21 09:10

StarLIMS Run: 660502, 660505, 660506, 660507

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-83C

21 % H3PO4: 11-GEN-05-83B

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By:	BLP	Date Analyzed:	11/19/19
Reviewed By:	[signature]	Date Reviewed:	11/21/19

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WorkOrder: HS19111065

LHAAP-16

Aptim Environmental & Infrastucture, Inc.

Susan Huang
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07-Dec-2019

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ALS WO# HS19111065

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December 04, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19111065**

Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 9 sample(s) on Nov 21, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19111065

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19111065-01	16RW01-191119	Groundwater		19-Nov-2019 07:25	21-Nov-2019 08:35	☐
HS19111065-02	16RW04-191119	Groundwater		19-Nov-2019 08:15	21-Nov-2019 08:35	☐
HS19111065-03	16RW04-191119-FD	Groundwater		19-Nov-2019 08:15	21-Nov-2019 08:35	☐
HS19111065-04	16WW26-191119	Groundwater		19-Nov-2019 09:10	21-Nov-2019 08:35	☐
HS19111065-05	16RW05-191119	Groundwater		19-Nov-2019 10:00	21-Nov-2019 08:35	☐
HS19111065-06	16RW02-191119	Groundwater		19-Nov-2019 10:45	21-Nov-2019 08:35	☐
HS19111065-07	16RW03-191119	Groundwater		19-Nov-2019 11:35	21-Nov-2019 08:35	☐
HS19111065-08	16IW09-191119	Groundwater		19-Nov-2019 12:25	21-Nov-2019 08:35	☐
HS19111065-09	16WW42-191119	Groundwater		19-Nov-2019 13:20	21-Nov-2019 08:35	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19111065

Work Order Comments

- The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

WetChemistry by Method SW9056

Batch ID: R351781

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW01-191119
Collection Date: 19-Nov-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19111065
Lab ID:HS19111065-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.520**		**0.150**	**0.500**	**0.500**	**mg/L**	5	04-Dec-2019 04:43
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2019 11:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW04-191119
Collection Date: 19-Nov-2019 08:15

ANALYTICAL REPORT
WorkOrder:HS19111065
Lab ID:HS19111065-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.660**		**0.150**	**0.500**	**0.500**	**mg/L**	5	04-Dec-2019 05:00
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2019 11:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW04-191119-FD
Collection Date: 19-Nov-2019 08:15

ANALYTICAL REPORT
WorkOrder:HS19111065
Lab ID:HS19111065-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.656**		**0.150**	**0.500**	**0.500**	**mg/L**	5	04-Dec-2019 05:16
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2019 11:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW26-191119
Collection Date: 19-Nov-2019 09:10

ANALYTICAL REPORT
WorkOrder:HS19111065
Lab ID:HS19111065-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.262**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	04-Dec-2019 10:32
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2019 11:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW05-191119
Collection Date: 19-Nov-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19111065
Lab ID:HS19111065-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**75.4**		**1.50**	**5.00**	**5.00**	**mg/L**	50	04-Dec-2019 05:50
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2019 11:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW02-191119
Collection Date: 19-Nov-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19111065
Lab ID:HS19111065-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.130**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	04-Dec-2019 10:49
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2019 11:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW03-191119
Collection Date: 19-Nov-2019 11:35

ANALYTICAL REPORT
WorkOrder:HS19111065
Lab ID:HS19111065-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.713**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	04-Dec-2019 11:05
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2019 11:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16IW09-191119
Collection Date: 19-Nov-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19111065
Lab ID:HS19111065-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**70.7**		**15.0**	**50.0**	**50.0**	**mg/L**	500	04-Dec-2019 07:13
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2019 11:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16WW42-191119
Collection Date: 19-Nov-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19111065
Lab ID:HS19111065-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.662**		**0.150**	**0.500**	**0.500**	**mg/L**	5	04-Dec-2019 07:29
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2019 11:02

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19111065

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R351528 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS19111065-01	16RW01-191119	19 Nov 2019 07:25			30 Nov 2019 11:02	1
HS19111065-02	16RW04-191119	19 Nov 2019 08:15			30 Nov 2019 11:02	1
HS19111065-03	16RW04-191119-FD	19 Nov 2019 08:15			30 Nov 2019 11:02	1
HS19111065-04	16WW26-191119	19 Nov 2019 09:10			30 Nov 2019 11:02	1
HS19111065-05	16RW05-191119	19 Nov 2019 10:00			30 Nov 2019 11:02	1
HS19111065-06	16RW02-191119	19 Nov 2019 10:45			30 Nov 2019 11:02	1
HS19111065-07	16RW03-191119	19 Nov 2019 11:35			30 Nov 2019 11:02	1
HS19111065-08	16IW09-191119	19 Nov 2019 12:25			30 Nov 2019 11:02	1
HS19111065-09	16WW42-191119	19 Nov 2019 13:20			30 Nov 2019 11:02	1
Batch ID: R351781 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19111065-01	16RW01-191119	19 Nov 2019 07:25			04 Dec 2019 04:43	5
HS19111065-02	16RW04-191119	19 Nov 2019 08:15			04 Dec 2019 05:00	5
HS19111065-03	16RW04-191119-FD	19 Nov 2019 08:15			04 Dec 2019 05:16	5
HS19111065-04	16WW26-191119	19 Nov 2019 09:10			04 Dec 2019 10:32	1
HS19111065-05	16RW05-191119	19 Nov 2019 10:00			04 Dec 2019 05:50	50
HS19111065-06	16RW02-191119	19 Nov 2019 10:45			04 Dec 2019 10:49	1
HS19111065-07	16RW03-191119	19 Nov 2019 11:35			04 Dec 2019 11:05	1
HS19111065-08	16IW09-191119	19 Nov 2019 12:25			04 Dec 2019 07:13	500
HS19111065-09	16WW42-191119	19 Nov 2019 13:20			04 Dec 2019 07:29	5

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19111065

QC BATCH REPORT

Batch ID: R351781 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **WBLKW2-120319** Units: **mg/L** Analysis Date: **04-Dec-2019 03:54**
Client ID: Run ID: **ICS-Integrion_351781** SeqNo: **5373567** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW2-120319** Units: **mg/L** Analysis Date: **04-Dec-2019 04:10**
Client ID: Run ID: **ICS-Integrion_351781** SeqNo: **5373568** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.86	0.100	4	0	96.5	80 - 120				

LCSD Sample ID: **WLCSDW2-120319** Units: **mg/L** Analysis Date: **04-Dec-2019 04:27**
Client ID: Run ID: **ICS-Integrion_351781** SeqNo: **5373569** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.856	0.100	4	0	96.4	80 - 120	3.86	0.127	20	

MS Sample ID: **HS19111065-09MS** Units: **mg/L** Analysis Date: **04-Dec-2019 07:46**
Client ID: **16WW42-191119** Run ID: **ICS-Integrion_351781** SeqNo: **5373581** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	9.392	0.500	10	0.6615	87.3	80 - 120				

MSD Sample ID: **HS19111065-09MSD** Units: **mg/L** Analysis Date: **04-Dec-2019 08:03**
Client ID: **16WW42-191119** Run ID: **ICS-Integrion_351781** SeqNo: **5373582** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	9.373	0.500	10	0.6615	87.1	80 - 120	9.392	0.197	20	

The following samples were analyzed in this batch:

HS19111065-01	HS19111065-02	HS19111065-03	HS19111065-04
HS19111065-05	HS19111065-06	HS19111065-07	HS19111065-08
HS19111065-09			

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19111065**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19111065

Date/Time Received: **21-Nov-2019 08:35**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature — 21-Nov-2019 Date

Reviewed by: *RJ Modashia* eSignature — 21-Nov-2019 Date

Matrices: **GW**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.9c U/C	IR11
Cooler(s)/Kit(s):	45371	
Date/Time sample(s) sent to storage:	11/21/19 15:05	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

Page 1 of ____

COC ID: 16NOV2019-LF1-1911__-ALS

TURNAROUND TIME:

RUSH:

PROJECT/CLIENT INFO			
Facility Name	Longhorn AAP		
Project Number	501032		
	LHAAP-16		
Address	1203-B East Grand Avenue		
	PMB 202		
City	Marshall	State	TX
Postal Code	75670	Country	USA
Phone Number	713.243.7264		
Project Manager	Praveen Srivastav		

LABORATORY			
Lab Name	ALS Laboratories		
Lab Contact	RJ Modashia		
Email	RJ.Modashia@alsglobal.com		
Address	10450 Stancliff Rd., Suite 210		
City	Houston	State	TX
Postal Code	77099	Country	USA
Phone Number	281.575.2279 or 281.530.5656		

OTHER INFO			
Email Invoice To	FedInvoices@aptim.com		
Email Report To	Susan.Huang@aptim.com		
Mail Reports To	Susan Huang		
Address	4005 Port Chicago Highway, Suite 200		
City	Concord	State	CA
Postal Code	94520	Country	USA
Shipping Company			

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	TOC by SM5310 (2-40ml Amber/H2SO4)	Bromide by SW9056 (1-250ml /Cool to 6 deg C)
16RW01-191119	LHAAP16				WG	11/19/19	0725	3		X	X
16RW04-191119	LHAAP16				WG	11/19/19	0815	3		X	X
16RW04-191119-FD	LHAAP16				WG	11/19/19	0815	3		X	X
16WW26-191119	LHAAP16				WG	11/19/19	0910	3		X	X
16RW05-191119	LHAAP16				WG	11/19/19	1000	3		X	X
16RW02-191119	LHAAP16				WG	11/19/19	1045	3		X	X
16RW03-191119	LHAAP16				WG	11/19/19	1135	3		X	X
16IW09-191119	LHAAP16				WG	11/19/19	1225	3		X	X
16WW42-191119	LHAAP16				WG	11/19/19	1320	3		X	X
16WW42-191119-MS	LHAAP16				WG	11/19/19	1320	3		X	X
16WW42-191119-MSD	LHAAP16				WG	11/19/19	1320	3		X	X

HS19111065

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
ULC 0.9 IR 11 C/F-0 45371	Smith Business/BHATE	11/20/19 1415	PG Nov/21/19	Nov/21/19 8:35

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45371

CUSTODY SEAL

Date: 11/20/19 Time: 1430
Name: Scott Beesinger
Company: WHETC

Seal Broken By: SW
Date: 11/21/19

45371

Must Deliver Next Business Day
Time and Tempature Sensitive!

45371

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 05NOV19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-16-BD 68473-RJ
AMA:

FedEx Express

FedEx
TRK# 0221 1251 0291 3761

THU - 21 NOV 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FTD 5187232 20NOV19 GGGA 66AC1/F33F/05A2

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
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F : +1 360 636 1068
www.alsglobal.com

November 27, 2019 **Analytical Report for Service Request No:** K1911033

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

RE: HS19111065

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory November 22, 2019
For your reference, these analyses have been assigned our service request number **K1911033.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
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www.alsglobal.com

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Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS19111065
Sample Matrix: Ground Water

Service Request: K1911033
Date Received: 11/22/2019

CASE NARRATIVE

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

Sample Receipt:

Nine ground water samples were received for analysis at ALS Environmental on 11/22/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

Method SM 5310 C, 11/24/2019: The Relative Percent Difference (RPD) for the replicate analysis of Total Organic Carbon in samples 16RW02-191119 and 16RW03-191119 was outside the normal ALS control limits. The associated QA/QC results (e.g. control sample, matrix spike, method blank, calibration standards, etc.) indicate the analysis was in control. No further corrective action was appropriate.

Approved by Kelley Lovejoy Date 11/27/2019

Chain of Custody

ALS Environmental—Kelso Laboratory
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K1911033

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

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12684**

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19111065
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19111065-01**	**16RW01-191119**	**Groundwater**	**19 Nov 2019 07:25**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
2.	**HS19111065-02**	**16RW04-191119**	**Groundwater**	**19 Nov 2019 08:15**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
3.	**HS19111065-03**	**16RW04-191119-FD**	**Groundwater**	**19 Nov 2019 08:15**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
4.	**HS19111065-04**	**16WW26-191119**	**Groundwater**	**19 Nov 2019 09:10**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
5.	**HS19111065-05**	**16RW05-191119**	**Groundwater**	**19 Nov 2019 10:00**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
6.	**HS19111065-06**	**16RW02-191119**	**Groundwater**	**19 Nov 2019 10:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
7.	**HS19111065-07**	**16RW03-191119**	**Groundwater**	**19 Nov 2019 11:35**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
8.	**HS19111065-08**	**16IW09-191119**	**Groundwater**	**19 Nov 2019 12:25**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
9.	**HS19111065-09**	**16WW42-191119** MS/MSD	**Groundwater**	**19 Nov 2019 13:20**

RIGHT SOLUTIONS | RIGHT PARTNER

Rec'd 11/22/19 0940

K1911033

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12684**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS19111065-09A = MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. MAMMY	Date/Time:	11/21/19 18:00
Received By:	[signature]	Date/Time:	11/22/19 0940
Cooler ID(s):		Temperature(s):	

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 11033

Received: 11/22/19 Opened: 11/22/19 By: CG Unloaded: 11/22/19 By: CG

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.6	-0.5	-0.2	-0.1	+0.1	360	12684	1251 0292 0914	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

otes, Discrepancies, & Resolutions: _____

RUSH

General Chemistry

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1911033
Project:	HS19111065	**Date Collected:**	11/19/19
Sample Matrix:	Ground Water	**Date Received:**	11/22/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16RW01-191119	K1911033-001	**3.66**	0.50	0.20	0.07	1	11/24/19 07:24	
16RW04-191119	K1911033-002	**2.81**	0.50	0.20	0.07	1	11/24/19 07:52	
16RW04-191119-FD	K1911033-003	**2.80**	0.50	0.20	0.07	1	11/24/19 08:20	
16WW26-191119	K1911033-004	**2.38**	0.50	0.20	0.07	1	11/24/19 08:48	
16RW05-191119	K1911033-005	**791**	10	4	2	20	11/24/19 09:16	
16RW02-191119	K1911033-006	**4.37**	0.50	0.20	0.07	1	11/24/19 09:44	
16RW03-191119	K1911033-007	**2.51**	0.50	0.20	0.07	1	11/24/19 10:12	
16IW09-191119	K1911033-008	**7820**	500	200	70	1000	11/24/19 10:41	
16WW42-191119	K1911033-009	**3.94**	0.50	0.20	0.07	1	11/24/19 11:09	
Method Blank	K1911033-MB	ND	0.50	0.20	0.07	1	11/24/19 02:41	U

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1911033
Project	HS19111065	**Date Collected:**	11/19/19
Sample Matrix:	Ground Water	**Date Received:**	11/22/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	LOQ	LOD	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16RW01-191119	K1911033-001DUP	0.50	0.20	0.07	3.66	3.65	3.65	<1	10	11/24/19
16RW04-191119	K1911033-002DUP	0.50	0.20	0.07	2.81	2.74	2.77	3	10	11/24/19
16RW04-191119-FD	K1911033-003DUP	0.50	0.20	0.07	2.80	2.76	2.78	1	10	11/24/19
16WW26-191119	K1911033-004DUP	0.50	0.20	0.07	2.38	2.31	2.35	3	10	11/24/19
16RW05-191119	K1911033-005DUP	10	4	2	791	775	783	2	10	11/24/19
16RW02-191119	K1911033-006DUP	0.50	0.20	0.07	4.37	3.18	3.77	31 *	10	11/24/19
16RW03-191119	K1911033-007DUP	0.50	0.20	0.07	2.51	2.24	2.37	11 *	10	11/24/19
16IW09-191119	K1911033-008DUP	500	200	70	7820	8010	7920	2	10	11/24/19
16WW42-191119	K1911033-009DUP	0.50	0.20	0.07	3.94	3.61	3.77	9	10	11/24/19

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1911033
Project:	HS19111065	**Date Collected:**	11/19/19
Sample Matrix:	Ground Water	**Date Received:**	11/22/19
		Date Analyzed:	11/24/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW42-191119	**Units:**	mg/L
Lab Code:	K1911033-009	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1911033-009MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	3.94	52.2	50.0	97	83-117

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1911033
Project:	HS19111065	**Date Analyzed:**	11/24/19
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	661077

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1911033-LCS	25.1	25.0	100	83-117

Client: ALS Environmental - US **Service Request:** K1911033
Project: HS19111065

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	661077	KQ1917447-01	11/24/19 02:11	25.0	24.6	98	90-110
CCV2	661077	KQ1917447-02	11/24/19 06:54	25.0	24.2	97	90-110
CCV3	661077	KQ1917447-03	11/24/19 11:51	25.0	24.7	99	90-110
CCV4	661077	KQ1917447-04	11/24/19 16:22	25.0	24.3	97	90-110

Client: ALS Environmental - US **Service Request:**K1911033
Project: HS19111065

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	661077	KQ1917447-05	11/24/19 02:26	0.50	0.20	0.07	ND	U
CCB2	661077	KQ1917447-06	11/24/19 07:09	0.50	0.20	0.07	ND	U
CCB3	661077	KQ1917447-07	11/24/19 12:06	0.50	0.20	0.07	0.23	J
CCB4	661077	KQ1917447-08	11/24/19 16:36	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) K1910680, 796, 847, 861, 929, 959, 11031, 11032, 11033, 10803, 11028, 11032, 11047, 11049, 975, 11043

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

Date Analyzed: 11/23/19

Analyst: BCV

Run # TOC: 661076, 661077, 661078 DOC: 661079

Analysis: TOC/DOC

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: K1910847-4/4d, K1910903-2/2d, 803-4/4d sent for CA due to being above calibration curve.
K1910903-3/3d, 803-5/5d sent for CA due to sample carry over.
K1911043-2 sent for CA due to being overdiluted.
K1910680-2/2d, 680-4/4d, 680-5/5d, 796-2/2d, 929-2/2d, 11031-1/1d, 11028-3/3d, and 10975-1/1d report a high %RSD. However these samples are less than 5x the MRL.
K1911033-6/6d, 11033-7/7d, 10803-3, 10803-5, 11047-1/1d report a high %RSD due to suspected non-homogenous samples.

Final Approved by: _____ Date: 11/26/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661076 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910680-001	Carbon, Total Organic	N/A		Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50			11/23/19 17:58	N	II
K1910680-002	Carbon, Total Organic	N/A		Water	0.30 mg/L	10 ml	0.30 mg/L J	1	0.07	0.50			11/23/19 18:26	N	II
K1910680-003	Carbon, Total Organic	N/A		Water	0.63 mg/L	10 ml	0.63 mg/L	1	0.07	0.50			11/23/19 18:54	N	II
K1910680-004	Carbon, Total Organic	N/A		Water	0.56 mg/L	10 ml	0.56 mg/L	1	0.07	0.50			11/23/19 19:22	N	II
K1910680-005	Carbon, Total Organic	N/A		Water	0.17 mg/L	10 ml	0.17 mg/L J	1	0.07	0.50			11/23/19 19:50	N	II
K1910796-001	Carbon, Total Organic	N/A		Ground Water	1.05 mg/L	10 ml	1.05 mg/L	1	0.07	0.50			11/23/19 21:30	N	IV
K1910796-002	Carbon, Total Organic	N/A		Ground Water	0.88 mg/L	10 ml	0.88 mg/L	1	0.07	0.50			11/23/19 21:59	N	IV
K1910796-003	Carbon, Total Organic	N/A		Ground Water	1.78 mg/L	10 ml	1.78 mg/L	1	0.07	0.50			11/23/19 22:27	N	IV
K1910796-004	Carbon, Total Organic	N/A		Ground Water	0.20 mg/L	10 ml	0.20 mg/L J	1	0.07	0.50			11/23/19 20:18	Y	IV
K1910847-001	Carbon, Total Organic	N/A		Ground Water	34.01 mg/L	10 ml	680 mg/L	20	2	10			11/23/19 22:55	N	IV
K1910847-002	Carbon, Total Organic	N/A		Ground Water	32.82 mg/L	10 ml	32.8 mg/L	1	0.07	0.50			11/23/19 23:23	N	IV
K1910847-003	Carbon, Total Organic	N/A		Ground Water	35.27 mg/L	10 ml	35.3 mg/L	1	0.07	0.50			11/23/19 23:51	N	IV
K1910847-004	Carbon, Total Organic	N/A		Ground Water	61.27 mg/L	10 ml	61.3 mg/L	1	0.07	0.50			11/24/19 00:19	N	IV
K1910861-001	Carbon, Total Organic	N/A		Water	7.26 mg/L	10 ml	726 mg/L	100	7	50			11/24/19 00:47	N	II
K1910861-002	Carbon, Total Organic	N/A		Water	5.98 mg/L	10 ml	598 mg/L	100	7	50			11/24/19 01:15	N	II
K1910861-003	Carbon, Total Organic	N/A		Water	5.96 mg/L	10 ml	596 mg/L	100	7	50			11/24/19 01:43	N	II
K1910861-004	Carbon, Total Organic	N/A		Water	7.78 mg/L	10 ml	778 mg/L	100	7	50			11/24/19 03:10	N	II
K1910861-005	Carbon, Total Organic	N/A		Water	7.46 mg/L	10 ml	746 mg/L	100	7	50			11/24/19 03:38	N	II
K1910861-006	Carbon, Total Organic	N/A		Water	10.75 mg/L	10 ml	1080 mg/L	100	7	50			11/24/19 04:06	N	II
K1910861-007	Carbon, Total Organic	N/A		Water	8.35 mg/L	10 ml	835 mg/L	100	7	50			11/24/19 04:34	N	II
KQ1917446-01	Carbon, Total Organic	CCV		Water	24.53 mg/L	10 ml	24.5 mg/L	1					11/23/19 16:45	N	II
KQ1917446-02	Carbon, Total Organic	CCV		Water	24.61 mg/L	10 ml	24.6 mg/L	1					11/23/19 21:01	N	II
KQ1917446-03	Carbon, Total Organic	CCV		Water	24.56 mg/L	10 ml	24.6 mg/L	1					11/24/19 02:11	N	II
KQ1917446-04	Carbon, Total Organic	CCV		Water	24.22 mg/L	10 ml	24.2 mg/L	1					11/24/19 06:54	N	II
KQ1917446-05	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/23/19 16:59	N	II
KQ1917446-06	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/23/19 21:15	N	II
KQ1917446-07	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 02:26	N	II
KQ1917446-08	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 07:09	N	II
KQ1917446-09	Carbon, Total Organic	MB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/23/19 17:14	N	II
KQ1917446-10	Carbon, Total Organic	LCS		Water	24.74 mg/L	10 ml	24.7 mg/L	1	0.07	0.50	99		11/23/19 17:29	N	II
KQ1917446-11	Carbon, Total Organic	MS	K1910796-004	Ground Water	22.48 mg/L	10 ml	22.5 mg/L	1	0.07	0.50	89		11/23/19 20:46	N	IV

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

11/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661076 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917446-12	Carbon, Total Organic	DUP	K1910680-001	Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50		2	11/23/19 17:58	N	II
KQ1917446-13	Carbon, Total Organic	DUP	K1910680-002	Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50		13*	11/23/19 18:26	N	II
KQ1917446-14	Carbon, Total Organic	DUP	K1910680-003	Water	0.61 mg/L	10 ml	0.61 mg/L	1	0.07	0.50		3	11/23/19 18:54	N	II
KQ1917446-15	Carbon, Total Organic	DUP	K1910680-004	Water	0.67 mg/L	10 ml	0.67 mg/L	1	0.07	0.50		17*	11/23/19 19:22	N	II
KQ1917446-16	Carbon, Total Organic	DUP	K1910680-005	Water	0.20 mg/L	10 ml	0.20 mg/L J	1	0.07	0.50		15*	11/23/19 19:50	N	II
KQ1917446-17	Carbon, Total Organic	DUP	K1910796-002	Ground Water	0.77 mg/L	10 ml	0.77 mg/L	1	0.07	0.50		14*	11/23/19 21:59	N	IV
KQ1917446-18	Carbon, Total Organic	DUP	K1910796-001	Ground Water	1.14 mg/L	10 ml	1.14 mg/L	1	0.07	0.50		8	11/23/19 21:30	N	IV
KQ1917446-19	Carbon, Total Organic	DUP	K1910796-003	Ground Water	1.75 mg/L	10 ml	1.75 mg/L	1	0.07	0.50		1	11/23/19 22:27	N	IV
KQ1917446-20	Carbon, Total Organic	DUP	K1910796-004	Ground Water	0.21 mg/L	10 ml	0.21 mg/L J	1	0.07	0.50		6	11/23/19 20:18	N	IV
KQ1917446-21	Carbon, Total Organic	DUP	K1910847-002	Ground Water	32.44 mg/L	10 ml	32.4 mg/L	1	0.07	0.50		1	11/23/19 23:23	N	IV
KQ1917446-22	Carbon, Total Organic	DUP	K1910847-001	Ground Water	33.78 mg/L	10 ml	676 mg/L	20	2	10		<1	11/23/19 22:55	N	IV
KQ1917446-23	Carbon, Total Organic	DUP	K1910847-003	Ground Water	34.76 mg/L	10 ml	34.8 mg/L	1	0.07	0.50		1	11/23/19 23:51	N	IV
KQ1917446-24	Carbon, Total Organic	DUP	K1910847-004	Ground Water	60.91 mg/L	10 ml	60.9 mg/L	1	0.07	0.50		<1	11/24/19 00:19	N	IV
KQ1917446-25	Carbon, Total Organic	DUP	K1910861-001	Water	6.74 mg/L	10 ml	674 mg/L	100	7	50		7	11/24/19 00:47	N	II
KQ1917446-26	Carbon, Total Organic	DUP	K1910861-002	Water	5.82 mg/L	10 ml	582 mg/L	100	7	50		3	11/24/19 01:15	N	II
KQ1917446-27	Carbon, Total Organic	DUP	K1910861-003	Water	5.90 mg/L	10 ml	590 mg/L	100	7	50		1	11/24/19 01:43	N	II
KQ1917446-28	Carbon, Total Organic	DUP	K1910861-004	Water	7.76 mg/L	10 ml	776 mg/L	100	7	50		<1	11/24/19 03:10	N	II
KQ1917446-29	Carbon, Total Organic	DUP	K1910861-005	Water	7.41 mg/L	10 ml	741 mg/L	100	7	50		<1	11/24/19 03:38	N	II
KQ1917446-30	Carbon, Total Organic	DUP	K1910861-006	Water	10.62 mg/L	10 ml	1060 mg/L	100	7	50		1	11/24/19 04:06	N	II
KQ1917446-31	Carbon, Total Organic	DUP	K1910861-007	Water	8.16 mg/L	10 ml	816 mg/L	100	7	50		2	11/24/19 04:34	N	II

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661077 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910929-001	Carbon, Total Organic	N/A		Water	1.49 mg/L	10 ml	1.49 mg/L	1	0.07	0.50			11/24/19 05:02	N	II
K1910929-002	Carbon, Total Organic	N/A		Water	0.79 mg/L	10 ml	0.79 mg/L	1	0.07	0.50			11/24/19 05:30	N	II
K1910929-003	Carbon, Total Organic	N/A		Water	1.91 mg/L	10 ml	1.91 mg/L	1	0.07	0.50			11/24/19 05:58	N	II
K1910969-002	Carbon, Total Organic	N/A		Drinking Water	1.16 mg/L	10 ml	1.16 mg/L	1	0.07	0.50			11/24/19 06:26	N	I
K1911031-001	Carbon, Total Organic	N/A		Water	0.90 mg/L	10 ml	0.90 mg/L	1	0.07	0.50			11/24/19 12:50	N	IV
K1911032-001	Carbon, Total Organic	N/A		Ground Water	1.54 mg/L	10 ml	1.54 mg/L	1	0.07	0.50			11/24/19 13:19	N	IV
K1911032-002	Carbon, Total Organic	N/A		Ground Water	1.55 mg/L	10 ml	1.55 mg/L	1	0.07	0.50			11/24/19 13:47	N	IV
K1911032-003	Carbon, Total Organic	N/A		Ground Water	1.59 mg/L	10 ml	1.59 mg/L	1	0.07	0.50			11/24/19 14:15	N	IV
K1911032-004	Carbon, Total Organic	N/A		Ground Water	2.02 mg/L	10 ml	2.02 mg/L	1	0.07	0.50			11/24/19 14:43	N	IV
K1911032-005	Carbon, Total Organic	N/A		Ground Water	4.63 mg/L	10 ml	1850 mg/L	400	30	200			11/24/19 15:11	N	IV
K1911032-006	Carbon, Total Organic	N/A		Ground Water	1.99 mg/L	10 ml	1.99 mg/L	1	0.07	0.50			11/24/19 15:39	N	IV
K1911033-001	Carbon, Total Organic	N/A		Ground Water	3.66 mg/L	10 ml	3.66 mg/L	1	0.07	0.50			11/24/19 07:24	N	IV
K1911033-002	Carbon, Total Organic	N/A		Ground Water	2.81 mg/L	10 ml	2.81 mg/L	1	0.07	0.50			11/24/19 07:52	N	IV
K1911033-003	Carbon, Total Organic	N/A		Ground Water	2.80 mg/L	10 ml	2.80 mg/L	1	0.07	0.50			11/24/19 08:20	N	IV
K1911033-004	Carbon, Total Organic	N/A		Ground Water	2.38 mg/L	10 ml	2.38 mg/L	1	0.07	0.50			11/24/19 08:48	N	IV
K1911033-005	Carbon, Total Organic	N/A		Ground Water	39.57 mg/L	10 ml	791 mg/L	20	2	10			11/24/19 09:16	N	IV
K1911033-006	Carbon, Total Organic	N/A		Ground Water	4.37 mg/L	10 ml	4.37 mg/L	1	0.07	0.50			11/24/19 09:44	N	IV
K1911033-007	Carbon, Total Organic	N/A		Ground Water	2.51 mg/L	10 ml	2.51 mg/L	1	0.07	0.50			11/24/19 10:12	N	IV
K1911033-008	Carbon, Total Organic	N/A		Ground Water	7.82 mg/L	10 ml	7820 mg/L	1000	70	500			11/24/19 10:41	N	IV
K1911033-009	Carbon, Total Organic	N/A		Ground Water	3.94 mg/L	10 ml	3.94 mg/L	1	0.07	0.50			11/24/19 11:09	Y	IV
KQ1917447-01	Carbon, Total Organic	CCV		Water	24.56 mg/L	10 ml	24.6 mg/L	1					11/24/19 02:11	N	II
KQ1917447-02	Carbon, Total Organic	CCV		Water	24.22 mg/L	10 ml	24.2 mg/L	1					11/24/19 06:54	N	II
KQ1917447-03	Carbon, Total Organic	CCV		Water	24.73 mg/L	10 ml	24.7 mg/L	1					11/24/19 11:51	N	II
KQ1917447-04	Carbon, Total Organic	CCV		Water	24.32 mg/L	10 ml	24.3 mg/L	1					11/24/19 16:22	N	II
KQ1917447-05	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 02:26	N	II
KQ1917447-06	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 07:09	N	II
KQ1917447-07	Carbon, Total Organic	CCB		Water	0.23 mg/L	10 ml	0.23 mg/L J	1	0.07	0.50			11/24/19 12:06	N	II
KQ1917447-08	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 16:36	N	II

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Results Summary

11/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661077 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917447-09	Carbon, Total Organic	MB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 02:41	N	II
KQ1917447-10	Carbon, Total Organic	LCS		Water	25.09 mg/L	10 ml	25.1 mg/L	1	0.07	0.50	100		11/24/19 02:55	N	II
KQ1917447-11	Carbon, Total Organic	MS	K1911033-009	Ground Water	26.11 mg/L	10 ml	52.2 mg/L	2	0.2	1.0	97		11/24/19 11:37	N	IV
KQ1917447-12	Carbon, Total Organic	DUP	K1910929-001	Water	1.39 mg/L	10 ml	1.39 mg/L	1	0.07	0.50		7	11/24/19 05:02	N	II
KQ1917447-13	Carbon, Total Organic	DUP	K1910929-002	Water	0.88 mg/L	10 ml	0.88 mg/L	1	0.07	0.50		11*	11/24/19 05:30	N	II
KQ1917447-14	Carbon, Total Organic	DUP	K1910929-003	Water	1.94 mg/L	10 ml	1.94 mg/L	1	0.07	0.50		2	11/24/19 05:58	N	II
KQ1917447-15	Carbon, Total Organic	DUP	K1910969-002	Drinking Water	1.11 mg/L	10 ml	1.11 mg/L	1	0.07	0.50		5	11/24/19 06:26	N	I
KQ1917447-16	Carbon, Total Organic	DUP	K1911031-001	Water	0.79 mg/L	10 ml	0.79 mg/L	1	0.07	0.50		13*	11/24/19 12:50	N	IV
KQ1917447-17	Carbon, Total Organic	DUP	K1911032-002	Ground Water	1.60 mg/L	10 ml	1.60 mg/L	1	0.07	0.50		3	11/24/19 13:47	N	IV
KQ1917447-18	Carbon, Total Organic	DUP	K1911032-001	Ground Water	1.42 mg/L	10 ml	1.42 mg/L	1	0.07	0.50		8	11/24/19 13:19	N	IV
KQ1917447-19	Carbon, Total Organic	DUP	K1911032-003	Ground Water	1.50 mg/L	10 ml	1.50 mg/L	1	0.07	0.50		5	11/24/19 14:15	N	IV
KQ1917447-20	Carbon, Total Organic	DUP	K1911032-004	Ground Water	1.87 mg/L	10 ml	1.87 mg/L	1	0.07	0.50		8	11/24/19 14:43	N	IV
KQ1917447-21	Carbon, Total Organic	DUP	K1911032-005	Ground Water	4.83 mg/L	10 ml	1930 mg/L	400	30	200		4	11/24/19 15:11	N	IV
KQ1917447-22	Carbon, Total Organic	DUP	K1911032-006	Ground Water	1.82 mg/L	10 ml	1.82 mg/L	1	0.07	0.50		9	11/24/19 15:39	N	IV
KQ1917447-23	Carbon, Total Organic	DUP	K1911033-001	Ground Water	3.65 mg/L	10 ml	3.65 mg/L	1	0.07	0.50		<1	11/24/19 07:24	N	IV
KQ1917447-24	Carbon, Total Organic	DUP	K1911033-002	Ground Water	2.74 mg/L	10 ml	2.74 mg/L	1	0.07	0.50		3	11/24/19 07:52	N	IV
KQ1917447-25	Carbon, Total Organic	DUP	K1911033-003	Ground Water	2.76 mg/L	10 ml	2.76 mg/L	1	0.07	0.50		1	11/24/19 08:20	N	IV
KQ1917447-26	Carbon, Total Organic	DUP	K1911033-004	Ground Water	2.31 mg/L	10 ml	2.31 mg/L	1	0.07	0.50		3	11/24/19 08:48	N	IV
KQ1917447-27	Carbon, Total Organic	DUP	K1911033-005	Ground Water	38.77 mg/L	10 ml	775 mg/L	20	2	10		2	11/24/19 09:16	N	IV
KQ1917447-28	Carbon, Total Organic	DUP	K1911033-006	Ground Water	3.18 mg/L	10 ml	3.18 mg/L	1	0.07	0.50		31*	11/24/19 09:44	N	IV
KQ1917447-29	Carbon, Total Organic	DUP	K1911033-007	Ground Water	2.24 mg/L	10 ml	2.24 mg/L	1	0.07	0.50		11*	11/24/19 10:12	N	IV
KQ1917447-30	Carbon, Total Organic	DUP	K1911033-008	Ground Water	8.01 mg/L	10 ml	8010 mg/L	1000	70	500		2	11/24/19 10:41	N	IV
KQ1917447-31	Carbon, Total Organic	DUP	K1911033-009	Ground Water	3.61 mg/L	10 ml	3.61 mg/L	1	0.07	0.50		9	11/24/19 11:09	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661078 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910803-001	Carbon, Total Organic	N/A		Water	43.43 mg/L	10 ml	43.4 mg/L	1	0.07	0.50			11/24/19 17:19	N	IV
K1910803-002	Carbon, Total Organic	N/A		Water	119.98 mg/L	10 ml	120 mg/L	1	0.07	0.50			11/24/19 17:47	N	IV
K1910803-003	Carbon, Total Organic	N/A		Water	21.79 mg/L	10 ml	21.8 mg/L	1	0.07	0.50			11/24/19 18:15	N	IV
K1910803-004	Carbon, Total Organic	N/A		Water	67.32 mg/L	10 ml	67.3 mg/L	1	0.07	0.50			11/24/19 18:43	N	IV
K1910803-005	Carbon, Total Organic	N/A		Water	39.95 mg/L	10 ml	39.9 mg/L	1	0.07	0.50			11/24/19 19:11	N	IV
K1910803-006	Carbon, Total Organic	N/A		Water	14.93 mg/L	10 ml	14.9 mg/L	1	0.07	0.50			11/24/19 19:40	N	IV
K1911028-001	Carbon, Total Organic	N/A		Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50			11/25/19 00:24	N	V
K1911028-002	Carbon, Total Organic	N/A		Water	22.10 mg/L	10 ml	22.1 mg/L	1	0.07	0.50			11/25/19 00:52	N	V
K1911028-003	Carbon, Total Organic	N/A		Water	0.73 mg/L	10 ml	0.73 mg/L	1	0.07	0.50			11/25/19 01:21	N	V
K1911028-004	Carbon, Total Organic	N/A		Water	1.41 mg/L	10 ml	1.41 mg/L	1	0.07	0.50			11/25/19 02:18	N	V
K1911028-005	Carbon, Total Organic	N/A		Water	1.44 mg/L	10 ml	1.44 mg/L	1	0.07	0.50			11/25/19 02:47	N	V
K1911032-007	Carbon, Total Organic	N/A		Ground Water	4.08 mg/L	10 ml	4.08 mg/L	1	0.07	0.50			11/24/19 16:51	Y	IV
K1911047-001	Carbon, Total Organic	N/A		Water	3.61 mg/L	10 ml	361 mg/L	100	7	50			11/24/19 20:08	N	II
K1911047-002	Carbon, Total Organic	N/A		Water	26.84 mg/L	10 ml	2680 mg/L	100	7	50			11/24/19 20:36	N	II
K1911049-001	Carbon, Total Organic	N/A		Water	4.21 mg/L	10 ml	84 mg/L	20	2	10			11/24/19 21:04	N	II
K1911049-002	Carbon, Total Organic	N/A		Water	9.04 mg/L	10 ml	181 mg/L	20	2	10			11/24/19 22:31	Y	II
K1911049-003	Carbon, Total Organic	N/A		Water	11.75 mg/L	10 ml	11.7 mg/L	1	0.07	0.50			11/24/19 23:28	N	II
K1911049-004	Carbon, Total Organic	N/A		Water	1.62 mg/L	10 ml	1.62 mg/L	1	0.07	0.50			11/24/19 23:56	N	II
KQ1917448-01	Carbon, Total Organic	CCV		Ground Water	24.73 mg/L	10 ml	24.7 mg/L	1					11/24/19 11:51	N	IV
KQ1917448-02	Carbon, Total Organic	CCV		Ground Water	24.32 mg/L	10 ml	24.3 mg/L	1					11/24/19 16:22	N	IV
KQ1917448-03	Carbon, Total Organic	CCV		Ground Water	24.63 mg/L	10 ml	24.6 mg/L	1					11/24/19 21:32	N	IV
KQ1917448-04	Carbon, Total Organic	CCV		Ground Water	24.22 mg/L	10 ml	24.2 mg/L	1					11/25/19 01:49	N	IV
KQ1917448-05	Carbon, Total Organic	CCV		Ground Water	24.12 mg/L	10 ml	24.1 mg/L	1					11/25/19 06:19	N	IV
KQ1917448-06	Carbon, Total Organic	CCB		Ground Water	0.23 mg/L	10 ml	0.23 mg/L J	1	0.07	0.50			11/24/19 12:06	N	IV
KQ1917448-07	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 16:36	N	IV
KQ1917448-08	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 21:47	N	IV
KQ1917448-09	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 02:04	N	IV
KQ1917448-10	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 06:34	N	IV
KQ1917448-11	Carbon, Total Organic	MB		Ground Water	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50			11/24/19 12:21	N	IV

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

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Results Summary

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661078 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917448-12	Carbon, Total Organic	LCS		Ground Water	24.93 mg/L	10 ml	24.9 mg/L	1	0.07	0.50	100		11/24/19 12:36	N	IV
KQ1917448-13	Carbon, Total Organic	MS	K1911032-007	Ground Water	26.35 mg/L	10 ml	52.7 mg/L	2	0.2	1.0	97		11/24/19 16:07	N	IV
KQ1917448-14	Carbon, Total Organic	MS	K1911049-002	Water	29.03 mg/L	10 ml	2900 mg/L	100	7	50	109		11/24/19 22:59	N	II
KQ1917448-15	Carbon, Total Organic	DUP	K1910803-002	Water	122.07 mg/L	10 ml	122 mg/L	1	0.07	0.50		2	11/24/19 17:47	N	IV
KQ1917448-16	Carbon, Total Organic	DUP	K1910803-003	Water	18.16 mg/L	10 ml	18.2 mg/L	1	0.07	0.50		18*	11/24/19 18:15	N	IV
KQ1917448-17	Carbon, Total Organic	DUP	K1910803-004	Water	69.64 mg/L	10 ml	69.6 mg/L	1	0.07	0.50		3	11/24/19 18:43	N	IV
KQ1917448-18	Carbon, Total Organic	DUP	K1910803-005	Water	22.58 mg/L	10 ml	22.6 mg/L	1	0.07	0.50		56*	11/24/19 19:11	N	IV
KQ1917448-19	Carbon, Total Organic	DUP	K1910803-006	Water	13.68 mg/L	10 ml	13.7 mg/L	1	0.07	0.50		9	11/24/19 19:40	N	IV
KQ1917448-20	Carbon, Total Organic	DUP	K1910803-001	Water	44.82 mg/L	10 ml	44.8 mg/L	1	0.07	0.50		3	11/24/19 17:19	N	IV
KQ1917448-21	Carbon, Total Organic	DUP	K1911028-003	Water	0.66 mg/L	10 ml	0.66 mg/L	1	0.07	0.50		11*	11/25/19 01:21	N	V
KQ1917448-22	Carbon, Total Organic	DUP	K1911028-004	Water	1.38 mg/L	10 ml	1.38 mg/L	1	0.07	0.50		2	11/25/19 02:18	N	V
KQ1917448-23	Carbon, Total Organic	DUP	K1911028-005	Water	1.42 mg/L	10 ml	1.42 mg/L	1	0.07	0.50		1	11/25/19 02:47	N	V
KQ1917448-24	Carbon, Total Organic	DUP	K1911028-001	Water	0.82 mg/L	10 ml	0.82 mg/L	1	0.07	0.50		9	11/25/19 00:24	N	V
KQ1917448-25	Carbon, Total Organic	DUP	K1911028-002	Water	21.52 mg/L	10 ml	21.5 mg/L	1	0.07	0.50		3	11/25/19 00:52	N	V
KQ1917448-26	Carbon, Total Organic	DUP	K1911032-007	Ground Water	4.18 mg/L	10 ml	4.18 mg/L	1	0.07	0.50		2	11/24/19 16:51	N	IV
KQ1917448-27	Carbon, Total Organic	DUP	K1911047-001	Water	3.03 mg/L	10 ml	303 mg/L	100	7	50		18*	11/24/19 20:08	N	II
KQ1917448-28	Carbon, Total Organic	DUP	K1911047-002	Water	26.76 mg/L	10 ml	2680 mg/L	100	7	50		<1	11/24/19 20:36	N	II
KQ1917448-29	Carbon, Total Organic	DUP	K1911049-001	Water	3.99 mg/L	10 ml	80 mg/L	20	2	10		5	11/24/19 21:04	N	II
KQ1917448-30	Carbon, Total Organic	DUP	K1911049-002	Water	8.98 mg/L	10 ml	179 mg/L	20	2	10		<1	11/24/19 22:31	N	II
KQ1917448-31	Carbon, Total Organic	DUP	K1911049-003	Water	11.81 mg/L	10 ml	11.8 mg/L	1	0.07	0.50		<1	11/24/19 23:28	N	II
KQ1917448-32	Carbon, Total Organic	DUP	K1911049-004	Water	1.50 mg/L	10 ml	1.50 mg/L	1	0.07	0.50		8	11/24/19 23:56	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661079 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910975-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50			11/25/19 05:08	N	I
K1910975-002	Carbon, Dissolved Organic (DOC)	N/A		Water	7.97 mg/L	10 ml	79.7 mg/L	10	0.7	5.0			11/25/19 04:40	N	I
K1911043-001	Carbon, Dissolved Organic (DOC)	N/A		Water	11.72 mg/L	10 ml	11700 mg/L	1000	70	500			11/25/19 03:44	N	II
K1911043-002.R01	Carbon, Dissolved Organic (DOC)	N/A		Water	-0.04 mg/L	10 ml	500 mg/L U	1000	70	500			11/25/19 04:12	N	II
KQ1917449-01	Carbon, Dissolved Organic (DOC)	CCV		Water	-0.04 mg/L	10 ml	-0.0368 mg/L	1					11/24/19 22:01	N	II
KQ1917449-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.12 mg/L	10 ml	24.1 mg/L	1					11/25/19 06:19	N	II
KQ1917449-03	Carbon, Dissolved Organic (DOC)	CCB		Water	24.68 mg/L	10 ml	24.7 mg/L	1	0.07	0.50			11/24/19 22:16	N	II
KQ1917449-04	Carbon, Dissolved Organic (DOC)	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 06:34	N	II
KQ1917449-05	Carbon, Dissolved Organic (DOC)	MB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 01:49	N	II
KQ1917449-06	Carbon, Dissolved Organic (DOC)	LCS		Water	24.22 mg/L	10 ml	24.2 mg/L	1	0.07	0.50	97		11/25/19 02:04	N	II
KQ1917449-07	Carbon, Dissolved Organic (DOC)	MS	K1910975-001	Water	26.58 mg/L	10 ml	26.6 mg/L	1	0.07	0.50	103		11/25/19 05:36	N	I
KQ1917449-08	Carbon, Dissolved Organic (DOC)	DUP	K1910975-001	Water	0.72 mg/L	10 ml	0.72 mg/L	1	0.07	0.50		21*	11/25/19 05:08	N	I
KQ1917449-09	Carbon, Dissolved Organic (DOC)	DUP	K1910975-002	Water	8.27 mg/L	10 ml	82.7 mg/L	10	0.7	5.0		4	11/25/19 04:40	N	I
KQ1917449-10	Carbon, Dissolved Organic (DOC)	DUP	K1911043-001	Water	11.71 mg/L	10 ml	11700 mg/L	1000	70	500		<1	11/25/19 03:44	N	II
KQ1917449-11	Carbon, Dissolved Organic (DOC)	DUP	K1911043-002	Water	-0.04 mg/L	10 ml	500 mg/L U	1000	70	500		NC	11/25/19 04:12	N	II

11/26/19

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

0.031	0.031	#DIV/0!	#DIV/0!	OBSERVATIONS	13	0.031
0.000				STD Deviation	0.08537	0
0.000				AVERAGE	0.03675	0
0.000				UCL	0.12213	0
0.000				LCL	-0.04862	0
0.000						0
0.270						ABOVE
0.177				OBSERVATIONS	1	ABOVE
0.000				STD Deviation	#DIV/0!	0
0.000				AVERAGE	0.03100	0
0.000				UCL	#DIV/0!	0
0.000				LCL	#DIV/0!	0
0.000						0
						0
				OBSERVATIONS	0	0
				STD Deviation	#DIV/0!	0
				AVERAGE	#DIV/0!	0
				UCL	#DIV/0!	0
				LCL	#DIV/0!	0
						0
						0
				OBSERVATIONS	0	0
				STD Deviation	#DIV/0!	0
				AVERAGE	#DIV/0!	0
						0
						0
						0
						0
						0
						0

11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.567	0.0368	24.5300	24.52995	24.5	11/23/2019
3	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/23/2019
4	mb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/23/2019
5	lcs	1	24.774	0.0368	24.7370	24.73695	24.7	11/23/2019
6	K1910680-001	1	0.394	0.0368	0.3575	0.35745	<0.5	11/23/2019
7	K1910680-001	1	0.400	0.0368	0.3632	0.36315	<0.5	11/23/2019
8	K1910680-002	1	0.336	0.0368	0.2995	0.29945	<0.5	11/23/2019
9	K1910680-002	1	0.301	0.0368	0.2638	0.26375	<0.5	11/23/2019
10	K1910680-003	1	0.665	0.0368	0.6281	0.62805	0.63	11/23/2019
11	K1910680-003	1	0.645	0.0368	0.6085	0.60845	0.6	11/23/2019
12	K1910680-004	1	0.598	0.0368	0.5611	0.56105	0.56	11/23/2019
13	K1910680-004	1	0.704	0.0368	0.6673	0.66725	0.67	11/23/2019
14	K1910680-005	1	0.209	0.0368	0.1722	0.17215	<0.5	11/23/2019
15	K1910680-005	1	0.237	0.0368	0.1999	0.19985	<0.5	11/23/2019
16	K1910796-004	1	0.235	0.0368	0.1982	0.19815	<0.5	11/23/2019
17	K1910796-004	1	0.247	0.0368	0.2103	0.21025	<0.5	11/23/2019
18	KQ1917446-11	1	22.520	0.0368	22.4829	22.48285	22.5	11/23/2019
19	ccv	1	24.651	0.0368	24.6140	24.61395	24.6	11/23/2019
20	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/23/2019
21	K1910796-001	1	1.085	0.0368	1.0481	1.04805	1.05	11/23/2019
22	K1910796-001	1	1.173	0.0368	1.1367	1.13665	1.1	11/23/2019
23	K1910796-002	1	0.917	0.0368	0.8806	0.88055	0.9	11/23/2019
24	K1910796-002	1	0.803	0.0368	0.7659	0.76585	0.77	11/23/2019
25	K1910796-003	1	1.814	0.0368	1.7772	1.77715	1.78	11/23/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

23 BKP 11/26/19 date time

Analyzed By: BKP	Date Analyzed 11/26/19
Reviewed By:	Date Reviewed 11/26/19

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1910796-003	1	1.791	0.0368	1.7545	1.75445	1.75	11/23/2019
27	K1910847-001	20	34.048	0.0368	34.0116	680.231	680.23	11/23/2019
28	K1910847-001	20	33.816	0.0368	33.7788	675.575	675.6	11/23/2019
29	K1910847-002	1	32.858	0.0368	32.8211	32.82105	32.8	11/23/2019
30	K1910847-002	1	32.481	0.0368	32.4447	32.44465	32.4	11/23/2019
31	K1910847-003	1	35.302	0.0368	35.2656	35.26555	35.3	11/23/2019
32	K1910847-003	1	34.801	0.0368	34.7641	34.76405	34.8	11/23/2019
33	K1910847-004	1	61.309	0.0368	61.2726	61.27255	61.3	11/24/2019
34	K1910847-004	1	60.948	0.0368	60.9109	60.91085	60.9	11/24/2019
35	K1910861-001	100	7.292	0.0368	7.2555	725.545	725.5	11/24/2019
36	K1910861-001	100	6.781	0.0368	6.7447	674.465	674.5	11/24/2019
37	K1910861-002	100	6.013	0.0368	5.9758	597.575	597.6	11/24/2019
38	K1910861-002	100	5.852	0.0368	5.8151	581.505	581.5	11/24/2019
39	K1910861-003	100	5.998	0.0368	5.9616	596.155	596.2	11/24/2019
40	K1910861-003	100	5.934	0.0368	5.8973	589.725	589.7	11/24/2019
41	ccv	1	24.592	0.0368	24.5555	24.55545	24.6	11/24/2019
42	ccb	1	0.031	0.0368	-0.0058	-0.00575	<0.5	11/24/2019
43	K1910861-004	100	7.819	0.0368	7.7823	778.225	778.2	11/24/2019
44	K1910861-004	100	7.801	0.0368	7.7640	776.395	776.4	11/24/2019
45	K1910861-005	100	7.497	0.0368	7.4601	746.005	746.0	11/24/2019
46	K1910861-005	100	7.442	0.0368	7.4053	740.525	740.5	11/24/2019
47	K1910861-006	100	10.791	0.0368	10.7546	1075.455	1075.5	11/24/2019
48	K1910861-006	100	10.652	0.0368	10.6153	1061.525	1061.5	11/24/2019
49	K1910861-007	100	8.384	0.0368	8.3476	834.755	834.8	11/24/2019
50	K1910861-007	100	8.194	0.0368	8.1568	815.675	815.7	11/24/2019

Analyzed By: BCD	Date Analyzed 11/23/19
Reviewed By:	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	24.259	0.0368	24.2227	24.22265	24.22	11/24/2019
52	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BCP	Date Analyzed 11/25/19
Reviewed By: [signature]	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.592	0.0368	24.5555	24.55545	24.6	11/24/2019
3	ccb	1	0.031	0.0368	-0.0058	-0.00575	<0.5	11/24/2019
4	mb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
5	lcs	1	25.123	0.0368	25.0866	25.08655	25.1	11/24/2019
6	K1910929-001	1	1.527	0.0368	1.4898	1.48975	1.49	11/24/2019
7	K1910929-001	1	1.429	0.0368	1.3918	1.39175	1.4	11/24/2019
8	K1910929-002	1	0.827	0.0368	0.7902	0.79015	1	11/24/2019
9	K1910929-002	1	0.919	0.0368	0.8820	0.88195	0.88	11/24/2019
10	K1910929-003	1	1.943	0.0368	1.9064	1.90635	1.91	11/24/2019
11	K1910929-003	1	1.976	0.0368	1.9391	1.93905	1.9	11/24/2019
12	K1910969-002	1	1.201	0.0368	1.1638	1.16375	1.16	11/24/2019
13	K1910969-002	1	1.147	0.0368	1.1100	1.10995	1.11	11/24/2019
14	ccv	1	24.259	0.0368	24.2227	24.22265	24.22	11/24/2019
15	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
16	K1911033-001	1	3.696	0.0368	3.6588	3.65875	3.7	11/24/2019
17	K1911033-001	1	3.684	0.0368	3.6472	3.64715	3.65	11/24/2019
18	K1911033-002	1	2.845	0.0368	2.8083	2.80825	2.8	11/24/2019
19	K1911033-002	1	2.775	0.0368	2.7385	2.73845	2.7	11/24/2019
20	K1911033-003	1	2.836	0.0368	2.7992	2.79915	2.80	11/24/2019
21	K1911033-003	1	2.795	0.0368	2.7582	2.75815	2.76	11/24/2019
22	K1911033-004	1	2.422	0.0368	2.3849	2.38485	2.4	11/24/2019
23	K1911033-004	1	2.347	0.0368	2.3104	2.31035	2.3	11/24/2019
24	K1911033-005	20	39.603	0.0368	39.5660	791.319	791.32	11/24/2019
25	K1911033-005	20	38.802	0.0368	38.7653	775.305	775.31	11/24/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BCP		Date Analyzed 11/23/19	
Reviewed By: [signature]		Date Reviewed 11/26/19	

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1911033-006	1	4.402	0.0368	4.3652	4.36515	4.37	11/24/2019
27	K1911033-006	1	3.221	0.0368	3.1843	3.18425	3.18	11/24/2019
28	K1911033-007	1	2.543	0.0368	2.5060	2.50595	2.5	11/24/2019
29	K1911033-007	1	2.273	0.0368	2.2363	2.23625	2.2	11/24/2019
30	K1911033-008	1000	7.861	0.0368	7.8241	7824.05	7824.1	11/24/2019
31	K1911033-008	1000	8.044	0.0368	8.0074	8007.35	8007.4	11/24/2019
32	K1911033-009	1	3.972	0.0368	3.9355	3.93545	3.9	11/24/2019
33	K1911033-009	1	3.647	0.0368	3.6099	3.60985	3.6	11/24/2019
34	KQ1917447-11	2	26.144	0.0368	26.1076	52.2151	52.2	11/24/2019
35	ccv	1	24.762	0.0368	24.7255	24.72545	24.7	11/24/2019
36	ccb	1	0.270	0.0368	0.2328	0.23275	<0.5	11/24/2019
37	K1911031-001	1	0.934	0.0368	0.8970	0.89695	0.9	11/24/2019
38	K1911031-001	1	0.826	0.0368	0.7890	0.78895	0.8	11/24/2019
39	K1911032-001	1	1.580	0.0368	1.5437	1.54365	1.5	11/24/2019
40	K1911032-001	1	1.458	0.0368	1.4216	1.42155	1.4	11/24/2019
41	K1911032-002	1	1.585	0.0368	1.5487	1.54865	1.5	11/24/2019
42	K1911032-002	1	1.638	0.0368	1.6012	1.60115	1.6	11/24/2019
43	K1911032-003	1	1.623	0.0368	1.5864	1.58635	1.6	11/24/2019
44	K1911032-003	1	1.541	0.0368	1.5038	1.50375	1.5	11/24/2019
45	K1911032-004	1	2.055	0.0368	2.0187	2.01865	2.0	11/24/2019
46	K1911032-004	1	1.904	0.0368	1.8668	1.86675	1.9	11/24/2019
47	K1911032-005	400	4.671	0.0368	4.6341	1853.62	1853.6	11/24/2019
48	K1911032-005	400	4.867	0.0368	4.8300	1931.98	1932.0	11/24/2019
49	K1911032-006	1	2.028	0.0368	1.9917	1.99165	2.0	11/24/2019
50	K1911032-006	1	1.861	0.0368	1.8238	1.82375	1.8	11/24/2019

Analyzed By:	BCD	Date Analyzed	11/23/19
Reviewed By:		Date Reviewed	11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	24.356	0.0368	24.3194	24.31935	24.32	11/24/2019
52	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BAP	Date Analyzed 11/23/19
Reviewed By:	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.762	0.0368	24.7255	24.72545	24.7	11/24/2019
3	ccb	1	0.270	0.0368	0.2328	0.23275	<0.5	11/24/2019
4	mb	1	0.177	0.0368	0.1406	0.14055	<0.5	11/24/2019
5	lcs	1	24.962	0.0368	24.9254	24.92535	24.9	11/24/2019
6	KQ1917448-13	2	26.387	0.0368	26.3507	52.7013	52.70	11/24/2019
7	ccv	1	24.356	0.0368	24.3194	24.31935	24.3	11/24/2019
8	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
9	K1911032-007	1	4.121	0.0368	4.0838	4.08375	4.08	11/24/2019
10	K1911032-007	1	4.215	0.0368	4.1781	4.17805	4.18	11/24/2019
11	K1910803-001	1	43.462	0.0368	43.4256	43.42555	43.4	11/24/2019
12	K1910803-001	1	44.855	0.0368	44.8186	44.81855	44.82	11/24/2019
13	K1910803-002	1	120.019	0.0368	119.9820	119.98195	119.98	11/24/2019
14	K1910803-002	1	122.103	0.0368	122.0664	122.06635	122.07	11/24/2019
15	K1910803-003	1	21.826	0.0368	21.7893	21.78925	21.8	11/24/2019
16	K1910803-003	1	18.201	0.0368	18.1638	18.16375	18.2	11/24/2019
17	K1910803-004	1	67.352	0.0368	67.3154	67.31535	67.32	11/24/2019
18	K1910803-004	1	69.680	0.0368	69.6435	69.64345	69.6	11/24/2019
19	K1910803-005	1	39.984	0.0368	39.9477	39.94765	39.9	11/24/2019
20	K1910803-005	1	22.612	0.0368	22.5756	22.57555	22.58	11/24/2019
21	K1910803-006	1	14.967	0.0368	14.9307	14.93065	14.93	11/24/2019
22	K1910803-006	1	13.722	0.0368	13.6848	13.68475	13.7	11/24/2019
23	K1911047-001	100	3.650	0.0368	3.6131	361.305	361.3	11/24/2019
24	K1911047-001	100	3.066	0.0368	3.0297	302.965	302.97	11/24/2019
25	K1911047-002	100	26.873	0.0368	26.8364	2683.635	2683.64	11/24/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BOP	Date Analyzed	11/23/19	
Reviewed By:	Date Reviewed	11/26/19	

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1911047-002	100	26.799	0.0368	26.7618	2676.175	2676.18	11/24/2019
27	K1911049-001	20	4.249	0.0368	4.2124	84.247	84.25	11/24/2019
28	K1911049-001	20	4.029	0.0368	3.9925	79.849	79.8	11/24/2019
29	ccv	1	24.669	0.0368	24.6320	24.63195	24.6	11/24/2019
30	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
31	K1911049-002	20	9.079	0.0368	9.0426	180.851	180.9	11/24/2019
32	K1911049-002	20	9.012	0.0368	8.9750	179.499	179.5	11/24/2019
33	KQ1917448-14	100	29.072	0.0368	29.0348	2903.475	2903.5	11/24/2019
34	K1911049-003	1	11.784	0.0368	11.7471	11.74705	11.7	11/24/2019
35	K1911049-003	1	11.848	0.0368	11.8116	11.81155	11.8	11/24/2019
36	K1911049-004	1	1.659	0.0368	1.6225	1.62245	1.6	11/24/2019
37	K1911049-004	1	1.541	0.0368	1.5039	1.50385	1.5	11/24/2019
38	K1911028-001	1	0.932	0.0368	0.8949	0.89485	0.9	11/25/2019
39	K1911028-001	1	0.858	0.0368	0.8217	0.82165	0.8	11/25/2019
40	K1911028-002	1	22.140	0.0368	22.1030	22.10295	22.1	11/25/2019
41	K1911028-002	1	21.561	0.0368	21.5239	21.52385	21.5	11/25/2019
42	K1911028-003	1	0.771	0.0368	0.7346	0.73455	0.7	11/25/2019
43	K1911028-003	1	0.696	0.0368	0.6592	0.65915	0.7	11/25/2019
44	ccv	1	24.254	0.0368	24.2171	24.21705	24.2	11/25/2019
45	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
46	K1911028-004	1	1.442	0.0368	1.4057	1.40565	1.4	11/25/2019
47	K1911028-004	1	1.412	0.0368	1.3753	1.37525	1.4	11/25/2019
48	K1911028-005	1	1.478	0.0368	1.4409	1.44085	1.4	11/25/2019
49	K1911028-005	1	1.461	0.0368	1.4244	1.42435	1.4	11/25/2019
50	ccv	1	24.161	0.0368	24.1246	24.12455	24.1	11/25/2019

Analyzed By: BH	Date Analyzed 11/23/19
Reviewed By: [signature]	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
52		1		0.0000	0.0000	0	<0.5	
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BKP	Date Analyzed 11/27/19
Reviewed By:	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	mb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
3	lcs	1	24.714	0.0368	24.6774	24.67735	24.7	11/24/2019
4	ccv	1	24.254	0.0368	24.2171	24.21705	24.2	11/25/2019
5	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
6	K1911043-001	1000	11.760	0.0368	11.7231	11723.05	11723.05	11/25/2019
7	K1911043-001	1000	11.743	0.0368	11.7062	11706.15	11706.2	11/25/2019
8	K1911043-002	1000	0.000	0.0368	-0.0368	-36.75	<0.5	11/25/2019
9	K1911043-002	1000	0.000	0.0368	-0.0368	-36.75	<0.5	11/25/2019
10	K1910975-002	10	8.002	0.0368	7.9657	79.6565	79.66	11/25/2019
11	K1910975-002	10	8.302	0.0368	8.2651	82.6505	82.7	11/25/2019
12	K1910975-001	1	0.922	0.0368	0.8852	0.88515	0.89	11/25/2019
13	K1910975-001	1	0.756	0.0368	0.7189	0.71885	0.72	11/25/2019
14	KQ1917449-07	1	26.613	0.0368	26.5764	26.57635	26.58	11/25/2019
15	ccv	1	24.161	0.0368	24.1246	24.12455	24.1	11/25/2019
16	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
17		1		0.0000	0.0000	0	<0.5	
18		1		0.0000	0.0000	0	<0.5	
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By:		Date Analyzed	11/23/19
Reviewed By:		Date Reviewed	11/26/19

TOC: 661076,
661077,
661078
DOC: 661079

Schedule: 11232019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/11/23 17:20 - Saturday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1910680-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1910680-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1910680-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1910680-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1910680-005.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1910796-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1910796-004.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1910796-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1910796-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1910796-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1910847-001.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1910847-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1910847-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1910847-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1910861-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1910861-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1910861-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1910861-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1910861-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1910861-006.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1910861-007.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1910929-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1910929-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1910929-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1910969-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1911033-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1911033-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1911033-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1911033-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1911033-005.03 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1911033-006.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1911033-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1911033-008.03 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1911033-009.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1911033-009.08 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Schedule: 11232019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1911031-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1911032-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1911032-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1911032-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1911032-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1911032-005.01 400x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1911032-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1911032-007.03 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1911032-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1910803-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1910803-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1910803-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1910803-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1910803-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1910803-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1911047-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1911047-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1911049-001.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	K1911049-002.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1911049-002.01 ms 100x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
61	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
62	Sample	K1911049-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1911049-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K1911028-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1911028-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K1911028-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	K1911028-004.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K1911028-005.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	FB 11/21/19	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
70	Sample	FB 11/22/19	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
71	Sample	K1911043-001.01 doc 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	K1911043-002.01 doc 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	K1910975-002.01 doc 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K1910975-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	K1910975-001.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
61	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 11232019
Saturday, November 23, 2019 02:23 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/11/26 09:09 - Tuesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11232019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8)		
Comment:			

11/26/19

Report Results

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/23 14:23

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.02	17.16	4.14	49.59	05:26
2	TC Clean	7.50	10.99	3.49	49.85	07:19
3	TC Clean	2.01	5.61	3.60	49.88	07:04
4	TC Clean	1.40	5.11	3.71	49.85	07:02

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/23 14:55

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.72	15.29	3.57	49.65	05:23

2	TC Clean	3.64	7.23	3.59	49.87	07:17
3	TC Clean	1.59	5.34	3.74	49.87	07:02
4	TC Clean	1.19	4.93	3.74	49.91	07:02

Sample Type: Clean From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/23 15:34

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.48	15.13	3.65	49.68	05:24
2	TC Clean	3.90	7.40	3.51	50.02	04:07
3	TC Clean	1.55	5.07	3.52	50.06	03:50
4	TC Clean	1.18	4.74	3.56	50.06	03:48

Sample Type: Blank (Creating v1323) From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/11/23 15:56

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.31	14.93	3.62	49.60	05:13
2	TC Clean	3.39	7.01	3.62	50.04	04:06
3	TC Clean	1.31	4.93	3.61	50.06	03:48
4	TC Clean	1.45	4.95	3.50	50.05	03:47
5	Reagent Blank	4.02	7.68	3.66	50.07	05:09
6	Acid Blank	1.14	4.93	3.79	49.74	05:31

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0324 ppm	0.0000 ppm	0.0000%	2019/11/23 16:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0324	0.3238	9.00	12.79	3.79	50.19	10:34

Dilution **Blank Contribution** **Method** **Calibration**

1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5667 ppm (PASS)	0.0000 ppm	0%	2019/11/23 16:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5667	245.6673	176.22	180.09	3.87	50.19	10:30

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

Sample Type: Check Standard --> CCB From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/23 16:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.20	10.93	3.73	50.19	10:29

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

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/23 17:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.91	9.77	3.86	50.22	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 8

	Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time

			(ppm)			(% dev)				
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.7737 ppm (PASS)	0.0000 ppm	0%	2019/11/23 17:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7737	247.7372	177.62	181.34	3.71	50.22	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0515 ppm	0.0000 ppm	0.0000%	2019/11/23 17:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0515	0.5154	9.13	12.75	3.61	50.28	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1910680-001.01	0.3971 ppm	0.0041 ppm	1.0200%	2019/11/23 17:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3942	3.9420	11.46	15.12	3.66	50.22	10:23
2	TOC	0.3999	3.9995	11.50	15.20	3.70	50.24	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1910680-002.01	0.3183 ppm	0.0252 ppm	7.9200%	2019/11/23 18:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3362	3.3616	11.07	14.56	3.49	50.27	10:28
2	TOC	0.3005	3.0051	10.82	14.32	3.50	50.24	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1910680-003.01	0.6550 ppm	0.0139 ppm	2.1200%	2019/11/23 18:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6648	6.6483	13.30	17.08	3.79	50.23	10:28
2	TOC	0.6452	6.4524	13.16	16.93	3.77	50.22	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1910680-004.01	0.6509 ppm	0.0751 ppm	11.5400%	2019/11/23 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5978	5.9780	12.84	16.55	3.71	50.24	10:25
2	TOC	0.7040	7.0402	13.56	17.06	3.50	50.21	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1910680-005.03	0.2227 ppm	0.0196 ppm	8.7900%	2019/11/23 19:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2089	2.0887	10.20	13.79	3.59	50.22	10:27
2	TOC	0.2366	2.3657	10.39	13.99	3.60	50.18	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1910796-004.01	0.2410 ppm	0.0085 ppm	3.5400%	2019/11/23 20:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2349	2.3495	10.38	14.07	3.70	50.17	10:30
2	TOC	0.2470	2.4703	10.46	14.10	3.64	50.21	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1910796-004.01 ms	22.5196 ppm	0.0000 ppm	0.0000%	2019/11/23 20:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	22.5196	225.1962	161.65	165.26	3.61	50.18	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6507 ppm (PASS)	0.0000 ppm	0%	2019/11/23 21:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6507	246.5070	176.79	180.47	3.68	50.17	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/23 21:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.20	10.96	3.76	50.20	10:30

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1910796-001.01	1.1291 ppm	0.0626 ppm	5.5400%	2019/11/23 21:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0848	10.8484	16.15	19.70	3.56	50.19	10:28
2	TOC	1.1734	11.7338	16.75	20.53	3.78	50.20	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1910796-002.01	0.8600 ppm	0.0811 ppm	9.4400%	2019/11/23 21:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9173	9.1734	15.01	18.72	3.71	50.17	10:29

2	TOC	0.8026	8.0257	14.23	17.85	3.62	50.21	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1910796-003.01	1.8026 ppm	0.0160 ppm	0.8900%	2019/11/23 22:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8139	18.1393	21.10	24.61	3.52	50.15	10:27
2	TOC	1.7912	17.9124	20.94	24.64	3.70	50.17	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1910847-001.01 20x	33.9319 ppm	0.1646 ppm	0.4900%	2019/11/23 22:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	34.0483	340.4830	239.90	243.51	3.61	50.13	10:25
2	TOC	33.8155	338.1553	238.32	242.06	3.74	50.17	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1910847-002.01	32.6696 ppm	0.2662 ppm	0.8100%	2019/11/23 23:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.8578	328.5780	231.82	235.44	3.62	50.13	10:29
2	TOC	32.4814	324.8140	229.27	232.83	3.57	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1910847-003.01	35.0515 ppm	0.3546 ppm	1.0100%	2019/11/23 23:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	35.3023	353.0229	248.41	251.92	3.51	50.15	10:24
2	TOC	34.8008	348.0081	245.01	248.71	3.70	50.19	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	16	TOC	K1910847-004.01	61.1285 ppm	0.2557 ppm	0.4200%	2019/11/24 00:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	61.3093	613.0929	424.95	428.74	3.79	50.16	10:26
2	TOC	60.9476	609.4762	422.49	426.28	3.78	50.18	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K1910861-001.01 100x	7.0368 ppm	0.3612 ppm	5.1300%	2019/11/24 00:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.2922	72.9217	58.28	62.10	3.82	50.15	10:27
2	TOC	6.7814	67.8141	54.82	58.35	3.54	50.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K1910861-002.01 100x	5.9322 ppm	0.1137 ppm	1.9200%	2019/11/24 01:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0125	60.1255	49.60	53.26	3.66	50.14	10:29
2	TOC	5.8518	58.5182	48.51	52.12	3.61	50.05	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K1910861-003.01 100x	5.9661 ppm	0.0454 ppm	0.7600%	2019/11/24 01:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.9983	59.9826	49.50	53.04	3.54	50.09	10:26
2	TOC	5.9340	59.3403	49.06	52.60	3.54	50.03	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5922 ppm (PASS)	0.0000 ppm	0%	2019/11/24 02:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5922	245.9222	176.39	179.84	3.44	50.03	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0310 ppm (PASS)	0.0000 ppm	0%	2019/11/24 02:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0310	0.3101	9.67	13.33	3.66	50.08	10:31

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/24 02:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.75	12.48	3.72	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.1233 ppm (PASS)	0.0000 ppm	0%	2019/11/24 02:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1233	251.2331	180.00	183.53	3.53	50.03	10:32

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1910861-004.01 100x	7.8099 ppm	0.0129 ppm	0.1700%	2019/11/24 03:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8190	78.1899	61.86	65.43	3.57	50.08	10:27
2	TOC	7.8007	78.0072	61.74	65.35	3.62	50.02	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1910861-005.01 100x	7.4694 ppm	0.0388 ppm	0.5200%	2019/11/24 03:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.4968	74.9680	59.67	63.39	3.72	50.08	10:26
2	TOC	7.4420	74.4200	59.30	62.89	3.59	50.04	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1910861-006.01 100x	10.7216 ppm	0.0985 ppm	0.9200%	2019/11/24 04:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.7913	107.9132	82.04	85.66	3.63	50.12	10:29
2	TOC	10.6520	106.5195	81.09	84.72	3.63	50.06	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1910861-007.01 100x	8.2889 ppm	0.1349 ppm	1.6300%	2019/11/24 04:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.3843	83.8426	65.70	69.24	3.54	50.09	10:26
2	TOC	8.1935	81.9348	64.40	67.94	3.54	50.10	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1910929-001.01	1.4775 ppm	0.0693 ppm	4.6900%	2019/11/24 05:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5265	15.2651	19.15	22.67	3.52	50.08	10:26
2	TOC	1.4285	14.2854	18.48	22.07	3.59	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1910929-002.01	0.8728 ppm	0.0649 ppm	7.4400%	2019/11/24 05:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8269	8.2688	14.40	17.92	3.52	50.11	10:29
2	TOC	0.9187	9.1866	15.02	18.57	3.55	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1910929-003.01	1.9595 ppm	0.0231 ppm	1.1800%	2019/11/24 05:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9431	19.4313	21.97	25.45	3.48	50.14	10:29
2	TOC	1.9758	19.7583	22.20	25.88	3.69	50.11	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1910969-002.01	1.1736 ppm	0.0380 ppm	3.2400%	2019/11/24 06:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2005	12.0049	16.93	20.49	3.56	50.15	10:28
2	TOC	1.1467	11.4671	16.57	20.16	3.59	50.15	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2594 ppm (PASS)	0.0000 ppm	0%	2019/11/24 06:54

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

	Type		#							Time
B	TOC	25 ppm	1	24.2594	242.5942	174.13	177.81	3.67	50.11	10:29

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

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/24 07:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.62	11.38	3.76	50.13	10:30

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1911033-001.03	3.6897 ppm	0.0082 ppm	0.2200%	2019/11/24 07:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6955	36.9550	33.87	37.44	3.58	50.10	10:30
2	TOC	3.6839	36.8386	33.79	37.44	3.65	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K1911033-002.03	2.8101 ppm	0.0494 ppm	1.7600%	2019/11/24 07:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8450	28.4502	28.10	31.78	3.68	50.13	10:24
2	TOC	2.7752	27.7519	27.62	31.38	3.76	50.10	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	K1911033-003.03	2.8154 ppm	0.0290 ppm	1.0300%	2019/11/24 08:20

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	2.8359	28.3589	28.03	31.72	3.68	50.10	10:27
2	TOC	2.7949	27.9493	27.76	31.45	3.69	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1911033-004.03	2.3843 ppm	0.0527 ppm	2.2100%	2019/11/24 08:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4216	24.2162	25.22	28.84	3.62	50.11	10:29
2	TOC	2.3471	23.4708	24.72	28.28	3.57	50.10	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1911033-005.03 20x	39.2024 ppm	0.5662 ppm	1.4400%	2019/11/24 09:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	39.6027	396.0271	277.60	281.33	3.73	50.11	10:27
2	TOC	38.8020	388.0202	272.17	276.09	3.92	50.14	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1911033-006.03	3.8114 ppm	0.8350 ppm	21.9100%	2019/11/24 09:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4019	44.0190	38.66	42.53	3.86	50.11	10:29
2	TOC	3.2210	32.2098	30.65	34.21	3.56	50.10	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1911033-007.03	2.4078 ppm	0.1907 ppm	7.9200%	2019/11/24 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5427	25.4272	26.04	29.72	3.67	50.12	10:29
2	TOC	2.2730	22.7298	24.21	27.75	3.54	50.10	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8608	78.6083	62.14	65.77	3.63	50.14	10:31
2	TOC	8.0441	80.4409	63.39	67.04	3.65	50.09	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1911033-009.08	3.8094 ppm	0.2302 ppm	6.0400%	2019/11/24 11:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9722	39.7217	35.75	39.38	3.63	50.12	10:30
2	TOC	3.6466	36.4659	33.54	37.02	3.49	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1911033-009.08 ms 2x	26.1443 ppm	0.0000 ppm	0.0000%	2019/11/24 11:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1443	261.4428	186.25	189.80	3.55	50.11	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.7622 ppm (PASS)	0.0000 ppm	0%	2019/11/24 11:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7622	247.6222	177.55	181.02	3.47	50.15	10:28

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.2695 ppm (PASS)	0.0000 ppm	0%	2019/11/24 12:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.2695	2.6952	11.29	14.85	3.56	50.13	10:34

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.1773 ppm	0.0000 ppm	0.0000%	2019/11/24 12:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1773	1.7735	9.99	13.72	3.73	50.13	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.9621 ppm (PASS)	0.0000 ppm	0%	2019/11/24 12:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.9621	249.6214	178.90	182.70	3.80	50.17	10:37

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K1911031-001.01	0.8797 ppm	0.0764 ppm	8.6800%	2019/11/24 12:50

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

1	TOC	0.9337	9.3369	15.12	18.87	3.75	50.14	10:29
2	TOC	0.8257	8.2570	14.39	18.18	3.79	50.17	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K1911032-001.01	1.5194 ppm	0.0864 ppm	5.6800%	2019/11/24 13:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5804	15.8042	19.51	23.29	3.78	50.19	10:28
2	TOC	1.4583	14.5830	18.68	22.26	3.58	50.20	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K1911032-002.01	1.6117 ppm	0.0371 ppm	2.3000%	2019/11/24 13:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5854	15.8543	19.55	22.98	3.44	50.25	10:28
2	TOC	1.6379	16.3788	19.90	23.42	3.52	50.20	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1911032-003.01	1.5818 ppm	0.0584 ppm	3.6900%	2019/11/24 14:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6231	16.2315	19.80	23.26	3.46	50.22	10:25
2	TOC	1.5405	15.4050	19.24	22.79	3.54	50.25	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1911032-004.01	1.9794 ppm	0.1074 ppm	5.4300%	2019/11/24 14:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0554	20.5538	22.74	26.37	3.63	50.21	10:30
2	TOC	1.9035	19.0350	21.70	25.32	3.61	50.22	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1911032-005.01 400x	4.7687 ppm	0.1385 ppm	2.9100%	2019/11/24 15:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6708	46.7076	40.49	43.95	3.46	50.26	10:28
2	TOC	4.8667	48.6669	41.82	45.56	3.74	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1911032-006.01	1.9445 ppm	0.1188 ppm	6.1100%	2019/11/24 15:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0284	20.2842	22.55	26.14	3.58	50.27	10:31
2	TOC	1.8605	18.6048	21.41	25.06	3.65	50.23	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1911032-007.03 ms 2x	26.3874 ppm	0.0000 ppm	0.0000%	2019/11/24 16:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.3874	263.8736	187.90	191.52	3.62	50.24	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3561 ppm (PASS)	0.0000 ppm	0%	2019/11/24 16:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3561	243.5606	174.79	178.42	3.63	50.26	10:33

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/24 16:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.48	11.05	3.57	50.24	10:31

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	K1911032-007.03	4.1677 ppm	0.0667 ppm	1.6000%	2019/11/24 16:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1205	41.2052	36.75	40.48	3.73	50.22	10:28
2	TOC	4.2148	42.1480	37.39	40.98	3.59	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K1910803-001.01	44.1588 ppm	0.9849 ppm	2.2300%	2019/11/24 17:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	43.4623	434.6235	303.80	307.50	3.70	50.24	10:26
2	TOC	44.8553	448.5526	313.26	317.05	3.79	50.20	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	K1910803-002.01	121.0609 ppm	1.4739 ppm	1.2200%	2019/11/24 17:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	120.0187	1200.1870	823.46	827.29	3.83	50.25	10:28
2	TOC	122.1031	1221.0313	837.61	842.19	4.58	50.24	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	51	TOC	K1910803-003.01	20.0133 ppm	2.5636 ppm	12.8100%	2019/11/24 18:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.8260	218.2603	156.94	161.38	4.44	50.17	10:27
2	TOC	18.2005	182.0049	132.33	136.43	4.11	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K1910803-004.01	68.5161 ppm	1.6462 ppm	2.4000%	2019/11/24 18:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	67.3521	673.5207	465.97	469.89	3.93	50.19	10:27
2	TOC	69.6802	696.8016	481.77	488.04	6.27	50.15	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K1910803-005.01	31.2983 ppm	12.2840 ppm	39.2500%	2019/11/24 19:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	39.9844	399.8441	280.20	285.79	5.59	50.18	10:30
2	TOC	22.6123	226.1228	162.27	166.53	4.26	50.14	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	K1910803-006.01	14.3445 ppm	0.8810 ppm	6.1400%	2019/11/24 19:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.9674	149.6740	110.38	114.24	3.86	50.18	10:28
2	TOC	13.7215	137.2151	101.92	105.81	3.89	50.14	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	K1911047-001.01 100x	3.3581 ppm	0.4125 ppm	12.2800%	2019/11/24 20:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6498	36.4983	33.56	37.32	3.76	50.14	10:27
2	TOC	3.0664	30.6644	29.60	33.16	3.56	50.17	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1911047-002.01 100x	26.8358 ppm	0.0527 ppm	0.2000%	2019/11/24 20:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.8731	268.7307	191.20	194.84	3.64	50.13	10:25
2	TOC	26.7985	267.9853	190.69	194.42	3.73	50.17	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1911049-001.01 20x	4.1392 ppm	0.1555 ppm	3.7600%	2019/11/24 21:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2491	42.4913	37.63	41.27	3.65	50.16	10:28
2	TOC	4.0292	40.2918	36.13	39.75	3.61	50.12	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6687 ppm (PASS)	0.0000 ppm	0%	2019/11/24 21:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6687	246.6868	176.91	180.57	3.66	50.17	10:34

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

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/24 21:47

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

	Type									
D	TOC	0 ppm	1	0.0000	0.0000	8.80	12.38	3.58	50.14	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/24 22:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.03	11.47	3.43	50.10	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.7141 ppm (PASS)	0.0000 ppm	0%	2019/11/24 22:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7141	247.1405	177.22	180.81	3.59	50.14	10:30

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1911049-002.01 20x	9.0455 ppm	0.0478 ppm	0.5300%	2019/11/24 22:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0793	90.7931	70.41	74.08	3.66	50.15	10:27
2	TOC	9.0117	90.1169	69.96	73.45	3.50	50.14	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	60	TOC	K1911049-002.01 ms 100x	29.0715 ppm	0.0000 ppm	0.0000%	2019/11/24 22:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.0715	290.7153	206.12	209.76	3.64	50.16	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/24 23:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.92	11.64	3.72	50.14	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K1911049-003.01	11.8161 ppm	0.0456 ppm	0.3900%	2019/11/24 23:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.7838	117.8381	88.77	92.40	3.62	50.11	10:31
2	TOC	11.8483	118.4834	89.21	92.81	3.60	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	K1911049-004.01	1.5999 ppm	0.0839 ppm	5.2400%	2019/11/24 23:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6592	16.5924	20.05	23.59	3.54	50.11	10:30
2	TOC	1.5406	15.4065	19.24	22.81	3.57	50.13	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K1911028-001.04	0.8950 ppm	0.0518 ppm	5.7800%	2019/11/25 00:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9316	9.3163	15.11	18.58	3.47	50.15	10:28
2	TOC	0.8584	8.5841	14.61	18.06	3.45	50.11	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC)	CAS_salt_010711	CAS_salt_010711

(v1323) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	65	TOC	K1911028-002.04	21.8501 ppm	0.4095 ppm	1.8700%	2019/11/25 00:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	22.1397	221.3968	159.07	162.59	3.52	50.14	10:29
2	TOC	21.5606	215.6056	155.14	158.84	3.70	50.12	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	K1911028-003.04	0.7336 ppm	0.0533 ppm	7.2700%	2019/11/25 01:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7713	7.7134	14.02	17.61	3.59	50.10	10:26
2	TOC	0.6959	6.9591	13.51	17.14	3.64	50.14	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2538 ppm (PASS)	0.0000 ppm	0%	2019/11/25 01:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2538	242.5382	174.10	177.84	3.74	50.11	10:29

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/25 02:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.19	9.91	3.72	50.09	10:33

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	K1911028-004.04	1.4272 ppm	0.0215 ppm	1.5000%	2019/11/25 02:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4424	14.4239	18.58	22.17	3.60	50.13	10:29
2	TOC	1.4120	14.1204	18.37	22.07	3.70	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	68	TOC	K1911028-005.04	1.4693 ppm	0.0117 ppm	0.7900%	2019/11/25 02:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4776	14.7759	18.81	22.49	3.68	50.15	10:28
2	TOC	1.4611	14.6110	18.70	22.34	3.64	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	69	TOC	FB 11/21/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 03:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.76	9.25	3.49	50.12	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	70	TOC	FB 11/22/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 03:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.79	9.29	3.50	50.13	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◈	71	TOC	K1911043-001.01 doc 1000x	11.7513 ppm	0.0120 ppm	0.1000%	2019/11/25 03:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.7598	117.5980	88.61	92.27	3.66	50.11	10:29
2	TOC	11.7429	117.4286	88.49	92.16	3.67	50.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1911043-002.01 doc 1000x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 04:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.79	11.41	3.62	50.11	10:29
2	TOC	0.0000	0.0000	7.15	10.87	3.72	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K1910975-002.01 doc 10x	8.1521 ppm	0.2117 ppm	2.6000%	2019/11/25 04:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.0024	80.0240	63.10	66.61	3.51	50.14	10:30
2	TOC	8.3018	83.0176	65.14	68.78	3.64	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K1910975-001.01 doc	0.8387 ppm	0.1176 ppm	14.0200%	2019/11/25 05:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9219	9.2190	15.04	18.69	3.65	50.11	10:26
2	TOC	0.7556	7.5558	13.91	17.48	3.57	50.12	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	75	TOC	K1910975-001.01 ms doc	26.6131 ppm	0.0000 ppm	0.0000%	2019/11/25 05:36

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

1	TOC	26.6131	266.1305	189.43	193.03	3.60	50.14	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 05:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.23	10.93	3.70	50.12	10:28
2	TOC	0.0000	0.0000	6.73	10.14	3.40	50.11	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1613 ppm (PASS)	0.0000 ppm	0%	2019/11/25 06:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1613	241.6131	173.47	177.17	3.70	50.11	10:33

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/25 06:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.86	9.52	3.65	50.12	10:29

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1322	1.2997	0.8410	0.0000	0.0000	0.0000	2019/11/21 13:13	Fusion1 (Fusion1)
v1323	1.3397	1.1360	0.0000	0.0000	0.0000	2019/11/23 16:30	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
Ver Creation: 2019/03/05 17:42
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 6.788x + 9.463
r^2 value: TOC: r^2 = 0.99963

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Ver Creation: 2019/02/21 17:57
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7

PreSpargeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/11/25 06:49

StarLIMS Run: 661076, 661077, 661078, 661079

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-83D

21 % H3PO4: 11-GEN-05-83B

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

23 [illegible] 11/26/19

Analyzed By: [illegible]	Date Analyzed: 11/26/19
Reviewed By: [illegible]	Date Reviewed: 11/26/19

HS19111065 Wet Chem Raw Data

ALS WO# HS19111065

Sequence: 120219
Last Update Operator: alshs.nouser

HS19111065

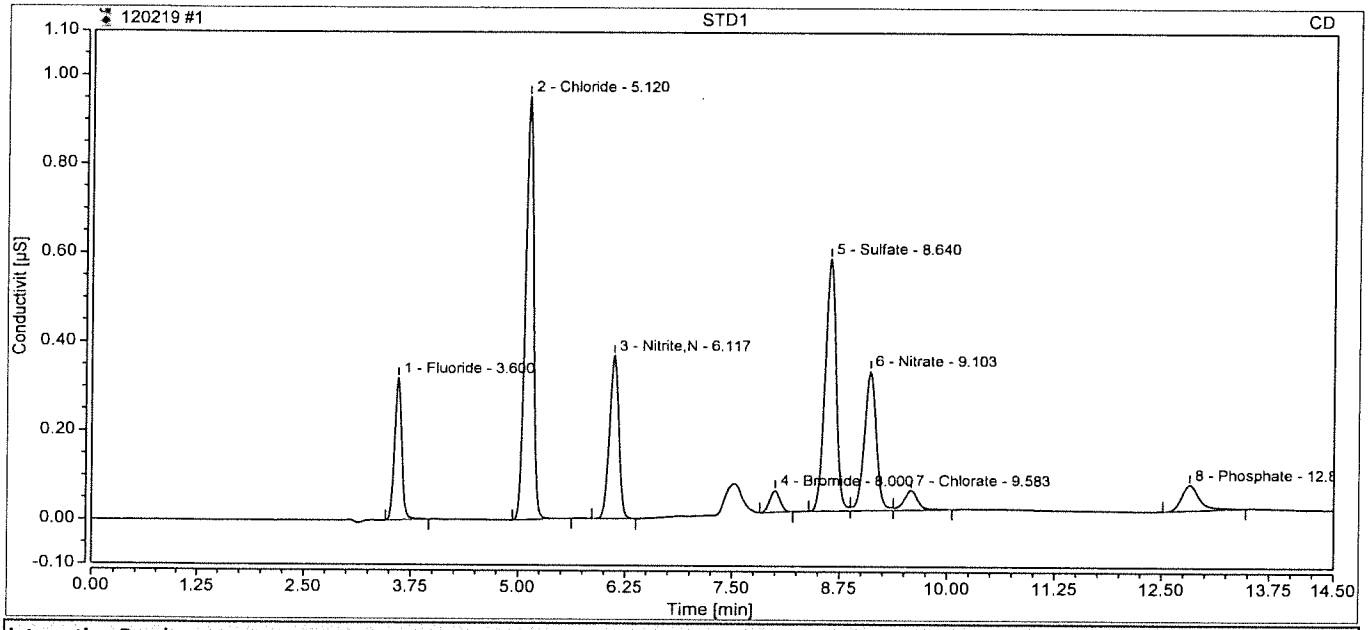
CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	me	Status	Inject Time
	STD1	2970209205	Calibration	GA1	1.0000	1	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:08:06 PM -05:00
	STD2		Calibration	GA2	1.0000	2	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:24:42 PM -05:00
	STD3		Calibration	GA3	1.0000	3	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:41:19 PM -05:00
	STD4		Calibration	GA4	1.0000	4	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:57:54 PM -05:00
	STD5		Calibration	GA5	1.0000	5	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 3:14:30 PM -05:00
	STD6	F, NO2 MAX 10PPM	Calibration	GB8	1.0000	6	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:37:32 PM -05:00
	ICV	2970209123	Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:54:07 PM -05:00
	ICB		Unknown	GB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 7:29:52 PM -05:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 3:20:49 AM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 3:37:26 AM -06:00
	WBLKW2-120319		Unknown	RD7	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 3:54:01 AM -06:00
	WLCSW2-120319		Unknown	RD8	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 4:10:36 AM -06:00
	WLCSDW2-120319		Unknown	RE1	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 4:27:12 AM -06:00
	HS19111065-01DF5		Unknown	RE2	5.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 4:43:48 AM -06:00
	HS19111065-02DF5		Unknown	RE3	5.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 5:00:23 AM -06:00
	HS19111065-03DF5		Unknown	RE4	5.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 5:16:57 AM -06:00
	HS19111065-04DF5		Unknown	RE5	5.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 5:33:32 AM -06:00
	HS19111065-05DF50	matrix	Unknown	RE6	50.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 5:50:08 AM -06:00
	HS19111065-06DF5		Unknown	RE7	5.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 6:06:43 AM -06:00
	HS19111065-07DF5		Unknown	RE8	5.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 6:23:18 AM -06:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 6:39:54 AM -06:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 6:56:32 AM -06:00
	HS19111065-08DF500	matrix	Unknown	GA1	500.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 7:13:12 AM -06:00
	HS19111065-09DF5		Unknown	GA2	5.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 7:29:49 AM -06:00
	HS19111065-09MSDF5		Unknown	GA3	5.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 7:46:24 AM -06:00
	HS19111065-09MSDDF5		Unknown	GA4	5.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 8:03:02 AM -06:00
	HS19111401-01DF10		Unknown	GA5	10.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 8:19:38 AM -06:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 9:59:15 AM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 10:15:57 AM -06:00
	HS19111065-04		Unknown	GB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 10:32:38 AM -06:00
	HS19111065-06		Unknown	GC1	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 10:49:14 AM -06:00
	HS19111065-07		Unknown	GC2	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 11:05:53 AM -06:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 1:02:13 PM -06:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/4/2019 1:18:50 PM -06:00

Peak No.	Peak Name	Cal.Type	Eval.Type	Number of Points	Rel.Std.Dev. %	Coeff.of Determination	C0 (Offset)	C1 (Slope)	C2 (Curve)
1	*Fluoride*	*Lin, WithOffset, 1/*	*Area*	*5*	*10.1532*	*0.99927*	*-0.0056*	*0.3716*	*0.0000*
2	Chloride	Lin, WithOffset, 1/	Area	6	0.2804	1.00000	-0.0135	0.2355	0.0000
3	Nitrite,N	Lin, WithOffset, 1/	Area	5	15.1147	0.99824	0.0003	0.5120	0.0000
4	Bromide	Lin, WithOffset, 1/	Area	6	14.0217	0.99919	-0.0052	0.1009	0.0000
5	Sulfate	Lin, WithOffset, 1/	Area	6	1.1258	0.99999	-0.0022	0.1717	0.0000
6	Nitrate	Lin, WithOffset, 1/	Area	6	2.2249	0.99998	-0.0102	0.5876	0.0000
7	Chlorate	Lin, WithOffset, 1/	Area	6	10.0265	0.99953	-0.0024	0.0944	0.0000
8	Phosphate	Lin, WithOffset, 1/	Area	6	6.6198	0.99981	-0.0110	0.2321	0.0000
Maximum					**15.1147**	1.00000			
Minimum					0.2804	**0.99824**			

1 STD1

Sample Name:	**STD1**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:08**	*Sample Weight:*	**1.0000**

Run Time:



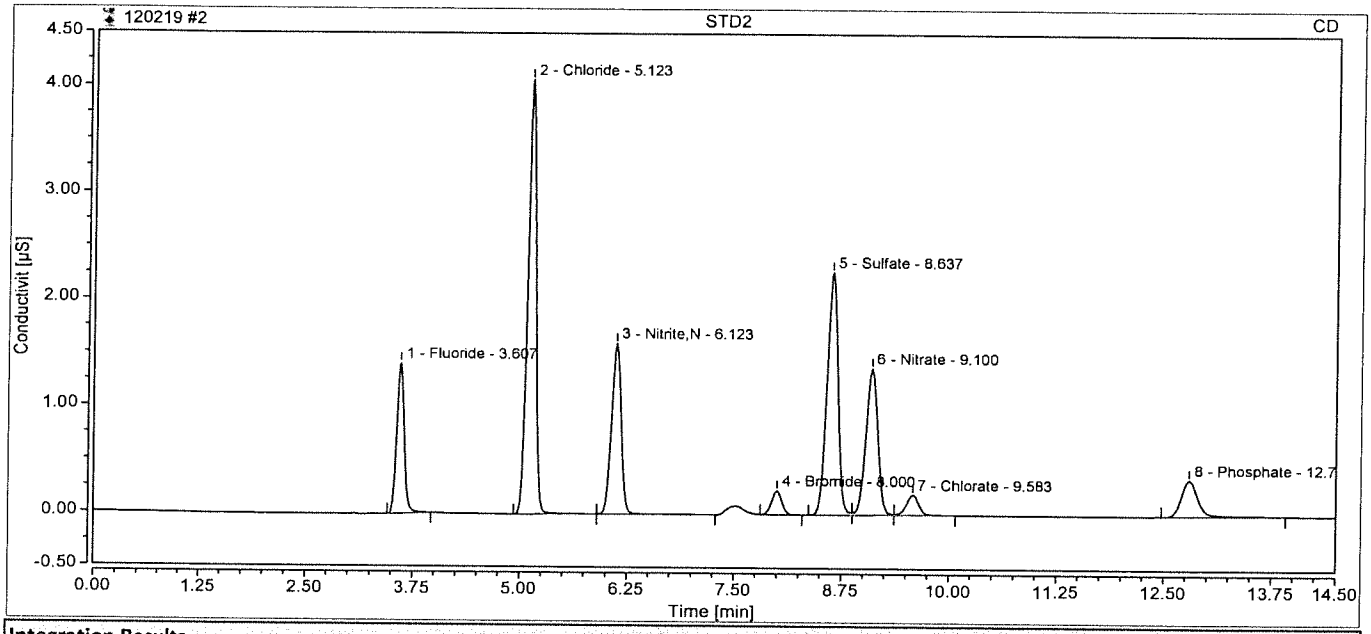
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.031	0.0973	0.0973	1.0000
2	5.12	Chloride	BMB	0.105	0.5026	0.5026	1.0000
3	6.12	Nitrite,N	BMB	0.046	0.0893	0.0893	1.0000
4	8.00	Bromide	BMB	0.007	0.1192	0.1192	1.0000
5	8.64	Sulfate	BM	0.084	0.5042	0.5042	1.0000
6	9.10	Nitrate	M	0.051	0.1034	0.1034	1.0000
7	9.58	Chlorate	MB	0.008	0.1143	0.1143	1.0000
8	12.83	Phosphate	BMB	0.014	0.1085	0.1085	1.0000
Total:			**0.000**	**0.346**		**1.64**	

2 *STD2*

Sample Name:	**STD2**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:24**	*Sample Weight:*	**1.0000**

Run Time:



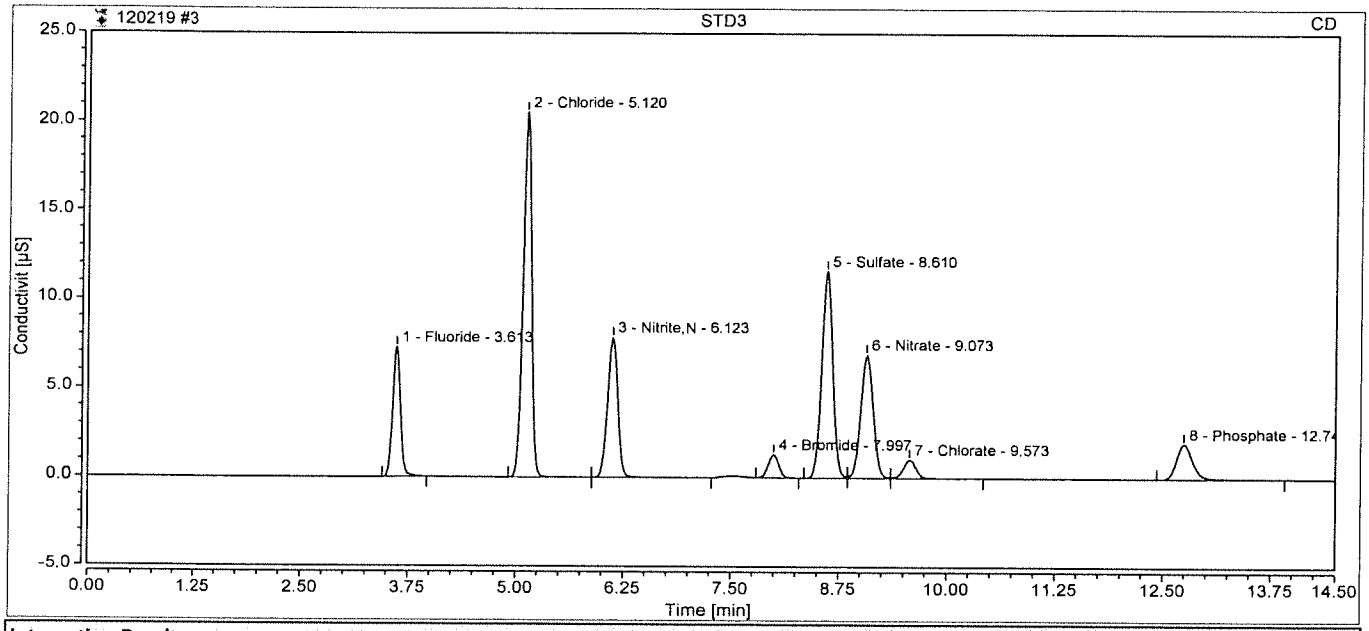
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.140	0.3929	0.3929	1.0000
2	5.12	Chloride	BMB	0.456	1.9918	1.9918	1.0000
3	6.12	Nitrite,N	BMB	0.211	0.4119	0.4119	1.0000
4	8.00	Bromide	BMB	0.031	0.3593	0.3593	1.0000
5	8.64	Sulfate	BM	0.337	1.9733	1.9733	1.0000
6	9.10	Nitrate	M	0.220	0.3917	0.3917	1.0000
7	9.58	Chlorate	MB	0.033	0.3704	0.3704	1.0000
8	12.80	Phosphate	BMB	0.078	0.3841	0.3841	1.0000
Total:			**0.000**	**1.506**		**6.28**	

3 STD3

Sample Name:	**STD3**	*Injection Volume:*	**5.00**
Vial Number:	**GA3**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:41**	*Sample Weight:*	**1.0000**

Run Time:



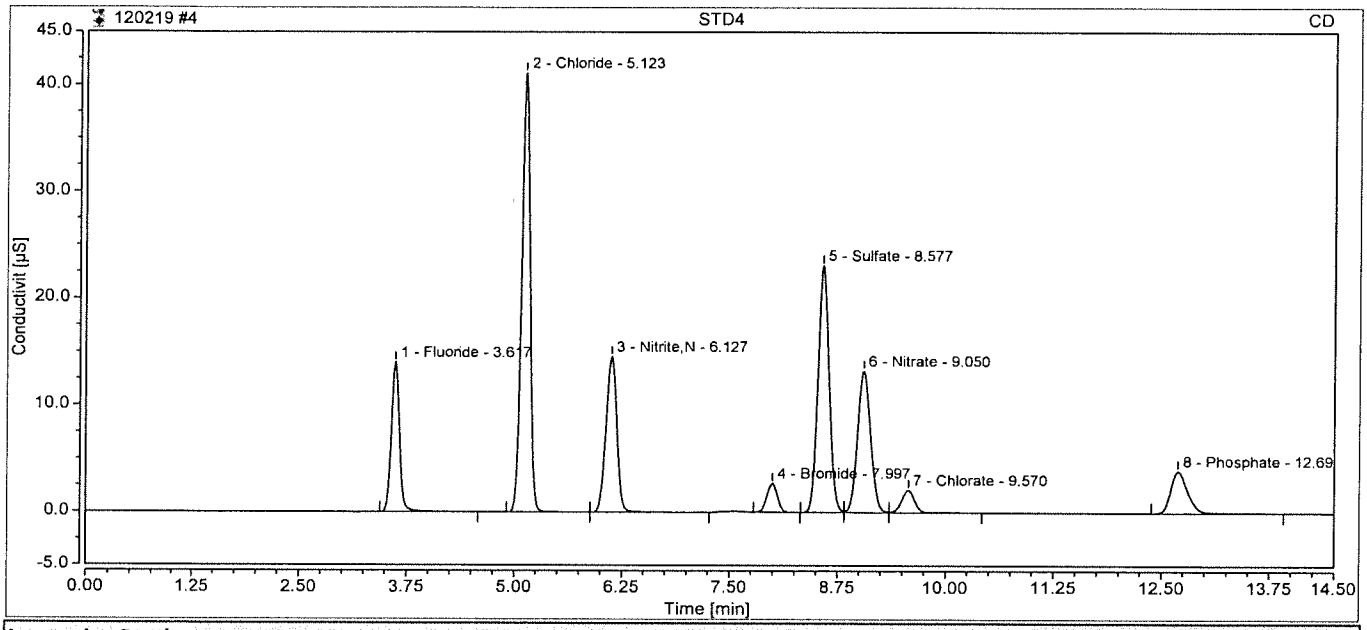
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.758	2.0551	2.0551	1.0000
2	5.12	Chloride	BMB	2.339	9.9888	9.9888	1.0000
3	6.12	Nitrite,N	BMB	1.091	2.1305	2.1305	1.0000
4	8.00	Bromide	BMB	0.182	1.8590	1.8590	1.0000
5	8.61	Sulfate	BM	1.715	10.0007	10.0007	1.0000
6	9.07	Nitrate	M	1.153	1.9792	1.9792	1.0000
7	9.57	Chlorate	MB	0.176	1.8940	1.8940	1.0000
8	12.75	Phosphate	BMB	0.436	1.9269	1.9269	1.0000
Total:			**0.000**	**7.851**		**31.83**	

4 STD4

Sample Name:	**STD4**	*Injection Volume:*	**5.00**
Vial Number:	**GA4**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:57**	*Sample Weight:*	**1.0000**

Run Time:



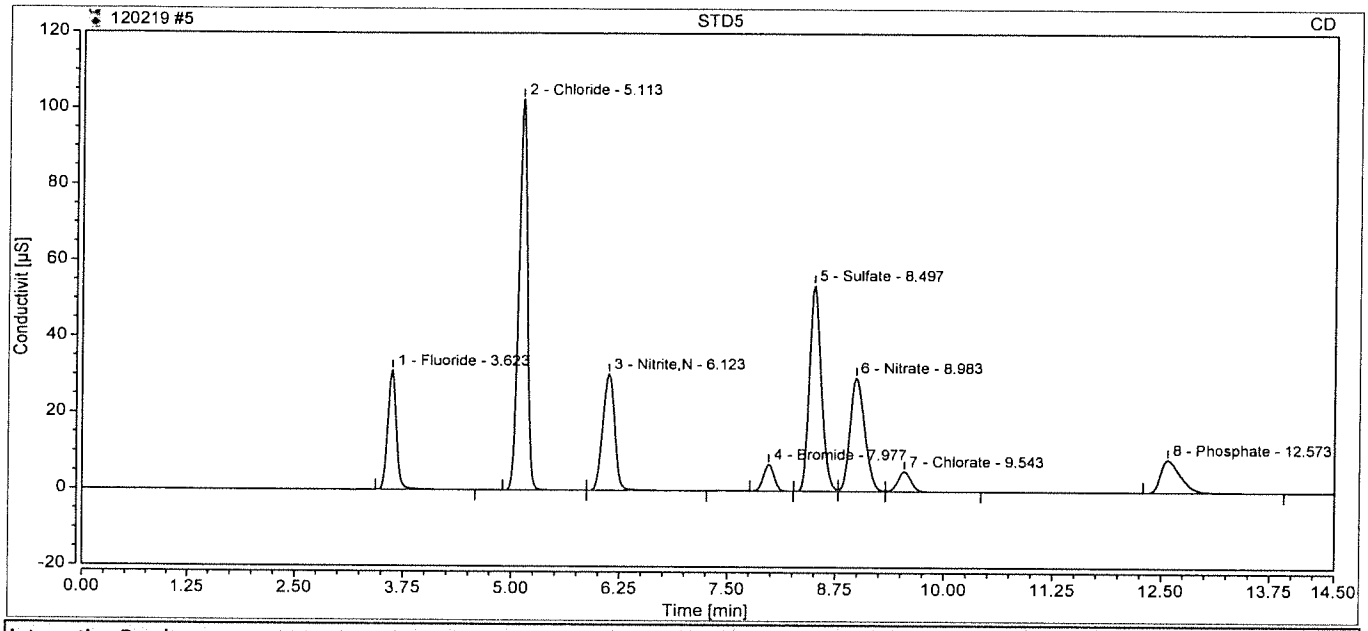
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.535	4.1457	4.1457	1.0000
2	5.12	Chloride	BMB	4.695	19.9948	19.9948	1.0000
3	6.13	Nitrite,N	BMB	2.133	4.1659	4.1659	1.0000
4	8.00	Bromide	BMB	0.385	3.8642	3.8642	1.0000
5	8.58	Sulfate	BM	3.451	20.1082	20.1082	1.0000
6	9.05	Nitrate	M	2.330	3.9823	3.9823	1.0000
7	9.57	Chlorate	MB	0.365	3.8956	3.8956	1.0000
8	12.69	Phosphate	BMB	0.903	3.9395	3.9395	1.0000
Total:			**0.000**	**15.798**		**64.10**	

5 STD5

Sample Name:	**STD5**	*Injection Volume:*	**5.00**
Vial Number:	**GA5**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 15:14**	*Sample Weight:*	**1.0000**

Run Time:

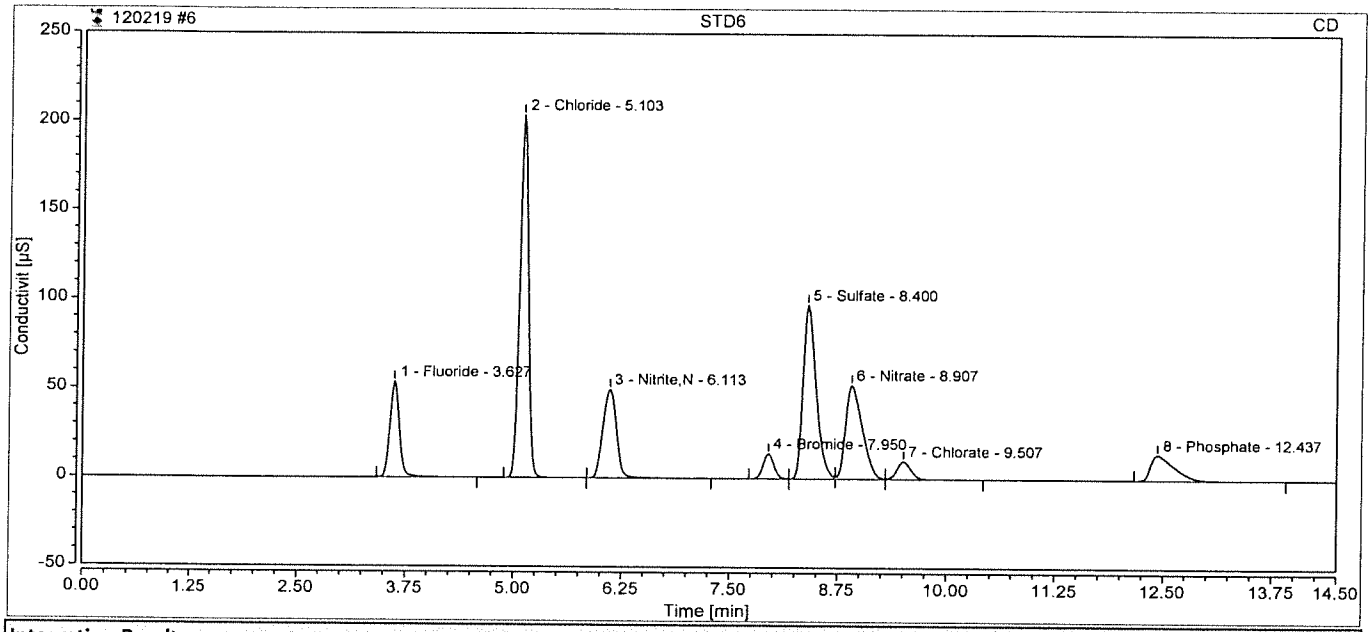


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.639	9.8090	9.8090	1.0000
2	5.11	Chloride	BMB	11.762	49.9996	49.9996	1.0000
3	6.12	Nitrite,N	BMB	4.968	9.7023	9.7023	1.0000
4	7.98	Bromide	BMB	1.001	9.9786	9.9786	1.0000
5	8.50	Sulfate	BM	8.590	50.0271	50.0271	1.0000
6	8.98	Nitrate	M	5.854	9.9805	9.9805	1.0000
7	9.54	Chlorate	MB	0.939	9.9670	9.9670	1.0000
8	12.57	Phosphate	BMB	2.305	9.9803	9.9803	1.0000
Total:			**0.000**	**39.057**		**159.44**	

6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:37**	*Sample Weight:*	**1.0000**
Run Time:			

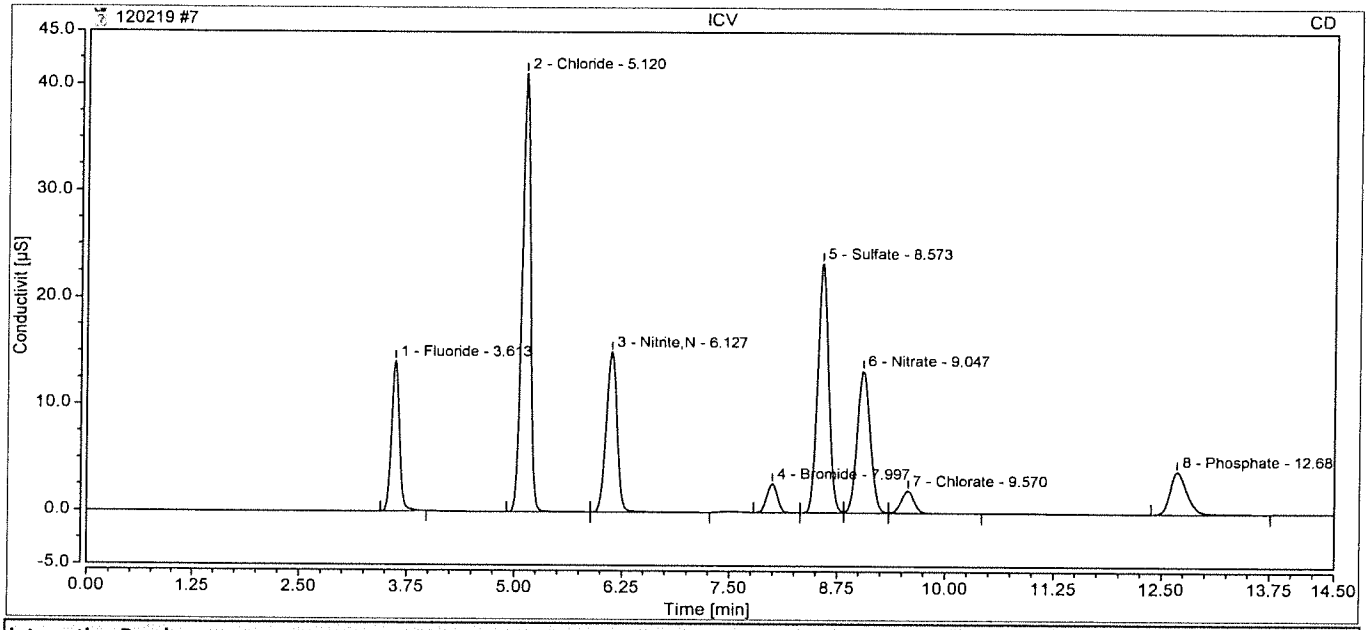


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	6.773	18.2418	18.2418	1.0000
2	5.10	Chloride	BMB	23.542	100.0224	100.0224	1.0000
3	6.11	Nitrite,N	BMB	9.157	17.8850	17.8850	1.0000
4	7.95	Bromide	BM	2.045	20.3197	20.3197	1.0000
5	8.40	Sulfate	M	17.153	99.8863	99.8863	1.0000
6	8.91	Nitrate	M	11.778	20.0629	20.0629	1.0000
7	9.51	Chlorate	MB	1.910	20.2586	20.2586	1.0000
8	12.44	Phosphate	BMB	4.668	20.1606	20.1606	1.0000
Total:			**0.000**	**77.025**		**316.84**	

7 ICV

Sample Name:	**ICV**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:54**	*Sample Weight:*	**1.0000**
Run Time:			

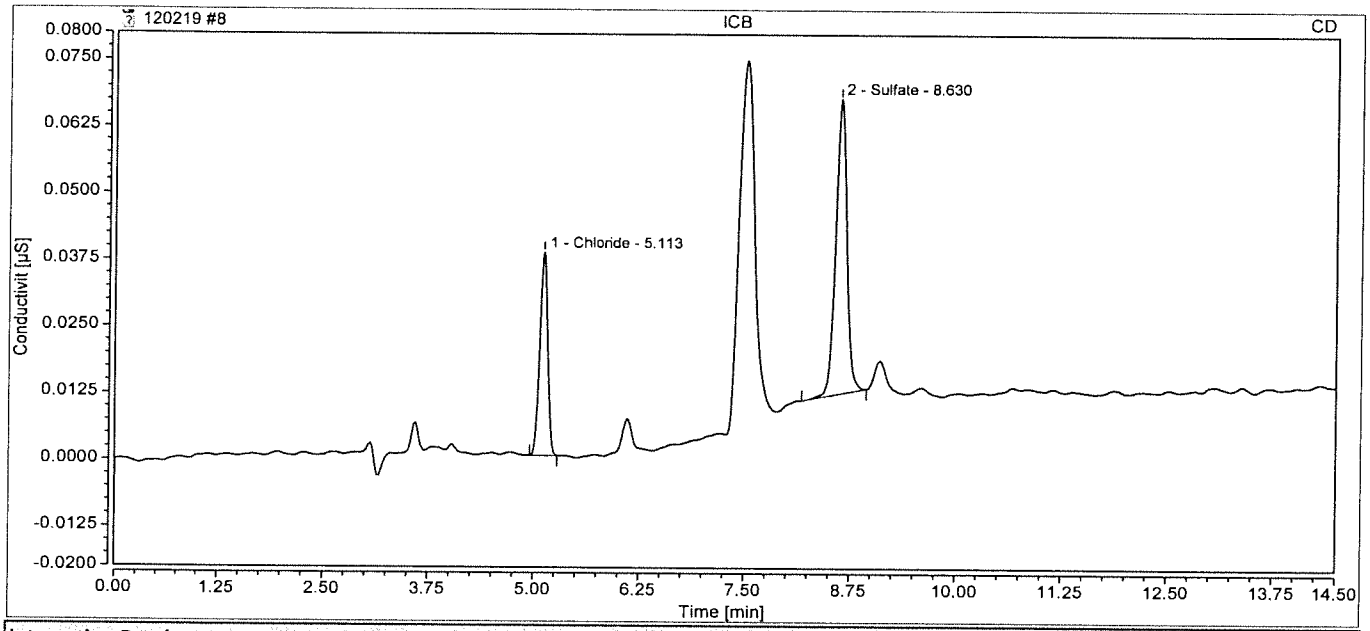


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.495	4.0374	4.0374	1.0000
2	5.12	Chloride	BMB	4.681	19.9333	19.9333	1.0000
3	6.13	Nitrite,N	BMB	2.195	4.2858	4.2858	1.0000
4	8.00	Bromide	BMB	0.384	3.8585	3.8585	1.0000
5	8.57	Sulfate	BM	3.469	20.2132	20.2132	1.0000
6	9.05	Nitrate	M	2.340	3.9993	3.9993	1.0000
7	9.57	Chlorate	MB	0.367	3.9104	3.9104	1.0000
8	12.68	Phosphate	BMB	0.911	3.9732	3.9732	1.0000
Total:			**0.000**	**15.841**		**64.21**	

8 ICB

Sample Name:	**ICB**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 19:29**	*Sample Weight:*	**1.0000**
Run Time:			

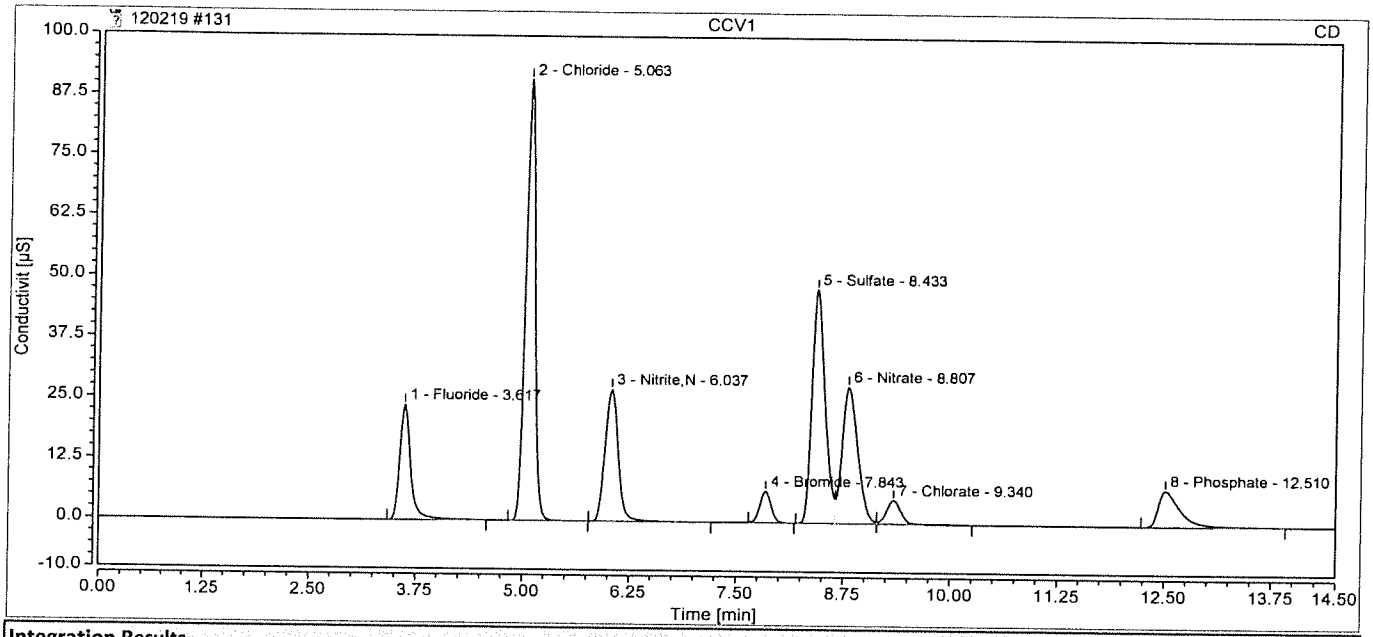


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.11	Chloride	BMB	0.004	0.0748	0.0748	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.63	Sulfate	BMB	0.008	0.0618	0.0618	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.013**		**0.14**	

131 CCV1

Sample Name:	CCV1	Injection Volume:	5.00
Vial Number:	BA7	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	1.0000
Recording Time:	12/04/2019 03:20	Sample Weight:	1.0000
Run Time:			

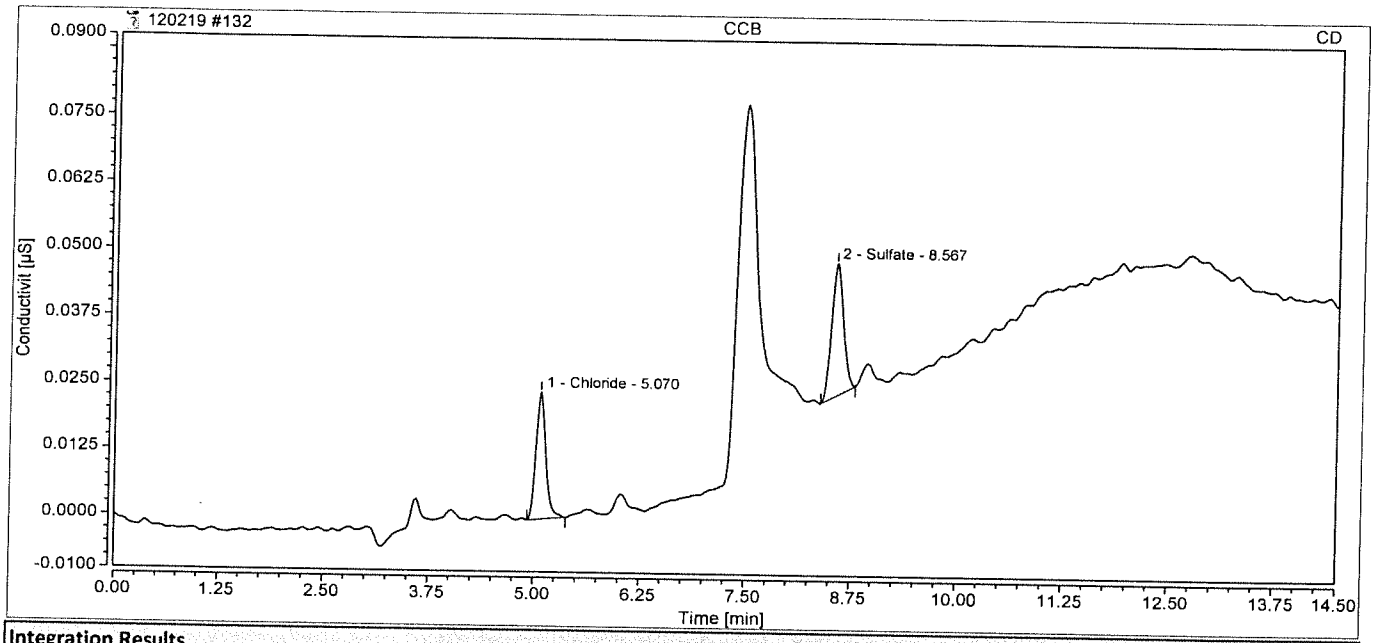


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.509	9.4583	9.4583	1.0000
2	5.06	Chloride	BMB	11.654	49.5448	49.5448	1.0000
3	6.04	Nitrite,N	BMB	4.922	9.6118	9.6118	1.0000
4	7.84	Bromide	BMB	0.981	9.7787	9.7787	1.0000
5	8.43	Sulfate	BM	8.455	49.2402	49.2402	1.0000
6	8.81	Nitrate	M	6.003	10.2347	10.2347	1.0000
7	9.34	Chlorate	MB	0.967	10.2700	10.2700	1.0000
8	12.51	Phosphate	BMB	2.227	9.6427	9.6427	1.0000
Total:			**0.000**	**38.718**		**157.78**	

132 CCB

Sample Name:	CCB	Injection Volume:	5.00
Vial Number:	BA8	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	1.0000
Recording Time:	12/04/2019 03:37	Sample Weight:	1.0000
Run Time:			

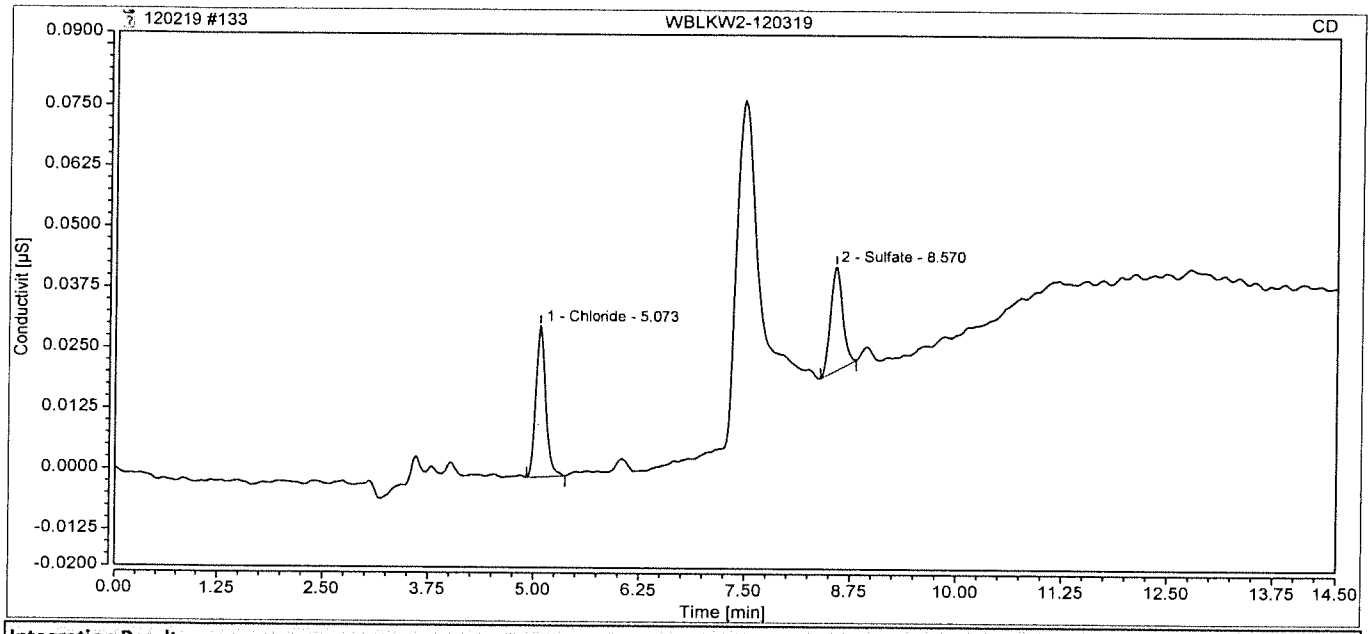


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.07	Chloride	BMB	0.003	0.0710	0.0710	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.57	Sulfate	BMB	0.004	0.0359	0.0359	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.007**		**0.11**	

133 WBLKW2-120319

Sample Name:	**WBLKW2-120319**	*Injection Volume:*	**5.00**
Vial Number:	**RD7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/04/2019 03:54**	*Sample Weight:*	**1.0000**
Run Time:			



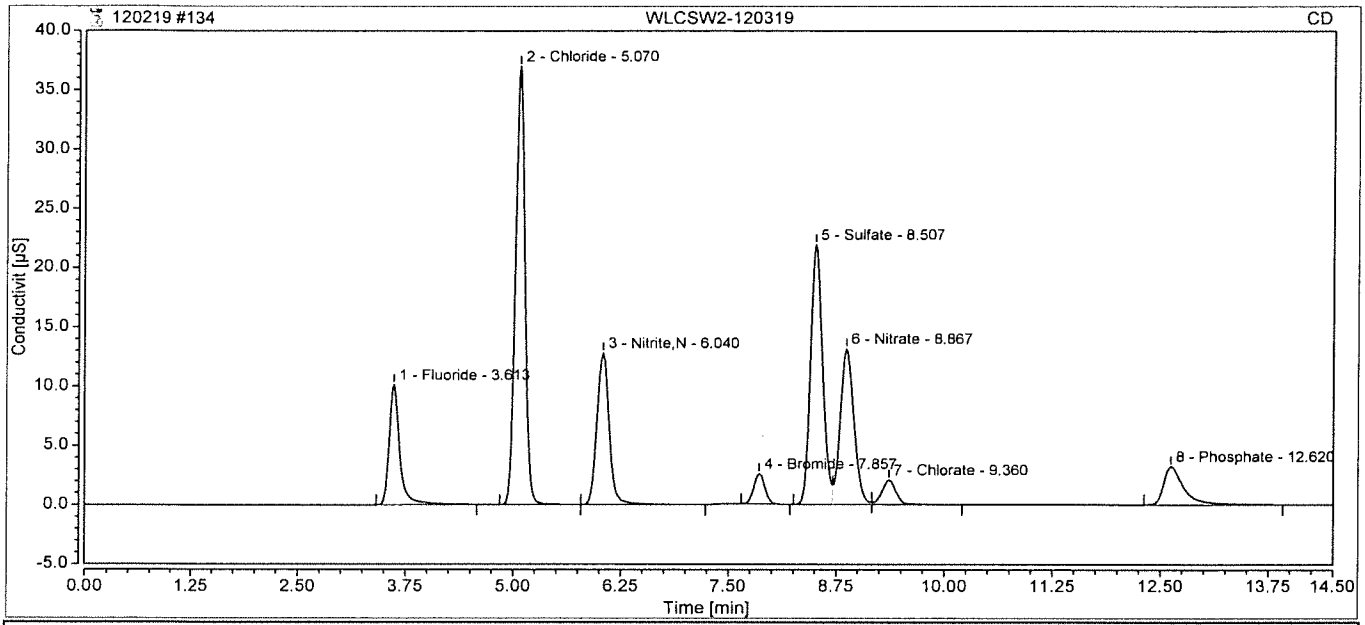
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.07	Chloride	BMB	0.004	0.0752	0.0752	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.57	Sulfate	BMB	0.004	0.0332	0.0332	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.008**		**0.11**	

134 WLCSW2-120319

Sample Name:	**WLCSW2-120319**	*Injection Volume:*	**5.00**
Vial Number:	**RD8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/04/2019 04:10**	*Sample Weight:*	**1.0000**

Run Time:



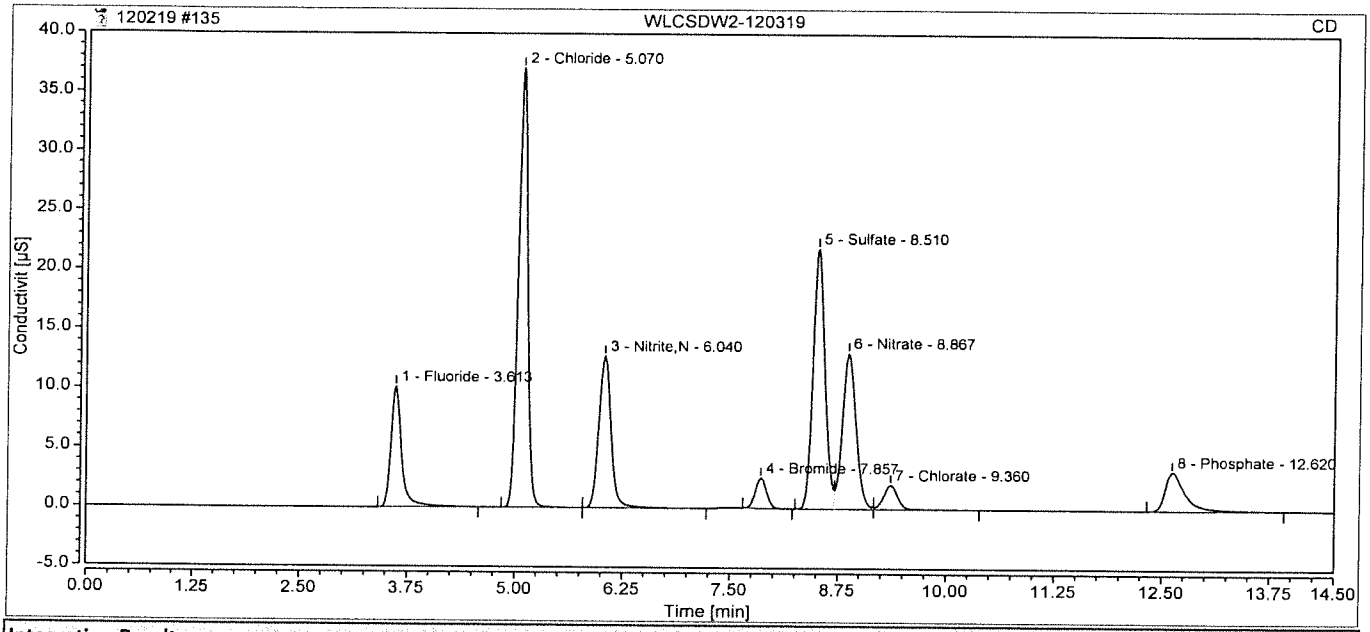
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.455	3.9295	3.9295	1.0000
2	5.07	Chloride	BMB	4.714	20.0746	20.0746	1.0000
3	6.04	Nitrite,N	BMB	2.119	4.1390	4.1390	1.0000
4	7.86	Bromide	BMB	0.384	3.8605	3.8605	1.0000
5	8.51	Sulfate	BM	3.541	20.6327	20.6327	1.0000
6	8.87	Nitrate	M	2.416	4.1299	4.1299	1.0000
7	9.36	Chlorate	MB	0.394	4.1940	4.1940	1.0000
8	12.62	Phosphate	BMB	0.892	3.8921	3.8921	1.0000
Total:			**0.000**	**15.916**		**64.85**	

135 *WLCSDW2-120319*

Sample Name:	**WLCSDW2-120319**	*Injection Volume:*	**5.00**
Vial Number:	**RE1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/04/2019 04:27**	*Sample Weight:*	**1.0000**

Run Time:



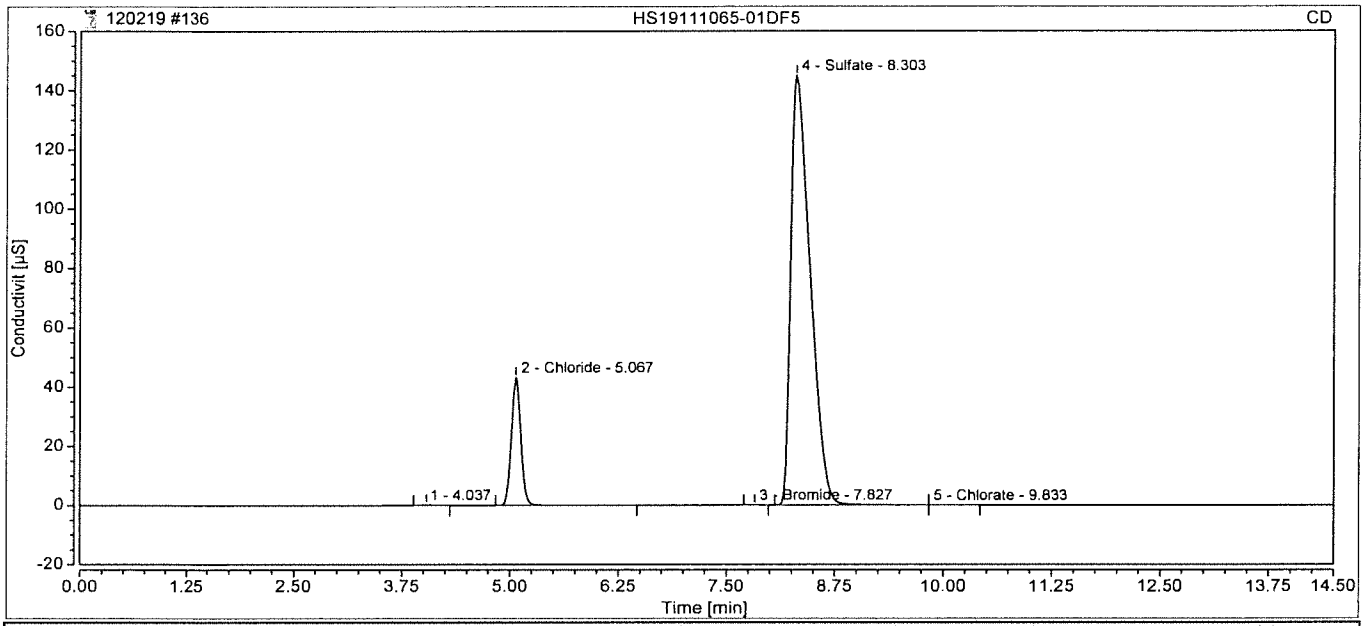
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.456	3.9347	3.9347	1.0000
2	5.07	Chloride	BMB	4.722	20.1065	20.1065	1.0000
3	6.04	Nitrite,N	BMB	2.121	4.1423	4.1423	1.0000
4	7.86	Bromide	BMB	0.384	3.8556	3.8556	1.0000
5	8.51	Sulfate	BM	3.538	20.6148	20.6148	1.0000
6	8.87	Nitrate	M	2.421	4.1385	4.1385	1.0000
7	9.36	Chlorate	MB	0.394	4.2010	4.2010	1.0000
8	12.62	Phosphate	BMB	0.910	3.9680	3.9680	1.0000
Total:			**0.000**	**15.947**		**64.96**	

136 *HS19111065-01DF5*

Sample Name:	**HS19111065-01DF5**	*Injection Volume:*	**5.00**
Vial Number:	**RE2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/04/2019 04:43**	*Sample Weight:*	**1.0000**

Run Time:



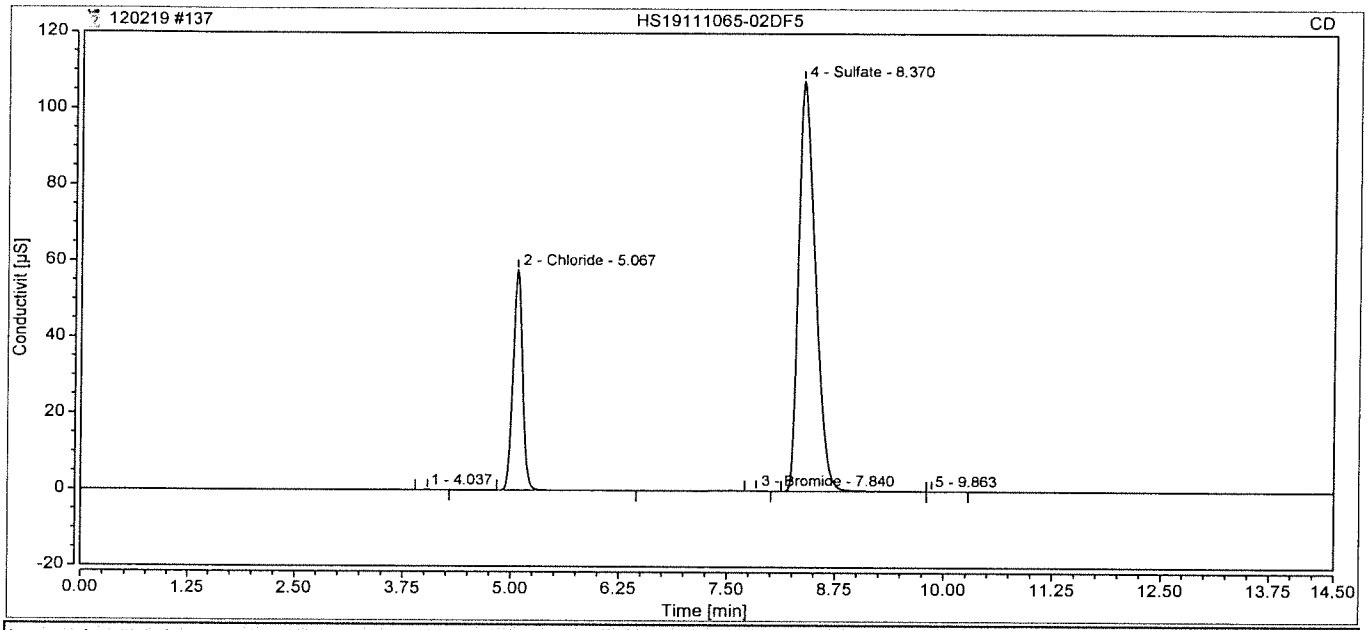
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	5.0000
2	5.07	Chloride	BMB	5.486	23.3526	116.7628	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
3	7.83	Bromide	BMB	0.005	0.1041	0.5205	5.0000
4	8.30	Sulfate	BM	37.651	219.2399	1096.1997	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
5	9.83	Chlorate	MB	0.004	0.0648	0.3242	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**43.146**		**1213.81**	

137 *HS19111065-02DF5*

Sample Name:	**HS19111065-02DF5**	*Injection Volume:*	**5.00**
Vial Number:	**RE3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/04/2019 05:00**	*Sample Weight:*	**1.0000**

Run Time:



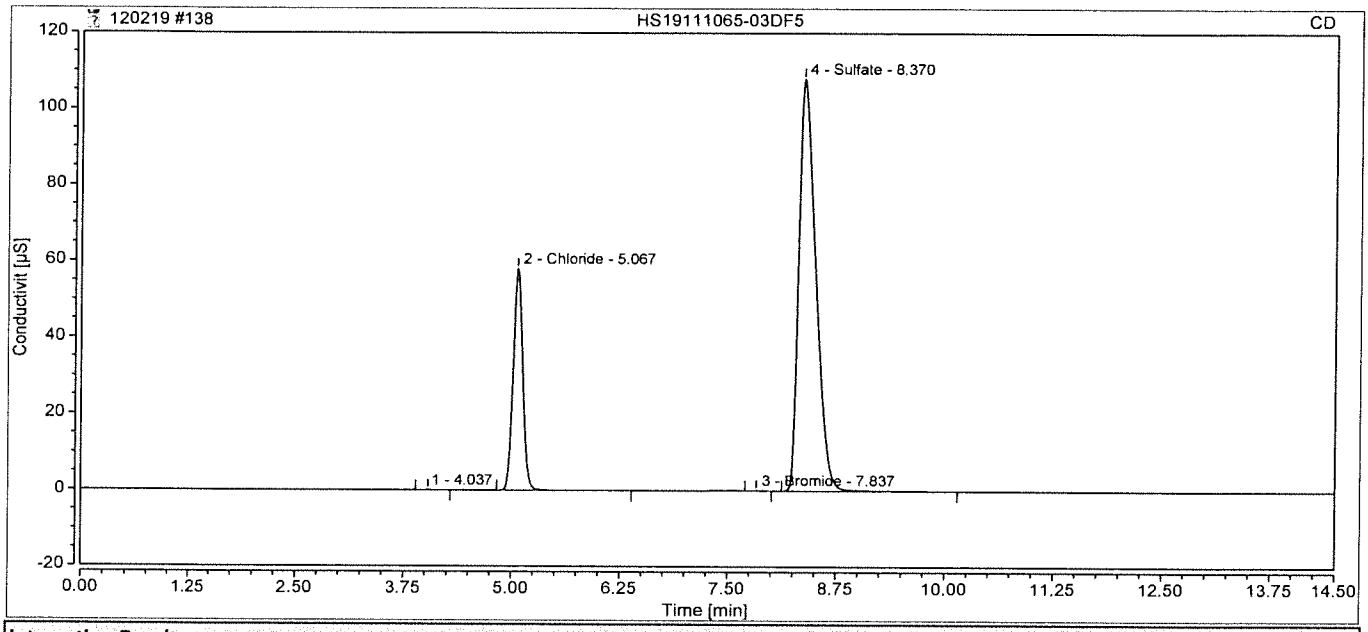
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	5.0000
2	5.07	Chloride	BMB	7.388	31.4265	157.1323	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
3	7.84	Bromide	BMB	0.008	0.1319	0.6594	5.0000
4	8.37	Sulfate	BM	24.292	141.4540	707.2698	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**31.687**		**865.06**	

138 HS19111065-03DF5

Sample Name:	**HS19111065-03DF5**	*Injection Volume:*	**5.00**
Vial Number:	**RE4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/04/2019 05:16**	*Sample Weight:*	**1.0000**

Run Time:

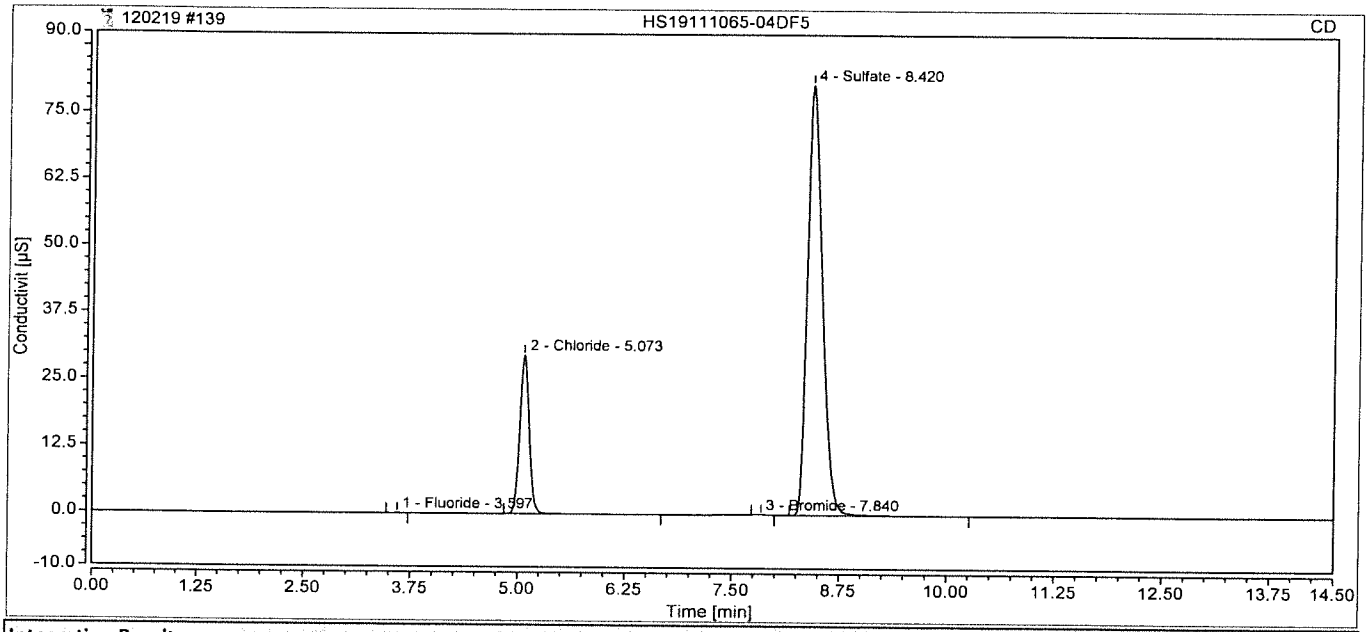


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	5.0000
2	5.07	Chloride	BMB	7.427	31.5927	157.9636	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
3	7.84	Bromide	BMB	0.008	0.1312	0.6561	5.0000
4	8.37	Sulfate	BMB	24.364	141.8717	709.3587	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**31.798**		**867.98**	

139 HS19111065-04DF5

Sample Name:	**HS19111065-04DF5**	*Injection Volume:*	**5.00**
Vial Number:	**RE5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/04/2019 05:33**	*Sample Weight:*	**1.0000**
Run Time:			



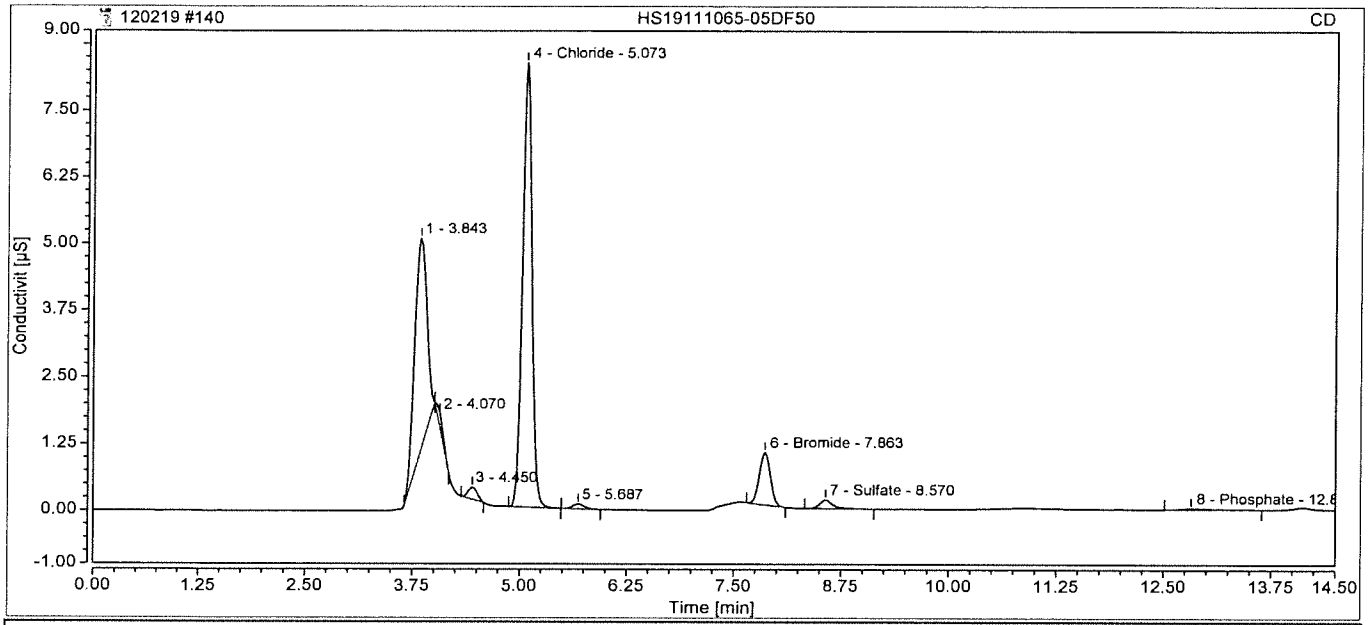
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.004	0.0261	0.1305	5.0000
2	5.07	Chloride	BMB	3.788	16.1432	80.7158	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
3	7.84	Bromide	BMB	0.003	0.0839	0.4196	5.0000
4	8.42	Sulfate	BMB	16.303	94.9398	474.6991	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**20.099**		**555.96**	

140 HS19111065-05DF50

Sample Name:	**HS19111065-05DF50**	*Injection Volume:*	**5.00**
Vial Number:	**RE6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**50.0000**
Recording Time:	**12/04/2019 05:50**	*Sample Weight:*	**1.0000**

Run Time:



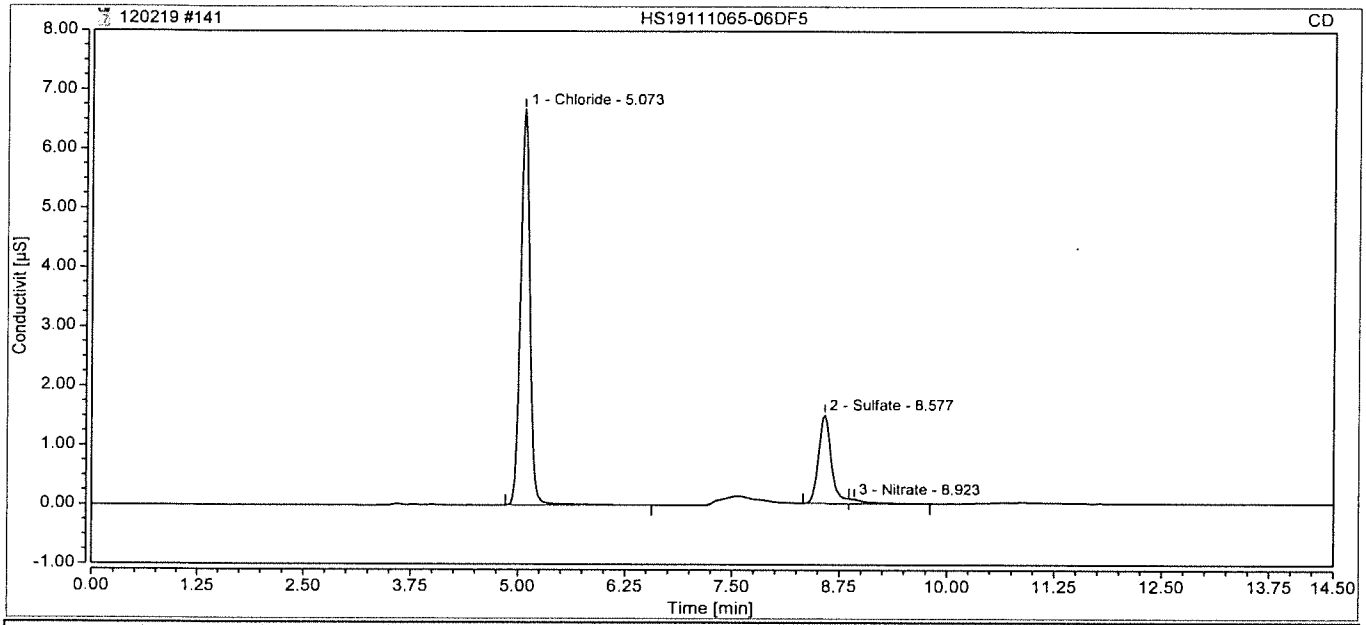
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	50.0000
4	5.07	Chloride	BMB	1.055	4.5361	226.8039	50.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	50.0000
6	7.86	Bromide	BMB	0.147	1.5077	75.3865	50.0000
7	8.57	Sulfate	BMB	0.030	0.1880	9.3990	50.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	50.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	50.0000
8	12.83	Phosphate	BMB	0.010	0.0908	4.5408	50.0000
Total:			**0.000**	**1.242**		**316.13**	

141 HS19111065-06DF5

Sample Name:	**HS19111065-06DF5**	*Injection Volume:*	**5.00**
Vial Number:	**RE7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/04/2019 06:06**	*Sample Weight:*	**1.0000**

Run Time:

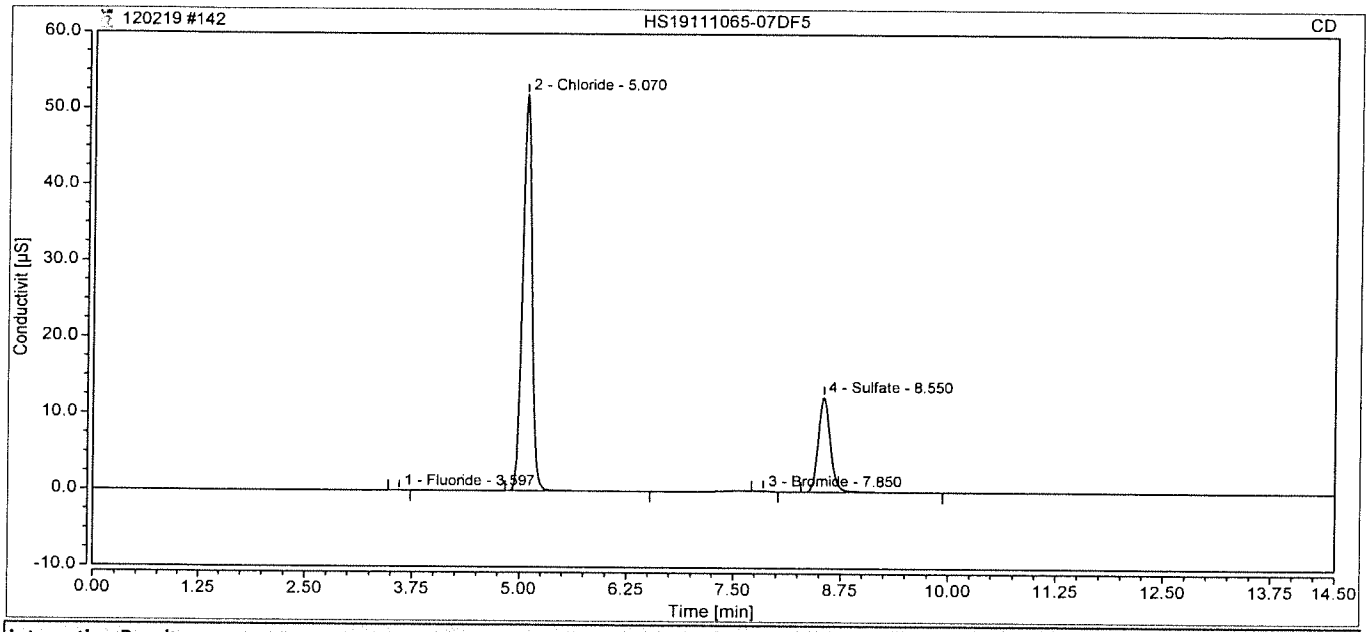


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	5.0000
1	5.07	Chloride	BMB	0.852	3.6759	18.3793	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	5.0000
2	8.58	Sulfate	BM	0.255	1.4992	7.4960	5.0000
3	8.92	Nitrate	MB	0.017	0.0461	0.2303	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**1.124**		**26.11**	

142 HS19111065-07DF5

Sample Name:	**HS19111065-07DF5**	*Injection Volume:*	**5.00**
Vial Number:	**RE8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/04/2019 06:23**	*Sample Weight:*	**1.0000**
Run Time:			

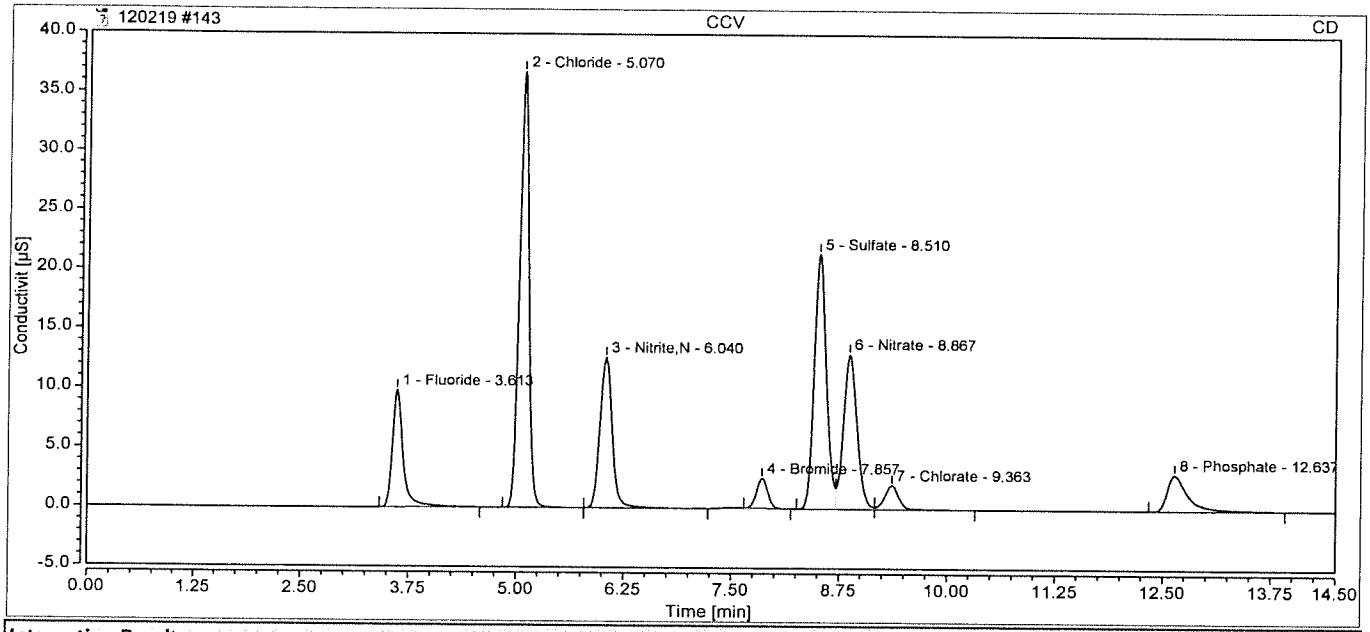


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.005	0.0282	0.1412	5.0000
2	5.07	Chloride	BMB	6.642	28.2624	141.3119	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
3	7.85	Bromide	BMB	0.009	0.1425	0.7126	5.0000
4	8.55	Sulfate	BMB	2.047	11.9299	59.6494	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**8.703**		**201.82**	

143 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/04/2019 06:39**	*Sample Weight:*	**1.0000**
Run Time:			



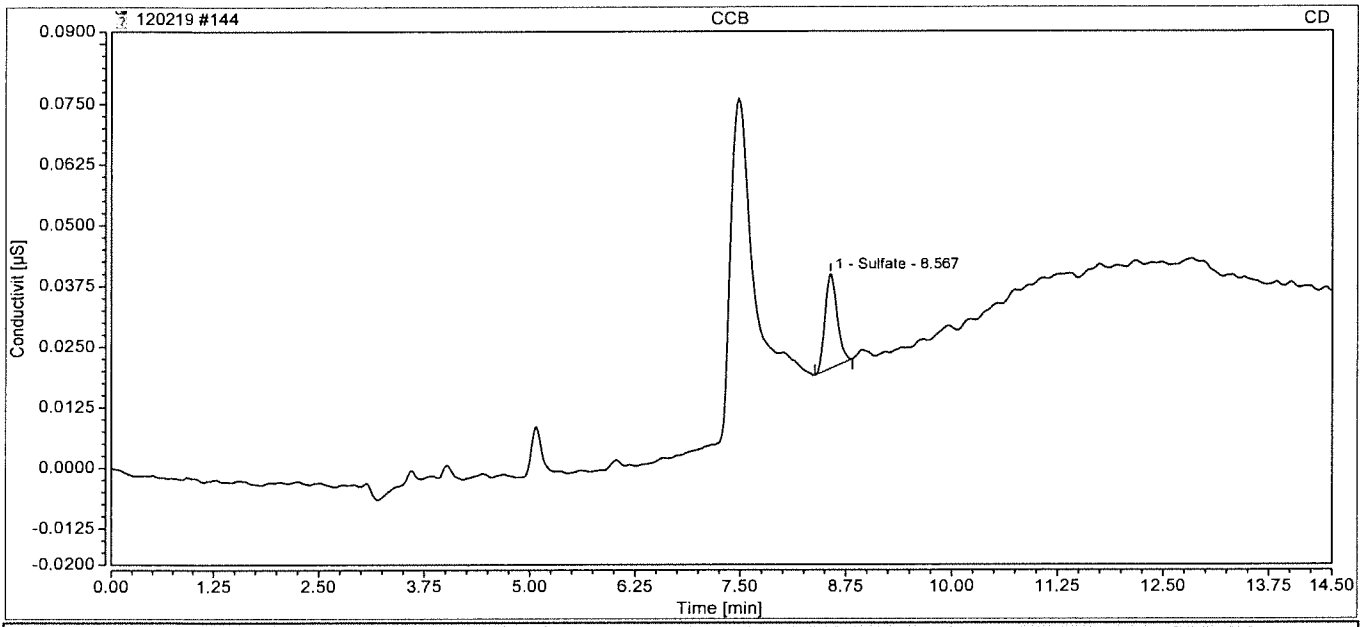
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.433	3.8714	3.8714	1.0000
2	5.07	Chloride	BMB	4.685	19.9517	19.9517	1.0000
3	6.04	Nitrite,N	BMB	2.104	4.1092	4.1092	1.0000
4	7.86	Bromide	BMB	0.379	3.8126	3.8126	1.0000
5	8.51	Sulfate	BM	3.489	20.3268	20.3268	1.0000
6	8.87	Nitrate	M	2.408	4.1152	4.1152	1.0000
7	9.36	Chlorate	MB	0.393	4.1846	4.1846	1.0000
8	12.64	Phosphate	BMB	0.872	3.8043	3.8043	1.0000
Total:			**0.000**	**15.763**		**64.18**	

144 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/04/2019 06:56**	*Sample Weight:*	**1.0000**

Run Time:



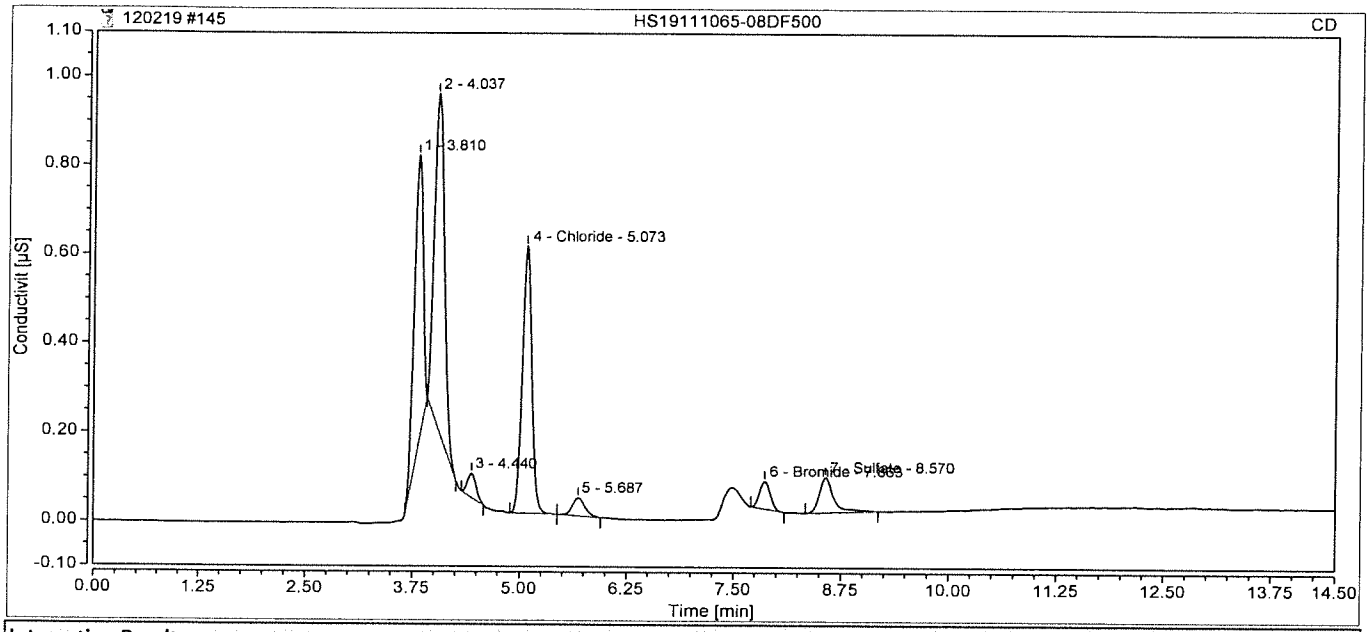
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chloride	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
1	8.57	Sulfate	BMB	0.003	0.0318	0.0318	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.03**	

145 HS19111065-08DF500

Sample Name:	**HS19111065-08DF500**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**500.0000**
Recording Time:	**12/04/2019 07:13**	*Sample Weight:*	**1.0000**

Run Time:



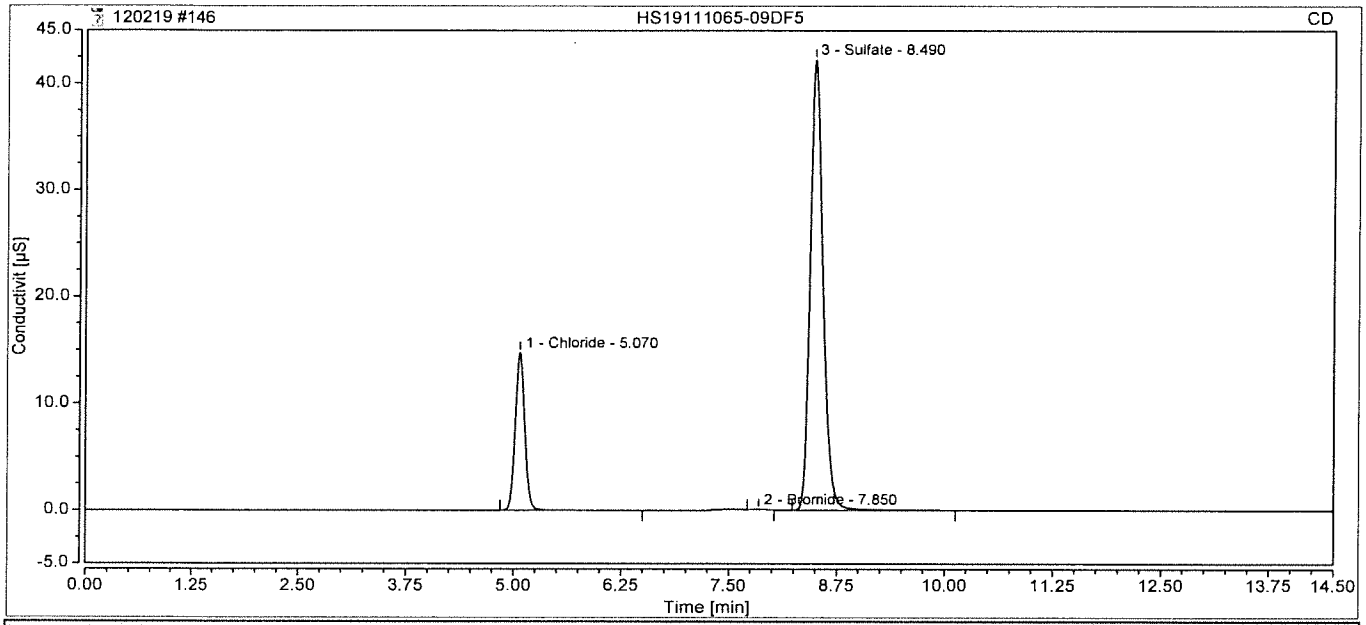
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	500.0000
4	5.07	Chloride	BMB	0.077	0.3827	191.3508	500.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	500.0000
6	7.86	Bromide	BMB	0.009	0.1414	70.7061	500.0000
7	8.57	Sulfate	BMB	0.015	0.1028	51.4237	500.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	500.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	500.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	500.0000
Total:			**0.000**	**0.101**		**313.48**	

146 HS19111065-09DF5

Sample Name:	**HS19111065-09DF5**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/04/2019 07:29**	*Sample Weight:*	**1.0000**

Run Time:

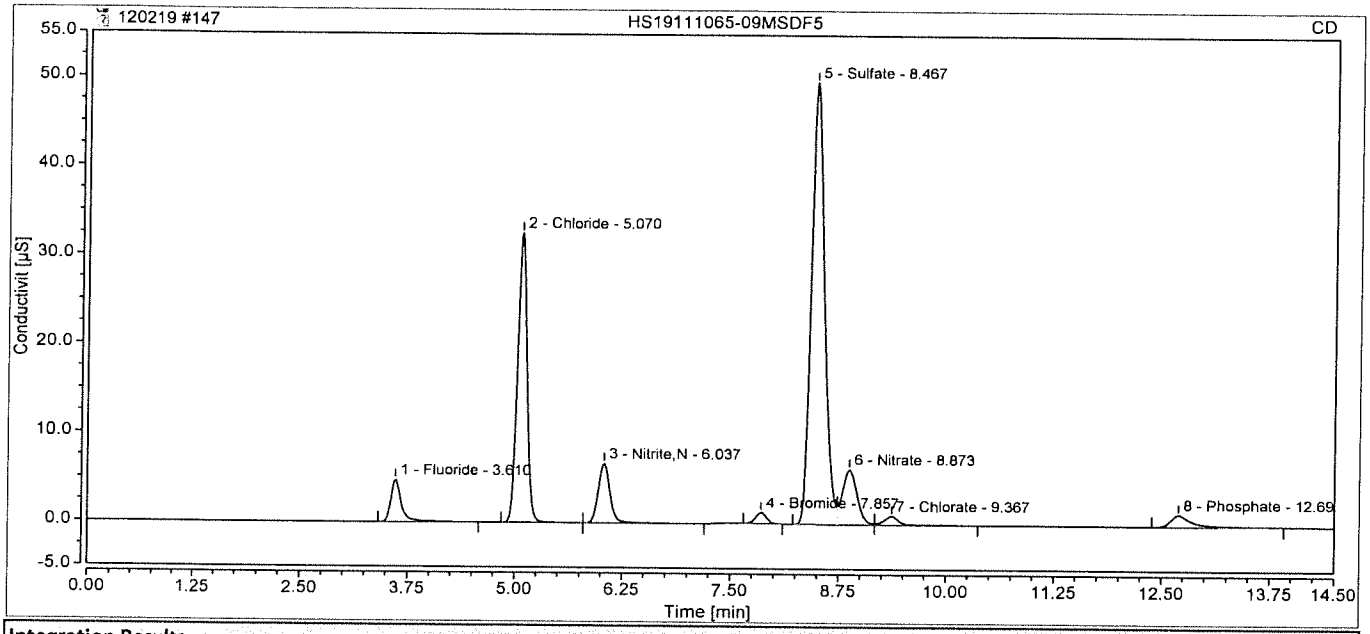


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	5.0000
1	5.07	Chloride	BMB	1.882	8.0479	40.2397	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
2	7.85	Bromide	BMB	0.008	0.1323	0.6617	5.0000
3	8.49	Sulfate	BMB	7.353	42.8250	214.1250	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**9.243**		**255.03**	

147 HS19111065-09MSDF5

Sample Name:	HS19111065-09MSDF5	Injection Volume:	5.00
Vial Number:	GA3	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	5.0000
Recording Time:	12/04/2019 07:46	Sample Weight:	1.0000
Run Time:			



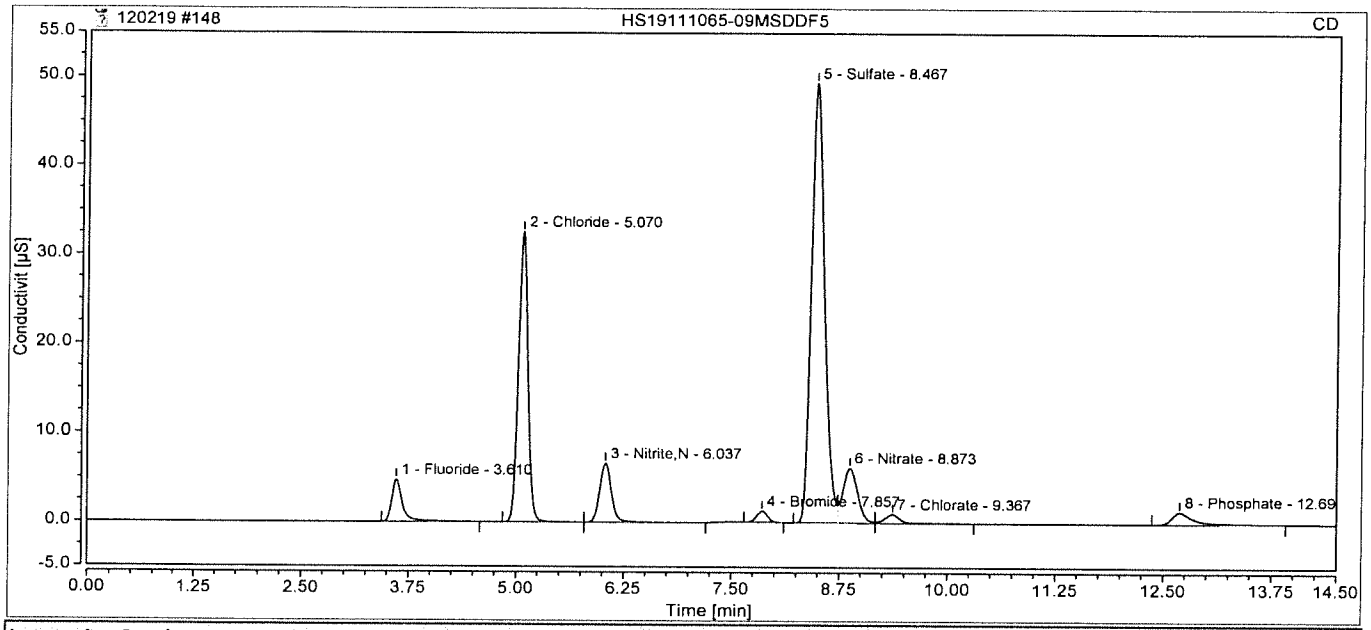
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.687	1.8648	9.3238	5.0000
2	5.07	Chloride	BMB	4.147	17.6685	88.3425	5.0000
3	6.04	Nitrite,N	BMB	1.055	2.0590	10.2951	5.0000
4	7.86	Bromide	BMB	0.184	1.8783	9.3917	5.0000
5	8.47	Sulfate	BM	8.768	51.0644	255.3219	5.0000
6	8.87	Nitrate	M	1.223	2.0997	10.4984	5.0000
7	9.37	Chlorate	MB	0.201	2.1535	10.7675	5.0000
8	12.70	Phosphate	BMB	0.403	1.7843	8.9214	5.0000
Total:			**0.000**	**16.669**		**402.86**	

148 HS19111065-09MSDDF5

Sample Name:	**HS19111065-09MSDDF5**	*Injection Volume:*	**5.00**
Vial Number:	**GA4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**12/04/2019 08:03**	*Sample Weight:*	**1.0000**

Run Time:



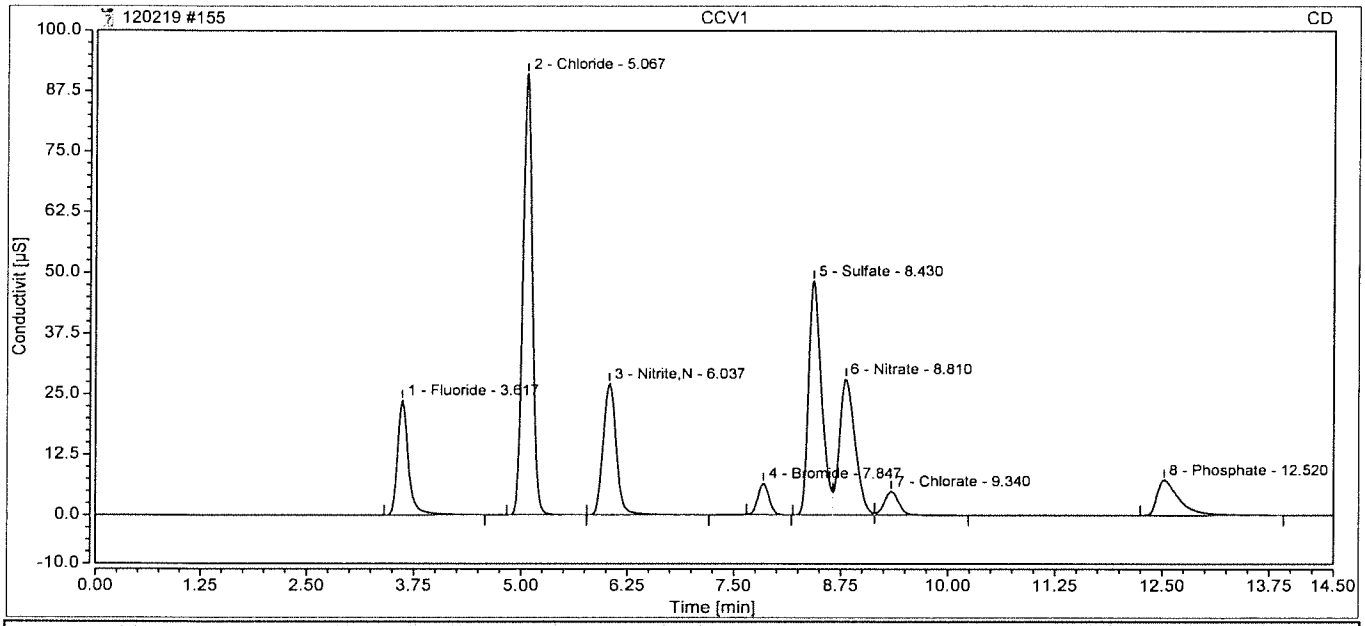
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.683	1.8540	9.2702	5.0000
2	5.07	Chloride	BMB	4.153	17.6903	88.4513	5.0000
3	6.04	Nitrite,N	BMB	1.051	2.0514	10.2568	5.0000
4	7.86	Bromide	BMB	0.184	1.8746	9.3728	5.0000
5	8.47	Sulfate	BM	8.741	50.9075	254.5373	5.0000
6	8.87	Nitrate	M	1.219	2.0919	10.4593	5.0000
7	9.37	Chlorate	MB	0.200	2.1448	10.7241	5.0000
8	12.69	Phosphate	BMB	0.409	1.8114	9.0571	5.0000
Total:			**0.000**	**16.640**		**402.13**	

155 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/04/2019 09:59**	*Sample Weight:*	**1.0000**

Run Time:



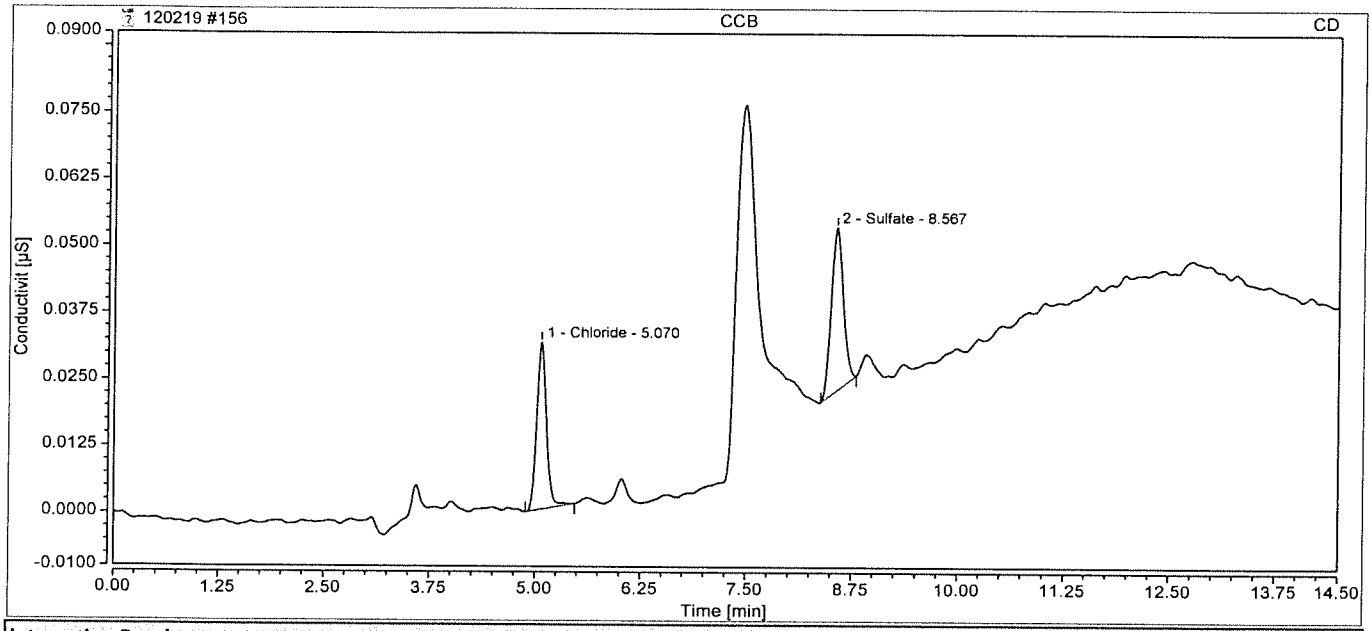
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.498	9.4277	9.4277	1.0000
2	5.07	Chloride	BMB	11.685	49.6745	49.6745	1.0000
3	6.04	Nitrite,N	BMB	4.918	9.6048	9.6048	1.0000
4	7.85	Bromide	BMB	0.984	9.8061	9.8061	1.0000
5	8.43	Sulfate	BM	8.475	49.3576	49.3576	1.0000
6	8.81	Nitrate	M	5.992	10.2154	10.2154	1.0000
7	9.34	Chlorate	MB	0.967	10.2714	10.2714	1.0000
8	12.52	Phosphate	BMB	2.233	9.6706	9.6706	1.0000
Total:			**0.000**	**38.752**		**158.03**	

156 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/04/2019 10:15**	*Sample Weight:*	**1.0000**

Run Time:

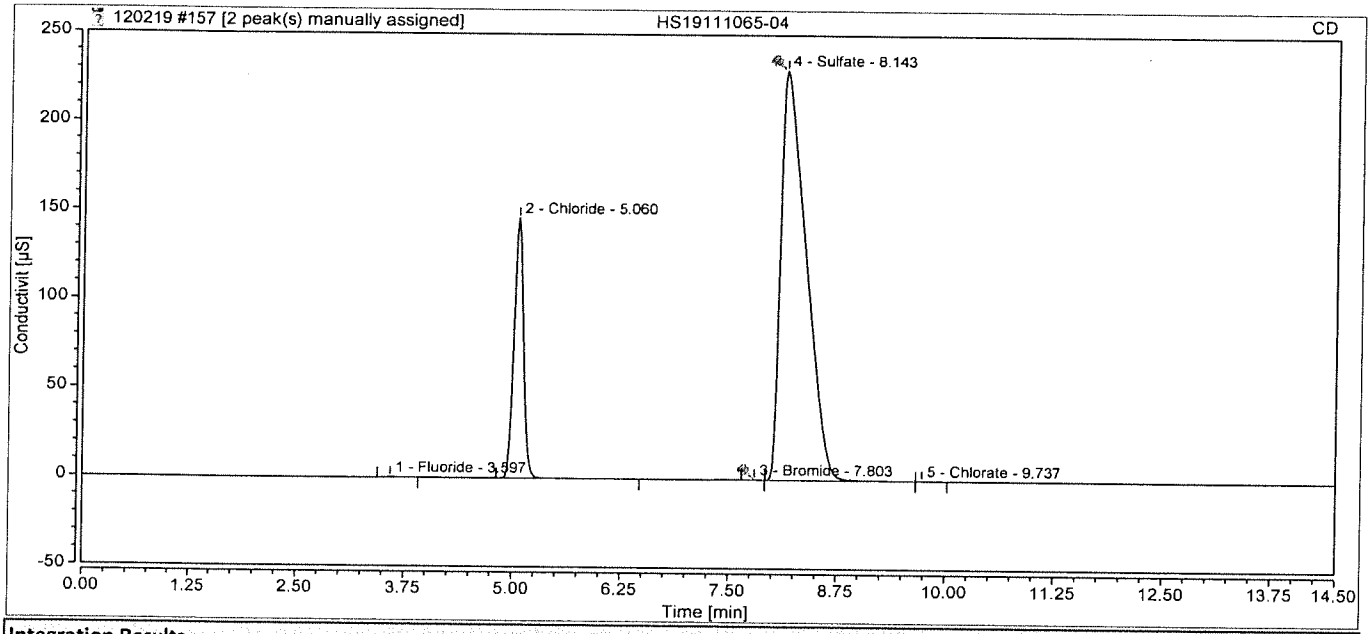


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.07	Chloride	BMB	0.004	0.0750	0.0750	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.57	Sulfate	BMB	0.005	0.0417	0.0417	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.009**		**0.12**	

157 HS19111065-04

Sample Name:	HS19111065-04	Injection Volume:	5.00
Vial Number:	GB8	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	1.0000
Recording Time:	12/04/2019 10:32	Sample Weight:	1.0000
Run Time:			



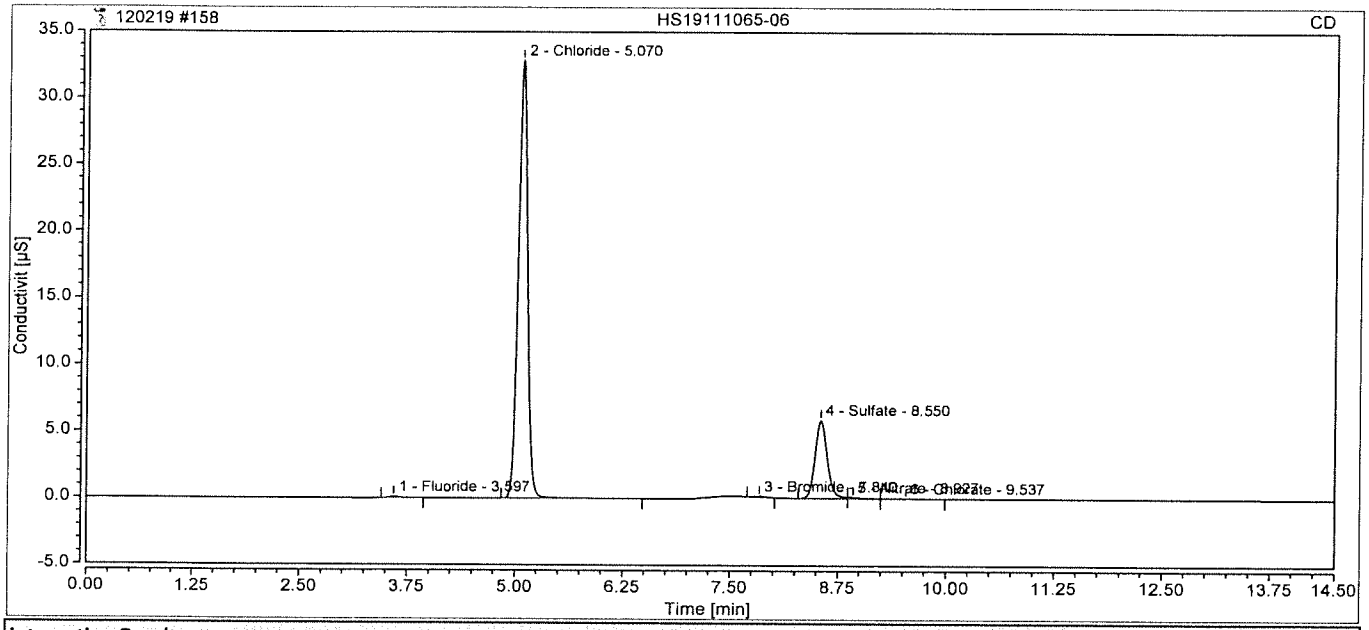
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.031	0.0994	0.0994	1.0000
2	5.06	Chloride	BMB	18.739	79.6275	79.6275	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
3	7.80	Bromide	BMB^	0.021	0.2618	0.2618	1.0000
4	8.14	Sulfate	BM ^	77.781	452.9010	452.9010	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
5	9.74	Chlorate	MB	0.002	0.0512	0.0512	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**96.575**		**532.94**	

158 HS19111065-06

Sample Name:	**HS19111065-06**	*Injection Volume:*	**5.00**
Vial Number:	**GC1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/04/2019 10:49**	*Sample Weight:*	**1.0000**

Run Time:



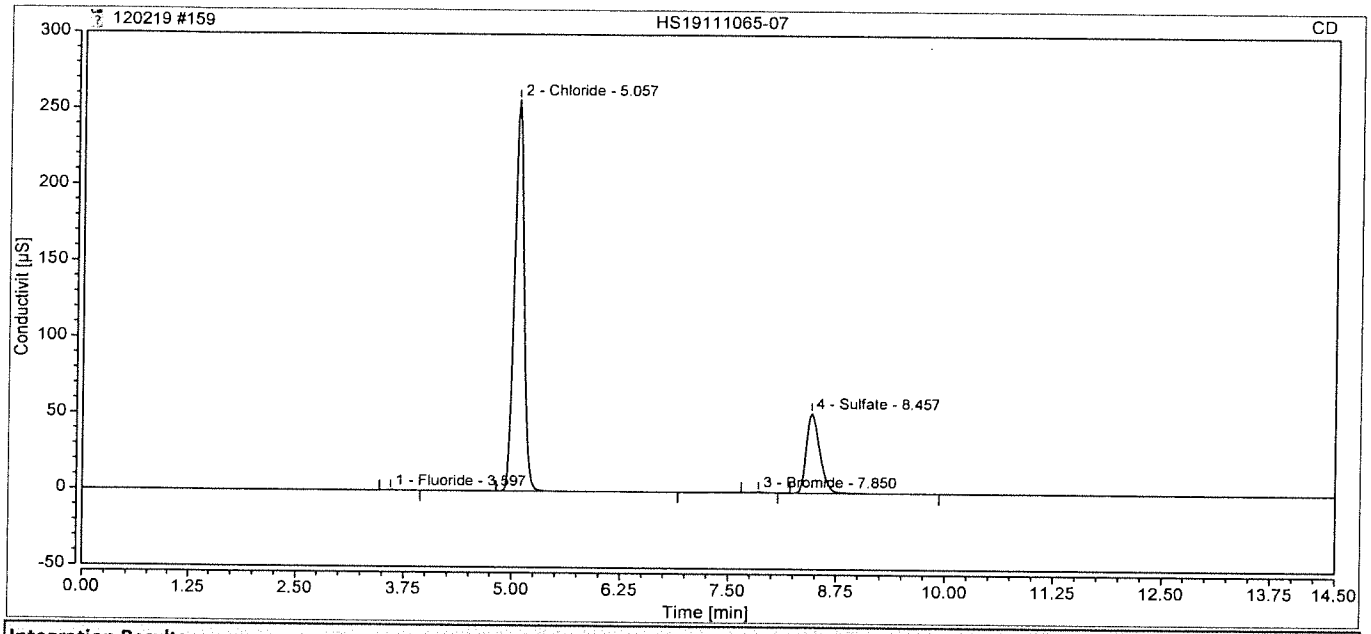
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.015	0.0560	0.0560	1.0000
2	5.07	Chloride	BMB	4.168	17.7564	17.7564	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
3	7.84	Bromide	BMB	0.008	0.1296	0.1296	1.0000
4	8.55	Sulfate	BM	0.955	5.5718	5.5718	1.0000
5	8.93	Nitrate	M	0.016	0.0453	0.0453	1.0000
6	9.54	Chlorate	MB	0.007	0.0978	0.0978	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**5.169**		**23.66**	

159 HS19111065-07

Sample Name:	HS19111065-07	Injection Volume:	5.00
Vial Number:	GC2	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	1.0000
Recording Time:	12/04/2019 11:05	Sample Weight:	1.0000

Run Time:



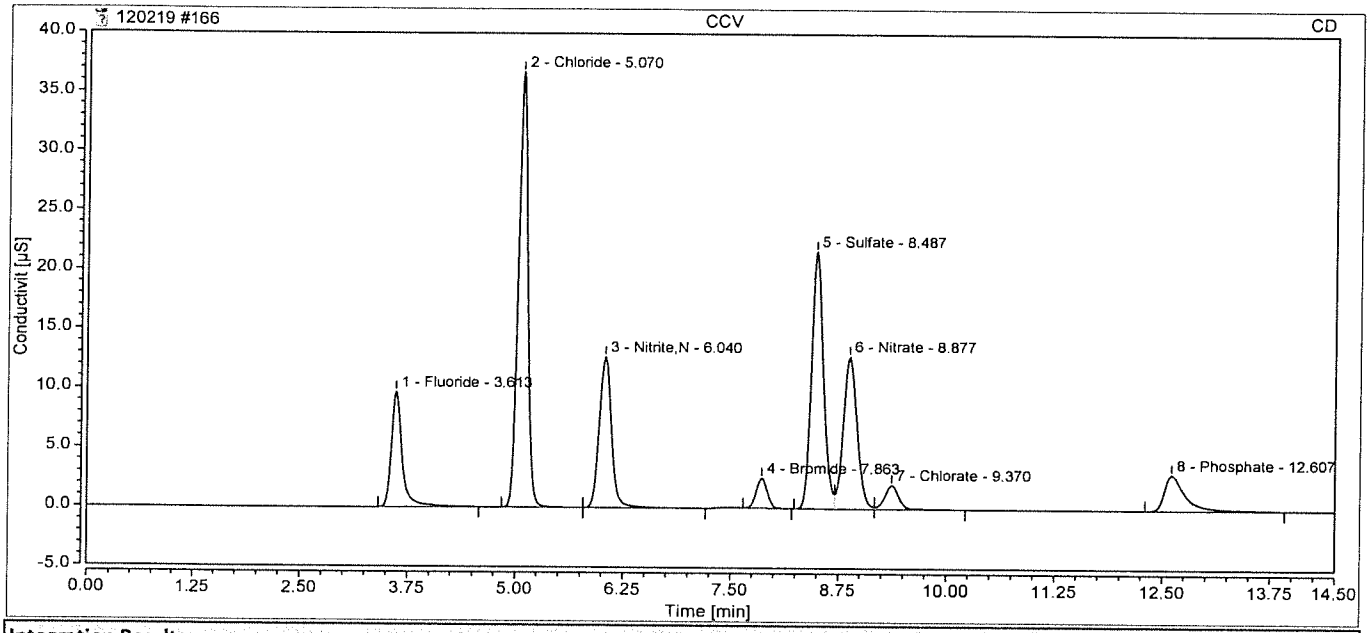
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.039	0.1192	0.1192	1.0000
2	5.06	Chloride	BMB	33.262	141.2950	141.2950	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
3	7.85	Bromide	BMB	0.067	0.7133	0.7133	1.0000
4	8.46	Sulfate	BMB	9.548	55.6048	55.6048	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**42.915**		**197.73**	

166 CCV

Sample Name:	CCV	Injection Volume:	5.00
Vial Number:	BA5	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	1.0000
Recording Time:	12/04/2019 13:02	Sample Weight:	1.0000

Run Time:

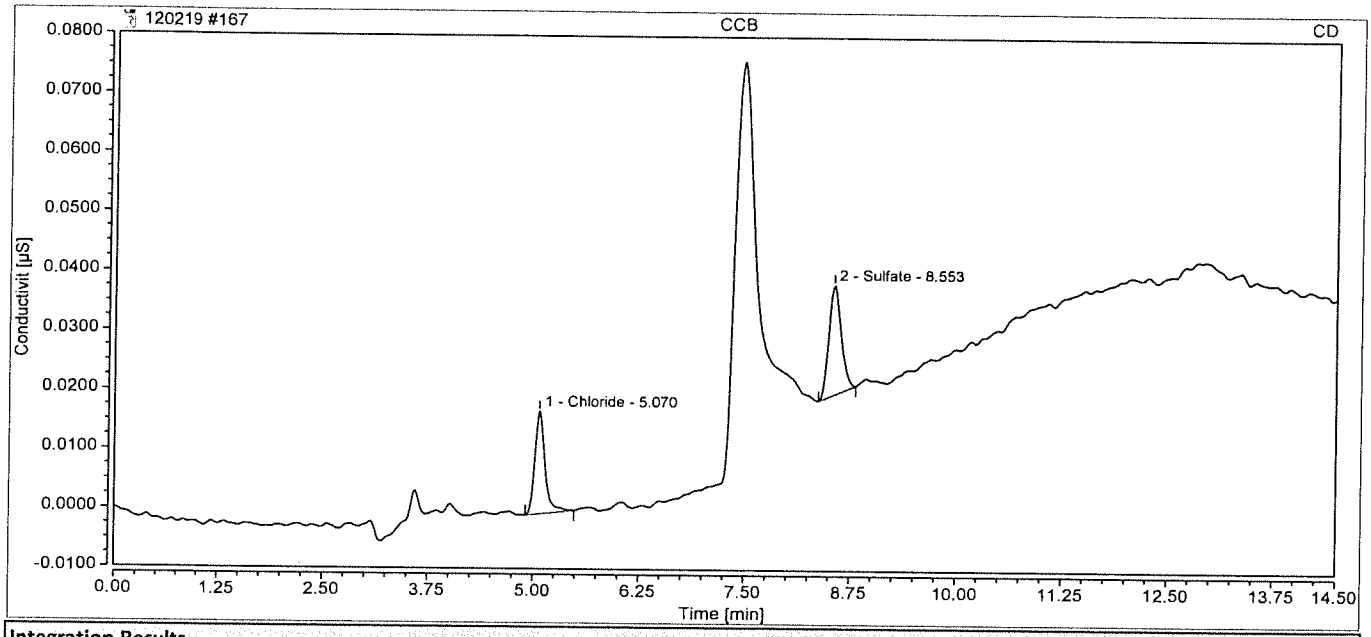


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.419	3.8349	3.8349	1.0000
2	5.07	Chloride	BMB	4.688	19.9636	19.9636	1.0000
3	6.04	Nitrite,N	BMB	2.106	4.1134	4.1134	1.0000
4	7.86	Bromide	BMB	0.380	3.8230	3.8230	1.0000
5	8.49	Sulfate	BM	3.486	20.3101	20.3101	1.0000
6	8.88	Nitrate	M	2.396	4.0956	4.0956	1.0000
7	9.37	Chlorate	MB	0.390	4.1549	4.1549	1.0000
8	12.61	Phosphate	BMB	0.874	3.8116	3.8116	1.0000
Total:			**0.000**	**15.740**		**64.11**	

167 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/04/2019 13:18**	*Sample Weight:*	**1.0000**
Run Time:			



Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.07	Chloride	BMB	0.002	0.0676	0.0676	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.55	Sulfate	BMB	0.003	0.0310	0.0310	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.006**		**0.10**	

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

WorkOrder: HS19111080

LHAAP-16

Aptim Environmental & Infrastucture, Inc.

Susan Huang
2500 City West Blvd., Suite 1700
Houston TX 77042

04-Dec-2019

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

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HS19111080 LHAAP16 Final

ALS WO# HS19111080

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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November 27, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19111080**

Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 7 sample(s) on Nov 21, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19111080

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19111080-01	16RW06-191120	GW		20-Nov-2019 08:20	21-Nov-2019 08:35	☐
HS19111080-02	16RW06-191120-FD	GW		20-Nov-2019 08:20	21-Nov-2019 08:35	☐
HS19111080-03	16RW07-191120	GW		20-Nov-2019 09:15	21-Nov-2019 08:35	☐
HS19111080-04	16RW08-191120	GW		20-Nov-2019 10:05	21-Nov-2019 08:35	☐
HS19111080-05	16IW10-191120	GW		20-Nov-2019 10:55	21-Nov-2019 08:35	☐
HS19111080-06	16RW09-191120	GW		20-Nov-2019 11:45	21-Nov-2019 08:35	☐
HS19111080-07	16RW10-191120	GW		20-Nov-2019 12:40	21-Nov-2019 08:35	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19111080

Work Order Comments

• The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

WetChemistry by Method SW9056

Batch ID: R351461

Sample ID: HS19111269-02MS

• MS and MSD are for an unrelated sample (Bromide)

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW06-191120
Collection Date: 20-Nov-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19111080
Lab ID:HS19111080-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**5.03**		**0.150**	**0.500**	**0.500**	**mg/L**	5	26-Nov-2019 00:22
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 09:14

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW06-191120-FD
Collection Date: 20-Nov-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19111080
Lab ID:HS19111080-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**5.05**		**0.150**	**0.500**	**0.500**	**mg/L**	5	26-Nov-2019 01:12
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 09:14

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW07-191120
Collection Date: 20-Nov-2019 09:15

ANALYTICAL REPORT
WorkOrder:HS19111080
Lab ID:HS19111080-03
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.25**		**0.150**	**0.500**	**0.500**	**mg/L**	5	26-Nov-2019 01:28
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 09:14

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW08-191120
Collection Date: 20-Nov-2019 10:05

ANALYTICAL REPORT
WorkOrder:HS19111080
Lab ID:HS19111080-04
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**6.06**		**0.150**	**0.500**	**0.500**	**mg/L**	5	26-Nov-2019 01:45
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 09:14

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16IW10-191120
Collection Date: 20-Nov-2019 10:55

ANALYTICAL REPORT
WorkOrder:HS19111080
Lab ID:HS19111080-05
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**201**		**6.00**	**20.0**	**20.0**	**mg/L**	200	26-Nov-2019 02:01
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 09:14

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW09-191120
Collection Date: 20-Nov-2019 11:45

ANALYTICAL REPORT
WorkOrder:HS19111080
Lab ID:HS19111080-06
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.53**		**0.150**	**0.500**	**0.500**	**mg/L**	5	26-Nov-2019 02:18
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 09:14

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16RW10-191120
Collection Date: 20-Nov-2019 12:40

ANALYTICAL REPORT
WorkOrder:HS19111080
Lab ID:HS19111080-07
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.99**		**0.150**	**0.500**	**0.500**	**mg/L**	5	26-Nov-2019 02:34
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 09:14

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19111080

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R351402 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** GW	
HS19111080-01	16RW06-191120	20 Nov 2019 08:20			27 Nov 2019 09:14	1
HS19111080-02	16RW06-191120-FD	20 Nov 2019 08:20			27 Nov 2019 09:14	1
HS19111080-03	16RW07-191120	20 Nov 2019 09:15			27 Nov 2019 09:14	1
HS19111080-04	16RW08-191120	20 Nov 2019 10:05			27 Nov 2019 09:14	1
HS19111080-05	16IW10-191120	20 Nov 2019 10:55			27 Nov 2019 09:14	1
HS19111080-06	16RW09-191120	20 Nov 2019 11:45			27 Nov 2019 09:14	1
HS19111080-07	16RW10-191120	20 Nov 2019 12:40			27 Nov 2019 09:14	1
Batch ID: R351461 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS19111080-01	16RW06-191120	20 Nov 2019 08:20			26 Nov 2019 00:22	5
HS19111080-02	16RW06-191120-FD	20 Nov 2019 08:20			26 Nov 2019 01:12	5
HS19111080-03	16RW07-191120	20 Nov 2019 09:15			26 Nov 2019 01:28	5
HS19111080-04	16RW08-191120	20 Nov 2019 10:05			26 Nov 2019 01:45	5
HS19111080-05	16IW10-191120	20 Nov 2019 10:55			26 Nov 2019 02:01	200
HS19111080-06	16RW09-191120	20 Nov 2019 11:45			26 Nov 2019 02:18	5
HS19111080-07	16RW10-191120	20 Nov 2019 12:40			26 Nov 2019 02:34	5

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19111080

QC BATCH REPORT

Batch ID: R351461 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **WBLKW1-112519** Units: **mg/L** Analysis Date: **25-Nov-2019 17:13**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364933** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-112519** Units: **mg/L** Analysis Date: **25-Nov-2019 17:30**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364934** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.722	0.100	4	0	93.0	80 - 120				

LCSD Sample ID: **WLCSDW1-112519** Units: **mg/L** Analysis Date: **25-Nov-2019 17:46**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364935** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.736	0.100	4	0	93.4	80 - 120	3.722	0.365	20	

MS Sample ID: **HS19111269-02MS** Units: **mg/L** Analysis Date: **25-Nov-2019 19:39**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364937** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.736	0.100	2	0.1866	77.5	80 - 120				S

MS Sample ID: **HS19111080-07MS** Units: **mg/L** Analysis Date: **26-Nov-2019 02:51**
Client ID: **16RW10-191120** Run ID: **ICS-Integrion_351461** SeqNo: **5364958** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	12.99	0.500	10	3.988	90.0	80 - 120				

MSD Sample ID: **HS19111269-02MSD** Units: **mg/L** Analysis Date: **25-Nov-2019 19:56**
Client ID: Run ID: **ICS-Integrion_351461** SeqNo: **5364938** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.74	0.100	2	0.1866	77.7	80 - 120	1.736	0.236	20	S

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19111080

QC BATCH REPORT

Batch ID: R351461 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MSD Sample ID: **HS19111080-07MSD** Units: **mg/L** Analysis Date: **26-Nov-2019 03:08**
Client ID: **16RW10-191120** Run ID: **ICS-Integrion_351461** SeqNo: **5364959** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	12.92	0.500	10	3.988	89.4	80 - 120	12.99	0.502	20	

The following samples were analyzed in this batch: HS19111080-01 HS19111080-02 HS19111080-03 HS19111080-04 HS19111080-05 HS19111080-06 HS19111080-07

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19111080**

QUALIFIERS, ACRONYMS, UNITS

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

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

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19111080

Date/Time Received: **21-Nov-2019 08:35**
Received by: **PMG**

Checklist completed by: *Asad Chaudhry* eSignature — 21-Nov-2019 Date

Reviewed by: *RJ Modashia* eSignature — 22-Nov-2019 Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.9c U/C	IR 25
Cooler(s)/Kit(s):	45371	
Date/Time sample(s) sent to storage:	11/21/2019 17:15	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: 16NOV2019-LF3-1911__-ALS

TURNAROUND TIME:

RUSH:

Page 1 of ____

PROJECT/CLIENT INFO

Facility Name	Longhorn AAP
Project Number	501032
	LHAAP-16
Address	1203-B East Grand Avenue
	PMB 202
City	Marshall
Postal Code	75670
Phone Number	713.243.7264
Project Manager	Praveen Srivastav

State

Cour

LABORATORY

Lab Name	ALS Laboratories
Lab Contact	RJ Modashia
Email	RJ.Modashia@alsglobal.com

OTHER INFO

Email Invoice To	FedInvoices@aptim.com		
Email Report To	Susan.Huang@aptim.com		
Mail Reports To	Susan Huang		
Address	4005 Port Chicago Highway, Suite 200		
City	Concord	State	CA
Postal Code	94520	Country	USA
Shipping Company			

HS19111080

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

SAMPLE DETAILS

ALYSIS REQUESTED

Cool

C

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	TOC by SM5310	Bromide by SW9056
16RW06-191120	LHAAP16				WG	11/20/19	0820	3		X	X
16RW06-191120-FD	LHAAP16				WG	11/20/19	0820	3		X	X
16RW07-191120	LHAAP16				WG	11/20/19	0915	3		X	X
16RW08-191120	LHAAP16				WG	11/20/19	1005	3		X	X
16IW10-191120	LHAAP16				WG	11/20/19	1055	3		X	X
16RW09-191120	LHAAP16				WG	11/20/19	1145	3		X	X
16RW10-191120	LHAAP16				WG	11/20/19	1240	3		X	X
16RW10-191120-MS	LHAAP16				WG	11/20/19	1240	3		X	X
16RW10-191120-MSD	LHAAP16				WG	11/20/19	1240	3		X	X

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
U/C 0.9 IR11 C/F-0 45371	Scott Bessinger / BHATE	11/20/19 1415	DG	Nov/21/19 8:35

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45371

CUSTODY SEAL

Date: 11/20/19 Time: 1430
Name: Scott Beesinger
Company: Bhate

Seal Broken By: SBG
Date: 11/21/19

45371

Must Deliver Next Business Day
Time and Tempature Sensitive!

45371

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
RMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 05NOV19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-16-BO 60473-RJ
RMA:

FedEx Express

FedEx
TRK# 0221 1251 0291 3761

THU - 21 NOV 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID 5107232 20NOV19
SGGA 56AC1/F33F/B5A2

ALS Environmental
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November 27, 2019 **Analytical Report for Service Request No:** K1911032

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

RE: HS19111080

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory November 22, 2019
For your reference, these analyses have been assigned our service request number **K1911032.**

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

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Acronyms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS19111080
Sample Matrix: Ground Water

Service Request: K1911032
Date Received: 11/22/2019

CASE NARRATIVE

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

Sample Receipt:

Seven ground water samples were received for analysis at ALS Environmental on 11/22/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 11/27/2019

Chain of Custody

ALS Environmental—Kelso Laboratory
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K1911032

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12690**

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19111080
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19111080-01**	**16RW06-191120**	**GW**	**20 Nov 2019 08:20**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
2.	**HS19111080-02**	**16RW06-191120-FD**	**GW**	**20 Nov 2019 08:20**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
3.	**HS19111080-03**	**16RW07-191120**	**GW**	**20 Nov 2019 09:15**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
4.	**HS19111080-04**	**16RW08-191120**	**GW**	**20 Nov 2019 10:05**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
5.	**HS19111080-05**	**16IW10-191120**	**GW**	**20 Nov 2019 10:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
6.	**HS19111080-06**	**16RW09-191120**	**GW**	**20 Nov 2019 11:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019
7.	**HS19111080-07**	**16RW10-191120 (MS/MSD)**	**GW**	**20 Nov 2019 12:40**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Dec 2019

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

Rec'd C Cravens 11/22/19 0946

RIGHT SOLUTIONS | RIGHT PARTNER

K1911032

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12690**

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Musgrave	Date/Time:	11/21/19 18:00
Received By:		Date/Time:	11/22/19 0940
Cooler ID(s):		Temperature(s):	

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 11032

Received: 11/22/19 Opened: 11/22/19 By: CG Unloaded: 11/22/19 By: CG

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.6	-0.5	-0.2	-0.1	+0.1	360	12690	1251 0292 0914	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: RUSH

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1911032
Project:	HS19111080	**Date Collected:**	11/20/19
Sample Matrix:	Ground Water	**Date Received:**	11/22/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16RW06-191120	K1911032-001	**1.54**	0.50	0.20	0.07	1	11/24/19 13:19	
16RW06-191120-FD	K1911032-002	**1.55**	0.50	0.20	0.07	1	11/24/19 13:47	
16RW07-191120	K1911032-003	**1.59**	0.50	0.20	0.07	1	11/24/19 14:15	
16RW08-191120	K1911032-004	**2.02**	0.50	0.20	0.07	1	11/24/19 14:43	
16IW10-191120	K1911032-005	**1850**	200	80	30	400	11/24/19 15:11	
16RW09-191120	K1911032-006	**1.99**	0.50	0.20	0.07	1	11/24/19 15:39	
16RW10-191120	K1911032-007	**4.08**	0.50	0.20	0.07	1	11/24/19 16:51	
Method Blank	K1911032-MB1	ND U	0.50	0.20	0.07	1	11/24/19 02:41	
Method Blank	K1911032-MB2	**0.14 J**	0.50	0.20	0.07	1	11/24/19 12:21	

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1911032
Project	HS19111080	**Date Collected:**	11/20/19
Sample Matrix:	Ground Water	**Date Received:**	11/22/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	LOQ	LOD	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16RW06-191120	K1911032-001DUP	0.50	0.20	0.07	1.54	1.42	1.48	8	10	11/24/19
16RW06-191120-FD	K1911032-002DUP	0.50	0.20	0.07	1.55	1.60	1.57	3	10	11/24/19
16RW07-191120	K1911032-003DUP	0.50	0.20	0.07	1.59	1.50	1.55	5	10	11/24/19
16RW08-191120	K1911032-004DUP	0.50	0.20	0.07	2.02	1.87	1.94	8	10	11/24/19
16IW10-191120	K1911032-005DUP	200	80	30	1850	1930	1890	4	10	11/24/19
16RW09-191120	K1911032-006DUP	0.50	0.20	0.07	1.99	1.82	1.91	9	10	11/24/19
16RW10-191120	K1911032-007DUP	0.50	0.20	0.07	4.08	4.18	4.13	2	10	11/24/19

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1911032
Project:	HS19111080	**Date Collected:**	11/20/19
Sample Matrix:	Ground Water	**Date Received:**	11/22/19
		Date Analyzed:	11/24/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16RW10-191120	**Units:**	mg/L
Lab Code:	K1911032-007	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1911032-007MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	4.08	52.7	50.0	97	83-117

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

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

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

Client:	ALS Environmental - US	**Service Request:**	K1911032
Project:	HS19111080	**Date Analyzed:**	11/24/19
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	661077

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1911032-LCS1	25.1	25.0	100	83-117

Client:	ALS Environmental - US	**Service Request:**	K1911032
Project:	HS19111080	**Date Analyzed:**	11/24/19
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	661078

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1911032-LCS2	24.9	25.0	100	83-117

Client: ALS Environmental - US **Service Request:** K1911032
Project: HS19111080

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	661077	KQ1917447-01	11/24/19 02:11	25.0	24.6	98	90-110
CCV2	661077	KQ1917447-02	11/24/19 06:54	25.0	24.2	97	90-110
CCV3	661077	KQ1917447-03	11/24/19 11:51	25.0	24.7	99	90-110
CCV4	661077	KQ1917447-04	11/24/19 16:22	25.0	24.3	97	90-110
CCV5	661078	KQ1917448-01	11/24/19 11:51	25.0	24.7	99	90-110
CCV6	661078	KQ1917448-02	11/24/19 16:22	25.0	24.3	97	90-110
CCV7	661078	KQ1917448-03	11/24/19 21:32	25.0	24.6	99	90-110
CCV8	661078	KQ1917448-04	11/25/19 01:49	25.0	24.2	97	90-110
CCV9	661078	KQ1917448-05	11/25/19 06:19	25.0	24.1	96	90-110

Client: ALS Environmental - US **Service Request:**K1911032
Project: HS19111080

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

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

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	661077	KQ1917447-05	11/24/19 02:26	0.50	0.20	0.07	ND	U
CCB2	661077	KQ1917447-06	11/24/19 07:09	0.50	0.20	0.07	ND	U
CCB3	661077	KQ1917447-07	11/24/19 12:06	0.50	0.20	0.07	0.23	J
CCB4	661077	KQ1917447-08	11/24/19 16:36	0.50	0.20	0.07	ND	U
CCB5	661078	KQ1917448-06	11/24/19 12:06	0.50	0.20	0.07	0.23	J
CCB6	661078	KQ1917448-07	11/24/19 16:36	0.50	0.20	0.07	ND	U
CCB7	661078	KQ1917448-08	11/24/19 21:47	0.50	0.20	0.07	ND	U
CCB8	661078	KQ1917448-09	11/25/19 02:04	0.50	0.20	0.07	ND	U
CCB9	661078	KQ1917448-10	11/25/19 06:34	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original (_____) K1910680, 796, 847, 861, 929, 969, 11031, 11032, 11033, 10803, 11028, 11032, 11047, 11049, 975, 11043

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

Date Analyzed: 11/23/19

Analyst: BCD

Analysis: TOC/DOC

Run # TOC: 661076, 661077, 661078 DOC: 661079

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: K1910847-4/4d, K1910803-2/2d, 803-4/4d sent for RA due to being above calibration curve.
K1910803-3/3d, 803-5/5d sent for RA due to sample carry over.
K1911043-2 sent for RA due to being overdiluted.
K1910680-2/2d, 680-4/4d, 680-5/5d, 796-2/2d, 929-2/2d, 11031-1/1d, 11028-3/3d, and 10975-1/1d report a high %RSD. However these samples are less than 5x the MRL.
K1911033-6/6d, 11033-7/7d, 10803-3, 10803-5, 11047-1/1d report a high %RSD due to suspected non-homogenous sample.

Final Approved by: [signature] Date: 11/26/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661076 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910680-001	Carbon, Total Organic	N/A		Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50			11/23/19 17:58	N	II
K1910680-002	Carbon, Total Organic	N/A		Water	0.30 mg/L	10 ml	0.30 mg/L J	1	0.07	0.50			11/23/19 18:26	N	II
K1910680-003	Carbon, Total Organic	N/A		Water	0.63 mg/L	10 ml	0.63 mg/L	1	0.07	0.50			11/23/19 18:54	N	II
K1910680-004	Carbon, Total Organic	N/A		Water	0.56 mg/L	10 ml	0.56 mg/L	1	0.07	0.50			11/23/19 19:22	N	II
K1910680-005	Carbon, Total Organic	N/A		Water	0.17 mg/L	10 ml	0.17 mg/L J	1	0.07	0.50			11/23/19 19:50	N	II
K1910796-001	Carbon, Total Organic	N/A		Ground Water	1.05 mg/L	10 ml	1.05 mg/L	1	0.07	0.50			11/23/19 21:30	N	IV
K1910796-002	Carbon, Total Organic	N/A		Ground Water	0.88 mg/L	10 ml	0.88 mg/L	1	0.07	0.50			11/23/19 21:59	N	IV
K1910796-003	Carbon, Total Organic	N/A		Ground Water	1.78 mg/L	10 ml	1.78 mg/L	1	0.07	0.50			11/23/19 22:27	N	IV
K1910796-004	Carbon, Total Organic	N/A		Ground Water	0.20 mg/L	10 ml	0.20 mg/L J	1	0.07	0.50			11/23/19 20:18	Y	IV
K1910847-001	Carbon, Total Organic	N/A		Ground Water	34.01 mg/L	10 ml	680 mg/L	20	2	10			11/23/19 22:55	N	IV
K1910847-002	Carbon, Total Organic	N/A		Ground Water	32.82 mg/L	10 ml	32.8 mg/L	1	0.07	0.50			11/23/19 23:23	N	IV
K1910847-003	Carbon, Total Organic	N/A		Ground Water	35.27 mg/L	10 ml	35.3 mg/L	1	0.07	0.50			11/23/19 23:51	N	IV
K1910847-004	Carbon, Total Organic	N/A		Ground Water	61.27 mg/L	10 ml	61.3 mg/L	1	0.07	0.50			11/24/19 00:19	N	IV
K1910861-001	Carbon, Total Organic	N/A		Water	7.26 mg/L	10 ml	726 mg/L	100	7	50			11/24/19 00:47	N	II
K1910861-002	Carbon, Total Organic	N/A		Water	5.98 mg/L	10 ml	598 mg/L	100	7	50			11/24/19 01:15	N	II
K1910861-003	Carbon, Total Organic	N/A		Water	5.96 mg/L	10 ml	596 mg/L	100	7	50			11/24/19 01:43	N	II
K1910861-004	Carbon, Total Organic	N/A		Water	7.78 mg/L	10 ml	778 mg/L	100	7	50			11/24/19 03:10	N	II
K1910861-005	Carbon, Total Organic	N/A		Water	7.46 mg/L	10 ml	746 mg/L	100	7	50			11/24/19 03:38	N	II
K1910861-006	Carbon, Total Organic	N/A		Water	10.75 mg/L	10 ml	1080 mg/L	100	7	50			11/24/19 04:06	N	II
K1910861-007	Carbon, Total Organic	N/A		Water	8.35 mg/L	10 ml	835 mg/L	100	7	50			11/24/19 04:34	N	II
KQ1917446-01	Carbon, Total Organic	CCV		Water	24.53 mg/L	10 ml	24.5 mg/L	1					11/23/19 16:45	N	II
KQ1917446-02	Carbon, Total Organic	CCV		Water	24.61 mg/L	10 ml	24.6 mg/L	1					11/23/19 21:01	N	II
KQ1917446-03	Carbon, Total Organic	CCV		Water	24.56 mg/L	10 ml	24.6 mg/L	1					11/24/19 02:11	N	II
KQ1917446-04	Carbon, Total Organic	CCV		Water	24.22 mg/L	10 ml	24.2 mg/L	1					11/24/19 06:54	N	II
KQ1917446-05	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/23/19 16:59	N	II
KQ1917446-06	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/23/19 21:15	N	II
KQ1917446-07	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 02:26	N	II
KQ1917446-08	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 07:09	N	II
KQ1917446-09	Carbon, Total Organic	MB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/23/19 17:14	N	II
KQ1917446-10	Carbon, Total Organic	LCS		Water	24.74 mg/L	10 ml	24.7 mg/L	1	0.07	0.50	99		11/23/19 17:29	N	II
KQ1917446-11	Carbon, Total Organic	MS	K1910796-004	Ground Water	22.48 mg/L	10 ml	22.5 mg/L	1	0.07	0.50	89		11/23/19 20:46	N	IV

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

11/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661076 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917446-12	Carbon, Total Organic	DUP	K1910680-001	Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50		2	11/23/19 17:58	N	II
KQ1917446-13	Carbon, Total Organic	DUP	K1910680-002	Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50		13*	11/23/19 18:26	N	II
KQ1917446-14	Carbon, Total Organic	DUP	K1910680-003	Water	0.61 mg/L	10 ml	0.61 mg/L	1	0.07	0.50		3	11/23/19 18:54	N	II
KQ1917446-15	Carbon, Total Organic	DUP	K1910680-004	Water	0.67 mg/L	10 ml	0.67 mg/L	1	0.07	0.50		17*	11/23/19 19:22	N	II
KQ1917446-16	Carbon, Total Organic	DUP	K1910680-005	Water	0.20 mg/L	10 ml	0.20 mg/L J	1	0.07	0.50		15*	11/23/19 19:50	N	II
KQ1917446-17	Carbon, Total Organic	DUP	K1910796-002	Ground Water	0.77 mg/L	10 ml	0.77 mg/L	1	0.07	0.50		14*	11/23/19 21:59	N	IV
KQ1917446-18	Carbon, Total Organic	DUP	K1910796-001	Ground Water	1.14 mg/L	10 ml	1.14 mg/L	1	0.07	0.50		8	11/23/19 21:30	N	IV
KQ1917446-19	Carbon, Total Organic	DUP	K1910796-003	Ground Water	1.75 mg/L	10 ml	1.75 mg/L	1	0.07	0.50		1	11/23/19 22:27	N	IV
KQ1917446-20	Carbon, Total Organic	DUP	K1910796-004	Ground Water	0.21 mg/L	10 ml	0.21 mg/L J	1	0.07	0.50		6	11/23/19 20:18	N	IV
KQ1917446-21	Carbon, Total Organic	DUP	K1910847-002	Ground Water	32.44 mg/L	10 ml	32.4 mg/L	1	0.07	0.50		1	11/23/19 23:23	N	IV
KQ1917446-22	Carbon, Total Organic	DUP	K1910847-001	Ground Water	33.78 mg/L	10 ml	676 mg/L	20	2	10		<1	11/23/19 22:55	N	IV
KQ1917446-23	Carbon, Total Organic	DUP	K1910847-003	Ground Water	34.76 mg/L	10 ml	34.8 mg/L	1	0.07	0.50		1	11/23/19 23:51	N	IV
KQ1917446-24	Carbon, Total Organic	DUP	K1910847-004	Ground Water	60.91 mg/L	10 ml	60.9 mg/L	1	0.07	0.50		<1	11/24/19 00:19	N	IV
KQ1917446-25	Carbon, Total Organic	DUP	K1910861-001	Water	6.74 mg/L	10 ml	674 mg/L	100	7	50		7	11/24/19 00:47	N	II
KQ1917446-26	Carbon, Total Organic	DUP	K1910861-002	Water	5.82 mg/L	10 ml	582 mg/L	100	7	50		3	11/24/19 01:15	N	II
KQ1917446-27	Carbon, Total Organic	DUP	K1910861-003	Water	5.90 mg/L	10 ml	590 mg/L	100	7	50		1	11/24/19 01:43	N	II
KQ1917446-28	Carbon, Total Organic	DUP	K1910861-004	Water	7.76 mg/L	10 ml	776 mg/L	100	7	50		<1	11/24/19 03:10	N	II
KQ1917446-29	Carbon, Total Organic	DUP	K1910861-005	Water	7.41 mg/L	10 ml	741 mg/L	100	7	50		<1	11/24/19 03:38	N	II
KQ1917446-30	Carbon, Total Organic	DUP	K1910861-006	Water	10.62 mg/L	10 ml	1060 mg/L	100	7	50		1	11/24/19 04:06	N	II
KQ1917446-31	Carbon, Total Organic	DUP	K1910861-007	Water	8.16 mg/L	10 ml	816 mg/L	100	7	50		2	11/24/19 04:34	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661077 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910929-001	Carbon, Total Organic	N/A		Water	1.49 mg/L	10 ml	1.49 mg/L	1	0.07	0.50			11/24/19 05:02	N	II
K1910929-002	Carbon, Total Organic	N/A		Water	0.79 mg/L	10 ml	0.79 mg/L	1	0.07	0.50			11/24/19 05:30	N	II
K1910929-003	Carbon, Total Organic	N/A		Water	1.91 mg/L	10 ml	1.91 mg/L	1	0.07	0.50			11/24/19 05:58	N	II
K1910969-002	Carbon, Total Organic	N/A		Drinking Water	1.16 mg/L	10 ml	1.16 mg/L	1	0.07	0.50			11/24/19 06:26	N	I
K1911031-001	Carbon, Total Organic	N/A		Water	0.90 mg/L	10 ml	0.90 mg/L	1	0.07	0.50			11/24/19 12:50	N	IV
K1911032-001	Carbon, Total Organic	N/A		Ground Water	1.54 mg/L	10 ml	1.54 mg/L	1	0.07	0.50			11/24/19 13:19	N	IV
K1911032-002	Carbon, Total Organic	N/A		Ground Water	1.55 mg/L	10 ml	1.55 mg/L	1	0.07	0.50			11/24/19 13:47	N	IV
K1911032-003	Carbon, Total Organic	N/A		Ground Water	1.59 mg/L	10 ml	1.59 mg/L	1	0.07	0.50			11/24/19 14:15	N	IV
K1911032-004	Carbon, Total Organic	N/A		Ground Water	2.02 mg/L	10 ml	2.02 mg/L	1	0.07	0.50			11/24/19 14:43	N	IV
K1911032-005	Carbon, Total Organic	N/A		Ground Water	4.63 mg/L	10 ml	1850 mg/L	400	30	200			11/24/19 15:11	N	IV
K1911032-006	Carbon, Total Organic	N/A		Ground Water	1.99 mg/L	10 ml	1.99 mg/L	1	0.07	0.50			11/24/19 15:39	N	IV
K1911033-001	Carbon, Total Organic	N/A		Ground Water	3.66 mg/L	10 ml	3.66 mg/L	1	0.07	0.50			11/24/19 07:24	N	IV
K1911033-002	Carbon, Total Organic	N/A		Ground Water	2.81 mg/L	10 ml	2.81 mg/L	1	0.07	0.50			11/24/19 07:52	N	IV
K1911033-003	Carbon, Total Organic	N/A		Ground Water	2.80 mg/L	10 ml	2.80 mg/L	1	0.07	0.50			11/24/19 08:20	N	IV
K1911033-004	Carbon, Total Organic	N/A		Ground Water	2.38 mg/L	10 ml	2.38 mg/L	1	0.07	0.50			11/24/19 08:48	N	IV
K1911033-005	Carbon, Total Organic	N/A		Ground Water	39.57 mg/L	10 ml	791 mg/L	20	2	10			11/24/19 09:16	N	IV
K1911033-006	Carbon, Total Organic	N/A		Ground Water	4.37 mg/L	10 ml	4.37 mg/L	1	0.07	0.50			11/24/19 09:44	N	IV
K1911033-007	Carbon, Total Organic	N/A		Ground Water	2.51 mg/L	10 ml	2.51 mg/L	1	0.07	0.50			11/24/19 10:12	N	IV
K1911033-008	Carbon, Total Organic	N/A		Ground Water	7.82 mg/L	10 ml	7820 mg/L	1000	70	500			11/24/19 10:41	N	IV
K1911033-009	Carbon, Total Organic	N/A		Ground Water	3.94 mg/L	10 ml	3.94 mg/L	1	0.07	0.50			11/24/19 11:09	Y	IV
KQ1917447-01	Carbon, Total Organic	CCV		Water	24.56 mg/L	10 ml	24.6 mg/L	1					11/24/19 02:11	N	II
KQ1917447-02	Carbon, Total Organic	CCV		Water	24.22 mg/L	10 ml	24.2 mg/L	1					11/24/19 06:54	N	II
KQ1917447-03	Carbon, Total Organic	CCV		Water	24.73 mg/L	10 ml	24.7 mg/L	1					11/24/19 11:51	N	II
KQ1917447-04	Carbon, Total Organic	CCV		Water	24.32 mg/L	10 ml	24.3 mg/L	1					11/24/19 16:22	N	II
KQ1917447-05	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 02:26	N	II
KQ1917447-06	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 07:09	N	II
KQ1917447-07	Carbon, Total Organic	CCB		Water	0.23 mg/L	10 ml	0.23 mg/L J	1	0.07	0.50			11/24/19 12:06	N	II
KQ1917447-08	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 16:36	N	II

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

Printed 11/26/19 13:34

Results Summary

11/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661077 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917447-09	Carbon, Total Organic	MB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 02:41	N	II
KQ1917447-10	Carbon, Total Organic	LCS		Water	25.09 mg/L	10 ml	25.1 mg/L	1	0.07	0.50	100		11/24/19 02:55	N	II
KQ1917447-11	Carbon, Total Organic	MS	K1911033-009	Ground Water	26.11 mg/L	10 ml	52.2 mg/L	2	0.2	1.0	97		11/24/19 11:37	N	IV
KQ1917447-12	Carbon, Total Organic	DUP	K1910929-001	Water	1.39 mg/L	10 ml	1.39 mg/L	1	0.07	0.50		7	11/24/19 05:02	N	II
KQ1917447-13	Carbon, Total Organic	DUP	K1910929-002	Water	0.88 mg/L	10 ml	0.88 mg/L	1	0.07	0.50		11*	11/24/19 05:30	N	II
KQ1917447-14	Carbon, Total Organic	DUP	K1910929-003	Water	1.94 mg/L	10 ml	1.94 mg/L	1	0.07	0.50		2	11/24/19 05:58	N	II
KQ1917447-15	Carbon, Total Organic	DUP	K1910969-002	Drinking Water	1.11 mg/L	10 ml	1.11 mg/L	1	0.07	0.50		5	11/24/19 06:26	N	I
KQ1917447-16	Carbon, Total Organic	DUP	K1911031-001	Water	0.79 mg/L	10 ml	0.79 mg/L	1	0.07	0.50		13*	11/24/19 12:50	N	IV
KQ1917447-17	Carbon, Total Organic	DUP	K1911032-002	Ground Water	1.60 mg/L	10 ml	1.60 mg/L	1	0.07	0.50		3	11/24/19 13:47	N	IV
KQ1917447-18	Carbon, Total Organic	DUP	K1911032-001	Ground Water	1.42 mg/L	10 ml	1.42 mg/L	1	0.07	0.50		8	11/24/19 13:19	N	IV
KQ1917447-19	Carbon, Total Organic	DUP	K1911032-003	Ground Water	1.50 mg/L	10 ml	1.50 mg/L	1	0.07	0.50		5	11/24/19 14:15	N	IV
KQ1917447-20	Carbon, Total Organic	DUP	K1911032-004	Ground Water	1.87 mg/L	10 ml	1.87 mg/L	1	0.07	0.50		8	11/24/19 14:43	N	IV
KQ1917447-21	Carbon, Total Organic	DUP	K1911032-005	Ground Water	4.83 mg/L	10 ml	1930 mg/L	400	30	200		4	11/24/19 15:11	N	IV
KQ1917447-22	Carbon, Total Organic	DUP	K1911032-006	Ground Water	1.82 mg/L	10 ml	1.82 mg/L	1	0.07	0.50		9	11/24/19 15:39	N	IV
KQ1917447-23	Carbon, Total Organic	DUP	K1911033-001	Ground Water	3.65 mg/L	10 ml	3.65 mg/L	1	0.07	0.50		<1	11/24/19 07:24	N	IV
KQ1917447-24	Carbon, Total Organic	DUP	K1911033-002	Ground Water	2.74 mg/L	10 ml	2.74 mg/L	1	0.07	0.50		3	11/24/19 07:52	N	IV
KQ1917447-25	Carbon, Total Organic	DUP	K1911033-003	Ground Water	2.76 mg/L	10 ml	2.76 mg/L	1	0.07	0.50		1	11/24/19 08:20	N	IV
KQ1917447-26	Carbon, Total Organic	DUP	K1911033-004	Ground Water	2.31 mg/L	10 ml	2.31 mg/L	1	0.07	0.50		3	11/24/19 08:48	N	IV
KQ1917447-27	Carbon, Total Organic	DUP	K1911033-005	Ground Water	38.77 mg/L	10 ml	775 mg/L	20	2	10		2	11/24/19 09:16	N	IV
KQ1917447-28	Carbon, Total Organic	DUP	K1911033-006	Ground Water	3.18 mg/L	10 ml	3.18 mg/L	1	0.07	0.50		31*	11/24/19 09:44	N	IV
KQ1917447-29	Carbon, Total Organic	DUP	K1911033-007	Ground Water	2.24 mg/L	10 ml	2.24 mg/L	1	0.07	0.50		11*	11/24/19 10:12	N	IV
KQ1917447-30	Carbon, Total Organic	DUP	K1911033-008	Ground Water	8.01 mg/L	10 ml	8010 mg/L	1000	70	500		2	11/24/19 10:41	N	IV
KQ1917447-31	Carbon, Total Organic	DUP	K1911033-009	Ground Water	3.61 mg/L	10 ml	3.61 mg/L	1	0.07	0.50		9	11/24/19 11:09	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661078 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910803-001	Carbon, Total Organic	N/A		Water	43.43 mg/L	10 ml	43.4 mg/L	1	0.07	0.50			11/24/19 17:19	N	IV
K1910803-002	Carbon, Total Organic	N/A		Water	119.98 mg/L	10 ml	120 mg/L	1	0.07	0.50			11/24/19 17:47	N	IV
K1910803-003	Carbon, Total Organic	N/A		Water	21.79 mg/L	10 ml	21.8 mg/L	1	0.07	0.50			11/24/19 18:15	N	IV
K1910803-004	Carbon, Total Organic	N/A		Water	67.32 mg/L	10 ml	67.3 mg/L	1	0.07	0.50			11/24/19 18:43	N	IV
K1910803-005	Carbon, Total Organic	N/A		Water	39.95 mg/L	10 ml	39.9 mg/L	1	0.07	0.50			11/24/19 19:11	N	IV
K1910803-006	Carbon, Total Organic	N/A		Water	14.93 mg/L	10 ml	14.9 mg/L	1	0.07	0.50			11/24/19 19:40	N	IV
K1911028-001	Carbon, Total Organic	N/A		Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50			11/25/19 00:24	N	V
K1911028-002	Carbon, Total Organic	N/A		Water	22.10 mg/L	10 ml	22.1 mg/L	1	0.07	0.50			11/25/19 00:52	N	V
K1911028-003	Carbon, Total Organic	N/A		Water	0.73 mg/L	10 ml	0.73 mg/L	1	0.07	0.50			11/25/19 01:21	N	V
K1911028-004	Carbon, Total Organic	N/A		Water	1.41 mg/L	10 ml	1.41 mg/L	1	0.07	0.50			11/25/19 02:18	N	V
K1911028-005	Carbon, Total Organic	N/A		Water	1.44 mg/L	10 ml	1.44 mg/L	1	0.07	0.50			11/25/19 02:47	N	V
K1911032-007	Carbon, Total Organic	N/A		Ground Water	4.08 mg/L	10 ml	4.08 mg/L	1	0.07	0.50			11/24/19 16:51	Y	IV
K1911047-001	Carbon, Total Organic	N/A		Water	3.61 mg/L	10 ml	361 mg/L	100	7	50			11/24/19 20:08	N	II
K1911047-002	Carbon, Total Organic	N/A		Water	26.84 mg/L	10 ml	2680 mg/L	100	7	50			11/24/19 20:36	N	II
K1911049-001	Carbon, Total Organic	N/A		Water	4.21 mg/L	10 ml	84 mg/L	20	2	10			11/24/19 21:04	N	II
K1911049-002	Carbon, Total Organic	N/A		Water	9.04 mg/L	10 ml	181 mg/L	20	2	10			11/24/19 22:31	Y	II
K1911049-003	Carbon, Total Organic	N/A		Water	11.75 mg/L	10 ml	11.7 mg/L	1	0.07	0.50			11/24/19 23:28	N	II
K1911049-004	Carbon, Total Organic	N/A		Water	1.62 mg/L	10 ml	1.62 mg/L	1	0.07	0.50			11/24/19 23:56	N	II
KQ1917448-01	Carbon, Total Organic	CCV		Ground Water	24.73 mg/L	10 ml	24.7 mg/L	1					11/24/19 11:51	N	IV
KQ1917448-02	Carbon, Total Organic	CCV		Ground Water	24.32 mg/L	10 ml	24.3 mg/L	1					11/24/19 16:22	N	IV
KQ1917448-03	Carbon, Total Organic	CCV		Ground Water	24.63 mg/L	10 ml	24.6 mg/L	1					11/24/19 21:32	N	IV
KQ1917448-04	Carbon, Total Organic	CCV		Ground Water	24.22 mg/L	10 ml	24.2 mg/L	1					11/25/19 01:49	N	IV
KQ1917448-05	Carbon, Total Organic	CCV		Ground Water	24.12 mg/L	10 ml	24.1 mg/L	1					11/25/19 06:19	N	IV
KQ1917448-06	Carbon, Total Organic	CCB		Ground Water	0.23 mg/L	10 ml	0.23 mg/L J	1	0.07	0.50			11/24/19 12:06	N	IV
KQ1917448-07	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 16:36	N	IV
KQ1917448-08	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 21:47	N	IV
KQ1917448-09	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 02:04	N	IV
KQ1917448-10	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 06:34	N	IV
KQ1917448-11	Carbon, Total Organic	MB		Ground Water	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50			11/24/19 12:21	N	IV

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

11/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661078 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917448-12	Carbon, Total Organic	LCS		Ground Water	24.93 mg/L	10 ml	24.9 mg/L	1	0.07	0.50	100		11/24/19 12:36	N	IV
KQ1917448-13	Carbon, Total Organic	MS	K1911032-007	Ground Water	26.35 mg/L	10 ml	52.7 mg/L	2	0.2	1.0	97		11/24/19 16:07	N	IV
KQ1917448-14	Carbon, Total Organic	MS	K1911049-002	Water	29.03 mg/L	10 ml	2900 mg/L	100	7	50	109		11/24/19 22:59	N	II
KQ1917448-15	Carbon, Total Organic	DUP	K1910803-002	Water	122.07 mg/L	10 ml	122 mg/L	1	0.07	0.50		2	11/24/19 17:47	N	IV
KQ1917448-16	Carbon, Total Organic	DUP	K1910803-003	Water	18.16 mg/L	10 ml	18.2 mg/L	1	0.07	0.50		18*	11/24/19 18:15	N	IV
KQ1917448-17	Carbon, Total Organic	DUP	K1910803-004	Water	69.64 mg/L	10 ml	69.6 mg/L	1	0.07	0.50		3	11/24/19 18:43	N	IV
KQ1917448-18	Carbon, Total Organic	DUP	K1910803-005	Water	22.58 mg/L	10 ml	22.6 mg/L	1	0.07	0.50		56*	11/24/19 19:11	N	IV
KQ1917448-19	Carbon, Total Organic	DUP	K1910803-006	Water	13.68 mg/L	10 ml	13.7 mg/L	1	0.07	0.50		9	11/24/19 19:40	N	IV
KQ1917448-20	Carbon, Total Organic	DUP	K1910803-001	Water	44.82 mg/L	10 ml	44.8 mg/L	1	0.07	0.50		3	11/24/19 17:19	N	IV
KQ1917448-21	Carbon, Total Organic	DUP	K1911028-003	Water	0.66 mg/L	10 ml	0.66 mg/L	1	0.07	0.50		11*	11/25/19 01:21	N	V
KQ1917448-22	Carbon, Total Organic	DUP	K1911028-004	Water	1.38 mg/L	10 ml	1.38 mg/L	1	0.07	0.50		2	11/25/19 02:18	N	V
KQ1917448-23	Carbon, Total Organic	DUP	K1911028-005	Water	1.42 mg/L	10 ml	1.42 mg/L	1	0.07	0.50		1	11/25/19 02:47	N	V
KQ1917448-24	Carbon, Total Organic	DUP	K1911028-001	Water	0.82 mg/L	10 ml	0.82 mg/L	1	0.07	0.50		9	11/25/19 00:24	N	V
KQ1917448-25	Carbon, Total Organic	DUP	K1911028-002	Water	21.52 mg/L	10 ml	21.5 mg/L	1	0.07	0.50		3	11/25/19 00:52	N	V
KQ1917448-26	Carbon, Total Organic	DUP	K1911032-007	Ground Water	4.18 mg/L	10 ml	4.18 mg/L	1	0.07	0.50		2	11/24/19 16:51	N	IV
KQ1917448-27	Carbon, Total Organic	DUP	K1911047-001	Water	3.03 mg/L	10 ml	303 mg/L	100	7	50		18*	11/24/19 20:08	N	II
KQ1917448-28	Carbon, Total Organic	DUP	K1911047-002	Water	26.76 mg/L	10 ml	2680 mg/L	100	7	50		<1	11/24/19 20:36	N	II
KQ1917448-29	Carbon, Total Organic	DUP	K1911049-001	Water	3.99 mg/L	10 ml	80 mg/L	20	2	10		5	11/24/19 21:04	N	II
KQ1917448-30	Carbon, Total Organic	DUP	K1911049-002	Water	8.98 mg/L	10 ml	179 mg/L	20	2	10		<1	11/24/19 22:31	N	II
KQ1917448-31	Carbon, Total Organic	DUP	K1911049-003	Water	11.81 mg/L	10 ml	11.8 mg/L	1	0.07	0.50		<1	11/24/19 23:28	N	II
KQ1917448-32	Carbon, Total Organic	DUP	K1911049-004	Water	1.50 mg/L	10 ml	1.50 mg/L	1	0.07	0.50		8	11/24/19 23:56	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661079 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910975-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50			11/25/19 05:08	N	I
K1910975-002	Carbon, Dissolved Organic (DOC)	N/A		Water	7.97 mg/L	10 ml	79.7 mg/L	10	0.7	5.0			11/25/19 04:40	N	I
K1911043-001	Carbon, Dissolved Organic (DOC)	N/A		Water	11.72 mg/L	10 ml	11700 mg/L	1000	70	500			11/25/19 03:44	N	II
K1911043-002.R01	Carbon, Dissolved Organic (DOC)	N/A		Water	-0.04 mg/L	10 ml	500 mg/L U	1000	70	500			11/25/19 04:12	N	II
KQ1917449-01	Carbon, Dissolved Organic (DOC)	CCV		Water	-0.04 mg/L	10 ml	-0.0368 mg/L	1					11/24/19 22:01	N	II
KQ1917449-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.12 mg/L	10 ml	24.1 mg/L	1					11/25/19 06:19	N	II
KQ1917449-03	Carbon, Dissolved Organic (DOC)	CCB		Water	24.68 mg/L	10 ml	24.7 mg/L	1	0.07	0.50			11/24/19 22:16	N	II
KQ1917449-04	Carbon, Dissolved Organic (DOC)	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 06:34	N	II
KQ1917449-05	Carbon, Dissolved Organic (DOC)	MB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 01:49	N	II
KQ1917449-06	Carbon, Dissolved Organic (DOC)	LCS		Water	24.22 mg/L	10 ml	24.2 mg/L	1	0.07	0.50	97		11/25/19 02:04	N	II
KQ1917449-07	Carbon, Dissolved Organic (DOC)	MS	K1910975-001	Water	26.58 mg/L	10 ml	26.6 mg/L	1	0.07	0.50	103		11/25/19 05:36	N	I
KQ1917449-08	Carbon, Dissolved Organic (DOC)	DUP	K1910975-001	Water	0.72 mg/L	10 ml	0.72 mg/L	1	0.07	0.50		21*	11/25/19 05:08	N	I
KQ1917449-09	Carbon, Dissolved Organic (DOC)	DUP	K1910975-002	Water	8.27 mg/L	10 ml	82.7 mg/L	10	0.7	5.0		4	11/25/19 04:40	N	I
KQ1917449-10	Carbon, Dissolved Organic (DOC)	DUP	K1911043-001	Water	11.71 mg/L	10 ml	11700 mg/L	1000	70	500		<1	11/25/19 03:44	N	II
KQ1917449-11	Carbon, Dissolved Organic (DOC)	DUP	K1911043-002	Water	-0.04 mg/L	10 ml	500 mg/L U	1000	70	500		NC	11/25/19 04:12	N	II

11/26/19

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0.031	0.031	#DIV/0!	#DIV/0!	OBSERVATIONS	13	0.031
0.000				STD Deviation	0.08537	0
0.000				AVERAGE	0.03675	0
0.000				UCL	0.12213	0
0.000				LCL	-0.04862	0
0.000						0
0.270						ABOVE
0.177				OBSERVATIONS	1	ABOVE
0.000				STD Deviation	#DIV/0!	0
0.000				AVERAGE	0.03100	0
0.000				UCL	#DIV/0!	0
0.000				LCL	#DIV/0!	0
0.000						0
						0
				OBSERVATIONS	0	0
				STD Deviation	#DIV/0!	0
				AVERAGE	#DIV/0!	0
				UCL	#DIV/0!	0
				LCL	#DIV/0!	0
						0
						0
				OBSERVATIONS	0	0
				STD Deviation	#DIV/0!	0
				AVERAGE	#DIV/0!	0
						0
						0
						0
						0
						0
						0

11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.567	0.0368	24.5300	24.52995	24.5	11/23/2019
3	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/23/2019
4	mb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/23/2019
5	lcs	1	24.774	0.0368	24.7370	24.73695	24.7	11/23/2019
6	K1910680-001	1	0.394	0.0368	0.3575	0.35745	<0.5	11/23/2019
7	K1910680-001	1	0.400	0.0368	0.3632	0.36315	<0.5	11/23/2019
8	K1910680-002	1	0.336	0.0368	0.2995	0.29945	<0.5	11/23/2019
9	K1910680-002	1	0.301	0.0368	0.2638	0.26375	<0.5	11/23/2019
10	K1910680-003	1	0.665	0.0368	0.6281	0.62805	0.63	11/23/2019
11	K1910680-003	1	0.645	0.0368	0.6085	0.60845	0.6	11/23/2019
12	K1910680-004	1	0.598	0.0368	0.5611	0.56105	0.56	11/23/2019
13	K1910680-004	1	0.704	0.0368	0.6673	0.66725	0.67	11/23/2019
14	K1910680-005	1	0.209	0.0368	0.1722	0.17215	<0.5	11/23/2019
15	K1910680-005	1	0.237	0.0368	0.1999	0.19985	<0.5	11/23/2019
16	K1910796-004	1	0.235	0.0368	0.1982	0.19815	<0.5	11/23/2019
17	K1910796-004	1	0.247	0.0368	0.2103	0.21025	<0.5	11/23/2019
18	KQ1917446-11	1	22.520	0.0368	22.4829	22.48285	22.5	11/23/2019
19	ccv	1	24.651	0.0368	24.6140	24.61395	24.6	11/23/2019
20	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/23/2019
21	K1910796-001	1	1.085	0.0368	1.0481	1.04805	1.05	11/23/2019
22	K1910796-001	1	1.173	0.0368	1.1367	1.13665	1.1	11/23/2019
23	K1910796-002	1	0.917	0.0368	0.8806	0.88055	0.9	11/23/2019
24	K1910796-002	1	0.803	0.0368	0.7659	0.76585	0.77	11/23/2019
25	K1910796-003	1	1.814	0.0368	1.7772	1.77715	1.78	11/23/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

23 BKP 11/26/19 date time

Analyzed By: BKP	Date Analyzed 11/26/19
Reviewed By:	Date Reviewed 11/26/19

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1910796-003	1	1.791	0.0368	1.7545	1.75445	1.75	11/23/2019
27	K1910847-001	20	34.048	0.0368	34.0116	680.231	680.23	11/23/2019
28	K1910847-001	20	33.816	0.0368	33.7788	675.575	675.6	11/23/2019
29	K1910847-002	1	32.858	0.0368	32.8211	32.82105	32.8	11/23/2019
30	K1910847-002	1	32.481	0.0368	32.4447	32.44465	32.4	11/23/2019
31	K1910847-003	1	35.302	0.0368	35.2656	35.26555	35.3	11/23/2019
32	K1910847-003	1	34.801	0.0368	34.7641	34.76405	34.8	11/23/2019
33	K1910847-004	1	61.309	0.0368	61.2726	61.27255	61.3	11/24/2019
34	K1910847-004	1	60.948	0.0368	60.9109	60.91085	60.9	11/24/2019
35	K1910861-001	100	7.292	0.0368	7.2555	725.545	725.5	11/24/2019
36	K1910861-001	100	6.781	0.0368	6.7447	674.465	674.5	11/24/2019
37	K1910861-002	100	6.013	0.0368	5.9758	597.575	597.6	11/24/2019
38	K1910861-002	100	5.852	0.0368	5.8151	581.505	581.5	11/24/2019
39	K1910861-003	100	5.998	0.0368	5.9616	596.155	596.2	11/24/2019
40	K1910861-003	100	5.934	0.0368	5.8973	589.725	589.7	11/24/2019
41	ccv	1	24.592	0.0368	24.5555	24.55545	24.6	11/24/2019
42	ccb	1	0.031	0.0368	-0.0058	-0.00575	<0.5	11/24/2019
43	K1910861-004	100	7.819	0.0368	7.7823	778.225	778.2	11/24/2019
44	K1910861-004	100	7.801	0.0368	7.7640	776.395	776.4	11/24/2019
45	K1910861-005	100	7.497	0.0368	7.4601	746.005	746.0	11/24/2019
46	K1910861-005	100	7.442	0.0368	7.4053	740.525	740.5	11/24/2019
47	K1910861-006	100	10.791	0.0368	10.7546	1075.455	1075.5	11/24/2019
48	K1910861-006	100	10.652	0.0368	10.6153	1061.525	1061.5	11/24/2019
49	K1910861-007	100	8.384	0.0368	8.3476	834.755	834.8	11/24/2019
50	K1910861-007	100	8.194	0.0368	8.1568	815.675	815.7	11/24/2019

Analyzed By: BCD	Date Analyzed 11/23/19
Reviewed By:	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	24.259	0.0368	24.2227	24.22265	24.22	11/24/2019
52	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By:	BCP	Date Analyzed	11/25/19
Reviewed By:	[signature]	Date Reviewed	11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.592	0.0368	24.5555	24.55545	24.6	11/24/2019
3	ccb	1	0.031	0.0368	-0.0058	-0.00575	<0.5	11/24/2019
4	mb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
5	lcs	1	25.123	0.0368	25.0866	25.08655	25.1	11/24/2019
6	K1910929-001	1	1.527	0.0368	1.4898	1.48975	1.49	11/24/2019
7	K1910929-001	1	1.429	0.0368	1.3918	1.39175	1.4	11/24/2019
8	K1910929-002	1	0.827	0.0368	0.7902	0.79015	1	11/24/2019
9	K1910929-002	1	0.919	0.0368	0.8820	0.88195	0.88	11/24/2019
10	K1910929-003	1	1.943	0.0368	1.9064	1.90635	1.91	11/24/2019
11	K1910929-003	1	1.976	0.0368	1.9391	1.93905	1.9	11/24/2019
12	K1910969-002	1	1.201	0.0368	1.1638	1.16375	1.16	11/24/2019
13	K1910969-002	1	1.147	0.0368	1.1100	1.10995	1.11	11/24/2019
14	ccv	1	24.259	0.0368	24.2227	24.22265	24.22	11/24/2019
15	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
16	K1911033-001	1	3.696	0.0368	3.6588	3.65875	3.7	11/24/2019
17	K1911033-001	1	3.684	0.0368	3.6472	3.64715	3.65	11/24/2019
18	K1911033-002	1	2.845	0.0368	2.8083	2.80825	2.8	11/24/2019
19	K1911033-002	1	2.775	0.0368	2.7385	2.73845	2.7	11/24/2019
20	K1911033-003	1	2.836	0.0368	2.7992	2.79915	2.80	11/24/2019
21	K1911033-003	1	2.795	0.0368	2.7582	2.75815	2.76	11/24/2019
22	K1911033-004	1	2.422	0.0368	2.3849	2.38485	2.4	11/24/2019
23	K1911033-004	1	2.347	0.0368	2.3104	2.31035	2.3	11/24/2019
24	K1911033-005	20	39.603	0.0368	39.5660	791.319	791.32	11/24/2019
25	K1911033-005	20	38.802	0.0368	38.7653	775.305	775.31	11/24/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BCP		Date Analyzed 11/23/19	
Reviewed By: [signature]		Date Reviewed 11/26/19	

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1911033-006	1	4.402	0.0368	4.3652	4.36515	4.37	11/24/2019
27	K1911033-006	1	3.221	0.0368	3.1843	3.18425	3.18	11/24/2019
28	K1911033-007	1	2.543	0.0368	2.5060	2.50595	2.5	11/24/2019
29	K1911033-007	1	2.273	0.0368	2.2363	2.23625	2.2	11/24/2019
30	K1911033-008	1000	7.861	0.0368	7.8241	7824.05	7824.1	11/24/2019
31	K1911033-008	1000	8.044	0.0368	8.0074	8007.35	8007.4	11/24/2019
32	K1911033-009	1	3.972	0.0368	3.9355	3.93545	3.9	11/24/2019
33	K1911033-009	1	3.647	0.0368	3.6099	3.60985	3.6	11/24/2019
34	KQ1917447-11	2	26.144	0.0368	26.1076	52.2151	52.2	11/24/2019
35	ccv	1	24.762	0.0368	24.7255	24.72545	24.7	11/24/2019
36	ccb	1	0.270	0.0368	0.2328	0.23275	<0.5	11/24/2019
37	K1911031-001	1	0.934	0.0368	0.8970	0.89695	0.9	11/24/2019
38	K1911031-001	1	0.826	0.0368	0.7890	0.78895	0.8	11/24/2019
39	K1911032-001	1	1.580	0.0368	1.5437	1.54365	1.5	11/24/2019
40	K1911032-001	1	1.458	0.0368	1.4216	1.42155	1.4	11/24/2019
41	K1911032-002	1	1.585	0.0368	1.5487	1.54865	1.5	11/24/2019
42	K1911032-002	1	1.638	0.0368	1.6012	1.60115	1.6	11/24/2019
43	K1911032-003	1	1.623	0.0368	1.5864	1.58635	1.6	11/24/2019
44	K1911032-003	1	1.541	0.0368	1.5038	1.50375	1.5	11/24/2019
45	K1911032-004	1	2.055	0.0368	2.0187	2.01865	2.0	11/24/2019
46	K1911032-004	1	1.904	0.0368	1.8668	1.86675	1.9	11/24/2019
47	K1911032-005	400	4.671	0.0368	4.6341	1853.62	1853.6	11/24/2019
48	K1911032-005	400	4.867	0.0368	4.8300	1931.98	1932.0	11/24/2019
49	K1911032-006	1	2.028	0.0368	1.9917	1.99165	2.0	11/24/2019
50	K1911032-006	1	1.861	0.0368	1.8238	1.82375	1.8	11/24/2019

Analyzed By:	BCD	Date Analyzed	11/23/19
Reviewed By:		Date Reviewed	11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	24.356	0.0368	24.3194	24.31935	24.32	11/24/2019
52	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BCP	Date Analyzed 11/23/19
Reviewed By:	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.762	0.0368	24.7255	24.72545	24.7	11/24/2019
3	ccb	1	0.270	0.0368	0.2328	0.23275	<0.5	11/24/2019
4	mb	1	0.177	0.0368	0.1406	0.14055	<0.5	11/24/2019
5	lcs	1	24.962	0.0368	24.9254	24.92535	24.9	11/24/2019
6	KQ1917448-13	2	26.387	0.0368	26.3507	52.7013	52.70	11/24/2019
7	ccv	1	24.356	0.0368	24.3194	24.31935	24.3	11/24/2019
8	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
9	K1911032-007	1	4.121	0.0368	4.0838	4.08375	4.08	11/24/2019
10	K1911032-007	1	4.215	0.0368	4.1781	4.17805	4.18	11/24/2019
11	K1910803-001	1	43.462	0.0368	43.4256	43.42555	43.4	11/24/2019
12	K1910803-001	1	44.855	0.0368	44.8186	44.81855	44.82	11/24/2019
13	K1910803-002	1	120.019	0.0368	119.9820	119.98195	119.98	11/24/2019
14	K1910803-002	1	122.103	0.0368	122.0664	122.06635	122.07	11/24/2019
15	K1910803-003	1	21.826	0.0368	21.7893	21.78925	21.8	11/24/2019
16	K1910803-003	1	18.201	0.0368	18.1638	18.16375	18.2	11/24/2019
17	K1910803-004	1	67.352	0.0368	67.3154	67.31535	67.32	11/24/2019
18	K1910803-004	1	69.680	0.0368	69.6435	69.64345	69.6	11/24/2019
19	K1910803-005	1	39.984	0.0368	39.9477	39.94765	39.9	11/24/2019
20	K1910803-005	1	22.612	0.0368	22.5756	22.57555	22.58	11/24/2019
21	K1910803-006	1	14.967	0.0368	14.9307	14.93065	14.93	11/24/2019
22	K1910803-006	1	13.722	0.0368	13.6848	13.68475	13.7	11/24/2019
23	K1911047-001	100	3.650	0.0368	3.6131	361.305	361.3	11/24/2019
24	K1911047-001	100	3.066	0.0368	3.0297	302.965	302.97	11/24/2019
25	K1911047-002	100	26.873	0.0368	26.8364	2683.635	2683.64	11/24/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BOB	Date Analyzed	11/23/19	
Reviewed By:	Date Reviewed	11/26/19	

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1911047-002	100	26.799	0.0368	26.7618	2676.175	2676.18	11/24/2019
27	K1911049-001	20	4.249	0.0368	4.2124	84.247	84.25	11/24/2019
28	K1911049-001	20	4.029	0.0368	3.9925	79.849	79.8	11/24/2019
29	ccv	1	24.669	0.0368	24.6320	24.63195	24.6	11/24/2019
30	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
31	K1911049-002	20	9.079	0.0368	9.0426	180.851	180.9	11/24/2019
32	K1911049-002	20	9.012	0.0368	8.9750	179.499	179.5	11/24/2019
33	KQ1917448-14	100	29.072	0.0368	29.0348	2903.475	2903.5	11/24/2019
34	K1911049-003	1	11.784	0.0368	11.7471	11.74705	11.7	11/24/2019
35	K1911049-003	1	11.848	0.0368	11.8116	11.81155	11.8	11/24/2019
36	K1911049-004	1	1.659	0.0368	1.6225	1.62245	1.6	11/24/2019
37	K1911049-004	1	1.541	0.0368	1.5039	1.50385	1.5	11/24/2019
38	K1911028-001	1	0.932	0.0368	0.8949	0.89485	0.9	11/25/2019
39	K1911028-001	1	0.858	0.0368	0.8217	0.82165	0.8	11/25/2019
40	K1911028-002	1	22.140	0.0368	22.1030	22.10295	22.1	11/25/2019
41	K1911028-002	1	21.561	0.0368	21.5239	21.52385	21.5	11/25/2019
42	K1911028-003	1	0.771	0.0368	0.7346	0.73455	0.7	11/25/2019
43	K1911028-003	1	0.696	0.0368	0.6592	0.65915	0.7	11/25/2019
44	ccv	1	24.254	0.0368	24.2171	24.21705	24.2	11/25/2019
45	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
46	K1911028-004	1	1.442	0.0368	1.4057	1.40565	1.4	11/25/2019
47	K1911028-004	1	1.412	0.0368	1.3753	1.37525	1.4	11/25/2019
48	K1911028-005	1	1.478	0.0368	1.4409	1.44085	1.4	11/25/2019
49	K1911028-005	1	1.461	0.0368	1.4244	1.42435	1.4	11/25/2019
50	ccv	1	24.161	0.0368	24.1246	24.12455	24.1	11/25/2019

Analyzed By: BH	Date Analyzed 11/23/19
Reviewed By: [signature]	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
52		1		0.0000	0.0000	0	<0.5	
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BKP	Date Analyzed 11/27/19
Reviewed By:	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	mb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
3	lcs	1	24.714	0.0368	24.6774	24.67735	24.7	11/24/2019
4	ccv	1	24.254	0.0368	24.2171	24.21705	24.2	11/25/2019
5	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
6	K1911043-001	1000	11.760	0.0368	11.7231	11723.05	11723.05	11/25/2019
7	K1911043-001	1000	11.743	0.0368	11.7062	11706.15	11706.2	11/25/2019
8	K1911043-002	1000	0.000	0.0368	-0.0368	-36.75	<0.5	11/25/2019
9	K1911043-002	1000	0.000	0.0368	-0.0368	-36.75	<0.5	11/25/2019
10	K1910975-002	10	8.002	0.0368	7.9657	79.6565	79.66	11/25/2019
11	K1910975-002	10	8.302	0.0368	8.2651	82.6505	82.7	11/25/2019
12	K1910975-001	1	0.922	0.0368	0.8852	0.88515	0.89	11/25/2019
13	K1910975-001	1	0.756	0.0368	0.7189	0.71885	0.72	11/25/2019
14	KQ1917449-07	1	26.613	0.0368	26.5764	26.57635	26.58	11/25/2019
15	ccv	1	24.161	0.0368	24.1246	24.12455	24.1	11/25/2019
16	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
17		1		0.0000	0.0000	0	<0.5	
18		1		0.0000	0.0000	0	<0.5	
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By:		Date Analyzed	11/23/19
Reviewed By:		Date Reviewed	11/26/19

TOC: 661076, 661077, 661078
DOC: 661079

Schedule: 11232019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/11/23 17:20 - Saturday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1910680-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1910680-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1910680-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1910680-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1910680-005.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1910796-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1910796-004.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1910796-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1910796-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1910796-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1910847-001.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1910847-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1910847-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1910847-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1910861-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1910861-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1910861-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1910861-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1910861-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1910861-006.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1910861-007.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1910929-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1910929-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1910929-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1910969-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1911033-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1911033-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1911033-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1911033-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1911033-005.03 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1911033-006.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1911033-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1911033-008.03 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1911033-009.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1911033-009.08 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Schedule: 11232019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1911031-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1911032-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1911032-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1911032-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1911032-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1911032-005.01 400x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1911032-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1911032-007.03 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1911032-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1910803-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1910803-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1910803-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1910803-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1910803-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1910803-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1911047-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1911047-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1911049-001.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	K1911049-002.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1911049-002.01 ms 100x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
61	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
62	Sample	K1911049-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1911049-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K1911028-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1911028-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K1911028-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	K1911028-004.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K1911028-005.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	FB 11/21/19	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
70	Sample	FB 11/22/19	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
71	Sample	K1911043-001.01 doc 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	K1911043-002.01 doc 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	K1910975-002.01 doc 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K1910975-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	K1910975-001.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
61	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 11232019
Saturday, November 23, 2019 02:23 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/11/26 09:09 - Tuesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11232019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8)		
Comment:			

11/26/19

Report Results

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/23 14:23

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.02	17.16	4.14	49.59	05:26
2	TC Clean	7.50	10.99	3.49	49.85	07:19
3	TC Clean	2.01	5.61	3.60	49.88	07:04
4	TC Clean	1.40	5.11	3.71	49.85	07:02

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/23 14:55

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.72	15.29	3.57	49.65	05:23

2	TC Clean	3.64	7.23	3.59	49.87	07:17
3	TC Clean	1.59	5.34	3.74	49.87	07:02
4	TC Clean	1.19	4.93	3.74	49.91	07:02

Sample Type: Clean From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/23 15:34

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.48	15.13	3.65	49.68	05:24
2	TC Clean	3.90	7.40	3.51	50.02	04:07
3	TC Clean	1.55	5.07	3.52	50.06	03:50
4	TC Clean	1.18	4.74	3.56	50.06	03:48

Sample Type: Blank (Creating v1323) From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/11/23 15:56

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.31	14.93	3.62	49.60	05:13
2	TC Clean	3.39	7.01	3.62	50.04	04:06
3	TC Clean	1.31	4.93	3.61	50.06	03:48
4	TC Clean	1.45	4.95	3.50	50.05	03:47
5	Reagent Blank	4.02	7.68	3.66	50.07	05:09
6	Acid Blank	1.14	4.93	3.79	49.74	05:31

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0324 ppm	0.0000 ppm	0.0000%	2019/11/23 16:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0324	0.3238	9.00	12.79	3.79	50.19	10:34

Dilution **Blank Contribution** **Method** **Calibration**

1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5667 ppm (PASS)	0.0000 ppm	0%	2019/11/23 16:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5667	245.6673	176.22	180.09	3.87	50.19	10:30

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

Sample Type: Check Standard --> CCB — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/23 16:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.20	10.93	3.73	50.19	10:29

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

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/23 17:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.91	9.77	3.86	50.22	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time

			(ppm)			(% dev)				
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.7737 ppm (PASS)	0.0000 ppm	0%	2019/11/23 17:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7737	247.7372	177.62	181.34	3.71	50.22	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0515 ppm	0.0000 ppm	0.0000%	2019/11/23 17:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0515	0.5154	9.13	12.75	3.61	50.28	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1910680-001.01	0.3971 ppm	0.0041 ppm	1.0200%	2019/11/23 17:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3942	3.9420	11.46	15.12	3.66	50.22	10:23
2	TOC	0.3999	3.9995	11.50	15.20	3.70	50.24	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1910680-002.01	0.3183 ppm	0.0252 ppm	7.9200%	2019/11/23 18:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3362	3.3616	11.07	14.56	3.49	50.27	10:28
2	TOC	0.3005	3.0051	10.82	14.32	3.50	50.24	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1910680-003.01	0.6550 ppm	0.0139 ppm	2.1200%	2019/11/23 18:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6648	6.6483	13.30	17.08	3.79	50.23	10:28
2	TOC	0.6452	6.4524	13.16	16.93	3.77	50.22	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1910680-004.01	0.6509 ppm	0.0751 ppm	11.5400%	2019/11/23 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5978	5.9780	12.84	16.55	3.71	50.24	10:25
2	TOC	0.7040	7.0402	13.56	17.06	3.50	50.21	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1910680-005.03	0.2227 ppm	0.0196 ppm	8.7900%	2019/11/23 19:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2089	2.0887	10.20	13.79	3.59	50.22	10:27
2	TOC	0.2366	2.3657	10.39	13.99	3.60	50.18	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1910796-004.01	0.2410 ppm	0.0085 ppm	3.5400%	2019/11/23 20:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2349	2.3495	10.38	14.07	3.70	50.17	10:30
2	TOC	0.2470	2.4703	10.46	14.10	3.64	50.21	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1910796-004.01 ms	22.5196 ppm	0.0000 ppm	0.0000%	2019/11/23 20:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	22.5196	225.1962	161.65	165.26	3.61	50.18	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6507 ppm (PASS)	0.0000 ppm	0%	2019/11/23 21:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6507	246.5070	176.79	180.47	3.68	50.17	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/23 21:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.20	10.96	3.76	50.20	10:30

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1910796-001.01	1.1291 ppm	0.0626 ppm	5.5400%	2019/11/23 21:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0848	10.8484	16.15	19.70	3.56	50.19	10:28
2	TOC	1.1734	11.7338	16.75	20.53	3.78	50.20	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1910796-002.01	0.8600 ppm	0.0811 ppm	9.4400%	2019/11/23 21:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9173	9.1734	15.01	18.72	3.71	50.17	10:29

2	TOC	0.8026	8.0257	14.23	17.85	3.62	50.21	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1910796-003.01	1.8026 ppm	0.0160 ppm	0.8900%	2019/11/23 22:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8139	18.1393	21.10	24.61	3.52	50.15	10:27
2	TOC	1.7912	17.9124	20.94	24.64	3.70	50.17	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1910847-001.01 20x	33.9319 ppm	0.1646 ppm	0.4900%	2019/11/23 22:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	34.0483	340.4830	239.90	243.51	3.61	50.13	10:25
2	TOC	33.8155	338.1553	238.32	242.06	3.74	50.17	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1910847-002.01	32.6696 ppm	0.2662 ppm	0.8100%	2019/11/23 23:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.8578	328.5780	231.82	235.44	3.62	50.13	10:29
2	TOC	32.4814	324.8140	229.27	232.83	3.57	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1910847-003.01	35.0515 ppm	0.3546 ppm	1.0100%	2019/11/23 23:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	35.3023	353.0229	248.41	251.92	3.51	50.15	10:24
2	TOC	34.8008	348.0081	245.01	248.71	3.70	50.19	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	16	TOC	K1910847-004.01	61.1285 ppm	0.2557 ppm	0.4200%	2019/11/24 00:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	61.3093	613.0929	424.95	428.74	3.79	50.16	10:26
2	TOC	60.9476	609.4762	422.49	426.28	3.78	50.18	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K1910861-001.01 100x	7.0368 ppm	0.3612 ppm	5.1300%	2019/11/24 00:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.2922	72.9217	58.28	62.10	3.82	50.15	10:27
2	TOC	6.7814	67.8141	54.82	58.35	3.54	50.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K1910861-002.01 100x	5.9322 ppm	0.1137 ppm	1.9200%	2019/11/24 01:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0125	60.1255	49.60	53.26	3.66	50.14	10:29
2	TOC	5.8518	58.5182	48.51	52.12	3.61	50.05	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K1910861-003.01 100x	5.9661 ppm	0.0454 ppm	0.7600%	2019/11/24 01:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.9983	59.9826	49.50	53.04	3.54	50.09	10:26
2	TOC	5.9340	59.3403	49.06	52.60	3.54	50.03	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5922 ppm (PASS)	0.0000 ppm	0%	2019/11/24 02:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5922	245.9222	176.39	179.84	3.44	50.03	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0310 ppm (PASS)	0.0000 ppm	0%	2019/11/24 02:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0310	0.3101	9.67	13.33	3.66	50.08	10:31

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/24 02:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.75	12.48	3.72	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.1233 ppm (PASS)	0.0000 ppm	0%	2019/11/24 02:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1233	251.2331	180.00	183.53	3.53	50.03	10:32

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1910861-004.01 100x	7.8099 ppm	0.0129 ppm	0.1700%	2019/11/24 03:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8190	78.1899	61.86	65.43	3.57	50.08	10:27
2	TOC	7.8007	78.0072	61.74	65.35	3.62	50.02	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1910861-005.01 100x	7.4694 ppm	0.0388 ppm	0.5200%	2019/11/24 03:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.4968	74.9680	59.67	63.39	3.72	50.08	10:26
2	TOC	7.4420	74.4200	59.30	62.89	3.59	50.04	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1910861-006.01 100x	10.7216 ppm	0.0985 ppm	0.9200%	2019/11/24 04:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.7913	107.9132	82.04	85.66	3.63	50.12	10:29
2	TOC	10.6520	106.5195	81.09	84.72	3.63	50.06	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1910861-007.01 100x	8.2889 ppm	0.1349 ppm	1.6300%	2019/11/24 04:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.3843	83.8426	65.70	69.24	3.54	50.09	10:26
2	TOC	8.1935	81.9348	64.40	67.94	3.54	50.10	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1910929-001.01	1.4775 ppm	0.0693 ppm	4.6900%	2019/11/24 05:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5265	15.2651	19.15	22.67	3.52	50.08	10:26
2	TOC	1.4285	14.2854	18.48	22.07	3.59	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1910929-002.01	0.8728 ppm	0.0649 ppm	7.4400%	2019/11/24 05:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8269	8.2688	14.40	17.92	3.52	50.11	10:29
2	TOC	0.9187	9.1866	15.02	18.57	3.55	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1910929-003.01	1.9595 ppm	0.0231 ppm	1.1800%	2019/11/24 05:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9431	19.4313	21.97	25.45	3.48	50.14	10:29
2	TOC	1.9758	19.7583	22.20	25.88	3.69	50.11	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1910969-002.01	1.1736 ppm	0.0380 ppm	3.2400%	2019/11/24 06:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2005	12.0049	16.93	20.49	3.56	50.15	10:28
2	TOC	1.1467	11.4671	16.57	20.16	3.59	50.15	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2594 ppm (PASS)	0.0000 ppm	0%	2019/11/24 06:54

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

	Type		#							Time
B	TOC	25 ppm	1	24.2594	242.5942	174.13	177.81	3.67	50.11	10:29

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

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/24 07:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.62	11.38	3.76	50.13	10:30

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1911033-001.03	3.6897 ppm	0.0082 ppm	0.2200%	2019/11/24 07:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6955	36.9550	33.87	37.44	3.58	50.10	10:30
2	TOC	3.6839	36.8386	33.79	37.44	3.65	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K1911033-002.03	2.8101 ppm	0.0494 ppm	1.7600%	2019/11/24 07:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8450	28.4502	28.10	31.78	3.68	50.13	10:24
2	TOC	2.7752	27.7519	27.62	31.38	3.76	50.10	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	K1911033-003.03	2.8154 ppm	0.0290 ppm	1.0300%	2019/11/24 08:20

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	2.8359	28.3589	28.03	31.72	3.68	50.10	10:27
2	TOC	2.7949	27.9493	27.76	31.45	3.69	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1911033-004.03	2.3843 ppm	0.0527 ppm	2.2100%	2019/11/24 08:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4216	24.2162	25.22	28.84	3.62	50.11	10:29
2	TOC	2.3471	23.4708	24.72	28.28	3.57	50.10	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1911033-005.03 20x	39.2024 ppm	0.5662 ppm	1.4400%	2019/11/24 09:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	39.6027	396.0271	277.60	281.33	3.73	50.11	10:27
2	TOC	38.8020	388.0202	272.17	276.09	3.92	50.14	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1911033-006.03	3.8114 ppm	0.8350 ppm	21.9100%	2019/11/24 09:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4019	44.0190	38.66	42.53	3.86	50.11	10:29
2	TOC	3.2210	32.2098	30.65	34.21	3.56	50.10	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1911033-007.03	2.4078 ppm	0.1907 ppm	7.9200%	2019/11/24 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5427	25.4272	26.04	29.72	3.67	50.12	10:29
2	TOC	2.2730	22.7298	24.21	27.75	3.54	50.10	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8608	78.6083	62.14	65.77	3.63	50.14	10:31
2	TOC	8.0441	80.4409	63.39	67.04	3.65	50.09	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1911033-009.08	3.8094 ppm	0.2302 ppm	6.0400%	2019/11/24 11:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9722	39.7217	35.75	39.38	3.63	50.12	10:30
2	TOC	3.6466	36.4659	33.54	37.02	3.49	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1911033-009.08 ms 2x	26.1443 ppm	0.0000 ppm	0.0000%	2019/11/24 11:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1443	261.4428	186.25	189.80	3.55	50.11	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.7622 ppm (PASS)	0.0000 ppm	0%	2019/11/24 11:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7622	247.6222	177.55	181.02	3.47	50.15	10:28

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.2695 ppm (PASS)	0.0000 ppm	0%	2019/11/24 12:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.2695	2.6952	11.29	14.85	3.56	50.13	10:34

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.1773 ppm	0.0000 ppm	0.0000%	2019/11/24 12:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1773	1.7735	9.99	13.72	3.73	50.13	10:34

Dilution: 1:10
Blank Contribution: (TC) 8.7842 (IC) (v1323)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.9621 ppm (PASS)	0.0000 ppm	0%	2019/11/24 12:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.9621	249.6214	178.90	182.70	3.80	50.17	10:37

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K1911031-001.01	0.8797 ppm	0.0764 ppm	8.6800%	2019/11/24 12:50

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

1	TOC	0.9337	9.3369	15.12	18.87	3.75	50.14	10:29
2	TOC	0.8257	8.2570	14.39	18.18	3.79	50.17	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	K1911032-001.01	1.5194 ppm	0.0864 ppm	5.6800%	2019/11/24 13:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5804	15.8042	19.51	23.29	3.78	50.19	10:28
2	TOC	1.4583	14.5830	18.68	22.26	3.58	50.20	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	42	TOC	K1911032-002.01	1.6117 ppm	0.0371 ppm	2.3000%	2019/11/24 13:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5854	15.8543	19.55	22.98	3.44	50.25	10:28
2	TOC	1.6379	16.3788	19.90	23.42	3.52	50.20	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	K1911032-003.01	1.5818 ppm	0.0584 ppm	3.6900%	2019/11/24 14:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6231	16.2315	19.80	23.26	3.46	50.22	10:25
2	TOC	1.5405	15.4050	19.24	22.79	3.54	50.25	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	44	TOC	K1911032-004.01	1.9794 ppm	0.1074 ppm	5.4300%	2019/11/24 14:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0554	20.5538	22.74	26.37	3.63	50.21	10:30
2	TOC	1.9035	19.0350	21.70	25.32	3.61	50.22	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1911032-005.01 400x	4.7687 ppm	0.1385 ppm	2.9100%	2019/11/24 15:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6708	46.7076	40.49	43.95	3.46	50.26	10:28
2	TOC	4.8667	48.6669	41.82	45.56	3.74	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1911032-006.01	1.9445 ppm	0.1188 ppm	6.1100%	2019/11/24 15:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0284	20.2842	22.55	26.14	3.58	50.27	10:31
2	TOC	1.8605	18.6048	21.41	25.06	3.65	50.23	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1911032-007.03 ms 2x	26.3874 ppm	0.0000 ppm	0.0000%	2019/11/24 16:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.3874	263.8736	187.90	191.52	3.62	50.24	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3561 ppm (PASS)	0.0000 ppm	0%	2019/11/24 16:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3561	243.5606	174.79	178.42	3.63	50.26	10:33

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

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/24 16:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.48	11.05	3.57	50.24	10:31

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	K1911032-007.03	4.1677 ppm	0.0667 ppm	1.6000%	2019/11/24 16:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1205	41.2052	36.75	40.48	3.73	50.22	10:28
2	TOC	4.2148	42.1480	37.39	40.98	3.59	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K1910803-001.01	44.1588 ppm	0.9849 ppm	2.2300%	2019/11/24 17:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	43.4623	434.6235	303.80	307.50	3.70	50.24	10:26
2	TOC	44.8553	448.5526	313.26	317.05	3.79	50.20	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	K1910803-002.01	121.0609 ppm	1.4739 ppm	1.2200%	2019/11/24 17:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	120.0187	1200.1870	823.46	827.29	3.83	50.25	10:28
2	TOC	122.1031	1221.0313	837.61	842.19	4.58	50.24	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	51	TOC	K1910803-003.01	20.0133 ppm	2.5636 ppm	12.8100%	2019/11/24 18:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.8260	218.2603	156.94	161.38	4.44	50.17	10:27
2	TOC	18.2005	182.0049	132.33	136.43	4.11	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K1910803-004.01	68.5161 ppm	1.6462 ppm	2.4000%	2019/11/24 18:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	67.3521	673.5207	465.97	469.89	3.93	50.19	10:27
2	TOC	69.6802	696.8016	481.77	488.04	6.27	50.15	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K1910803-005.01	31.2983 ppm	12.2840 ppm	39.2500%	2019/11/24 19:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	39.9844	399.8441	280.20	285.79	5.59	50.18	10:30
2	TOC	22.6123	226.1228	162.27	166.53	4.26	50.14	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	K1910803-006.01	14.3445 ppm	0.8810 ppm	6.1400%	2019/11/24 19:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.9674	149.6740	110.38	114.24	3.86	50.18	10:28
2	TOC	13.7215	137.2151	101.92	105.81	3.89	50.14	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	K1911047-001.01 100x	3.3581 ppm	0.4125 ppm	12.2800%	2019/11/24 20:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6498	36.4983	33.56	37.32	3.76	50.14	10:27
2	TOC	3.0664	30.6644	29.60	33.16	3.56	50.17	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1911047-002.01 100x	26.8358 ppm	0.0527 ppm	0.2000%	2019/11/24 20:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.8731	268.7307	191.20	194.84	3.64	50.13	10:25
2	TOC	26.7985	267.9853	190.69	194.42	3.73	50.17	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1911049-001.01 20x	4.1392 ppm	0.1555 ppm	3.7600%	2019/11/24 21:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2491	42.4913	37.63	41.27	3.65	50.16	10:28
2	TOC	4.0292	40.2918	36.13	39.75	3.61	50.12	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6687 ppm (PASS)	0.0000 ppm	0%	2019/11/24 21:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6687	246.6868	176.91	180.57	3.66	50.17	10:34

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

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/24 21:47

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

	Type									
D	TOC	0 ppm	1	0.0000	0.0000	8.80	12.38	3.58	50.14	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/24 22:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.03	11.47	3.43	50.10	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.7141 ppm (PASS)	0.0000 ppm	0%	2019/11/24 22:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7141	247.1405	177.22	180.81	3.59	50.14	10:30

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1911049-002.01 20x	9.0455 ppm	0.0478 ppm	0.5300%	2019/11/24 22:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0793	90.7931	70.41	74.08	3.66	50.15	10:27
2	TOC	9.0117	90.1169	69.96	73.45	3.50	50.14	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	60	TOC	K1911049-002.01 ms 100x	29.0715 ppm	0.0000 ppm	0.0000%	2019/11/24 22:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.0715	290.7153	206.12	209.76	3.64	50.16	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/24 23:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.92	11.64	3.72	50.14	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K1911049-003.01	11.8161 ppm	0.0456 ppm	0.3900%	2019/11/24 23:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.7838	117.8381	88.77	92.40	3.62	50.11	10:31
2	TOC	11.8483	118.4834	89.21	92.81	3.60	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	K1911049-004.01	1.5999 ppm	0.0839 ppm	5.2400%	2019/11/24 23:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6592	16.5924	20.05	23.59	3.54	50.11	10:30
2	TOC	1.5406	15.4065	19.24	22.81	3.57	50.13	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K1911028-001.04	0.8950 ppm	0.0518 ppm	5.7800%	2019/11/25 00:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9316	9.3163	15.11	18.58	3.47	50.15	10:28
2	TOC	0.8584	8.5841	14.61	18.06	3.45	50.11	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC)	CAS_salt_010711	CAS_salt_010711

(v1323) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	65	TOC	K1911028-002.04	21.8501 ppm	0.4095 ppm	1.8700%	2019/11/25 00:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	22.1397	221.3968	159.07	162.59	3.52	50.14	10:29
2	TOC	21.5606	215.6056	155.14	158.84	3.70	50.12	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	K1911028-003.04	0.7336 ppm	0.0533 ppm	7.2700%	2019/11/25 01:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7713	7.7134	14.02	17.61	3.59	50.10	10:26
2	TOC	0.6959	6.9591	13.51	17.14	3.64	50.14	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2538 ppm (PASS)	0.0000 ppm	0%	2019/11/25 01:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2538	242.5382	174.10	177.84	3.74	50.11	10:29

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/25 02:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.19	9.91	3.72	50.09	10:33

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	K1911028-004.04	1.4272 ppm	0.0215 ppm	1.5000%	2019/11/25 02:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4424	14.4239	18.58	22.17	3.60	50.13	10:29
2	TOC	1.4120	14.1204	18.37	22.07	3.70	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	68	TOC	K1911028-005.04	1.4693 ppm	0.0117 ppm	0.7900%	2019/11/25 02:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4776	14.7759	18.81	22.49	3.68	50.15	10:28
2	TOC	1.4611	14.6110	18.70	22.34	3.64	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	69	TOC	FB 11/21/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 03:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.76	9.25	3.49	50.12	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	70	TOC	FB 11/22/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 03:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.79	9.29	3.50	50.13	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◈	71	TOC	K1911043-001.01 doc 1000x	11.7513 ppm	0.0120 ppm	0.1000%	2019/11/25 03:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.7598	117.5980	88.61	92.27	3.66	50.11	10:29
2	TOC	11.7429	117.4286	88.49	92.16	3.67	50.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1911043-002.01 doc 1000x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 04:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.79	11.41	3.62	50.11	10:29
2	TOC	0.0000	0.0000	7.15	10.87	3.72	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K1910975-002.01 doc 10x	8.1521 ppm	0.2117 ppm	2.6000%	2019/11/25 04:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.0024	80.0240	63.10	66.61	3.51	50.14	10:30
2	TOC	8.3018	83.0176	65.14	68.78	3.64	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K1910975-001.01 doc	0.8387 ppm	0.1176 ppm	14.0200%	2019/11/25 05:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9219	9.2190	15.04	18.69	3.65	50.11	10:26
2	TOC	0.7556	7.5558	13.91	17.48	3.57	50.12	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	75	TOC	K1910975-001.01 ms doc	26.6131 ppm	0.0000 ppm	0.0000%	2019/11/25 05:36

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

1	TOC	26.6131	266.1305	189.43	193.03	3.60	50.14	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 05:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.23	10.93	3.70	50.12	10:28
2	TOC	0.0000	0.0000	6.73	10.14	3.40	50.11	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1613 ppm (PASS)	0.0000 ppm	0%	2019/11/25 06:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1613	241.6131	173.47	177.17	3.70	50.11	10:33

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/25 06:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.86	9.52	3.65	50.12	10:29

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1322	1.2997	0.8410	0.0000	0.0000	0.0000	2019/11/21 13:13	Fusion1 (Fusion1)
v1323	1.3397	1.1360	0.0000	0.0000	0.0000	2019/11/23 16:30	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
Ver Creation: 2019/03/05 17:42
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 6.788x + 9.463
r^2 value: TOC: r^2 = 0.99963

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Ver Creation: 2019/02/21 17:57
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7

PreSpargeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/11/25 06:49

StarLIMS Run: 661076, 661077, 661078, 661079

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-83D

21 % H3PO4: 11-GEN-05-83B

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: BP	Date Analyzed: 11/26/19
Reviewed By:	Date Reviewed: 11/26/19

23 BP 11/26/19

Work Request # Original (_____) K1910680, 796, 847, 861, 929, 969, 11031, 11032, 11033, 10803, 11028, 11032, 11047, 11049, 975, 11043

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

Date Analyzed: 11/23/19

Analyst: BCD

Analysis: TOC/DOC

Run # TOC: 661076, 661077, 661078 DOC: 661079

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: K1910847-4/4d, K1910803-2/2d, 803-4/4d sent for RA due to being above calibration curve.
K1910803-3/3d, 803-5/5d sent for RA due to sample carry over.
K1911043-2 sent for RA due to being overdiluted.
K1910680-2/2d, 680-4/4d, 680-5/5d, 796-2/2d, 929-2/2d, 11031-1/1d, 11028-3/3d, and 10975-1/1d report a high %RSD. However these samples are less than 5x the MRL.
K1911033-6/6d, 11033-7/7d, 10803-3, 10803-5, 11047-1/1d report a high %RSD due to suspected non-homogenous sample.

Final Approved by: [signature] Date: 11/26/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661076 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910680-001	Carbon, Total Organic	N/A		Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50			11/23/19 17:58	N	II
K1910680-002	Carbon, Total Organic	N/A		Water	0.30 mg/L	10 ml	0.30 mg/L J	1	0.07	0.50			11/23/19 18:26	N	II
K1910680-003	Carbon, Total Organic	N/A		Water	0.63 mg/L	10 ml	0.63 mg/L	1	0.07	0.50			11/23/19 18:54	N	II
K1910680-004	Carbon, Total Organic	N/A		Water	0.56 mg/L	10 ml	0.56 mg/L	1	0.07	0.50			11/23/19 19:22	N	II
K1910680-005	Carbon, Total Organic	N/A		Water	0.17 mg/L	10 ml	0.17 mg/L J	1	0.07	0.50			11/23/19 19:50	N	II
K1910796-001	Carbon, Total Organic	N/A		Ground Water	1.05 mg/L	10 ml	1.05 mg/L	1	0.07	0.50			11/23/19 21:30	N	IV
K1910796-002	Carbon, Total Organic	N/A		Ground Water	0.88 mg/L	10 ml	0.88 mg/L	1	0.07	0.50			11/23/19 21:59	N	IV
K1910796-003	Carbon, Total Organic	N/A		Ground Water	1.78 mg/L	10 ml	1.78 mg/L	1	0.07	0.50			11/23/19 22:27	N	IV
K1910796-004	Carbon, Total Organic	N/A		Ground Water	0.20 mg/L	10 ml	0.20 mg/L J	1	0.07	0.50			11/23/19 20:18	Y	IV
K1910847-001	Carbon, Total Organic	N/A		Ground Water	34.01 mg/L	10 ml	680 mg/L	20	2	10			11/23/19 22:55	N	IV
K1910847-002	Carbon, Total Organic	N/A		Ground Water	32.82 mg/L	10 ml	32.8 mg/L	1	0.07	0.50			11/23/19 23:23	N	IV
K1910847-003	Carbon, Total Organic	N/A		Ground Water	35.27 mg/L	10 ml	35.3 mg/L	1	0.07	0.50			11/23/19 23:51	N	IV
K1910847-004	Carbon, Total Organic	N/A		Ground Water	61.27 mg/L	10 ml	61.3 mg/L	1	0.07	0.50			11/24/19 00:19	N	IV
K1910861-001	Carbon, Total Organic	N/A		Water	7.26 mg/L	10 ml	726 mg/L	100	7	50			11/24/19 00:47	N	II
K1910861-002	Carbon, Total Organic	N/A		Water	5.98 mg/L	10 ml	598 mg/L	100	7	50			11/24/19 01:15	N	II
K1910861-003	Carbon, Total Organic	N/A		Water	5.96 mg/L	10 ml	596 mg/L	100	7	50			11/24/19 01:43	N	II
K1910861-004	Carbon, Total Organic	N/A		Water	7.78 mg/L	10 ml	778 mg/L	100	7	50			11/24/19 03:10	N	II
K1910861-005	Carbon, Total Organic	N/A		Water	7.46 mg/L	10 ml	746 mg/L	100	7	50			11/24/19 03:38	N	II
K1910861-006	Carbon, Total Organic	N/A		Water	10.75 mg/L	10 ml	1080 mg/L	100	7	50			11/24/19 04:06	N	II
K1910861-007	Carbon, Total Organic	N/A		Water	8.35 mg/L	10 ml	835 mg/L	100	7	50			11/24/19 04:34	N	II
KQ1917446-01	Carbon, Total Organic	CCV		Water	24.53 mg/L	10 ml	24.5 mg/L	1					11/23/19 16:45	N	II
KQ1917446-02	Carbon, Total Organic	CCV		Water	24.61 mg/L	10 ml	24.6 mg/L	1					11/23/19 21:01	N	II
KQ1917446-03	Carbon, Total Organic	CCV		Water	24.56 mg/L	10 ml	24.6 mg/L	1					11/24/19 02:11	N	II
KQ1917446-04	Carbon, Total Organic	CCV		Water	24.22 mg/L	10 ml	24.2 mg/L	1					11/24/19 06:54	N	II
KQ1917446-05	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/23/19 16:59	N	II
KQ1917446-06	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/23/19 21:15	N	II
KQ1917446-07	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 02:26	N	II
KQ1917446-08	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 07:09	N	II
KQ1917446-09	Carbon, Total Organic	MB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/23/19 17:14	N	II
KQ1917446-10	Carbon, Total Organic	LCS		Water	24.74 mg/L	10 ml	24.7 mg/L	1	0.07	0.50	99		11/23/19 17:29	N	II
KQ1917446-11	Carbon, Total Organic	MS	K1910796-004	Ground Water	22.48 mg/L	10 ml	22.5 mg/L	1	0.07	0.50	89		11/23/19 20:46	N	IV

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

11/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661076 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917446-12	Carbon, Total Organic	DUP	K1910680-001	Water	0.36 mg/L	10 ml	0.36 mg/L J	1	0.07	0.50		2	11/23/19 17:58	N	II
KQ1917446-13	Carbon, Total Organic	DUP	K1910680-002	Water	0.26 mg/L	10 ml	0.26 mg/L J	1	0.07	0.50		13*	11/23/19 18:26	N	II
KQ1917446-14	Carbon, Total Organic	DUP	K1910680-003	Water	0.61 mg/L	10 ml	0.61 mg/L	1	0.07	0.50		3	11/23/19 18:54	N	II
KQ1917446-15	Carbon, Total Organic	DUP	K1910680-004	Water	0.67 mg/L	10 ml	0.67 mg/L	1	0.07	0.50		17*	11/23/19 19:22	N	II
KQ1917446-16	Carbon, Total Organic	DUP	K1910680-005	Water	0.20 mg/L	10 ml	0.20 mg/L J	1	0.07	0.50		15*	11/23/19 19:50	N	II
KQ1917446-17	Carbon, Total Organic	DUP	K1910796-002	Ground Water	0.77 mg/L	10 ml	0.77 mg/L	1	0.07	0.50		14*	11/23/19 21:59	N	IV
KQ1917446-18	Carbon, Total Organic	DUP	K1910796-001	Ground Water	1.14 mg/L	10 ml	1.14 mg/L	1	0.07	0.50		8	11/23/19 21:30	N	IV
KQ1917446-19	Carbon, Total Organic	DUP	K1910796-003	Ground Water	1.75 mg/L	10 ml	1.75 mg/L	1	0.07	0.50		1	11/23/19 22:27	N	IV
KQ1917446-20	Carbon, Total Organic	DUP	K1910796-004	Ground Water	0.21 mg/L	10 ml	0.21 mg/L J	1	0.07	0.50		6	11/23/19 20:18	N	IV
KQ1917446-21	Carbon, Total Organic	DUP	K1910847-002	Ground Water	32.44 mg/L	10 ml	32.4 mg/L	1	0.07	0.50		1	11/23/19 23:23	N	IV
KQ1917446-22	Carbon, Total Organic	DUP	K1910847-001	Ground Water	33.78 mg/L	10 ml	676 mg/L	20	2	10		<1	11/23/19 22:55	N	IV
KQ1917446-23	Carbon, Total Organic	DUP	K1910847-003	Ground Water	34.76 mg/L	10 ml	34.8 mg/L	1	0.07	0.50		1	11/23/19 23:51	N	IV
KQ1917446-24	Carbon, Total Organic	DUP	K1910847-004	Ground Water	60.91 mg/L	10 ml	60.9 mg/L	1	0.07	0.50		<1	11/24/19 00:19	N	IV
KQ1917446-25	Carbon, Total Organic	DUP	K1910861-001	Water	6.74 mg/L	10 ml	674 mg/L	100	7	50		7	11/24/19 00:47	N	II
KQ1917446-26	Carbon, Total Organic	DUP	K1910861-002	Water	5.82 mg/L	10 ml	582 mg/L	100	7	50		3	11/24/19 01:15	N	II
KQ1917446-27	Carbon, Total Organic	DUP	K1910861-003	Water	5.90 mg/L	10 ml	590 mg/L	100	7	50		1	11/24/19 01:43	N	II
KQ1917446-28	Carbon, Total Organic	DUP	K1910861-004	Water	7.76 mg/L	10 ml	776 mg/L	100	7	50		<1	11/24/19 03:10	N	II
KQ1917446-29	Carbon, Total Organic	DUP	K1910861-005	Water	7.41 mg/L	10 ml	741 mg/L	100	7	50		<1	11/24/19 03:38	N	II
KQ1917446-30	Carbon, Total Organic	DUP	K1910861-006	Water	10.62 mg/L	10 ml	1060 mg/L	100	7	50		1	11/24/19 04:06	N	II
KQ1917446-31	Carbon, Total Organic	DUP	K1910861-007	Water	8.16 mg/L	10 ml	816 mg/L	100	7	50		2	11/24/19 04:34	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661077 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910929-001	Carbon, Total Organic	N/A		Water	1.49 mg/L	10 ml	1.49 mg/L	1	0.07	0.50			11/24/19 05:02	N	II
K1910929-002	Carbon, Total Organic	N/A		Water	0.79 mg/L	10 ml	0.79 mg/L	1	0.07	0.50			11/24/19 05:30	N	II
K1910929-003	Carbon, Total Organic	N/A		Water	1.91 mg/L	10 ml	1.91 mg/L	1	0.07	0.50			11/24/19 05:58	N	II
K1910969-002	Carbon, Total Organic	N/A		Drinking Water	1.16 mg/L	10 ml	1.16 mg/L	1	0.07	0.50			11/24/19 06:26	N	I
K1911031-001	Carbon, Total Organic	N/A		Water	0.90 mg/L	10 ml	0.90 mg/L	1	0.07	0.50			11/24/19 12:50	N	IV
K1911032-001	Carbon, Total Organic	N/A		Ground Water	1.54 mg/L	10 ml	1.54 mg/L	1	0.07	0.50			11/24/19 13:19	N	IV
K1911032-002	Carbon, Total Organic	N/A		Ground Water	1.55 mg/L	10 ml	1.55 mg/L	1	0.07	0.50			11/24/19 13:47	N	IV
K1911032-003	Carbon, Total Organic	N/A		Ground Water	1.59 mg/L	10 ml	1.59 mg/L	1	0.07	0.50			11/24/19 14:15	N	IV
K1911032-004	Carbon, Total Organic	N/A		Ground Water	2.02 mg/L	10 ml	2.02 mg/L	1	0.07	0.50			11/24/19 14:43	N	IV
K1911032-005	Carbon, Total Organic	N/A		Ground Water	4.63 mg/L	10 ml	1850 mg/L	400	30	200			11/24/19 15:11	N	IV
K1911032-006	Carbon, Total Organic	N/A		Ground Water	1.99 mg/L	10 ml	1.99 mg/L	1	0.07	0.50			11/24/19 15:39	N	IV
K1911033-001	Carbon, Total Organic	N/A		Ground Water	3.66 mg/L	10 ml	3.66 mg/L	1	0.07	0.50			11/24/19 07:24	N	IV
K1911033-002	Carbon, Total Organic	N/A		Ground Water	2.81 mg/L	10 ml	2.81 mg/L	1	0.07	0.50			11/24/19 07:52	N	IV
K1911033-003	Carbon, Total Organic	N/A		Ground Water	2.80 mg/L	10 ml	2.80 mg/L	1	0.07	0.50			11/24/19 08:20	N	IV
K1911033-004	Carbon, Total Organic	N/A		Ground Water	2.38 mg/L	10 ml	2.38 mg/L	1	0.07	0.50			11/24/19 08:48	N	IV
K1911033-005	Carbon, Total Organic	N/A		Ground Water	39.57 mg/L	10 ml	791 mg/L	20	2	10			11/24/19 09:16	N	IV
K1911033-006	Carbon, Total Organic	N/A		Ground Water	4.37 mg/L	10 ml	4.37 mg/L	1	0.07	0.50			11/24/19 09:44	N	IV
K1911033-007	Carbon, Total Organic	N/A		Ground Water	2.51 mg/L	10 ml	2.51 mg/L	1	0.07	0.50			11/24/19 10:12	N	IV
K1911033-008	Carbon, Total Organic	N/A		Ground Water	7.82 mg/L	10 ml	7820 mg/L	1000	70	500			11/24/19 10:41	N	IV
K1911033-009	Carbon, Total Organic	N/A		Ground Water	3.94 mg/L	10 ml	3.94 mg/L	1	0.07	0.50			11/24/19 11:09	Y	IV
KQ1917447-01	Carbon, Total Organic	CCV		Water	24.56 mg/L	10 ml	24.6 mg/L	1					11/24/19 02:11	N	II
KQ1917447-02	Carbon, Total Organic	CCV		Water	24.22 mg/L	10 ml	24.2 mg/L	1					11/24/19 06:54	N	II
KQ1917447-03	Carbon, Total Organic	CCV		Water	24.73 mg/L	10 ml	24.7 mg/L	1					11/24/19 11:51	N	II
KQ1917447-04	Carbon, Total Organic	CCV		Water	24.32 mg/L	10 ml	24.3 mg/L	1					11/24/19 16:22	N	II
KQ1917447-05	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 02:26	N	II
KQ1917447-06	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 07:09	N	II
KQ1917447-07	Carbon, Total Organic	CCB		Water	0.23 mg/L	10 ml	0.23 mg/L J	1	0.07	0.50			11/24/19 12:06	N	II
KQ1917447-08	Carbon, Total Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 16:36	N	II

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

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Results Summary

11/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661077 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917447-09	Carbon, Total Organic	MB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 02:41	N	II
KQ1917447-10	Carbon, Total Organic	LCS		Water	25.09 mg/L	10 ml	25.1 mg/L	1	0.07	0.50	100		11/24/19 02:55	N	II
KQ1917447-11	Carbon, Total Organic	MS	K1911033-009	Ground Water	26.11 mg/L	10 ml	52.2 mg/L	2	0.2	1.0	97		11/24/19 11:37	N	IV
KQ1917447-12	Carbon, Total Organic	DUP	K1910929-001	Water	1.39 mg/L	10 ml	1.39 mg/L	1	0.07	0.50		7	11/24/19 05:02	N	II
KQ1917447-13	Carbon, Total Organic	DUP	K1910929-002	Water	0.88 mg/L	10 ml	0.88 mg/L	1	0.07	0.50		11*	11/24/19 05:30	N	II
KQ1917447-14	Carbon, Total Organic	DUP	K1910929-003	Water	1.94 mg/L	10 ml	1.94 mg/L	1	0.07	0.50		2	11/24/19 05:58	N	II
KQ1917447-15	Carbon, Total Organic	DUP	K1910969-002	Drinking Water	1.11 mg/L	10 ml	1.11 mg/L	1	0.07	0.50		5	11/24/19 06:26	N	I
KQ1917447-16	Carbon, Total Organic	DUP	K1911031-001	Water	0.79 mg/L	10 ml	0.79 mg/L	1	0.07	0.50		13*	11/24/19 12:50	N	IV
KQ1917447-17	Carbon, Total Organic	DUP	K1911032-002	Ground Water	1.60 mg/L	10 ml	1.60 mg/L	1	0.07	0.50		3	11/24/19 13:47	N	IV
KQ1917447-18	Carbon, Total Organic	DUP	K1911032-001	Ground Water	1.42 mg/L	10 ml	1.42 mg/L	1	0.07	0.50		8	11/24/19 13:19	N	IV
KQ1917447-19	Carbon, Total Organic	DUP	K1911032-003	Ground Water	1.50 mg/L	10 ml	1.50 mg/L	1	0.07	0.50		5	11/24/19 14:15	N	IV
KQ1917447-20	Carbon, Total Organic	DUP	K1911032-004	Ground Water	1.87 mg/L	10 ml	1.87 mg/L	1	0.07	0.50		8	11/24/19 14:43	N	IV
KQ1917447-21	Carbon, Total Organic	DUP	K1911032-005	Ground Water	4.83 mg/L	10 ml	1930 mg/L	400	30	200		4	11/24/19 15:11	N	IV
KQ1917447-22	Carbon, Total Organic	DUP	K1911032-006	Ground Water	1.82 mg/L	10 ml	1.82 mg/L	1	0.07	0.50		9	11/24/19 15:39	N	IV
KQ1917447-23	Carbon, Total Organic	DUP	K1911033-001	Ground Water	3.65 mg/L	10 ml	3.65 mg/L	1	0.07	0.50		<1	11/24/19 07:24	N	IV
KQ1917447-24	Carbon, Total Organic	DUP	K1911033-002	Ground Water	2.74 mg/L	10 ml	2.74 mg/L	1	0.07	0.50		3	11/24/19 07:52	N	IV
KQ1917447-25	Carbon, Total Organic	DUP	K1911033-003	Ground Water	2.76 mg/L	10 ml	2.76 mg/L	1	0.07	0.50		1	11/24/19 08:20	N	IV
KQ1917447-26	Carbon, Total Organic	DUP	K1911033-004	Ground Water	2.31 mg/L	10 ml	2.31 mg/L	1	0.07	0.50		3	11/24/19 08:48	N	IV
KQ1917447-27	Carbon, Total Organic	DUP	K1911033-005	Ground Water	38.77 mg/L	10 ml	775 mg/L	20	2	10		2	11/24/19 09:16	N	IV
KQ1917447-28	Carbon, Total Organic	DUP	K1911033-006	Ground Water	3.18 mg/L	10 ml	3.18 mg/L	1	0.07	0.50		31*	11/24/19 09:44	N	IV
KQ1917447-29	Carbon, Total Organic	DUP	K1911033-007	Ground Water	2.24 mg/L	10 ml	2.24 mg/L	1	0.07	0.50		11*	11/24/19 10:12	N	IV
KQ1917447-30	Carbon, Total Organic	DUP	K1911033-008	Ground Water	8.01 mg/L	10 ml	8010 mg/L	1000	70	500		2	11/24/19 10:41	N	IV
KQ1917447-31	Carbon, Total Organic	DUP	K1911033-009	Ground Water	3.61 mg/L	10 ml	3.61 mg/L	1	0.07	0.50		9	11/24/19 11:09	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661078 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910803-001	Carbon, Total Organic	N/A		Water	43.43 mg/L	10 ml	43.4 mg/L	1	0.07	0.50			11/24/19 17:19	N	IV
K1910803-002	Carbon, Total Organic	N/A		Water	119.98 mg/L	10 ml	120 mg/L	1	0.07	0.50			11/24/19 17:47	N	IV
K1910803-003	Carbon, Total Organic	N/A		Water	21.79 mg/L	10 ml	21.8 mg/L	1	0.07	0.50			11/24/19 18:15	N	IV
K1910803-004	Carbon, Total Organic	N/A		Water	67.32 mg/L	10 ml	67.3 mg/L	1	0.07	0.50			11/24/19 18:43	N	IV
K1910803-005	Carbon, Total Organic	N/A		Water	39.95 mg/L	10 ml	39.9 mg/L	1	0.07	0.50			11/24/19 19:11	N	IV
K1910803-006	Carbon, Total Organic	N/A		Water	14.93 mg/L	10 ml	14.9 mg/L	1	0.07	0.50			11/24/19 19:40	N	IV
K1911028-001	Carbon, Total Organic	N/A		Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50			11/25/19 00:24	N	V
K1911028-002	Carbon, Total Organic	N/A		Water	22.10 mg/L	10 ml	22.1 mg/L	1	0.07	0.50			11/25/19 00:52	N	V
K1911028-003	Carbon, Total Organic	N/A		Water	0.73 mg/L	10 ml	0.73 mg/L	1	0.07	0.50			11/25/19 01:21	N	V
K1911028-004	Carbon, Total Organic	N/A		Water	1.41 mg/L	10 ml	1.41 mg/L	1	0.07	0.50			11/25/19 02:18	N	V
K1911028-005	Carbon, Total Organic	N/A		Water	1.44 mg/L	10 ml	1.44 mg/L	1	0.07	0.50			11/25/19 02:47	N	V
K1911032-007	Carbon, Total Organic	N/A		Ground Water	4.08 mg/L	10 ml	4.08 mg/L	1	0.07	0.50			11/24/19 16:51	Y	IV
K1911047-001	Carbon, Total Organic	N/A		Water	3.61 mg/L	10 ml	361 mg/L	100	7	50			11/24/19 20:08	N	II
K1911047-002	Carbon, Total Organic	N/A		Water	26.84 mg/L	10 ml	2680 mg/L	100	7	50			11/24/19 20:36	N	II
K1911049-001	Carbon, Total Organic	N/A		Water	4.21 mg/L	10 ml	84 mg/L	20	2	10			11/24/19 21:04	N	II
K1911049-002	Carbon, Total Organic	N/A		Water	9.04 mg/L	10 ml	181 mg/L	20	2	10			11/24/19 22:31	Y	II
K1911049-003	Carbon, Total Organic	N/A		Water	11.75 mg/L	10 ml	11.7 mg/L	1	0.07	0.50			11/24/19 23:28	N	II
K1911049-004	Carbon, Total Organic	N/A		Water	1.62 mg/L	10 ml	1.62 mg/L	1	0.07	0.50			11/24/19 23:56	N	II
KQ1917448-01	Carbon, Total Organic	CCV		Ground Water	24.73 mg/L	10 ml	24.7 mg/L	1					11/24/19 11:51	N	IV
KQ1917448-02	Carbon, Total Organic	CCV		Ground Water	24.32 mg/L	10 ml	24.3 mg/L	1					11/24/19 16:22	N	IV
KQ1917448-03	Carbon, Total Organic	CCV		Ground Water	24.63 mg/L	10 ml	24.6 mg/L	1					11/24/19 21:32	N	IV
KQ1917448-04	Carbon, Total Organic	CCV		Ground Water	24.22 mg/L	10 ml	24.2 mg/L	1					11/25/19 01:49	N	IV
KQ1917448-05	Carbon, Total Organic	CCV		Ground Water	24.12 mg/L	10 ml	24.1 mg/L	1					11/25/19 06:19	N	IV
KQ1917448-06	Carbon, Total Organic	CCB		Ground Water	0.23 mg/L	10 ml	0.23 mg/L J	1	0.07	0.50			11/24/19 12:06	N	IV
KQ1917448-07	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 16:36	N	IV
KQ1917448-08	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/24/19 21:47	N	IV
KQ1917448-09	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 02:04	N	IV
KQ1917448-10	Carbon, Total Organic	CCB		Ground Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 06:34	N	IV
KQ1917448-11	Carbon, Total Organic	MB		Ground Water	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50			11/24/19 12:21	N	IV

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

11/26/19

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Results Summary

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661078 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1917448-12	Carbon, Total Organic	LCS		Ground Water	24.93 mg/L	10 ml	24.9 mg/L	1	0.07	0.50	100		11/24/19 12:36	N	IV
KQ1917448-13	Carbon, Total Organic	MS	K1911032-007	Ground Water	26.35 mg/L	10 ml	52.7 mg/L	2	0.2	1.0	97		11/24/19 16:07	N	IV
KQ1917448-14	Carbon, Total Organic	MS	K1911049-002	Water	29.03 mg/L	10 ml	2900 mg/L	100	7	50	109		11/24/19 22:59	N	II
KQ1917448-15	Carbon, Total Organic	DUP	K1910803-002	Water	122.07 mg/L	10 ml	122 mg/L	1	0.07	0.50		2	11/24/19 17:47	N	IV
KQ1917448-16	Carbon, Total Organic	DUP	K1910803-003	Water	18.16 mg/L	10 ml	18.2 mg/L	1	0.07	0.50		18*	11/24/19 18:15	N	IV
KQ1917448-17	Carbon, Total Organic	DUP	K1910803-004	Water	69.64 mg/L	10 ml	69.6 mg/L	1	0.07	0.50		3	11/24/19 18:43	N	IV
KQ1917448-18	Carbon, Total Organic	DUP	K1910803-005	Water	22.58 mg/L	10 ml	22.6 mg/L	1	0.07	0.50		56*	11/24/19 19:11	N	IV
KQ1917448-19	Carbon, Total Organic	DUP	K1910803-006	Water	13.68 mg/L	10 ml	13.7 mg/L	1	0.07	0.50		9	11/24/19 19:40	N	IV
KQ1917448-20	Carbon, Total Organic	DUP	K1910803-001	Water	44.82 mg/L	10 ml	44.8 mg/L	1	0.07	0.50		3	11/24/19 17:19	N	IV
KQ1917448-21	Carbon, Total Organic	DUP	K1911028-003	Water	0.66 mg/L	10 ml	0.66 mg/L	1	0.07	0.50		11*	11/25/19 01:21	N	V
KQ1917448-22	Carbon, Total Organic	DUP	K1911028-004	Water	1.38 mg/L	10 ml	1.38 mg/L	1	0.07	0.50		2	11/25/19 02:18	N	V
KQ1917448-23	Carbon, Total Organic	DUP	K1911028-005	Water	1.42 mg/L	10 ml	1.42 mg/L	1	0.07	0.50		1	11/25/19 02:47	N	V
KQ1917448-24	Carbon, Total Organic	DUP	K1911028-001	Water	0.82 mg/L	10 ml	0.82 mg/L	1	0.07	0.50		9	11/25/19 00:24	N	V
KQ1917448-25	Carbon, Total Organic	DUP	K1911028-002	Water	21.52 mg/L	10 ml	21.5 mg/L	1	0.07	0.50		3	11/25/19 00:52	N	V
KQ1917448-26	Carbon, Total Organic	DUP	K1911032-007	Ground Water	4.18 mg/L	10 ml	4.18 mg/L	1	0.07	0.50		2	11/24/19 16:51	N	IV
KQ1917448-27	Carbon, Total Organic	DUP	K1911047-001	Water	3.03 mg/L	10 ml	303 mg/L	100	7	50		18*	11/24/19 20:08	N	II
KQ1917448-28	Carbon, Total Organic	DUP	K1911047-002	Water	26.76 mg/L	10 ml	2680 mg/L	100	7	50		<1	11/24/19 20:36	N	II
KQ1917448-29	Carbon, Total Organic	DUP	K1911049-001	Water	3.99 mg/L	10 ml	80 mg/L	20	2	10		5	11/24/19 21:04	N	II
KQ1917448-30	Carbon, Total Organic	DUP	K1911049-002	Water	8.98 mg/L	10 ml	179 mg/L	20	2	10		<1	11/24/19 22:31	N	II
KQ1917448-31	Carbon, Total Organic	DUP	K1911049-003	Water	11.81 mg/L	10 ml	11.8 mg/L	1	0.07	0.50		<1	11/24/19 23:28	N	II
KQ1917448-32	Carbon, Total Organic	DUP	K1911049-004	Water	1.50 mg/L	10 ml	1.50 mg/L	1	0.07	0.50		8	11/24/19 23:56	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 661079 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1910975-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50			11/25/19 05:08	N	I
K1910975-002	Carbon, Dissolved Organic (DOC)	N/A		Water	7.97 mg/L	10 ml	79.7 mg/L	10	0.7	5.0			11/25/19 04:40	N	I
K1911043-001	Carbon, Dissolved Organic (DOC)	N/A		Water	11.72 mg/L	10 ml	11700 mg/L	1000	70	500			11/25/19 03:44	N	II
K1911043-002.R01	Carbon, Dissolved Organic (DOC)	N/A		Water	-0.04 mg/L	10 ml	500 mg/L U	1000	70	500			11/25/19 04:12	N	II
KQ1917449-01	Carbon, Dissolved Organic (DOC)	CCV		Water	-0.04 mg/L	10 ml	-0.0368 mg/L	1					11/24/19 22:01	N	II
KQ1917449-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.12 mg/L	10 ml	24.1 mg/L	1					11/25/19 06:19	N	II
KQ1917449-03	Carbon, Dissolved Organic (DOC)	CCB		Water	24.68 mg/L	10 ml	24.7 mg/L	1	0.07	0.50			11/24/19 22:16	N	II
KQ1917449-04	Carbon, Dissolved Organic (DOC)	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 06:34	N	II
KQ1917449-05	Carbon, Dissolved Organic (DOC)	MB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			11/25/19 01:49	N	II
KQ1917449-06	Carbon, Dissolved Organic (DOC)	LCS		Water	24.22 mg/L	10 ml	24.2 mg/L	1	0.07	0.50	97		11/25/19 02:04	N	II
KQ1917449-07	Carbon, Dissolved Organic (DOC)	MS	K1910975-001	Water	26.58 mg/L	10 ml	26.6 mg/L	1	0.07	0.50	103		11/25/19 05:36	N	I
KQ1917449-08	Carbon, Dissolved Organic (DOC)	DUP	K1910975-001	Water	0.72 mg/L	10 ml	0.72 mg/L	1	0.07	0.50		21*	11/25/19 05:08	N	I
KQ1917449-09	Carbon, Dissolved Organic (DOC)	DUP	K1910975-002	Water	8.27 mg/L	10 ml	82.7 mg/L	10	0.7	5.0		4	11/25/19 04:40	N	I
KQ1917449-10	Carbon, Dissolved Organic (DOC)	DUP	K1911043-001	Water	11.71 mg/L	10 ml	11700 mg/L	1000	70	500		<1	11/25/19 03:44	N	II
KQ1917449-11	Carbon, Dissolved Organic (DOC)	DUP	K1911043-002	Water	-0.04 mg/L	10 ml	500 mg/L U	1000	70	500		NC	11/25/19 04:12	N	II

11/26/19

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

Printed 11/26/19 14:09

Results Summary

0.031	0.031	#DIV/0!	#DIV/0!	OBSERVATIONS	13	0.031
0.000				STD Deviation	0.08537	0
0.000				AVERAGE	0.03675	0
0.000				UCL	0.12213	0
0.000				LCL	-0.04862	0
0.000						0
0.270						ABOVE
0.177				OBSERVATIONS	1	ABOVE
0.000				STD Deviation	#DIV/0!	0
0.000				AVERAGE	0.03100	0
0.000				UCL	#DIV/0!	0
0.000				LCL	#DIV/0!	0
0.000						0
						0
				OBSERVATIONS	0	0
				STD Deviation	#DIV/0!	0
				AVERAGE	#DIV/0!	0
				UCL	#DIV/0!	0
				LCL	#DIV/0!	0
						0
						0
				OBSERVATIONS	0	0
				STD Deviation	#DIV/0!	0
				AVERAGE	#DIV/0!	0
						0
						0
						0
						0
						0
						0

11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.567	0.0368	24.5300	24.52995	24.5	11/23/2019
3	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/23/2019
4	mb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/23/2019
5	lcs	1	24.774	0.0368	24.7370	24.73695	24.7	11/23/2019
6	K1910680-001	1	0.394	0.0368	0.3575	0.35745	<0.5	11/23/2019
7	K1910680-001	1	0.400	0.0368	0.3632	0.36315	<0.5	11/23/2019
8	K1910680-002	1	0.336	0.0368	0.2995	0.29945	<0.5	11/23/2019
9	K1910680-002	1	0.301	0.0368	0.2638	0.26375	<0.5	11/23/2019
10	K1910680-003	1	0.665	0.0368	0.6281	0.62805	0.63	11/23/2019
11	K1910680-003	1	0.645	0.0368	0.6085	0.60845	0.6	11/23/2019
12	K1910680-004	1	0.598	0.0368	0.5611	0.56105	0.56	11/23/2019
13	K1910680-004	1	0.704	0.0368	0.6673	0.66725	0.67	11/23/2019
14	K1910680-005	1	0.209	0.0368	0.1722	0.17215	<0.5	11/23/2019
15	K1910680-005	1	0.237	0.0368	0.1999	0.19985	<0.5	11/23/2019
16	K1910796-004	1	0.235	0.0368	0.1982	0.19815	<0.5	11/23/2019
17	K1910796-004	1	0.247	0.0368	0.2103	0.21025	<0.5	11/23/2019
18	KQ1917446-11	1	22.520	0.0368	22.4829	22.48285	22.5	11/23/2019
19	ccv	1	24.651	0.0368	24.6140	24.61395	24.6	11/23/2019
20	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/23/2019
21	K1910796-001	1	1.085	0.0368	1.0481	1.04805	1.05	11/23/2019
22	K1910796-001	1	1.173	0.0368	1.1367	1.13665	1.1	11/23/2019
23	K1910796-002	1	0.917	0.0368	0.8806	0.88055	0.9	11/23/2019
24	K1910796-002	1	0.803	0.0368	0.7659	0.76585	0.77	11/23/2019
25	K1910796-003	1	1.814	0.0368	1.7772	1.77715	1.78	11/23/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

23 BCD date time

Analyzed By: BCD	Date Analyzed 11/26/19
Reviewed By: [signature]	Date Reviewed 11/26/19

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1910796-003	1	1.791	0.0368	1.7545	1.75445	1.75	11/23/2019
27	K1910847-001	20	34.048	0.0368	34.0116	680.231	680.23	11/23/2019
28	K1910847-001	20	33.816	0.0368	33.7788	675.575	675.6	11/23/2019
29	K1910847-002	1	32.858	0.0368	32.8211	32.82105	32.8	11/23/2019
30	K1910847-002	1	32.481	0.0368	32.4447	32.44465	32.4	11/23/2019
31	K1910847-003	1	35.302	0.0368	35.2656	35.26555	35.3	11/23/2019
32	K1910847-003	1	34.801	0.0368	34.7641	34.76405	34.8	11/23/2019
33	K1910847-004	1	61.309	0.0368	61.2726	61.27255	61.3	11/24/2019
34	K1910847-004	1	60.948	0.0368	60.9109	60.91085	60.9	11/24/2019
35	K1910861-001	100	7.292	0.0368	7.2555	725.545	725.5	11/24/2019
36	K1910861-001	100	6.781	0.0368	6.7447	674.465	674.5	11/24/2019
37	K1910861-002	100	6.013	0.0368	5.9758	597.575	597.6	11/24/2019
38	K1910861-002	100	5.852	0.0368	5.8151	581.505	581.5	11/24/2019
39	K1910861-003	100	5.998	0.0368	5.9616	596.155	596.2	11/24/2019
40	K1910861-003	100	5.934	0.0368	5.8973	589.725	589.7	11/24/2019
41	ccv	1	24.592	0.0368	24.5555	24.55545	24.6	11/24/2019
42	ccb	1	0.031	0.0368	-0.0058	-0.00575	<0.5	11/24/2019
43	K1910861-004	100	7.819	0.0368	7.7823	778.225	778.2	11/24/2019
44	K1910861-004	100	7.801	0.0368	7.7640	776.395	776.4	11/24/2019
45	K1910861-005	100	7.497	0.0368	7.4601	746.005	746.0	11/24/2019
46	K1910861-005	100	7.442	0.0368	7.4053	740.525	740.5	11/24/2019
47	K1910861-006	100	10.791	0.0368	10.7546	1075.455	1075.5	11/24/2019
48	K1910861-006	100	10.652	0.0368	10.6153	1061.525	1061.5	11/24/2019
49	K1910861-007	100	8.384	0.0368	8.3476	834.755	834.8	11/24/2019
50	K1910861-007	100	8.194	0.0368	8.1568	815.675	815.7	11/24/2019

Analyzed By: BCD	Date Analyzed 11/23/19
Reviewed By:	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	24.259	0.0368	24.2227	24.22265	24.22	11/24/2019
52	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By:	BCP	Date Analyzed	11/25/19
Reviewed By:	[signature]	Date Reviewed	11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.592	0.0368	24.5555	24.55545	24.6	11/24/2019
3	ccb	1	0.031	0.0368	-0.0058	-0.00575	<0.5	11/24/2019
4	mb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
5	lcs	1	25.123	0.0368	25.0866	25.08655	25.1	11/24/2019
6	K1910929-001	1	1.527	0.0368	1.4898	1.48975	1.49	11/24/2019
7	K1910929-001	1	1.429	0.0368	1.3918	1.39175	1.4	11/24/2019
8	K1910929-002	1	0.827	0.0368	0.7902	0.79015	1	11/24/2019
9	K1910929-002	1	0.919	0.0368	0.8820	0.88195	0.88	11/24/2019
10	K1910929-003	1	1.943	0.0368	1.9064	1.90635	1.91	11/24/2019
11	K1910929-003	1	1.976	0.0368	1.9391	1.93905	1.9	11/24/2019
12	K1910969-002	1	1.201	0.0368	1.1638	1.16375	1.16	11/24/2019
13	K1910969-002	1	1.147	0.0368	1.1100	1.10995	1.11	11/24/2019
14	ccv	1	24.259	0.0368	24.2227	24.22265	24.22	11/24/2019
15	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
16	K1911033-001	1	3.696	0.0368	3.6588	3.65875	3.7	11/24/2019
17	K1911033-001	1	3.684	0.0368	3.6472	3.64715	3.65	11/24/2019
18	K1911033-002	1	2.845	0.0368	2.8083	2.80825	2.8	11/24/2019
19	K1911033-002	1	2.775	0.0368	2.7385	2.73845	2.7	11/24/2019
20	K1911033-003	1	2.836	0.0368	2.7992	2.79915	2.80	11/24/2019
21	K1911033-003	1	2.795	0.0368	2.7582	2.75815	2.76	11/24/2019
22	K1911033-004	1	2.422	0.0368	2.3849	2.38485	2.4	11/24/2019
23	K1911033-004	1	2.347	0.0368	2.3104	2.31035	2.3	11/24/2019
24	K1911033-005	20	39.603	0.0368	39.5660	791.319	791.32	11/24/2019
25	K1911033-005	20	38.802	0.0368	38.7653	775.305	775.31	11/24/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BCP		Date Analyzed 11/23/19	
Reviewed By:		Date Reviewed 11/26/19	

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1911033-006	1	4.402	0.0368	4.3652	4.36515	4.37	11/24/2019
27	K1911033-006	1	3.221	0.0368	3.1843	3.18425	3.18	11/24/2019
28	K1911033-007	1	2.543	0.0368	2.5060	2.50595	2.5	11/24/2019
29	K1911033-007	1	2.273	0.0368	2.2363	2.23625	2.2	11/24/2019
30	K1911033-008	1000	7.861	0.0368	7.8241	7824.05	7824.1	11/24/2019
31	K1911033-008	1000	8.044	0.0368	8.0074	8007.35	8007.4	11/24/2019
32	K1911033-009	1	3.972	0.0368	3.9355	3.93545	3.9	11/24/2019
33	K1911033-009	1	3.647	0.0368	3.6099	3.60985	3.6	11/24/2019
34	KQ1917447-11	2	26.144	0.0368	26.1076	52.2151	52.2	11/24/2019
35	ccv	1	24.762	0.0368	24.7255	24.72545	24.7	11/24/2019
36	ccb	1	0.270	0.0368	0.2328	0.23275	<0.5	11/24/2019
37	K1911031-001	1	0.934	0.0368	0.8970	0.89695	0.9	11/24/2019
38	K1911031-001	1	0.826	0.0368	0.7890	0.78895	0.8	11/24/2019
39	K1911032-001	1	1.580	0.0368	1.5437	1.54365	1.5	11/24/2019
40	K1911032-001	1	1.458	0.0368	1.4216	1.42155	1.4	11/24/2019
41	K1911032-002	1	1.585	0.0368	1.5487	1.54865	1.5	11/24/2019
42	K1911032-002	1	1.638	0.0368	1.6012	1.60115	1.6	11/24/2019
43	K1911032-003	1	1.623	0.0368	1.5864	1.58635	1.6	11/24/2019
44	K1911032-003	1	1.541	0.0368	1.5038	1.50375	1.5	11/24/2019
45	K1911032-004	1	2.055	0.0368	2.0187	2.01865	2.0	11/24/2019
46	K1911032-004	1	1.904	0.0368	1.8668	1.86675	1.9	11/24/2019
47	K1911032-005	400	4.671	0.0368	4.6341	1853.62	1853.6	11/24/2019
48	K1911032-005	400	4.867	0.0368	4.8300	1931.98	1932.0	11/24/2019
49	K1911032-006	1	2.028	0.0368	1.9917	1.99165	2.0	11/24/2019
50	K1911032-006	1	1.861	0.0368	1.8238	1.82375	1.8	11/24/2019

Analyzed By:	BCD	Date Analyzed	11/23/19
Reviewed By:		Date Reviewed	11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	24.356	0.0368	24.3194	24.31935	24.32	11/24/2019
52	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BR	Date Analyzed 11/23/19
Reviewed By:	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.762	0.0368	24.7255	24.72545	24.7	11/24/2019
3	ccb	1	0.270	0.0368	0.2328	0.23275	<0.5	11/24/2019
4	mb	1	0.177	0.0368	0.1406	0.14055	<0.5	11/24/2019
5	lcs	1	24.962	0.0368	24.9254	24.92535	24.9	11/24/2019
6	KQ1917448-13	2	26.387	0.0368	26.3507	52.7013	52.70	11/24/2019
7	ccv	1	24.356	0.0368	24.3194	24.31935	24.3	11/24/2019
8	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
9	K1911032-007	1	4.121	0.0368	4.0838	4.08375	4.08	11/24/2019
10	K1911032-007	1	4.215	0.0368	4.1781	4.17805	4.18	11/24/2019
11	K1910803-001	1	43.462	0.0368	43.4256	43.42555	43.4	11/24/2019
12	K1910803-001	1	44.855	0.0368	44.8186	44.81855	44.82	11/24/2019
13	K1910803-002	1	120.019	0.0368	119.9820	119.98195	119.98	11/24/2019
14	K1910803-002	1	122.103	0.0368	122.0664	122.06635	122.07	11/24/2019
15	K1910803-003	1	21.826	0.0368	21.7893	21.78925	21.8	11/24/2019
16	K1910803-003	1	18.201	0.0368	18.1638	18.16375	18.2	11/24/2019
17	K1910803-004	1	67.352	0.0368	67.3154	67.31535	67.32	11/24/2019
18	K1910803-004	1	69.680	0.0368	69.6435	69.64345	69.6	11/24/2019
19	K1910803-005	1	39.984	0.0368	39.9477	39.94765	39.9	11/24/2019
20	K1910803-005	1	22.612	0.0368	22.5756	22.57555	22.58	11/24/2019
21	K1910803-006	1	14.967	0.0368	14.9307	14.93065	14.93	11/24/2019
22	K1910803-006	1	13.722	0.0368	13.6848	13.68475	13.7	11/24/2019
23	K1911047-001	100	3.650	0.0368	3.6131	361.305	361.3	11/24/2019
24	K1911047-001	100	3.066	0.0368	3.0297	302.965	302.97	11/24/2019
25	K1911047-002	100	26.873	0.0368	26.8364	2683.635	2683.64	11/24/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BOP	Date Analyzed	11/23/19	
Reviewed By:	Date Reviewed	11/26/19	

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1911047-002	100	26.799	0.0368	26.7618	2676.175	2676.18	11/24/2019
27	K1911049-001	20	4.249	0.0368	4.2124	84.247	84.25	11/24/2019
28	K1911049-001	20	4.029	0.0368	3.9925	79.849	79.8	11/24/2019
29	ccv	1	24.669	0.0368	24.6320	24.63195	24.6	11/24/2019
30	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
31	K1911049-002	20	9.079	0.0368	9.0426	180.851	180.9	11/24/2019
32	K1911049-002	20	9.012	0.0368	8.9750	179.499	179.5	11/24/2019
33	KQ1917448-14	100	29.072	0.0368	29.0348	2903.475	2903.5	11/24/2019
34	K1911049-003	1	11.784	0.0368	11.7471	11.74705	11.7	11/24/2019
35	K1911049-003	1	11.848	0.0368	11.8116	11.81155	11.8	11/24/2019
36	K1911049-004	1	1.659	0.0368	1.6225	1.62245	1.6	11/24/2019
37	K1911049-004	1	1.541	0.0368	1.5039	1.50385	1.5	11/24/2019
38	K1911028-001	1	0.932	0.0368	0.8949	0.89485	0.9	11/25/2019
39	K1911028-001	1	0.858	0.0368	0.8217	0.82165	0.8	11/25/2019
40	K1911028-002	1	22.140	0.0368	22.1030	22.10295	22.1	11/25/2019
41	K1911028-002	1	21.561	0.0368	21.5239	21.52385	21.5	11/25/2019
42	K1911028-003	1	0.771	0.0368	0.7346	0.73455	0.7	11/25/2019
43	K1911028-003	1	0.696	0.0368	0.6592	0.65915	0.7	11/25/2019
44	ccv	1	24.254	0.0368	24.2171	24.21705	24.2	11/25/2019
45	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
46	K1911028-004	1	1.442	0.0368	1.4057	1.40565	1.4	11/25/2019
47	K1911028-004	1	1.412	0.0368	1.3753	1.37525	1.4	11/25/2019
48	K1911028-005	1	1.478	0.0368	1.4409	1.44085	1.4	11/25/2019
49	K1911028-005	1	1.461	0.0368	1.4244	1.42435	1.4	11/25/2019
50	ccv	1	24.161	0.0368	24.1246	24.12455	24.1	11/25/2019

Analyzed By: BH	Date Analyzed 11/23/19
Reviewed By: [signature]	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
52		1		0.0000	0.0000	0	<0.5	
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BKP	Date Analyzed 11/27/19
Reviewed By:	Date Reviewed 11/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	mb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/24/2019
3	lcs	1	24.714	0.0368	24.6774	24.67735	24.7	11/24/2019
4	ccv	1	24.254	0.0368	24.2171	24.21705	24.2	11/25/2019
5	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
6	K1911043-001	1000	11.760	0.0368	11.7231	11723.05	11723.05	11/25/2019
7	K1911043-001	1000	11.743	0.0368	11.7062	11706.15	11706.2	11/25/2019
8	K1911043-002	1000	0.000	0.0368	-0.0368	-36.75	<0.5	11/25/2019
9	K1911043-002	1000	0.000	0.0368	-0.0368	-36.75	<0.5	11/25/2019
10	K1910975-002	10	8.002	0.0368	7.9657	79.6565	79.66	11/25/2019
11	K1910975-002	10	8.302	0.0368	8.2651	82.6505	82.7	11/25/2019
12	K1910975-001	1	0.922	0.0368	0.8852	0.88515	0.89	11/25/2019
13	K1910975-001	1	0.756	0.0368	0.7189	0.71885	0.72	11/25/2019
14	KQ1917449-07	1	26.613	0.0368	26.5764	26.57635	26.58	11/25/2019
15	ccv	1	24.161	0.0368	24.1246	24.12455	24.1	11/25/2019
16	ccb	1	0.000	0.0368	-0.0368	-0.03675	<0.5	11/25/2019
17		1		0.0000	0.0000	0	<0.5	
18		1		0.0000	0.0000	0	<0.5	
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By:		Date Analyzed	11/23/19
Reviewed By:		Date Reviewed	11/26/19

TOC: 661076, 661077, 661078
DOC: 661079

Schedule: 11232019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/11/23 17:20 - Saturday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1910680-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1910680-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1910680-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1910680-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1910680-005.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1910796-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1910796-004.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1910796-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1910796-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1910796-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1910847-001.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1910847-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1910847-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1910847-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1910861-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1910861-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1910861-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1910861-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1910861-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1910861-006.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1910861-007.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1910929-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1910929-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1910929-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1910969-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1911033-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1911033-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1911033-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1911033-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1911033-005.03 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1911033-006.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1911033-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1911033-008.03 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1911033-009.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1911033-009.08 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Schedule: 11232019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1911031-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1911032-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1911032-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1911032-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1911032-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1911032-005.01 400x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1911032-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1911032-007.03 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1911032-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1910803-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1910803-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1910803-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1910803-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1910803-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1910803-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1911047-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1911047-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1911049-001.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	K1911049-002.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1911049-002.01 ms 100x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
61	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
62	Sample	K1911049-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1911049-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K1911028-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1911028-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K1911028-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	K1911028-004.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K1911028-005.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	FB 11/21/19	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
70	Sample	FB 11/22/19	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
71	Sample	K1911043-001.01 doc 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	K1911043-002.01 doc 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	K1910975-002.01 doc 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K1910975-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	K1910975-001.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
61	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 11232019
Saturday, November 23, 2019 02:23 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/11/26 09:09 - Tuesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	11232019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8)		
Comment:			

11/26/19

Report Results

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/23 14:23

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.02	17.16	4.14	49.59	05:26
2	TC Clean	7.50	10.99	3.49	49.85	07:19
3	TC Clean	2.01	5.61	3.60	49.88	07:04
4	TC Clean	1.40	5.11	3.71	49.85	07:02

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/23 14:55

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.72	15.29	3.57	49.65	05:23

2	TC Clean	3.64	7.23	3.59	49.87	07:17
3	TC Clean	1.59	5.34	3.74	49.87	07:02
4	TC Clean	1.19	4.93	3.74	49.91	07:02

Sample Type: Clean From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/11/23 15:34

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.48	15.13	3.65	49.68	05:24
2	TC Clean	3.90	7.40	3.51	50.02	04:07
3	TC Clean	1.55	5.07	3.52	50.06	03:50
4	TC Clean	1.18	4.74	3.56	50.06	03:48

Sample Type: Blank (Creating v1323) From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/11/23 15:56

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.31	14.93	3.62	49.60	05:13
2	TC Clean	3.39	7.01	3.62	50.04	04:06
3	TC Clean	1.31	4.93	3.61	50.06	03:48
4	TC Clean	1.45	4.95	3.50	50.05	03:47
5	Reagent Blank	4.02	7.68	3.66	50.07	05:09
6	Acid Blank	1.14	4.93	3.79	49.74	05:31

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0324 ppm	0.0000 ppm	0.0000%	2019/11/23 16:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0324	0.3238	9.00	12.79	3.79	50.19	10:34

Dilution **Blank Contribution** **Method** **Calibration**

1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5667 ppm (PASS)	0.0000 ppm	0%	2019/11/23 16:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5667	245.6673	176.22	180.09	3.87	50.19	10:30

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

Sample Type: Check Standard --> CCB From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/23 16:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.20	10.93	3.73	50.19	10:29

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

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/23 17:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.91	9.77	3.86	50.22	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 8

	Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time

			(ppm)			(% dev)				
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.7737 ppm (PASS)	0.0000 ppm	0%	2019/11/23 17:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7737	247.7372	177.62	181.34	3.71	50.22	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0515 ppm	0.0000 ppm	0.0000%	2019/11/23 17:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0515	0.5154	9.13	12.75	3.61	50.28	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1910680-001.01	0.3971 ppm	0.0041 ppm	1.0200%	2019/11/23 17:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3942	3.9420	11.46	15.12	3.66	50.22	10:23
2	TOC	0.3999	3.9995	11.50	15.20	3.70	50.24	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1910680-002.01	0.3183 ppm	0.0252 ppm	7.9200%	2019/11/23 18:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3362	3.3616	11.07	14.56	3.49	50.27	10:28
2	TOC	0.3005	3.0051	10.82	14.32	3.50	50.24	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1910680-003.01	0.6550 ppm	0.0139 ppm	2.1200%	2019/11/23 18:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6648	6.6483	13.30	17.08	3.79	50.23	10:28
2	TOC	0.6452	6.4524	13.16	16.93	3.77	50.22	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1910680-004.01	0.6509 ppm	0.0751 ppm	11.5400%	2019/11/23 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5978	5.9780	12.84	16.55	3.71	50.24	10:25
2	TOC	0.7040	7.0402	13.56	17.06	3.50	50.21	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1910680-005.03	0.2227 ppm	0.0196 ppm	8.7900%	2019/11/23 19:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2089	2.0887	10.20	13.79	3.59	50.22	10:27
2	TOC	0.2366	2.3657	10.39	13.99	3.60	50.18	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1910796-004.01	0.2410 ppm	0.0085 ppm	3.5400%	2019/11/23 20:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2349	2.3495	10.38	14.07	3.70	50.17	10:30
2	TOC	0.2470	2.4703	10.46	14.10	3.64	50.21	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1910796-004.01 ms	22.5196 ppm	0.0000 ppm	0.0000%	2019/11/23 20:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	22.5196	225.1962	161.65	165.26	3.61	50.18	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6507 ppm (PASS)	0.0000 ppm	0%	2019/11/23 21:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6507	246.5070	176.79	180.47	3.68	50.17	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/23 21:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.20	10.96	3.76	50.20	10:30

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1910796-001.01	1.1291 ppm	0.0626 ppm	5.5400%	2019/11/23 21:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0848	10.8484	16.15	19.70	3.56	50.19	10:28
2	TOC	1.1734	11.7338	16.75	20.53	3.78	50.20	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1910796-002.01	0.8600 ppm	0.0811 ppm	9.4400%	2019/11/23 21:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9173	9.1734	15.01	18.72	3.71	50.17	10:29

2	TOC	0.8026	8.0257	14.23	17.85	3.62	50.21	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1910796-003.01	1.8026 ppm	0.0160 ppm	0.8900%	2019/11/23 22:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8139	18.1393	21.10	24.61	3.52	50.15	10:27
2	TOC	1.7912	17.9124	20.94	24.64	3.70	50.17	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1910847-001.01 20x	33.9319 ppm	0.1646 ppm	0.4900%	2019/11/23 22:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	34.0483	340.4830	239.90	243.51	3.61	50.13	10:25
2	TOC	33.8155	338.1553	238.32	242.06	3.74	50.17	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1910847-002.01	32.6696 ppm	0.2662 ppm	0.8100%	2019/11/23 23:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.8578	328.5780	231.82	235.44	3.62	50.13	10:29
2	TOC	32.4814	324.8140	229.27	232.83	3.57	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1910847-003.01	35.0515 ppm	0.3546 ppm	1.0100%	2019/11/23 23:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	35.3023	353.0229	248.41	251.92	3.51	50.15	10:24
2	TOC	34.8008	348.0081	245.01	248.71	3.70	50.19	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	16	TOC	K1910847-004.01	61.1285 ppm	0.2557 ppm	0.4200%	2019/11/24 00:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	61.3093	613.0929	424.95	428.74	3.79	50.16	10:26
2	TOC	60.9476	609.4762	422.49	426.28	3.78	50.18	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K1910861-001.01 100x	7.0368 ppm	0.3612 ppm	5.1300%	2019/11/24 00:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.2922	72.9217	58.28	62.10	3.82	50.15	10:27
2	TOC	6.7814	67.8141	54.82	58.35	3.54	50.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K1910861-002.01 100x	5.9322 ppm	0.1137 ppm	1.9200%	2019/11/24 01:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0125	60.1255	49.60	53.26	3.66	50.14	10:29
2	TOC	5.8518	58.5182	48.51	52.12	3.61	50.05	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K1910861-003.01 100x	5.9661 ppm	0.0454 ppm	0.7600%	2019/11/24 01:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.9983	59.9826	49.50	53.04	3.54	50.09	10:26
2	TOC	5.9340	59.3403	49.06	52.60	3.54	50.03	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5922 ppm (PASS)	0.0000 ppm	0%	2019/11/24 02:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5922	245.9222	176.39	179.84	3.44	50.03	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0310 ppm (PASS)	0.0000 ppm	0%	2019/11/24 02:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0310	0.3101	9.67	13.33	3.66	50.08	10:31

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/24 02:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.75	12.48	3.72	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.1233 ppm (PASS)	0.0000 ppm	0%	2019/11/24 02:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1233	251.2331	180.00	183.53	3.53	50.03	10:32

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1910861-004.01 100x	7.8099 ppm	0.0129 ppm	0.1700%	2019/11/24 03:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8190	78.1899	61.86	65.43	3.57	50.08	10:27
2	TOC	7.8007	78.0072	61.74	65.35	3.62	50.02	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1910861-005.01 100x	7.4694 ppm	0.0388 ppm	0.5200%	2019/11/24 03:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.4968	74.9680	59.67	63.39	3.72	50.08	10:26
2	TOC	7.4420	74.4200	59.30	62.89	3.59	50.04	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1910861-006.01 100x	10.7216 ppm	0.0985 ppm	0.9200%	2019/11/24 04:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.7913	107.9132	82.04	85.66	3.63	50.12	10:29
2	TOC	10.6520	106.5195	81.09	84.72	3.63	50.06	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1910861-007.01 100x	8.2889 ppm	0.1349 ppm	1.6300%	2019/11/24 04:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.3843	83.8426	65.70	69.24	3.54	50.09	10:26
2	TOC	8.1935	81.9348	64.40	67.94	3.54	50.10	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1910929-001.01	1.4775 ppm	0.0693 ppm	4.6900%	2019/11/24 05:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5265	15.2651	19.15	22.67	3.52	50.08	10:26
2	TOC	1.4285	14.2854	18.48	22.07	3.59	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1910929-002.01	0.8728 ppm	0.0649 ppm	7.4400%	2019/11/24 05:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8269	8.2688	14.40	17.92	3.52	50.11	10:29
2	TOC	0.9187	9.1866	15.02	18.57	3.55	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1910929-003.01	1.9595 ppm	0.0231 ppm	1.1800%	2019/11/24 05:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9431	19.4313	21.97	25.45	3.48	50.14	10:29
2	TOC	1.9758	19.7583	22.20	25.88	3.69	50.11	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1910969-002.01	1.1736 ppm	0.0380 ppm	3.2400%	2019/11/24 06:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2005	12.0049	16.93	20.49	3.56	50.15	10:28
2	TOC	1.1467	11.4671	16.57	20.16	3.59	50.15	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2594 ppm (PASS)	0.0000 ppm	0%	2019/11/24 06:54

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

	Type		#							Time
B	TOC	25 ppm	1	24.2594	242.5942	174.13	177.81	3.67	50.11	10:29

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

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/24 07:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.62	11.38	3.76	50.13	10:30

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1911033-001.03	3.6897 ppm	0.0082 ppm	0.2200%	2019/11/24 07:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6955	36.9550	33.87	37.44	3.58	50.10	10:30
2	TOC	3.6839	36.8386	33.79	37.44	3.65	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K1911033-002.03	2.8101 ppm	0.0494 ppm	1.7600%	2019/11/24 07:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8450	28.4502	28.10	31.78	3.68	50.13	10:24
2	TOC	2.7752	27.7519	27.62	31.38	3.76	50.10	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	K1911033-003.03	2.8154 ppm	0.0290 ppm	1.0300%	2019/11/24 08:20

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	2.8359	28.3589	28.03	31.72	3.68	50.10	10:27
2	TOC	2.7949	27.9493	27.76	31.45	3.69	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1911033-004.03	2.3843 ppm	0.0527 ppm	2.2100%	2019/11/24 08:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4216	24.2162	25.22	28.84	3.62	50.11	10:29
2	TOC	2.3471	23.4708	24.72	28.28	3.57	50.10	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1911033-005.03 20x	39.2024 ppm	0.5662 ppm	1.4400%	2019/11/24 09:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	39.6027	396.0271	277.60	281.33	3.73	50.11	10:27
2	TOC	38.8020	388.0202	272.17	276.09	3.92	50.14	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1911033-006.03	3.8114 ppm	0.8350 ppm	21.9100%	2019/11/24 09:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4019	44.0190	38.66	42.53	3.86	50.11	10:29
2	TOC	3.2210	32.2098	30.65	34.21	3.56	50.10	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1911033-007.03	2.4078 ppm	0.1907 ppm	7.9200%	2019/11/24 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5427	25.4272	26.04	29.72	3.67	50.12	10:29
2	TOC	2.2730	22.7298	24.21	27.75	3.54	50.10	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8608	78.6083	62.14	65.77	3.63	50.14	10:31
2	TOC	8.0441	80.4409	63.39	67.04	3.65	50.09	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1911033-009.08	3.8094 ppm	0.2302 ppm	6.0400%	2019/11/24 11:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9722	39.7217	35.75	39.38	3.63	50.12	10:30
2	TOC	3.6466	36.4659	33.54	37.02	3.49	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1911033-009.08 ms 2x	26.1443 ppm	0.0000 ppm	0.0000%	2019/11/24 11:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1443	261.4428	186.25	189.80	3.55	50.11	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.7622 ppm (PASS)	0.0000 ppm	0%	2019/11/24 11:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7622	247.6222	177.55	181.02	3.47	50.15	10:28

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.2695 ppm (PASS)	0.0000 ppm	0%	2019/11/24 12:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.2695	2.6952	11.29	14.85	3.56	50.13	10:34

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.1773 ppm	0.0000 ppm	0.0000%	2019/11/24 12:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1773	1.7735	9.99	13.72	3.73	50.13	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.9621 ppm (PASS)	0.0000 ppm	0%	2019/11/24 12:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.9621	249.6214	178.90	182.70	3.80	50.17	10:37

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K1911031-001.01	0.8797 ppm	0.0764 ppm	8.6800%	2019/11/24 12:50

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

1	TOC	0.9337	9.3369	15.12	18.87	3.75	50.14	10:29
2	TOC	0.8257	8.2570	14.39	18.18	3.79	50.17	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K1911032-001.01	1.5194 ppm	0.0864 ppm	5.6800%	2019/11/24 13:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5804	15.8042	19.51	23.29	3.78	50.19	10:28
2	TOC	1.4583	14.5830	18.68	22.26	3.58	50.20	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K1911032-002.01	1.6117 ppm	0.0371 ppm	2.3000%	2019/11/24 13:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5854	15.8543	19.55	22.98	3.44	50.25	10:28
2	TOC	1.6379	16.3788	19.90	23.42	3.52	50.20	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1911032-003.01	1.5818 ppm	0.0584 ppm	3.6900%	2019/11/24 14:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6231	16.2315	19.80	23.26	3.46	50.22	10:25
2	TOC	1.5405	15.4050	19.24	22.79	3.54	50.25	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1911032-004.01	1.9794 ppm	0.1074 ppm	5.4300%	2019/11/24 14:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0554	20.5538	22.74	26.37	3.63	50.21	10:30
2	TOC	1.9035	19.0350	21.70	25.32	3.61	50.22	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1911032-005.01 400x	4.7687 ppm	0.1385 ppm	2.9100%	2019/11/24 15:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6708	46.7076	40.49	43.95	3.46	50.26	10:28
2	TOC	4.8667	48.6669	41.82	45.56	3.74	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1911032-006.01	1.9445 ppm	0.1188 ppm	6.1100%	2019/11/24 15:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0284	20.2842	22.55	26.14	3.58	50.27	10:31
2	TOC	1.8605	18.6048	21.41	25.06	3.65	50.23	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1911032-007.03 ms 2x	26.3874 ppm	0.0000 ppm	0.0000%	2019/11/24 16:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.3874	263.8736	187.90	191.52	3.62	50.24	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3561 ppm (PASS)	0.0000 ppm	0%	2019/11/24 16:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3561	243.5606	174.79	178.42	3.63	50.26	10:33

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/24 16:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.48	11.05	3.57	50.24	10:31

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

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	K1911032-007.03	4.1677 ppm	0.0667 ppm	1.6000%	2019/11/24 16:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1205	41.2052	36.75	40.48	3.73	50.22	10:28
2	TOC	4.2148	42.1480	37.39	40.98	3.59	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K1910803-001.01	44.1588 ppm	0.9849 ppm	2.2300%	2019/11/24 17:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	43.4623	434.6235	303.80	307.50	3.70	50.24	10:26
2	TOC	44.8553	448.5526	313.26	317.05	3.79	50.20	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	K1910803-002.01	121.0609 ppm	1.4739 ppm	1.2200%	2019/11/24 17:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	120.0187	1200.1870	823.46	827.29	3.83	50.25	10:28
2	TOC	122.1031	1221.0313	837.61	842.19	4.58	50.24	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	51	TOC	K1910803-003.01	20.0133 ppm	2.5636 ppm	12.8100%	2019/11/24 18:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.8260	218.2603	156.94	161.38	4.44	50.17	10:27
2	TOC	18.2005	182.0049	132.33	136.43	4.11	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K1910803-004.01	68.5161 ppm	1.6462 ppm	2.4000%	2019/11/24 18:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	67.3521	673.5207	465.97	469.89	3.93	50.19	10:27
2	TOC	69.6802	696.8016	481.77	488.04	6.27	50.15	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K1910803-005.01	31.2983 ppm	12.2840 ppm	39.2500%	2019/11/24 19:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	39.9844	399.8441	280.20	285.79	5.59	50.18	10:30
2	TOC	22.6123	226.1228	162.27	166.53	4.26	50.14	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	K1910803-006.01	14.3445 ppm	0.8810 ppm	6.1400%	2019/11/24 19:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.9674	149.6740	110.38	114.24	3.86	50.18	10:28
2	TOC	13.7215	137.2151	101.92	105.81	3.89	50.14	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	K1911047-001.01 100x	3.3581 ppm	0.4125 ppm	12.2800%	2019/11/24 20:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6498	36.4983	33.56	37.32	3.76	50.14	10:27
2	TOC	3.0664	30.6644	29.60	33.16	3.56	50.17	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1911047-002.01 100x	26.8358 ppm	0.0527 ppm	0.2000%	2019/11/24 20:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.8731	268.7307	191.20	194.84	3.64	50.13	10:25
2	TOC	26.7985	267.9853	190.69	194.42	3.73	50.17	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1911049-001.01 20x	4.1392 ppm	0.1555 ppm	3.7600%	2019/11/24 21:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2491	42.4913	37.63	41.27	3.65	50.16	10:28
2	TOC	4.0292	40.2918	36.13	39.75	3.61	50.12	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6687 ppm (PASS)	0.0000 ppm	0%	2019/11/24 21:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6687	246.6868	176.91	180.57	3.66	50.17	10:34

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

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/24 21:47

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

	Type									
D	TOC	0 ppm	1	0.0000	0.0000	8.80	12.38	3.58	50.14	10:32

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/24 22:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.03	11.47	3.43	50.10	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.7141 ppm (PASS)	0.0000 ppm	0%	2019/11/24 22:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7141	247.1405	177.22	180.81	3.59	50.14	10:30

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1911049-002.01 20x	9.0455 ppm	0.0478 ppm	0.5300%	2019/11/24 22:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0793	90.7931	70.41	74.08	3.66	50.15	10:27
2	TOC	9.0117	90.1169	69.96	73.45	3.50	50.14	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	K1911049-002.01 ms 100x	29.0715 ppm	0.0000 ppm	0.0000%	2019/11/24 22:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.0715	290.7153	206.12	209.76	3.64	50.16	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/24 23:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.92	11.64	3.72	50.14	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K1911049-003.01	11.8161 ppm	0.0456 ppm	0.3900%	2019/11/24 23:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.7838	117.8381	88.77	92.40	3.62	50.11	10:31
2	TOC	11.8483	118.4834	89.21	92.81	3.60	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	K1911049-004.01	1.5999 ppm	0.0839 ppm	5.2400%	2019/11/24 23:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6592	16.5924	20.05	23.59	3.54	50.11	10:30
2	TOC	1.5406	15.4065	19.24	22.81	3.57	50.13	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K1911028-001.04	0.8950 ppm	0.0518 ppm	5.7800%	2019/11/25 00:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9316	9.3163	15.11	18.58	3.47	50.15	10:28
2	TOC	0.8584	8.5841	14.61	18.06	3.45	50.11	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC)	CAS_salt_010711	CAS_salt_010711

(v1323) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	65	TOC	K1911028-002.04	21.8501 ppm	0.4095 ppm	1.8700%	2019/11/25 00:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	22.1397	221.3968	159.07	162.59	3.52	50.14	10:29
2	TOC	21.5606	215.6056	155.14	158.84	3.70	50.12	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	K1911028-003.04	0.7336 ppm	0.0533 ppm	7.2700%	2019/11/25 01:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7713	7.7134	14.02	17.61	3.59	50.10	10:26
2	TOC	0.6959	6.9591	13.51	17.14	3.64	50.14	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2538 ppm (PASS)	0.0000 ppm	0%	2019/11/25 01:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2538	242.5382	174.10	177.84	3.74	50.11	10:29

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

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/25 02:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.19	9.91	3.72	50.09	10:33

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

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	K1911028-004.04	1.4272 ppm	0.0215 ppm	1.5000%	2019/11/25 02:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4424	14.4239	18.58	22.17	3.60	50.13	10:29
2	TOC	1.4120	14.1204	18.37	22.07	3.70	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	68	TOC	K1911028-005.04	1.4693 ppm	0.0117 ppm	0.7900%	2019/11/25 02:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4776	14.7759	18.81	22.49	3.68	50.15	10:28
2	TOC	1.4611	14.6110	18.70	22.34	3.64	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	69	TOC	FB 11/21/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 03:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.76	9.25	3.49	50.12	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	70	TOC	FB 11/22/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 03:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.79	9.29	3.50	50.13	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◈	71	TOC	K1911043-001.01 doc 1000x	11.7513 ppm	0.0120 ppm	0.1000%	2019/11/25 03:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.7598	117.5980	88.61	92.27	3.66	50.11	10:29
2	TOC	11.7429	117.4286	88.49	92.16	3.67	50.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K1911043-002.01 doc 1000x	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 04:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.79	11.41	3.62	50.11	10:29
2	TOC	0.0000	0.0000	7.15	10.87	3.72	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K1910975-002.01 doc 10x	8.1521 ppm	0.2117 ppm	2.6000%	2019/11/25 04:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.0024	80.0240	63.10	66.61	3.51	50.14	10:30
2	TOC	8.3018	83.0176	65.14	68.78	3.64	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K1910975-001.01 doc	0.8387 ppm	0.1176 ppm	14.0200%	2019/11/25 05:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9219	9.2190	15.04	18.69	3.65	50.11	10:26
2	TOC	0.7556	7.5558	13.91	17.48	3.57	50.12	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	75	TOC	K1910975-001.01 ms doc	26.6131 ppm	0.0000 ppm	0.0000%	2019/11/25 05:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	26.6131	266.1305	189.43	193.03	3.60	50.14	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/11/25 05:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.23	10.93	3.70	50.12	10:28
2	TOC	0.0000	0.0000	6.73	10.14	3.40	50.11	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7842 (IC) (v1323)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1613 ppm (PASS)	0.0000 ppm	0%	2019/11/25 06:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1613	241.6131	173.47	177.17	3.70	50.11	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/11/25 06:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.86	9.52	3.65	50.12	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1322	1.2997	0.8410	0.0000	0.0000	0.0000	2019/11/21 13:13	Fusion1 (Fusion1)
v1323	1.3397	1.1360	0.0000	0.0000	0.0000	2019/11/23 16:30	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
Ver Creation: 2019/03/05 17:42
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 6.788x + 9.463
r^2 value: TOC: r^2 = 0.99963

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Ver Creation: 2019/02/21 17:57
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7

PreSpargeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/11/25 06:49

StarLIMS Run: 661076, 661077, 661078, 661079

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-83D

21 % H3PO4: 11-GEN-05-83B

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

23 [illegible] 11/26/19

Analyzed By: [illegible]	Date Analyzed: 11/26/19
Reviewed By: [illegible]	Date Reviewed: 11/26/19

HS19111080 Wet Chem Raw Data

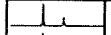
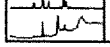
ALS WO# HS19111080

Sequence: 112519
Last Update Operator: alshs.nouser

HS19111080

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	me	Status	Inject Time
	STD1	2970209205	Calibration	GA1	1.0000	1	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:08:06 PM -05:00
	STD2		Calibration	GA2	1.0000	2	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:24:42 PM -05:00
	STD3		Calibration	GA3	1.0000	3	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:41:19 PM -05:00
	STD4		Calibration	GA4	1.0000	4	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:57:54 PM -05:00
	STD5		Calibration	GA5	1.0000	5	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 3:14:30 PM -05:00
	STD6	F, NO2 MAX 10PPM	Calibration	GB8	1.0000	6	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:37:32 PM -05:00
	ICV	2970209123	Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:54:07 PM -05:00
	ICB		Unknown	GB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 7:29:52 PM -05:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 3:15:15 PM -06:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 3:31:51 PM -06:00
	WBLKW1-112519		Unknown	GA1	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 5:13:48 PM -06:00
	WLCSW1-112519		Unknown	GA2	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 5:30:23 PM -06:00
	WLCSDW1-112519		Unknown	GA3	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 5:46:58 PM -06:00
	HS19111269-02		Unknown	GA4	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 7:23:03 PM -06:00
	HS19111269-02MS		Unknown	GA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 7:39:39 PM -06:00
	HS19111269-02MSD		Unknown	GA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 7:56:15 PM -06:00
	HS19111269-03		Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 8:12:53 PM -06:00
	HS19111269-04		Unknown	GA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 8:29:28 PM -06:00
	HS19111269-05		Unknown	GB1	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 8:46:04 PM -06:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 9:02:44 PM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 9:19:26 PM -06:00
	HS19111101-01		Unknown	GD3	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 9:36:06 PM -06:00
	HS19111250-01		Unknown	GB2	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 9:52:43 PM -06:00
	DI H2O		Unknown	BA1	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 10:09:19 PM -06:00
	HS19111069-07DF50		Unknown	GB3	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 10:25:58 PM -06:00
	HS19111069-08DF50		Unknown	GB4	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 10:42:33 PM -06:00
	HS19110634-01DF10		Unknown	GB5	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 10:59:10 PM -06:00
	HS19110634-02DF10		Unknown	GB6	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 11:15:45 PM -06:00
	HS19110634-03DF10		Unknown	GB7	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 11:32:22 PM -06:00
	HS19110634-04DF10		Unknown	GB8	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/25/2019 11:48:57 PM -06:00
	HS19110634-05DF10		Unknown	GC1	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 12:05:33 AM -06:00
	HS19111080-01DF5		Unknown	GC2	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 12:22:08 AM -06:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 12:38:47 AM -06:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 12:55:23 AM -06:00
	HS19111080-02DF5		Unknown	GC3	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 1:12:00 AM -06:00
	HS19111080-03DF5		Unknown	GC4	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 1:28:35 AM -06:00
	HS19111080-04DF5		Unknown	GC5	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 1:45:12 AM -06:00
	HS19111080-05DF200	matrix	Unknown	GC6	200.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 2:01:48 AM -06:00
	HS19111080-06DF5		Unknown	GC7	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 2:18:23 AM -06:00

Sequence: 112519
Last Update Operator: alshs.nouser

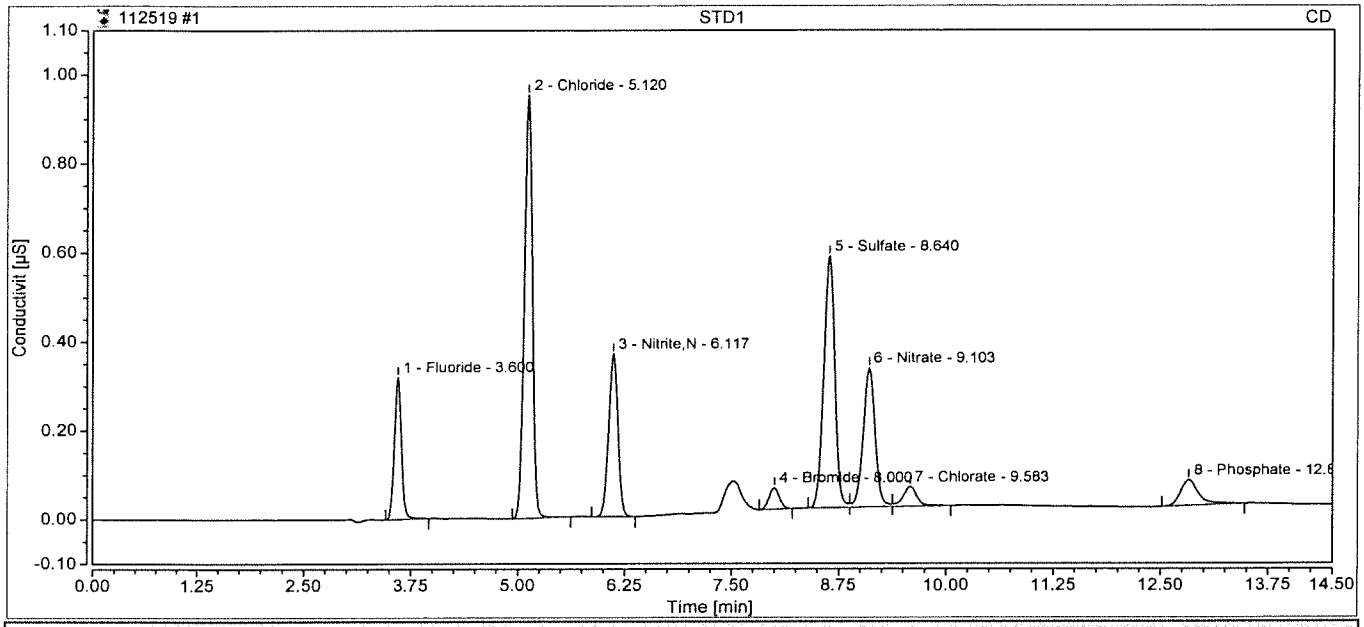
CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	me	Status	Inject Time
	HS19111080-07DF5		Unknown	GC8	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 2:34:58 AM -06:00
	HS19111080-07MSDF5		Unknown	GD1	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 2:51:35 AM -06:00
	HS19111080-07MSDDF5		Unknown	GD2	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 3:08:11 AM -06:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 3:24:47 AM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/26/2019 3:41:23 AM -06:00

Peak No.	Peak Name	Cal.Type	Eval.Type	Number of Points	Rel.Std.Dev. %	Coeff.of Determination	C0 (Offset)	C1 (Slope)	C2 (Curve)
1	*Fluoride*	*Lin, WithOffset, 1/x*	*Area*	*5*	*10.1532*	*0.99927*	*-0.0056*	*0.3716*	*0.0000*
2	Chloride	Lin, WithOffset, 1/x	Area	6	0.2804	1.00000	-0.0135	0.2355	0.0000
3	Nitrite,N	Lin, WithOffset, 1/x	Area	5	15.1147	0.99824	0.0003	0.5120	0.0000
4	Bromide	Lin, WithOffset, 1/x	Area	6	14.0217	0.99919	-0.0052	0.1009	0.0000
5	Sulfate	Lin, WithOffset, 1/x	Area	6	1.1258	0.99999	-0.0022	0.1717	0.0000
6	Nitrate	Lin, WithOffset, 1/x	Area	6	2.2249	0.99998	-0.0102	0.5876	0.0000
7	Chlorate	Lin, WithOffset, 1/x	Area	6	10.0265	0.99953	-0.0024	0.0944	0.0000
8	Phosphate	Lin, WithOffset, 1/x	Area	6	6.6198	0.99981	-0.0110	0.2321	0.0000
Maximum					15.1147	1.00000			
Minimum					0.2804	0.99824			

1 STD1

Sample Name:	**STD1**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:08**	*Sample Weight:*	**1.0000**

Run Time:



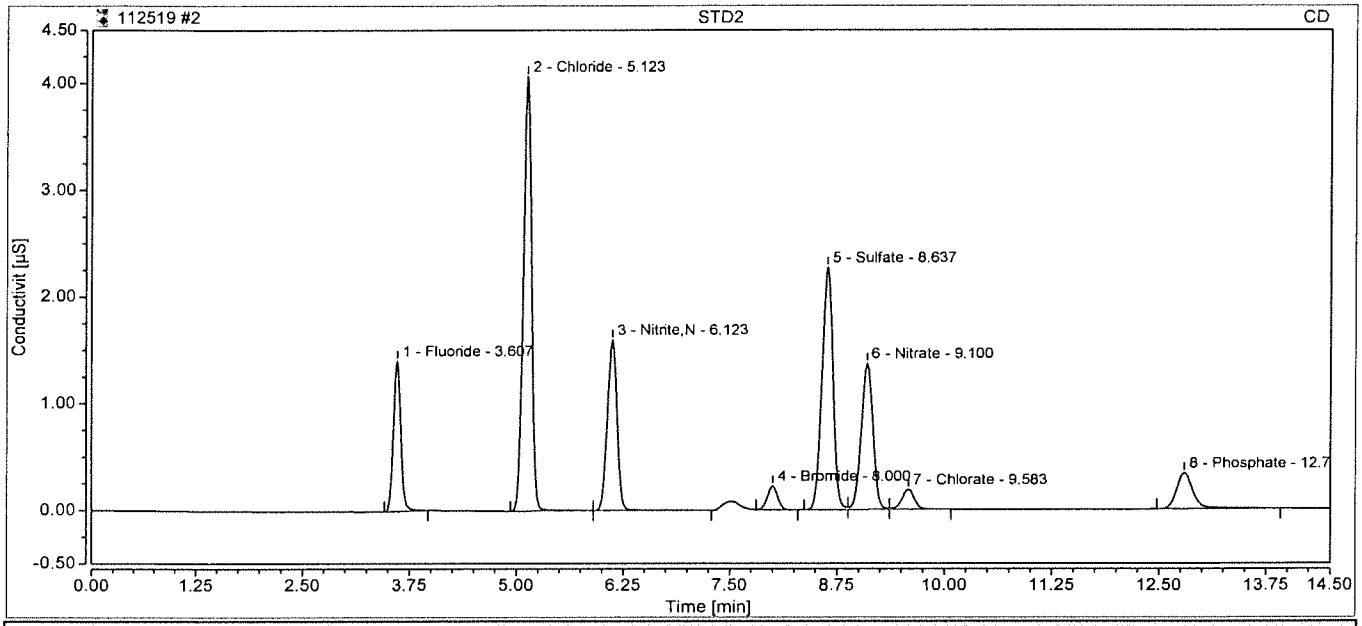
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.031	0.0973	0.0973	1.0000
2	5.12	Chloride	BMB	0.105	0.5026	0.5026	1.0000
3	6.12	Nitrite,N	BMB	0.046	0.0893	0.0893	1.0000
4	8.00	Bromide	BMB	0.007	0.1192	0.1192	1.0000
5	8.64	Sulfate	BM	0.084	0.5042	0.5042	1.0000
6	9.10	Nitrate	M	0.051	0.1034	0.1034	1.0000
7	9.58	Chlorate	MB	0.008	0.1143	0.1143	1.0000
8	12.83	Phosphate	BMB	0.014	0.1085	0.1085	1.0000
Total:			**0.000**	**0.346**		**1.64**	

2 STD2

Sample Name:	**STD2**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:24**	*Sample Weight:*	**1.0000**

Run Time:



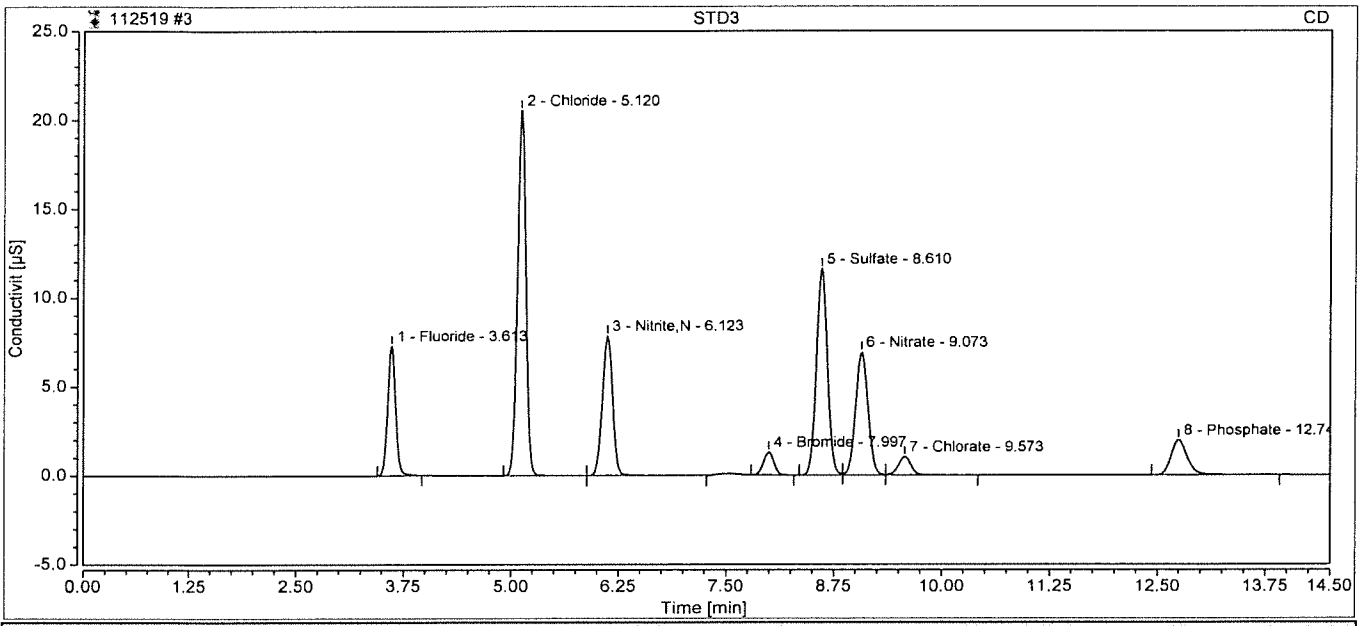
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.140	0.3929	0.3929	1.0000
2	5.12	Chloride	BMB	0.456	1.9918	1.9918	1.0000
3	6.12	Nitrite,N	BMB	0.211	0.4119	0.4119	1.0000
4	8.00	Bromide	BMB	0.031	0.3593	0.3593	1.0000
5	8.64	Sulfate	BM	0.337	1.9733	1.9733	1.0000
6	9.10	Nitrate	M	0.220	0.3917	0.3917	1.0000
7	9.58	Chlorate	MB	0.033	0.3704	0.3704	1.0000
8	12.80	Phosphate	BMB	0.078	0.3841	0.3841	1.0000
Total:			**0.000**	**1.506**		**6.28**	

3 STD3

Sample Name:	**STD3**	*Injection Volume:*	**5.00**
Vial Number:	**GA3**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:41**	*Sample Weight:*	**1.0000**

Run Time:



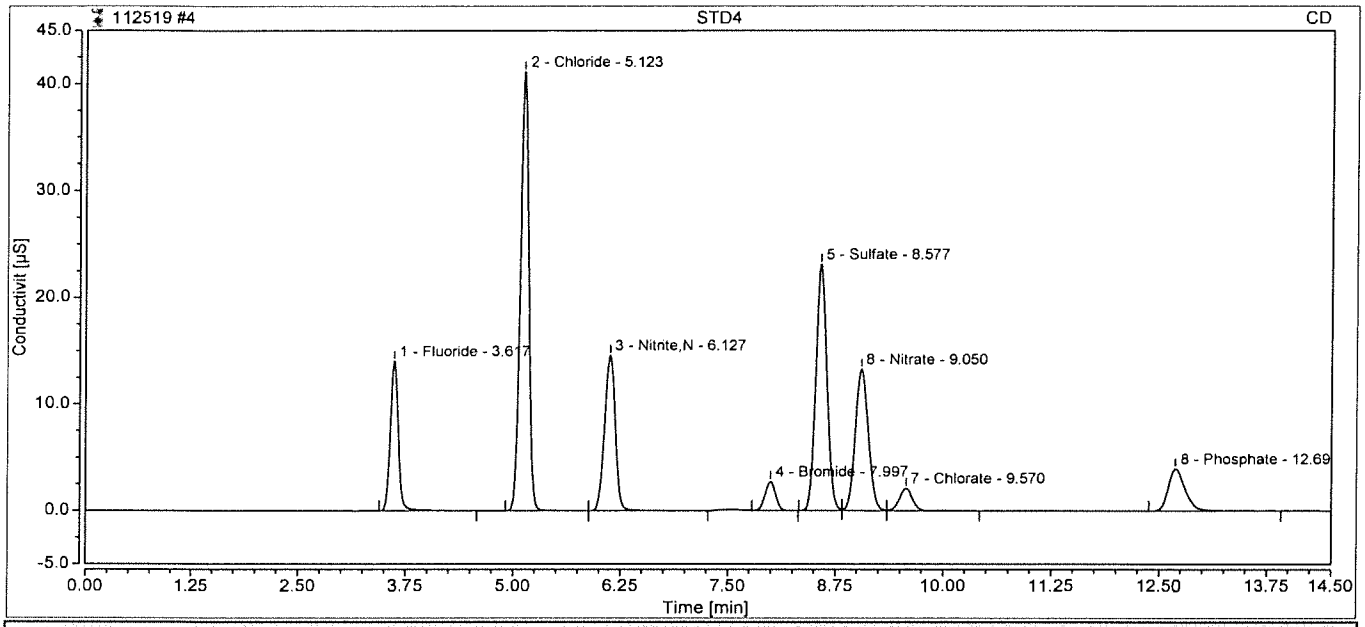
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.758	2.0551	2.0551	1.0000
2	5.12	Chloride	BMB	2.339	9.9888	9.9888	1.0000
3	6.12	Nitrite,N	BMB	1.091	2.1305	2.1305	1.0000
4	8.00	Bromide	BMB	0.182	1.8590	1.8590	1.0000
5	8.61	Sulfate	BM	1.715	10.0007	10.0007	1.0000
6	9.07	Nitrate	M	1.153	1.9792	1.9792	1.0000
7	9.57	Chlorate	MB	0.176	1.8940	1.8940	1.0000
8	12.75	Phosphate	BMB	0.436	1.9269	1.9269	1.0000
Total:			**0.000**	**7.851**		**31.83**	

4 STD4

Sample Name:	**STD4**	*Injection Volume:*	**5.00**
Vial Number:	**GA4**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:57**	*Sample Weight:*	**1.0000**

Run Time:



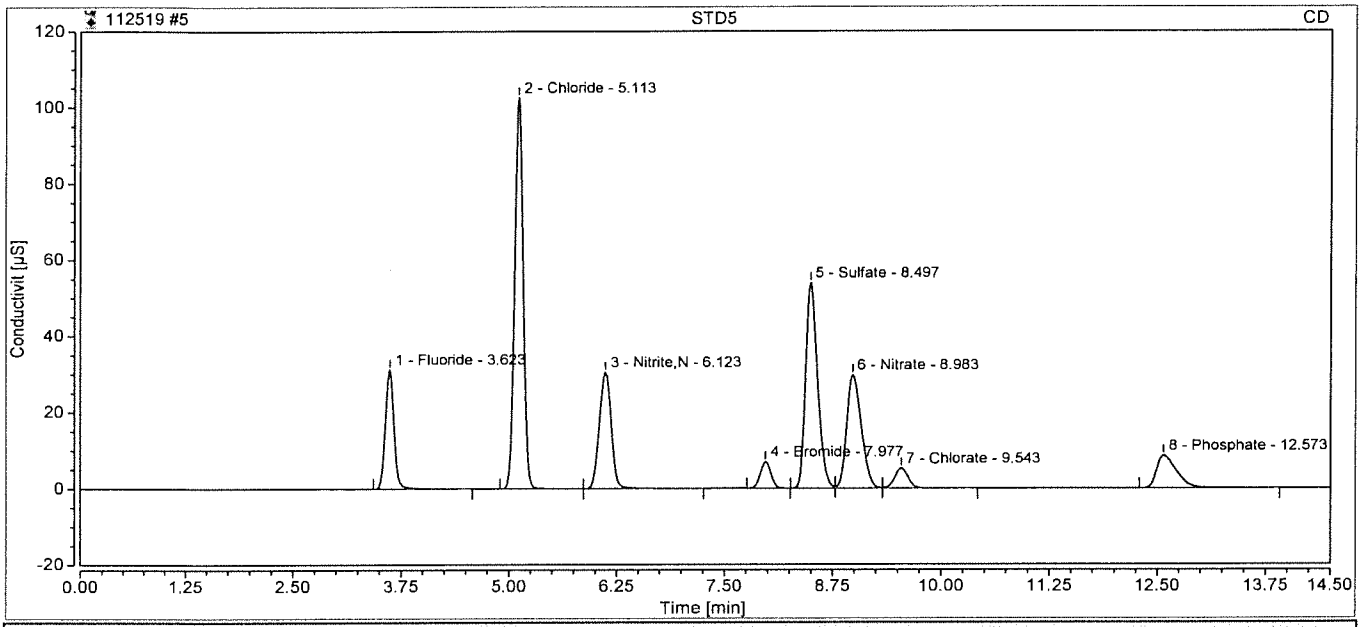
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.535	4.1457	4.1457	1.0000
2	5.12	Chloride	BMB	4.695	19.9948	19.9948	1.0000
3	6.13	Nitrite,N	BMB	2.133	4.1659	4.1659	1.0000
4	8.00	Bromide	BMB	0.385	3.8642	3.8642	1.0000
5	8.58	Sulfate	BM	3.451	20.1082	20.1082	1.0000
6	9.05	Nitrate	M	2.330	3.9823	3.9823	1.0000
7	9.57	Chlorate	MB	0.365	3.8956	3.8956	1.0000
8	12.69	Phosphate	BMB	0.903	3.9395	3.9395	1.0000
Total:			**0.000**	**15.798**		**64.10**	

5 STD5

Sample Name:	**STD5**	*Injection Volume:*	**5.00**
Vial Number:	**GA5**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 15:14**	*Sample Weight:*	**1.0000**

Run Time:



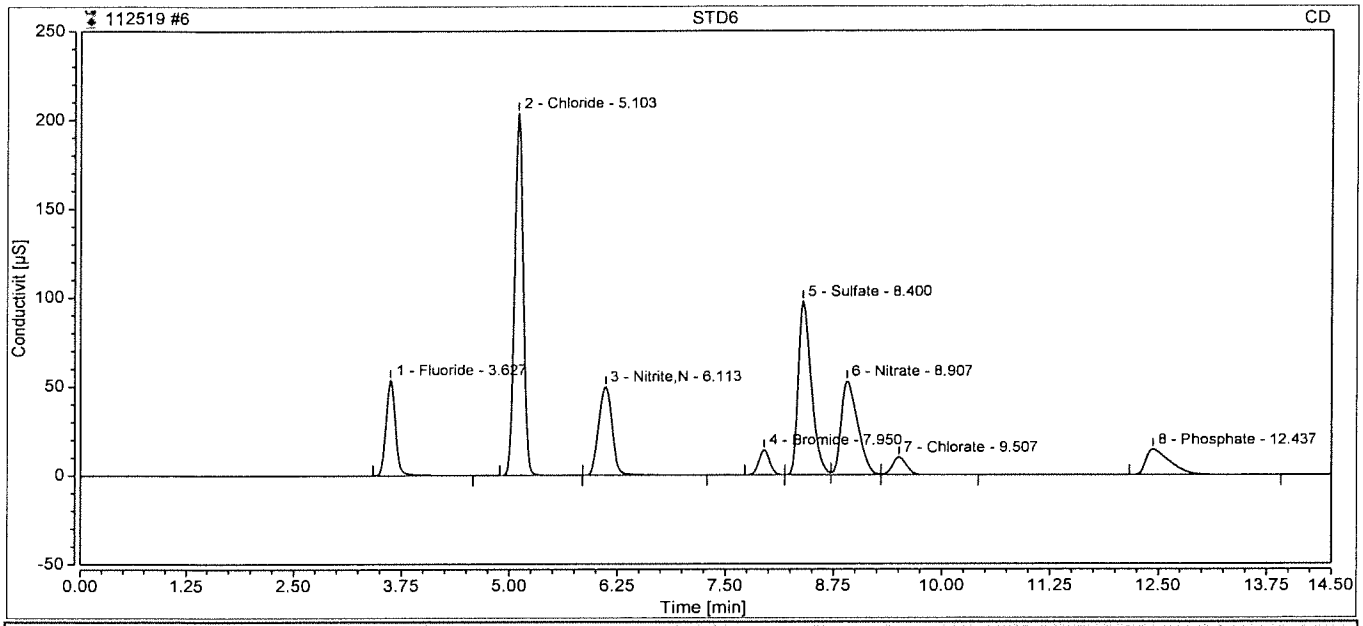
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.639	9.8090	9.8090	1.0000
2	5.11	Chloride	BMB	11.762	49.9996	49.9996	1.0000
3	6.12	Nitrite,N	BMB	4.968	9.7023	9.7023	1.0000
4	7.98	Bromide	BMB	1.001	9.9786	9.9786	1.0000
5	8.50	Sulfate	BM	8.590	50.0271	50.0271	1.0000
6	8.98	Nitrate	M	5.854	9.9805	9.9805	1.0000
7	9.54	Chlorate	MB	0.939	9.9670	9.9670	1.0000
8	12.57	Phosphate	BMB	2.305	9.9803	9.9803	1.0000
Total:			**0.000**	**39.057**		**159.44**	

6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:37**	*Sample Weight:*	**1.0000**

Run Time:



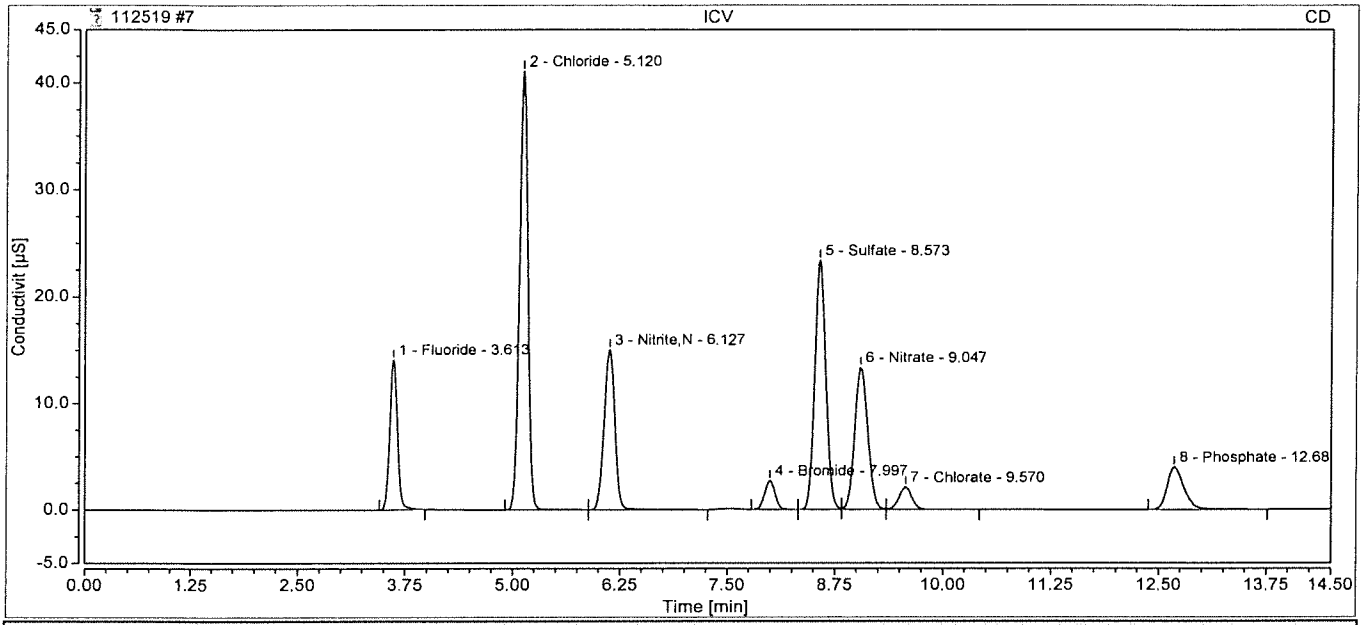
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	6.773	18.2418	18.2418	1.0000
2	5.10	Chloride	BMB	23.542	100.0224	100.0224	1.0000
3	6.11	Nitrite,N	BMB	9.157	17.8850	17.8850	1.0000
4	7.95	Bromide	BM	2.045	20.3197	20.3197	1.0000
5	8.40	Sulfate	M	17.153	99.8863	99.8863	1.0000
6	8.91	Nitrate	M	11.778	20.0629	20.0629	1.0000
7	9.51	Chlorate	MB	1.910	20.2586	20.2586	1.0000
8	12.44	Phosphate	BMB	4.668	20.1606	20.1606	1.0000
Total:			**0.000**	**77.025**		**316.84**	

7 ICV

Sample Name:	**ICV**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:54**	*Sample Weight:*	**1.0000**

Run Time:



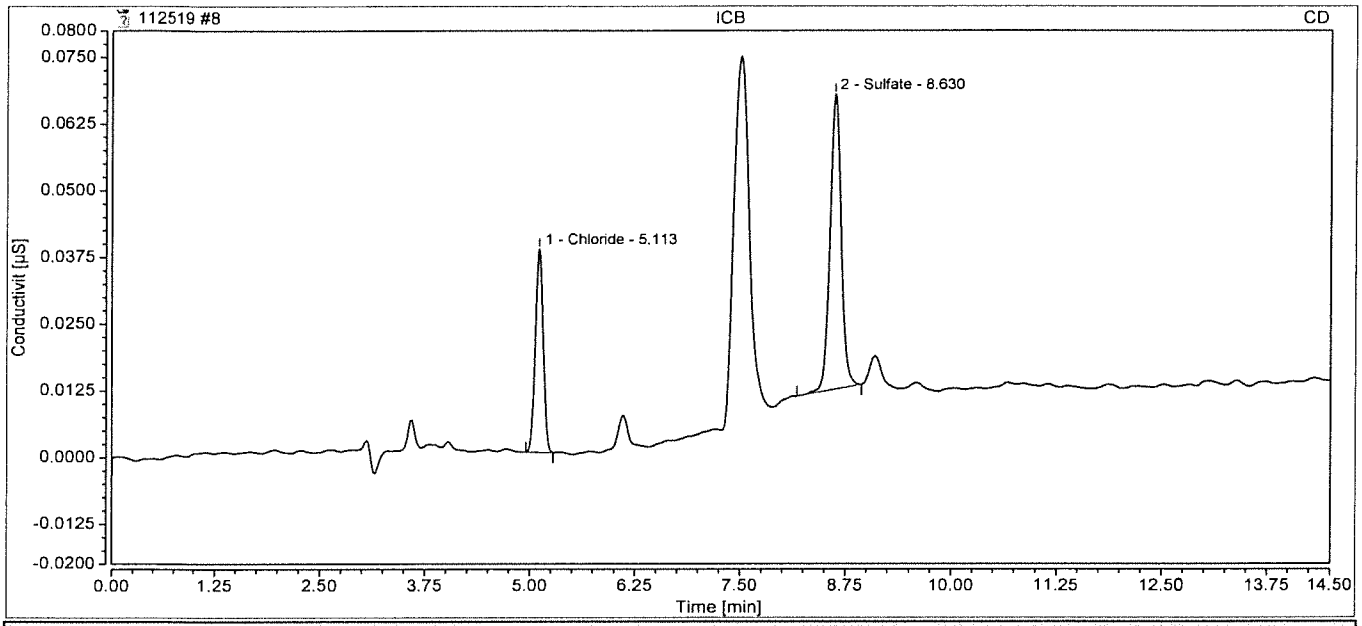
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.495	4.0374	4.0374	1.0000
2	5.12	Chloride	BMB	4.681	19.9333	19.9333	1.0000
3	6.13	Nitrite,N	BMB	2.195	4.2858	4.2858	1.0000
4	8.00	Bromide	BMB	0.384	3.8585	3.8585	1.0000
5	8.57	Sulfate	BM	3.469	20.2132	20.2132	1.0000
6	9.05	Nitrate	M	2.340	3.9993	3.9993	1.0000
7	9.57	Chlorate	MB	0.367	3.9104	3.9104	1.0000
8	12.68	Phosphate	BMB	0.911	3.9732	3.9732	1.0000
Total:			**0.000**	**15.841**		**64.21**	

8 ICB

Sample Name:	**ICB**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 19:29**	*Sample Weight:*	**1.0000**

Run Time:



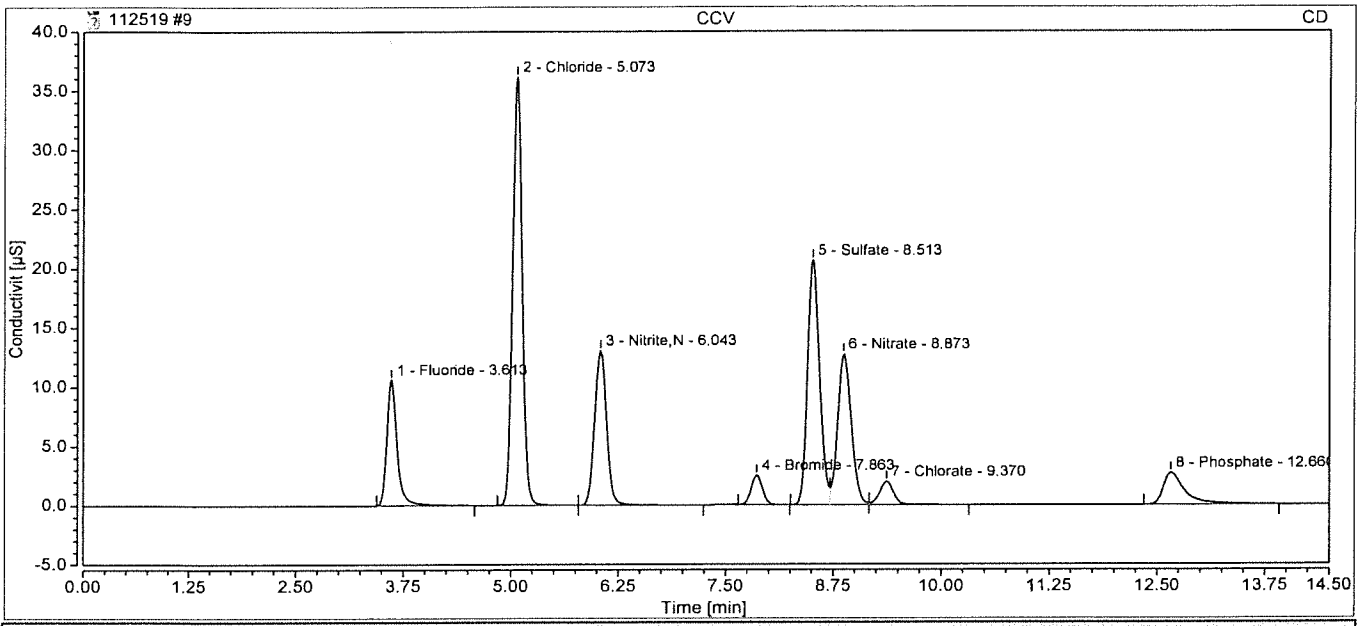
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.11	Chloride	BMB	0.004	0.0748	0.0748	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.63	Sulfate	BMB	0.008	0.0618	0.0618	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.013**		**0.14**	

9 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/25/2019 15:15**	*Sample Weight:*	**1.0000**

Run Time:



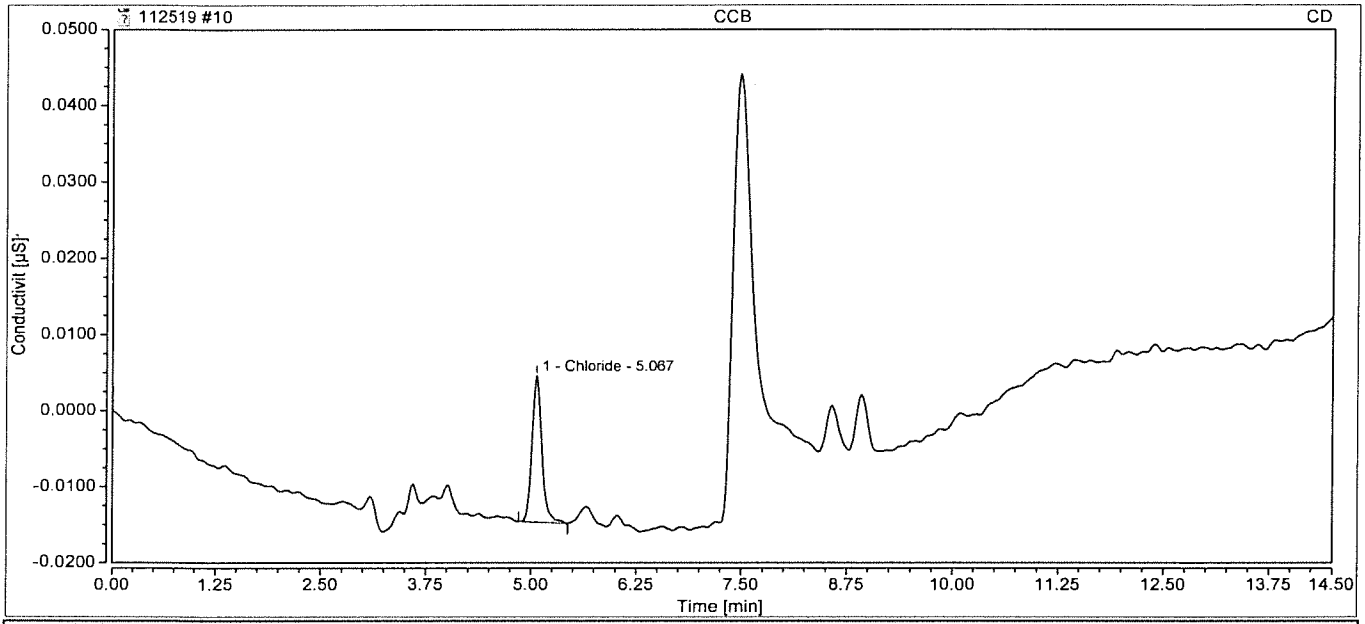
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.457	3.9353	3.9353	1.0000
2	5.07	Chloride	BMB	4.637	19.7478	19.7478	1.0000
3	6.04	Nitrite,N	BMB	2.105	4.1108	4.1108	1.0000
4	7.86	Bromide	BMB	0.376	3.7816	3.7816	1.0000
5	8.51	Sulfate	BM	3.347	19.4994	19.4994	1.0000
6	8.87	Nitrate	M	2.351	4.0181	4.0181	1.0000
7	9.37	Chlorate	MB	0.375	4.0006	4.0006	1.0000
8	12.66	Phosphate	BMB	0.797	3.4824	3.4824	1.0000
Total:			**0.000**	**15.445**		**62.58**	

10 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/25/2019 15:31**	*Sample Weight:*	**1.0000**

Run Time:



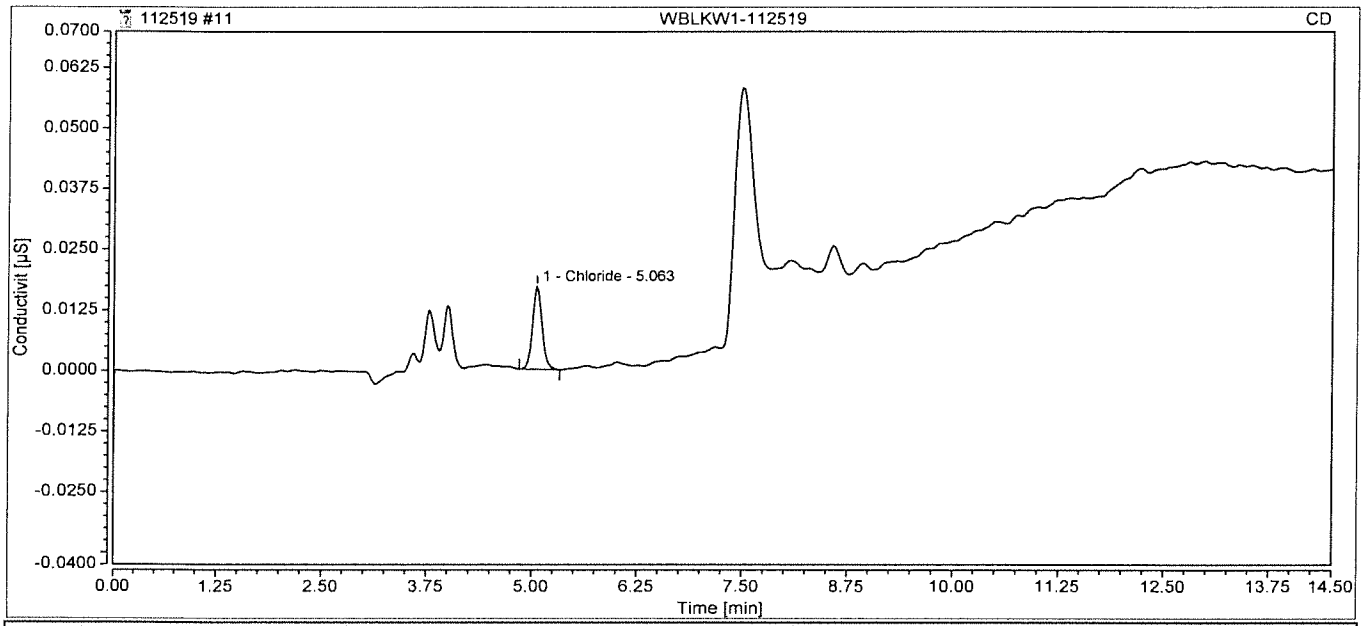
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.07	Chloride	BMB	0.003	0.0685	0.0685	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.07**	

11 WBLKW1-112519

Sample Name:	**WBLKW1-112519**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/25/2019 17:13**	*Sample Weight:*	**1.0000**

Run Time:



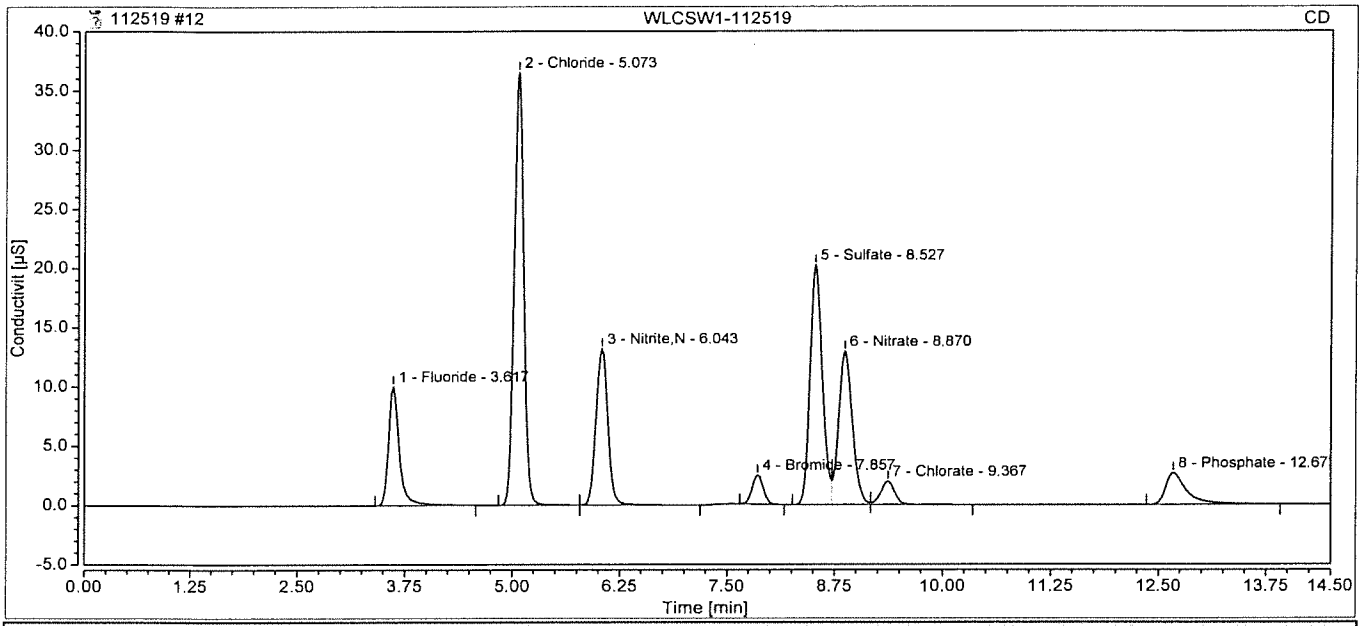
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.06	Chloride	BMB	0.002	0.0668	0.0668	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.002**		**0.07**	

12 *WLCSW1-112519*

Sample Name:	**WLCSW1-112519**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/25/2019 17:30**	*Sample Weight:*	**1.0000**

Run Time:



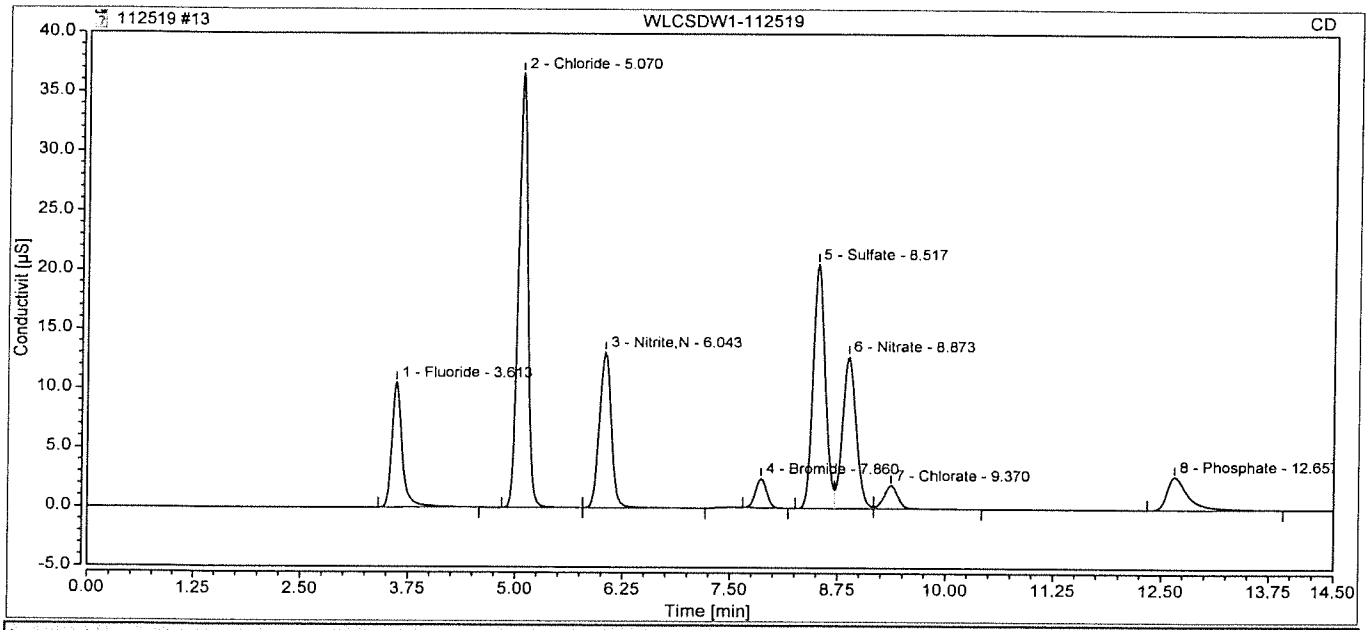
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.449	3.9144	3.9144	1.0000
2	5.07	Chloride	BMB	4.684	19.9463	19.9463	1.0000
3	6.04	Nitrite,N	BMB	2.115	4.1295	4.1295	1.0000
4	7.86	Bromide	BMB	0.370	3.7220	3.7220	1.0000
5	8.53	Sulfate	BM	3.344	19.4825	19.4825	1.0000
6	8.87	Nitrate	M	2.383	4.0732	4.0732	1.0000
7	9.37	Chlorate	MB	0.378	4.0342	4.0342	1.0000
8	12.67	Phosphate	BMB	0.781	3.4132	3.4132	1.0000
Total:			**0.000**	**15.504**		**62.72**	

13 WLCSDW1-112519

Sample Name:	WLCSDW1-112519	Injection Volume:	5.00
Vial Number:	GA3	Channel:	CD
Sample Type:	Unknown	Wavelength:	210
Control Program:	Anions Program 08092019	Bandwidth:	n.a.
Quantif. Method:	Anions Processing Method	Dilution Factor:	1.0000
Recording Time:	11/25/2019 17:46	Sample Weight:	1.0000

Run Time:

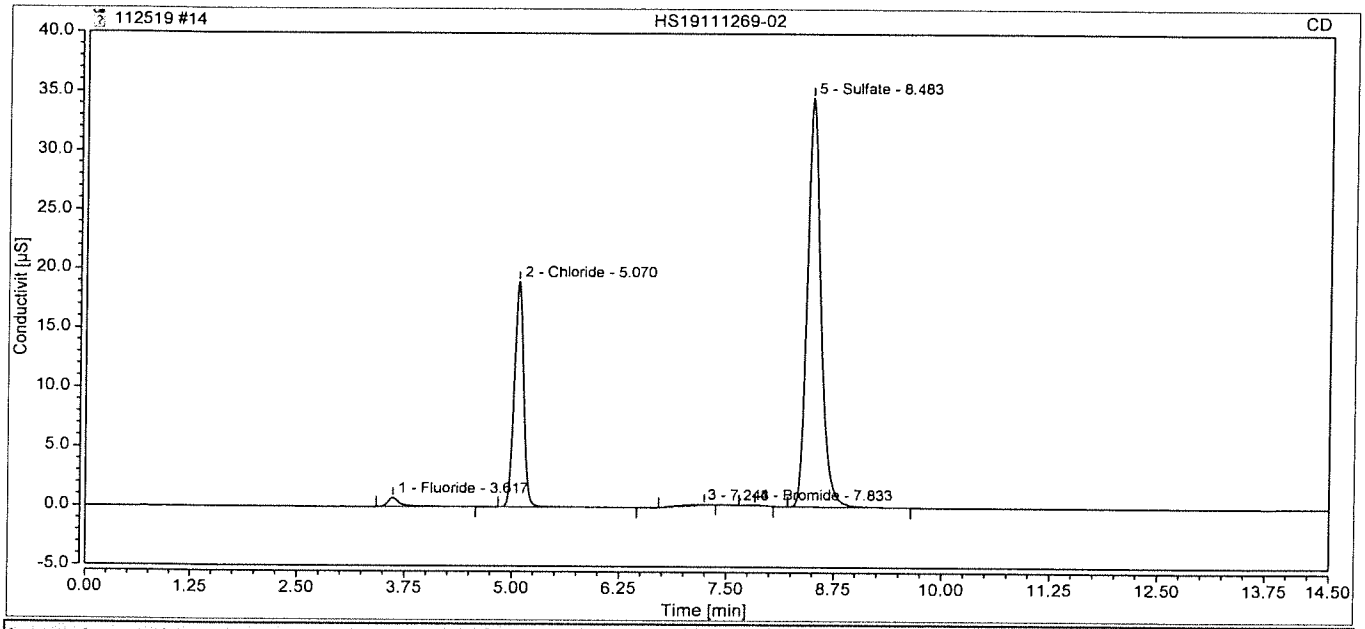


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.474	3.9811	3.9811	1.0000
2	5.07	Chloride	BMB	4.692	19.9805	19.9805	1.0000
3	6.04	Nitrite,N	BMB	2.119	4.1382	4.1382	1.0000
4	7.86	Bromide	BMB	0.372	3.7356	3.7356	1.0000
5	8.52	Sulfate	BM	3.366	19.6127	19.6127	1.0000
6	8.87	Nitrate	M	2.376	4.0614	4.0614	1.0000
7	9.37	Chlorate	MB	0.378	4.0319	4.0319	1.0000
8	12.66	Phosphate	BMB	0.818	3.5725	3.5725	1.0000
Total:			**0.000**	**15.595**		**63.11**	

14 HS19111269-02

Sample Name:	**HS19111269-02**	*Injection Volume:*	**5.00**
Vial Number:	**GA4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/25/2019 19:23**	*Sample Weight:*	**1.0000**
Run Time:			



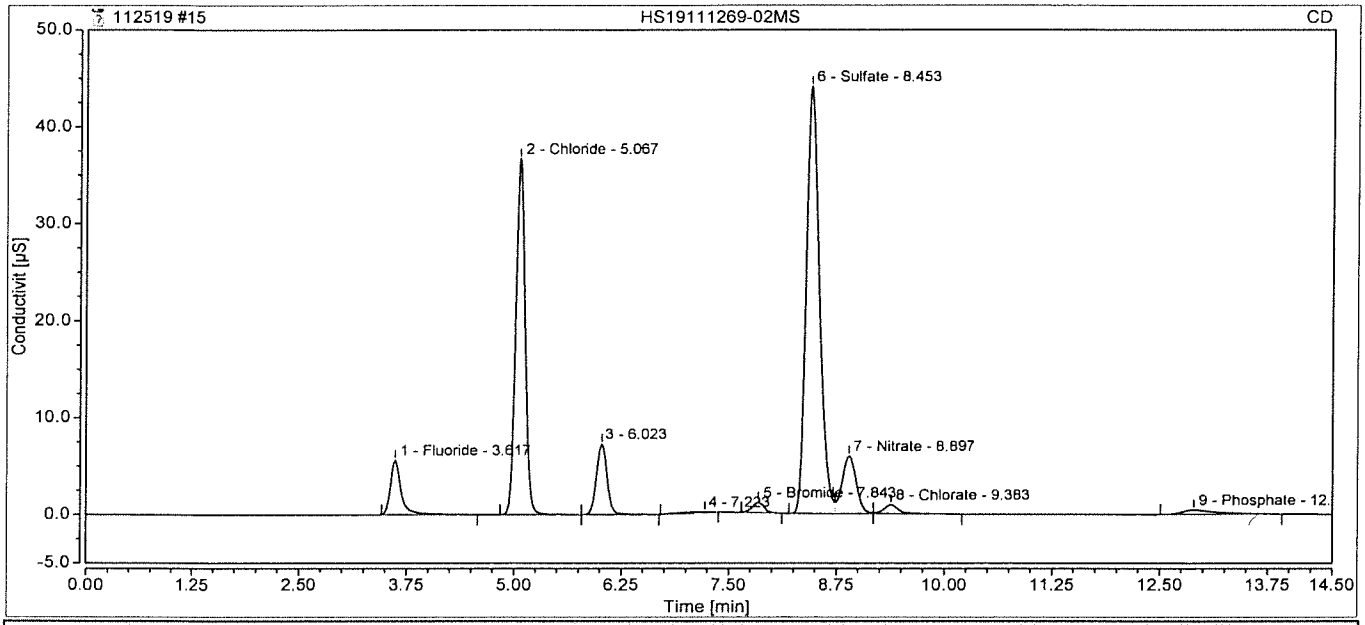
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.135	0.3792	0.3792	1.0000
2	5.07	Chloride	BMB	2.409	10.2861	10.2861	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
4	7.83	Bromide	BMB	0.014	0.1866	0.1866	1.0000
5	8.48	Sulfate	BMB	6.345	36.9585	36.9585	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**8.903**		**47.81**	

15 HS19111269-02MS

Sample Name:	**HS19111269-02MS**	*Injection Volume:*	**5.00**
Vial Number:	**GA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/25/2019 19:39**	*Sample Weight:*	**1.0000**

Run Time:



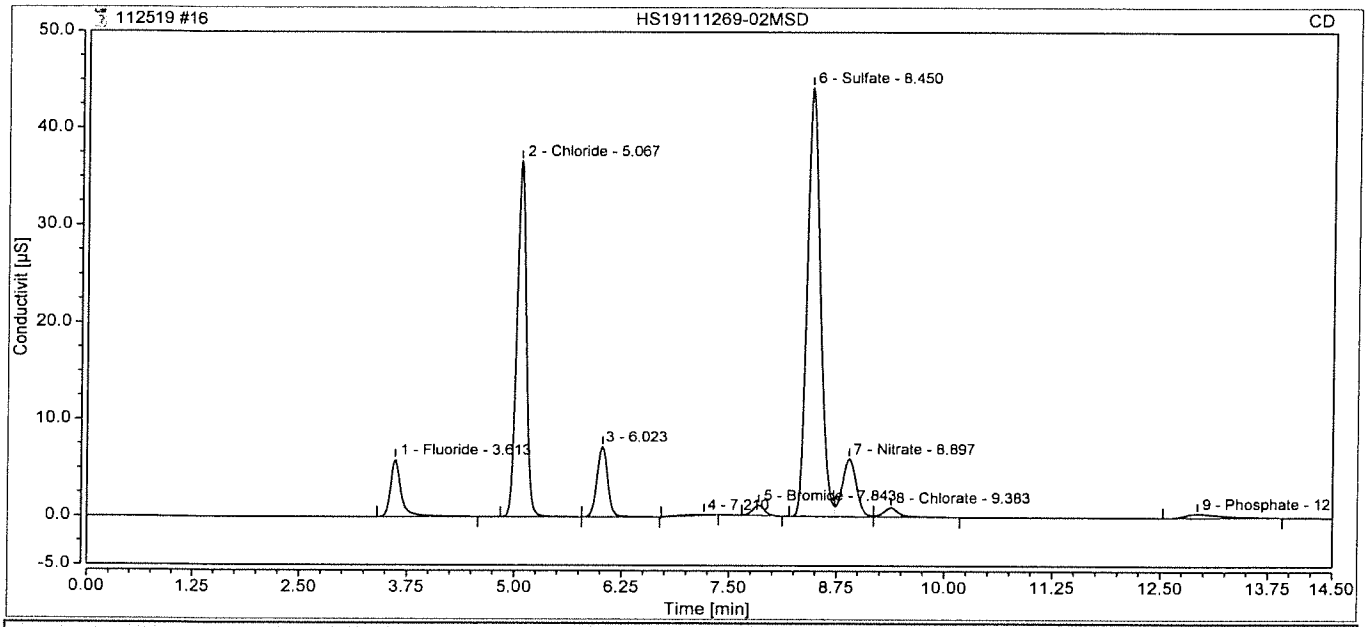
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.815	2.2076	2.2076	1.0000
2	5.07	Chloride	BMB	4.635	19.7386	19.7386	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
5	7.84	Bromide	BMB	0.170	1.7361	1.7361	1.0000
6	8.45	Sulfate	BM	7.849	45.7169	45.7169	1.0000
7	8.90	Nitrate	M	1.139	1.9568	1.9568	1.0000
8	9.38	Chlorate	MB	0.198	2.1195	2.1195	1.0000
9	12.89	Phosphate	BMB	0.228	1.0300	1.0300	1.0000
Total:			**0.000**	**15.034**		**74.51**	

16 *HS19111269-02MSD*

Sample Name:	**HS19111269-02MSD**	*Injection Volume:*	**5.00**
Vial Number:	**GA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/25/2019 19:56**	*Sample Weight:*	**1.0000**

Run Time:



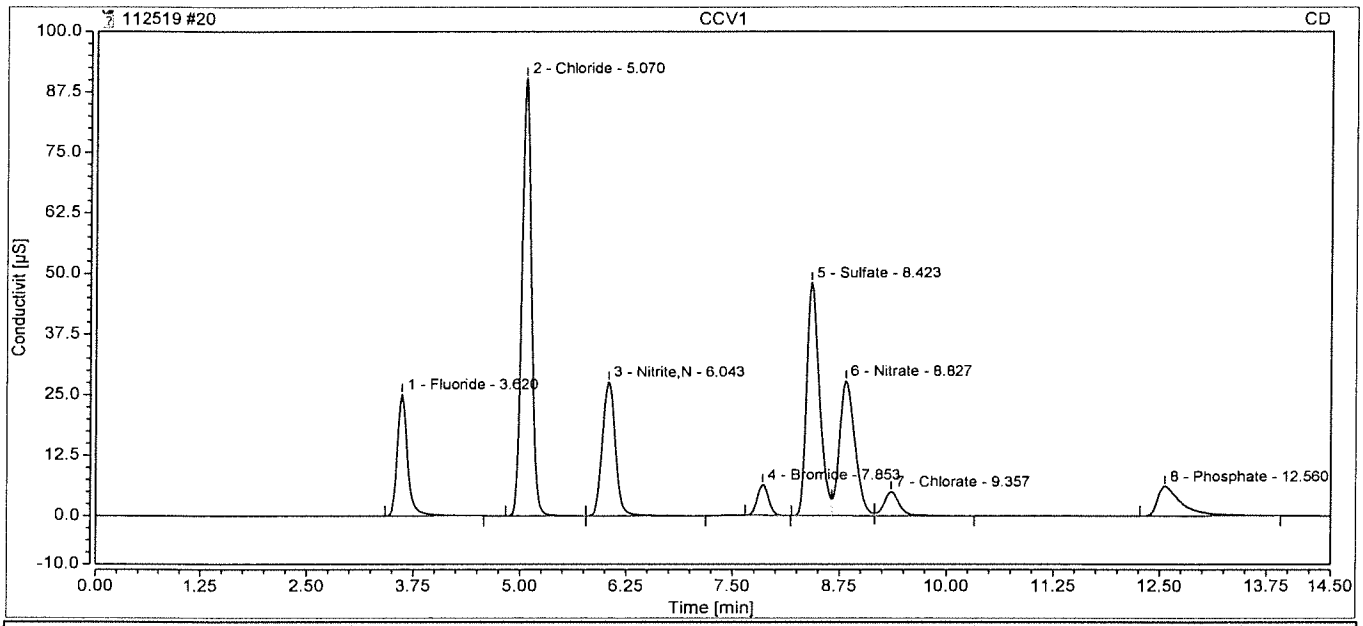
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.843	2.2828	2.2828	1.0000
2	5.07	Chloride	BMB	4.633	19.7319	19.7319	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
5	7.84	Bromide	BMB	0.170	1.7402	1.7402	1.0000
6	8.45	Sulfate	BM	7.835	45.6334	45.6334	1.0000
7	8.90	Nitrate	M	1.141	1.9590	1.9590	1.0000
8	9.38	Chlorate	MB	0.195	2.0919	2.0919	1.0000
9	12.93	Phosphate	BMB	0.223	1.0077	1.0077	1.0000
Total:			**0.000**	**15.040**		**74.45**	

20 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/25/2019 21:02**	*Sample Weight:*	**1.0000**

Run Time:



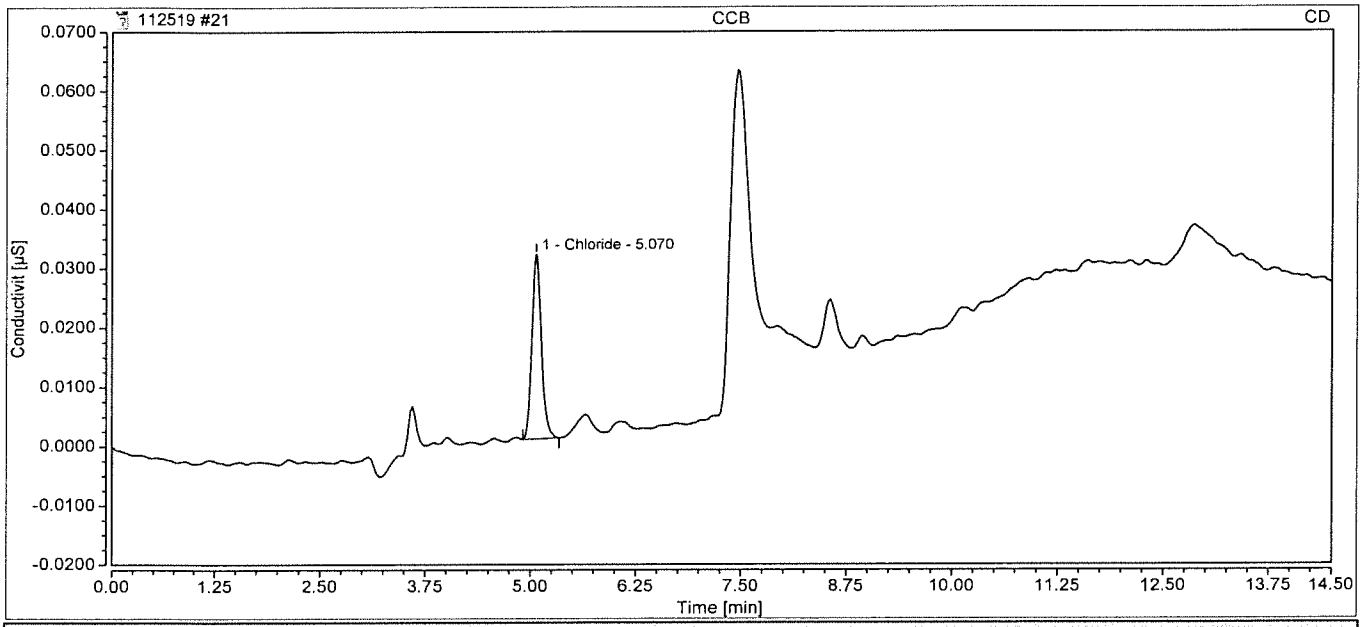
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.564	9.6077	9.6077	1.0000
2	5.07	Chloride	BMB	11.670	49.6096	49.6096	1.0000
3	6.04	Nitrite,N	BMB	4.942	9.6525	9.6525	1.0000
4	7.85	Bromide	BMB	0.979	9.7585	9.7585	1.0000
5	8.42	Sulfate	BM	8.407	48.9607	48.9607	1.0000
6	8.83	Nitrate	M	5.921	10.0955	10.0955	1.0000
7	9.36	Chlorate	MB	1.031	10.9504	10.9504	1.0000
8	12.56	Phosphate	BMB	2.051	8.8847	8.8847	1.0000
Total:			**0.000**	**38.566**		**157.52**	

21 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/25/2019 21:19**	*Sample Weight:*	**1.0000**

Run Time:



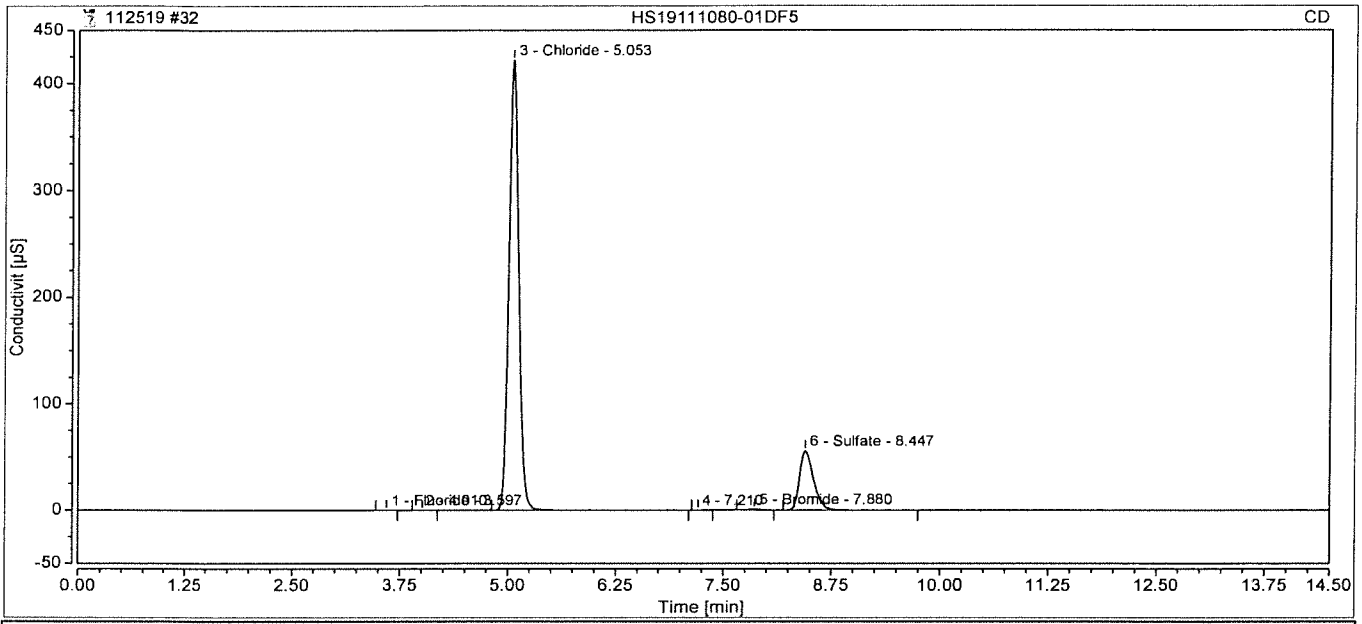
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.07	Chloride	BMB	0.004	0.0744	0.0744	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.004**		**0.07**	

32 HS19111080-01DF5

Sample Name:	**HS19111080-01DF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**11/26/2019 00:22**	*Sample Weight:*	**1.0000**

Run Time:



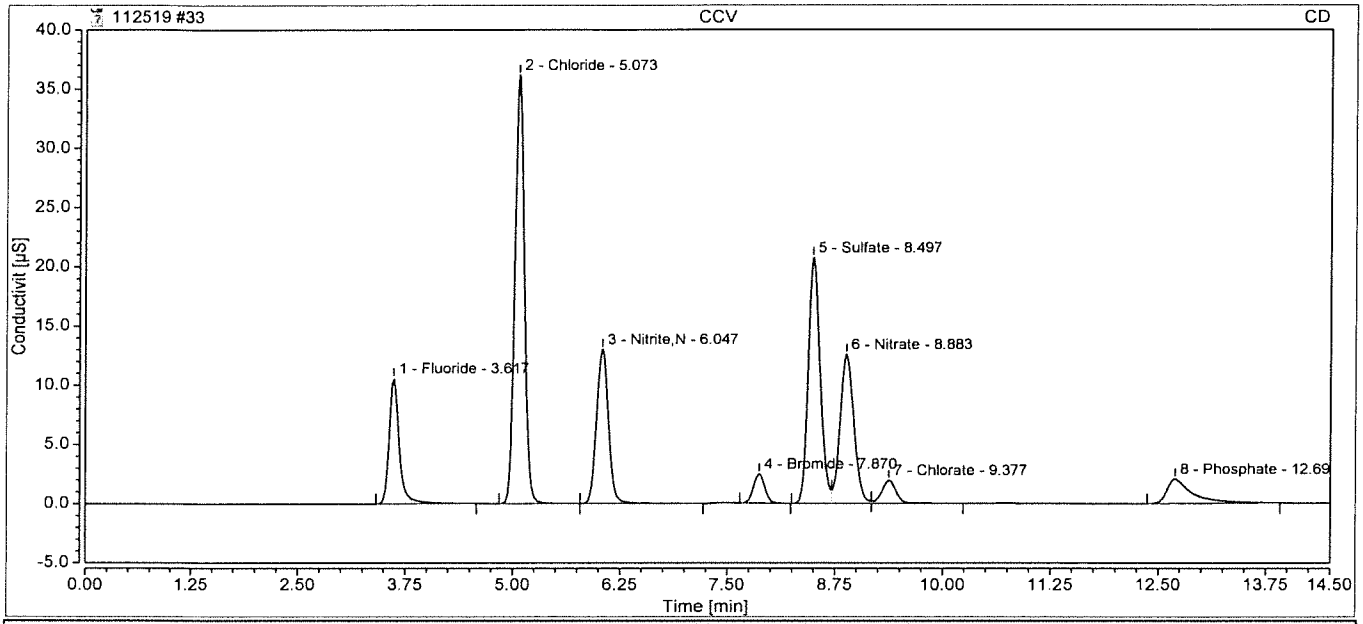
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.006	0.0312	0.1562	5.0000
3	5.05	Chloride	BMB	55.734	236.7179	1183.5896	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
5	7.86	Bromide	BMB	0.096	1.0055	5.0276	5.0000
6	8.45	Sulfate	BMB	10.376	60.4293	302.1463	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**66.212**		**1490.92**	

33 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/26/2019 00:38**	*Sample Weight:*	**1.0000**

Run Time:



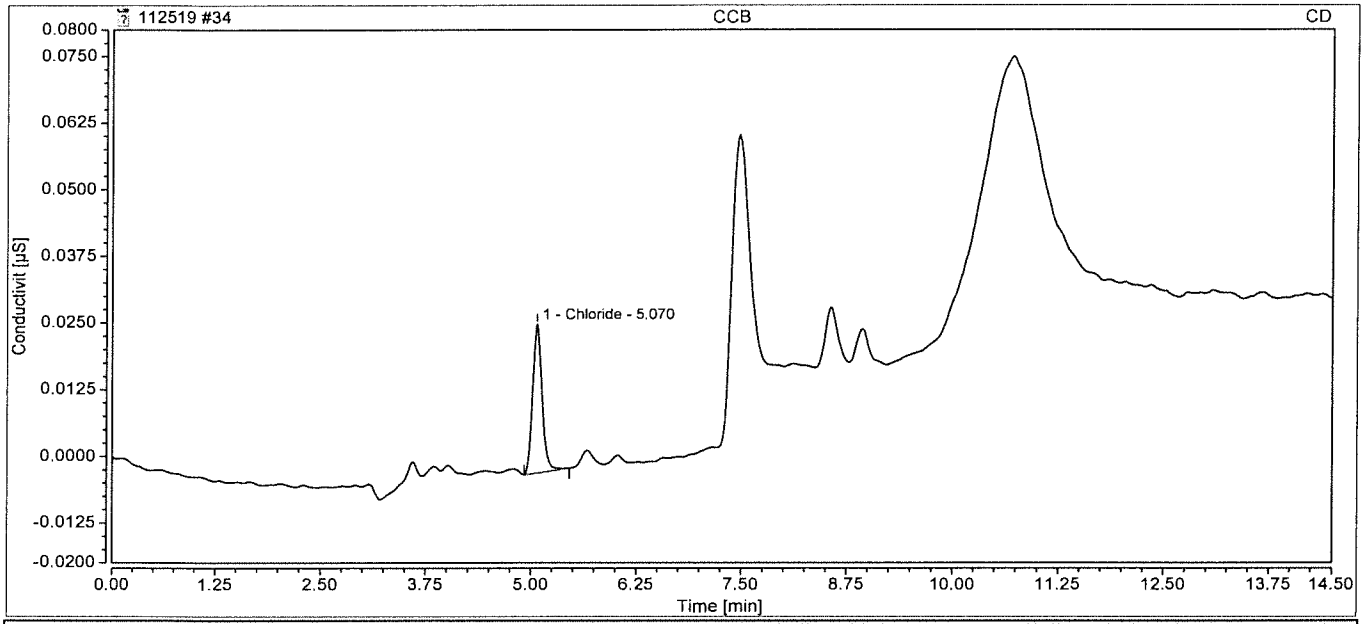
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.454	3.9290	3.9290	1.0000
2	5.07	Chloride	BMB	4.647	19.7903	19.7903	1.0000
3	6.05	Nitrite,N	BMB	2.102	4.1056	4.1056	1.0000
4	7.87	Bromide	BMB	0.372	3.7423	3.7423	1.0000
5	8.50	Sulfate	BM	3.346	19.4944	19.4944	1.0000
6	8.88	Nitrate	M	2.343	4.0052	4.0052	1.0000
7	9.38	Chlorate	MB	0.369	3.9378	3.9378	1.0000
8	12.70	Phosphate	BMB	0.725	3.1735	3.1735	1.0000
Total:			**0.000**	**15.360**		**62.18**	

34 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/26/2019 00:55**	*Sample Weight:*	**1.0000**

Run Time:



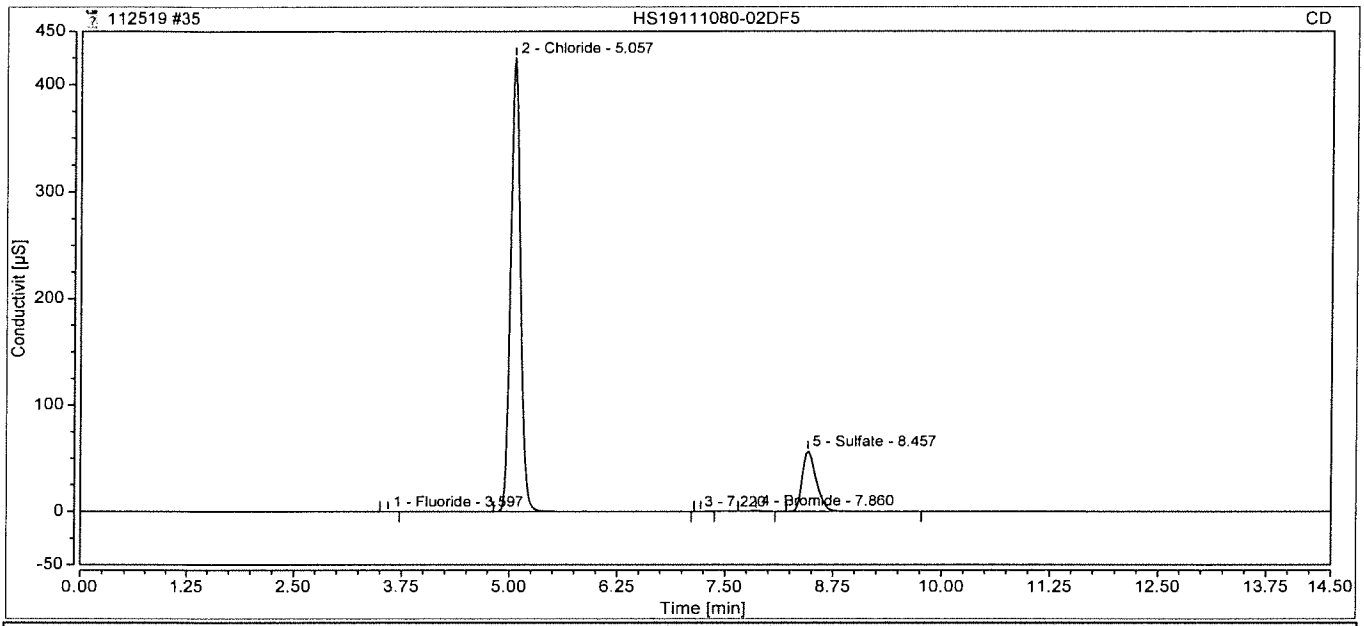
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.07	Chloride	BMB	0.004	0.0726	0.0726	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.004**		**0.07**	

35 *HS19111080-02DF5*

Sample Name:	**HS19111080-02DF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**11/26/2019 01:12**	*Sample Weight:*	**1.0000**

Run Time:



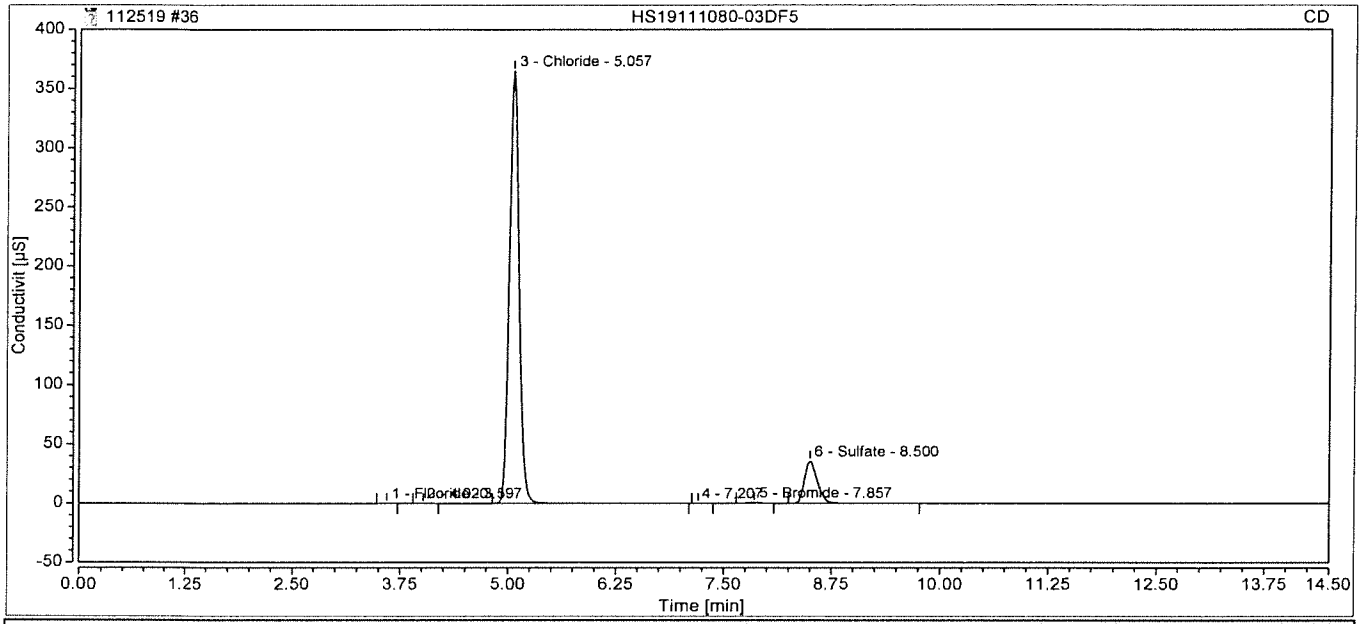
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.006	0.0309	0.1544	5.0000
2	5.06	Chloride	BMB	56.172	238.5771	1192.8856	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
4	7.86	Bromide	BMB	0.097	1.0103	5.0514	5.0000
5	8.46	Sulfate	BMB	10.499	61.1434	305.7171	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**66.773**		**1503.81**	

36 *HS19111080-03DF5*

Sample Name:	**HS19111080-03DF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**11/26/2019 01:28**	*Sample Weight:*	**1.0000**

Run Time:



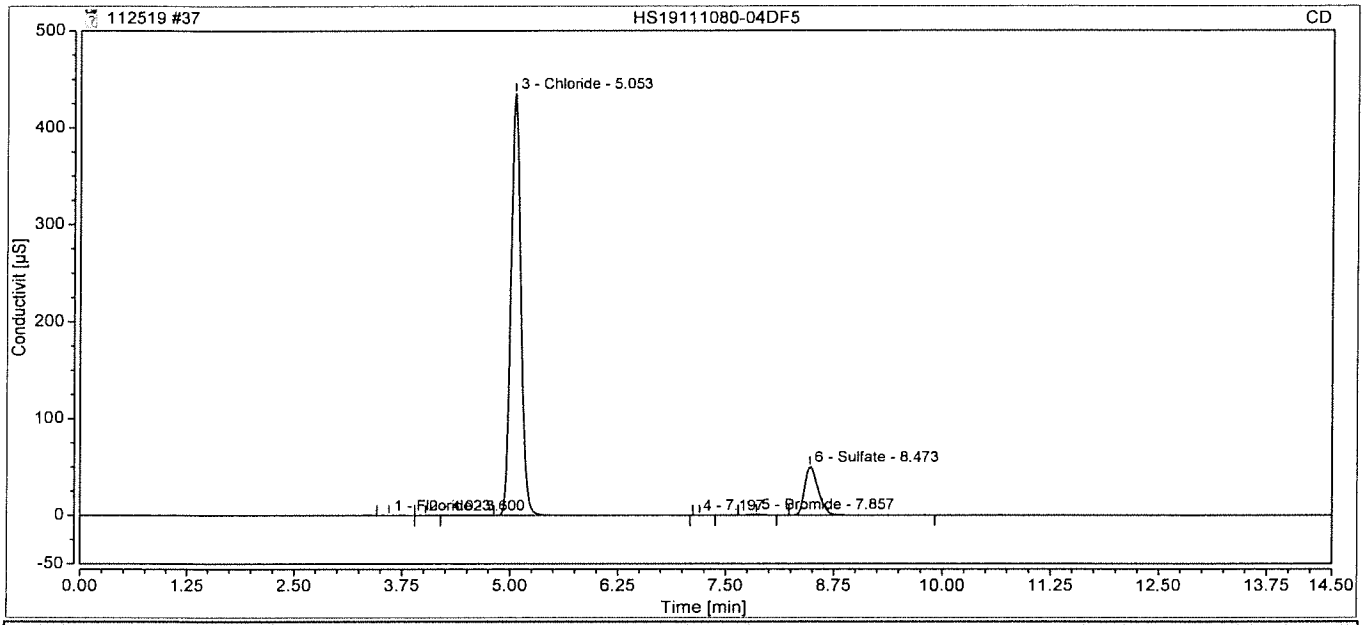
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.005	0.0289	0.1447	5.0000
3	5.06	Chloride	BMB	48.095	204.2805	1021.4025	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
5	7.86	Bromide	BMB	0.081	0.8502	4.2509	5.0000
6	8.50	Sulfate	BMB	6.122	35.6569	178.2843	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**54.302**		**1204.08**	

37 *HS19111080-04DF5*

Sample Name:	**HS19111080-04DF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**11/26/2019 01:45**	*Sample Weight:*	**1.0000**

Run Time:



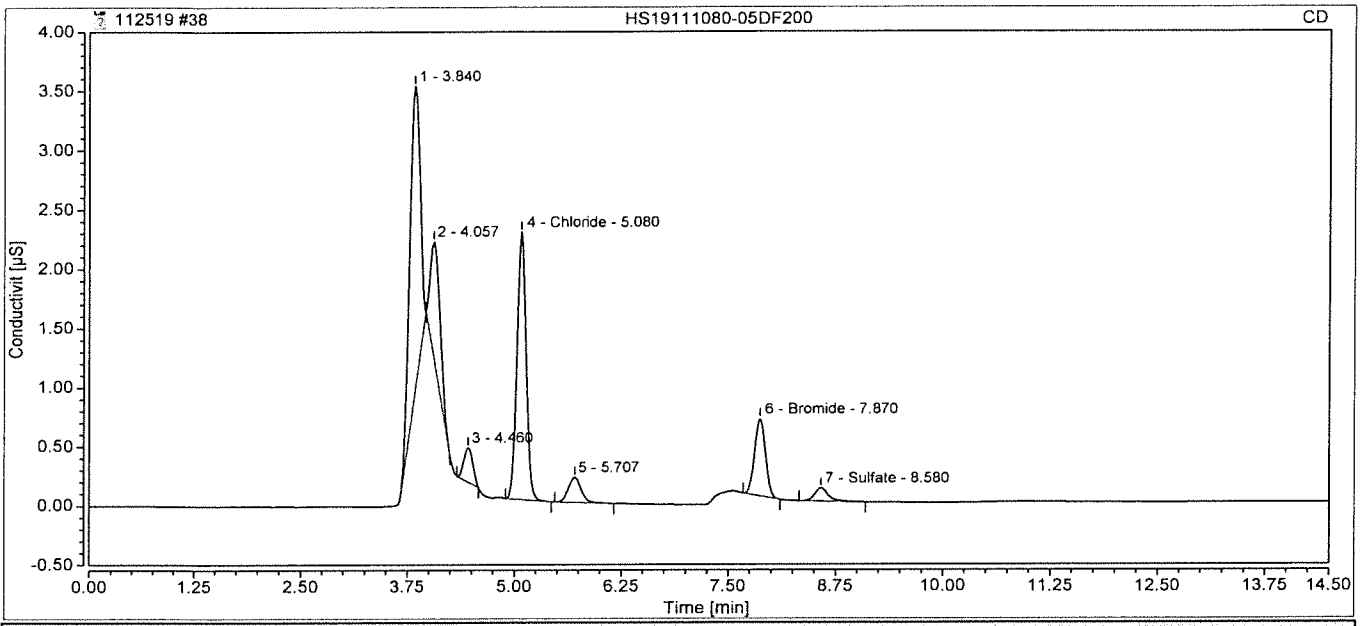
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.012	0.0460	0.2299	5.0000
3	5.05	Chloride	BMB	57.579	244.5513	1222.7564	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
5	7.86	Bromide	BMB	0.117	1.2120	6.0602	5.0000
6	8.47	Sulfate	BMB	9.070	52.8246	264.1230	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**66.777**		**1493.17**	

38 HS19111080-05DF200

Sample Name:	**HS19111080-05DF200**	*Injection Volume:*	**5.00**
Vial Number:	**GC6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**200.0000**
Recording Time:	**11/26/2019 02:01**	*Sample Weight:*	**1.0000**

Run Time:



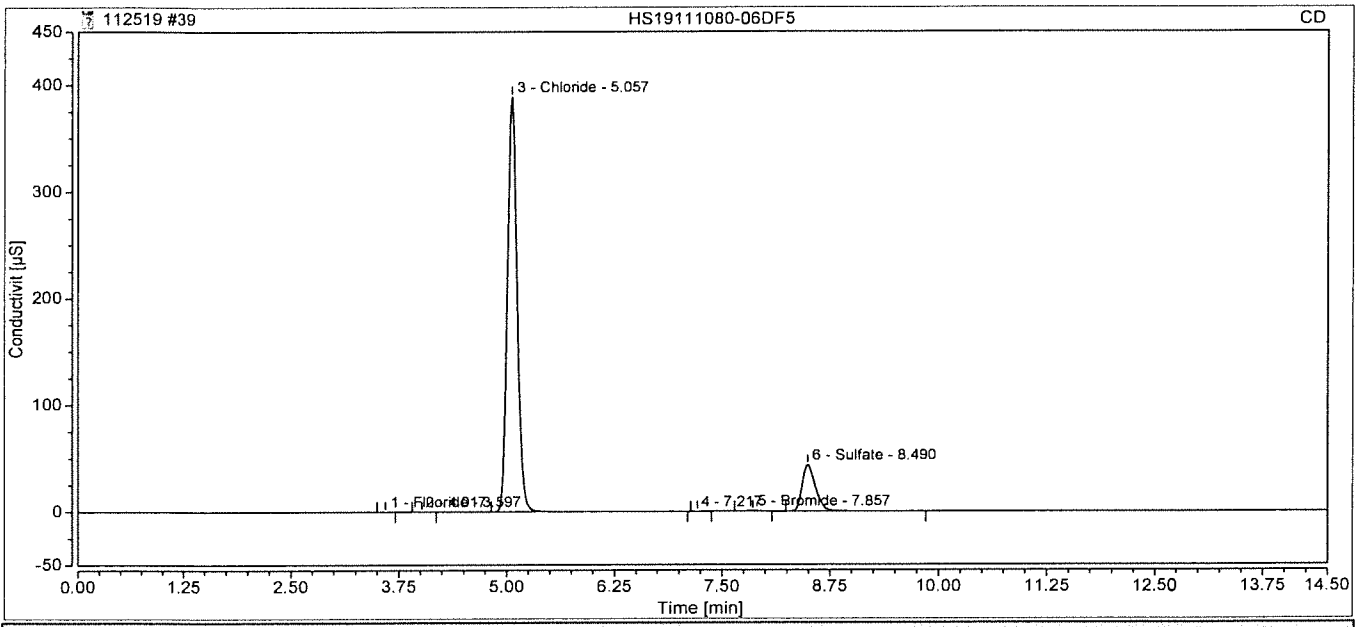
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	200.0000
4	5.08	Chloride	BMB	0.282	1.2557	251.1489	200.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	200.0000
6	7.87	Bromide	BMB	0.096	1.0031	200.6143	200.0000
7	8.58	Sulfate	BMB	0.021	0.1327	26.5401	200.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	200.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	200.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	200.0000
Total:			**0.000**	**0.399**		**478.30**	

39 *HS19111080-06DF5*

Sample Name:	**HS19111080-06DF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**11/26/2019 02:18**	*Sample Weight:*	**1.0000**

Run Time:



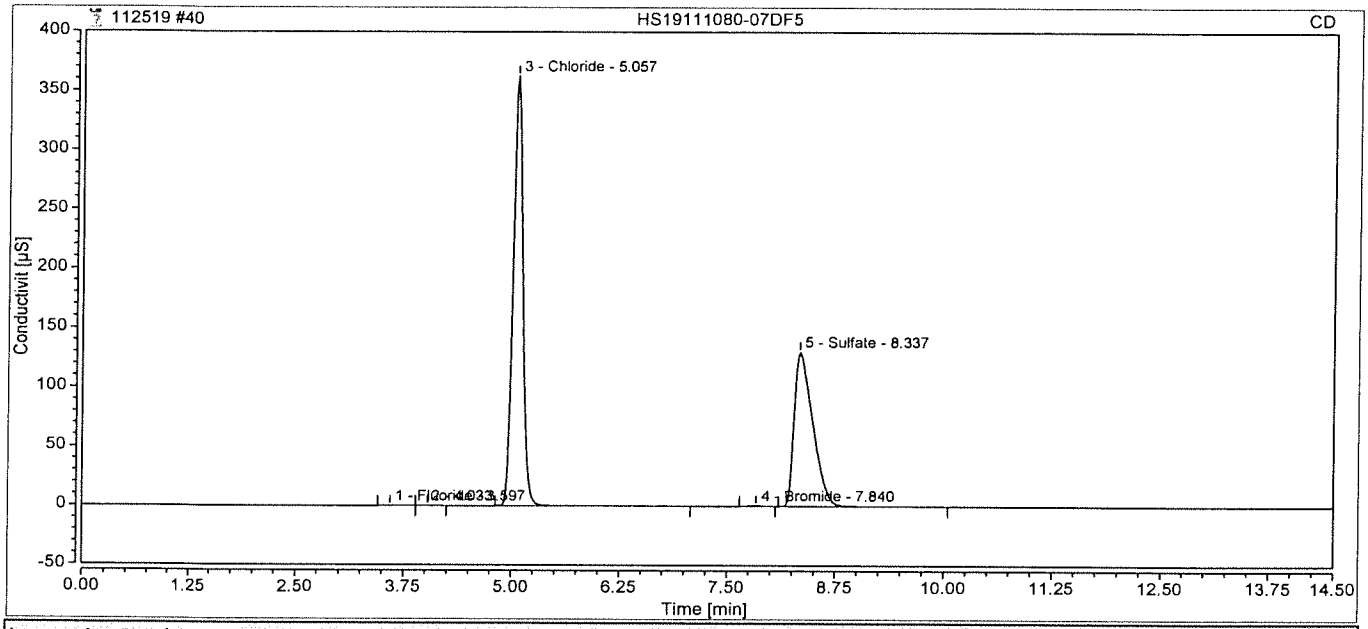
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.005	0.0292	0.1462	5.0000
3	5.06	Chloride	BMB	51.123	217.1391	1085.6955	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
5	7.86	Bromide	BMB	0.086	0.9054	4.5268	5.0000
6	8.49	Sulfate	BMB	7.727	45.0009	225.0045	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**58.941**		**1315.37**	

40 HS19111080-07DF5

Sample Name:	**HS19111080-07DF5**	*Injection Volume:*	**5.00**
Vial Number:	**GC8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**11/26/2019 02:34**	*Sample Weight:*	**1.0000**

Run Time:



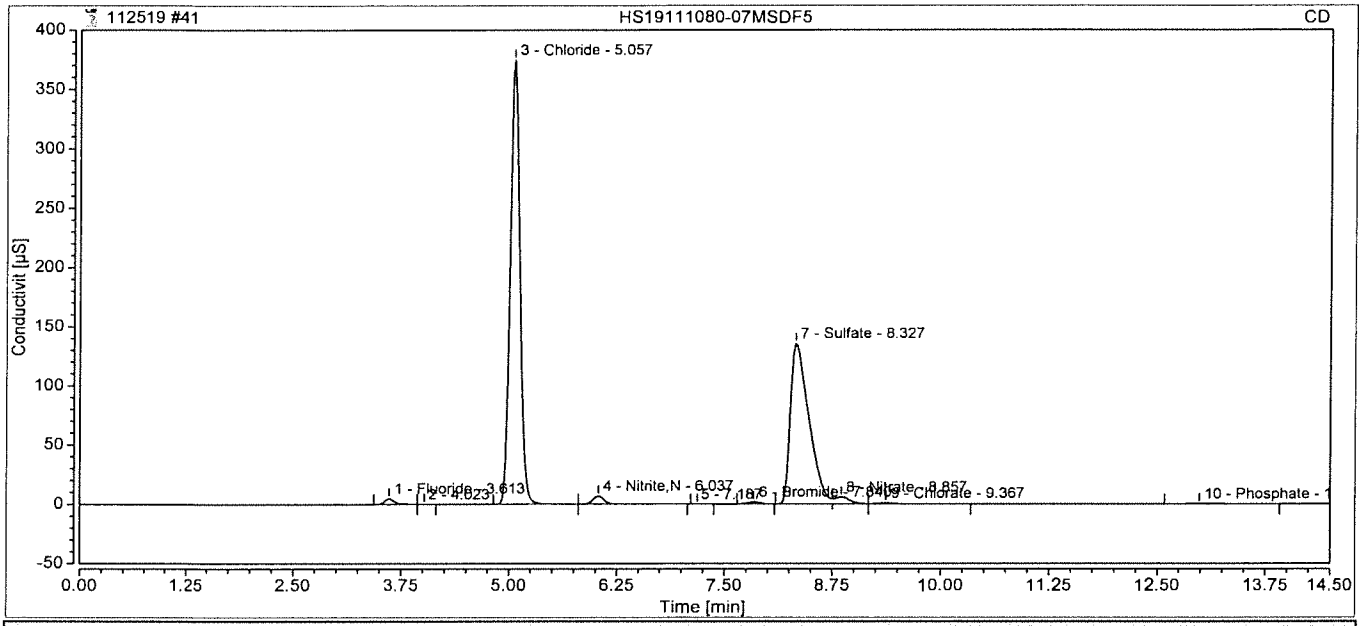
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.009	0.0385	0.1923	5.0000
3	5.06	Chloride	BMB	47.518	201.8318	1009.1592	5.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	5.0000
4	7.84	Bromide	BMB	0.075	0.7976	3.9881	5.0000
5	8.34	Sulfate	BMB	32.563	189.6106	948.0528	5.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	5.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	5.0000
Total:			**0.000**	**80.165**		**1961.39**	

41 HS19111080-07MSDF5

Sample Name:	**HS19111080-07MSDF5**	*Injection Volume:*	**5.00**
Vial Number:	**GD1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**11/26/2019 02:51**	*Sample Weight:*	**1.0000**

Run Time:



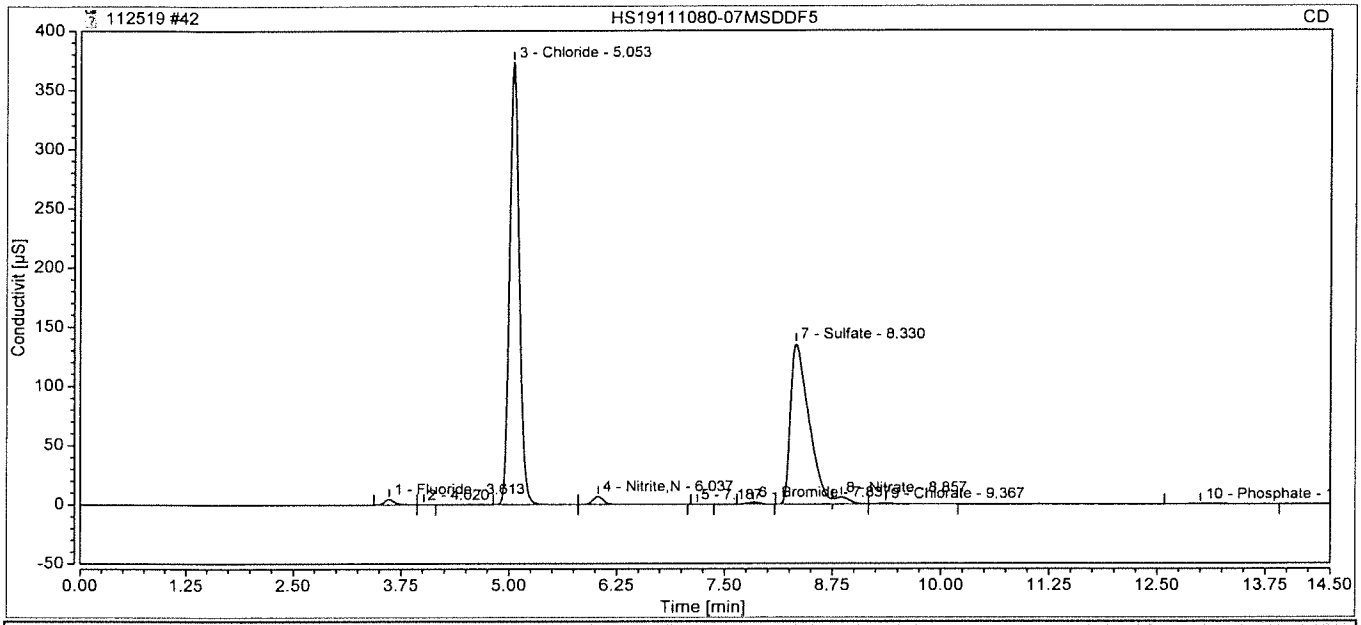
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.635	1.7233	8.6163	5.0000
3	5.06	Chloride	BMB	49.081	208.4668	1042.3342	5.0000
4	6.04	Nitrite,N	BMB	1.050	2.0509	10.2546	5.0000
6	7.84	Bromide	BMB	0.257	2.5977	12.9883	5.0000
7	8.33	Sulfate	BM	33.697	196.2130	981.0652	5.0000
8	8.86	Nitrate	M	1.232	2.1150	10.5750	5.0000
9	9.37	Chlorate	MB	0.196	2.1024	10.5120	5.0000
10	12.99	Phosphate	BMB	0.203	0.9209	4.6046	5.0000
Total:			**0.000**	**86.350**		**2080.95**	

42 *HS19111080-07MSDDF5*

Sample Name:	**HS19111080-07MSDDF5**	*Injection Volume:*	**5.00**
Vial Number:	**GD2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**5.0000**
Recording Time:	**11/26/2019 03:08**	*Sample Weight:*	**1.0000**

Run Time:



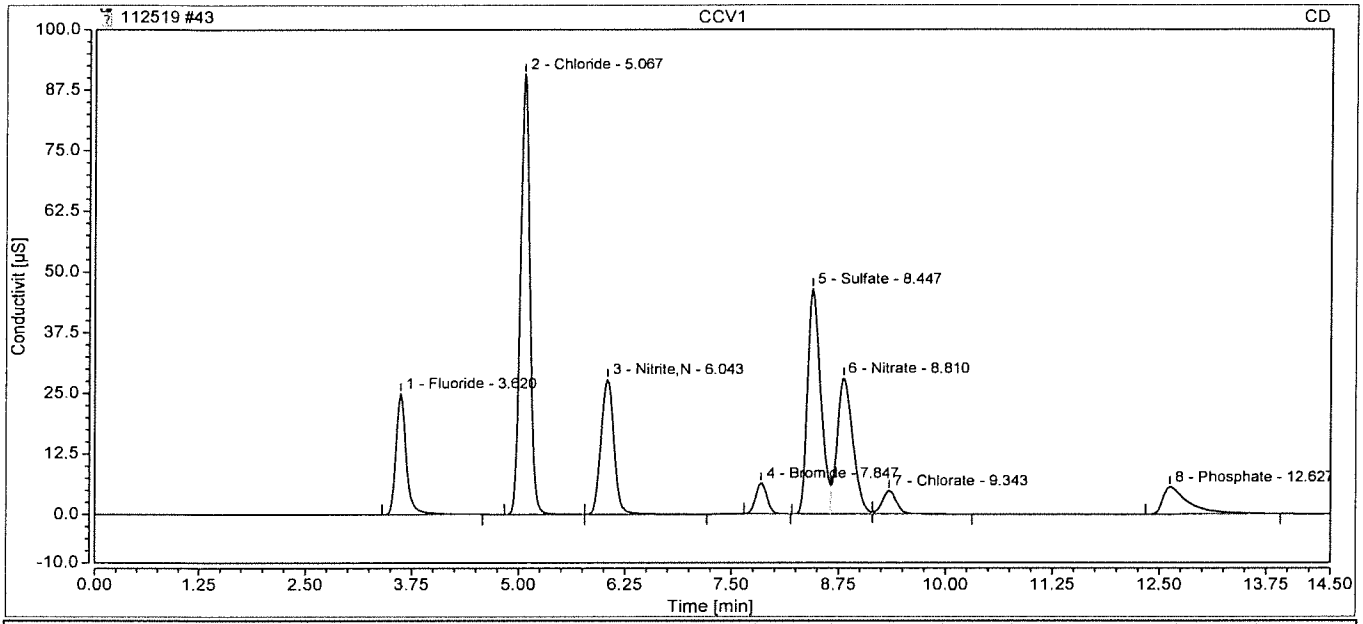
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.633	1.7197	8.5987	5.0000
3	5.05	Chloride	BMB	48.932	207.8349	1039.1743	5.0000
4	6.04	Nitrite,N	BMB	1.046	2.0431	10.2153	5.0000
6	7.84	Bromide	BMB	0.256	2.5847	12.9233	5.0000
7	8.33	Sulfate	BM	33.506	195.1039	975.5195	5.0000
8	8.86	Nitrate	M	1.221	2.0958	10.4788	5.0000
9	9.37	Chlorate	MB	0.194	2.0771	10.3856	5.0000
10	13.00	Phosphate	BMB	0.202	0.9192	4.5960	5.0000
Total:			**0.000**	**85.990**		**2071.89**	

43 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/26/2019 03:24**	*Sample Weight:*	**1.0000**

Run Time:



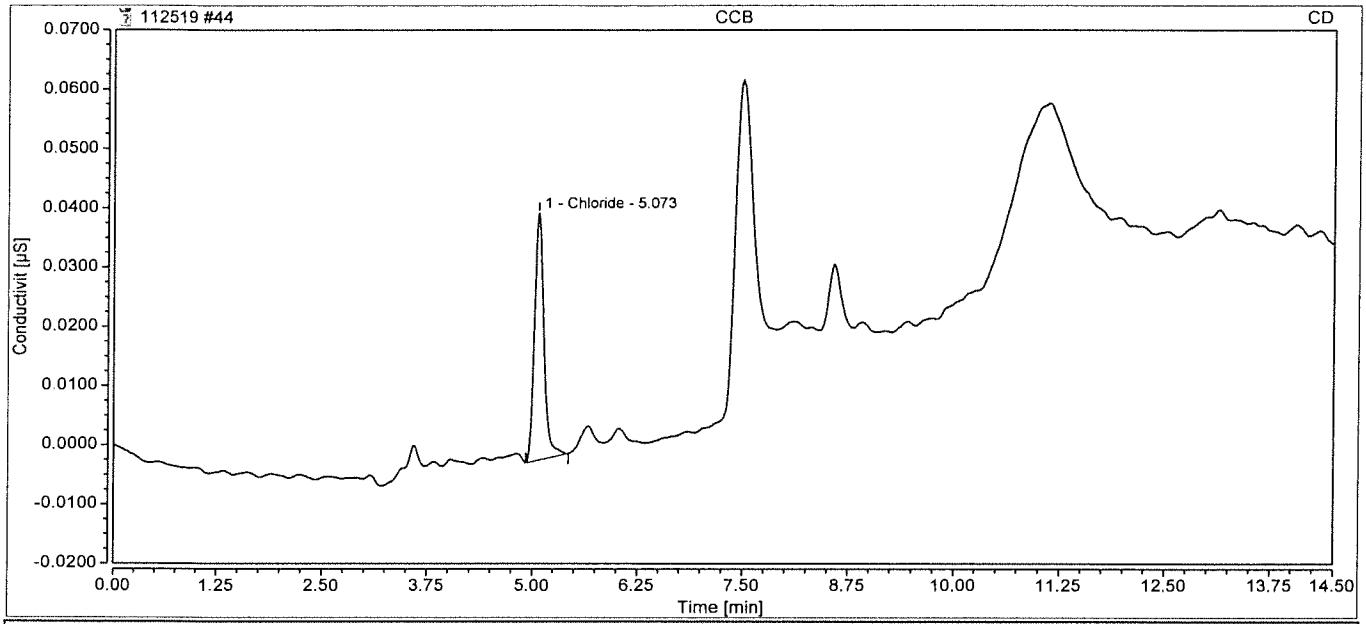
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.570	9.6229	9.6229	1.0000
2	5.07	Chloride	BMB	11.687	49.6824	49.6824	1.0000
3	6.04	Nitrite,N	BMB	4.945	9.6568	9.6568	1.0000
4	7.85	Bromide	BMB	0.975	9.7137	9.7137	1.0000
5	8.45	Sulfate	BM	8.345	48.6026	48.6026	1.0000
6	8.81	Nitrate	M	6.007	10.2415	10.2415	1.0000
7	9.34	Chlorate	MB	0.955	10.1373	10.1373	1.0000
8	12.63	Phosphate	BMB	2.000	8.6657	8.6657	1.0000
Total:			**0.000**	**38.483**		**156.32**	

44 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**11/26/2019 03:41**	*Sample Weight:*	**1.0000**

Run Time:



Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.07	Chloride	BMB	0.005	0.0805	0.0805	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.005**		**0.08**	

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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December 06, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19120208**

Laboratory Results for: **Longhorn Army Ammunition Plant -16**

Dear Susan,

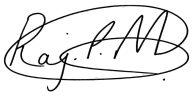
ALS Environmental received 5 sample(s) on Dec 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Work Order: HS19120208

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120208-01	16EW11-191203	Groundwater		03-Dec-2019 14:05	05-Dec-2019 09:15	☐
HS19120208-02	16EW12B-191203	Groundwater		03-Dec-2019 14:09	05-Dec-2019 09:15	☐
HS19120208-03	16EW13-191203	Groundwater		03-Dec-2019 14:17	05-Dec-2019 09:15	☐
HS19120208-04	16EW14B-191203	Groundwater		03-Dec-2019 14:26	05-Dec-2019 09:15	☐
HS19120208-05	16EW15-191203	Groundwater		03-Dec-2019 14:36	05-Dec-2019 09:15	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant -16
Work Order: HS19120208

WetChemistry by Method SM5310B

Batch ID: R351965

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW11-191203
Collection Date: 03-Dec-2019 14:05

ANALYTICAL REPORT
WorkOrder:HS19120208
Lab ID:HS19120208-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**6.36**		**0.500**	**1.00**	**1.00**	**mg/L**	1	06-Dec-2019 11:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW12B-191203
Collection Date: 03-Dec-2019 14:09

ANALYTICAL REPORT
WorkOrder:HS19120208
Lab ID:HS19120208-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**9.15**		**1.00**	**2.00**	**2.00**	**mg/L**	2	06-Dec-2019 12:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW13-191203
Collection Date: 03-Dec-2019 14:17

ANALYTICAL REPORT
WorkOrder:HS19120208
Lab ID:HS19120208-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**9.85**		**1.00**	**2.00**	**2.00**	**mg/L**	2	06-Dec-2019 12:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW14B-191203
Collection Date: 03-Dec-2019 14:26

ANALYTICAL REPORT
WorkOrder:HS19120208
Lab ID:HS19120208-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**21.6**		**2.50**	**5.00**	**5.00**	**mg/L**	5	06-Dec-2019 12:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW15-191203
Collection Date: 03-Dec-2019 14:36

ANALYTICAL REPORT
WorkOrder:HS19120208
Lab ID:HS19120208-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**21.0**		**2.50**	**5.00**	**5.00**	**mg/L**	5	06-Dec-2019 12:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19120208

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R351965 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS19120208-01	16EW11-191203	03 Dec 2019 14:05			06 Dec 2019 11:42	1
HS19120208-02	16EW12B-191203	03 Dec 2019 14:09			06 Dec 2019 12:11	2
HS19120208-03	16EW13-191203	03 Dec 2019 14:17			06 Dec 2019 12:26	2
HS19120208-04	16EW14B-191203	03 Dec 2019 14:26			06 Dec 2019 12:41	5
HS19120208-05	16EW15-191203	03 Dec 2019 14:36			06 Dec 2019 12:56	5

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19120208

QC BATCH REPORT

Batch ID: R351965 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-120619** Units: **mg/L** Analysis Date: **06-Dec-2019 11:02**
Client ID: Run ID: **TOC_02_351965** SeqNo: **5377688** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-120619** Units: **mg/L** Analysis Date: **06-Dec-2019 11:15**
Client ID: Run ID: **TOC_02_351965** SeqNo: **5377689** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.13	1.00	10	0	101	85 - 115				

LCSD Sample ID: **WLCSDW1-120619** Units: **mg/L** Analysis Date: **06-Dec-2019 11:28**
Client ID: Run ID: **TOC_02_351965** SeqNo: **5377690** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.58	1.00	10	0	106	85 - 115	10.13	4.35	20	

MS Sample ID: **HS19120208-01MS** Units: **mg/L** Analysis Date: **06-Dec-2019 11:55**
Client ID: **16EW11-191203** Run ID: **TOC_02_351965** SeqNo: **5377692** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	17.11	1.00	10	6.356	108	80 - 120				

The following samples were analyzed in this batch: HS19120208-01 HS19120208-02 HS19120208-03 HS19120208-04 HS19120208-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: **HS19120208**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19120208

Date/Time Received: **05-Dec-2019 09:15**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature — 5-Dec-2019 Date

Reviewed by: *RJ Modashia* eSignature — 5-Dec-2019 Date

Matrices: **GW**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.8c U/C	IR25
Cooler(s)/Kit(s):	43968	
Date/Time sample(s) sent to storage:	12/5/19 16:45	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-BB2-TOC-ALSHT-191203-BL

TURNAROUND TIME: 24 hr TAT

RUSH: 24 hr TAT

PROJECT/CLIENT INFO				LABORATORY					
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com	
Project Number	501032			Lab Contact	RJ Modashia				
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang	
	PMB 202							4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX	Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656				
Project Manager	Praveen Srivastav								

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS: Containers and Preservative	Bromide by SW9056: 1-250 ml HDPE, Ice	TOC by SM5310: 2-40ml Amber VOA H2SO4
16EW11-191203	16EW11				GW	12/3/2019	1405	2			2
16EW12B-191203	16EW12B				GW	12/3/2019	1409	2			2
16EW13-191203	16EW13				GW	12/3/2019	1417	2			2
16EW14B-191203	16EW14B				GW	12/3/2019	1426	2			2
16EW15-191203	16EW15				GW	12/3/2019	1436	2			2

HS19120208

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant - 16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] Aptim	12/4/19 1730	J M / ALS	12/5/19 09:15

UK
1.8
IR#25
CF-1.0
43963

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

43968

CUSTODY SEAL

Date: 12-4-19 Time: 1736
Name: [illegible]
Company: [illegible]

Seal Broken By: [illegible]
Date: 12/05/19

43968 DEC 0 5 2019

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

43968

CUSTODY SEAL

Date: 12-4-19 Time: 1736
Name: [illegible]
Company: [illegible]

Seal Broken By: [illegible]
Date: 12/05/19

Must Deliver Next Business Day
Time and Tempature Sensitive!

43968

ORIGIN ID:SGRA (909) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 05NOV19
ACTWGT: 1.00 LB MAN
CAD [illegible]130/CAFE3211
DIM [illegible]x16x13 IN

10 **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-16-BO 68473-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0291 3772

THU - 05 DEC 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
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F: +1 281 530 5887

December 06, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19120210**

Laboratory Results for: **Longhorn Army Ammunition Plant -16**

Dear Susan,

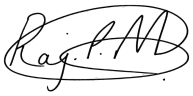
ALS Environmental received 5 sample(s) on Dec 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Work Order: HS19120210

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120210-01	16EW11-191204	Groundwater		04-Dec-2019 16:11	05-Dec-2019 09:15	☐
HS19120210-02	16EW12B-191204	Groundwater		04-Dec-2019 16:21	05-Dec-2019 09:15	☐
HS19120210-03	16EW13-191204	Groundwater		04-Dec-2019 16:29	05-Dec-2019 09:15	☐
HS19120210-04	16EW14B-191204	Groundwater		04-Dec-2019 16:38	05-Dec-2019 09:15	☐
HS19120210-05	16EW15-191204	Groundwater		04-Dec-2019 16:44	05-Dec-2019 09:15	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant -16
Work Order: HS19120210

WetChemistry by Method SM5310B

Batch ID: R351965

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R351948

Sample ID: HS19120212-01MS

- MS and MSD are for an unrelated sample (Bromide)

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW11-191204
Collection Date: 04-Dec-2019 16:11

ANALYTICAL REPORT
WorkOrder:HS19120210
Lab ID:HS19120210-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**7.02**		**2.50**	**5.00**	**5.00**	**mg/L**	5	06-Dec-2019 13:11
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.12**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Dec-2019 10:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW12B-191204
Collection Date: 04-Dec-2019 16:21

ANALYTICAL REPORT
WorkOrder:HS19120210
Lab ID:HS19120210-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**9.24**		**2.50**	**5.00**	**5.00**	**mg/L**	5	06-Dec-2019 13:57
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.32**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Dec-2019 10:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW13-191204
Collection Date: 04-Dec-2019 16:29

ANALYTICAL REPORT
WorkOrder:HS19120210
Lab ID:HS19120210-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**8.50**		**2.50**	**5.00**	**5.00**	**mg/L**	5	06-Dec-2019 14:10
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.28**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Dec-2019 10:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW14B-191204
Collection Date: 04-Dec-2019 16:38

ANALYTICAL REPORT
WorkOrder:HS19120210
Lab ID:HS19120210-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**21.0**		**2.50**	**5.00**	**5.00**	**mg/L**	5	06-Dec-2019 14:26
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.40**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Dec-2019 10:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW15-191204
Collection Date: 04-Dec-2019 16:44

ANALYTICAL REPORT
WorkOrder:HS19120210
Lab ID:HS19120210-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**27.7**		**2.50**	**5.00**	**5.00**	**mg/L**	5	06-Dec-2019 14:41
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.54**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Dec-2019 11:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19120210

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R351948 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19120210-01	16EW11-191204	04 Dec 2019 16:11			06 Dec 2019 10:00	10
HS19120210-02	16EW12B-191204	04 Dec 2019 16:21			06 Dec 2019 10:16	10
HS19120210-03	16EW13-191204	04 Dec 2019 16:29			06 Dec 2019 10:33	10
HS19120210-04	16EW14B-191204	04 Dec 2019 16:38			06 Dec 2019 10:49	10
HS19120210-05	16EW15-191204	04 Dec 2019 16:44			06 Dec 2019 11:06	10
Batch ID: R351965 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS19120210-01	16EW11-191204	04 Dec 2019 16:11			06 Dec 2019 13:11	5
HS19120210-02	16EW12B-191204	04 Dec 2019 16:21			06 Dec 2019 13:57	5
HS19120210-03	16EW13-191204	04 Dec 2019 16:29			06 Dec 2019 14:10	5
HS19120210-04	16EW14B-191204	04 Dec 2019 16:38			06 Dec 2019 14:26	5
HS19120210-05	16EW15-191204	04 Dec 2019 16:44			06 Dec 2019 14:41	5

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19120210

QC BATCH REPORT

Batch ID: R351948 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW3-120519** Units: **mg/L** Analysis Date: **06-Dec-2019 03:23**
Client ID: Run ID: **ICS-Integrion_351948** SeqNo: **5377275** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW3-120519** Units: **mg/L** Analysis Date: **06-Dec-2019 03:39**
Client ID: Run ID: **ICS-Integrion_351948** SeqNo: **5377276** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.806	0.100	4	0	95.2	80 - 120				

LCSD Sample ID: **WLCSDW3-120519** Units: **mg/L** Analysis Date: **06-Dec-2019 03:56**
Client ID: Run ID: **ICS-Integrion_351948** SeqNo: **5377277** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.792	0.100	4	0	94.8	80 - 120	3.806	0.363	20	

MS Sample ID: **HS19120212-01MS** Units: **mg/L** Analysis Date: **06-Dec-2019 11:39**
Client ID: Run ID: **ICS-Integrion_351948** SeqNo: **5377288** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.653	0.100	2	0.0732	79.0	80 - 120				S

MS Sample ID: **HS19120192-06MS** Units: **mg/L** Analysis Date: **06-Dec-2019 06:42**
Client ID: Run ID: **ICS-Integrion_351948** SeqNo: **5377293** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.645	0.100	2	0	82.2	80 - 120				

MSD Sample ID: **HS19120212-01MSD** Units: **mg/L** Analysis Date: **06-Dec-2019 11:56**
Client ID: Run ID: **ICS-Integrion_351948** SeqNo: **5377289** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.675	0.100	2	0.0732	80.1	80 - 120	1.653	1.36	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19120210

QC BATCH REPORT

Batch ID: R351948 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19120192-06MSD** Units: **mg/L** Analysis Date: **06-Dec-2019 06:59**
Client ID: Run ID: **ICS-Integrion_351948** SeqNo: **5377294** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.663	0.100	2	0	83.2	80 - 120	1.645	1.11	20	

The following samples were analyzed in this batch: HS19120210-01 HS19120210-02 HS19120210-03 HS19120210-04 HS19120210-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19120210

QC BATCH REPORT

Batch ID: R351965 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-120619** Units: **mg/L** Analysis Date: **06-Dec-2019 11:02**
Client ID: Run ID: **TOC_02_351965** SeqNo: **5377688** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-120619** Units: **mg/L** Analysis Date: **06-Dec-2019 11:15**
Client ID: Run ID: **TOC_02_351965** SeqNo: **5377689** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.13	1.00	10	0	101	85 - 115				

LCSD Sample ID: **WLCSDW1-120619** Units: **mg/L** Analysis Date: **06-Dec-2019 11:28**
Client ID: Run ID: **TOC_02_351965** SeqNo: **5377690** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.58	1.00	10	0	106	85 - 115	10.13	4.35	20	

MS Sample ID: **HS19120208-01MS** Units: **mg/L** Analysis Date: **06-Dec-2019 11:55**
Client ID: Run ID: **TOC_02_351965** SeqNo: **5377692** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	17.11	1.00	10	6.356	108	80 - 120				

The following samples were analyzed in this batch: HS19120210-01 HS19120210-02 HS19120210-03 HS19120210-04 HS19120210-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: **HS19120210**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Work Order: HS19120210

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19120210-01	16EW11-191204	Login	12/5/2019 4:38:01 PM	PMG	WET199
HS19120210-02	16EW12B-191204	Login	12/5/2019 4:38:01 PM	PMG	WET199
HS19120210-03	16EW13-191204	Login	12/5/2019 4:38:01 PM	PMG	WET199
HS19120210-04	16EW14B-191204	Login	12/5/2019 4:38:01 PM	PMG	WET199
HS19120210-05	16EW15-191204	Login	12/5/2019 4:38:01 PM	PMG	WET199

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19120210
Date/Time Received: **05-Dec-2019 09:15**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 5-Dec-2019 Date
Reviewed by: *RJ Modashia* eSignature 5-Dec-2019 Date

Matrices: **GW**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8c U/C	IR25	
Cooler(s)/Kit(s):	43968		
Date/Time sample(s) sent to storage:	12/5/19 16:50		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

Page 1 of 1

COC ID: 16NOV2019-Post Injection-191204-ALS

TURNAROUND TIME: 1 business day

RUSH: 1 business day

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Highway, Suite 200		
City	Marshall	State	TX	City	Houston	State	TX	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company			

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	TOC by SM5310 (2-40ml Amber/H2SO4)	Bromide by SW9056 (1-250ml /Cool to 6 deg C)
16EW11-191204	16EW11				GW	12/4/2019	1611	3		2	1
16EW12B-191204	16EW12B				GW	12/4/2019	1621	3		2	1
16EW13-191204	16EW13				GW	12/4/2019	1629	3		2	1
16EW14B-191204	16EW14B				GW	12/4/2019	1638	3		2	1
16EW15-191204	16EW15				GW	12/4/2019	1644	3		2	1

HS19120210
Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant -16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] APTIM	12-4-19/1730	J.M / ALS	12/5/19 09:15

U/C
18
IR#25
CF-0.0
43968

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

43968

CUSTODY SEAL

Date: 12-4-19 Time: 1736
Name:
Company:

Seal Broken By:
Date: 12/05/19

43968 DEC 0 5 2019

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

43968

CUSTODY SEAL

Date: 12-4-19 Time: 1736
Name:
Company:

Seal Broken By:
Date: 12/05/19

Must Deliver Next Business Day
Time and Tempature Sensitive!

43968

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 05NOV19
ACTWGT: 1.00 LB MAN
CAD: 0130/CAFE3211
DIM: 13x16x13 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5856
REF: LHAAP-16-80 68473-RJ
RMA:

FedEx Express

FedEx
TRK# 0221 1251 0291 3772

THU - 05 DEC 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 09, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19120309**

Laboratory Results for: **LHAAP-16**

Dear Susan,

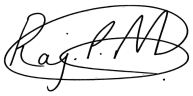
ALS Environmental received 5 sample(s) on Dec 06, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19120309

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120309-01	16EW11-191205	GW		05-Dec-2019 16:40	06-Dec-2019 08:48	☐
HS19120309-02	16EW12B-191205	GW		05-Dec-2019 16:45	06-Dec-2019 08:48	☐
HS19120309-03	16EW13-191205	GW		05-Dec-2019 16:51	06-Dec-2019 08:48	☐
HS19120309-04	16EW14B-191205	GW		05-Dec-2019 16:58	06-Dec-2019 08:48	☐
HS19120309-05	16EW15-191205	GW		05-Dec-2019 17:06	06-Dec-2019 08:48	☐

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19120309

CASE NARRATIVE

WetChemistry by Method SM5310B

Batch ID: R352090

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R352044

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW11-191205
Collection Date: 05-Dec-2019 16:40

ANALYTICAL REPORT
WorkOrder:HS19120309
Lab ID:HS19120309-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**8.32**		**2.50**	**5.00**	**5.00**	**mg/L**	5	09-Dec-2019 12:49
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.00**		**0.300**	**1.00**	**1.00**	**mg/L**	10	07-Dec-2019 15:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW12B-191205
Collection Date: 05-Dec-2019 16:45

ANALYTICAL REPORT
WorkOrder:HS19120309
Lab ID:HS19120309-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**38.2**		**2.50**	**5.00**	**5.00**	**mg/L**	5	09-Dec-2019 13:15
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.43**		**0.300**	**1.00**	**1.00**	**mg/L**	10	07-Dec-2019 16:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW13-191205
Collection Date: 05-Dec-2019 16:51

ANALYTICAL REPORT
WorkOrder:HS19120309
Lab ID:HS19120309-03
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**9.09**		**1.00**	**2.00**	**2.00**	**mg/L**	2	09-Dec-2019 13:29
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.33**		**0.300**	**1.00**	**1.00**	**mg/L**	10	07-Dec-2019 16:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW14B-191205
Collection Date: 05-Dec-2019 16:58

ANALYTICAL REPORT
WorkOrder:HS19120309
Lab ID:HS19120309-04
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**21.0**		**2.50**	**5.00**	**5.00**	**mg/L**	5	09-Dec-2019 13:44
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.43**		**0.300**	**1.00**	**1.00**	**mg/L**	10	07-Dec-2019 17:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16EW15-191205
Collection Date: 05-Dec-2019 17:06

ANALYTICAL REPORT
WorkOrder:HS19120309
Lab ID:HS19120309-05
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**30.8**		**5.00**	**10.0**	**10.0**	**mg/L**	10	09-Dec-2019 13:59
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.59**		**0.300**	**1.00**	**1.00**	**mg/L**	10	07-Dec-2019 17:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120309

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R352044 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** GW	
HS19120309-01	16EW11-191205	05 Dec 2019 16:40			07 Dec 2019 15:47	10
HS19120309-02	16EW12B-191205	05 Dec 2019 16:45			07 Dec 2019 16:37	10
HS19120309-03	16EW13-191205	05 Dec 2019 16:51			07 Dec 2019 16:54	10
HS19120309-04	16EW14B-191205	05 Dec 2019 16:58			07 Dec 2019 17:10	10
HS19120309-05	16EW15-191205	05 Dec 2019 17:06			07 Dec 2019 17:27	10
Batch ID: R352090 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** GW	
HS19120309-01	16EW11-191205	05 Dec 2019 16:40			09 Dec 2019 12:49	5
HS19120309-02	16EW12B-191205	05 Dec 2019 16:45			09 Dec 2019 13:15	5
HS19120309-03	16EW13-191205	05 Dec 2019 16:51			09 Dec 2019 13:29	2
HS19120309-04	16EW14B-191205	05 Dec 2019 16:58			09 Dec 2019 13:44	5
HS19120309-05	16EW15-191205	05 Dec 2019 17:06			09 Dec 2019 13:59	10

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120309

QC BATCH REPORT

Batch ID: R352044 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW3-120619** Units: **mg/L** Analysis Date: **07-Dec-2019 14:58**
Client ID: Run ID: **ICS-Integrion_352044** SeqNo: **5379639** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW3-120619** Units: **mg/L** Analysis Date: **07-Dec-2019 15:14**
Client ID: Run ID: **ICS-Integrion_352044** SeqNo: **5379640** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.811	0.100	4	0	95.3	80 - 120				

LCSD Sample ID: **WLCSDW3-120619** Units: **mg/L** Analysis Date: **07-Dec-2019 15:31**
Client ID: Run ID: **ICS-Integrion_352044** SeqNo: **5379641** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.799	0.100	4	0	95.0	80 - 120	3.811	0.3	20	

MS Sample ID: **HS19120309-01MS** Units: **mg/L** Analysis Date: **07-Dec-2019 16:04**
Client ID: **16EW11-191205** Run ID: **ICS-Integrion_352044** SeqNo: **5379643** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.65	1.00	20	4.004	88.2	80 - 120				

MS Sample ID: **HS19120190-01MS** Units: **mg/L** Analysis Date: **07-Dec-2019 19:07**
Client ID: Run ID: **ICS-Integrion_352044** SeqNo: **5379652** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	35.01	2.00	40	0	87.5	80 - 120				

MSD Sample ID: **HS19120309-01MSD** Units: **mg/L** Analysis Date: **07-Dec-2019 16:21**
Client ID: **16EW11-191205** Run ID: **ICS-Integrion_352044** SeqNo: **5379644** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.6	1.00	20	4.004	88.0	80 - 120	21.65	0.208	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120309

QC BATCH REPORT

Batch ID: R352044 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19120190-01MSD** Units: **mg/L** Analysis Date: **07-Dec-2019 19:23**
Client ID: Run ID: **ICS-Integrion_352044** SeqNo: **5379653** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	34.39	2.00	40	0	86.0	80 - 120	35.01	1.79	20	

The following samples were analyzed in this batch: HS19120309-01 HS19120309-02 HS19120309-03 HS19120309-04 HS19120309-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120309

QC BATCH REPORT

Batch ID: R352090 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-120919** Units: **mg/L** Analysis Date: **09-Dec-2019 12:09**
Client ID: Run ID: **TOC_02_352090** SeqNo: **5380470** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-120919** Units: **mg/L** Analysis Date: **09-Dec-2019 12:23**
Client ID: Run ID: **TOC_02_352090** SeqNo: **5380471** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.763	1.00	10	0	97.6	85 - 115				

LCSD Sample ID: **WLCSDW1-120919** Units: **mg/L** Analysis Date: **09-Dec-2019 12:36**
Client ID: Run ID: **TOC_02_352090** SeqNo: **5380472** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.71	1.00	10	0	97.1	85 - 115	9.763	0.544	20	

MS Sample ID: **HS19120309-01MS** Units: **mg/L** Analysis Date: **09-Dec-2019 13:02**
Client ID: **16EW11-191205** Run ID: **TOC_02_352090** SeqNo: **5380474** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	59.6	5.00	50	8.325	103	80 - 120				

The following samples were analyzed in this batch: HS19120309-01 HS19120309-02 HS19120309-03 HS19120309-04 HS19120309-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19120309**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19120309

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19120309-01	16EW11-191205	Login	12/6/2019 4:42:13 PM	AC	WET289
HS19120309-01	16EW11-191205	Login	12/6/2019 4:42:13 PM	AC	WET289

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19120309

Date/Time Received: **06-Dec-2019 08:48**
Received by: **AC**

Checklist completed by: *Asad Chaudhry* eSignature — 6-Dec-2019 Date

Reviewed by: *RJ Modashia* eSignature — 9-Dec-2019 Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.4c U/C	IR 25
Cooler(s)/Kit(s):	45061	
Date/Time sample(s) sent to storage:	12/06/2019 16:50	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

Page 1 of 1

COC ID: 16DEC2019-Post Injection-191205-ALS

TURNAROUND TIME: 1 business day

RUSH: 1 business day

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd , Suite 210			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Highway, Suite 200		
City	Marshall	State	TX	City	Houston	State	TX	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company			

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	TOC by SM5310 (2-40ml Amber/H2SO4)	Bromide by SW9056 (1-250ml /Cool to 6 deg C)
16EW11-191205	16EW11				GW	12/5/2019	1640	3		2	1
16EW12B-191205	16EW12B				GW	12/5/2019	1645	3		2	1
16EW13-191205	16EW13				GW	12/5/2019	1651	3		2	1
16EW14B-191205	16EW14B				GW	12/5/2019	1658	3		2	1
16EW15-191205	16EW15				GW	12/5/2019	1706	3		2	1

HS19120309

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[illegible] Aptim	12-5-19/1755	AC ALS	12/6/19 08:48

c/c
1.4
IR#25
CF o.c
4506

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45061

CUSTODY SEAL
Date: 12.5.19 Time: 1800
Name:
Company:

Seal Broken By:
Date: 12/06/19

45061 DEC 06

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45061

CUSTODY SEAL
Date: 12.5.19 Time: 1800
Name:
Company:

Seal Broken By:
Date: 12/06/19

Must Deliver Next Business Day
Time and Tempature Sensitive!

45061

ORIGIN ID:SGRA (903) 930-6133
MIKE MARTINEZ
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 01OCT19
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-17-SOIL-BO 67938-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0290 1584

FRI - 06 DEC 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 11, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19120314**

Laboratory Results for: **LHAAP-16**

Dear Susan,

ALS Environmental received 1 sample(s) on Dec 06, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Work Order: HS19120314

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120314-01	16LHAAP-IDW-191205	Soil		05-Dec-2019 13:20	06-Dec-2019 08:48	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-16
Work Order: HS19120314

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R352021

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 148409

Sample ID: 16LHAAP-IDW-191205 (HS19120314-01MS)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Manganese.

Sample ID: 16LHAAP-IDW-191205 (HS19120314-01MSD)

- Chromium failed on the MSD but passed on the MS and PDS. Due to non-homogeneity of the soil sample matrix the MS/MSD RPD were outside the control limits for Manganese. Due to non-homogeneity of the soil sample matrix the MS/MSD RPD were outside the control limits for Manganese.

WetChemistry by Method ASTM D2216

Batch ID: R352074

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
Sample ID: 16LHAAP-IDW-191205
Collection Date: 05-Dec-2019 13:20

ANALYTICAL REPORT
WorkOrder:HS19120314
Lab ID:HS19120314-01
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY SW8260C		**Method:SW8260**						Analyst: WLR
1,1,2-Trichloroethane	1.5	U	0.62	1.5	6.2	ug/Kg-dry	1	07-Dec-2019 12:06
1,1-Dichloroethene	1.5	U	0.62	1.5	6.2	ug/Kg-dry	1	07-Dec-2019 12:06
1,2-Dichloroethane	1.5	U	0.75	1.5	6.2	ug/Kg-dry	1	07-Dec-2019 12:06
cis-1,2-Dichloroethene	1.5	U	1.0	1.5	6.2	ug/Kg-dry	1	07-Dec-2019 12:06
Methylene chloride	3.1	U	1.2	3.1	12	ug/Kg-dry	1	07-Dec-2019 12:06
Trichloroethene	1.5	U	0.75	1.5	6.2	ug/Kg-dry	1	07-Dec-2019 12:06
Vinyl chloride	1.5	U	1.0	1.5	2.5	ug/Kg-dry	1	07-Dec-2019 12:06
Surr: 1,2-Dichloroethane-d4	*94.3*			**0**	*71-136*	*%REC*	*1*	*07-Dec-2019 12:06*
Surr: 4-Bromofluorobenzene	*97.3*			**0**	*79-119*	*%REC*	*1*	*07-Dec-2019 12:06*
Surr: Dibromofluoromethane	*97.5*			**0**	*78-119*	*%REC*	*1*	*07-Dec-2019 12:06*
Surr: Toluene-d8	*102*			**0**	*85-116*	*%REC*	*1*	*07-Dec-2019 12:06*
METALS BY SW6020A		**Method:SW6020**				Prep:SW3050A / 09-Dec-2019		Analyst: JC
Arsenic	**3.18**		**0.0925**	**0.132**	**0.660**	**mg/Kg-dry**	1	10-Dec-2019 00:07
Chromium	**15.7**		**0.0304**	**0.132**	**0.660**	**mg/Kg-dry**	1	10-Dec-2019 00:07
Manganese	**374**		**1.14**	**2.64**	**13.2**	**mg/Kg-dry**	20	10-Dec-2019 12:39
Nickel	**14.0**		**0.0634**	**0.132**	**0.660**	**mg/Kg-dry**	1	10-Dec-2019 00:07
Thallium	0.330	U	0.295	0.330	0.660	mg/Kg-dry	1	10-Dec-2019 00:07
MOISTURE - ASTM D2216		**Method:ASTM D2216**						Analyst: DFF
Percent Moisture	**27.0**		**0.0100**	**0.0100**	**0.0100**	**wt%**	1	09-Dec-2019 08:57
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA-dry	1	11-Dec-2019 11:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120314

Batch ID: 3485 **Start Date:** 06 Dec 2019 12:30 **End Date:** 06 Dec 2019 12:30
Method: VOLATILES ORGANICS BY SW8260C

Sample ID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS19120314-01	1	5.489 (g)	5 (mL)	0.91	TerraCore (5035A)

Batch ID: 148409 **Start Date:** 09 Dec 2019 08:34 **End Date:** 09 Dec 2019 14:30
Method: METALS PREP - SOLIDS - SW3050B **Prep Code:** 3050_I_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120314-01		0.5185 (g)	50 (mL)	96.43

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120314

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148409 (0)	**Test Name :** METALS BY SW6020A				**Matrix:** Soil	
HS19120314-01	16LHAAP-IDW-191205	05 Dec 2019 13:20		09 Dec 2019 14:30	10 Dec 2019 12:39	20
HS19120314-01	16LHAAP-IDW-191205	05 Dec 2019 13:20		09 Dec 2019 14:30	10 Dec 2019 00:07	1
Batch ID: R352021 (0)	**Test Name :** VOLATILES ORGANICS BY SW8260C				**Matrix:** Soil	
HS19120314-01	16LHAAP-IDW-191205	05 Dec 2019 13:20			07 Dec 2019 12:06	1
Batch ID: R352074 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Soil	
HS19120314-01	16LHAAP-IDW-191205	05 Dec 2019 13:20			09 Dec 2019 08:57	1
Batch ID: R352255 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Soil	
HS19120314-01	16LHAAP-IDW-191205	05 Dec 2019 13:20			11 Dec 2019 11:48	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120314

QC BATCH REPORT

Batch ID: 148409 (0) **Instrument: ICPMS04** **Method: METALS BY SW6020A**

MBLK Sample ID: **MBLK-148409** Units: **mg/Kg** Analysis Date: **10-Dec-2019 00:03**
Client ID: Run ID: **ICPMS04_352123** SeqNo: **5381190** PrepDate: **09-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.0986	0.493								U
Chromium	0.0986	0.493								U
Manganese	0.0986	0.493								U
Nickel	0.0986	0.493								U
Thallium	0.246	0.493								U

LCS Sample ID: **LCS-148409** Units: **mg/Kg** Analysis Date: **10-Dec-2019 00:05**
Client ID: Run ID: **ICPMS04_352123** SeqNo: **5381191** PrepDate: **09-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.582	0.481	9.621	0	89.2	82 - 118				
Chromium	8.594	0.481	9.621	0	89.3	83 - 119				
Manganese	8.855	0.481	9.621	0	92.0	85 - 116				
Nickel	8.83	0.481	9.621	0	91.8	84 - 119				
Thallium	9.59	0.481	9.621	0	99.7	83 - 118				

MS Sample ID: **HS19120314-01MS** Units: **mg/Kg** Analysis Date: **10-Dec-2019 00:12**
Client ID: **16LHAAP-IDW-191205** Run ID: **ICPMS04_352123** SeqNo: **5381194** PrepDate: **09-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.44	0.483	9.662	2.324	84.0	82 - 118				
Chromium	21.47	0.483	9.662	11.45	104	83 - 119				
Manganese	293.4	0.483	9.662	250.8	441	85 - 116				SEO
Nickel	19.2	0.483	9.662	10.25	92.6	84 - 119				
Thallium	9.556	0.483	9.662	0.1489	97.4	83 - 118				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120314

QC BATCH REPORT

Batch ID: 148409 (0) **Instrument: ICPMS04** **Method: METALS BY SW6020A**

MSD Sample ID: **HS19120314-01MSD** Units: **mg/Kg** Analysis Date: **10-Dec-2019 00:14**
Client ID: **16LHAAP-IDW-191205** Run ID: **ICPMS04_352123** SeqNo: **5381195** PrepDate: **09-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.66	0.477	9.546	2.324	87.3	82 - 118	10.44	2.09	20	
Chromium	23.3	0.477	9.546	11.45	124	83 - 119	21.47	8.18	20	S
Manganese	178.6	0.477	9.546	250.8	-757	85 - 116	293.4	48.7	20	SREO
Nickel	21.03	0.477	9.546	10.25	113	84 - 119	19.2	9.11	20	
Thallium	9.759	0.477	9.546	0.1489	101	83 - 118	9.556	2.1	20	

PDS Sample ID: **HS19120314-01PDS** Units: **mg/Kg** Analysis Date: **10-Dec-2019 00:16**
Client ID: **16LHAAP-IDW-191205** Run ID: **ICPMS04_352123** SeqNo: **5381196** PrepDate: **09-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.5	0.482	9.643	2.324	95.2	80 - 120				
Chromium	20.74	0.482	9.643	11.45	96.3	80 - 120				
Nickel	19.11	0.482	9.643	10.25	91.9	80 - 120				
Thallium	10.18	0.482	9.643	0.1489	104	80 - 120				

PDS Sample ID: **HS19120314-01PDS** Units: **mg/Kg** Analysis Date: **10-Dec-2019 12:43**
Client ID: **16LHAAP-IDW-191205** Run ID: **ICPMS04_352151** SeqNo: **5382023** PrepDate: **09-Dec-2019** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	463.7	9.64	192.9	272.8	99.0	80 - 120				

SD Sample ID: **HS19120314-01SD** Units: **mg/Kg** Analysis Date: **10-Dec-2019 00:09**
Client ID: **16LHAAP-IDW-191205** Run ID: **ICPMS04_352123** SeqNo: **5381193** PrepDate: **09-Dec-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	2.487	2.41					2.324	0	10	
Chromium	12.2	2.41					11.45	6.53	10	
Nickel	11.04	2.41					10.25	7.69	10	
Thallium	1.21	2.41					0	0	10	U

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120314

QC BATCH REPORT

Batch ID: 148409 (0) **Instrument: ICPMS04** **Method: METALS BY SW6020A**

SD Sample ID: **HS19120314-01SD** Units: **mg/Kg** Analysis Date: **10-Dec-2019 12:41**
Client ID: **16LHAAP-IDW-191205** Run ID: **ICPMS04_352151** SeqNo: **5382022** PrepDate: **09-Dec-2019** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Manganese	273.4	48.2					272.8	0.229	10	

The following samples were analyzed in this batch: HS19120314-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120314

QC BATCH REPORT

Batch ID: R352021 (0) **Instrument: VOA8** **Method: VOLATILES ORGANICS BY SW8260C**

MBLK Sample ID: **VBLKS1-120719** Units: **ug/Kg** Analysis Date: **07-Dec-2019 11:43**
Client ID: Run ID: **VOA8_352021** SeqNo: **5378985** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	1.2	5.0								U
1,1-Dichloroethene	1.2	5.0								U
1,2-Dichloroethane	1.2	5.0								U
cis-1,2-Dichloroethene	1.2	5.0								U
Methylene chloride	2.5	10								U
Trichloroethene	1.2	5.0								U
Vinyl chloride	1.2	2.0								U
Surr: Toluene-d8	*51.58*	*5.0*	*50*	*0*	*103*	*85 - 116*				
Surr: 1,2-Dichloroethane-d4	*50.49*	*5.0*	*50*	*0*	*101*	*71 - 136*				
Surr: 4-Bromofluorobenzene	*50.28*	*5.0*	*50*	*0*	*101*	*79 - 119*				
Surr: Dibromofluoromethane	*52.26*	*5.0*	*50*	*0*	*105*	*78 - 119*				

LCS Sample ID: **VLCSS1-120719** Units: **ug/Kg** Analysis Date: **07-Dec-2019 10:57**
Client ID: Run ID: **VOA8_352021** SeqNo: **5378984** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	42.43	5.0	50	0	84.9	78 - 121				
1,1-Dichloroethene	42.43	5.0	50	0	84.9	70 - 131				
1,2-Dichloroethane	41.95	5.0	50	0	83.9	73 - 128				
cis-1,2-Dichloroethene	42.04	5.0	50	0	84.1	77 - 123				
Methylene chloride	38.84	10	50	0	77.7	70 - 128				
Trichloroethene	43.23	5.0	50	0	86.5	77 - 123				
Vinyl chloride	45.55	2.0	50	0	91.1	56 - 135				
Surr: Toluene-d8	*48.78*	*5.0*	*50*	*0*	*97.6*	*85 - 116*				
Surr: 1,2-Dichloroethane-d4	*48.01*	*5.0*	*50*	*0*	*96.0*	*71 - 136*				
Surr: 4-Bromofluorobenzene	*48.32*	*5.0*	*50*	*0*	*96.6*	*79 - 119*				
Surr: Dibromofluoromethane	*49.65*	*5.0*	*50*	*0*	*99.3*	*78 - 119*				

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120314

QC BATCH REPORT

Batch ID: R352021 (0) **Instrument: VOA8** **Method: VOLATILES ORGANICS BY SW8260C**

MS Sample ID: **HS19120157-03MS** Units: **ug/Kg** Analysis Date: **07-Dec-2019 13:37**
Client ID: Run ID: **VOA8_352021** SeqNo: **5378988** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	51.04	5.0	50	0	102	78 - 121				
1,1-Dichloroethene	54.1	5.0	50	0	108	70 - 131				
1,2-Dichloroethane	51.89	5.0	50	0	104	73 - 128				
cis-1,2-Dichloroethene	54.62	5.0	50	0	109	77 - 123				
Methylene chloride	49.31	10	50	0	98.6	70 - 128				
Trichloroethene	53.42	5.0	50	0	107	77 - 123				
Vinyl chloride	56.72	2.0	50	0	113	56 - 135				
Surr: Toluene-d8	*50.75*	*5.0*	*50*	*0*	*102*	*85 - 116*				
Surr: 1,2-Dichloroethane-d4	*49.06*	*5.0*	*50*	*0*	*98.1*	*71 - 136*				
Surr: 4-Bromofluorobenzene	*49.76*	*5.0*	*50*	*0*	*99.5*	*79 - 119*				
Surr: Dibromofluoromethane	*50.78*	*5.0*	*50*	*0*	*102*	*78 - 119*				

MSD Sample ID: **HS19120157-03MSD** Units: **ug/Kg** Analysis Date: **07-Dec-2019 14:00**
Client ID: Run ID: **VOA8_352021** SeqNo: **5378989** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	51.25	5.0	50	0	102	78 - 121	51.04	0.408	20	
1,1-Dichloroethene	55.44	5.0	50	0	111	70 - 131	54.1	2.45	20	
1,2-Dichloroethane	53.13	5.0	50	0	106	73 - 128	51.89	2.36	20	
cis-1,2-Dichloroethene	54.05	5.0	50	0	108	77 - 123	54.62	1.04	20	
Methylene chloride	50.56	10	50	0	101	70 - 128	49.31	2.51	20	
Trichloroethene	53.27	5.0	50	0	107	77 - 123	53.42	0.274	20	
Vinyl chloride	58.47	2.0	50	0	117	56 - 135	56.72	3.03	20	
Surr: Toluene-d8	*51.53*	*5.0*	*50*	*0*	*103*	*85 - 116*	*50.75*	*1.52*	*20*	
Surr: 1,2-Dichloroethane-d4	*49*	*5.0*	*50*	*0*	*98.0*	*71 - 136*	*49.06*	*0.118*	*20*	
Surr: 4-Bromofluorobenzene	*51.38*	*5.0*	*50*	*0*	*103*	*79 - 119*	*49.76*	*3.2*	*20*	
Surr: Dibromofluoromethane	*51.78*	*5.0*	*50*	*0*	*104*	*78 - 119*	*50.78*	*1.95*	*20*	

The following samples were analyzed in this batch: HS19120314-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: HS19120314

QC BATCH REPORT

Batch ID: **R352074 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS19120314-01DUP** Units: **wt%** Analysis Date: **09-Dec-2019 08:57**
Client ID: **16LHAAP-lDW-191205** Run ID: **Balance1_352074** SeqNo: **5380210** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	26	0.0100					27	3.77	20	

The following samples were analyzed in this batch: HS19120314-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-16
WorkOrder: **HS19120314**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 11-Dec-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19120314
Date/Time Received: **06-Dec-2019 08:48**
Received by: **AC**

Checklist completed by: *Asad Chaudhry* 6-Dec-2019
eSignature | Date

Reviewed by: _____
eSignature | Date

Matrices: **Soil**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.4c U/C	IR 25
Cooler(s)/Kit(s):	45061	
Date/Time sample(s) sent to storage:	12/06/2019 17:40	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Bottle count differs: COC= 4, Received= 5.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: 16LHAAP IDW 191205-ALS

TURNAROUND TIME: 48 hour

RUSH: 48 hour

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Highway, Suite 200		
City	Marshall	State	TX	City	Houston	State	TX	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	94520	Count	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company			

SAMPLE DETAILS

ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	VOCs by 8260 (Please see required VOCs below)	Metals by SW6020 (Please see required metals below)
								Sample Container and Presrvatives		3-Terracores (1-vial Methanol + 2 vials w/ sodium bisulfate)	1-8oz CWM w/ Cool to 4°C
16LHAAP-IDW-191205	16 LHAAP					12/5/2019	1320	4		3	1

HS19120314

Aptim Environmental & Infrastucture, Inc.

LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
VOC analyses for TCE, cis 1,2-DCE, 1,1-DCE, 1,2-DCA, VC, 1,1,2-TCA, methylene chloride.	[signature] APTIM	12-5-19/1255	AC ALS	12/6/19 0848
Metals analysis for arsenic, chromium, manganese, nickel, thallium.				

U/C 1.4 IR #25 CFC 0 45061

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45061

CUSTODY SEAL
Date: 12.5.19 Time: 1800
Name:
Company: APTIM

Seal Broken By:
Date: 12/06/19

45061 DEC 06 2019

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45061

CUSTODY SEAL
Date: 12.5.19 Time: 1800
Name:
Company: APTIM

Broken By:
Date: 12/06/19

Must Deliver Next Business Day
Time and Tempature Sensitive!

45061

ORIGIN ID:SGRA (903) 930-6193
MIKE MARTINEZ
APTIM ENVIRONMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 010CT19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530--5868
REF: LHAAP – 17 – SOIL – BO 67938 – RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0290 1584

FRI – 06 DEC 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX – US IAH

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1934139; 1934141

Client: ALS Laboratories (Houston, TX)
Matrix: Soil
ELMS Batch (HBN): 2325 (253247)

General Set Information: There were two field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 1.00 to 1.20 g aliquot of each sample was combined with 9.95mL of ASTM Type II water. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, sonicated for at least 15 minutes and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe Filters. If necessary, the samples were centrifuged at 2700rpm for 15 minutes prior to filtering in order to remove excess particulates from the extract.

Holding Times: Holding times were met for all analyses.

Dilutions: NA

Method QC data: The method blank (687444) was less than 1/2 the CRDL. The recovery for the LCS (687441) was within acceptable parameters.

MS/MSD Analysis: Matrix Spike and Duplicates (MS/MSD – 687445/46) were performed on sample 1934139001 (Client ID: 16LHAAP-IDW-191205). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 30.µg/Kg. The MS/MSD failed QC acceptance criteria for percent recoveries. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected**.** The relative percent difference (RPD) passed QC acceptance criteria.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): None were required for this set.

Sample Calculation: Samples were reported in µg/Kg. Results were calculated in µg/Kg by the equation (A)x(B)x(C)x(D),

where: A = Analyte concentration from the standard curve (µg/L)
B = Conversion factor from µg/L to µg/kg (10mL/1.0g)
C = Dilution performed at time of analysis
D = Moisture correction

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1, Table F-12. The Reporting Limit Verification Standard (RLVS – 687442) was reported from the analysis of the Laboratory Control Sample (LCS – 687441) at a level of 30.µg/Kg. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03).

Thomas Bosch December 10, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: December 10, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1934139**
Project ID: HS19120314
Purchase Order: HS19120314
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
16LHAAP-IDW-191205	1934139001	12/05/19	12/06/19	16LHAAP

ANALYTICAL REPORT

Workorder: 34-1934139
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **16LHAAP-IDW-191205** | Sampling Site: 16LHAAP | Collected: 12/05/2019
Lab ID: 1934139001 | Media: 4 oz Amber Glass Jar | Received: 12/06/2019
Matrix: Soil/Solid/Sediment | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Soil | **Instrument ID:** LCMS04
Batch: ELMS/2325 (HBN: 253247) | **%Solids:** 73.6
Analyzed: 12/09/2019 12:10 | **Report Basis:** Dry

Analyte	Result (ug/Kg)	DL (ug/Kg)	LOD (ug/Kg)	LOQ (ug/Kg)	Dilution	Qual
Perchlorate	ND	14	14	27	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/09/2019 16:26	/S/ Stephen Brose 12/10/2019 10:04
Solids/Moisture Determination	/S/ Ilse J. Ovalle 12/10/2019 09:37	/S/ Jeff Ward 12/10/2019 16:12

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1934139
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample
Batch Report

Analysis Information

Workorder: 1934139

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2325 (HBN: 253247)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 687444
Analyzed: 12/09/2019 11:56
Units: ug/Kg

Analyte	Result	MDL	RL
Perchlorate	ND	10	10.0

Laboratory Control Sample

LCS: 687441
Analyzed: 12/09/2019 11:28
Dilution: 1
Units: ug/Kg

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	32.7	30.0	109	84.0	121.0

Matrix Spike - Matrix Spike Duplicate

Sample:	1934139001	**MS:**	687445
Analyzed:	12/09/2019 12:10	**Analyzed:**	12/09/2019 12:24
Dilution:	1	**Dilution:**	1
Units:	ug/Kg	**Units:**	ug/Kg

	MSD:	687446
	Analyzed:	12/09/2019 12:38
	Dilution:	1
	Units:	ug/Kg

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	21.6	30	# 72.1	78.8	123.8	21.8	# 72.8	0.87	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
12/09/2019 16:26	12/10/2019 10:04

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

APTIM

1934139

1934139

Page 1 of 1

COC ID: 16LHAAP IDW 191205-ALS-STL

TURNAROUND TIME: 48 HOUR

18698 / #9

RUSH: 48 HOUR

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	Kevin Griffiths/RJ Modashia						
	LHAAP-16			Email	Kevin. Griffiths@alsglobal.com			Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	960 West Levoy Drive			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Highway, Suite 200		
City	Marshall	State	TX	City	Salt Lake	State	UT	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	84123	Country	USA	Postal Code	94520	Country	USA
Phone Number	713.243.7264			Phone Number	801.266.7700						
Project Manager	Praveen Srivastav							Shipping Company			

SAMPLE DETAILS | **ANALYSIS REQUESTED**

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Sample Container and Presrvatives: 1-4oz CWM w/ Cool to 4°C
										Perchlorate by SW6850
16LHAAP-IDW-191205	16 LHAAP					12/5/2019	1320	1		1

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[illegible] APTIM	12-5-19/1700	[illegible] / ALS	12/6/19 09:10

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: 501032 LHAAP-16	Split:	Workorder ID: 1934139	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 4ozAGWM
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Count	Requested Analysis: EPA 6850, DoD QSM		
1	12/05/2019 13:20	16LHAAP-IDW-191205	1934139001		Soil/Solid/Sediment	A	1	A	1.043	g
2							MS		1.049	↓
3							MSD		1.064	
4										
5										
6										
7										
8										
9										
10										

BALANCE ID: 40890067

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	12/06/2019 09:10	ALS Sample Receiving	Sample Login
[signature]	12/6/19 1130	LoC	Storage
R.33.1	12.9.19/10:10	T. Bosch	CLOA / analysis

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

1934139

SAMPLING STATE: **Texas** **COC ID:** **12800**

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19120314
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19120314-01**	**16LHAAP-IDW-191205**	**Soil**	**05 Dec 2019 13:20**
	SUB_Perch-6850			10 Dec 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: _____

Cooler ID(s): _____ Temperature(s): _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: APTIM

Project/Task/Site: 1934139

Date/Time of Receipt: 12/6/19 09:10

Number of Coolers Received: 1

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/Absent/(NA)		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	(Yes)/No/NA
Ice Present:	(Yes)/No/NA		
	(Frozen)/Melted/NA	VOA Headspace Present?	Yes/No/(NA)

pH Check Performed:								
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA		
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA		
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA		
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA		

Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
1	Good	3 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: JayLynn Johnson (Signature) JayLynn Johnson (Printed Name) 12/6/19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

ORIGIN ID:SHVA (210) 247-8085
MICHEAL MARTINEZ

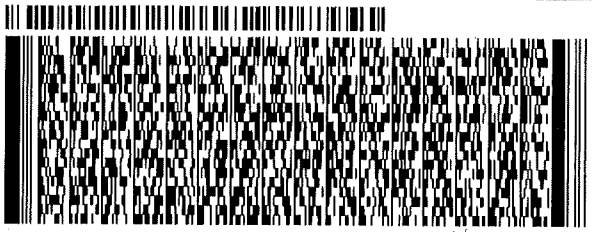
CONFIDENTIAL PRCNG-DONOT SHARE
10450 STANCLIFF RD
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 05DEC19
ACTWGT: 22.20 LB
CAD: 6994980/SSFE2021
DIMS: 18x10x17 IN

BILL THIRD PARTY

TO **ALS ENVIRONMENTAL**
ALS ENVIRONMENTAL
960 W LEVOY DR

SALT LAKE CITY UT 84123
(801) 266-7700 REF:
INV:
PO: DEPT:



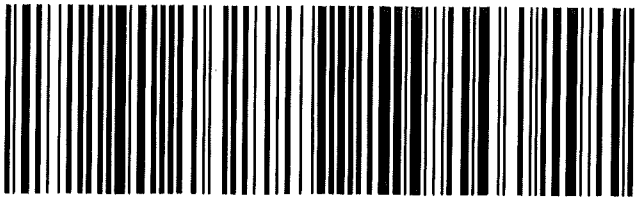
FedEx
Express

TRK# 0201 **7786 4396 7412**

FRI - 06 DEC 10:30A
PRIORITY OVERNIGHT

AX BTFA

AHS
84123
UT-US **SLC**



Batch Worklist

Batch: ELMS/ 2325 Created: 12/9/2019 10:57 Instrument: HBN: 253247

Rule: EPA 6850, DoD QSM Soil Analyst: T. Bosch Status: WP

Workorder: 1934139 [ENV_LVL4]

Workorder: 1934141 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	687440	CCV for HBN 253247 [ELMS/2325]				CCV	3		E685041C4Q	5311		12/10/2019	
2	687441	LCS for HBN 253247 [ELMS/2325]				LCS	4		E6850Q414Q	5311		12/10/2019	
3	687442	RLVS for HBN 253247 [ELMS/2325				RLVS	4		E6850Q414Q	5311		12/10/2019	
4	687443	ICS for HBN 253247 [ELMS/2325]				ICS	3		E6850..D4Q	5311		12/10/2019	
5	687444	LMB for HBN 253247 [ELMS/2325]				LMB	4		E6850Q414Q	5311		12/10/2019	
6	1934139001	16LHAAP-IDW-191205				SAMPLE	4	1934139001-A	E6850Q41.4	5480	1/2/2020	12/10/2019	
7	687445	16LHAAP-IDW-1...(1934139001MS)				MS	4		E6850Q414Q	5311		12/10/2019	
8	687446	16LHAAP-IDW-...(1934139001MSD)				MSD	4		E6850Q414Q	5311		12/10/2019	
9	1934141001	50LHAAP-IDW-191205				SAMPLE	4	1934141001-A	E6850Q41.4	5480	1/2/2020	12/10/2019	
10	687447	CCV for HBN 253247 [ELMS/2325]				CCV	3		E685041C4Q	5311		12/10/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1934139 (001); 1934141 (001)
ELMS Batch/HBN ID: 2325 (253247)
Prep Date: 12/09/2019 Analysis Date: 12/09/2019
Sequence:\\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\09DEC19D.s
Analyte: **Perchlorate** Method: **6850** Matrix: Soil Analyst: Tom Bosch
Instrument DL/LOD: 10.0µg/Kg Reported LOQ: 20.0µg/Kg

SAMPLE PREPARATION/ANALYSIS:

Soil: Samples were prepared by Tom Bosch. A 1.0 g (+/- 0.1g; Balance ID: 40090067) aliquot of sample was weighed into a 15mL centrifuge tube. 9.95mL of ASTM Type II water was added to each sample and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. Each sample was capped, vortexed, sonicated for at least 10 minutes and centrifuged (if necessary) at 2700rpm for 15 minutes. The samples are then filtered into autosampler vials using Phenex PES membrane 0.45µm Syringe filters. Sample weight have been scanned into the HBN folder.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) were used for the ICAL, CCV's and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19I.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: **LCMS04** Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: Eluent A1 - 70%; Eluent B1 - 30% Run Time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65

QC DATA:

Soil: Blank and QC samples were prepared using washed Ottawa sand (EM Science Lot# 36211706). A 3.0µL of QC Solution Horizon ID 47516 was used for LCS 687441; Targets = 30.0 µg/Kg. ASTM type II water was used for the LMB 687444.

CONVERSION: µg/L * 10.mL/1.0g * L/1,000mL * 1,000g/Kg = 10.µg/Kg

MS/MSD:

Soil: Matrix Spike and Duplicates (MS/MSD) were performed on sample 1934139001 (Client ID: 16LHAAP-IDW-191205). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 30.µg/Kg. The Matrix Spike/Duplicates passed QC acceptance criteria for percent recoveries and relative percent differences (RPD's).

COMMENTS:

1) Soil results reported in µg/Kg, with moisture corrections.
2) All QC, Blank and CCV results were within method parameters, except for the following. The Matrix Spike/Duplicate (687445/46) failed QC acceptance criteria for percent recoveries. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) passed QC acceptance criteria.
3) Sample data: \\ALSLTWS013\LCMS\LCMS04\2019\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Soils\2019\253247-ALS-Hstn-DOD-NBK-LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 687442) was reported from the analysis of the Laboratory Control Sample (LCS – 687441) at a level of 30.µg/Kg.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria **Batch(es)/SDG:** ELMS.2325 HBN: 253247 **Sample Set IDs if Applicable:** 1934139 / 1934141	**Analyst Initials**	**Reviewer Initials**
Sample positions on autosampler verified against instrument sequence	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#_____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 49946	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/23/2019 03:09PM	**Expires:** 09/19/2020
MFG Lot: TNB: 09/20/2019	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 47863	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 05/23/2019 10:05AM	**Expires:** 12/05/2028
MFG Lot: SDIH-016	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — **Description - 6850 WKG Std 100.ug/L**

Standard: 49948
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — **Description - 6850 Intermdt AccStd 10.ug/mL**

Standard: 49947
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/23/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L
Standard: 47516	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 05/06/2019 03:05PM	**Expires:** 03/31/2020
MFG Lot: TNB: 05/06/2019		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			**Description - ASTM Type II Water**
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L	
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025	
MFG Lot: Not Provided		**Usable:** Yes	
Part ID: Not Provided		**Lab Lot:** LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK	Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL
Standard: 47515	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 05/06/2019 03:05PM	**Expires:** 03/31/2020
MFG Lot: TNB: 05/06/2019		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

250 SMITH STREET • NORTH KINGSTOWN, RHODE ISLAND 02852 • WWW.ULTRASCI.COM

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013 **Lot Issue Date:** 29-Feb 2016
Lot Number: CP-0860 **Expiration Date:** 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Cambridge Isotope Laboratories, Inc. Certificate of Analysis

S 47863

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: ≥ 98%

MW*: 130.44
** For isotopically labeled compounds, MW listed is for the fully enriched product.*

$NaCl^{18}O_4$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.
Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number . Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\09DEC19D\09DEC19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
	*	687440	CCV@25	Vial 71	1	Control	1	1.96528e6	7.330	27.65522
	*	687441	QC@30.	Vial 72	1	Control	2	2.19960e5	7.271	32.68255
	*	687443	ICS@3.0	Vial 73	1	Control	3	1.24430e5	7.270	2.72355
	*	687444	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	1934139001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	687445	341391S	Vial 76	1	Sample	6	1.88246e5	7.276	21.63787
	*	687446	341391D	Vial 77	1	Sample	7	1.94571e5	7.317	21.82727
	*	1934141001		Vial 78	1	Sample	8	0.00000	0.000	0.00000
	*	687447	CCV@25	Vial 71	1	Control	9	1.89396e6	7.365	27.60008

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	687440	CCV@25	Vial 71	1	Control	1	2.40181e5	7.353	5.00000
	*	687441	QC@30.	Vial 72	1	Control	2	2.47878e5	7.293	50.00000
	*	687443	ICS@3.0	Vial 73	1	Control	3	1.67855e5	7.284	5.00000
	*	687444	LMB	Vial 74	1	Control	4	2.41583e5	7.413	50.00000
	*	1934139001		Vial 75	1	Sample	5	3.00642e5	7.288	47.94000
	*	687445	341391S	Vial 76	1	Sample	6	3.03542e5	7.315	47.66500
	*	687446	341391D	Vial 77	1	Sample	7	3.06786e5	7.344	46.99000
	*	1934141001		Vial 78	1	Sample	8	2.71059e5	7.502	48.40500
	*	687447	CCV@25	Vial 71	1	Control	9	2.31980e5	7.392	5.00000

#	*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
	*	687440	CCV@25	Vial 71	1	Control	1	5.96373e5	7.348	27.55874
	*	687441	QC@30.	Vial 72	1	Control	2	7.35058e4	7.280	34.92164
	*	687443	ICS@3.0	Vial 73	1	Control	3	4.87057e4	7.290	3.41470
	*	687444	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	1934139001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	687445	341391S	Vial 76	1	Sample	6	6.27139e4	7.288	22.82794
	*	687446	341391D	Vial 77	1	Sample	7	6.24741e4	7.322	22.16276
	*	1934141001		Vial 78	1	Sample	8	0.00000	0.000	0.00000
	*	687447	CCV@25	Vial 71	1	Control	9	5.76944e5	7.380	27.59921

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

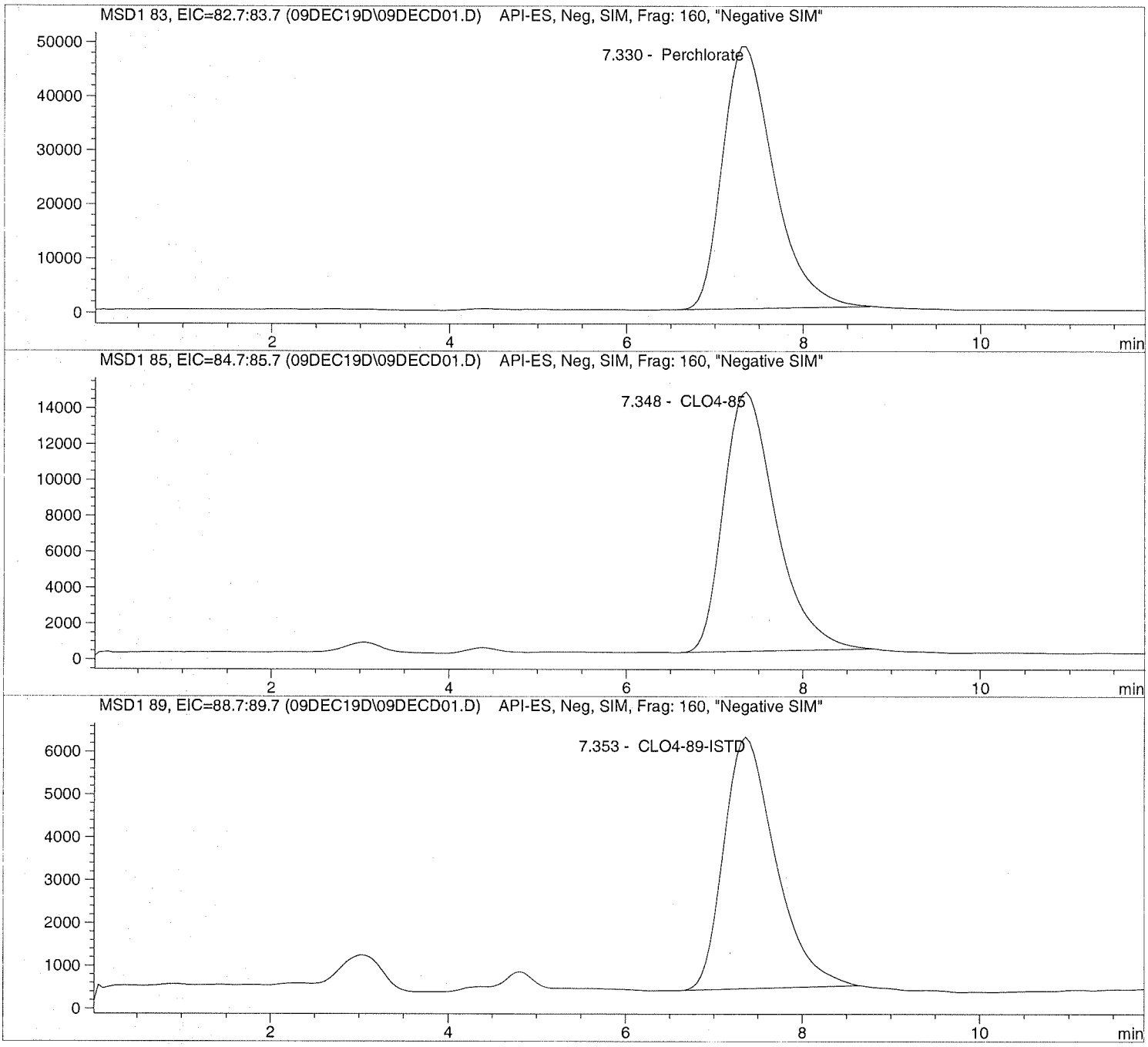
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	687440	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	687441	QC@30.	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	687443	ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	687444	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1934139001		CLO4-AQN	1	Sample		
6	Vial 76	687445	341391S	CLO4-AQN	1	Sample		
7	Vial 77	687446	341391D	CLO4-AQN	1	Sample		
8	Vial 78	1934141001		CLO4-AQN	1	Sample		
9	Vial 71	687447	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD01.D Sample Name: 687440 CCV@25

Injection Date:	12/09/2019 11:09:23	Seq Line:	1
Sample Name:	687440 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD01.D Sample Name: 687440 CCV@25

Injection Date:	12/09/2019 11:09:23	Seq Line:	1
Sample Name:	687440 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.330	PBA	1965278.4	27.6552	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.348	PBA	596373.0	27.5587	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.353	PBA	240180.9	5.0000	CLO4-89-ISTD

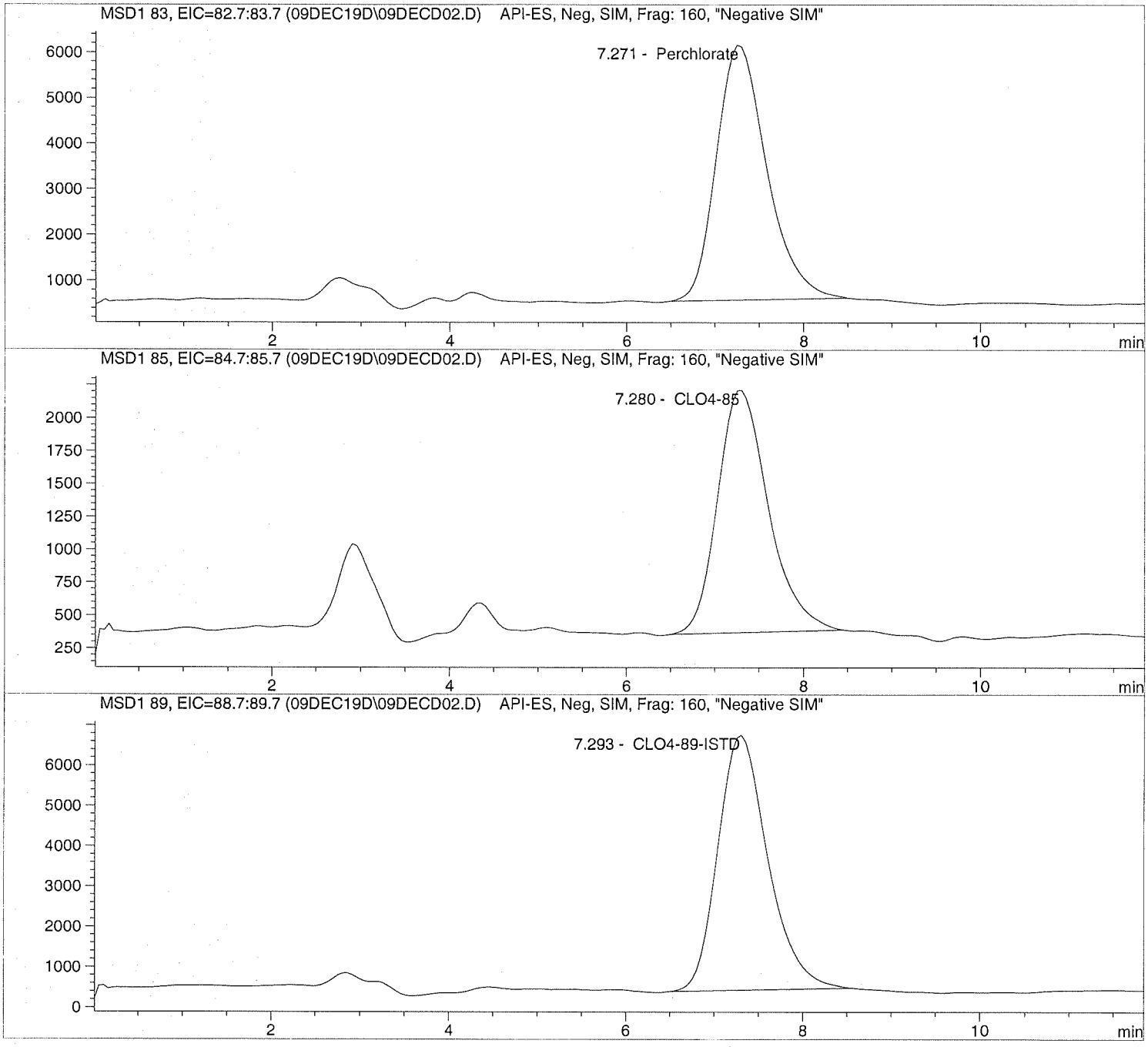
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD02.D Sample Name: 687441 QC@30.

Injection Date:	12/09/2019 11:28:47	Seq Line:	2
Sample Name:	687441 QC@30.	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD02.D Sample Name: 687441 QC@30.

Injection Date:	12/09/2019 11:28:47	Seq Line:	2
Sample Name:	687441 QC@30.	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	10.000000
Dilution:	1.000000
Sample Amount:	30.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.271	BBA	219959.6	32.6825	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.280	PBA	73505.8	34.9216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.293	PBA	247877.6	50.0000	CLO4-89-ISTD

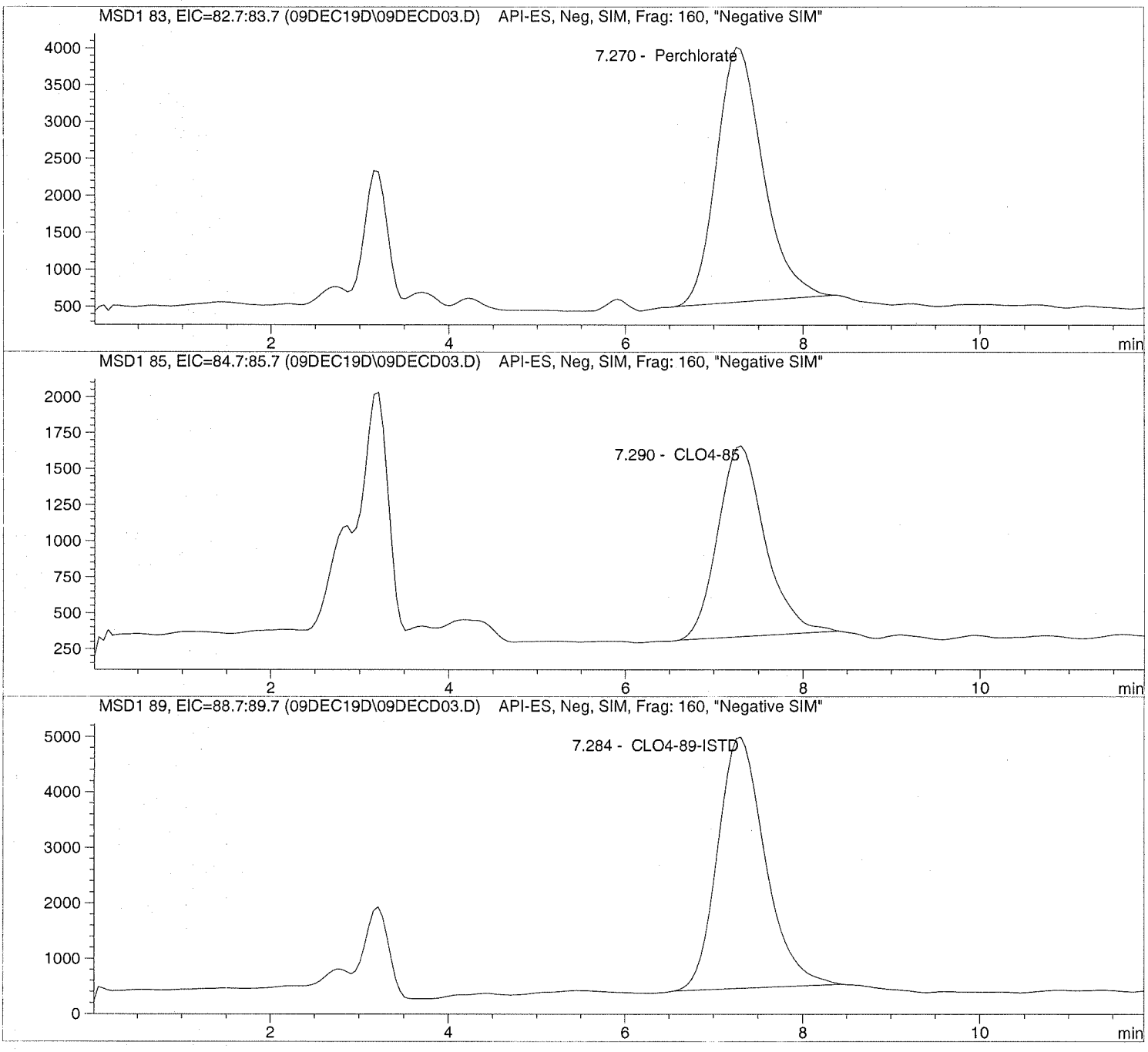
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD03.D Sample Name: 687443 ICS@3.0

Injection Date:	12/09/2019 11:42:43	Seq Line:	3
Sample Name:	687443 ICS@3.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD03.D Sample Name: 687443 ICS@3.0

Injection Date:	12/09/2019 11:42:43	Seq Line:	3
Sample Name:	687443 ICS@3.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.270	PBA	124430.1	2.7236	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.290	PBA	48705.7	3.4147	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.284	PBA	167855.2	5.0000	CLO4-89-ISTD

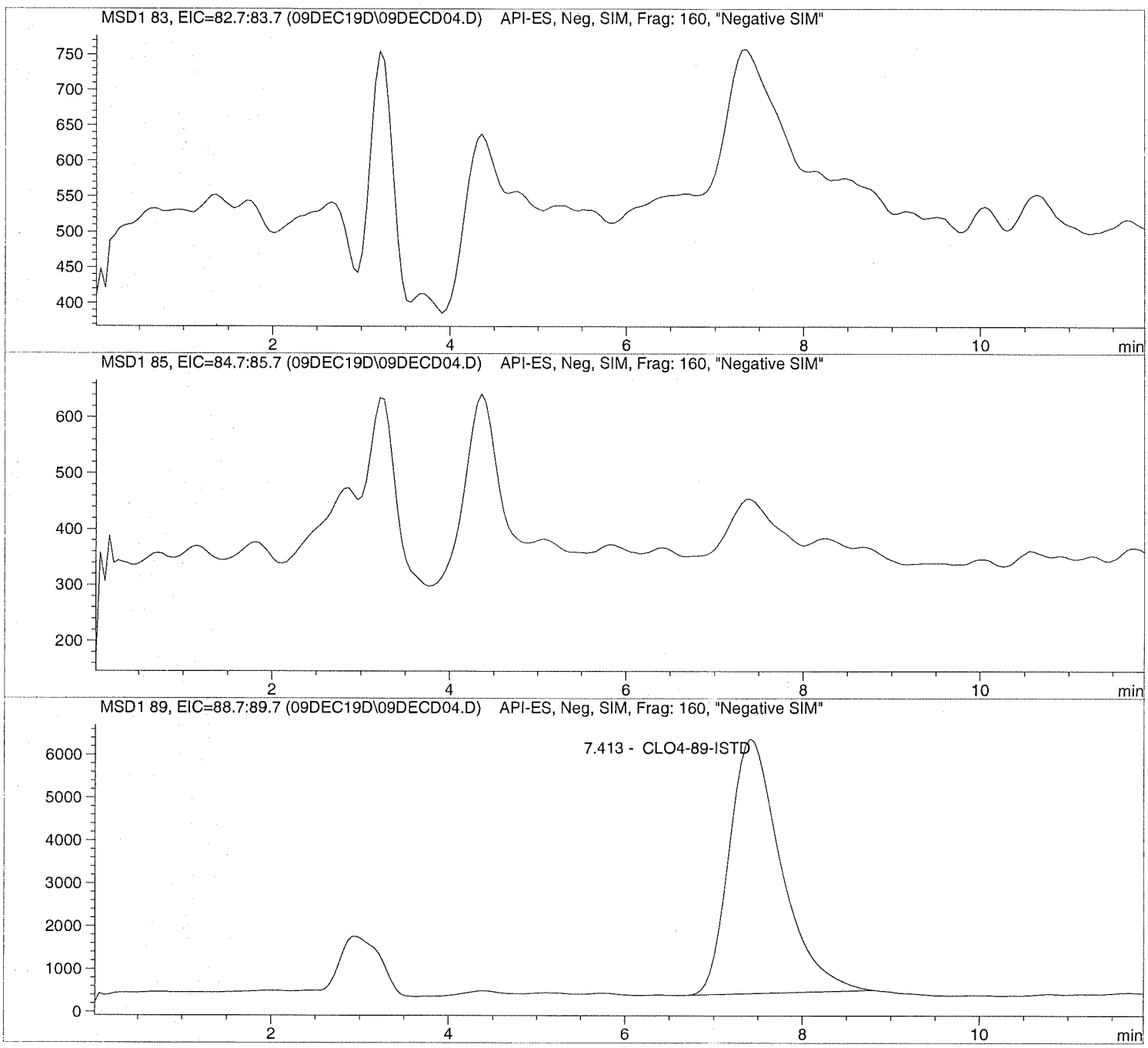
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD04.D Sample Name: 687444 LMB

Injection Date:	12/09/2019 11:56:39	Seq Line:	4
Sample Name:	687444 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD04.D Sample Name: 687444 LMB

Injection Date:	12/09/2019 11:56:39	Seq Line:	4
Sample Name:	687444 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	10.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.413	PBA	241583.0	50.0000	CLO4-89-ISTD

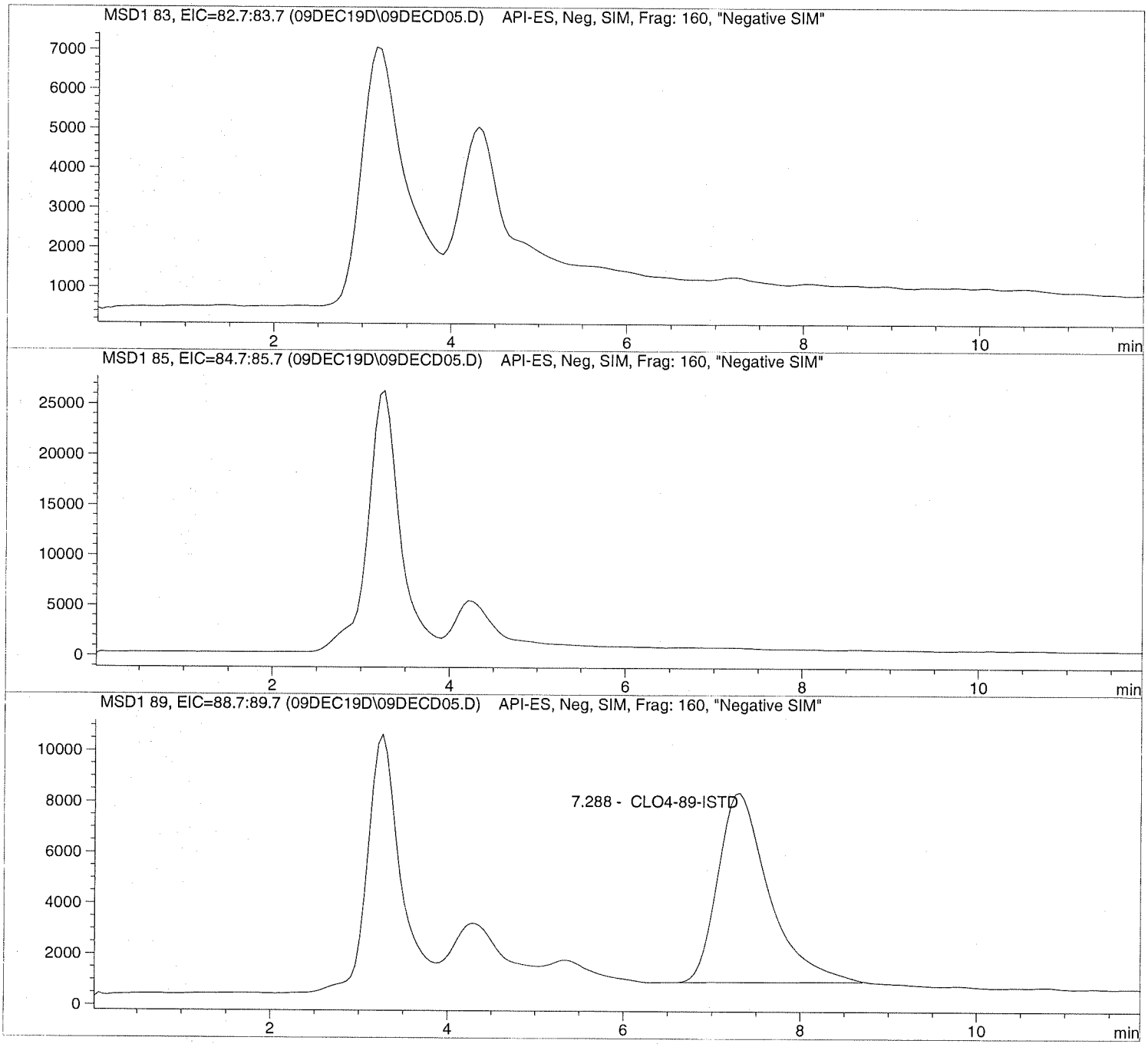
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD05.D Sample Name: 1934139001

Injection Date:	12/09/2019 12:10:32	Seq Line:	5
Sample Name:	1934139001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD05.D Sample Name: 1934139001

Injection Date:	12/09/2019 12:10:32	Seq Line:	5
Sample Name:	1934139001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	9.588000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.288	PBA	300641.5	47.9400	CLO4-89-ISTD

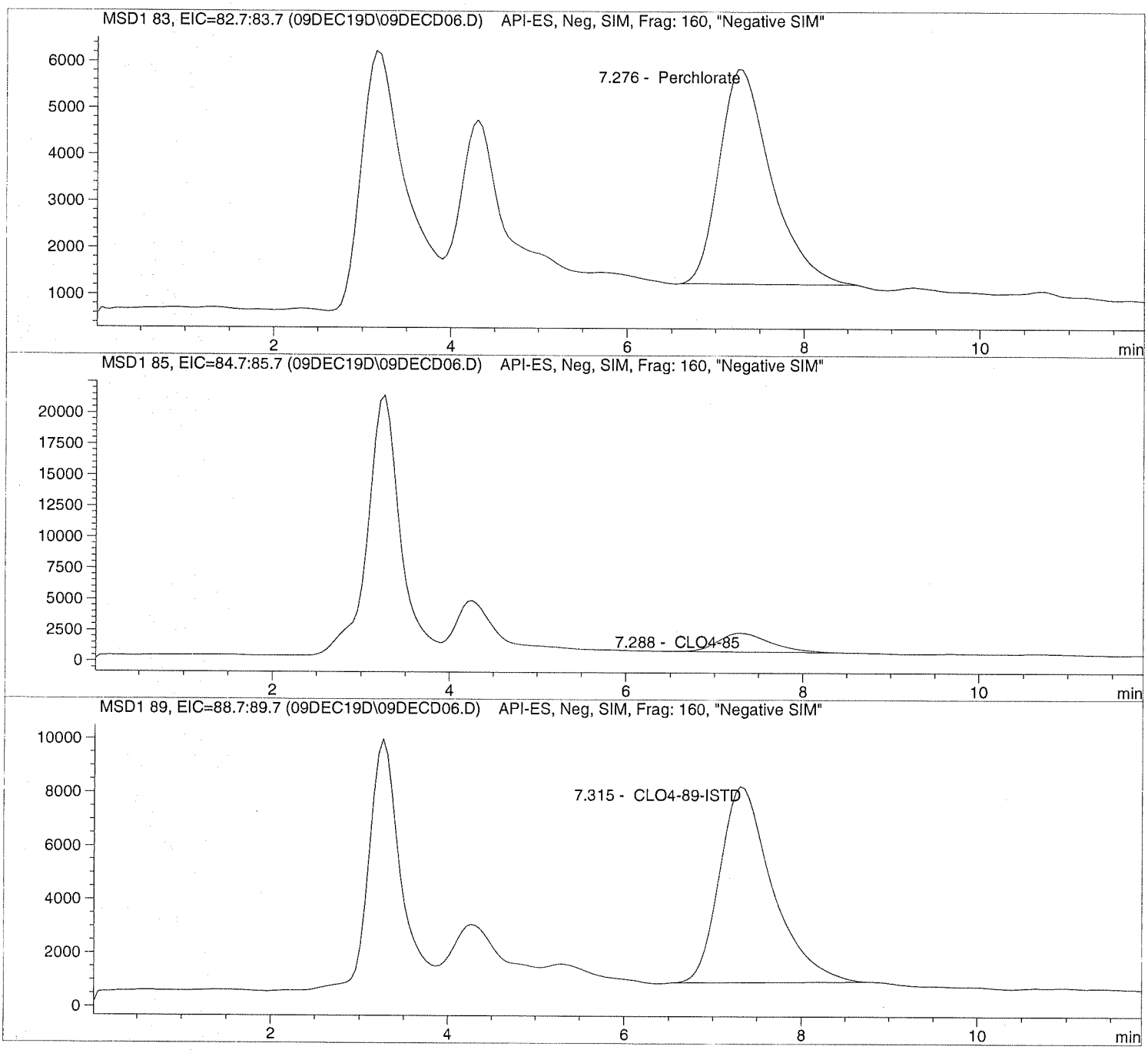
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD06.D Sample Name: 687445 341391S

Injection Date:	12/09/2019 12:24:26	Seq Line:	6
Sample Name:	687445 341391S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD06.D Sample Name: 687445 341391S

Injection Date:	12/09/2019 12:24:26	Seq Line:	6
Sample Name:	687445 341391S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	9.533000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.276	PBA	188246.3	21.6379	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.288	PBA	62713.9	22.8279	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.315	PBA	303541.6	47.6650	CLO4-89-ISTD

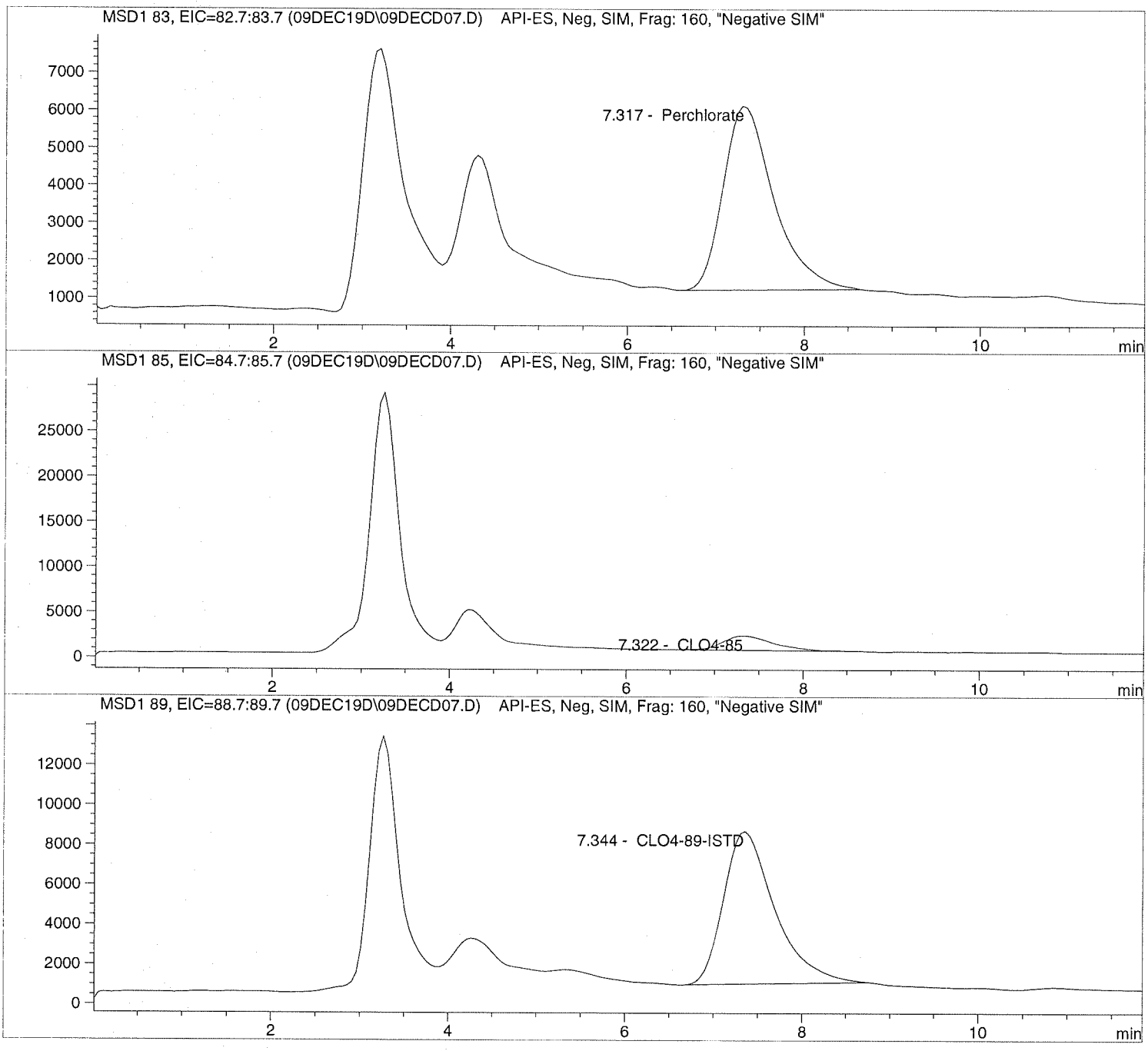
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD07.D Sample Name: 687446 341391D

Injection Date:	12/09/2019 12:38:18	Seq Line:	7
Sample Name:	687446 341391D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD07.D Sample Name: 687446 341391D

Injection Date:	12/09/2019 12:38:18	Seq Line:	7
Sample Name:	687446 341391D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	9.398000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.317	PBA	194570.8	21.8273	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.322	PBA	62474.1	22.1628	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.344	PBA	306785.9	46.9900	CLO4-89-ISTD

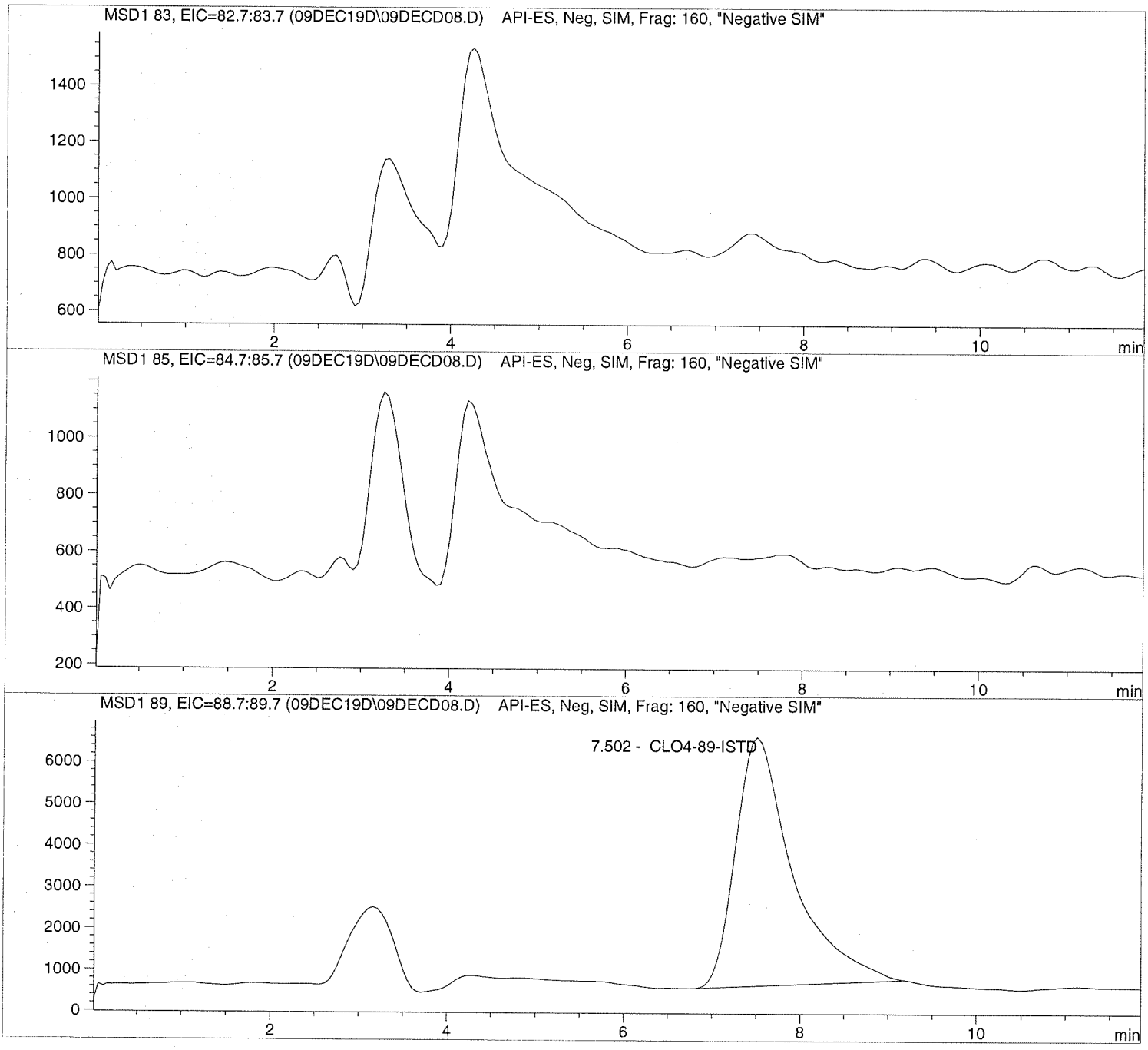
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD08.D Sample Name: 1934141001

Injection Date:	12/09/2019 12:52:13	Seq Line:	8
Sample Name:	1934141001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD08.D Sample Name: 1934141001

Injection Date:	12/09/2019 12:52:13	Seq Line:	8
Sample Name:	1934141001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	9.681000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.502	PBA	271059.3	48.4050	CLO4-89-ISTD

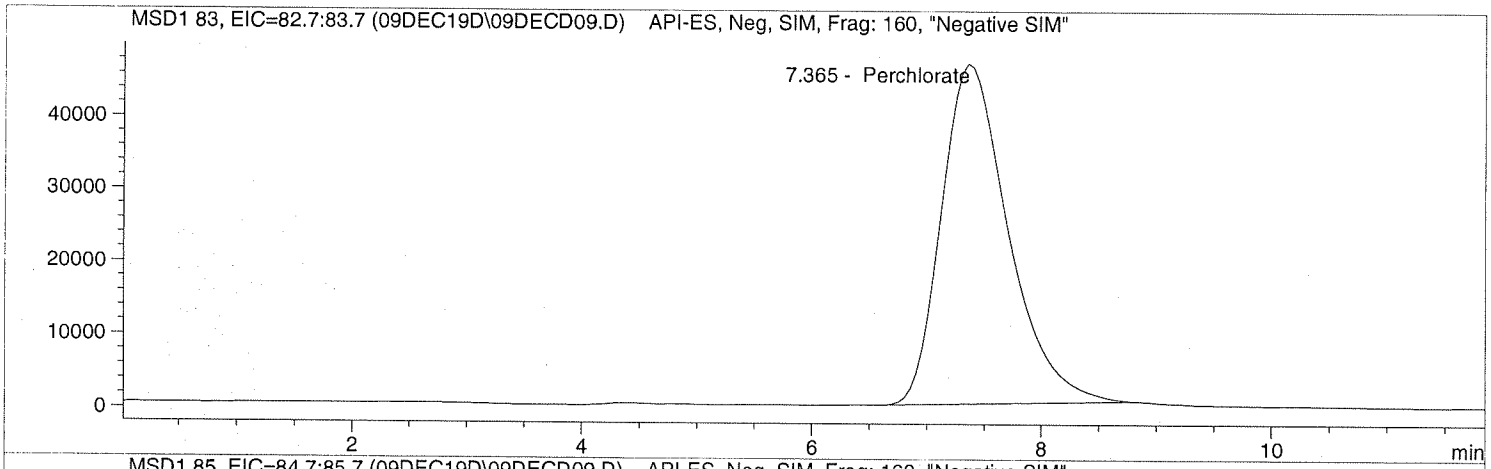
*** End of Report ***

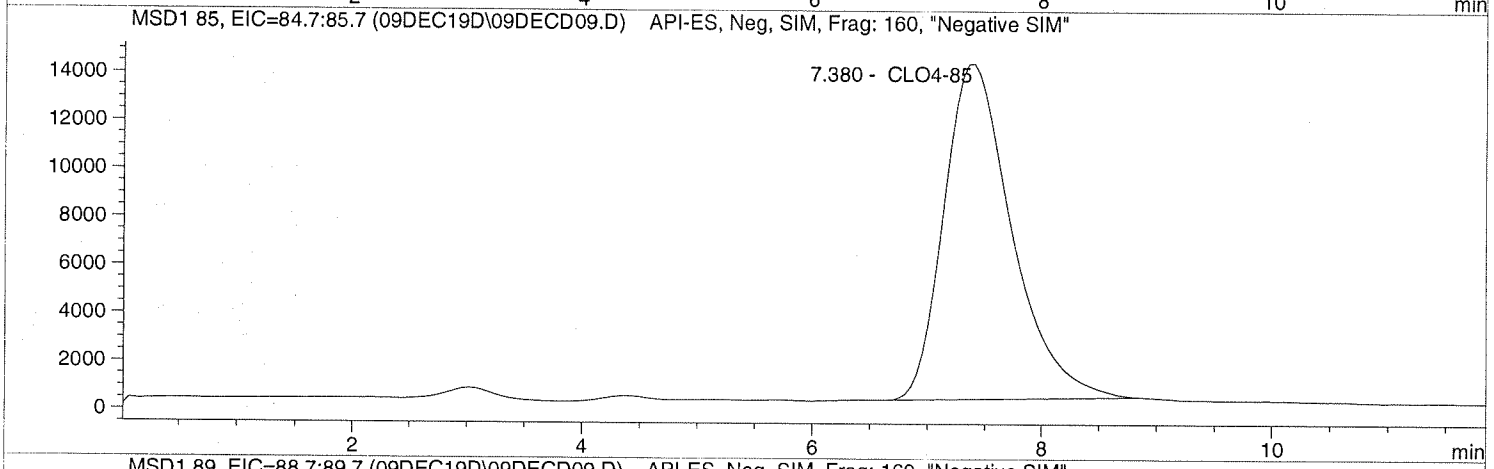
Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD09.D Sample Name: 687447 CCV@25

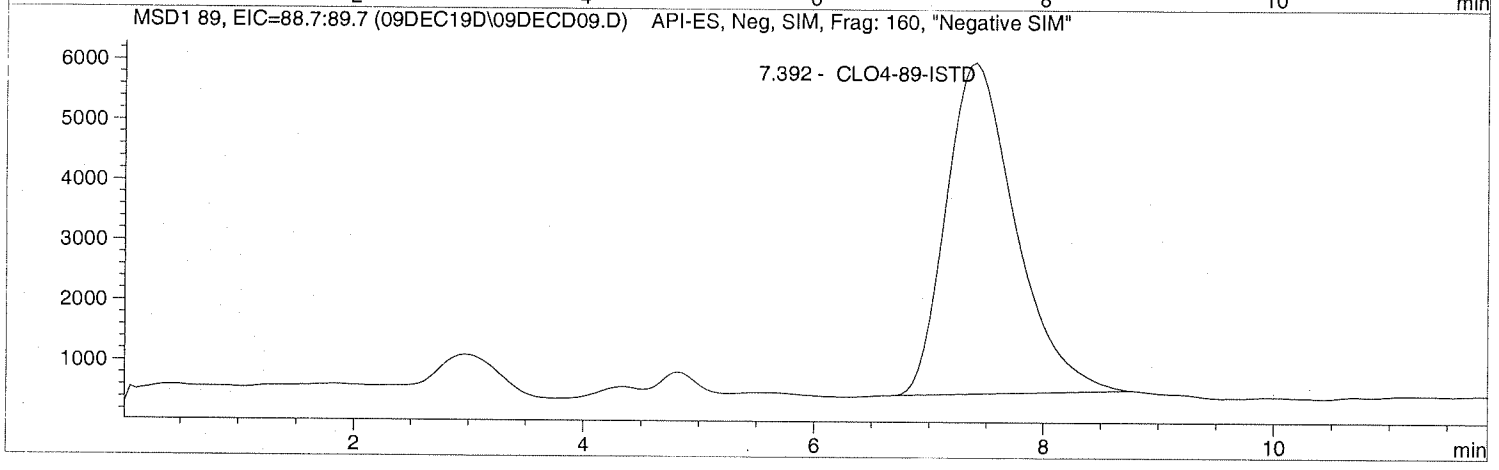
Injection Date:	12/09/2019 13:07:13	Seq Line:	9
Sample Name:	687447 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\09DEC19D\09DECD09.D Sample Name: 687447 CCV@25

Injection Date:	12/09/2019 13:07:13	Seq Line:	9
Sample Name:	687447 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.365	PBA	1893964.4	27.6001	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.380	PBA	576943.9	27.5992	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.392	PBA	231980.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl Sig		Amount	Area	Amt/Area	Ref	Grp	Name
7.750	1	3	1.00000	5.39218e4	1.85454e-5		1	Perchlorate
		4	2.00000	1.32825e5	1.50574e-5			
		5	5.00000	2.76271e5	1.80982e-5			
		6	10.00000	5.61298e5	1.78159e-5			
		7	25.00000	1.51820e6	1.64669e-5			
		8	50.00000	3.31156e6	1.50986e-5			
		9	75.00000	5.23914e6	1.43153e-5			
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1		CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5			
		5	5.00000	2.13407e5	2.34294e-5			
		6	5.00000	2.09246e5	2.38953e-5			
		7	5.00000	2.07403e5	2.41077e-5			
		8	5.00000	2.02929e5	2.46391e-5			
		9	5.00000	1.97933e5	2.52611e-5			
7.778	2	3	1.00000	1.70436e4	5.86732e-5		1	CLO4-85
		4	2.00000	4.20754e4	4.75337e-5			
		5	5.00000	9.24707e4	5.40712e-5			
		6	10.00000	1.68622e5	5.93041e-5			
		7	25.00000	4.63724e5	5.39114e-5			
		8	50.00000	9.95933e5	5.02042e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		9	75.00000	1.58066e6	4.74484e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 3.581 min To 11.899 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 0.5
  - Level 5 : 0.2
  - Level 6 : 0.1
  - Level 7 : 0.04
  - Level 8 : 0.02
  - Level 9 : 0.013333

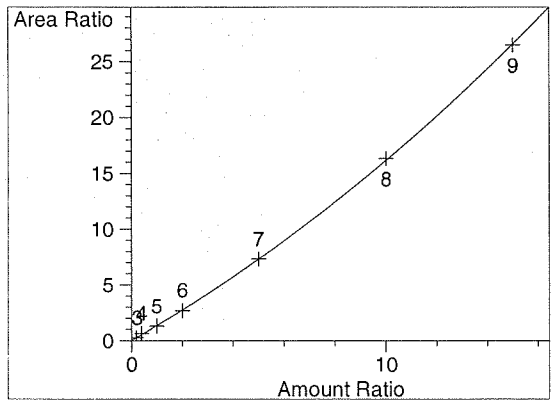
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

Compound: CLO4-85
- Time Window : From 3.601 min To 11.913 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 0.5
  - Level 5 : 0.2
  - Level 6 : 0.1
  - Level 7 : 0.04
  - Level 8 : 0.02
  - Level 9 : 0.013333

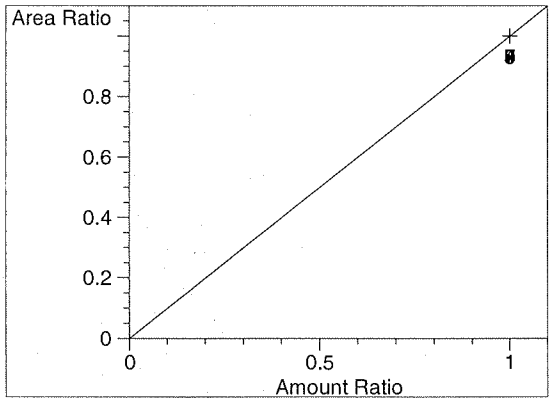
Peak Sum Table

No Entries in table

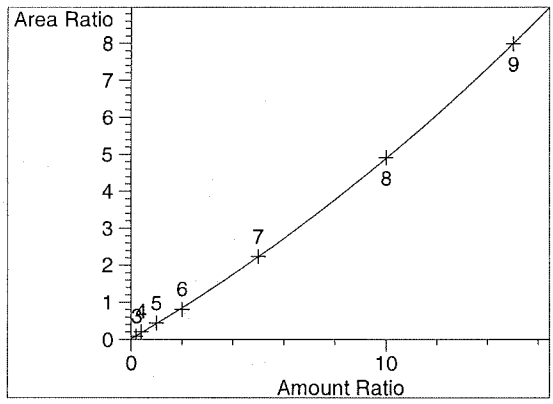
Calibration Curves



Perchlorate at exp. RT: 7.750
MSD1 83, EIC=82.7:83.7
Correlation: 0.99975
Residual Std. Dev.: 0.10284
Formula: $y = ax^2 + bx + c$
a: 3.10463e-2
b: 1.30369
c: 2.19496e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1
Level 8 : 1
Level 9 : 1



CLO4-85 at exp. RT: 7.778
MSD1 85, EIC=84.7:85.7
Correlation: 0.99969
Residual Std. Dev.: 0.02601
Formula: $y = ax^2 + bx + c$
a: 8.85207e-3
b: 3.99283e-1
c: 1.33505e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333

Batch Report: C:\HPCHEM\1\DATA\20SEP19I\20SEP19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

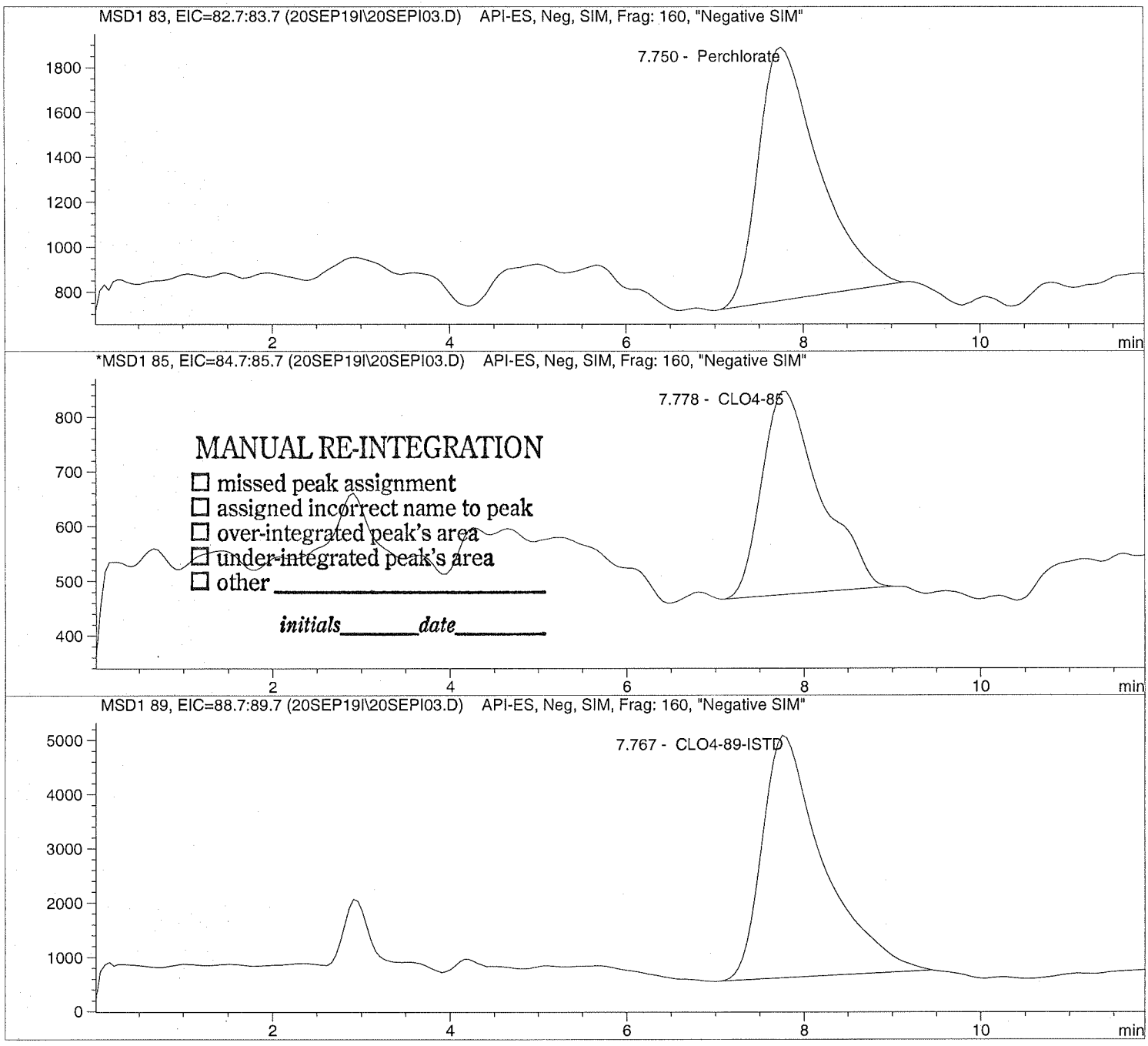
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

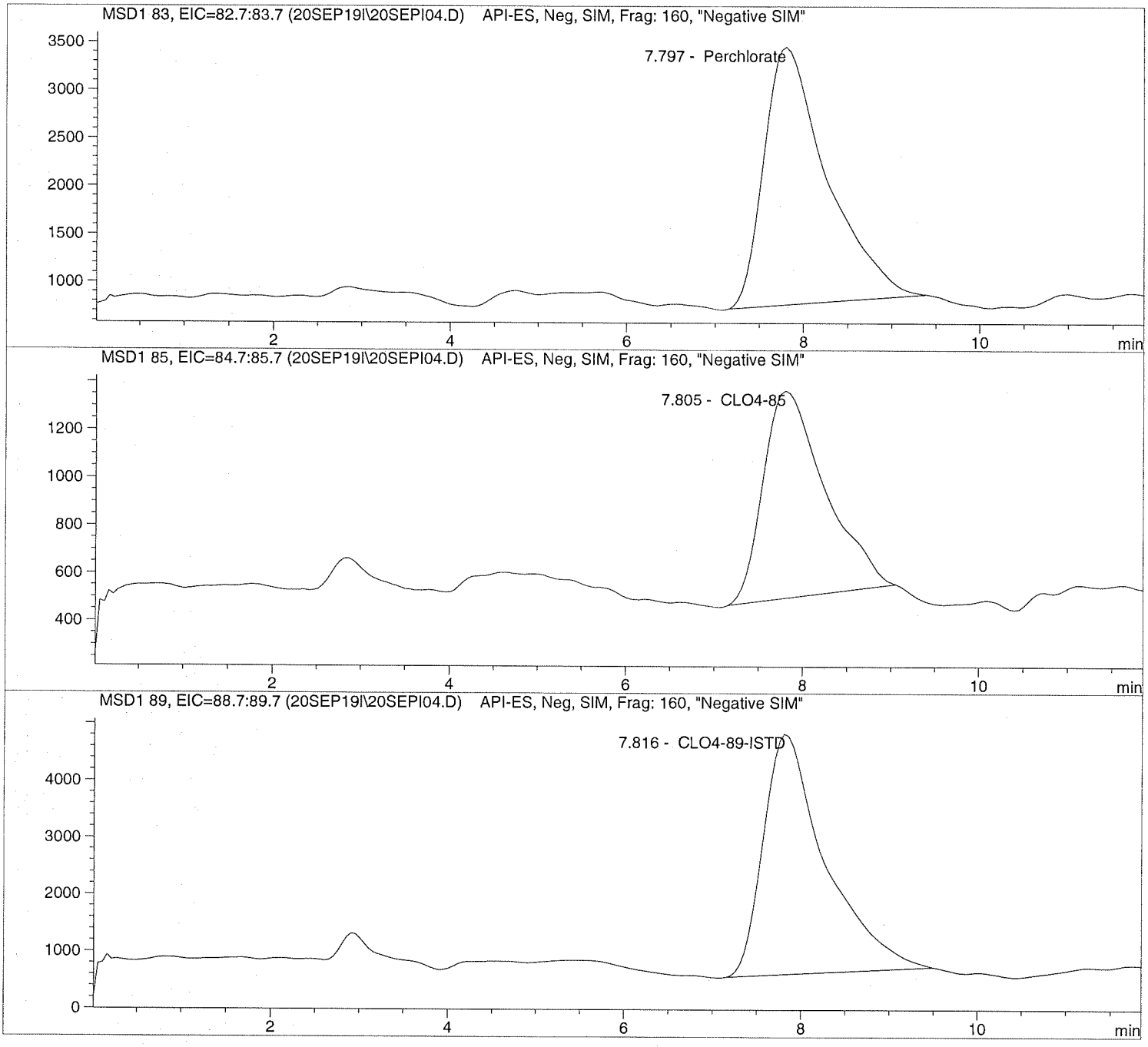
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

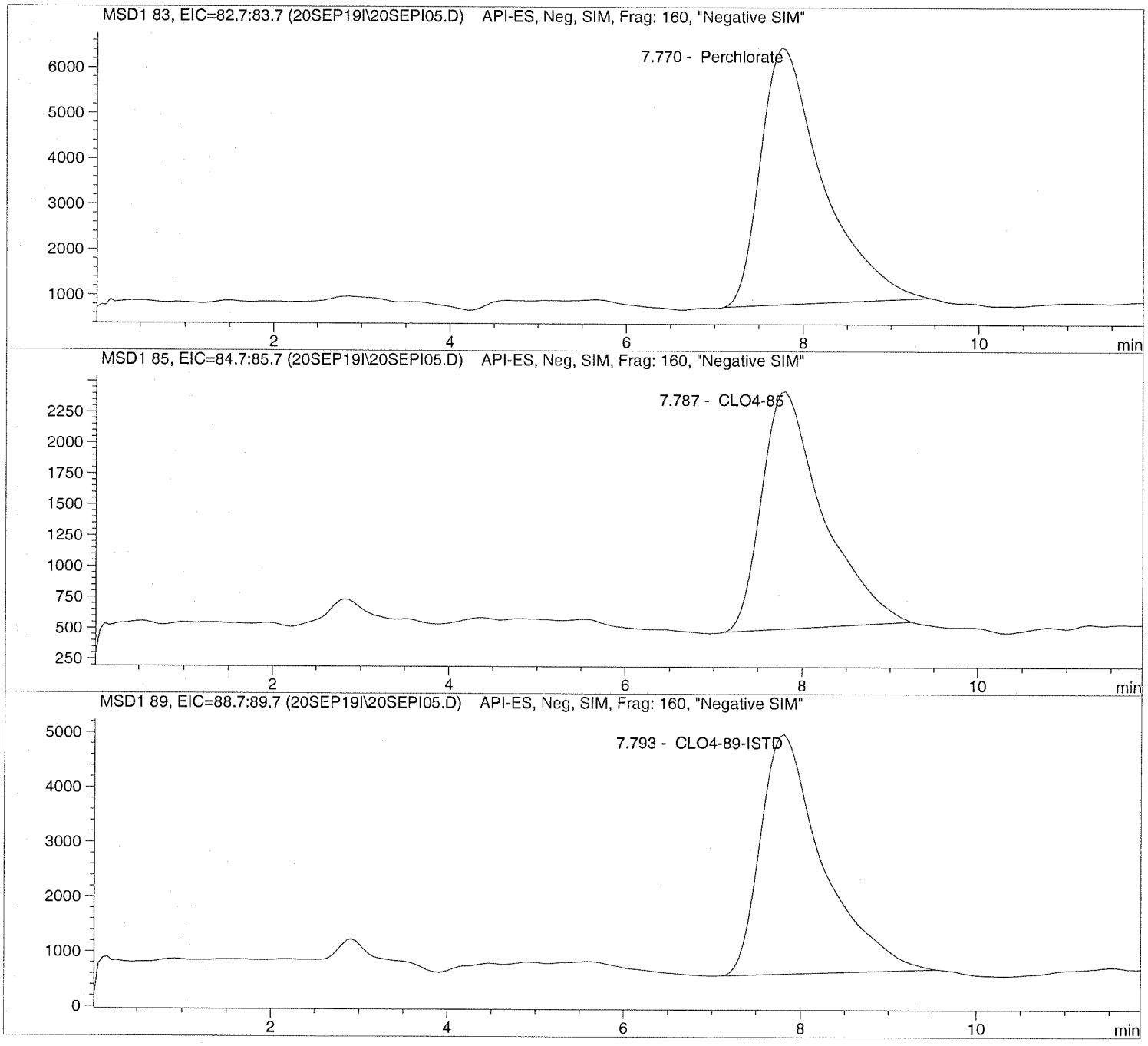
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	9/20/2019 09:51:49	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	9/20/2019 09:51:49	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

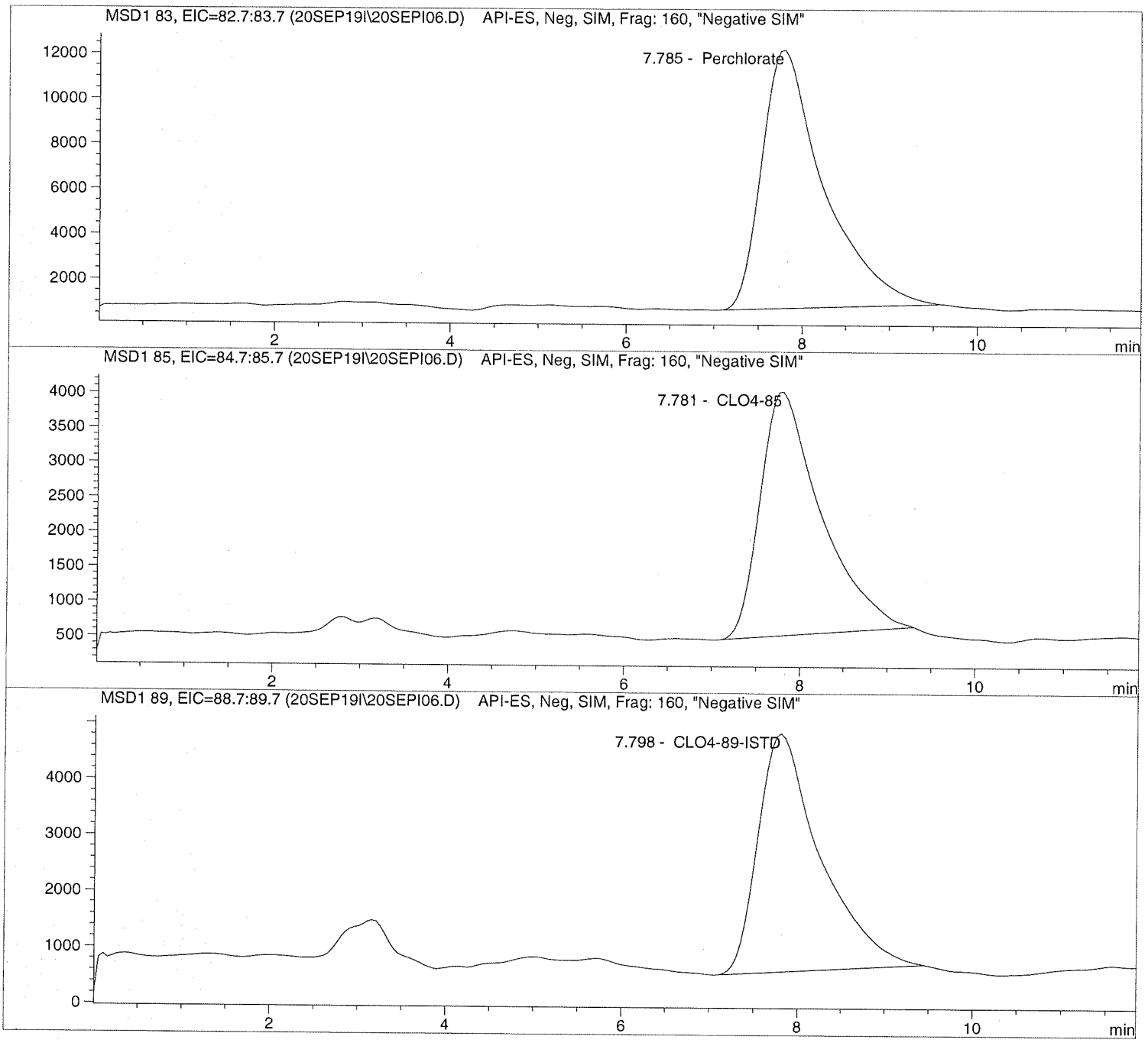
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

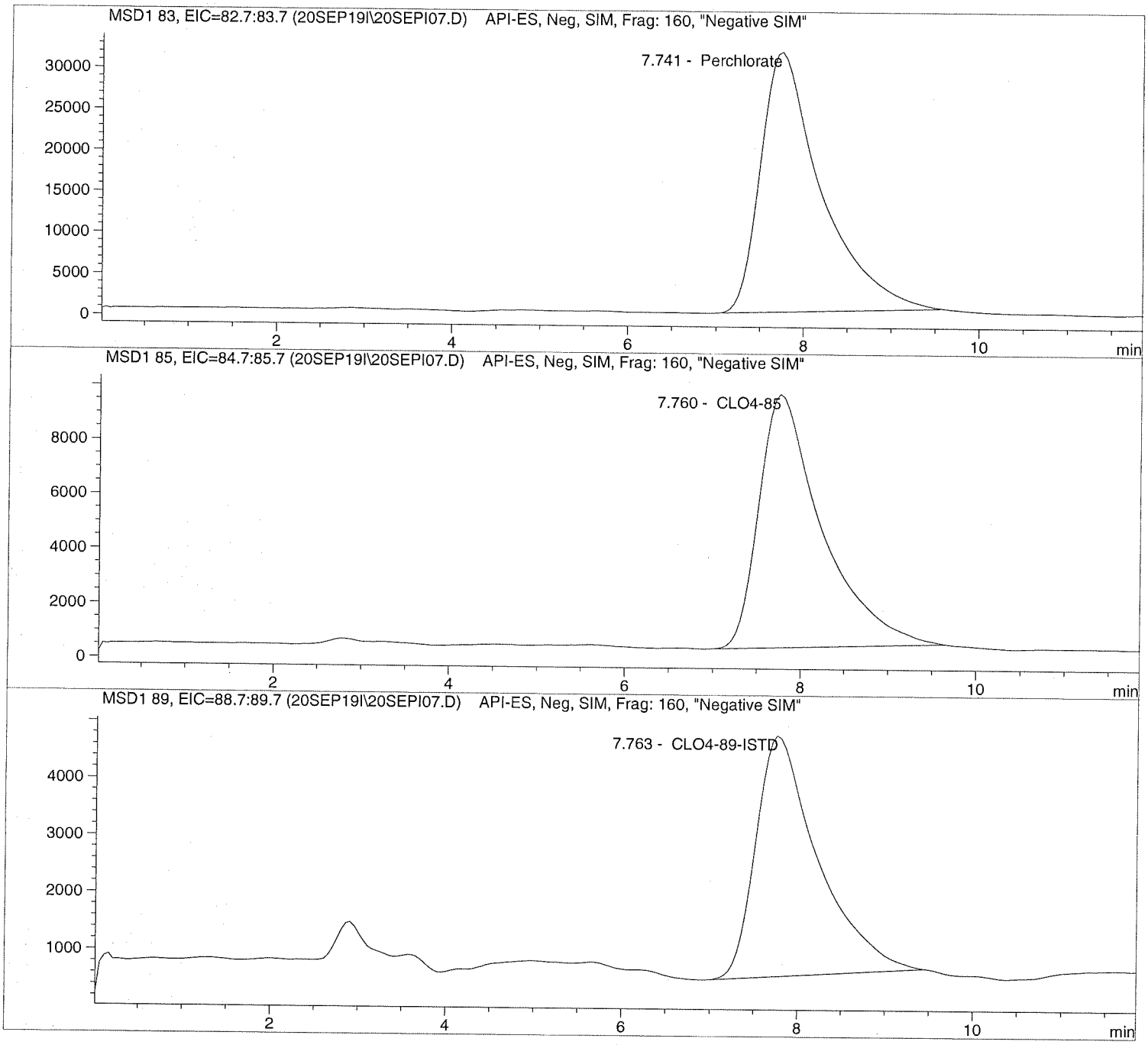
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	9/20/2019 10:19:23	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	9/20/2019 10:19:23	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

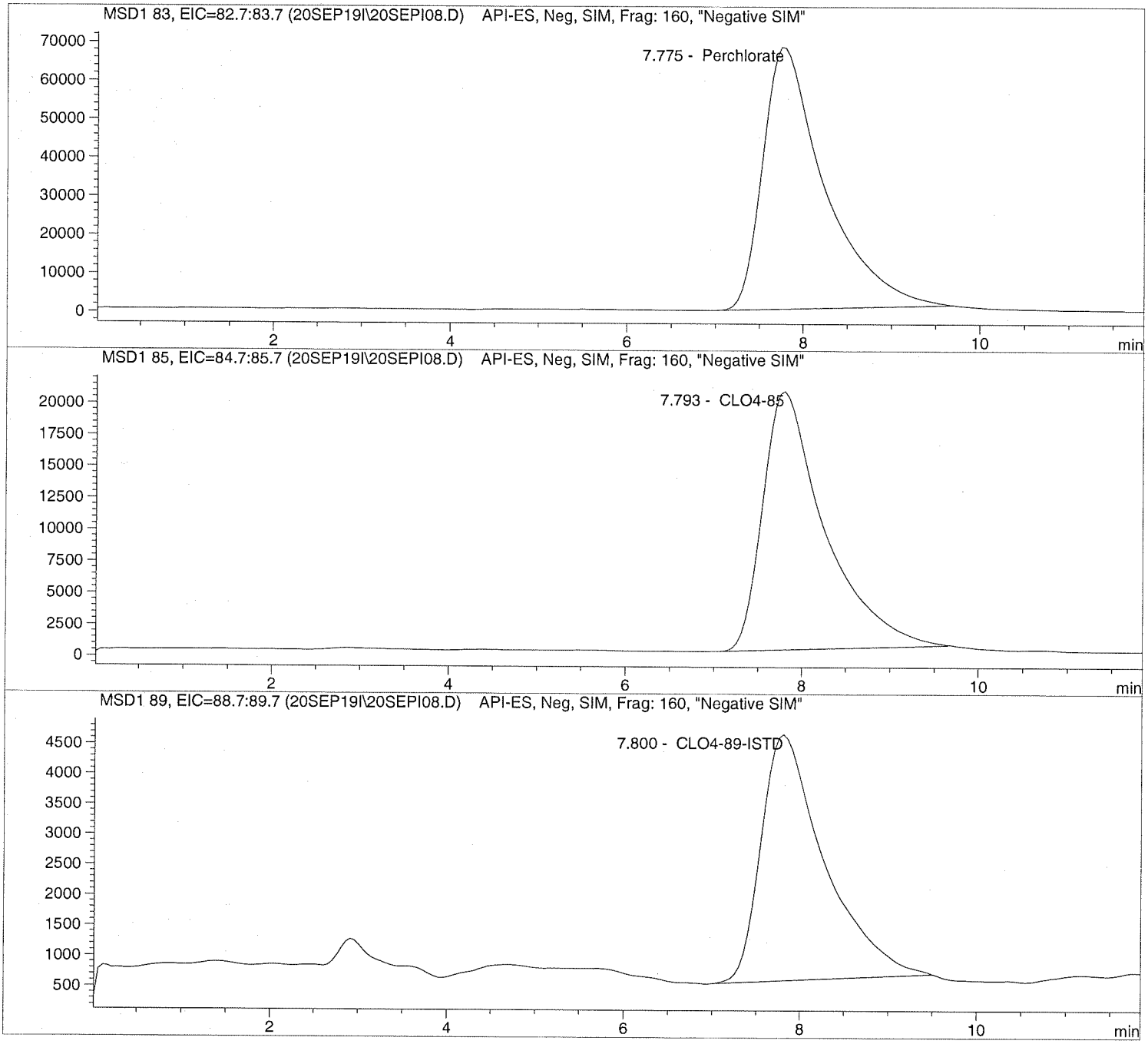
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	9/20/2019 10:33:18	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	9/20/2019 10:33:18	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

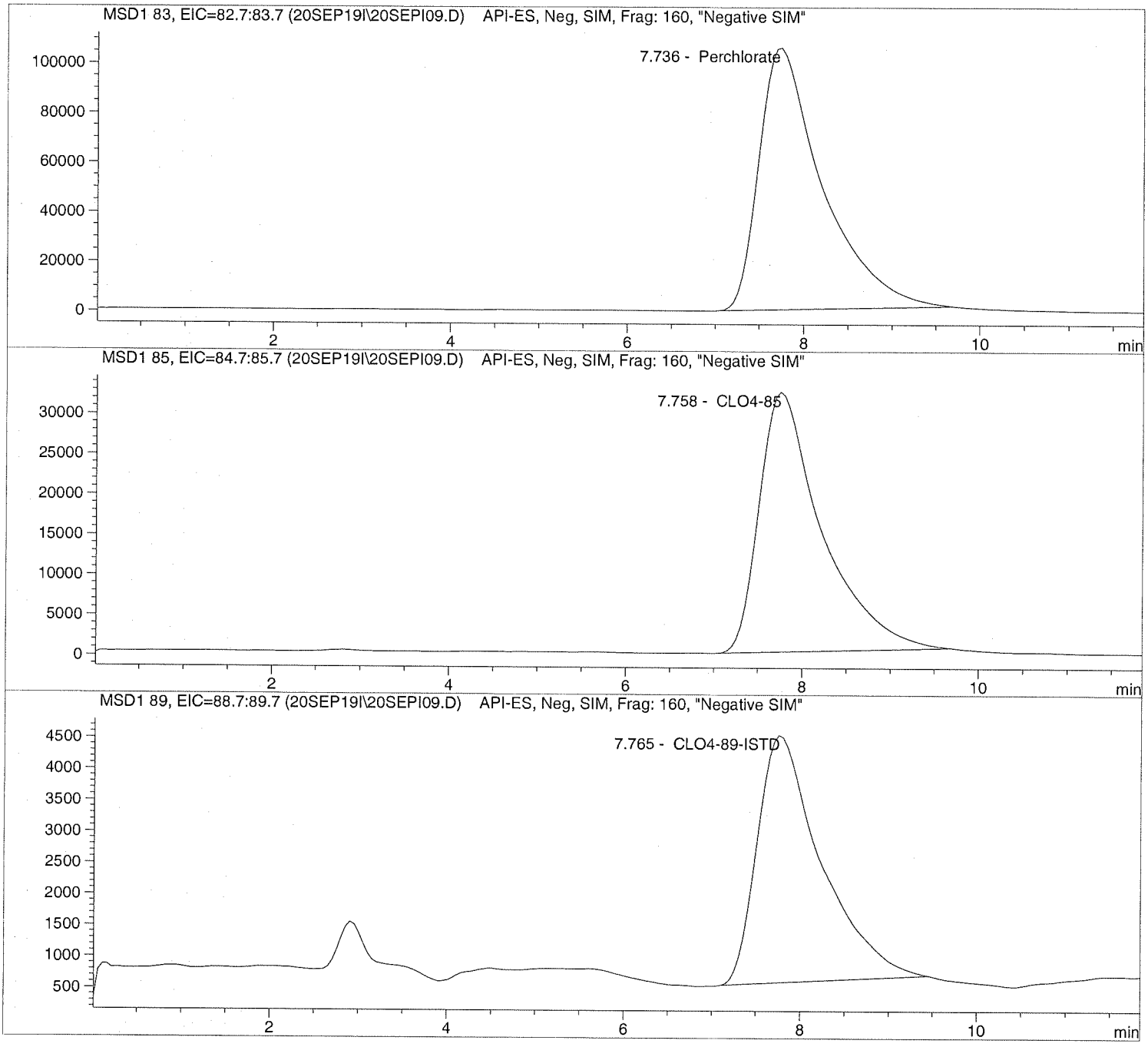
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	9/20/2019 10:47:05	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	9/20/2019 10:47:05	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

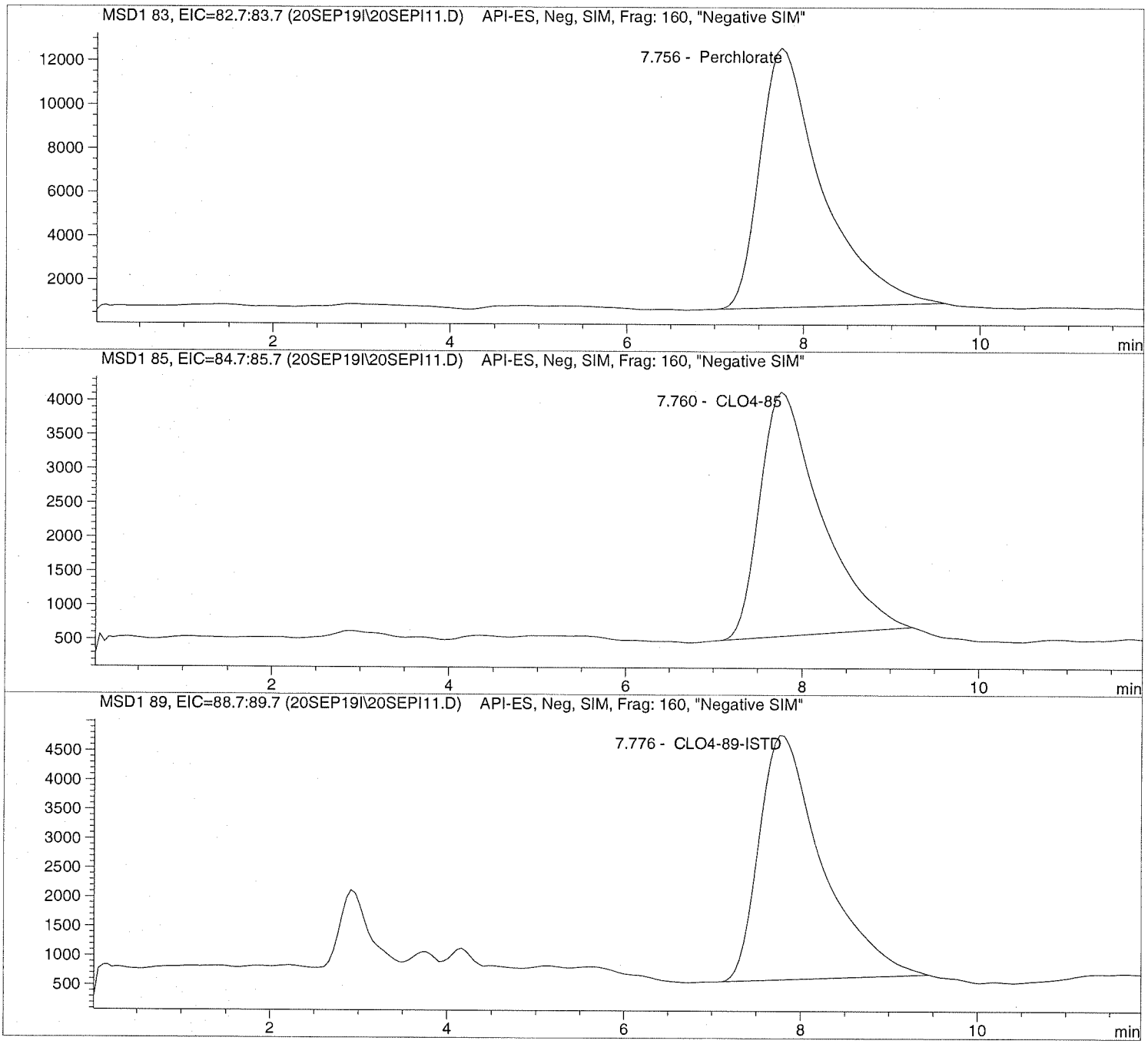
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

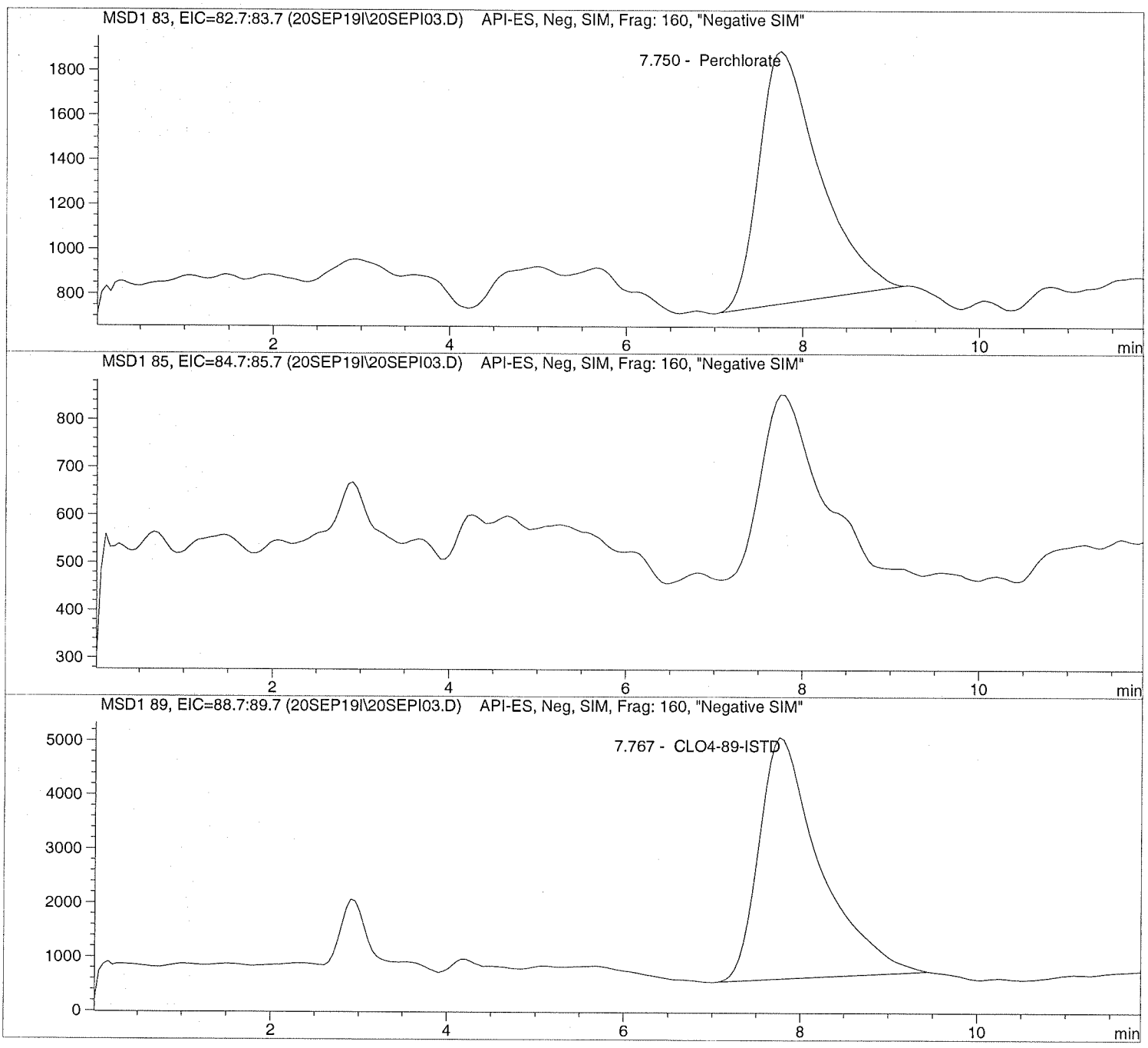
Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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December 10, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19120336**

Laboratory Results for: **Longhorn Army Ammunition Plant -16**

Dear Susan,

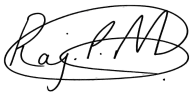
ALS Environmental received 5 sample(s) on Dec 07, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Work Order: HS19120336

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120336-01	16EW11-191206	Water		06-Dec-2019 15:15	07-Dec-2019 09:00	☐
HS19120336-02	16EW12B-191206	Water		06-Dec-2019 15:23	07-Dec-2019 09:00	☐
HS19120336-03	16EW13-191206	Water		06-Dec-2019 15:33	07-Dec-2019 09:00	☐
HS19120336-04	16EW14B-191206	Water		06-Dec-2019 15:48	07-Dec-2019 09:00	☐
HS19120336-05	16EW15-191206	Water		06-Dec-2019 15:55	07-Dec-2019 09:00	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant -16
Work Order: HS19120336

WetChemistry by Method SW9056

Batch ID: R352147

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R352090

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW11-191206
Collection Date: 06-Dec-2019 15:15

ANALYTICAL REPORT
WorkOrder:HS19120336
Lab ID:HS19120336-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**93.4**		**2.50**	**5.00**	**5.00**	**mg/L**	5	09-Dec-2019 14:14
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.91**		**0.300**	**1.00**	**1.00**	**mg/L**	10	09-Dec-2019 18:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW12B-191206
Collection Date: 06-Dec-2019 15:23

ANALYTICAL REPORT
WorkOrder:HS19120336
Lab ID:HS19120336-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**12.7**		**2.50**	**5.00**	**5.00**	**mg/L**	5	09-Dec-2019 19:13
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.60**		**0.300**	**1.00**	**1.00**	**mg/L**	10	09-Dec-2019 18:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW13-191206
Collection Date: 06-Dec-2019 15:33

ANALYTICAL REPORT
WorkOrder:HS19120336
Lab ID:HS19120336-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**9.21**		**1.00**	**2.00**	**2.00**	**mg/L**	2	09-Dec-2019 19:26
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.35**		**0.300**	**1.00**	**1.00**	**mg/L**	10	09-Dec-2019 19:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW14B-191206
Collection Date: 06-Dec-2019 15:48

ANALYTICAL REPORT
WorkOrder:HS19120336
Lab ID:HS19120336-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**20.7**		**2.50**	**5.00**	**5.00**	**mg/L**	5	09-Dec-2019 19:41
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.37**		**0.300**	**1.00**	**1.00**	**mg/L**	10	09-Dec-2019 20:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW15-191206
Collection Date: 06-Dec-2019 15:55

ANALYTICAL REPORT
WorkOrder:HS19120336
Lab ID:HS19120336-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**30.3**		**2.50**	**5.00**	**5.00**	**mg/L**	5	09-Dec-2019 19:56
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.52**		**0.300**	**1.00**	**1.00**	**mg/L**	10	09-Dec-2019 20:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19120336

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R352090 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Water	
HS19120336-01	16EW11-191206	06 Dec 2019 15:15			09 Dec 2019 14:14	5
HS19120336-02	16EW12B-191206	06 Dec 2019 15:23			09 Dec 2019 19:13	5
HS19120336-03	16EW13-191206	06 Dec 2019 15:33			09 Dec 2019 19:26	2
HS19120336-04	16EW14B-191206	06 Dec 2019 15:48			09 Dec 2019 19:41	5
HS19120336-05	16EW15-191206	06 Dec 2019 15:55			09 Dec 2019 19:56	5
Batch ID: R352147 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS19120336-01	16EW11-191206	06 Dec 2019 15:15			09 Dec 2019 18:19	10
HS19120336-02	16EW12B-191206	06 Dec 2019 15:23			09 Dec 2019 18:35	10
HS19120336-03	16EW13-191206	06 Dec 2019 15:33			09 Dec 2019 19:25	10
HS19120336-04	16EW14B-191206	06 Dec 2019 15:48			09 Dec 2019 20:15	10
HS19120336-05	16EW15-191206	06 Dec 2019 15:55			09 Dec 2019 20:31	10

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19120336

QC BATCH REPORT

Batch ID: R352090 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-120919** Units: **mg/L** Analysis Date: **09-Dec-2019 12:09**
Client ID: Run ID: **TOC_02_352090** SeqNo: **5380470** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-120919** Units: **mg/L** Analysis Date: **09-Dec-2019 12:23**
Client ID: Run ID: **TOC_02_352090** SeqNo: **5380471** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.763	1.00	10	0	97.6	85 - 115				

LCSD Sample ID: **WLCSDW1-120919** Units: **mg/L** Analysis Date: **09-Dec-2019 12:36**
Client ID: Run ID: **TOC_02_352090** SeqNo: **5380472** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.71	1.00	10	0	97.1	85 - 115	9.763	0.544	20	

MS Sample ID: **HS19120309-01MS** Units: **mg/L** Analysis Date: **09-Dec-2019 13:02**
Client ID: Run ID: **TOC_02_352090** SeqNo: **5380474** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	59.6	5.00	50	8.325	103	80 - 120				

The following samples were analyzed in this batch: HS19120336-01 HS19120336-02 HS19120336-03 HS19120336-04 HS19120336-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19120336

QC BATCH REPORT

Batch ID: R352147 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-120919** Units: **mg/L** Analysis Date: **09-Dec-2019 15:34**
Client ID: Run ID: **ICS-Integrion_352147** SeqNo: **5381798** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-120919** Units: **mg/L** Analysis Date: **09-Dec-2019 15:50**
Client ID: Run ID: **ICS-Integrion_352147** SeqNo: **5381799** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.805	0.100	4	0	95.1	80 - 120				

LCSD Sample ID: **WLCSDW1-120919** Units: **mg/L** Analysis Date: **09-Dec-2019 16:07**
Client ID: Run ID: **ICS-Integrion_352147** SeqNo: **5381800** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.786	0.100	4	0	94.7	80 - 120	3.805	0.49	20	

MS Sample ID: **HS19120336-02MS** Units: **mg/L** Analysis Date: **09-Dec-2019 18:52**
Client ID: **16EW12B-191206** Run ID: **ICS-Integrion_352147** SeqNo: **5381803** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	19.73	1.00	20	2.604	85.6	80 - 120				

MSD Sample ID: **HS19120336-02MSD** Units: **mg/L** Analysis Date: **09-Dec-2019 19:08**
Client ID: **16EW12B-191206** Run ID: **ICS-Integrion_352147** SeqNo: **5381804** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	19.74	1.00	20	2.604	85.7	80 - 120	19.73	0.0355	20	

The following samples were analyzed in this batch: HS19120336-01 HS19120336-02 HS19120336-03 HS19120336-04 HS19120336-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: **HS19120336**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19120336

Date/Time Received: **07-Dec-2019 09:00**
Received by: **JRM**

Checklist completed by: *Asad Chaudhry* eSignature 7-Dec-2019 Date

Reviewed by: *RJ Modashia* eSignature 9-Dec-2019 Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.9c U/C	IR 25
Cooler(s)/Kit(s):	42759	
Date/Time sample(s) sent to storage:	12/07/2019 10:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: 16DEC2019-Post Injection-191206-ALS

TURNAROUND TIME: 1 business day

RUSH: 1 business day

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stanciff Rd., Suite 210			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Highway, Suite 200		
City	Marshall	State	TX	City	Houston	State	TX	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FedEx		

SAMPLE DETAILS / **ANALYSIS REQUESTED**

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	Sample Container and Preservative	2-40ml Amber/H2SO4	1-250ml /Cool to 6 deg C
									ANALYSIS	TOC by SM5310	Bromide by SW9056
16EW11-191206	16EW11				GW	12/6/2019	1515	3		2	1
16EW12B-191206	16EW12B				GW	12/6/2019	1523	3		2	1
16EW13-191206	16EW13				GW	12/6/2019	1533	3		2	1
16EW14B-191206	16EW14B				GW	12/6/2019	1548	3		2	1
16EW15-191206	16EW15				GW	12/6/2019	1555	3		2	1

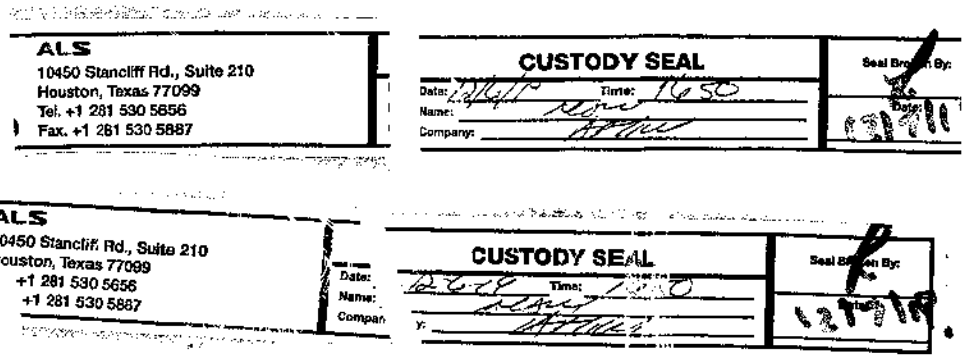
HS19120336

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant -16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	APTIM 12-6-19/1535		J.M ALS	12/7/19 09:00

VIC 3.9 IR#35 CF0.0 42759


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date:
Time:
Name:
Company:
Seal Broken By:
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
+1 281 530 5656
+1 281 530 5887
1595
12.07
CUSTODY SEAL
Time:
Seal Broken By:

FedEx
TRK#
0221
1251 0290 1595
SATURDAY 12
PRIORITY OVERN
XO SGRA
TX-US

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 11, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19120453**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP-16**

Dear Susan,

ALS Environmental received 5 sample(s) on Dec 10, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS19120453

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120453-01	16EW11-191209	Groundwater		09-Dec-2019 16:00	10-Dec-2019 09:15	☐
HS19120453-02	16EW12B-191209	Groundwater		09-Dec-2019 16:08	10-Dec-2019 09:15	☐
HS19120453-03	16EW13-191209	Groundwater		09-Dec-2019 16:14	10-Dec-2019 09:15	☐
HS19120453-04	16EW14B-191209	Groundwater		09-Dec-2019 16:23	10-Dec-2019 09:15	☐
HS19120453-05	16EW15-191209	Groundwater		09-Dec-2019 16:32	10-Dec-2019 09:15	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS19120453

Work Order Comments

- Sample logged in for TOC analysis in Houston Lab per client request. Houston is not DOD certified to analyze TOC.

WetChemistry by Method SW9056

Batch ID: R352268

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R352212

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW11-191209
Collection Date: 09-Dec-2019 16:00

ANALYTICAL REPORT
WorkOrder:HS19120453
Lab ID:HS19120453-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**13.5**		**2.50**	**5.00**	**5.00**	**mg/L**	5	10-Dec-2019 19:58
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.77**		**0.300**	**1.00**	**1.00**	**mg/L**	10	10-Dec-2019 17:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW12B-191209
Collection Date: 09-Dec-2019 16:08

ANALYTICAL REPORT
WorkOrder:HS19120453
Lab ID:HS19120453-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**11.2**		**2.50**	**5.00**	**5.00**	**mg/L**	5	10-Dec-2019 20:42
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.93**		**0.300**	**1.00**	**1.00**	**mg/L**	10	10-Dec-2019 17:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW13-191209
Collection Date: 09-Dec-2019 16:14

ANALYTICAL REPORT
WorkOrder:HS19120453
Lab ID:HS19120453-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**9.54**		**2.50**	**5.00**	**5.00**	**mg/L**	5	10-Dec-2019 20:56
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.23**		**0.300**	**1.00**	**1.00**	**mg/L**	10	10-Dec-2019 17:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW14B-191209
Collection Date: 09-Dec-2019 16:23

ANALYTICAL REPORT
WorkOrder:HS19120453
Lab ID:HS19120453-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**22.6**		**2.50**	**5.00**	**5.00**	**mg/L**	5	10-Dec-2019 21:11
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.48**		**0.300**	**1.00**	**1.00**	**mg/L**	10	10-Dec-2019 18:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW15-191209
Collection Date: 09-Dec-2019 16:32

ANALYTICAL REPORT
WorkOrder:HS19120453
Lab ID:HS19120453-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**26.1**		**2.50**	**5.00**	**5.00**	**mg/L**	5	10-Dec-2019 21:26
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.53**		**0.300**	**1.00**	**1.00**	**mg/L**	10	10-Dec-2019 19:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19120453

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R352212 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS19120453-01	16EW11-191209	09 Dec 2019 16:00			10 Dec 2019 19:58	5
HS19120453-02	16EW12B-191209	09 Dec 2019 16:08			10 Dec 2019 20:42	5
HS19120453-03	16EW13-191209	09 Dec 2019 16:14			10 Dec 2019 20:56	5
HS19120453-04	16EW14B-191209	09 Dec 2019 16:23			10 Dec 2019 21:11	5
HS19120453-05	16EW15-191209	09 Dec 2019 16:32			10 Dec 2019 21:26	5
Batch ID: R352268 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19120453-01	16EW11-191209	09 Dec 2019 16:00			10 Dec 2019 17:05	10
HS19120453-02	16EW12B-191209	09 Dec 2019 16:08			10 Dec 2019 17:21	10
HS19120453-03	16EW13-191209	09 Dec 2019 16:14			10 Dec 2019 17:38	10
HS19120453-04	16EW14B-191209	09 Dec 2019 16:23			10 Dec 2019 18:44	10
HS19120453-05	16EW15-191209	09 Dec 2019 16:32			10 Dec 2019 19:01	10

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19120453

QC BATCH REPORT

Batch ID: R352212 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-121019** Units: **mg/L** Analysis Date: **10-Dec-2019 17:51**
Client ID: Run ID: **TOC_02_352212** SeqNo: **5383075** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-121019** Units: **mg/L** Analysis Date: **10-Dec-2019 18:06**
Client ID: Run ID: **TOC_02_352212** SeqNo: **5383076** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.832	1.00	10	0	98.3	85 - 115				

LCSD Sample ID: **WLCSDW1-121019** Units: **mg/L** Analysis Date: **10-Dec-2019 18:19**
Client ID: Run ID: **TOC_02_352212** SeqNo: **5383077** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.589	1.00	10	0	95.9	85 - 115	9.832	2.5	20	

MS Sample ID: **HS19120114-01MS** Units: **mg/L** Analysis Date: **10-Dec-2019 18:46**
Client ID: Run ID: **TOC_02_352212** SeqNo: **5383079** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	13.32	1.00	10	3.39	99.3	80 - 120				

The following samples were analyzed in this batch: HS19120453-01 HS19120453-02 HS19120453-03 HS19120453-04 HS19120453-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19120453

QC BATCH REPORT

Batch ID: R352268 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-121019** Units: **mg/L** Analysis Date: **10-Dec-2019 10:22**
Client ID: Run ID: **ICS-Integrion_352268** SeqNo: **5384195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-121019** Units: **mg/L** Analysis Date: **10-Dec-2019 10:38**
Client ID: Run ID: **ICS-Integrion_352268** SeqNo: **5384196** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.832	0.100	4	0	95.8	80 - 120				

LCSD Sample ID: **WLCSDW1-121019** Units: **mg/L** Analysis Date: **10-Dec-2019 10:55**
Client ID: Run ID: **ICS-Integrion_352268** SeqNo: **5384197** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.811	0.100	4	0	95.3	80 - 120	3.832	0.544	20	

MS Sample ID: **HS19120456-01MS** Units: **mg/L** Analysis Date: **10-Dec-2019 19:34**
Client ID: Run ID: **ICS-Integrion_352268** SeqNo: **5384211** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.616	0.100	2	0	80.8	80 - 120				

MS Sample ID: **HS19120367-01MS** Units: **mg/L** Analysis Date: **10-Dec-2019 11:28**
Client ID: Run ID: **ICS-Integrion_352268** SeqNo: **5384199** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	16.57	1.00	20	0	82.8	80 - 120				

MSD Sample ID: **HS19120456-01MSD** Units: **mg/L** Analysis Date: **10-Dec-2019 19:51**
Client ID: Run ID: **ICS-Integrion_352268** SeqNo: **5384212** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1.619	0.100	2	0	80.9	80 - 120	1.616	0.148	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19120453

QC BATCH REPORT

Batch ID: R352268 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19120367-01MSD** Units: **mg/L** Analysis Date: **10-Dec-2019 11:45**
Client ID: Run ID: **ICS-Integrion_352268** SeqNo: **5384200** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	16.59	1.00	20	0	83.0	80 - 120	16.57	0.157	20	

The following samples were analyzed in this batch: HS19120453-01 HS19120453-02 HS19120453-03 HS19120453-04 HS19120453-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: **HS19120453**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 11-Dec-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19120453
Date/Time Received: **10-Dec-2019 09:15**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 10-Dec-2019 Date
Reviewed by: *RJ Modashia* eSignature 10-Dec-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.1°C / 1.1°C UC/C	IR11	
Cooler(s)/Kit(s):	44672		
Date/Time sample(s) sent to storage:	12/10/2019 13:50		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: 16DEC2019-Post Injection-191209-ALS

TURNAROUND TIME: 1 business day

RUSH: 1 business day

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Highway, Suite 200		
City	Marshall	State	TX	City	Houston	State	TX	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company			

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	TOC by SM5310 (2-40ml Amber/H2SO4)	Bromide by SW9056 (1-250ml /Cool to 6 deg C)
16EW11-191209	16EW11				GW	12/9/2019	1600	3		2	1
16EW12B-191209	16EW12B				GW	12/9/2019	1608	3		2	1
16EW13-191209	16EW13				GW	12/9/2019	1614	3		2	1
16EW14B-191209	16EW14B				GW	12/9/2019	1623	3		2	1
16EW15-191209	16EW15				GW	12/9/2019	1632	3		2	1

HS19120453

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Cooler 44672 1K11 Temp 1.1 CF0.0	[signature]	12/9/19 1641	J. Mauan	12/10/19 09:15

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

ww672

CUSTODY SEAL

Date: 12-9-19 Time: 1452
Name: [illegible]
Company: [illegible]

Seal Broken By: SM
Date: 12/10/19

ww672

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

ww672

CUSTODY SEAL

Date: 12-9-19 Time: 1452
Name: [illegible]
Company: [illegible]

Seal Broken By: SM
Date: 12/10/19

Must Deliver Next Business Day
Time and Tempature Sensitive!

ww672

ORIGIN ID:SGRA (903) 930-8193
MIKE MARTINEZ
APTIM ENVIRONMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 203
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 010CT19
ACTWGT: 1.00 LB MAN
CAD: 3C0130/CAFE3211
DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-17-SOIL-BD 67936-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0250 1551

TUE - 10 DEC 10:30
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 16, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19120673**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP-16**

Dear Susan,

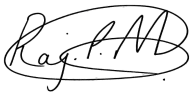
ALS Environmental received 5 sample(s) on Dec 13, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS19120673

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120673-01	16EW11-191212	Groundwater		12-Dec-2019 11:15	13-Dec-2019 09:00	☐
HS19120673-02	16EW12B-191212	Groundwater		12-Dec-2019 11:20	13-Dec-2019 09:00	☐
HS19120673-03	16EW13-191212	Groundwater		12-Dec-2019 11:25	13-Dec-2019 09:00	☐
HS19120673-04	16EW14B-191212	Groundwater		12-Dec-2019 11:30	13-Dec-2019 09:00	☐
HS19120673-05	16EW15-191212	Groundwater		12-Dec-2019 11:35	13-Dec-2019 09:00	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS19120673

WetChemistry by Method SM5310B

Batch ID: R352625

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R352614

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW11-191212
Collection Date: 12-Dec-2019 11:15

ANALYTICAL REPORT
WorkOrder:HS19120673
Lab ID:HS19120673-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: KMU
Organic Carbon, Total	**11.2**		**0.500**	**1.00**	**1.00**	**mg/L**	1	16-Dec-2019 14:13
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**3.92**		**0.300**	**1.00**	**1.00**	**mg/L**	10	14-Dec-2019 12:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW12B-191212
Collection Date: 12-Dec-2019 11:20

ANALYTICAL REPORT
WorkOrder:HS19120673
Lab ID:HS19120673-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: KMU
Organic Carbon, Total	**11.8**		**0.500**	**1.00**	**1.00**	**mg/L**	1	16-Dec-2019 14:40
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.94**		**0.300**	**1.00**	**1.00**	**mg/L**	10	14-Dec-2019 12:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW13-191212
Collection Date: 12-Dec-2019 11:25

ANALYTICAL REPORT
WorkOrder:HS19120673
Lab ID:HS19120673-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: KMU
Organic Carbon, Total	**10.2**		**0.500**	**1.00**	**1.00**	**mg/L**	1	16-Dec-2019 14:55
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.53**		**0.300**	**1.00**	**1.00**	**mg/L**	10	14-Dec-2019 13:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW14B-191212
Collection Date: 12-Dec-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19120673
Lab ID:HS19120673-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: KMU
Organic Carbon, Total	**21.0**		**0.500**	**1.00**	**1.00**	**mg/L**	1	16-Dec-2019 15:10
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.43**		**0.300**	**1.00**	**1.00**	**mg/L**	10	14-Dec-2019 13:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW15-191212
Collection Date: 12-Dec-2019 11:35

ANALYTICAL REPORT
WorkOrder:HS19120673
Lab ID:HS19120673-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: KMU
Organic Carbon, Total	**27.4**		**0.500**	**1.00**	**1.00**	**mg/L**	1	16-Dec-2019 15:26
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.48**		**0.300**	**1.00**	**1.00**	**mg/L**	10	14-Dec-2019 13:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19120673

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R352614 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19120673-01	16EW11-191212	12 Dec 2019 11:15			14 Dec 2019 12:43	10
HS19120673-02	16EW12B-191212	12 Dec 2019 11:20			14 Dec 2019 12:59	10
HS19120673-03	16EW13-191212	12 Dec 2019 11:25			14 Dec 2019 13:16	10
HS19120673-04	16EW14B-191212	12 Dec 2019 11:30			14 Dec 2019 13:32	10
HS19120673-05	16EW15-191212	12 Dec 2019 11:35			14 Dec 2019 13:49	10
Batch ID: R352625 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS19120673-01	16EW11-191212	12 Dec 2019 11:15			16 Dec 2019 14:13	1
HS19120673-02	16EW12B-191212	12 Dec 2019 11:20			16 Dec 2019 14:40	1
HS19120673-03	16EW13-191212	12 Dec 2019 11:25			16 Dec 2019 14:55	1
HS19120673-04	16EW14B-191212	12 Dec 2019 11:30			16 Dec 2019 15:10	1
HS19120673-05	16EW15-191212	12 Dec 2019 11:35			16 Dec 2019 15:26	1

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19120673

QC BATCH REPORT

Batch ID: R352614 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW3-121319** Units: **mg/L** Analysis Date: **14-Dec-2019 11:53**
Client ID: Run ID: **ICS-Integrion_352614** SeqNo: **5392610** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW3-121319** Units: **mg/L** Analysis Date: **14-Dec-2019 12:09**
Client ID: Run ID: **ICS-Integrion_352614** SeqNo: **5392611** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.746	0.100	4	0	93.7	80 - 120				

LCSD Sample ID: **WLCSDW3-121319** Units: **mg/L** Analysis Date: **14-Dec-2019 12:26**
Client ID: Run ID: **ICS-Integrion_352614** SeqNo: **5392612** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.719	0.100	4	0	93.0	80 - 120	3.746	0.742	20	

MS Sample ID: **HS19120363-06MS** Units: **mg/L** Analysis Date: **14-Dec-2019 19:21**
Client ID: Run ID: **ICS-Integrion_352614** SeqNo: **5392627** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	177.7	10.0	200	8.75	84.5	80 - 120				

MS Sample ID: **HS19120363-06MS** Units: **mg/L** Analysis Date: **14-Dec-2019 18:31**
Client ID: Run ID: **ICS-Integrion_352614** SeqNo: **5392624** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	24.33	1.00	20	6.449	89.4	80 - 120				

MSD Sample ID: **HS19120363-06MSD** Units: **mg/L** Analysis Date: **14-Dec-2019 19:38**
Client ID: Run ID: **ICS-Integrion_352614** SeqNo: **5392628** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	177.5	10.0	200	8.75	84.4	80 - 120	177.7	0.158	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19120673

QC BATCH REPORT

Batch ID: R352614 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19120363-06MSD** Units: **mg/L** Analysis Date: **14-Dec-2019 18:48**
Client ID: Run ID: **ICS-Integrion_352614** SeqNo: **5392625** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	24.32	1.00	20	6.449	89.3	80 - 120	24.33	0.0658	20	

The following samples were analyzed in this batch: HS19120673-01 HS19120673-02 HS19120673-03 HS19120673-04 HS19120673-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19120673

QC BATCH REPORT

Batch ID: R352625 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-121619** Units: **mg/L** Analysis Date: **16-Dec-2019 13:30**
Client ID: Run ID: **TOC_02_352625** SeqNo: **5392879** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-121619** Units: **mg/L** Analysis Date: **16-Dec-2019 13:45**
Client ID: Run ID: **TOC_02_352625** SeqNo: **5392880** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.51	1.00	10	0	105	85 - 115				

LCSD Sample ID: **WLCSDW1-121619** Units: **mg/L** Analysis Date: **16-Dec-2019 14:00**
Client ID: Run ID: **TOC_02_352625** SeqNo: **5392881** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.66	1.00	10	0	107	85 - 115	10.51	1.42	20	

MS Sample ID: **HS19120673-01MS** Units: **mg/L** Analysis Date: **16-Dec-2019 14:27**
Client ID: **16EW11-191212** Run ID: **TOC_02_352625** SeqNo: **5392883** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	22.11	1.00	10	11.18	109	80 - 120				

The following samples were analyzed in this batch: HS19120673-01 HS19120673-02 HS19120673-03 HS19120673-04 HS19120673-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: **HS19120673**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19120673

Date/Time Received: **13-Dec-2019 09:00**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 13-Dec-2019 Date

Reviewed by: *RJ Modashia* eSignature 13-Dec-2019 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.1°C / 2.1°C UC/C	IR11
Cooler(s)/Kit(s):	44016	
Date/Time sample(s) sent to storage:	12/13/2019 13:21	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

Page 1 of _____

COC ID: 16DEC2019-Post Injection-191212-ALS

TURNAROUND TIME: 1 business day

RUSH: 1 business day

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Highway, Suite 200		
City	Marshall	State	TX	City	Houston	State	TX	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company			

SAMPLE DETAILS / ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	TOC by SM5310 (2-40ml Amber/H2SO4)	Bromide by SW9056 (1-250ml /Cool to 6 deg C)
16EW11-191212	16EW11				GW	12/12/2019	1115	3		2	1
16EW12B-191212	16EW12B				GW	12/12/2019	1120	3		2	1
16EW13-191212	16EW13				GW	12/12/2019	1125	3		2	1
16EW14B-191212	16EW14B				GW	12/12/2019	1130	3		2	1
16EW15-191212	16EW15				GW	12/12/2019	1135	3		2	1

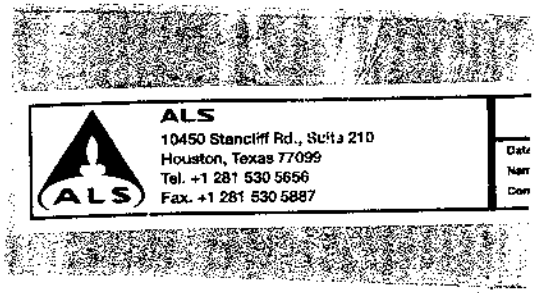
HS19120673

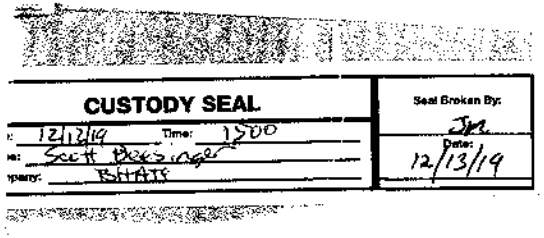
Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
44014 2.1 u/c IR11 C/F 0			Jm Fedex	12/13/19 9:00

FedEx
TRK# 0221 1251 0291 3740
FRI - 13 DEC 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US IAH


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887


CUSTODY SEAL
Seal Broken By:
Time:
Date:
12/13/19

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 24, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19121088**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP-16**

Dear Susan,

ALS Environmental received 5 sample(s) on Dec 19, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS19121088

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121088-01	16EW11-191218	Groundwater		18-Dec-2019 11:31	19-Dec-2019 10:20	☐
HS19121088-02	16EW12B-191218	Groundwater		18-Dec-2019 11:38	19-Dec-2019 10:20	☐
HS19121088-03	16EW13-191218	Groundwater		18-Dec-2019 11:47	19-Dec-2019 10:20	☐
HS19121088-04	16EW14B-191218	Groundwater		18-Dec-2019 11:58	19-Dec-2019 10:20	☐
HS19121088-05	16EW15-191218	Groundwater		18-Dec-2019 12:06	19-Dec-2019 10:20	☐

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS19121088

CASE NARRATIVE

WetChemistry by Method SM5310B

Batch ID: R353185

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R353133

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW11-191218
Collection Date: 18-Dec-2019 11:31

ANALYTICAL REPORT
WorkOrder:HS19121088
Lab ID:HS19121088-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**15.6**		**2.50**	**5.00**	**5.00**	**mg/L**	5	23-Dec-2019 20:47
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.58**		**0.300**	**1.00**	**1.00**	**mg/L**	10	23-Dec-2019 11:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW12B-191218
Collection Date: 18-Dec-2019 11:38

ANALYTICAL REPORT
WorkOrder:HS19121088
Lab ID:HS19121088-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**13.8**		**2.50**	**5.00**	**5.00**	**mg/L**	5	23-Dec-2019 21:12
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.93**		**0.300**	**1.00**	**1.00**	**mg/L**	10	23-Dec-2019 12:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW13-191218
Collection Date: 18-Dec-2019 11:47

ANALYTICAL REPORT
WorkOrder:HS19121088
Lab ID:HS19121088-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**23.9**		**2.50**	**5.00**	**5.00**	**mg/L**	5	23-Dec-2019 21:23
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.52**		**0.300**	**1.00**	**1.00**	**mg/L**	10	23-Dec-2019 12:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW14B-191218
Collection Date: 18-Dec-2019 11:58

ANALYTICAL REPORT
WorkOrder:HS19121088
Lab ID:HS19121088-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**22.1**		**2.50**	**5.00**	**5.00**	**mg/L**	5	23-Dec-2019 21:34
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.65**		**0.300**	**1.00**	**1.00**	**mg/L**	10	23-Dec-2019 12:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW15-191218
Collection Date: 18-Dec-2019 12:06

ANALYTICAL REPORT
WorkOrder:HS19121088
Lab ID:HS19121088-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**26.7**		**2.50**	**5.00**	**5.00**	**mg/L**	5	23-Dec-2019 21:45
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.59**		**0.300**	**1.00**	**1.00**	**mg/L**	10	23-Dec-2019 12:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19121088

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R353133 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19121088-01	16EW11-191218	18 Dec 2019 11:31			23 Dec 2019 11:19	10
HS19121088-02	16EW12B-191218	18 Dec 2019 11:38			23 Dec 2019 12:09	10
HS19121088-03	16EW13-191218	18 Dec 2019 11:47			23 Dec 2019 12:25	10
HS19121088-04	16EW14B-191218	18 Dec 2019 11:58			23 Dec 2019 12:42	10
HS19121088-05	16EW15-191218	18 Dec 2019 12:06			23 Dec 2019 12:59	10
Batch ID: R353185 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS19121088-01	16EW11-191218	18 Dec 2019 11:31			23 Dec 2019 20:47	5
HS19121088-02	16EW12B-191218	18 Dec 2019 11:38			23 Dec 2019 21:12	5
HS19121088-03	16EW13-191218	18 Dec 2019 11:47			23 Dec 2019 21:23	5
HS19121088-04	16EW14B-191218	18 Dec 2019 11:58			23 Dec 2019 21:34	5
HS19121088-05	16EW15-191218	18 Dec 2019 12:06			23 Dec 2019 21:45	5

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19121088

QC BATCH REPORT

Batch ID: R353133 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-122119** Units: **mg/L** Analysis Date: **23-Dec-2019 10:29**
Client ID: Run ID: **ICS-Integrion_353133** SeqNo: **5405808** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-122119** Units: **mg/L** Analysis Date: **23-Dec-2019 10:46**
Client ID: Run ID: **ICS-Integrion_353133** SeqNo: **5405809** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.756	0.100	4	0	93.9	80 - 120				

LCSD Sample ID: **WLCSDW1-122119** Units: **mg/L** Analysis Date: **23-Dec-2019 11:02**
Client ID: Run ID: **ICS-Integrion_353133** SeqNo: **5405810** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.715	0.100	4	0	92.9	80 - 120	3.756	1.09	20	

MS Sample ID: **HS19121088-01MS** Units: **mg/L** Analysis Date: **23-Dec-2019 11:36**
Client ID: **16EW11-191218** Run ID: **ICS-Integrion_353133** SeqNo: **5405812** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	22.32	1.00	20	4.578	88.7	80 - 120				

MSD Sample ID: **HS19121088-01MSD** Units: **mg/L** Analysis Date: **23-Dec-2019 11:52**
Client ID: **16EW11-191218** Run ID: **ICS-Integrion_353133** SeqNo: **5405813** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.74	1.00	20	4.578	85.8	80 - 120	22.32	2.61	20	

The following samples were analyzed in this batch: HS19121088-01 HS19121088-02 HS19121088-03 HS19121088-04 HS19121088-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS19121088

QC BATCH REPORT

Batch ID: R353185 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW1-122319** Units: **mg/L** Analysis Date: **23-Dec-2019 19:59**
Client ID: Run ID: **TOC_02_353185** SeqNo: **5406774** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW1-122319** Units: **mg/L** Analysis Date: **23-Dec-2019 20:12**
Client ID: Run ID: **TOC_02_353185** SeqNo: **5406775** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.355	1.00	10	0	93.6	85 - 115				

LCSD Sample ID: **WLCSDW1-122319** Units: **mg/L** Analysis Date: **23-Dec-2019 20:23**
Client ID: Run ID: **TOC_02_353185** SeqNo: **5406776** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.283	1.00	10	0	92.8	85 - 115	9.355	0.773	20	

MS Sample ID: **HS19121088-01MS** Units: **mg/L** Analysis Date: **23-Dec-2019 21:01**
Client ID: **16EW11-191218** Run ID: **TOC_02_353185** SeqNo: **5406779** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	63.95	5.00	50	15.64	96.6	80 - 120				

The following samples were analyzed in this batch: HS19121088-01 HS19121088-02 HS19121088-03 HS19121088-04 HS19121088-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: **HS19121088**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS19121088

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19121088-01	16EW11-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393
HS19121088-01	16EW11-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393
HS19121088-02	16EW12B-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393
HS19121088-02	16EW12B-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393
HS19121088-03	16EW13-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393
HS19121088-03	16EW13-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393
HS19121088-04	16EW14B-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393
HS19121088-04	16EW14B-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393
HS19121088-05	16EW15-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393
HS19121088-05	16EW15-191218	Login	12/19/2019 4:58:24 PM	RPG	WET393

ALS Houston, US Date: 24-Dec-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19121088
Date/Time Received: **19-Dec-2019 10:20**
Received by: **NDR**

Checklist completed by: *Raegen Giga* eSignature 19-Dec-2019 Date
Reviewed by: *Corey Grandits* eSignature 20-Dec-2019 Date

Matrices: **GW**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.2c uc/c	IR 25
Cooler(s)/Kit(s):	44591	
Date/Time sample(s) sent to storage:	12/19/2019 17:02	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

Page 1 of 1

COC ID: 16NOV2019-Post Injection-191218-ALS

TURNAROUND TIME: 1 business day

RUSH: 1 business day

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@aptim.com		
Project Number	501032			Lab Contact	RJ Modashia						
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Email Report To	Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Susan Huang		
	PMB 202							Address	4005 Port Chicago Highway, Suite 200		
City	Marshall	State	TX	City	Houston	State	TX	City	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	94520	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company			

SAMPLE DETAILS

ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	TOC by SM5310	Bromide by SW9056
								Sample Container and Preservatives		2-40ml Amber/H2SO4	1-250ml /Cool to 6 deg C
16EW11-191218	16EW11				GW	12/18/2019	1131	3		2	1
16EW12B-191218	16EW12B				GW	12/18/2019	1138	3		2	1
16EW13-191218	16EW13				GW	12/18/2019	1147	3		2	1
16EW14B-191218	16EW14B				GW	12/18/2019	1158	3		2	1
16EW15-191218	16EW15				GW	12/18/2019	1206	3		2	1

HS19121088

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP-16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] Aptim	12-18-19/1950	NL ALS	12/19/19 1020

44591 Temp adc 0.2

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44591

CUSTODY SEAL

Date: 12-18-19 Time: 1500
Name: [illegible]
Company: [illegible]

Seal Broken By: [illegible]
Date: 12/19/19

44591 DEC 19 2019

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44591

CUSTODY SEAL

Date: 12-18-19 Time: 1500
Name: [illegible]
Company: [illegible]

Seal Broken By: [illegible]
Date: 12/19/19

Must Deliver Next Business Day
Time and Tempature Sensitive!

44591

ORIGIN ID:SGRA (903) 930-8193
SCOTT BEESINGER
APTIM ENVIRONMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 02DEC19
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 19x16x13 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16 - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0292 4600

THU - 19 DEC 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

FTD 5090257 18DEC19 GGGA 55AC2/18DD/85A2

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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WorkOrder: HS19121313

Longhorn Army Ammunition Plant -16

Aptim Environmental & Infrastucture, Inc.

Susan Huang
2500 City West Blvd., Suite 1700
Houston TX 77042

31-Dec-2019

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
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HS19121313 Longhorn Army Ammunition Plant
16 Final

ALS WO# HS19121313

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 30, 2019

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19121313**

Laboratory Results for: **Longhorn Army Ammunition Plant -16**

Dear Susan,

ALS Environmental received 5 sample(s) on Dec 24, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Work Order: HS19121313

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121313-01	16EW05-E2-191223	Groundwater		23-Dec-2019 08:30	24-Dec-2019 09:45	☐
HS19121313-02	16EW06-E2-191223	Groundwater		23-Dec-2019 09:25	24-Dec-2019 09:45	☐
HS19121313-03	16EW06-E2-191223-FD	Groundwater		23-Dec-2019 09:25	24-Dec-2019 09:45	☐
HS19121313-04	16EW07-E2-191223	Groundwater		23-Dec-2019 10:20	24-Dec-2019 09:45	☐
HS19121313-05	16EW08-E2-191223	Groundwater		23-Dec-2019 11:30	24-Dec-2019 09:45	☐

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Work Order: HS19121313

CASE NARRATIVE

WetChemistry by Method SM5310B

Batch ID: R353497

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R353307

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW05-E2-191223
Collection Date: 23-Dec-2019 08:30

ANALYTICAL REPORT
WorkOrder:HS19121313
Lab ID:HS19121313-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**22,900**		**1000**	**2000**	**2000**	**mg/L**	2000	28-Dec-2019 06:02
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**350**		**6.00**	**20.0**	**20.0**	**mg/L**	200	26-Dec-2019 11:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW06-E2-191223
Collection Date: 23-Dec-2019 09:25

ANALYTICAL REPORT
WorkOrder:HS19121313
Lab ID:HS19121313-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**144,000**		**2000**	**4000**	**4000**	**mg/L**	4000	30-Dec-2019 10:44
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**521**		**12.0**	**40.0**	**40.0**	**mg/L**	400	26-Dec-2019 11:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW06-E2-191223-FD
Collection Date: 23-Dec-2019 09:25

ANALYTICAL REPORT
WorkOrder:HS19121313
Lab ID:HS19121313-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**137,000**		**2000**	**4000**	**4000**	**mg/L**	4000	30-Dec-2019 10:59
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**539**		**12.0**	**40.0**	**40.0**	**mg/L**	400	26-Dec-2019 12:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW07-E2-191223
Collection Date: 23-Dec-2019 10:20

ANALYTICAL REPORT
WorkOrder:HS19121313
Lab ID:HS19121313-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**48,000**		**1000**	**2000**	**2000**	**mg/L**	2000	28-Dec-2019 07:11
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**357**		**15.0**	**50.0**	**50.0**	**mg/L**	500	26-Dec-2019 12:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
Sample ID: 16EW08-E2-191223
Collection Date: 23-Dec-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19121313
Lab ID:HS19121313-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: MWG
Organic Carbon, Total	**38,000**		**1000**	**2000**	**2000**	**mg/L**	2000	28-Dec-2019 07:57
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**379**		**12.0**	**40.0**	**40.0**	**mg/L**	400	26-Dec-2019 13:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19121313

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R353307 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19121313-01	16EW05-E2-191223	23 Dec 2019 08:30			26 Dec 2019 11:27	200
HS19121313-02	16EW06-E2-191223	23 Dec 2019 09:25			26 Dec 2019 11:43	400
HS19121313-03	16EW06-E2-191223-FD	23 Dec 2019 09:25			26 Dec 2019 12:00	400
HS19121313-04	16EW07-E2-191223	23 Dec 2019 10:20			26 Dec 2019 12:17	500
HS19121313-05	16EW08-E2-191223	23 Dec 2019 11:30			26 Dec 2019 13:06	400
Batch ID: R353497 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS19121313-01	16EW05-E2-191223	23 Dec 2019 08:30			28 Dec 2019 06:02	2000
HS19121313-02	16EW06-E2-191223	23 Dec 2019 09:25			30 Dec 2019 10:44	4000
HS19121313-03	16EW06-E2-191223-FD	23 Dec 2019 09:25			30 Dec 2019 10:59	4000
HS19121313-04	16EW07-E2-191223	23 Dec 2019 10:20			28 Dec 2019 07:11	2000
HS19121313-05	16EW08-E2-191223	23 Dec 2019 11:30			28 Dec 2019 07:57	2000

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19121313

QC BATCH REPORT

Batch ID: R353307 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **WBLKW1-122619** Units: **mg/L** Analysis Date: **26-Dec-2019 10:37**
Client ID: Run ID: **ICS-Integrion_353307** SeqNo: **5409816** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-122619** Units: **mg/L** Analysis Date: **26-Dec-2019 10:54**
Client ID: Run ID: **ICS-Integrion_353307** SeqNo: **5409817** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.701	0.100	4	0	92.5	80 - 120				

LCSD Sample ID: **WLCSDW1-122619** Units: **mg/L** Analysis Date: **26-Dec-2019 11:10**
Client ID: Run ID: **ICS-Integrion_353307** SeqNo: **5409818** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.695	0.100	4	0	92.4	80 - 120	3.701	0.162	20	

MS Sample ID: **HS19121313-04MS** Units: **mg/L** Analysis Date: **26-Dec-2019 12:33**
Client ID: **16EW07-E2-191223** Run ID: **ICS-Integrion_353307** SeqNo: **5409823** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1279	50.0	1000	357	92.2	80 - 120				

MSD Sample ID: **HS19121313-04MSD** Units: **mg/L** Analysis Date: **26-Dec-2019 12:50**
Client ID: **16EW07-E2-191223** Run ID: **ICS-Integrion_353307** SeqNo: **5409824** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	1269	50.0	1000	357	91.2	80 - 120	1279	0.789	20	

The following samples were analyzed in this batch: HS19121313-01 HS19121313-02 HS19121313-03 HS19121313-04 HS19121313-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: HS19121313

QC BATCH REPORT

Batch ID: R353497 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW3-122719** Units: **mg/L** Analysis Date: **28-Dec-2019 05:20**
Client ID: Run ID: **TOC_02_353497** SeqNo: **5415041** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW3-122719** Units: **mg/L** Analysis Date: **28-Dec-2019 05:36**
Client ID: Run ID: **TOC_02_353497** SeqNo: **5415042** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.562	1.00	10	0	95.6	85 - 115				

LCSD Sample ID: **WLCSDW3-122719** Units: **mg/L** Analysis Date: **28-Dec-2019 05:49**
Client ID: Run ID: **TOC_02_353497** SeqNo: **5415043** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.521	1.00	10	0	95.2	85 - 115	9.562	0.43	20	

MS Sample ID: **HS19121313-04MS** Units: **mg/L** Analysis Date: **28-Dec-2019 07:27**
Client ID: **16EW07-E2-191223** Run ID: **TOC_02_353497** SeqNo: **5415050** PrepDate: DF: **2000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	70960	2000	20000	48000	115	80 - 120				

MSD Sample ID: **HS19121313-04MSD** Units: **mg/L** Analysis Date: **28-Dec-2019 07:42**
Client ID: **16EW07-E2-191223** Run ID: **TOC_02_353497** SeqNo: **5415051** PrepDate: DF: **2000**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	71000	2000	20000	48000	115	80 - 120	70960	0.0564	20	

The following samples were analyzed in this batch: HS19121313-01 HS19121313-02 HS19121313-03 HS19121313-04 HS19121313-05

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant -16
WorkOrder: **HS19121313**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19121313
Date/Time Received: **24-Dec-2019 09:45**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature 24-Dec-2019 Date
Reviewed by: *Andy C. Neir* eSignature 24-Dec-2019 Date

Matrices: **GW**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.2c U/C	IR25
Cooler(s)/Kit(s):	45464	
Date/Time sample(s) sent to storage:	12/24/19 11:15	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-BromideTOC-ALSHT-1910-

TURNAROUND TIME: 24 hr TAT

RUSH: 24 hr TAT

Page 1 of

PROJECT/CLIENT INFO

Facility Name	Longhorn AAP
Project Number	501032
	LHAAP-16
Address	1203-B East Grand Avenue
	PMB 202
City	Marshall
State	TX
Postal Code	75670
Country	USA
Phone Number	713.243.7264
Project Manager	Praveen Srivastav

LABORATORY

Lab Name	ALS Laboratories
Lab Contact	RJ Modashia
Email	RJ.Modashia@alsglobal.com
Address	10450 Stancliff Rd., Suite 210
City	Houston
State	TX
Postal Code	77099
Country	USA
Phone Number	281.575.2279 or 281.530.5656

Fedinvoices @aptim.com

Susan.Huang@aptim.com

Susan Huang

4005 Port Chicago Hwy

Concord

State CA

94520

Country USA

SAMPLE DETAILS

ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Bromide by SW9056 (1-250 ml HDPE, Ice)	TOC by SM5310 C (ALS Houson) (2x40 ml VOA H2SO4)
16EW05-E2-191223	LHAAP 16				WG	12/23/19	0830	3		X	X
16EW06-E2-191223	LHAAP 16				WG	12/23/19	0925	3		X	X
16EW06-E2-191223-FD	LHAAP16				WG	12/23/19	0925	3		X	X
16EW07-E2-191223	LHAAP 16				WG	12/23/19	1020	3		X	X
16EW07-E2-191223-MS	LHAAP16				WG	12/23/19	1020	3		X	X
16EW07-E2-191223-MSD	LHAAP 16				WG	12/23/19	1020	3		X	X
16EW08-E2-191223	LHAAP16				WG	12/23/19	1130	3		X	X

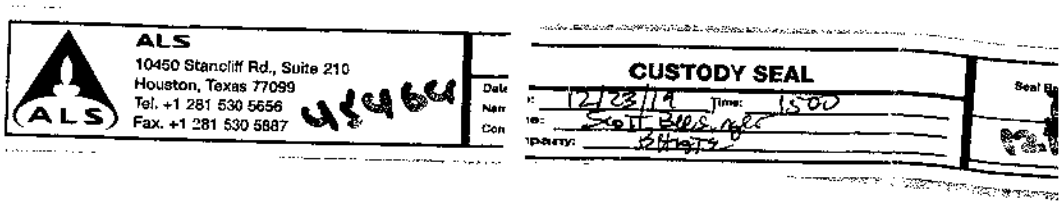
HS19121313

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant -16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	[signature] / BHATE	12/23/19 1500	[signature]	12/24/19 09:45

45464. v/c.
1-20
#25
C/F 0.0°



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45464

Date
Name
Con

CUSTODY SEAL

Date: 12/23/19 Time: 1500
Name: Scott Beesinger
Company: BHGTS

Seal Bo

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIRONMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 11DEC19
ACTWGT: 7.70 LB MA
CAD: 300130/CAFE32
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP-BO - 69246-RJ

45464

RMA:

FedEx Express

E

FedEx
TRK# 0221 1251 0292 8102

TUE - 24 DEC 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

*475872 12/23 567J2/1800/0582

HS19121313 Wet Chem Raw Data

ALS WO# HS19121313

Sequence: 122319
Last Update Operator: alshs.nouser

HS19121313

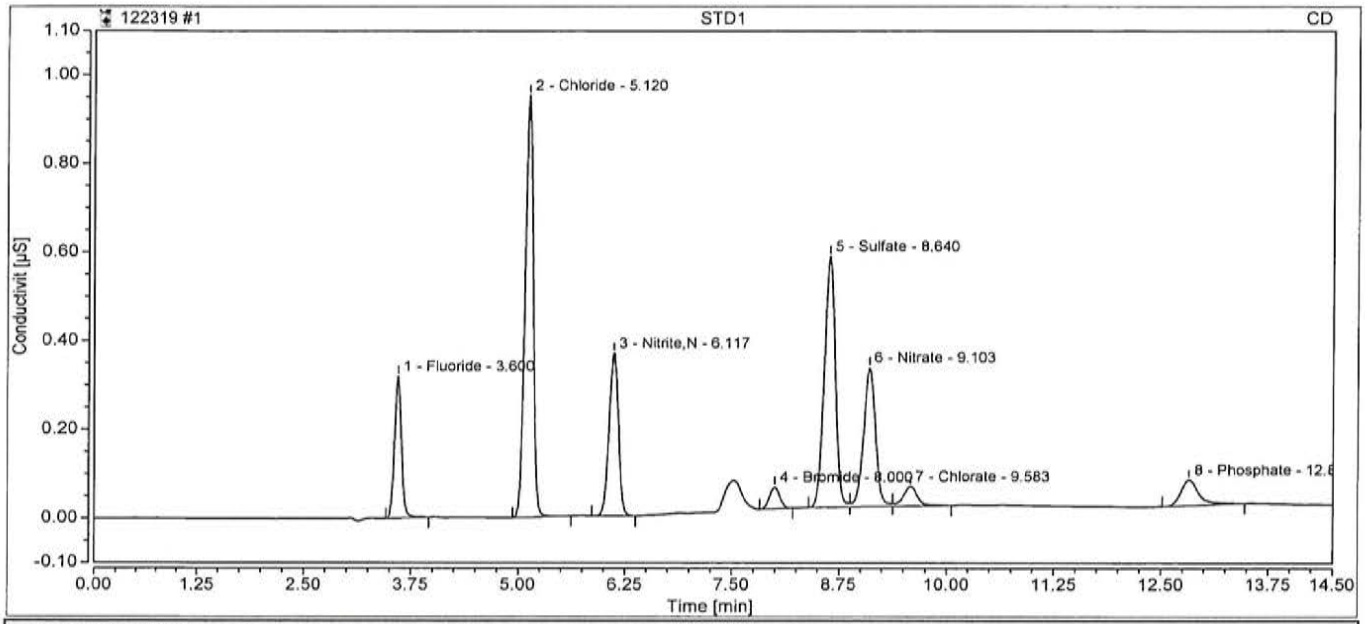
CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	me	Status	Inject Time
	STD1	2970209205	Calibration	GA1	1.0000	1	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:08:06 PM -05:00
	STD2		Calibration	GA2	1.0000	2	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:24:42 PM -05:00
	STD3		Calibration	GA3	1.0000	3	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:41:19 PM -05:00
	STD4		Calibration	GA4	1.0000	4	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 2:57:54 PM -05:00
	STD5		Calibration	GA5	1.0000	5	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 3:14:30 PM -05:00
	STD6	F, NO2 MAX 10PPM	Calibration	GB8	1.0000	6	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:37:32 PM -05:00
	ICV	2970209123	Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:54:07 PM -05:00
	ICB		Unknown	GB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 7:29:52 PM -05:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 9:58:32 AM -06:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 10:15:08 AM -06:00
	WBLKW1-122619		Unknown	GC1	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 10:37:31 AM -06:00
	WLCSW1-122619		Unknown	GC2	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 10:54:06 AM -06:00
	WLCSDW1-122619		Unknown	GC3	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 11:10:42 AM -06:00
	HS19121313-01DF200		Unknown	GC4	200.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 11:27:21 AM -06:00
	HS19121313-02DF400		Unknown	GC5	400.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 11:43:58 AM -06:00
	HS19121313-03DF400		Unknown	GC6	400.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 12:00:33 PM -06:00
	HS19121313-04DF500		Unknown	GC7	500.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 12:17:08 PM -06:00
	HS19121313-04MSDF500		Unknown	GC8	500.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 12:33:45 PM -06:00
	HS19121313-04MSDDF500		Unknown	GD1	500.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 12:50:22 PM -06:00
	HS19121313-05DF400		Unknown	GD2	400.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 1:06:57 PM -06:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 1:23:39 PM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 1:40:14 PM -06:00
	HS19121316-01DF10		Unknown	GD3	10.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 2:03:34 PM -06:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 4:49:46 PM -06:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 5:06:22 PM -06:00
	HS19121028-01DF10		Unknown	BC8	10.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 5:22:59 PM -06:00
	HS19121029-01DF10		Unknown	BD1	10.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 5:39:34 PM -06:00
	HS19120760-11DF500		Unknown	GE6	500.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 6:12:45 PM -06:00
	HS19120760-11MSDF500		Unknown	GE7	500.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 6:29:22 PM -06:00
	HS19120760-11MSDDF500		Unknown	GE8	500.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 6:45:56 PM -06:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 7:19:10 PM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	12/26/2019 7:35:47 PM -06:00

Peak No.	Peak Name	Cal.Type	Eval.Type	Number of Points	Rel.Std.Dev. %	Coeff.of Determination	C0 (Offset)	C1 (Slope)	C2 (Curve)
1	*Fluoride*	*Lin, WithOffset, 1/*	*Area*	*5*	*10.1532*	*0.99927*	*-0.0056*	*0.3716*	*0.0000*
2	Chloride	Lin, WithOffset, 1/	Area	6	0.2804	1.00000	-0.0135	0.2355	0.0000
3	Nitrite,N	Lin, WithOffset, 1/	Area	5	15.1147	0.99824	0.0003	0.5120	0.0000
4	Bromide	Lin, WithOffset, 1/	Area	6	14.0217	0.99919	-0.0052	0.1009	0.0000
5	Sulfate	Lin, WithOffset, 1/	Area	6	1.1258	0.99999	-0.0022	0.1717	0.0000
6	Nitrate	Lin, WithOffset, 1/	Area	6	2.2249	0.99998	-0.0102	0.5876	0.0000
7	Chlorate	Lin, WithOffset, 1/	Area	6	10.0265	0.99953	-0.0024	0.0944	0.0000
8	Phosphate	Lin, WithOffset, 1/	Area	6	6.6198	0.99981	-0.0110	0.2321	0.0000
Maximum					**15.1147**	1.00000			
Minimum					0.2804	**0.99824**			

1 STD1

Sample Name:	**STD1**	*Injection Volume:*	**5.00**
Vial Number:	**GA1**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:08**	*Sample Weight:*	**1.0000**

Run Time:



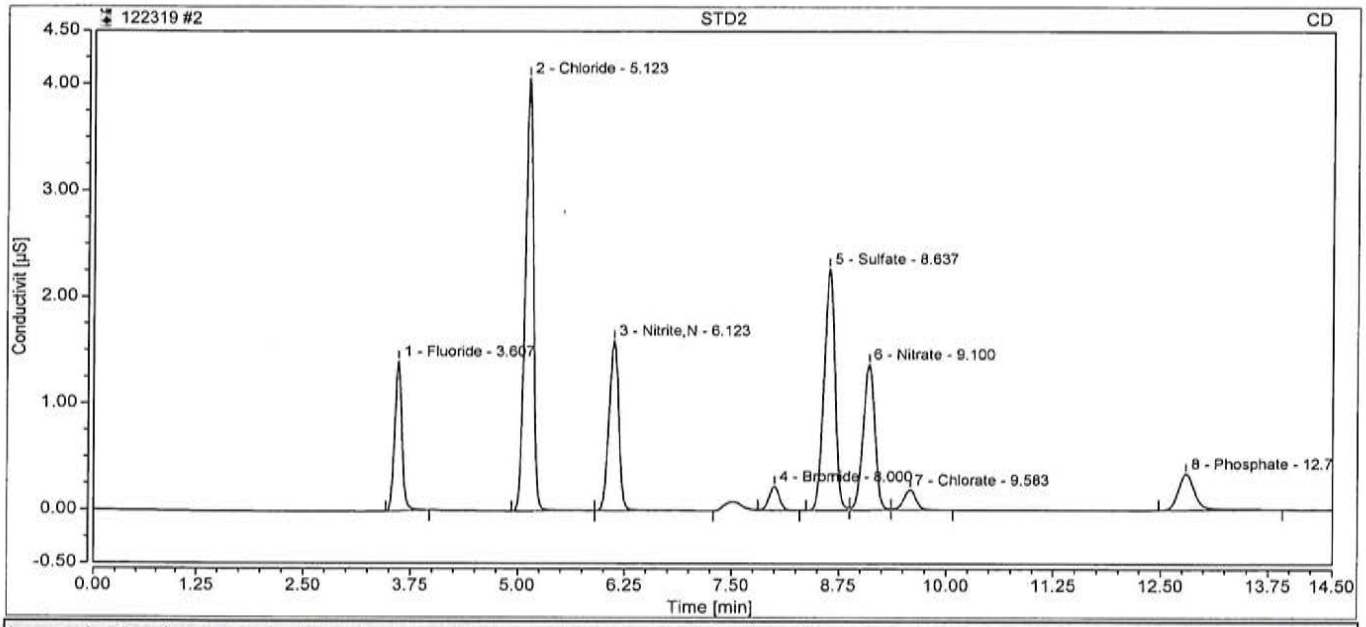
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.031	0.0973	0.0973	1.0000
2	5.12	Chloride	BMB	0.105	0.5026	0.5026	1.0000
3	6.12	Nitrite,N	BMB	0.046	0.0893	0.0893	1.0000
4	8.00	Bromide	BMB	0.007	0.1192	0.1192	1.0000
5	8.64	Sulfate	BM	0.084	0.5042	0.5042	1.0000
6	9.10	Nitrate	M	0.051	0.1034	0.1034	1.0000
7	9.58	Chlorate	MB	0.008	0.1143	0.1143	1.0000
8	12.83	Phosphate	BMB	0.014	0.1085	0.1085	1.0000
Total:			**0.000**	**0.346**		**1.64**	

2 STD2

Sample Name:	**STD2**	*Injection Volume:*	**5.00**
Vial Number:	**GA2**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:24**	*Sample Weight:*	**1.0000**

Run Time:



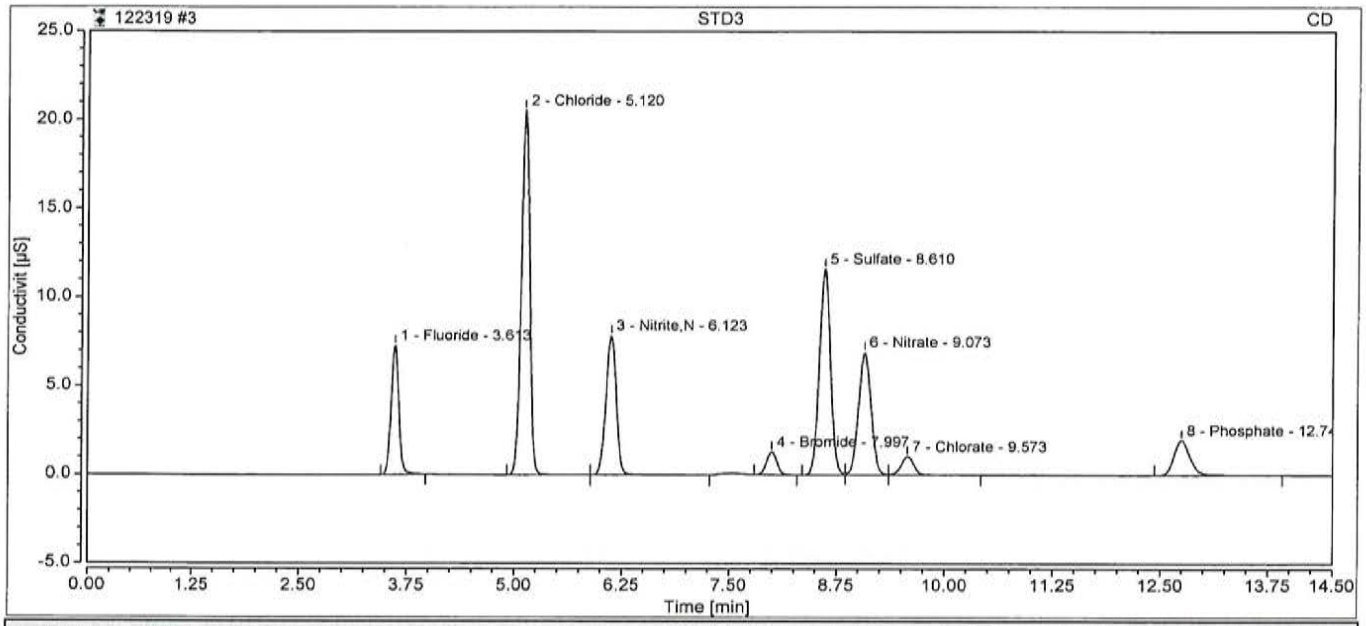
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.140	0.3929	0.3929	1.0000
2	5.12	Chloride	BMB	0.456	1.9918	1.9918	1.0000
3	6.12	Nitrite,N	BMB	0.211	0.4119	0.4119	1.0000
4	8.00	Bromide	BMB	0.031	0.3593	0.3593	1.0000
5	8.64	Sulfate	BM	0.337	1.9733	1.9733	1.0000
6	9.10	Nitrate	M	0.220	0.3917	0.3917	1.0000
7	9.58	Chlorate	MB	0.033	0.3704	0.3704	1.0000
8	12.80	Phosphate	BMB	0.078	0.3841	0.3841	1.0000
Total:			**0.000**	**1.506**		**6.28**	

3 STD3

Sample Name:	**STD3**	*Injection Volume:*	**5.00**
Vial Number:	**GA3**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:41**	*Sample Weight:*	**1.0000**

Run Time:



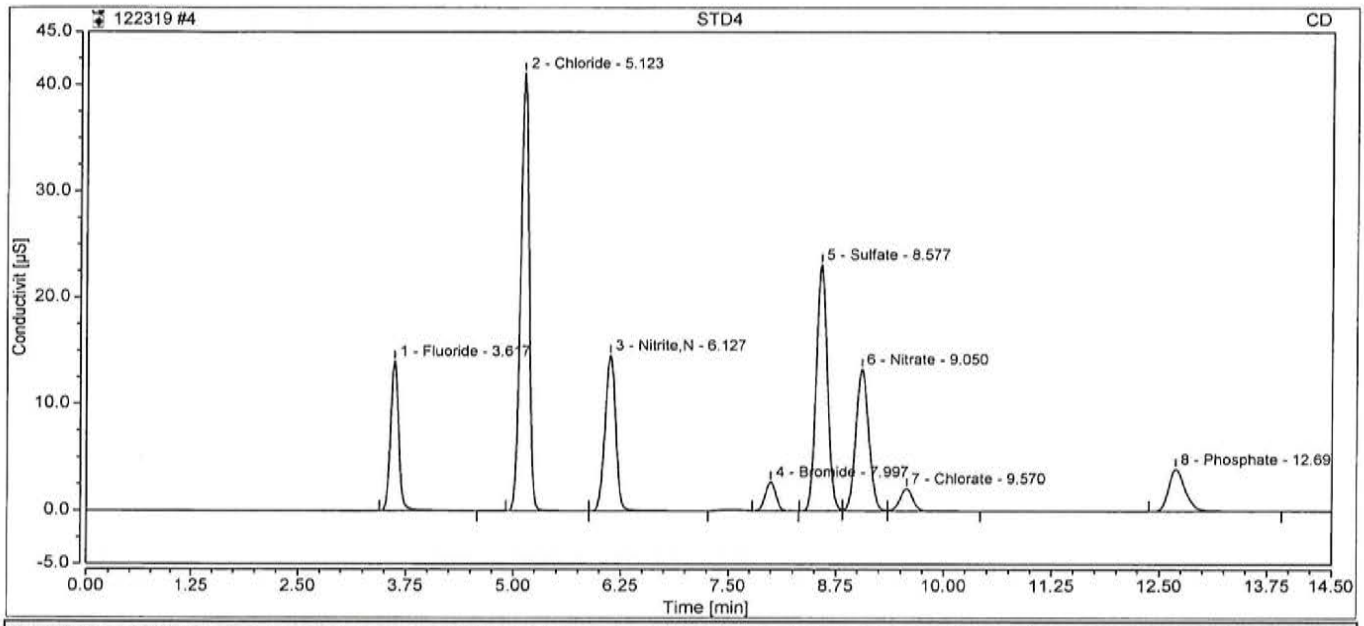
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.758	2.0551	2.0551	1.0000
2	5.12	Chloride	BMB	2.339	9.9888	9.9888	1.0000
3	6.12	Nitrite,N	BMB	1.091	2.1305	2.1305	1.0000
4	8.00	Bromide	BMB	0.182	1.8590	1.8590	1.0000
5	8.61	Sulfate	BM	1.715	10.0007	10.0007	1.0000
6	9.07	Nitrate	M	1.153	1.9792	1.9792	1.0000
7	9.57	Chlorate	MB	0.176	1.8940	1.8940	1.0000
8	12.75	Phosphate	BMB	0.436	1.9269	1.9269	1.0000
Total:			**0.000**	**7.851**		**31.83**	

4 STD4

Sample Name:	**STD4**	*Injection Volume:*	**5.00**
Vial Number:	**GA4**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 14:57**	*Sample Weight:*	**1.0000**

Run Time:



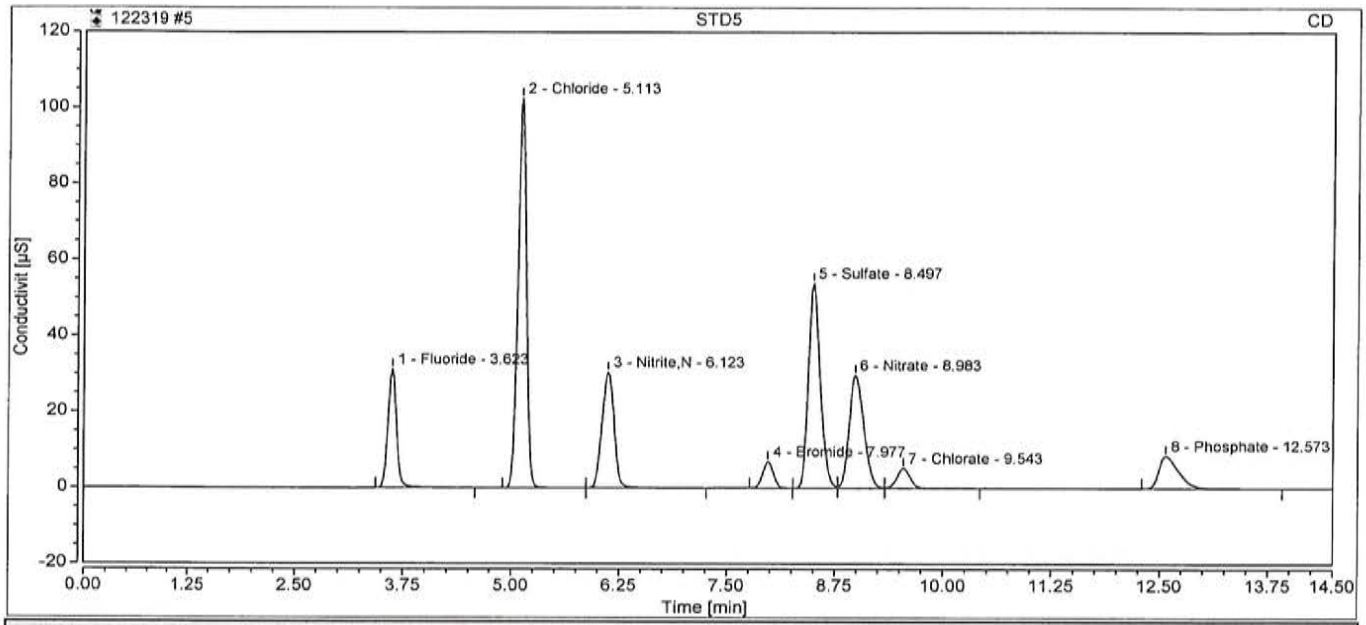
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.535	4.1457	4.1457	1.0000
2	5.12	Chloride	BMB	4.695	19.9948	19.9948	1.0000
3	6.13	Nitrite,N	BMB	2.133	4.1659	4.1659	1.0000
4	8.00	Bromide	BMB	0.385	3.8642	3.8642	1.0000
5	8.58	Sulfate	BM	3.451	20.1082	20.1082	1.0000
6	9.05	Nitrate	M	2.330	3.9823	3.9823	1.0000
7	9.57	Chlorate	MB	0.365	3.8956	3.8956	1.0000
8	12.69	Phosphate	BMB	0.903	3.9395	3.9395	1.0000
Total:			**0.000**	**15.798**		**64.10**	

5 STD5

Sample Name:	**STD5**	*Injection Volume:*	**5.00**
Vial Number:	**GA5**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 15:14**	*Sample Weight:*	**1.0000**

Run Time:



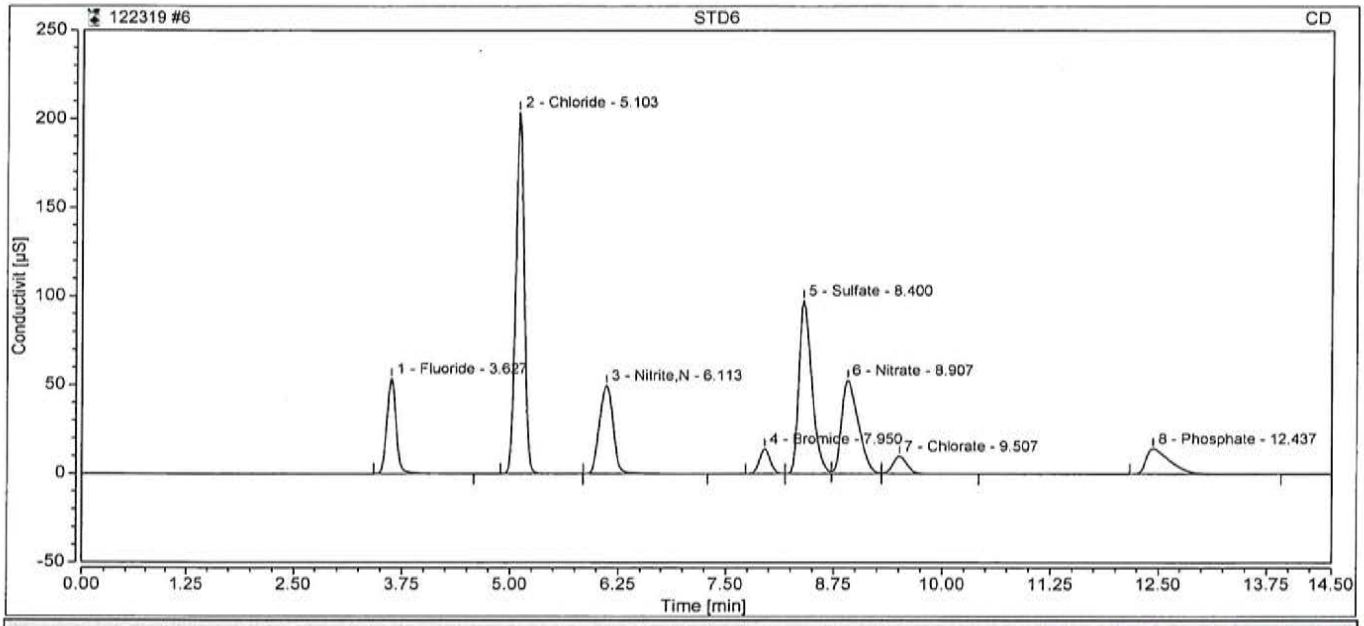
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.639	9.8090	9.8090	1.0000
2	5.11	Chloride	BMB	11.762	49.9996	49.9996	1.0000
3	6.12	Nitrite,N	BMB	4.968	9.7023	9.7023	1.0000
4	7.98	Bromide	BMB	1.001	9.9786	9.9786	1.0000
5	8.50	Sulfate	BM	8.590	50.0271	50.0271	1.0000
6	8.98	Nitrate	M	5.854	9.9805	9.9805	1.0000
7	9.54	Chlorate	MB	0.939	9.9670	9.9670	1.0000
8	12.57	Phosphate	BMB	2.305	9.9803	9.9803	1.0000
Total:			**0.000**	**39.057**		**159.44**	

6 STD6

Sample Name:	**STD6**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Calibration Standard**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:37**	*Sample Weight:*	**1.0000**

Run Time:



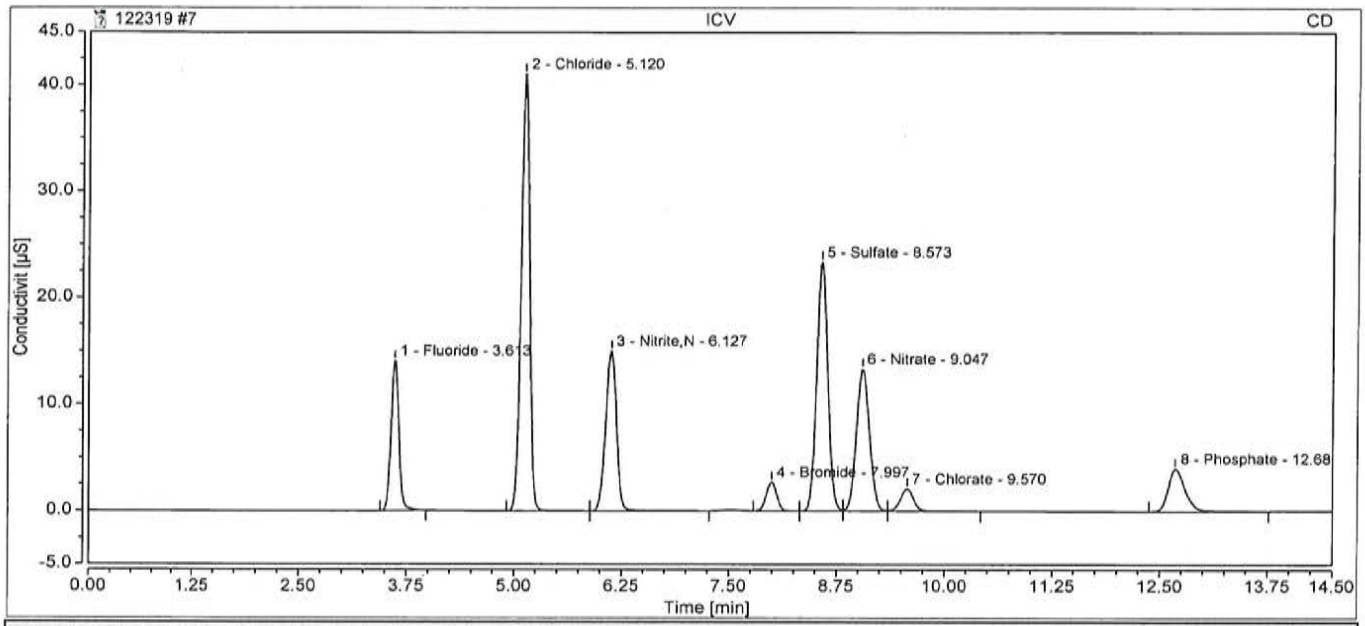
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	6.773	18.2418	18.2418	1.0000
2	5.10	Chloride	BMB	23.542	100.0224	100.0224	1.0000
3	6.11	Nitrite,N	BMB	9.157	17.8850	17.8850	1.0000
4	7.95	Bromide	BM	2.045	20.3197	20.3197	1.0000
5	8.40	Sulfate	M	17.153	99.8863	99.8863	1.0000
6	8.91	Nitrate	M	11.778	20.0629	20.0629	1.0000
7	9.51	Chlorate	MB	1.910	20.2586	20.2586	1.0000
8	12.44	Phosphate	BMB	4.668	20.1606	20.1606	1.0000
Total:			**0.000**	**77.025**		**316.84**	

7 ICV

Sample Name:	**ICV**	*Injection Volume:*	**5.00**
Vial Number:	**GA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 18:54**	*Sample Weight:*	**1.0000**

Run Time:



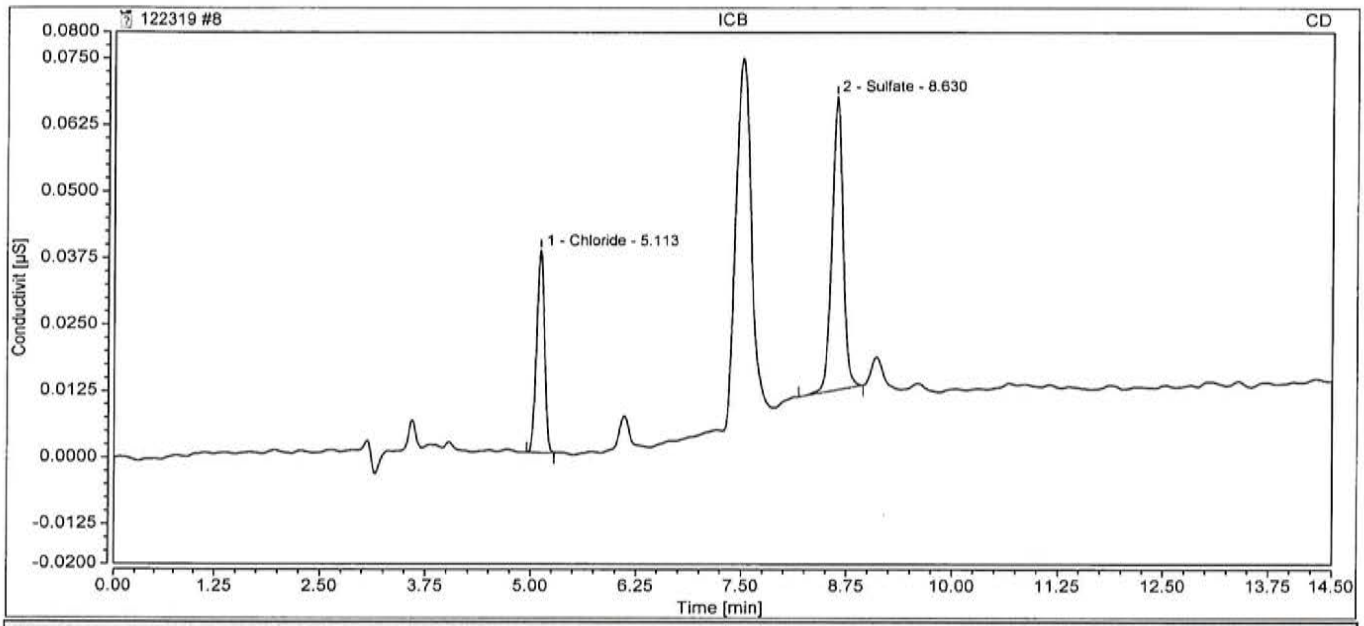
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.495	4.0374	4.0374	1.0000
2	5.12	Chloride	BMB	4.681	19.9333	19.9333	1.0000
3	6.13	Nitrite,N	BMB	2.195	4.2858	4.2858	1.0000
4	8.00	Bromide	BMB	0.384	3.8585	3.8585	1.0000
5	8.57	Sulfate	BM	3.469	20.2132	20.2132	1.0000
6	9.05	Nitrate	M	2.340	3.9993	3.9993	1.0000
7	9.57	Chlorate	MB	0.367	3.9104	3.9104	1.0000
8	12.68	Phosphate	BMB	0.911	3.9732	3.9732	1.0000
Total:			**0.000**	**15.841**		**64.21**	

8 ICB

Sample Name:	**ICB**	*Injection Volume:*	**5.00**
Vial Number:	**GB8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**08/12/2019 19:29**	*Sample Weight:*	**1.0000**

Run Time:



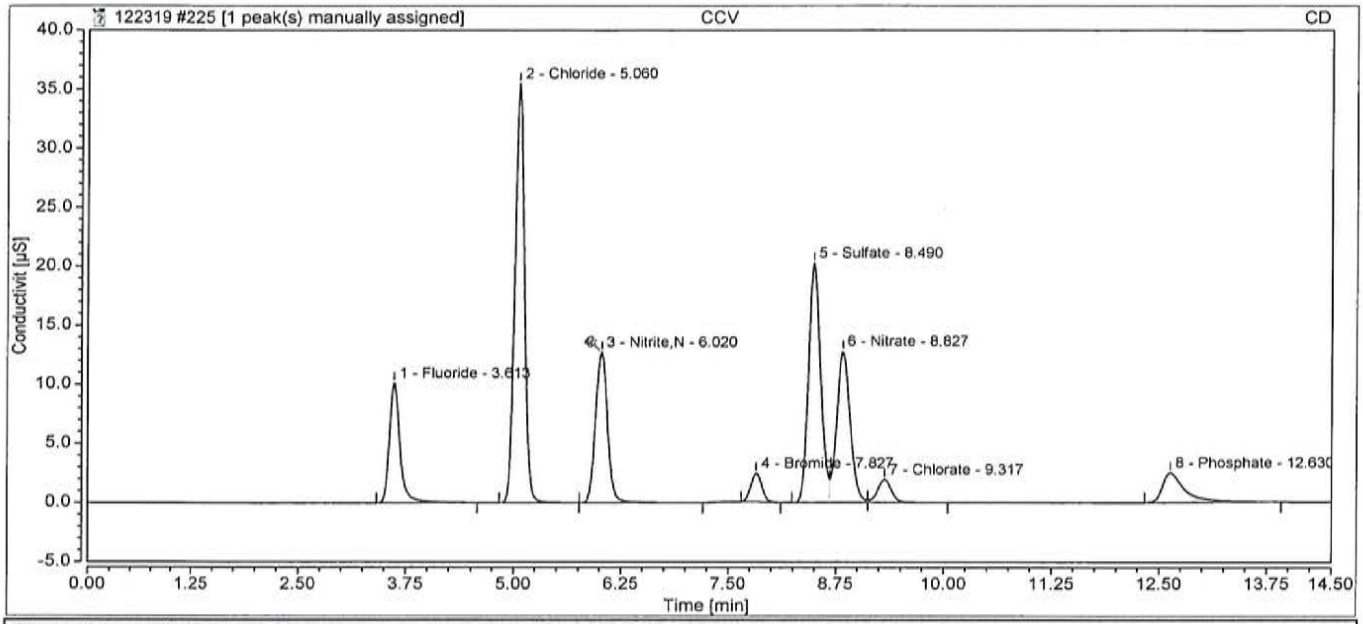
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.11	Chloride	BMB	0.004	0.0748	0.0748	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
2	8.63	Sulfate	BMB	0.008	0.0618	0.0618	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.013**		**0.14**	

225 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 09:58**	*Sample Weight:*	**1.0000**

Run Time:



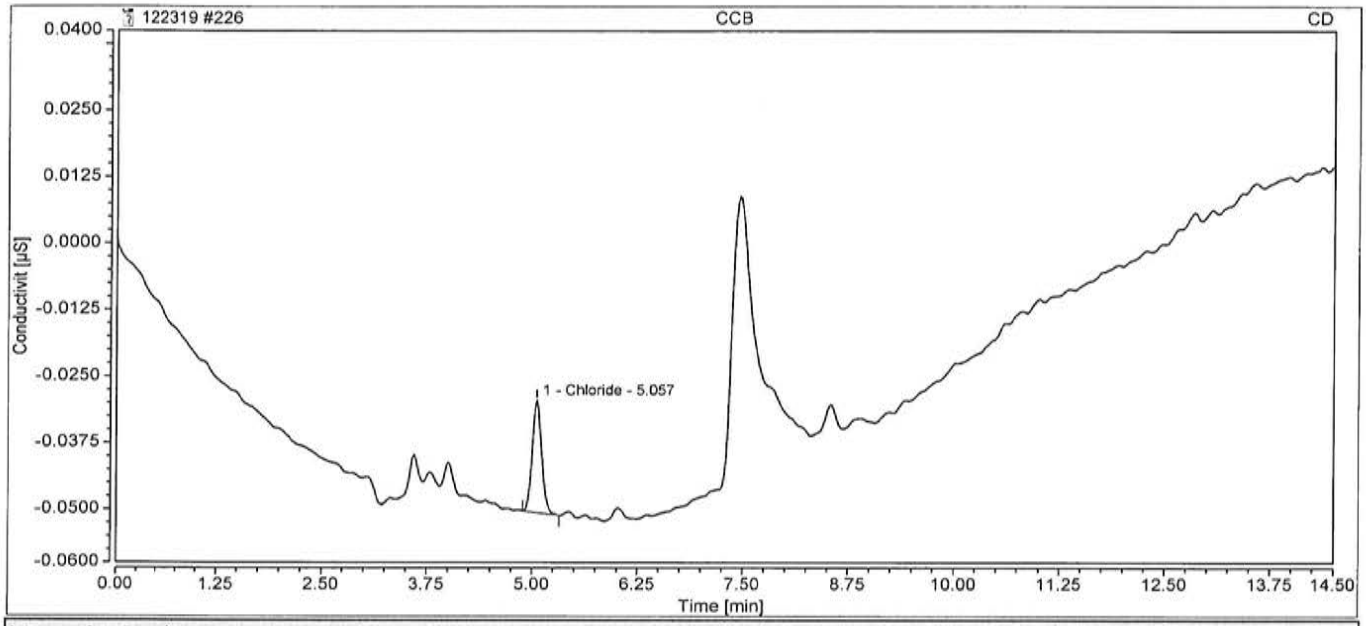
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.452	3.9239	3.9239	1.0000
2	5.06	Chloride	BMB	4.611	19.6382	19.6382	1.0000
3	6.02	Nitrite,N	BMB^	2.087	4.0755	4.0755	1.0000
4	7.83	Bromide	BMB	0.366	3.6814	3.6814	1.0000
5	8.49	Sulfate	BM	3.305	19.2580	19.2580	1.0000
6	8.83	Nitrate	M	2.339	3.9982	3.9982	1.0000
7	9.32	Chlorate	MB	0.372	3.9674	3.9674	1.0000
8	12.63	Phosphate	BMB	0.780	3.4070	3.4070	1.0000
Total:			**0.000**	**15.313**		**61.95**	

226 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 10:15**	*Sample Weight:*	**1.0000**

Run Time:



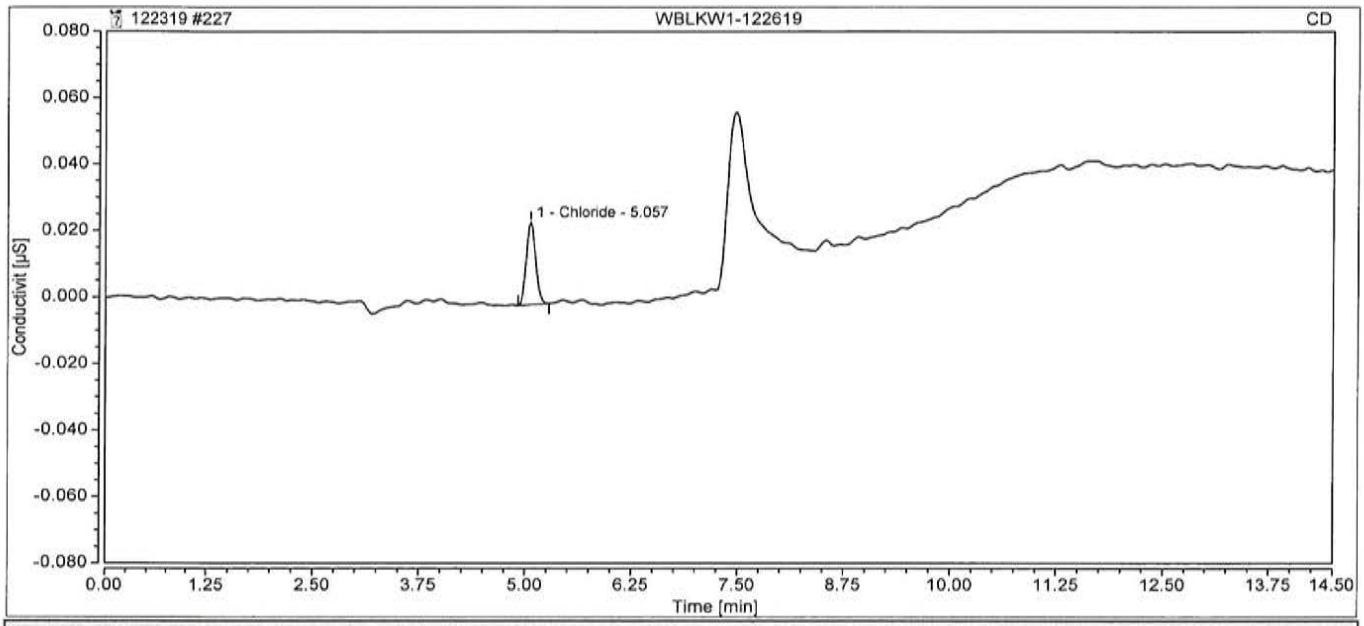
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.06	Chloride	BMB	0.003	0.0689	0.0689	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.07**	

227 *WBLKW1-122619*

Sample Name:	**WBLKW1-122619**	*Injection Volume:*	**5.00**
Vial Number:	**GC1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 10:37**	*Sample Weight:*	**1.0000**

Run Time:



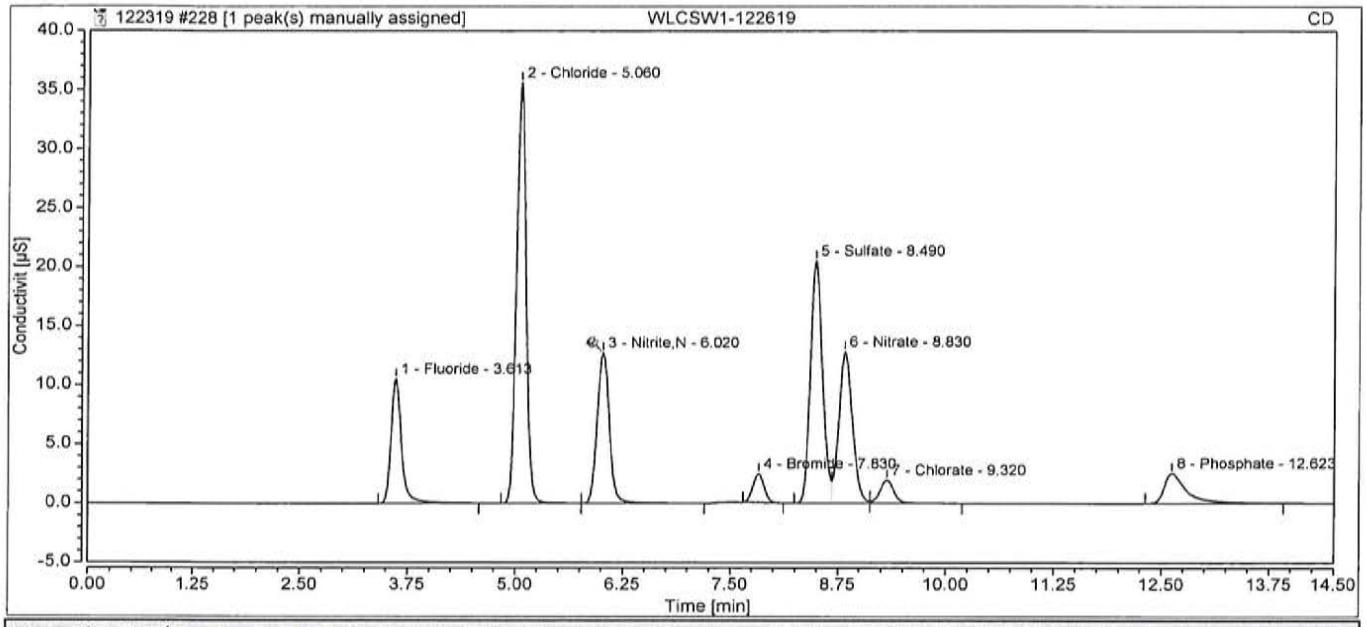
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.06	Chloride	BMB	0.003	0.0707	0.0707	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.07**	

228 *WLCSW1-122619*

Sample Name:	**WLCSW1-122619**	*Injection Volume:*	**5.00**
Vial Number:	**GC2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 10:54**	*Sample Weight:*	**1.0000**

Run Time:



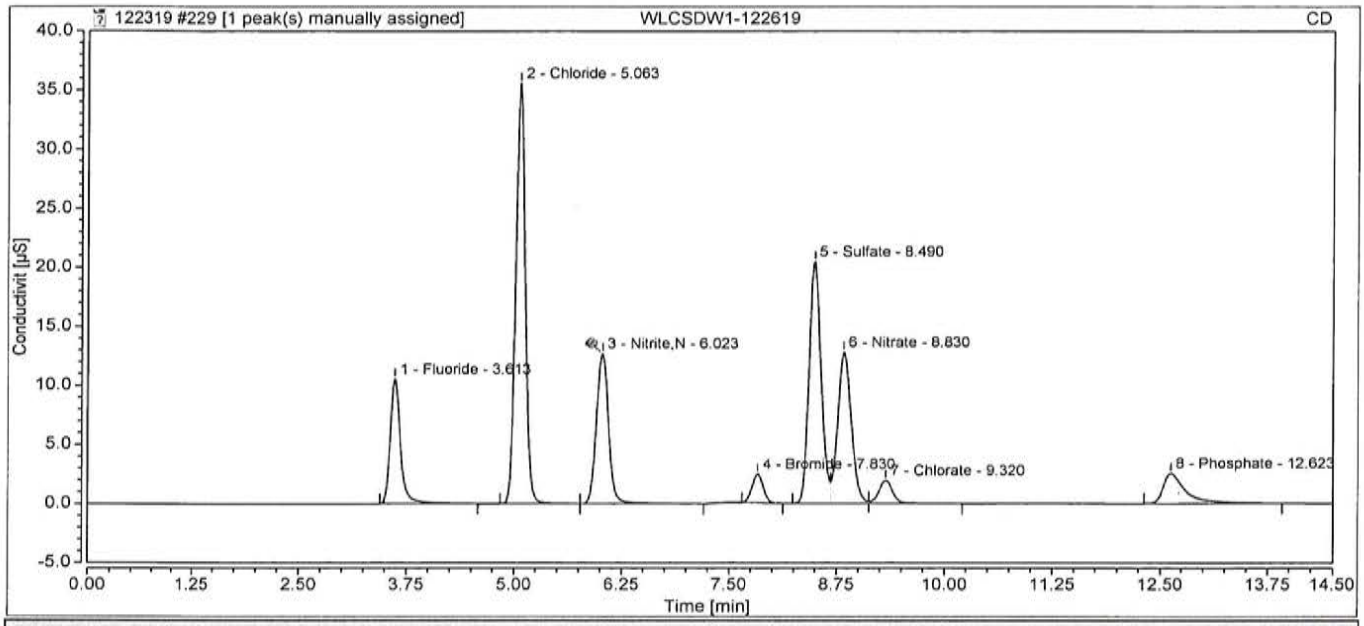
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.469	3.9681	3.9681	1.0000
2	5.06	Chloride	BMB	4.626	19.6996	19.6996	1.0000
3	6.02	Nitrite,N	BMB^	2.093	4.0863	4.0863	1.0000
4	7.83	Bromide	BMB	0.368	3.7009	3.7009	1.0000
5	8.49	Sulfate	BM	3.328	19.3920	19.3920	1.0000
6	8.83	Nitrate	M	2.354	4.0240	4.0240	1.0000
7	9.32	Chlorate	MB	0.373	3.9777	3.9777	1.0000
8	12.62	Phosphate	BMB	0.781	3.4148	3.4148	1.0000
Total:			**0.000**	**15.392**		**62.26**	

229 *WLCSDW1-122619*

Sample Name:	**WLCSDW1-122619**	*Injection Volume:*	**5.00**
Vial Number:	**GC3**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 11:10**	*Sample Weight:*	**1.0000**

Run Time:



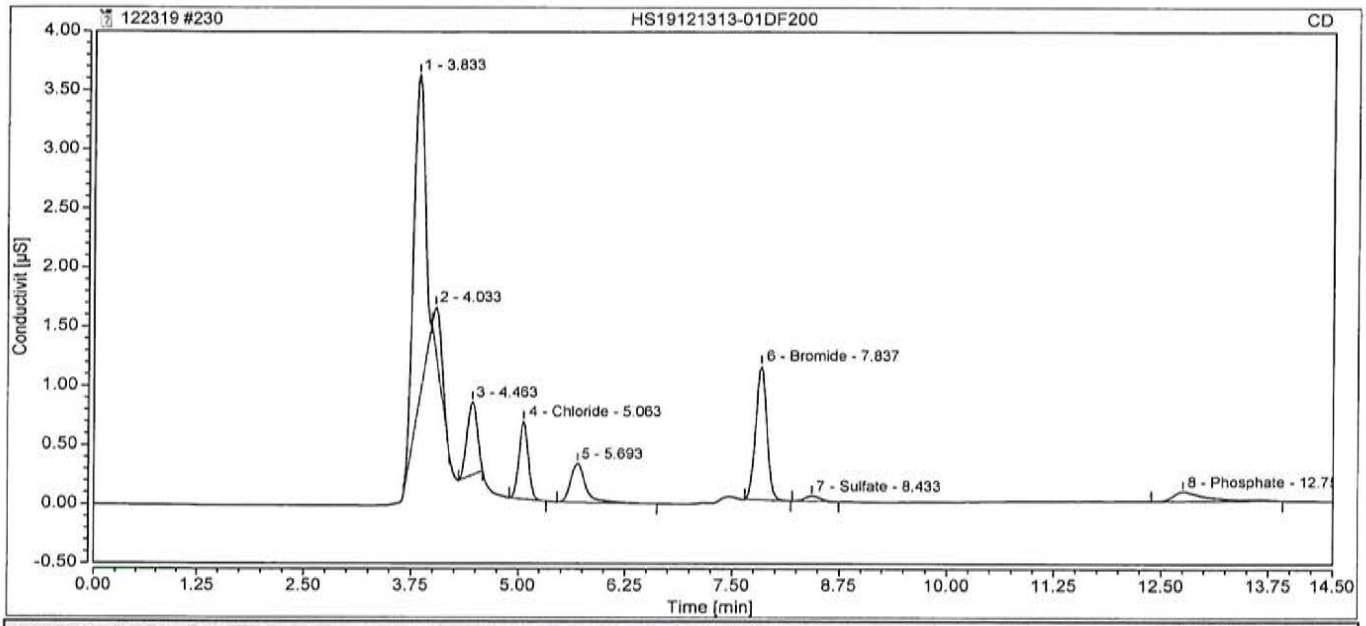
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	1.458	3.9397	3.9397	1.0000
2	5.06	Chloride	BMB	4.624	19.6939	19.6939	1.0000
3	6.02	Nitrite,N	BMB^	2.087	4.0750	4.0750	1.0000
4	7.83	Bromide	BMB	0.368	3.6949	3.6949	1.0000
5	8.49	Sulfate	BM	3.317	19.3241	19.3241	1.0000
6	8.83	Nitrate	M	2.344	4.0076	4.0076	1.0000
7	9.32	Chlorate	MB	0.371	3.9557	3.9557	1.0000
8	12.62	Phosphate	BMB	0.790	3.4530	3.4530	1.0000
Total:			**0.000**	**15.360**		**62.14**	

230 HS19121313-01DF200

Sample Name:	**HS19121313-01DF200**	*Injection Volume:*	**5.00**
Vial Number:	**GC4**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**200.0000**
Recording Time:	**12/26/2019 11:27**	*Sample Weight:*	**1.0000**

Run Time:



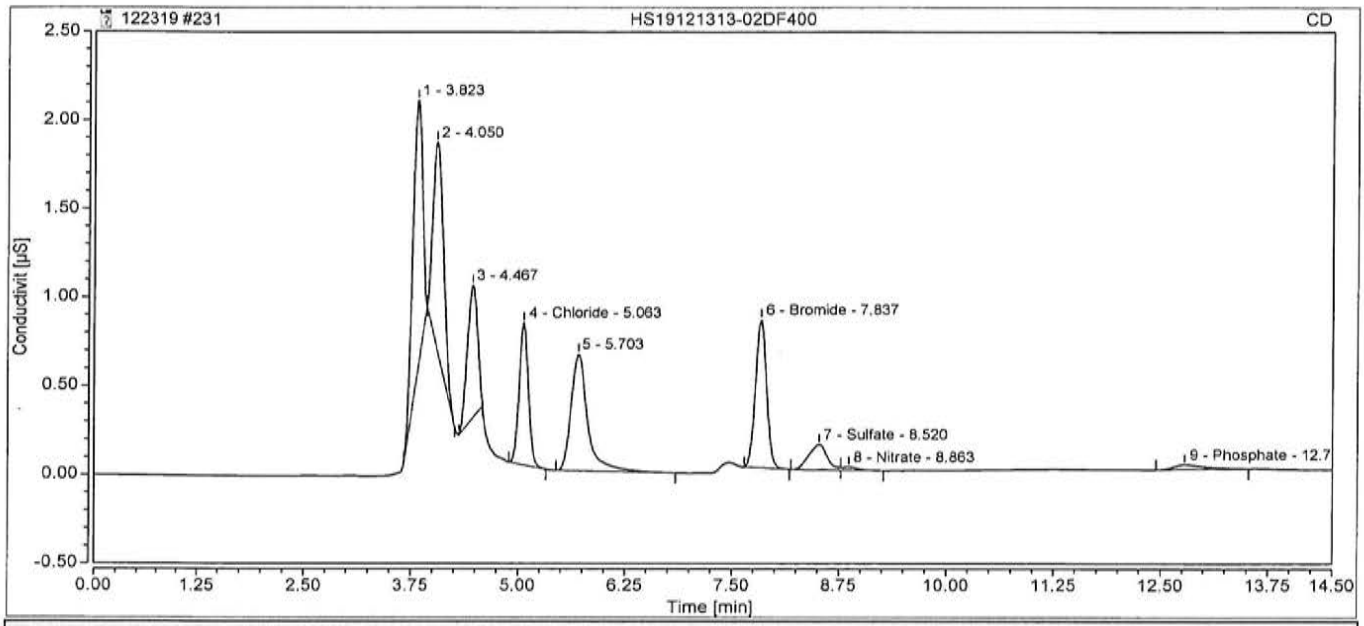
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	200.0000
4	5.06	Chloride	BMB	0.084	0.4127	82.5367	200.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	200.0000
6	7.84	Bromide	BMB	0.171	1.7518	350.3632	200.0000
7	8.43	Sulfate	BMB	0.009	0.0672	13.4475	200.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	200.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	200.0000
8	12.75	Phosphate	BMB	0.039	0.2157	43.1432	200.0000
Total:			**0.000**	**0.304**		**489.49**	

231 HS19121313-02DF400

Sample Name:	**HS19121313-02DF400**	*Injection Volume:*	**5.00**
Vial Number:	**GC5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**400.0000**
Recording Time:	**12/26/2019 11:43**	*Sample Weight:*	**1.0000**

Run Time:

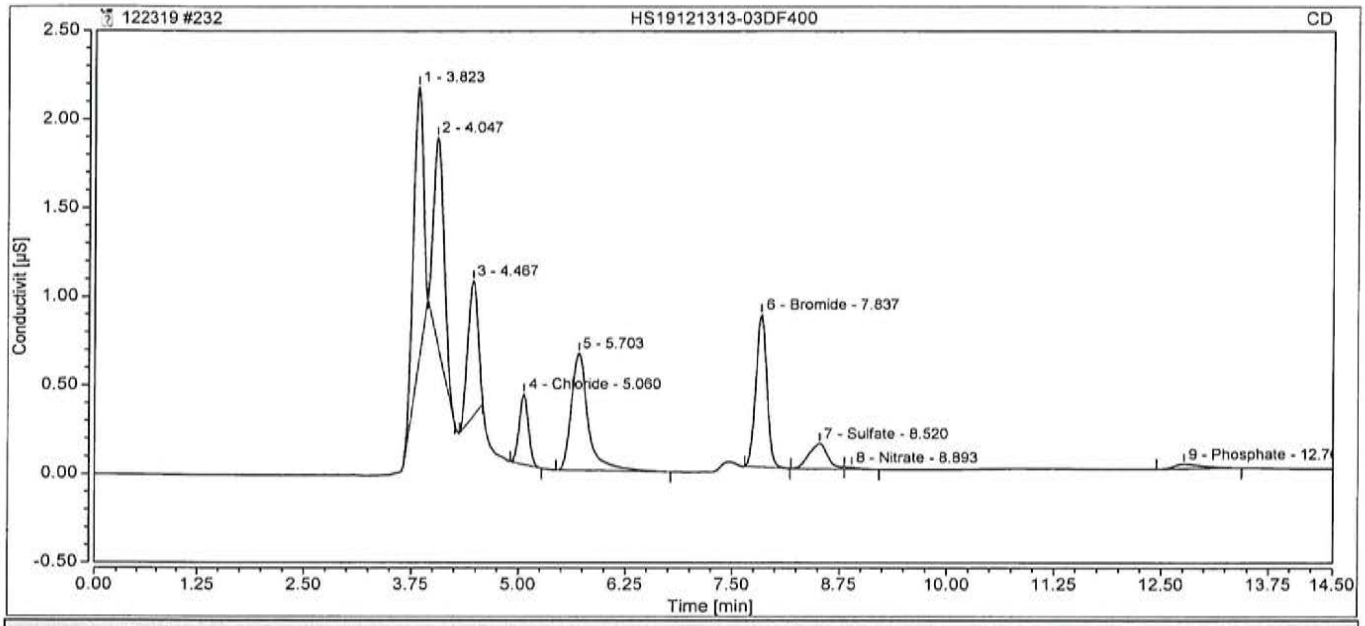


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	400.0000
4	5.06	Chloride	BMB	0.101	0.4875	195.0087	400.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	400.0000
6	7.84	Bromide	BMB	0.126	1.3021	520.8576	400.0000
7	8.52	Sulfate	BM	0.036	0.2195	87.7990	400.0000
8	8.86	Nitrate	MB	0.004	0.0238	9.5266	400.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	400.0000
9	12.78	Phosphate	BMB	0.011	0.0970	38.7938	400.0000
Total:			**0.000**	**0.278**		**851.99**	

232 *HS19121313-03DF400*

Sample Name:	**HS19121313-03DF400**	*Injection Volume:*	**5.00**
Vial Number:	**GC6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**400.0000**
Recording Time:	**12/26/2019 12:00**	*Sample Weight:*	**1.0000**
Run Time:			

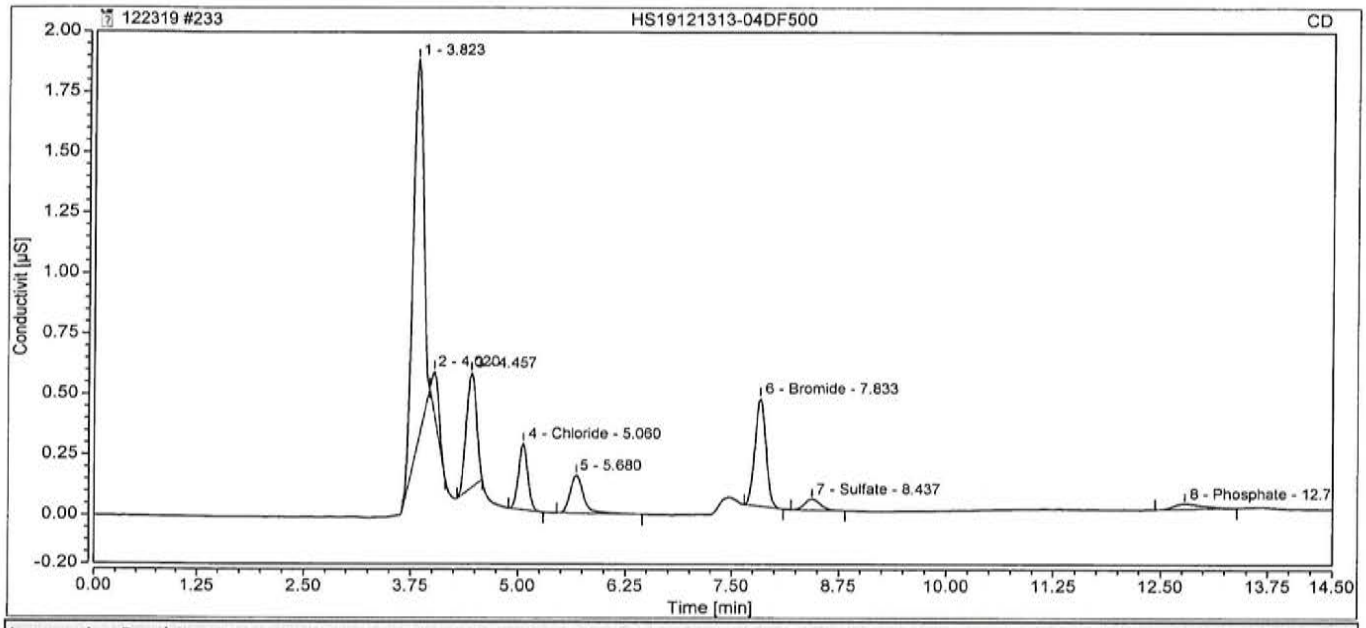


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	400.0000
4	5.06	Chloride	BMB	0.050	0.2701	108.0221	400.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	400.0000
6	7.84	Bromide	BMB	0.131	1.3471	538.8561	400.0000
7	8.52	Sulfate	BM	0.036	0.2242	89.6909	400.0000
8	8.89	Nitrate	MB	0.002	0.0209	8.3429	400.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	400.0000
9	12.76	Phosphate	BMB	0.011	0.0950	38.0111	400.0000
Total:			**0.000**	**0.230**		**782.92**	

233 HS19121313-04DF500

Sample Name:	**HS19121313-04DF500**	*Injection Volume:*	**5.00**
Vial Number:	**GC7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**500.0000**
Recording Time:	**12/26/2019 12:17**	*Sample Weight:*	**1.0000**
Run Time:			



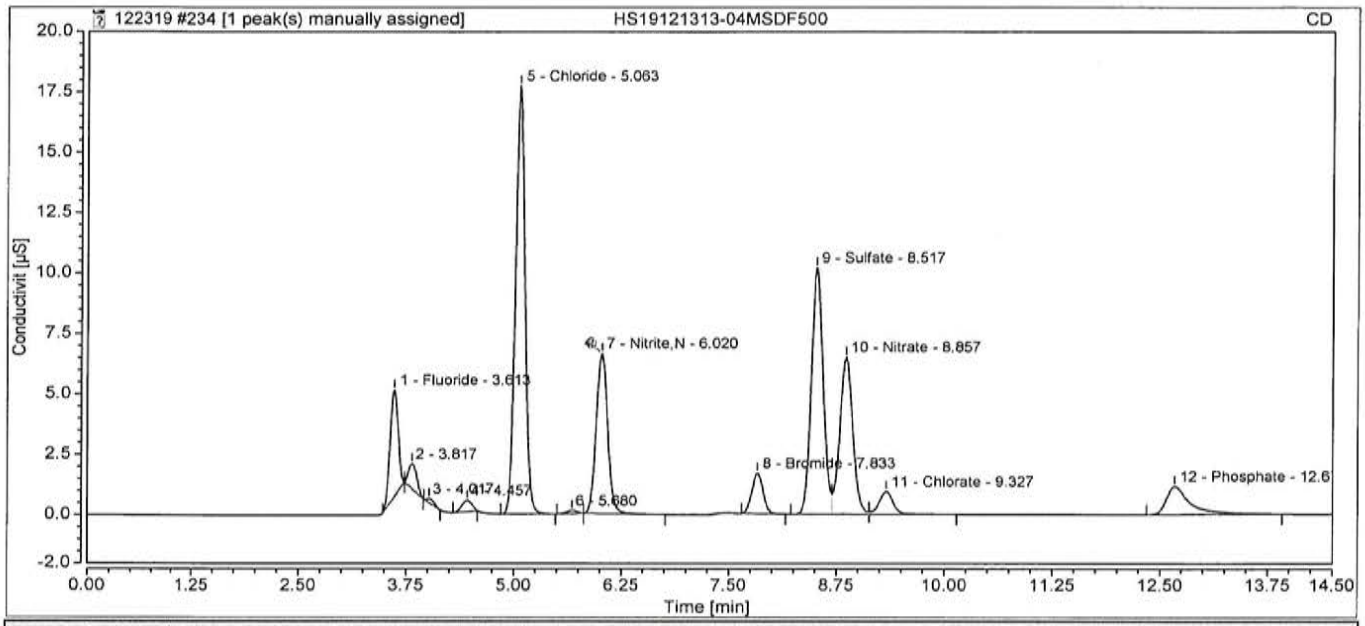
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	500.0000
4	5.06	Chloride	BMB	0.034	0.2035	101.7697	500.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	500.0000
6	7.83	Bromide	BMB	0.067	0.7140	356.9953	500.0000
7	8.44	Sulfate	BMB	0.010	0.0699	34.9487	500.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	500.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	500.0000
8	12.78	Phosphate	BMB	0.009	0.0860	42.9883	500.0000
Total:			**0.000**	**0.120**		**536.70**	

234 HS19121313-04MSDF500

Sample Name:	**HS19121313-04MSDF500**	*Injection Volume:*	**5.00**
Vial Number:	**GC8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**500.0000**
Recording Time:	**12/26/2019 12:33**	*Sample Weight:*	**1.0000**

Run Time:

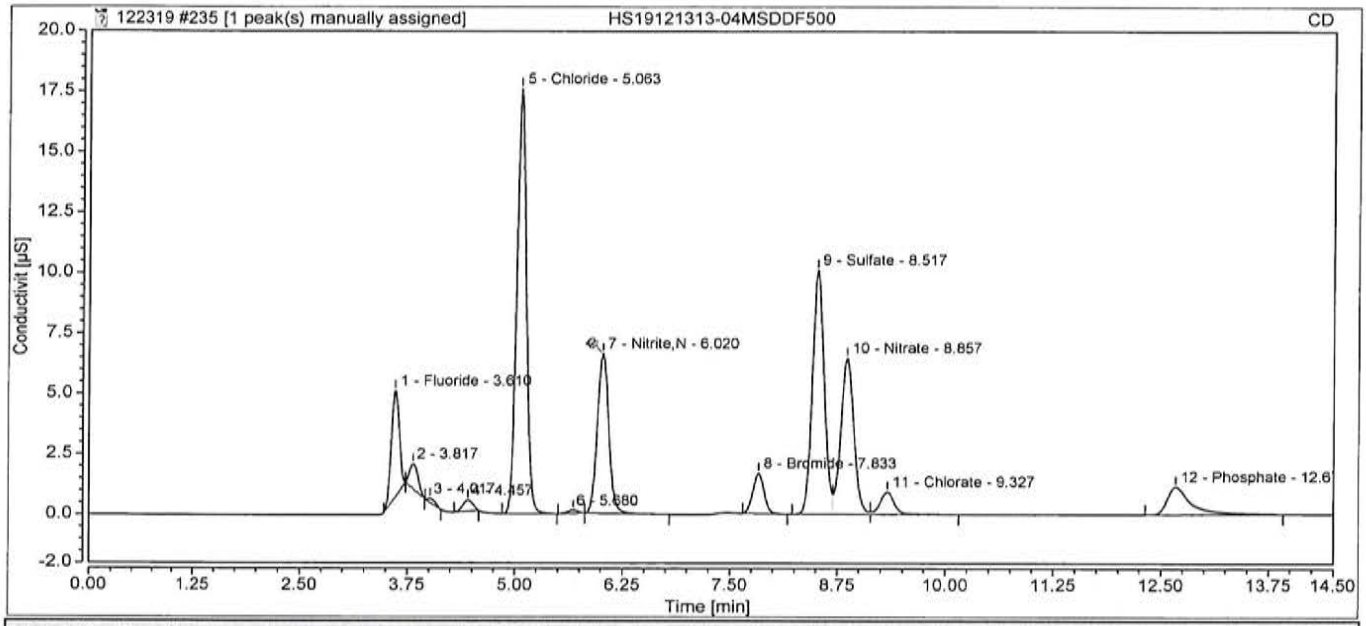


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.471	1.2825	641.2446	500.0000
5	5.06	Chloride	BMB	2.291	9.7843	4892.1464	500.0000
7	6.02	Nitrite,N	BMB^	1.029	2.0089	1004.4656	500.0000
8	7.83	Bromide	BMB	0.253	2.5589	1279.4549	500.0000
9	8.52	Sulfate	BM	1.622	9.4557	4727.8722	500.0000
10	8.86	Nitrate	M	1.148	1.9706	985.3046	500.0000
11	9.33	Chlorate	MB	0.181	1.9418	970.8946	500.0000
12	12.67	Phosphate	BMB	0.383	1.6998	849.8942	500.0000
Total:			**0.000**	**7.377**		**15351.28**	

235 *HS19121313-04MSDDF500*

Sample Name:	**HS19121313-04MSDDF500**	*Injection Volume:*	**5.00**
Vial Number:	**GD1**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**500.0000**
Recording Time:	**12/26/2019 12:50**	*Sample Weight:*	**1.0000**
Run Time:			



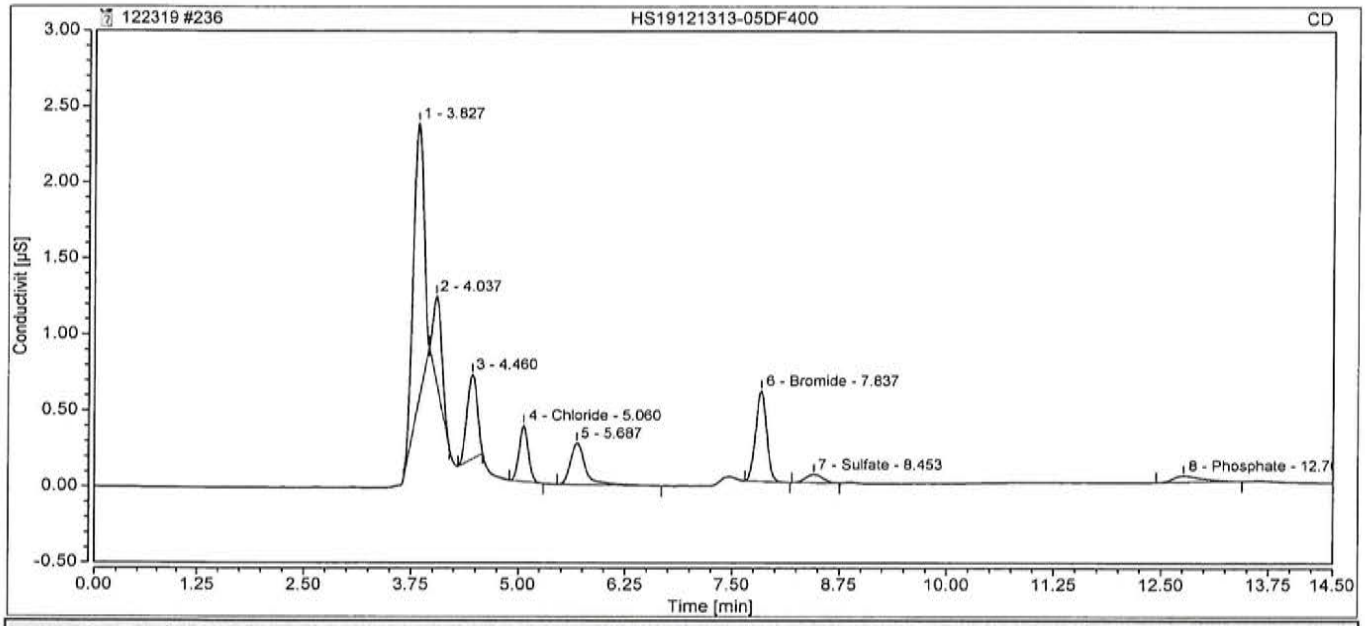
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.467	1.2708	635.4189	500.0000
5	5.06	Chloride	BMB	2.270	9.6983	4849.1688	500.0000
7	6.02	Nitrite,N	BMB^	1.022	1.9946	997.3118	500.0000
8	7.83	Bromide	BMB	0.251	2.5388	1269.4051	500.0000
9	8.52	Sulfate	BM	1.608	9.3747	4687.3635	500.0000
10	8.86	Nitrate	M	1.140	1.9571	978.5666	500.0000
11	9.33	Chlorate	MB	0.178	1.9158	957.9004	500.0000
12	12.67	Phosphate	BMB	0.383	1.6983	849.1298	500.0000
Total:			**0.000**	**7.319**		**15224.26**	

236 *HS19121313-05DF400*

Sample Name:	**HS19121313-05DF400**	*Injection Volume:*	**5.00**
Vial Number:	**GD2**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**400.0000**
Recording Time:	**12/26/2019 13:06**	*Sample Weight:*	**1.0000**

Run Time:



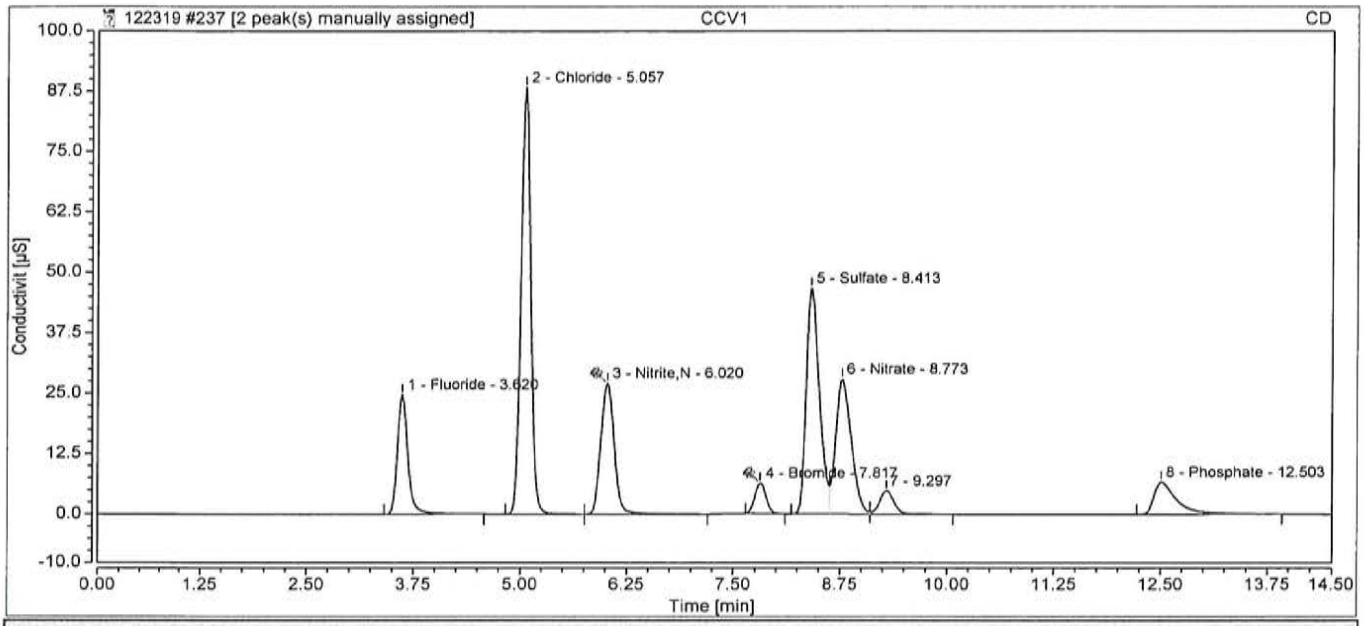
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	400.0000
4	5.06	Chloride	BMB	0.047	0.2559	102.3597	400.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	400.0000
6	7.84	Bromide	BMB	0.090	0.9484	379.3485	400.0000
7	8.45	Sulfate	BMB	0.013	0.0874	34.9624	400.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	400.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	400.0000
8	12.76	Phosphate	BMB	0.017	0.1210	48.3973	400.0000
Total:			**0.000**	**0.167**		**565.07**	

237 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 13:23**	*Sample Weight:*	**1.0000**

Run Time:



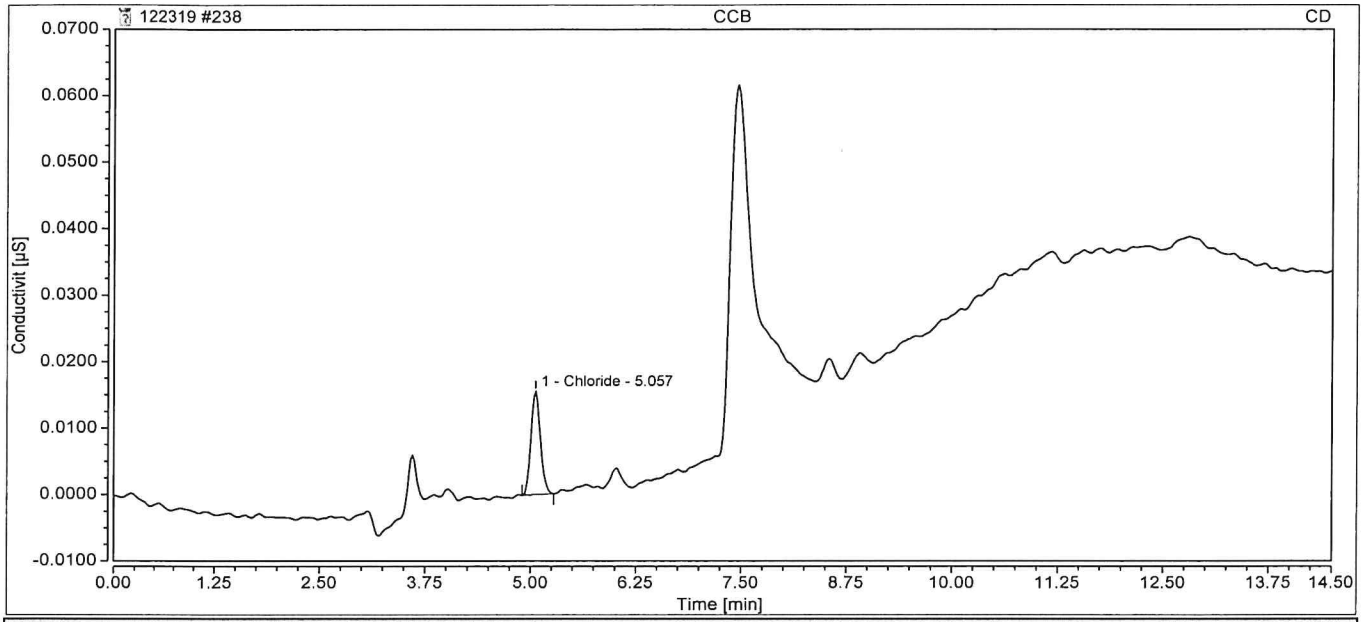
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.572	9.6292	9.6292	1.0000
2	5.06	Chloride	BMB	11.581	49.2327	49.2327	1.0000
3	6.02	Nitrite,N	BMB^	4.893	9.5560	9.5560	1.0000
4	7.82	Bromide	BMB^	0.957	9.5351	9.5351	1.0000
5	8.41	Sulfate	BM	8.251	48.0556	48.0556	1.0000
6	8.77	Nitrate	M	5.948	10.1398	10.1398	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
8	12.50	Phosphate	BMB	2.097	9.0822	9.0822	1.0000
Total:			**0.000**	**37.298**		**145.23**	

238 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 13:40**	*Sample Weight:*	**1.0000**

Run Time:



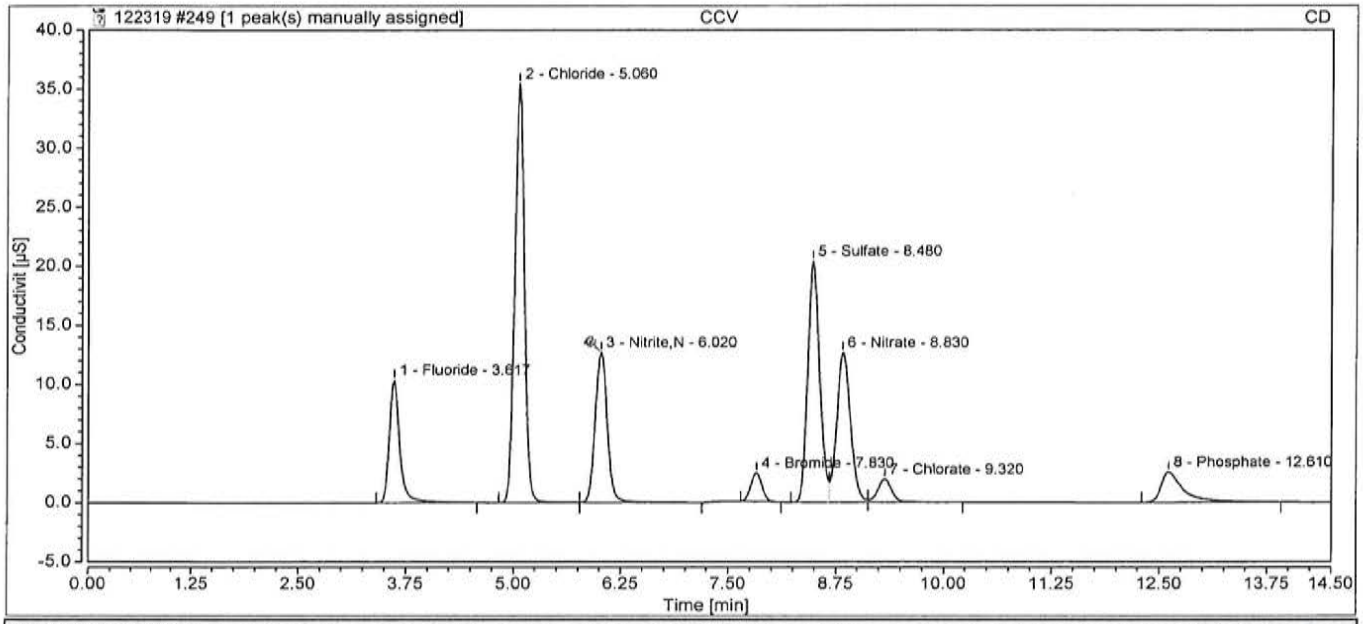
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.06	Chloride	BMB	0.002	0.0659	0.0659	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.002**		**0.07**	

249 CCV

Sample Name:	**CCV**	*Injection Volume:*	**5.00**
Vial Number:	**BA5**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 16:49**	*Sample Weight:*	**1.0000**

Run Time:



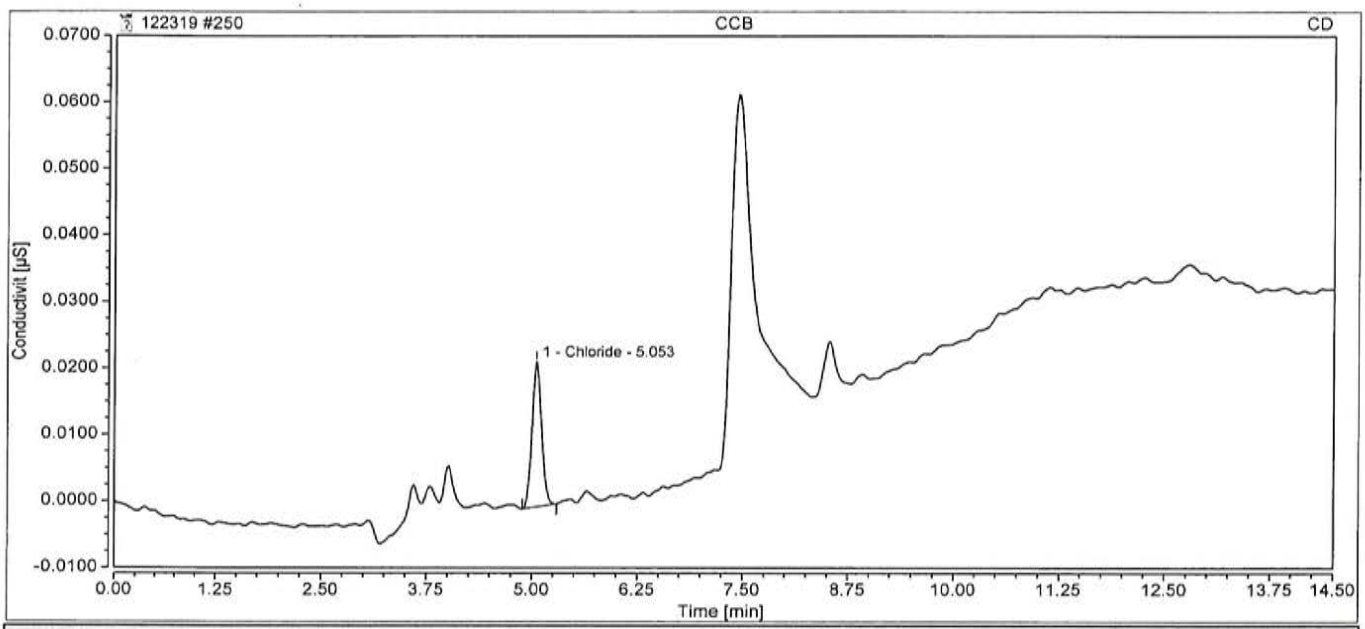
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	1.464	3.9552	3.9552	1.0000
2	5.06	Chloride	BMB	4.615	19.6524	19.6524	1.0000
3	6.02	Nitrite,N	BMB^	2.091	4.0825	4.0825	1.0000
4	7.83	Bromide	BMB	0.366	3.6835	3.6835	1.0000
5	8.48	Sulfate	BM	3.304	19.2485	19.2485	1.0000
6	8.83	Nitrate	M	2.349	4.0148	4.0148	1.0000
7	9.32	Chlorate	MB	0.375	3.9982	3.9982	1.0000
8	12.61	Phosphate	BMB	0.784	3.4246	3.4246	1.0000
Total:			**0.000**	**15.347**		**62.06**	

250 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 17:06**	*Sample Weight:*	**1.0000**

Run Time:



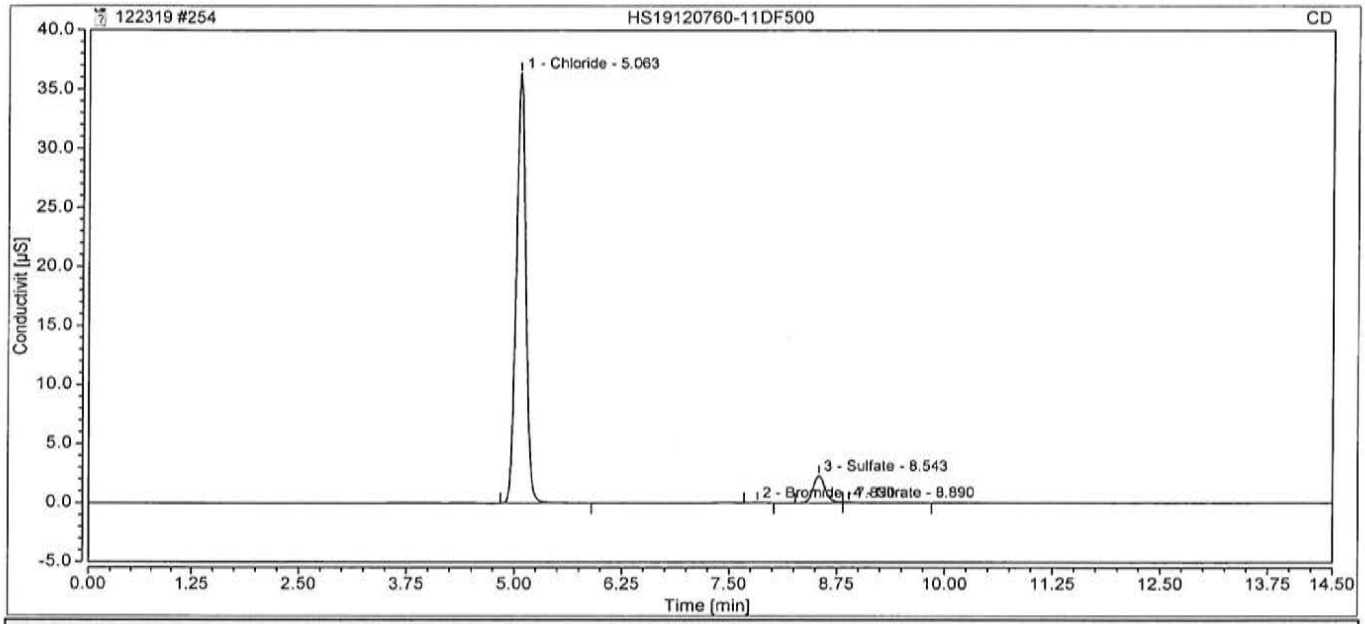
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.05	Chloride	BMB	0.003	0.0694	0.0694	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.003**		**0.07**	

254 HS19120760-11DF500

Sample Name:	**HS19120760-11DF500**	*Injection Volume:*	**5.00**
Vial Number:	**GE6**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**500.0000**
Recording Time:	**12/26/2019 18:12**	*Sample Weight:*	**1.0000**

Run Time:



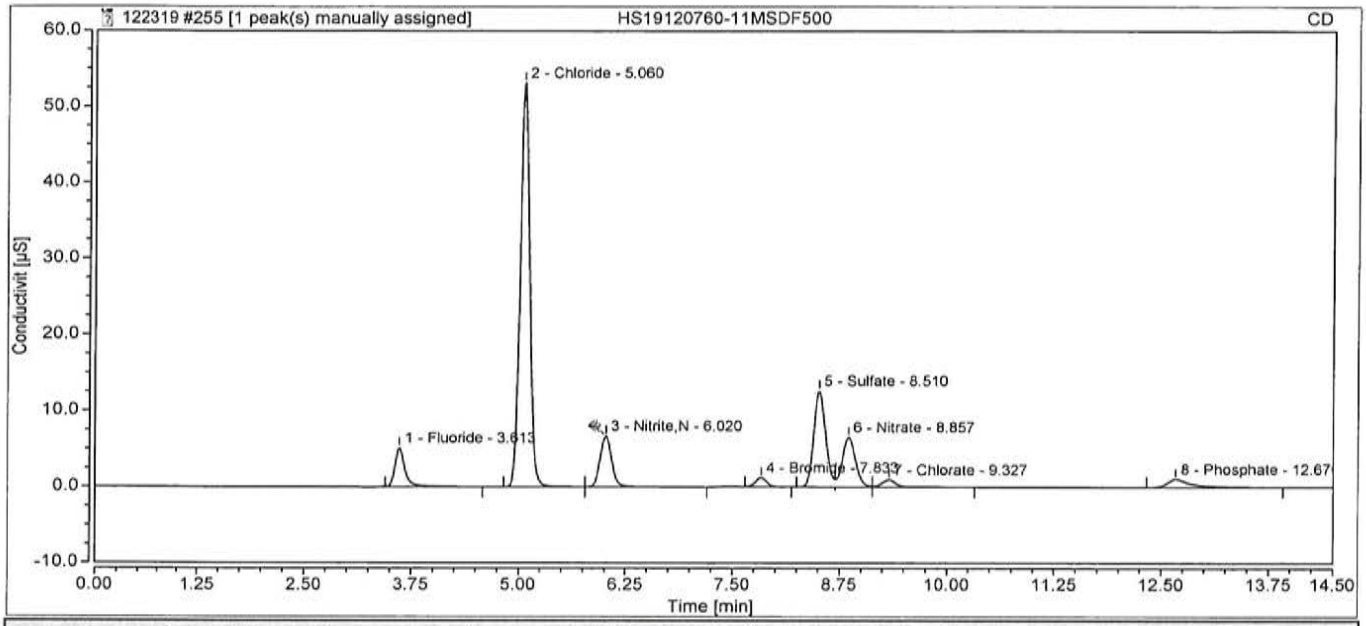
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	500.0000
1	5.06	Chloride	BMB	4.750	20.2286	10114.2759	500.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	500.0000
2	7.83	Bromide	BMB	0.006	0.1069	53.4587	500.0000
3	8.54	Sulfate	BM	0.375	2.1979	1098.9507	500.0000
4	8.89	Nitrate	MB	0.018	0.0485	24.2330	500.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	500.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	500.0000
Total:			**0.000**	**5.149**		**11290.92**	

255 HS19120760-11MSDF500

Sample Name:	**HS19120760-11MSDF500**	*Injection Volume:*	**5.00**
Vial Number:	**GE7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**500.0000**
Recording Time:	**12/26/2019 18:29**	*Sample Weight:*	**1.0000**

Run Time:



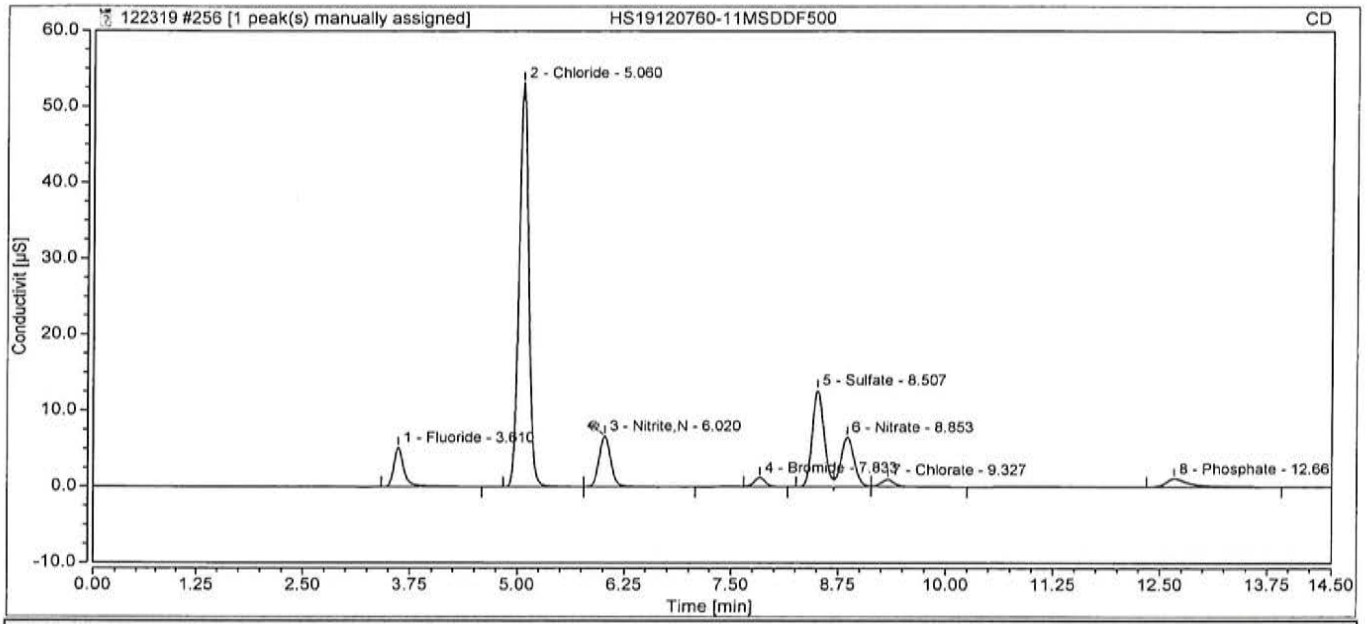
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.723	1.9618	980.8763	500.0000
2	5.06	Chloride	BMB	6.960	29.6091	14804.5335	500.0000
3	6.02	Nitrite,N	BMB^	1.057	2.0632	1031.6145	500.0000
4	7.83	Bromide	BMB	0.182	1.8523	926.1527	500.0000
5	8.51	Sulfate	BM	2.019	11.7663	5883.1541	500.0000
6	8.86	Nitrate	M	1.170	2.0090	1004.4907	500.0000
7	9.33	Chlorate	MB	0.184	1.9747	987.3564	500.0000
8	12.67	Phosphate	BMB	0.355	1.5776	788.8205	500.0000
Total:			**0.000**	**12.649**		**26407.00**	

256 HS19120760-11MSDDF500

Sample Name:	**HS19120760-11MSDDF500**	*Injection Volume:*	**5.00**
Vial Number:	**GE8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**500.0000**
Recording Time:	**12/26/2019 18:45**	*Sample Weight:*	**1.0000**

Run Time:



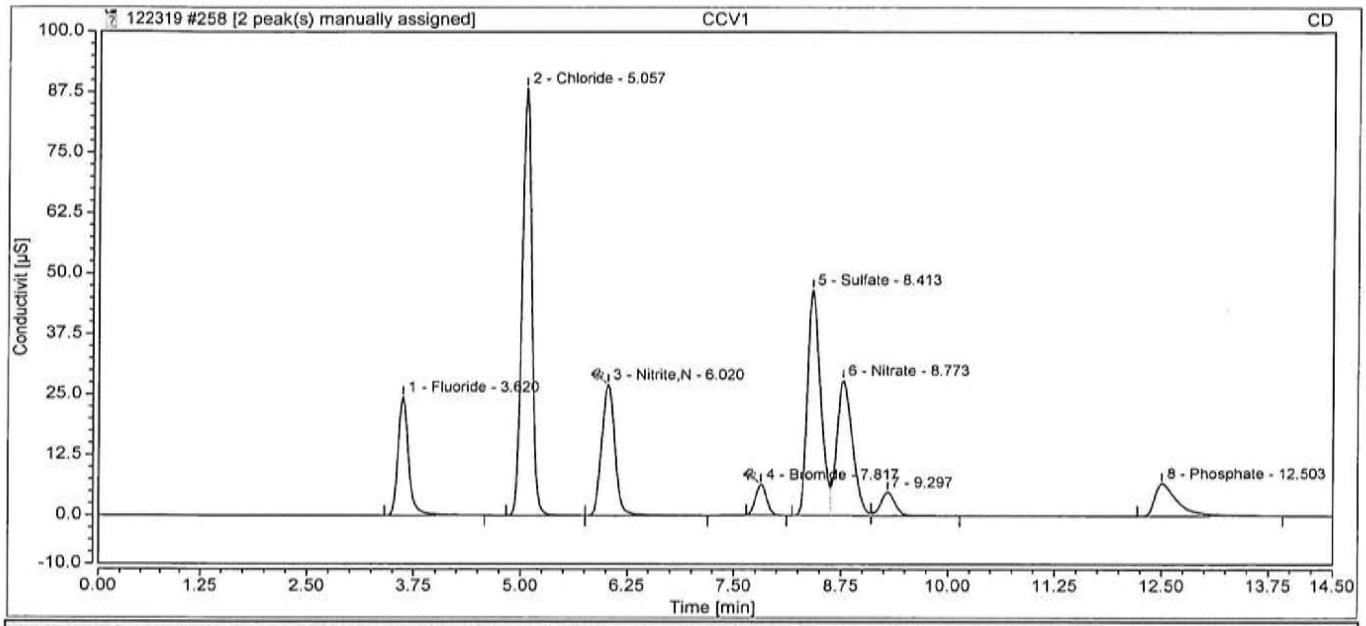
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.725	1.9668	983.3831	500.0000
2	5.06	Chloride	BMB	6.972	29.6618	14830.9112	500.0000
3	6.02	Nitrite,N	BMB^	1.056	2.0621	1031.0312	500.0000
4	7.83	Bromide	BMB	0.181	1.8503	925.1728	500.0000
5	8.51	Sulfate	BM	2.029	11.8287	5914.3640	500.0000
6	8.85	Nitrate	M	1.164	1.9988	999.3893	500.0000
7	9.33	Chlorate	MB	0.182	1.9580	979.0131	500.0000
8	12.67	Phosphate	BMB	0.362	1.6060	803.0000	500.0000
Total:			**0.000**	**12.672**		**26466.26**	

258 CCV1

Sample Name:	**CCV1**	*Injection Volume:*	**5.00**
Vial Number:	**BA7**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 19:19**	*Sample Weight:*	**1.0000**

Run Time:



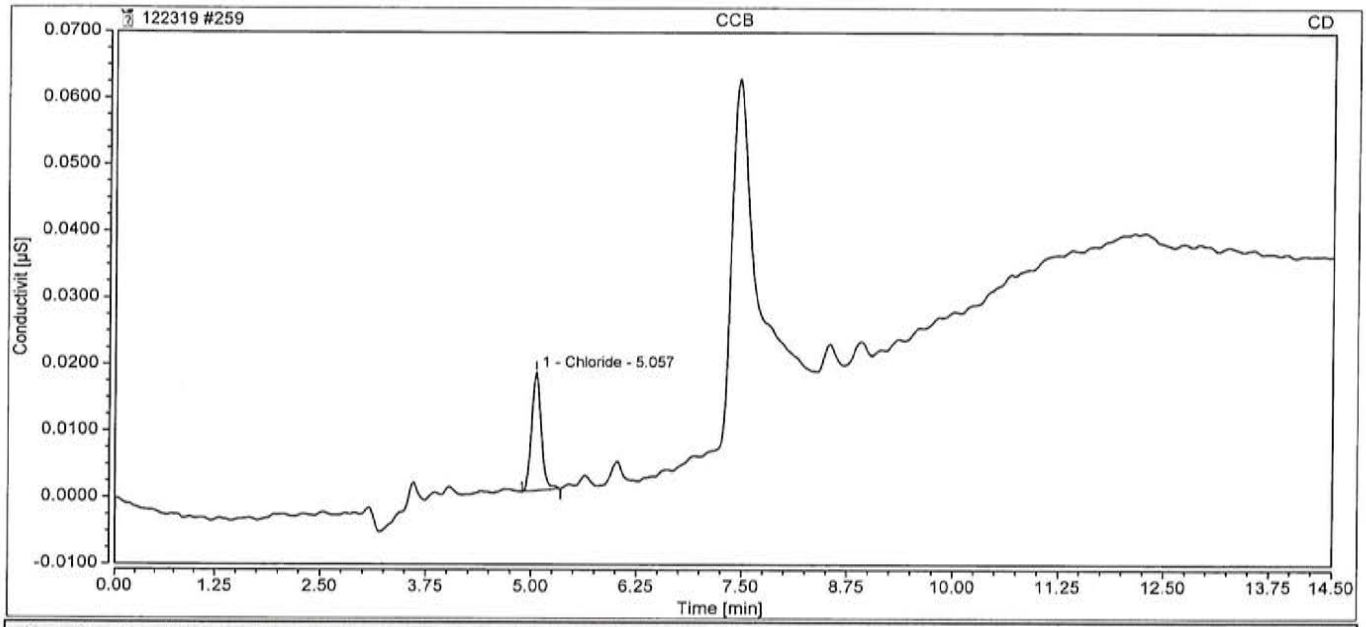
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	3.574	9.6340	9.6340	1.0000
2	5.06	Chloride	BMB	11.592	49.2809	49.2809	1.0000
3	6.02	Nitrite,N	BMB^	4.901	9.5724	9.5724	1.0000
4	7.82	Bromide	BMB^	0.956	9.5330	9.5330	1.0000
5	8.41	Sulfate	BM	8.259	48.1004	48.1004	1.0000
6	8.77	Nitrate	M	5.969	10.1761	10.1761	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
8	12.50	Phosphate	BMB	2.114	9.1562	9.1562	1.0000
Total:			**0.000**	**37.366**		**145.45**	

259 CCB

Sample Name:	**CCB**	*Injection Volume:*	**5.00**
Vial Number:	**BA8**	*Channel:*	**CD**
Sample Type:	**Unknown**	*Wavelength:*	**210**
Control Program:	**Anions Program 08092019**	*Bandwidth:*	**n.a.**
Quantif. Method:	**Anions Processing Method**	*Dilution Factor:*	**1.0000**
Recording Time:	**12/26/2019 19:35**	*Sample Weight:*	**1.0000**

Run Time:



Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
n.a.	n.a.	Fluoride	n.a.	n.a.	n.a.	n.a.	1.0000
1	5.06	Chloride	BMB	0.002	0.0673	0.0673	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Sulfate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Chlorate	n.a.	n.a.	n.a.	n.a.	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**0.002**		**0.07**	

HS19122 1313

	T	Analysi	Sample Name	Sample ID	Origin	Result	Status	Date / Time	Vial
1	S	NPOC	CAL	312.093(401-40	12-27-2019.2		Completed	12/27/2019 7:01:10 PM	1, 2, 3
2	U	NPOC	ICV	312.093.407	12-27-2019.c	NPOC:9.611mg/L	Completed	12/27/2019 7:14:23 PM	7
3	U	NPOC	ICB	Untitled	12-27-2019.c	NPOC:0.1604mg/	Completed	12/27/2019 7:27:36 PM	8
4	U	NPOC	WBLKW1-122719	5310B	12-27-2019.c	NPOC:0.1409mg/	Completed	12/27/2019 7:42:54 PM	9
5	U	NPOC	WLCSW-122719		12-27-2019.c	NPOC:9.499mg/L	Completed	12/27/2019 8:12:28 PM	10
6	U	NPOC	WLCSDW-122719		12-27-2019.c	NPOC:9.534mg/L	Completed	12/27/2019 8:25:41 PM	11
7	U	NPOC	HS19120594-01	1/2	12-27-2019.c	NPOC:3.476mg/L	Completed	12/27/2019 8:38:54 PM	12
8	U	NPOC	HS19120596-01	1/2	12-27-2019.c	NPOC:6.586mg/L	Completed	12/27/2019 8:52:07 PM	13
9	U	NPOC	HS19120790-01DF20	1/1	12-27-2019.c	NPOC:3.832mg/L	Completed	12/27/2019 9:07:25 PM	14
10	U	NPOC	HS19120790-02DF20	1/1	12-27-2019.c	NPOC:2.895mg/L	Completed	12/27/2019 9:20:33 PM	15
11	U	NPOC	HS19120790-03DF20	1/1	12-27-2019.c	NPOC:6.811mg/L	Completed	12/27/2019 9:33:48 PM	16
12	U	NPOC	HS19120790-04DF20	1/1	12-27-2019.c	NPOC:5.517mg/L	Completed	12/27/2019 9:52:06 PM	17
13	U	NPOC	HS19120790-05DF20	1/1	12-27-2019.c	NPOC:6.992mg/L	Completed	12/27/2019 10:06:30 P	18
14	U	NPOC	CCV	312.093.408	12-27-2019.c	NPOC:23.75mg/L	Completed	12/27/2019 10:20:02 P	19
15	U	NPOC	CCB		12-27-2019.c	NPOC:0.2278mg/	Completed	12/27/2019 10:35:20 P	20
16	U	NPOC	HS19120790-06DF5	1/1	12-27-2019.c	NPOC:3.066mg/L	Completed	12/27/2019 10:48:28 P	21
17	U	NPOC	HS19120790-07DF20	1/1	12-27-2019.c	NPOC:21.59mg/L	Completed	12/27/2019 11:01:58 P	22
18	U	NPOC	HS19121167-01	1/2	12-27-2019.c	NPOC:11.90mg/L	Completed	12/27/2019 11:15:26 P	23
19	U	NPOC	HS19121167-01MS	1/2	12-27-2019.c	NPOC:21.31mg/L	Completed	12/27/2019 11:28:39 P	24
20	U	NPOC	CCV		12-27-2019.c	NPOC:24.98mg/L	Completed	12/27/2019 11:41:54 P	25
21	U	NPOC	CCB		12-27-2019.c	NPOC:0.2541mg/	Completed	12/27/2019 11:57:12 P	26
22	U	NPOC	WBLKW-122719	415.1 DISS	12-27-2019.c	NPOC:0.3005mg/	Completed	12/28/2019 12:12:26 A	27
23	U	NPOC	WLCSW-122719		12-27-2019.c	NPOC:9.382mg/L	Completed	12/28/2019 12:25:35 A	28
24	U	NPOC	WLCSDW-122719		12-27-2019.c	NPOC:9.440mg/L	Completed	12/28/2019 12:38:49 A	29
25	U	NPOC	HS19120742-01	1/1 PH=2	12-27-2019.c	NPOC:1.819mg/L	Completed	12/28/2019 12:52:03 A	30
26	U	NPOC	HS19120742-01MS	1/1	12-27-2019.c	NPOC:11.68mg/L	Completed	12/28/2019 1:05:17 AM	31
27	U	NPOC	CCV		12-27-2019.c	NPOC:24.53mg/L	Completed	12/28/2019 1:18:31 AM	32
28	U	NPOC	CCB		12-27-2019.c	NPOC:0.2052mg/	Completed	12/28/2019 1:31:45 AM	33
29	U	NPOC	WBLKW2-122719		12-27-2019.c	NPOC:0.2622mg/	Completed	12/28/2019 1:44:59 AM	34
30	U	NPOC	WLCSW2-122719		12-27-2019.c	NPOC:9.431mg/L	Completed	12/28/2019 1:58:13 AM	35
31	U	NPOC	WLCSDW2-122719		12-27-2019.c	NPOC:9.464mg/L	Completed	12/28/2019 2:11:27 AM	36
32	U	NPOC	HS19121045-02	1/2	12-27-2019.c	NPOC:3.736mg/L	Completed	12/28/2019 2:26:55 AM	37
33	U	NPOC	HS19121097-01	1/2	12-27-2019.c	NPOC:3.892mg/L	Completed	12/28/2019 2:40:04 AM	38
34	U	NPOC	HS19121134-01	1/2	12-27-2019.c	NPOC:4.409mg/L	Completed	12/28/2019 2:53:18 AM	39
35	U	NPOC	HS19121188-01	1/2	12-27-2019.c	NPOC:2.718mg/L	Completed	12/28/2019 3:06:32 AM	40
36	U	NPOC	HS19121084-01	1/2	12-27-2019.c	NPOC:4.135mg/L	Completed	12/28/2019 3:19:46 AM	41
37	U	NPOC	HS19120862-01	1/2	12-27-2019.c	NPOC:8.834mg/L	Completed	12/28/2019 3:33:00 AM	42
38	U	NPOC	HS19120874-01	1/2	12-27-2019.c	NPOC:4.295mg/L	Completed	12/28/2019 3:48:19 AM	43
39	U	NPOC	CCV		12-27-2019.c	NPOC:24.64mg/L	Completed	12/28/2019 4:01:28 AM	44
40	U	NPOC	CCB		12-27-2019.c	NPOC:0.2241mg/	Completed	12/28/2019 4:16:47 AM	45
41	U	NPOC	HS19121214-01DF20	1/2	12-27-2019.c	NPOC:1.360mg/L	Completed	12/28/2019 4:32:01 AM	46
42	U	NPOC	HS19121263-01	1/2	12-27-2019.c	NPOC:10.06mg/L	Completed	12/28/2019 4:45:11 AM	47
43	U	NPOC	HS19121274-01	1/2	12-27-2019.c	NPOC:11.12mg/L	Completed	12/28/2019 4:58:26 AM	48
44	U	NPOC	HS19121274-01MS	1/2	12-27-2019.c	NPOC:21.21mg/L	Completed	12/28/2019 5:11:41 AM	49
45	U	NPOC	WBLKW3-122719		12-27-2019.c	NPOC:0.3120mg/	Completed	12/28/2019 5:27:02 AM	50
46	U	NPOC	WLCSW3-122719		12-27-2019.c	NPOC:9.562mg/L	Completed	12/28/2019 5:40:12 AM	51
47	U	NPOC	WLCSDW3-122719		12-27-2019.c	NPOC:9.521mg/L	Completed	12/28/2019 5:53:27 AM	52
48	U	NPOC	HS191121313-01DF2000	1/2	12-27-2019.c	NPOC:11.47mg/L	Completed	12/28/2019 6:08:47 AM	53
49	U	NPOC	HS191121313-02DF2000	1/2	12-27-2019.c	NPOC:77.35mg/L	Completed	12/28/2019 6:22:19 AM	54
50	U	NPOC	HS191121313-03DF2000	1/2	12-27-2019.c	NPOC:72.13mg/L	Completed	12/28/2019 6:36:06 AM	55
51	U	NPOC	CCV		12-27-2019.c	NPOC:24.45mg/L	Completed	12/28/2019 6:49:37 AM	56

	T	Analysi	Sample Name	Sample ID	Origin	Result	Status	Date / Time	Vial
52	U	NPOC	CCB		12-27-2019.c	NPOC:0.3809mg/	Completed	12/28/2019 7:02:52 AM	57
53	U	NPOC	HS191121313-04DF2000	1/6	12-27-2019.c	NPOC:24.00mg/L	Completed	12/28/2019 7:18:13 AM	58
54	U	NPOC	HS191121313-04MSDF2000	1/6	12-27-2019.c	NPOC:35.48mg/L	Completed	12/28/2019 7:33:28 AM	59
55	U	NPOC	HS191121313-04MSDDF2000	1/6	12-27-2019.c	NPOC:35.50mg/L	Completed	12/28/2019 7:48:44 AM	60
56	U	NPOC	HS191121313-05DF2000	1/2	12-27-2019.c	NPOC:19.02mg/L	Completed	12/28/2019 8:04:00 AM	61
57	U	NPOC	CCV		12-27-2019.c	NPOC:23.94mg/L	Completed	12/28/2019 8:17:11 AM	62
58	U	NPOC	CCB		12-27-2019.c	NPOC:0.2852mg/	Completed	12/28/2019 8:32:32 AM	63
59	U	NPOC	CCV	RERUN	12-27-2019.c	NPOC:24.20mg/L	Completed	12/30/2019 10:19:47 A	1
60	U	NPOC	CCB		12-27-2019.c	NPOC:0.1740mg/	Completed	12/30/2019 10:35:05 A	2
61	U	NPOC	HS191121313-01DF4000	1/2	12-27-2019.c	NPOC:36.12mg/L	Completed	12/30/2019 10:48:22 A	3
62	U	NPOC	HS191121313-02DF4000	1/2	12-27-2019.c	NPOC:34.19mg/L	Completed	12/30/2019 11:03:58 A	4
63	U	NPOC	CCV		12-27-2019.c	NPOC:24.87mg/L	Completed	12/30/2019 11:17:20 A	5
64	U	NPOC	CCB		12-27-2019.c	NPOC:0.4667mg/	Completed	12/30/2019 11:32:38 A	6

Instr.Information

System	TOC csh with asi
Instrument Options	TOC/ASI/IC Unit/
Catalyst	Regular Sensitivity

Cal. Curve

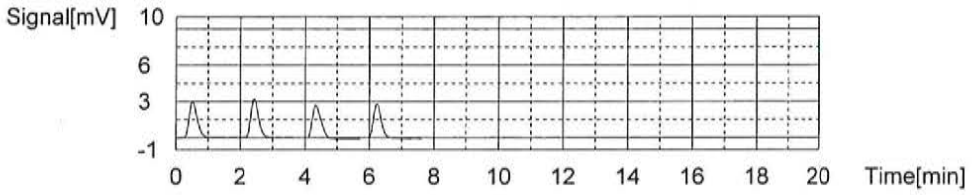
Sample Name:	CAL
Sample ID:	312.093(401-406)
Cal. Curve:	12-27-2019.2019_12_27_17_39_54.cal
Status	Completed

Type	Anal.
Standard	NPOC

Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	5.197	50uL	1	*******		12/27/2019 5:48:38 PM
2	5.190	50uL	1	*******		12/27/2019 5:50:43 PM
3	4.974	50uL	1	*******		12/27/2019 5:52:48 PM
4	4.605	50uL	1	*******	E	12/27/2019 5:54:53 PM

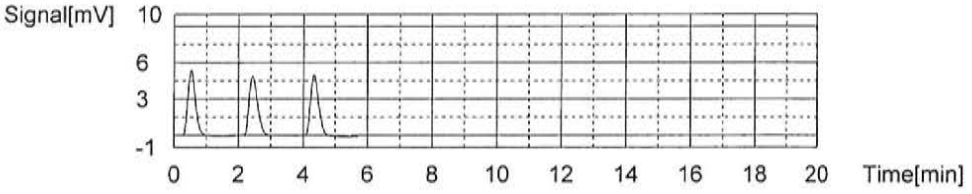
Acid Add. 0.000%
Sp. Time 180.0sec
Mean Area 5.120



Conc: 2.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	8.696	50uL	1	*******		12/27/2019 6:03:51 PM
2	8.755	50uL	1	*******		12/27/2019 6:05:56 PM
3	8.629	50uL	1	*******		12/27/2019 6:08:01 PM

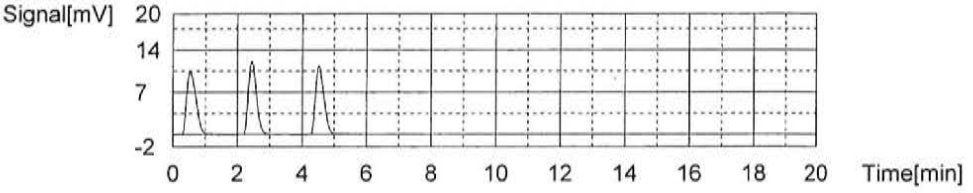
Acid Add. 0.000%
Sp. Time 180.0sec
Mean Area 8.693



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	20.77	50uL	1	*******		12/27/2019 6:17:04 PM
2	20.80	50uL	1	*******		12/27/2019 6:19:20 PM
3	20.69	50uL	1	*******		12/27/2019 6:21:25 PM

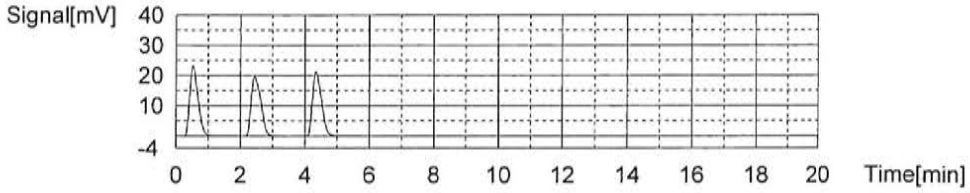
Acid Add. 0.000%
Sp. Time 180.0sec
Mean Area 20.75



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	41.28	50uL	1	*******		12/27/2019 6:30:28 PM
2	41.15	50uL	1	*******		12/27/2019 6:32:33 PM
3	41.51	50uL	1	*******		12/27/2019 6:34:38 PM

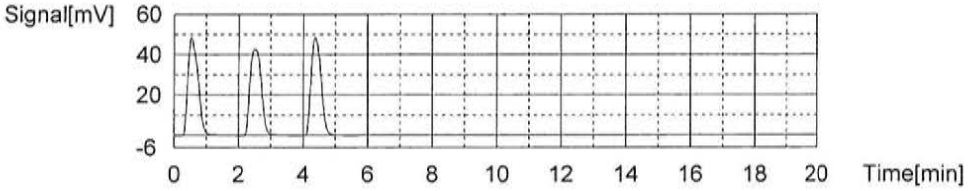
Acid Add. 0.000%
Sp. Time 180.0sec
Mean Area 41.31



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	104.6	50uL	1	*******		12/27/2019 6:43:41 PM
2	104.2	50uL	1	*******		12/27/2019 6:45:46 PM
3	104.9	50uL	1	*******		12/27/2019 6:47:51 PM

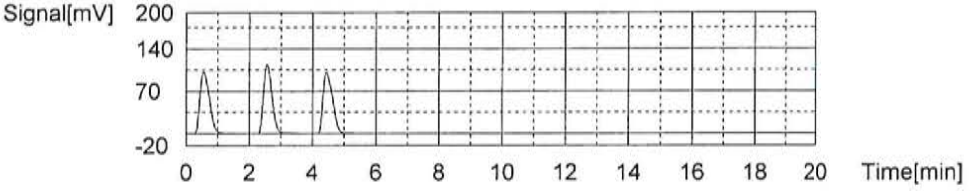
Acid Add. 0.000%
Sp. Time 180.0sec
Mean Area 104.6



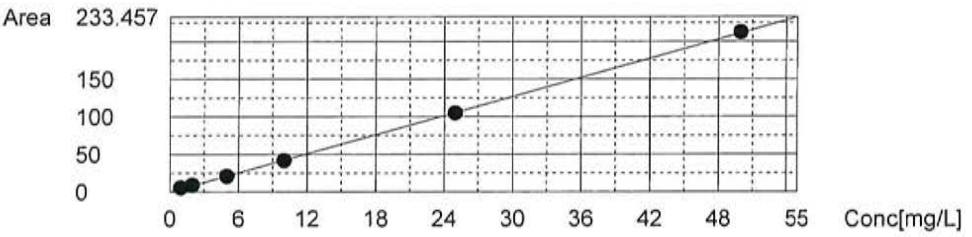
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	212.1	50uL	1	*******		12/27/2019 6:57:00 PM
2	212.9	50uL	1	*******		12/27/2019 6:59:05 PM
3	211.7	50uL	1	*******		12/27/2019 7:01:10 PM

Acid Add. 0.000%
Sp. Time 180.0sec
Mean Area 212.2



Slope: 4.234
Intercept 0.000
r^2 0.9999
r 0.9999
Zero Shift Yes



Sample

Sample Name: ICV
Sample ID: 312.093.407
Origin: 12-27-2019.cal
Status Completed
Chk. Result

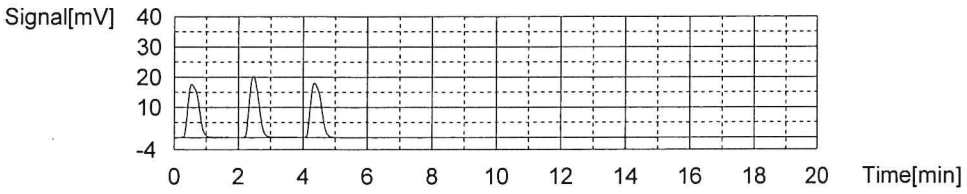
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:9.611mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	40.69	9.610mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/27/2019 7:10:13 PM
2	40.63	9.596mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/27/2019 7:12:18 PM
3	40.76	9.626mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/27/2019 7:14:23 PM

Mean Area 40.69
Mean Conc. 9.611mg/L



Sample

Sample Name: ICB
Sample ID: Untitled
Origin: 12-27-2019.cal
Status Completed
Chk. Result

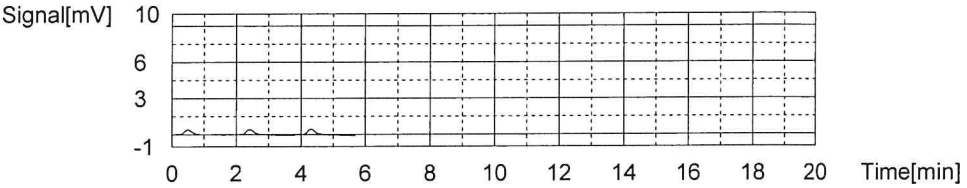
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.1604mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	0.6561	0.1550mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/27/2019 7:23:26 PM
2	0.6578	0.1554mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/27/2019 7:25:31 PM
3	0.7234	0.1708mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/27/2019 7:27:36 PM

Mean Area 0.6791
Mean Conc. 0.1604mg/L



Sample

Sample Name: CCV
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

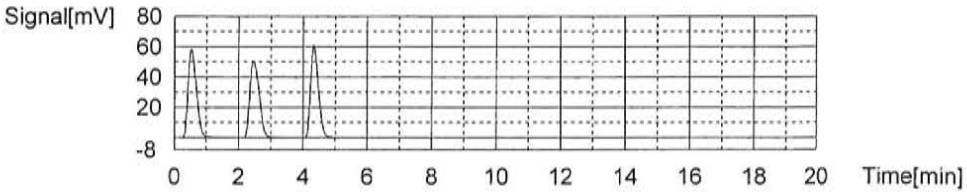
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:24.64mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	105.5	24.92mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 3:57:18 AM
2	103.7	24.49mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 3:59:23 AM
3	103.8	24.51mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 4:01:28 AM

Mean Area 104.3
Mean Conc. 24.64mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

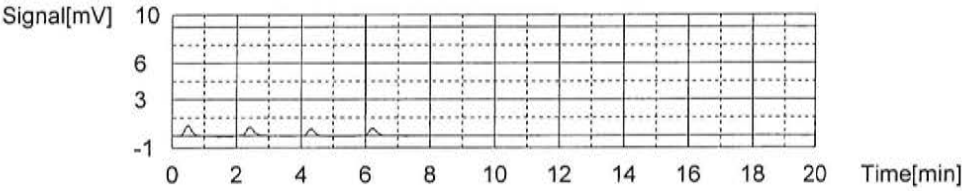
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.2241mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.244	0.2938mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 4:10:32 AM
2	1.141	0.2695mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 4:12:37 AM
3	0.8406	0.1985mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 4:14:42 AM
4	0.8653	0.2044mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 4:16:47 AM

Mean Area 0.9490
Mean Conc. 0.2241mg/L



Sample

Sample Name: WBLKW3-122719
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

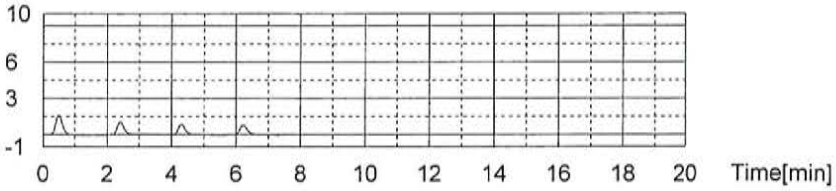
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.3120mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2.390	0.5645mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:20:47 AM
2	1.486	0.3510mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:22:52 AM
3	1.221	0.2884mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:24:57 AM
4	1.256	0.2966mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:27:02 AM

Mean Area 1.321
Mean Conc. 0.3120mg/L



Sample

Sample Name: WLCSW3-122719
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

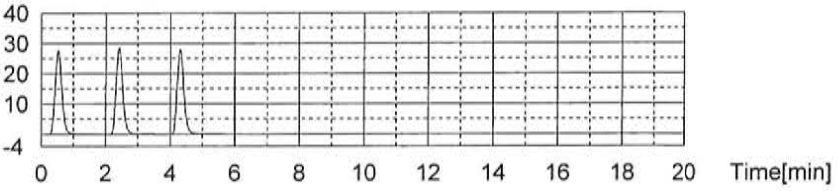
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:9.562mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	40.30	9.518mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:36:02 AM
2	40.69	9.610mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:38:07 AM
3	40.47	9.558mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:40:12 AM

Mean Area 40.49
Mean Conc. 9.562mg/L



Sample

Sample Name: WLCSDW3-122719
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

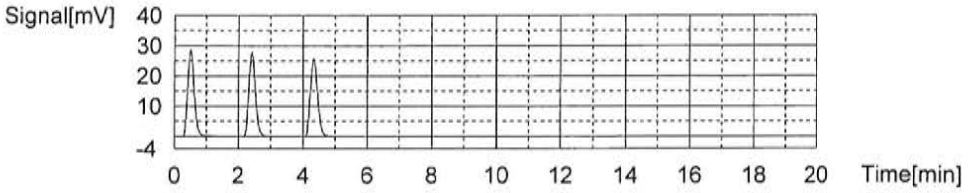
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:9.521mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	40.73	9.619mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:49:17 AM
2	39.77	9.393mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:51:22 AM
3	40.44	9.551mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 5:53:27 AM

Mean Area 40.31
Mean Conc. 9.521mg/L



Sample

Sample Name: HS191121313-01DF2000
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

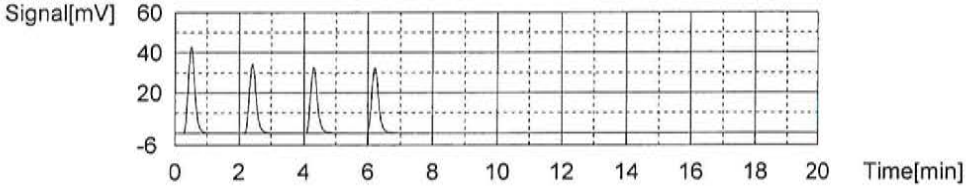
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:11.47mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	61.21	14.46mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:02:32 AM
2	50.19	11.85mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:04:37 AM
3	48.01	11.34mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:06:42 AM
4	47.51	11.22mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:08:47 AM

Mean Area 48.57
Mean Conc. 11.47mg/L



Sample

Sample Name: HS191121313-02DF2000
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

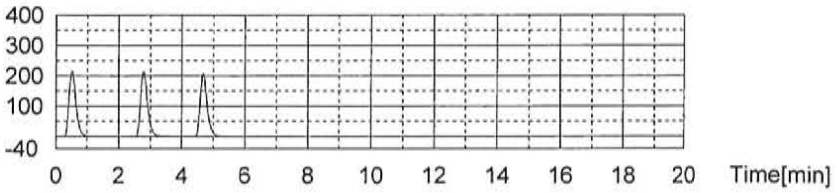
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:77.35mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	332.9	78.62mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:18:09 AM
2	326.4	77.09mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:20:14 AM
3	323.3	76.35mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:22:19 AM

Mean Area 327.5
Mean Conc. 77.35mg/L



Sample

Sample Name: HS191121313-03DF2000
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

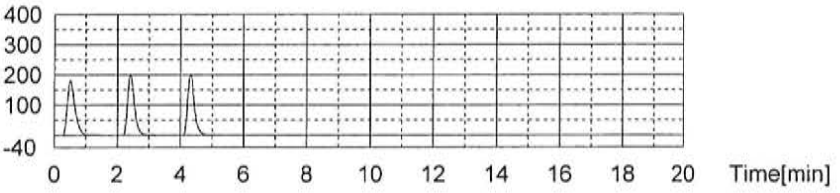
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:72.13mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	312.2	73.73mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:31:25 AM
2	301.6	71.23mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:33:30 AM
3	302.4	71.42mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:36:06 AM

Mean Area 305.4
Mean Conc. 72.13mg/L



Sample

Sample Name: CCV
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

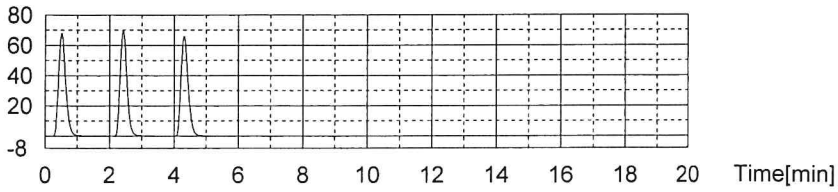
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:24.45mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	104.4	24.66mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:45:11 AM
2	102.8	24.28mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:47:16 AM
3	103.4	24.42mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:49:37 AM

Mean Area 103.5
Mean Conc. 24.45mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

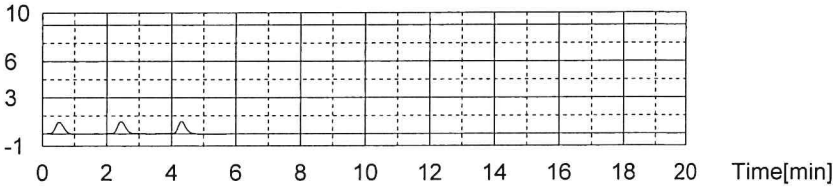
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.3809mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.680	0.3968mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 6:58:42 AM
2	1.602	0.3783mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:00:47 AM
3	1.556	0.3675mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:02:52 AM

Mean Area 1.613
Mean Conc. 0.3809mg/L



Sample

Sample Name: HS191121313-04DF2000
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

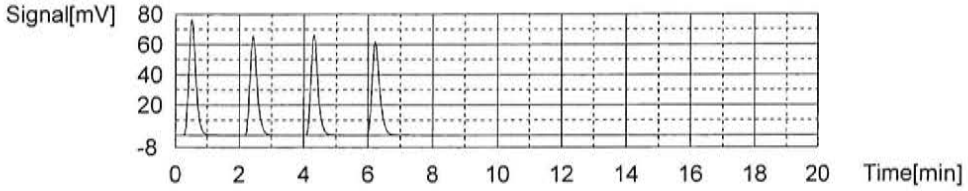
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:24.00mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	115.8	27.35mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:11:57 AM
2	103.2	24.37mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:14:02 AM
3	100.8	23.81mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:16:07 AM
4	100.9	23.83mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:18:13 AM

Mean Area 101.6
Mean Conc. 24.00mg/L



Sample

Sample Name: HS191121313-04MSDF2000
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

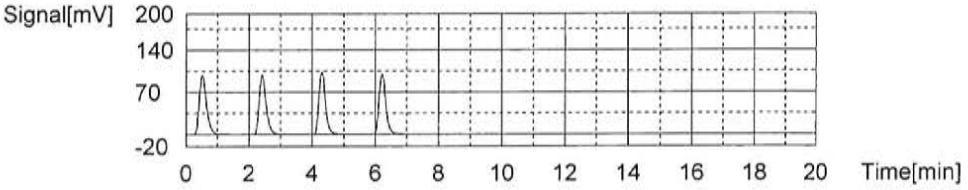
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:35.48mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	158.7	37.48mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:27:13 AM
2	153.8	36.32mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:29:18 AM
3	148.9	35.17mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:31:23 AM
4	148.0	34.95mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:33:28 AM

Mean Area 150.2
Mean Conc. 35.48mg/L



Sample

Sample Name: HS191121313-04MSDDF2000
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

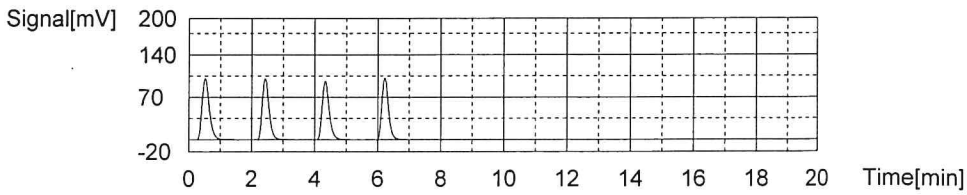
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:35.50mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	163.7	38.66mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:42:29 AM
2	150.2	35.47mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:44:34 AM
3	151.3	35.73mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:46:39 AM
4	149.4	35.28mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:48:44 AM

Mean Area 150.3
Mean Conc. 35.50mg/L



Sample

Sample Name: HS191121313-05DF2000
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

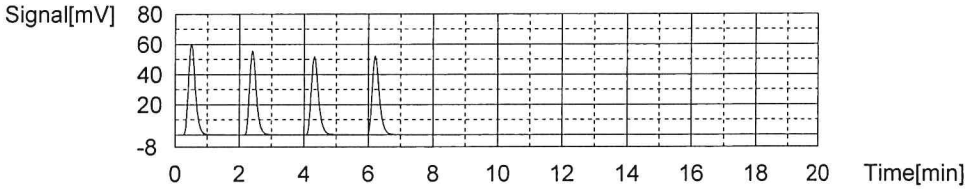
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:19.02mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	89.16	21.06mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:57:45 AM
2	81.01	19.13mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 7:59:50 AM
3	80.55	19.02mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 8:01:55 AM
4	80.09	18.92mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 8:04:00 AM

Mean Area 80.55
Mean Conc. 19.02mg/L



Sample

Sample Name: CCV
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

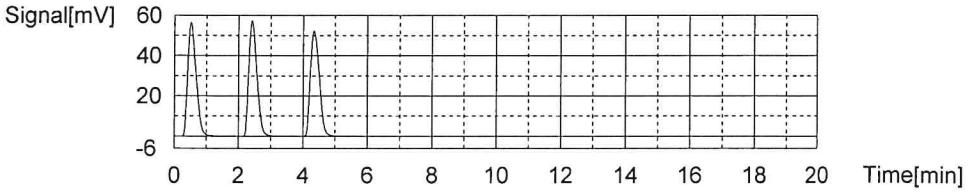
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:23.94mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	101.8	24.04mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 8:13:01 AM
2	100.2	23.66mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 8:15:06 AM
3	102.1	24.11mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 8:17:11 AM

Mean Area 101.4
Mean Conc. 23.94mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

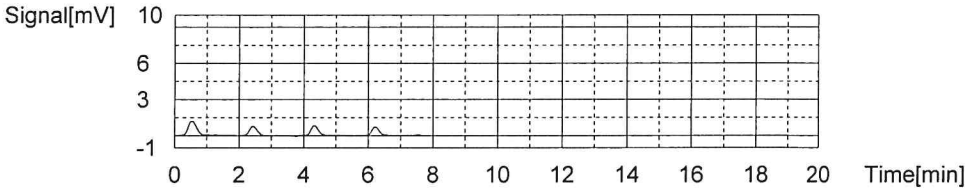
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.2852mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2.067	0.4882mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 8:26:17 AM
2	1.269	0.2997mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 8:28:22 AM
3	1.212	0.2862mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 8:30:27 AM
4	1.142	0.2697mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/28/2019 8:32:32 AM

Mean Area 1.208
Mean Conc. 0.2852mg/L



Sample

Sample Name: CCV
Sample ID: RERUN
Origin: 12-27-2019.cal
Status Completed
Chk. Result

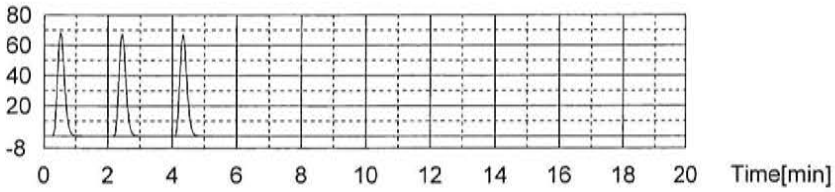
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:24.20mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	103.5	24.44mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:15:37 AM
2	101.4	23.95mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:17:42 AM
3	102.5	24.21mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:19:47 AM

Mean Area 102.5
Mean Conc. 24.20mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

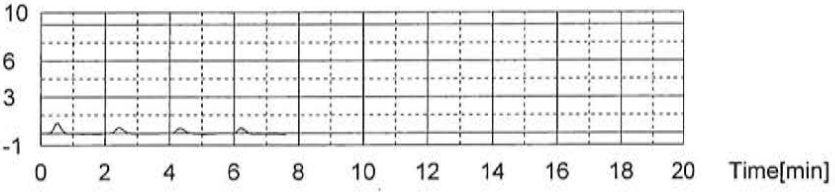
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.1740mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1.258	0.2971mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:28:50 AM
2	0.7579	0.1790mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:30:55 AM
3	0.7908	0.1868mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:33:00 AM
4	0.6610	0.1561mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:35:05 AM

Mean Area 0.7366
Mean Conc. 0.1740mg/L



Sample

Sample Name: HS191121313-01DF4000
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

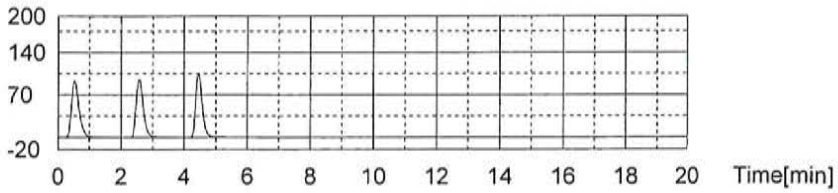
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:36.12mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	155.8	36.80mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:44:12 AM
2	151.2	35.71mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:46:17 AM
3	151.8	35.85mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:48:22 AM

Mean Area 152.9
Mean Conc. 36.12mg/L



Sample

Sample Name: HS191121313-02DF4000
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

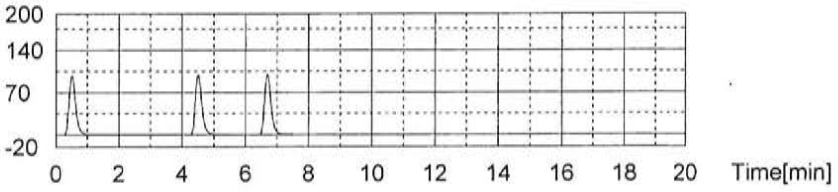
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:34.19mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	146.2	34.53mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 10:59:31 AM
2	143.2	33.82mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 11:01:53 AM
3	144.9	34.22mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 11:03:58 AM

Mean Area 144.8
Mean Conc. 34.19mg/L



Sample

Sample Name: CCV
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

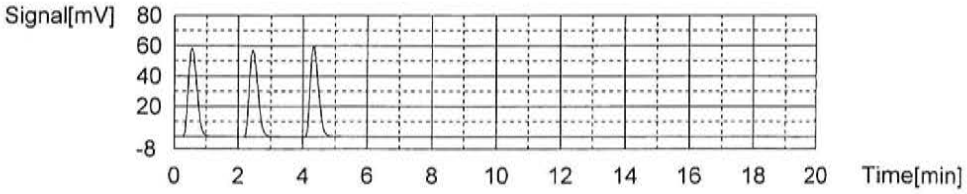
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:24.87mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	106.5	25.15mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 11:13:10 AM
2	104.0	24.56mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 11:15:15 AM
3	105.4	24.89mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 11:17:20 AM

Mean Area 105.3
Mean Conc. 24.87mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: 12-27-2019.cal
Status Completed
Chk. Result

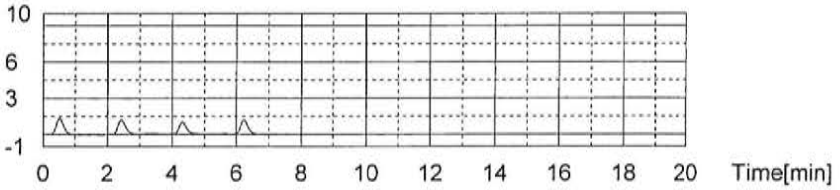
Type	Anal.	Manual Dilution	Result
Unknown	NPOC	1.000	NPOC:0.4667mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2.170	0.5125mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 11:26:23 AM
2	1.919	0.4532mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 11:28:28 AM
3	1.534	0.3623mg/L	50uL	1	E	12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 11:30:33 AM
4	1.839	0.4343mg/L	50uL	1		12-27-2019.2019_12_27_17_39_54.cal	12/30/2019 11:32:38 AM

Mean Area 1.976
Mean Conc. 0.4667mg/L



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February 07, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20011144**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier**

Dear Susan,

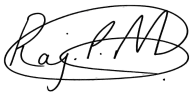
ALS Environmental received 9 sample(s) on Jan 24, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier
Work Order: HS20011144

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20011144-01	16WW36-200123	Groundwater		23-Jan-2020 10:25	24-Jan-2020 08:50	☐
HS20011144-02	16PM09-200123	Groundwater		23-Jan-2020 11:15	24-Jan-2020 08:50	☐
HS20011144-03	16PM06-200123	Groundwater		23-Jan-2020 12:05	24-Jan-2020 08:50	☐
HS20011144-04	16PM06-200123-FD	Groundwater		23-Jan-2020 12:05	24-Jan-2020 08:50	☐
HS20011144-05	16IW04-200123	Groundwater		23-Jan-2020 12:55	24-Jan-2020 08:50	☐
HS20011144-06	16IW03-200123	Groundwater		23-Jan-2020 13:45	24-Jan-2020 08:50	☐
HS20011144-07	16PM14-200123	Groundwater		23-Jan-2020 14:40	24-Jan-2020 08:50	☐
HS20011144-08	16PM02-200123	Groundwater		23-Jan-2020 15:30	24-Jan-2020 08:50	☐
HS20011144-09	16PM03-200123	Groundwater		23-Jan-2020 16:15	24-Jan-2020 08:50	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier
Work Order: HS20011144

Work Order Comments

- The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final report attached.

WetChemistry by Method SW9056

Batch ID: R355881

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier WorkOrder:HS20011144
Sample ID: 16WW36-200123 Lab ID:HS20011144-01
Collection Date: 23-Jan-2020 10:25 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**1.40**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Feb-2020 14:21
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier WorkOrder:HS20011144
Sample ID: 16PM09-200123 Lab ID:HS20011144-02
Collection Date: 23-Jan-2020 11:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.744**		**0.150**	**0.500**	**0.500**	**mg/L**	5	06-Feb-2020 15:15
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier WorkOrder:HS20011144
Sample ID: 16PM06-200123 Lab ID:HS20011144-03
Collection Date: 23-Jan-2020 12:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.74**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Feb-2020 15:51
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier WorkOrder:HS20011144
Sample ID: 16PM06-200123-FD Lab ID:HS20011144-04
Collection Date: 23-Jan-2020 12:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.74**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Feb-2020 16:09
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier WorkOrder:HS20011144
Sample ID: 16IW04-200123 Lab ID:HS20011144-05
Collection Date: 23-Jan-2020 12:55 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.68**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Feb-2020 17:04
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier WorkOrder:HS20011144
Sample ID: 16IW03-200123 Lab ID:HS20011144-06
Collection Date: 23-Jan-2020 13:45 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.660**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	06-Feb-2020 17:22
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier WorkOrder:HS20011144
Sample ID: 16PM14-200123 Lab ID:HS20011144-07
Collection Date: 23-Jan-2020 14:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**2.99**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Feb-2020 17:58
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier WorkOrder:HS20011144
Sample ID: 16PM02-200123 Lab ID:HS20011144-08
Collection Date: 23-Jan-2020 15:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**0.774**		**0.150**	**0.500**	**0.500**	**mg/L**	5	06-Feb-2020 18:16
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier WorkOrder:HS20011144
Sample ID: 16PM03-200123 Lab ID:HS20011144-09
Collection Date: 23-Jan-2020 16:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Bromide	**4.55**		**0.300**	**1.00**	**1.00**	**mg/L**	10	06-Feb-2020 18:52
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier
WorkOrder: HS20011144

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R355729 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS20011144-01	16WW36-200123	23 Jan 2020 10:25			05 Feb 2020 15:19	1
HS20011144-02	16PM09-200123	23 Jan 2020 11:15			05 Feb 2020 15:19	1
HS20011144-03	16PM06-200123	23 Jan 2020 12:05			05 Feb 2020 15:19	1
HS20011144-04	16PM06-200123-FD	23 Jan 2020 12:05			05 Feb 2020 15:19	1
HS20011144-05	16IW04-200123	23 Jan 2020 12:55			05 Feb 2020 15:19	1
HS20011144-06	16IW03-200123	23 Jan 2020 13:45			05 Feb 2020 15:19	1
HS20011144-07	16PM14-200123	23 Jan 2020 14:40			05 Feb 2020 15:19	1
HS20011144-08	16PM02-200123	23 Jan 2020 15:30			05 Feb 2020 15:19	1
HS20011144-09	16PM03-200123	23 Jan 2020 16:15			05 Feb 2020 15:19	1
Batch ID: R355881 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20011144-01	16WW36-200123	23 Jan 2020 10:25			06 Feb 2020 14:21	10
HS20011144-02	16PM09-200123	23 Jan 2020 11:15			06 Feb 2020 15:15	5
HS20011144-03	16PM06-200123	23 Jan 2020 12:05			06 Feb 2020 15:51	10
HS20011144-04	16PM06-200123-FD	23 Jan 2020 12:05			06 Feb 2020 16:09	10
HS20011144-05	16IW04-200123	23 Jan 2020 12:55			06 Feb 2020 17:04	10
HS20011144-06	16IW03-200123	23 Jan 2020 13:45			06 Feb 2020 17:22	1
HS20011144-07	16PM14-200123	23 Jan 2020 14:40			06 Feb 2020 17:58	10
HS20011144-08	16PM02-200123	23 Jan 2020 15:30			06 Feb 2020 18:16	5
HS20011144-09	16PM03-200123	23 Jan 2020 16:15			06 Feb 2020 18:52	10

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier
WorkOrder: HS20011144

QC BATCH REPORT

Batch ID: R355881 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-020520** Units: **mg/L** Analysis Date: **06-Feb-2020 13:26**
Client ID: Run ID: **ICS-Integrion_355881** SeqNo: **5464425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW2-020520** Units: **mg/L** Analysis Date: **06-Feb-2020 13:44**
Client ID: Run ID: **ICS-Integrion_355881** SeqNo: **5464426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.983	0.100	4	0	99.6	80 - 120				

LCSD Sample ID: **WLCSDW2-020520** Units: **mg/L** Analysis Date: **06-Feb-2020 14:02**
Client ID: Run ID: **ICS-Integrion_355881** SeqNo: **5464427** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.982	0.100	4	0	99.6	80 - 120	3.983	0.01	20	

MS Sample ID: **HS20011144-01MS** Units: **mg/L** Analysis Date: **06-Feb-2020 14:39**
Client ID: **16WW36-200123** Run ID: **ICS-Integrion_355881** SeqNo: **5464429** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	19.38	1.00	20	1.405	89.9	80 - 120				

MSD Sample ID: **HS20011144-01MSD** Units: **mg/L** Analysis Date: **06-Feb-2020 14:57**
Client ID: **16WW36-200123** Run ID: **ICS-Integrion_355881** SeqNo: **5464430** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	19.21	1.00	20	1.405	89.0	80 - 120	19.38	0.876	20	

The following samples were analyzed in this batch:

HS20011144-01	HS20011144-02	HS20011144-03	HS20011144-04
HS20011144-05	HS20011144-06	HS20011144-07	HS20011144-08
HS20011144-09			

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16 PM Biobarrier
WorkOrder: **HS20011144**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS20011144

Date/Time Received: **24-Jan-2020 08:50**
Received by: **AC**

Checklist completed by: *Jared R. Makan* eSignature — 24-Jan-2020 Date

Reviewed by: *RJ Modashia* eSignature — 27-Jan-2020 Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.2°C/1.2°C UC/C	IR25
Cooler(s)/Kit(s):	24330	
Date/Time sample(s) sent to storage:	01/24/2020 19:10	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-ALSHT-2020-

TURNAROUND TIME: normal

RUSH:

Page 1 of

PROJECT/CLIENT INFO				LABORATORY					
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com	
Project Number	501032			Lab Contact	RJ Modashia				
	LHAAP-16 PM Biobarrier			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang	
	PMB 202							4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX	Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country USA
Phone Number	713.243.7264			Phone Number	281 575 2279 or 281.530.5656				
Project Manager	Praveen Srivastav								

SAMPLE DETAILS									ANALYSIS REQUESTED			
								Containers and Preservative	1-250 ml HDPE, Ice	2X40ml Vial Vials /H2SO4		
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont	ANALYSIS	Bromide by SW9056	TOC by SM5310	
16MW36-200123	LHAAP16				WG	1/23/20	1025	3		X	X	
16MW36-200123-MS	LHAAP16				WG	1/23/20	1025	3		X	X	
16MW36-200123MSD	LHAAP16				WG	1/23/20	1025	3		X	X	
16PM09-200123	LHAAP16				WG	1/23/20	1115	3		X	X	
16PM06-200123	LHAAP16				WG	1/23/20	1205	3		X	X	
16PM06-200123-FD	LHAAP16				WG	1/23/20	1205	3		X	X	
16IW04-200123	LHAAP16				WG	1/23/20	1255	3		X	X	
16IW03-200123	LHAAP16				WG	1/23/20	1345	3		X	X	
16PM14-200123	LHAAP16				WG	1/23/20	1440	3		X	X	
16PM02-200123	LHAAP16				WG	1/23/20	1530	3		X	X	
16PM03-200123	LHAAP16				WG	1/23/20	1615	3		X	X	

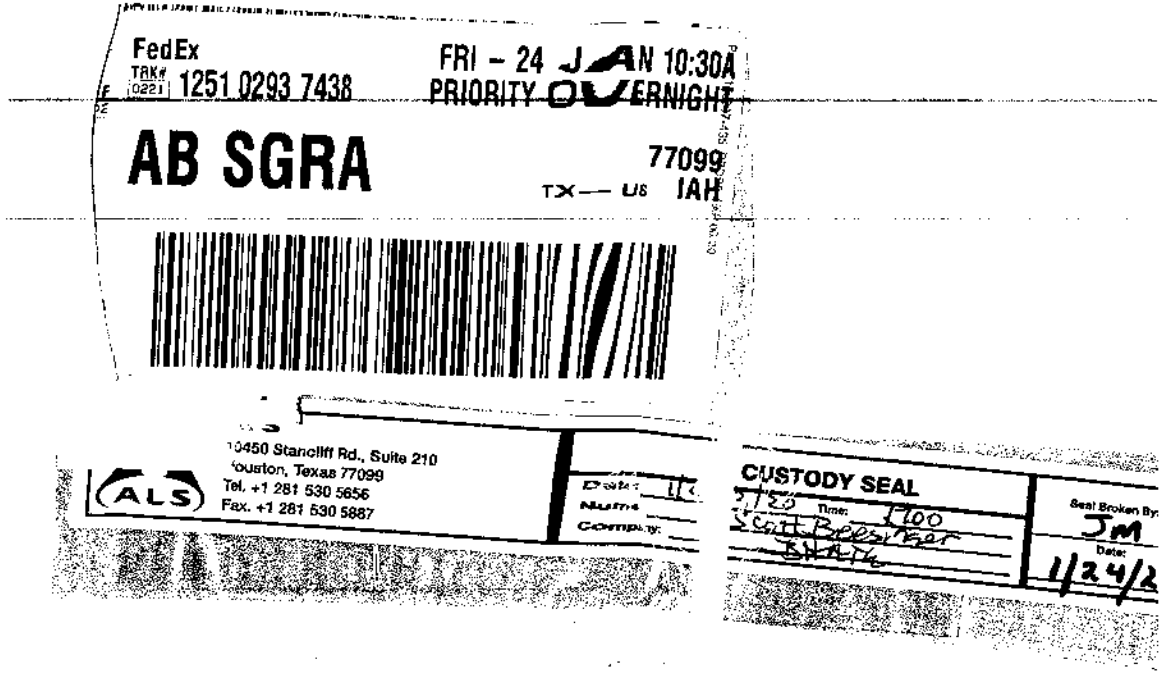
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Scott Belanger / BHATE	1/23/20 1700	AC / ALS	01/24/2020 0850

WIC
12
IR#25
cFe
24330

HS20011144

Aptim Environmental & Infrastucture. Inc.

Longhorn Army Ammunition Plant LHAAP-16 PM Bio


FedEx
TRK# 0221 1251 0293 7438
FRI - 24 JAN 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX— US IAH
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
ALS
CUSTODY SEAL
Time: 1100
Seal Broken By:
JM
Date:
1/24/2

ALS Environmental
ALS Group USA, Corp
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Kelso, WA 98626
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www.alsglobal.com

February 05, 2020

Analytical Report for Service Request No: K2000749

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS20011144

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 28, 2020
For your reference, these analyses have been assigned our service request number **K2000749.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - US
Project: HS20011144
Sample Matrix: Ground Water

Service Request: K2000749
Date Received: 01/28/2020

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Nine ground water samples were received for analysis at ALS Environmental on 01/28/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

Method SM 5310 C, 01/31/2020:The matrix spike recovery of Total Organic Carbon for sample 16WW36-200123 was outside control criteria because of suspected matrix interference. Sample 16IW03-200123 initial, undiluted analysis resulted in shutting down of the instrument. The subsequent 1000x dilution did not yield any spike recovery. The sample matrix does not appear suitable for analysis by this method. No further corrective action was appropriate.

Approved by Kelley Lovejoy Date 02/05/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
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K2006749

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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **13198**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20011144
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20011144-01**	**16WW36-200123**	**Groundwater**	**23 Jan 2020 10:25**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Feb 2020
2.	**HS20011144-02**	**16PM09-200123**	**Groundwater**	**23 Jan 2020 11:15**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Feb 2020
3.	**HS20011144-03**	**16PM06-200123**	**Groundwater**	**23 Jan 2020 12:05**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Feb 2020
4.	**HS20011144-04**	**16PM06-200123-FD**	**Groundwater**	**23 Jan 2020 12:05**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Feb 2020
5.	**HS20011144-05**	**16IW04-200123**	**Groundwater**	**23 Jan 2020 12:55**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Feb 2020
6.	**HS20011144-06**	**16IW03-200123**	**Groundwater**	**23 Jan 2020 13:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Feb 2020
7.	**HS20011144-07**	**16PM14-200123**	**Groundwater**	**23 Jan 2020 14:40**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Feb 2020
8.	**HS20011144-08**	**16PM02-200123**	**Groundwater**	**23 Jan 2020 15:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Feb 2020
9.	**HS20011144-09**	**16PM03-200123**	**Groundwater**	**23 Jan 2020 16:15**

Received: Cleared 1/24/2020 0910

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID: 13198**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
TOC Analysis with DOD Level IV/EQuIS APTIM EDD			03 Feb 2020

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

HS20011144-01 MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. MAKAN	Date/Time:	01/27/20 18:00
Received By:	[signature]	Date/Time:	1/28/2020 0920
Cooler ID(s):		Temperature(s):	

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K20 00749

Received: 1/28/2020 Opened: 1/28/2020 By: CG Unloaded: 1/28/2020 By: CG

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	File
0.0	-0.2	1.8	1.6	-0.2	376	13198	1251 0293 9923	

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

RUSH

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2000749
Project:	HS20011144	**Date Collected:**	01/23/20
Sample Matrix:	Ground Water	**Date Received:**	01/28/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
16WW36-200123	K2000749-001	**21.0**	0.50	0.20	0.07	1	01/31/20 00:01	
16PM09-200123	K2000749-002	**7.58**	0.50	0.20	0.07	1	01/31/20 00:59	
16PM06-200123	K2000749-003	**9.03**	0.50	0.20	0.07	1	01/31/20 01:27	
16PM06-200123-FD	K2000749-004	**9.01**	0.50	0.20	0.07	1	01/31/20 01:55	
16IW04-200123	K2000749-005	**6.70**	0.50	0.20	0.07	1	01/31/20 02:52	
16IW03-200123	K2000749-006	ND U	500	200	70	1000	01/31/20 03:20	
16PM14-200123	K2000749-007	**10.4**	0.50	0.20	0.07	1	01/31/20 03:48	
16PM02-200123	K2000749-008	**6.58**	0.50	0.20	0.07	1	01/31/20 04:16	
16PM03-200123	K2000749-009	**4.88**	0.50	0.20	0.07	1	01/31/20 04:44	
Method Blank	K2000749-MB	ND U	0.50	0.20	0.07	1	01/30/20 22:49	

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000749
Project	HS20011144	**Date Collected:**	01/23/20
Sample Matrix:	Ground Water	**Date Received:**	01/28/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	LOQ	LOD	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
16WW36-200123	K2000749-001DUP	0.50	0.20	0.07	21.0	20.6	20.8	2	10	01/31/20
16PM09-200123	K2000749-002DUP	0.50	0.20	0.07	7.58	7.39	7.48	3	10	01/31/20
16PM06-200123	K2000749-003DUP	0.50	0.20	0.07	9.03	9.33	9.18	3	10	01/31/20
16PM06-200123-FD	K2000749-004DUP	0.50	0.20	0.07	9.01	8.83	8.92	2	10	01/31/20
16IW04-200123	K2000749-005DUP	0.50	0.20	0.07	6.70	6.57	6.63	2	10	01/31/20
16IW03-200123	K2000749-006DUP	500	200	70	ND U	ND U	NC	NC	10	01/31/20
16PM14-200123	K2000749-007DUP	0.50	0.20	0.07	10.4	10.5	10.4	<1	10	01/31/20
16PM02-200123	K2000749-008DUP	0.50	0.20	0.07	6.58	6.49	6.53	1	10	01/31/20
16PM03-200123	K2000749-009DUP	0.50	0.20	0.07	4.88	4.76	4.82	2	10	01/31/20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000749
Project:	HS20011144	**Date Collected:**	01/23/20
Sample Matrix:	Ground Water	**Date Received:**	01/28/20
		Date Analyzed:	01/31/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	16WW36-200123	**Units:**	mg/L
Lab Code:	K2000749-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2000749-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	21.0	1.49	25.0	-78 *	83-117

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	ALS Environmental - US	**Service Request:**	K2000749
Project:	HS20011144	**Date Analyzed:**	01/30/20
Sample Matrix:	Ground Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	668439

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2000749-LCS	26.6	25.0	107	83-117

Client: ALS Environmental - US **Service Request:** K2000749
Project: HS20011144

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	668439	KQ2001484-01	01/30/20 22:20	25.0	24.9	99	90-110
CCV2	668439	KQ2001484-02	01/31/20 02:23	25.0	25.6	102	90-110
CCV3	668439	KQ2001484-03	01/31/20 07:33	25.0	25.6	103	90-110
CCV4	668439	KQ2001484-04	01/31/20 11:36	25.0	25.0	100	90-110

Client: ALS Environmental - US **Service Request:**K2000749
Project: HS20011144

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	668439	KQ2001484-05	01/30/20 22:35	0.50	0.20	0.07	ND	U
CCB2	668439	KQ2001484-06	01/31/20 02:37	0.50	0.20	0.07	ND	U
CCB3	668439	KQ2001484-07	01/31/20 07:48	0.50	0.20	0.07	ND	U
CCB4	668439	KQ2001484-08	01/31/20 11:51	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
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General Chemistry

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Work Request # Original (_____) K2000534, 570, 584, 625, 719, 749, 670, 695, 729, 730, 846, 833, 866

Tier: II, IV, II, IV, IV, IV, II, IV, IV, II, I, II, II

Date Analyzed: 1/30/20

Analyst: BCP

Analysis: TOC/DOC

Run # TOC: 668439, 668440, DOC: 668441, 668442

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS: K2000749-1MS reports a low % rec, due to matrix interference. K2000584-1/1d, 695-1/1d, 695-2/2d report a high % RSD. However, these samples are less than 5x the MRL.

Final Approved by: [signature] Date: 02/04/20

DQREPORT

C:\Documents and Settings\adam.bradbury\My Documents\DATAQUAL.DOC

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668439 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2000534-016	Carbon, Total Organic	N/A		Water	17.24 mg/L	10 mL	17.2 mg/L	1	0.07	0.50			1/31/20 05:12:00	N	II
K2000534-017	Carbon, Total Organic	N/A		Water	1.53 mg/L	10 mL	153 mg/L	100	7	50			1/31/20 05:40:00	N	II
K2000534-018	Carbon, Total Organic	N/A		Water	2.29 mg/L	10 mL	229 mg/L	100	7	50			1/31/20 06:09:00	N	II
K2000570-001	Carbon, Total Organic	N/A		Storm Water	11.31 mg/L	10 mL	11.3 mg/L	1	0.07	0.50			1/31/20 06:37:00	N	IV
K2000570-002	Carbon, Total Organic	N/A		Storm Water	10.73 mg/L	10 mL	10.7 mg/L	1	0.07	0.50			1/31/20 07:05:00	N	IV
K2000584-001	Carbon, Total Organic	N/A		Water	1.18 mg/L	10 mL	118 mg/L	100	7	50			1/31/20 08:32:00	N	II
K2000625-004	Carbon, Total Organic	N/A		Water	4.60 mg/L	10 mL	4.60 mg/L	1	0.07	0.50			1/31/20 09:00:00	N	IV
K2000625-008	Carbon, Total Organic	N/A		Water	0.65 mg/L	10 mL	6.5 mg/L	10	0.7	5.0			1/31/20 09:28:00	N	IV
K2000625-010	Carbon, Total Organic	N/A		Water	16.09 mg/L	10 mL	16.1 mg/L	1	0.07	0.50			1/31/20 09:56:00	Y	IV
K2000625-011	Carbon, Total Organic	N/A		Water	5.24 mg/L	10 mL	105 mg/L	20	2	10			1/31/20 10:53:00	Y	IV
K2000719-001	Carbon, Total Organic	N/A		Water	2.02 mg/L	10 mL	2.02 mg/L	1	0.07	0.50			1/30/20 23:33:00	N	IV
K2000749-001	Carbon, Total Organic	N/A		Ground Water	21.02 mg/L	10 mL	21.0 mg/L	1	0.07	0.50			1/31/20 00:01:00	Y	IV
K2000749-002	Carbon, Total Organic	N/A		Ground Water	7.58 mg/L	10 mL	7.58 mg/L	1	0.07	0.50			1/31/20 00:59:00	N	IV
K2000749-003	Carbon, Total Organic	N/A		Ground Water	9.03 mg/L	10 mL	9.03 mg/L	1	0.07	0.50			1/31/20 01:27:00	N	IV
K2000749-004	Carbon, Total Organic	N/A		Ground Water	9.01 mg/L	10 mL	9.01 mg/L	1	0.07	0.50			1/31/20 01:55:00	N	IV
K2000749-005	Carbon, Total Organic	N/A		Ground Water	6.70 mg/L	10 mL	6.70 mg/L	1	0.07	0.50			1/31/20 02:52:00	N	IV
K2000749-006	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	500 mg/L U	1000	70	500			1/31/20 03:20:00	N	IV
K2000749-007	Carbon, Total Organic	N/A		Ground Water	10.39 mg/L	10 mL	10.4 mg/L	1	0.07	0.50			1/31/20 03:48:00	N	IV
K2000749-008	Carbon, Total Organic	N/A		Ground Water	6.58 mg/L	10 mL	6.58 mg/L	1	0.07	0.50			1/31/20 04:16:00	N	IV
K2000749-009	Carbon, Total Organic	N/A		Ground Water	4.88 mg/L	10 mL	4.88 mg/L	1	0.07	0.50			1/31/20 04:44:00	N	IV
KQ2001484-01	Carbon, Total Organic	CCV		Water	24.87 mg/L	10 mL	24.9 mg/L	1					1/30/20 22:20:00	N	IV
KQ2001484-02	Carbon, Total Organic	CCV		Water	25.57 mg/L	10 mL	25.6 mg/L	1					1/31/20 02:23:00	N	IV
KQ2001484-03	Carbon, Total Organic	CCV		Water	25.63 mg/L	10 mL	25.6 mg/L	1					1/31/20 07:33:00	N	IV
KQ2001484-04	Carbon, Total Organic	CCV		Water	24.96 mg/L	10 mL	25.0 mg/L	1					1/31/20 11:36:00	N	IV
KQ2001484-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/30/20 22:35:00	N	IV
KQ2001484-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 02:37:00	N	IV
KQ2001484-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 07:48:00	N	IV
KQ2001484-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 11:51:00	N	IV
KQ2001484-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/30/20 22:49:00	N	IV
KQ2001484-10	Carbon, Total Organic	LCS		Water	26.63 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	107		1/30/20 23:04:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Printed 2/1/20 16:27

Results Summary

02/04/20

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668439 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ2001484-11	Carbon, Total Organic	MS	K2000749-001	Ground Water	1.49 mg/L	10 mL	1.49 mg/L	1	0.07	0.50	-78*		1/31/20 00:30:00	N	IV
KQ2001484-12	Carbon, Total Organic	DUP	K2000534-016	Water	17.18 mg/L	10 mL	17.2 mg/L	1	0.07	0.50		<1	1/31/20 05:12:00	N	II
KQ2001484-13	Carbon, Total Organic	DUP	K2000534-017	Water	1.42 mg/L	10 mL	142 mg/L	100	7	50		8	1/31/20 05:40:00	N	II
KQ2001484-14	Carbon, Total Organic	DUP	K2000534-018	Water	2.31 mg/L	10 mL	231 mg/L	100	7	50		<1	1/31/20 06:09:00	N	II
KQ2001484-15	Carbon, Total Organic	DUP	K2000570-001	Storm Water	11.41 mg/L	10 mL	11.4 mg/L	1	0.07	0.50		<1	1/31/20 06:37:00	N	IV
KQ2001484-16	Carbon, Total Organic	DUP	K2000570-002	Storm Water	10.78 mg/L	10 mL	10.8 mg/L	1	0.07	0.50		<1	1/31/20 07:05:00	N	IV
KQ2001484-17	Carbon, Total Organic	DUP	K2000584-001	Water	0.80 mg/L	10 mL	80 mg/L	100	7	50		38*	1/31/20 08:32:00	N	II
KQ2001484-18	Carbon, Total Organic	DUP	K2000625-004	Water	4.55 mg/L	10 mL	4.55 mg/L	1	0.07	0.50		1	1/31/20 09:00:00	N	IV
KQ2001484-19	Carbon, Total Organic	DUP	K2000625-008	Water	0.63 mg/L	10 mL	6.3 mg/L	10	0.7	5.0		3	1/31/20 09:28:00	N	IV
KQ2001484-20	Carbon, Total Organic	DUP	K2000625-010	Water	16.64 mg/L	10 mL	16.6 mg/L	1	0.07	0.50		3	1/31/20 09:56:00	N	IV
KQ2001484-21	Carbon, Total Organic	DUP	K2000625-011	Water	5.25 mg/L	10 mL	105 mg/L	20	2	10		<1	1/31/20 10:53:00	N	IV
KQ2001484-22	Carbon, Total Organic	DUP	K2000719-001	Water	1.97 mg/L	10 mL	1.97 mg/L	1	0.07	0.50		3	1/30/20 23:33:00	N	IV
KQ2001484-23	Carbon, Total Organic	DUP	K2000749-002	Ground Water	7.39 mg/L	10 mL	7.39 mg/L	1	0.07	0.50		3	1/31/20 00:59:00	N	IV
KQ2001484-24	Carbon, Total Organic	DUP	K2000749-003	Ground Water	9.33 mg/L	10 mL	9.33 mg/L	1	0.07	0.50		3	1/31/20 01:27:00	N	IV
KQ2001484-25	Carbon, Total Organic	DUP	K2000749-004	Ground Water	8.83 mg/L	10 mL	8.83 mg/L	1	0.07	0.50		2	1/31/20 01:55:00	N	IV
KQ2001484-26	Carbon, Total Organic	DUP	K2000749-001	Ground Water	20.60 mg/L	10 mL	20.6 mg/L	1	0.07	0.50		2	1/31/20 00:01:00	N	IV
KQ2001484-27	Carbon, Total Organic	DUP	K2000749-005	Ground Water	6.57 mg/L	10 mL	6.57 mg/L	1	0.07	0.50		2	1/31/20 02:52:00	N	IV
KQ2001484-28	Carbon, Total Organic	DUP	K2000749-006	Ground Water	0.00 mg/L	10 mL	500 mg/L U	1000	70	500		NC	1/31/20 03:20:00	N	IV
KQ2001484-29	Carbon, Total Organic	DUP	K2000749-007	Ground Water	10.48 mg/L	10 mL	10.5 mg/L	1	0.07	0.50		<1	1/31/20 03:48:00	N	IV
KQ2001484-30	Carbon, Total Organic	DUP	K2000749-008	Ground Water	6.49 mg/L	10 mL	6.49 mg/L	1	0.07	0.50		1	1/31/20 04:16:00	N	IV
KQ2001484-31	Carbon, Total Organic	DUP	K2000749-009	Ground Water	4.76 mg/L	10 mL	4.76 mg/L	1	0.07	0.50		2	1/31/20 04:44:00	N	IV
KQ2001484-32	Carbon, Total Organic	MS	K2000625-010	Water	32.38 mg/L	10 mL	130 mg/L	4	0.3	2.0	113		1/31/20 10:24:00	N	IV
KQ2001484-33	Carbon, Total Organic	MS	K2000625-011	Water	27.93 mg/L	10 mL	2790 mg/L	100	7	50	108		1/31/20 11:21:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668440 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2000625-012	Carbon, Total Organic	N/A		Water	0.94 mg/L	10 mL	94 mg/L	100	7	50			1/31/20 12:05:00	Y	IV
K2000670-002	Carbon, Total Organic	N/A		Water	21.87 mg/L	10 mL	21.9 mg/L	1	0.07	0.50			1/31/20 15:23:00	N	II
K2000695-001	Carbon, Total Organic	N/A		Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50			1/31/20 15:51:00	N	IV
K2000695-002	Carbon, Total Organic	N/A		Water	0.26 mg/L	10 mL	0.26 mg/L J	1	0.07	0.50			1/31/20 17:18:00	N	IV
K2000729-038	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 17:46:00	N	IV
K2000730-001	Carbon, Total Organic	N/A		Water	0.50 mg/L	10 mL	0.50 mg/L J	1	0.07	0.50			1/31/20 18:14:00	N	II
K2000730-002	Carbon, Total Organic	N/A		Water	0.44 mg/L	10 mL	0.44 mg/L J	1	0.07	0.50			1/31/20 18:43:00	N	II
K2000730-003	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 19:11:00	N	II
K2000730-004	Carbon, Total Organic	N/A		Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50			1/31/20 19:39:00	N	II
K2000730-005	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 20:07:00	N	II
K2000730-006	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 20:35:00	N	II
K2000730-007	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 21:32:00	N	II
K2000730-008	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 22:01:00	N	II
K2000846-001	Carbon, Total Organic	N/A		Water	3.82 mg/L	10 mL	3.82 mg/L	1	0.07	0.50			1/31/20 13:03:00	N	I
K2000846-002	Carbon, Total Organic	N/A		Water	2.05 mg/L	10 mL	2.05 mg/L	1	0.07	0.50			1/31/20 13:31:00	N	I
K2000846-003	Carbon, Total Organic	N/A		Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			1/31/20 13:59:00	N	I
K2000846-004	Carbon, Total Organic	N/A		Water	2.10 mg/L	10 mL	2.10 mg/L	1	0.07	0.50			1/31/20 14:27:00	N	I
K2000846-005	Carbon, Total Organic	N/A		Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			1/31/20 14:55:00	N	I
KQ2001485-01	Carbon, Total Organic	CCV		Water	24.96 mg/L	10 mL	25.0 mg/L	1					1/31/20 11:36:00	N	IV
KQ2001485-02	Carbon, Total Organic	CCV		Water	24.64 mg/L	10 mL	24.6 mg/L	1					1/31/20 16:19:00	N	IV
KQ2001485-03	Carbon, Total Organic	CCV		Water	24.37 mg/L	10 mL	24.4 mg/L	1					1/31/20 21:03:00	N	IV
KQ2001485-04	Carbon, Total Organic	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					2/1/20 01:47:00	N	IV
KQ2001485-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 11:51:00	N	IV
KQ2001485-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 16:34:00	N	IV
KQ2001485-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 21:18:00	N	IV
KQ2001485-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 02:01:00	N	IV
KQ2001485-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 08:03:00	N	IV
KQ2001485-10	Carbon, Total Organic	LCS		Water	27.91 mg/L	10 mL	27.9 mg/L	1	0.07	0.50	112		1/31/20 08:17:00	N	IV
KQ2001485-11	Carbon, Total Organic	MS	K2000625-012	Water	27.15 mg/L	10 mL	10900 mg/L	400	30	200	108		1/31/20 12:33:00	N	IV
KQ2001485-12	Carbon, Total Organic	DUP	K2000670-002	Water	22.31 mg/L	10 mL	22.3 mg/L	1	0.07	0.50		2	1/31/20 15:23:00	N	II
KQ2001485-13	Carbon, Total Organic	DUP	K2000695-002	Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50		31*	1/31/20 17:18:00	N	IV
KQ2001485-14	Carbon, Total Organic	DUP	K2000695-001	Water	0.21 mg/L	10 mL	0.21 mg/L J	1	0.07	0.50		35*	1/31/20 15:51:00	N	IV
KQ2001485-15	Carbon, Total Organic	DUP	K2000625-012	Water	0.92 mg/L	10 mL	92 mg/L	100	7	50		2	1/31/20 12:05:00	N	IV
KQ2001485-16	Carbon, Total Organic	DUP	K2000729-038	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 17:46:00	N	IV
KQ2001485-17	Carbon, Total Organic	DUP	K2000730-001	Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50		2	1/31/20 18:14:00	N	II
KQ2001485-18	Carbon, Total Organic	DUP	K2000730-002	Water	0.47 mg/L	10 mL	0.47 mg/L J	1	0.07	0.50		7	1/31/20 18:43:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668440 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ2001485-19	Carbon, Total Organic	DUP	K2000730-003	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 19:11:00	N	II
KQ2001485-20	Carbon, Total Organic	DUP	K2000730-004	Water	2.55 mg/L	10 mL	2.55 mg/L	1	0.07	0.50		2	1/31/20 19:39:00	N	II
KQ2001485-21	Carbon, Total Organic	DUP	K2000730-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 20:07:00	N	II
KQ2001485-22	Carbon, Total Organic	DUP	K2000730-006	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 20:35:00	N	II
KQ2001485-23	Carbon, Total Organic	DUP	K2000730-007	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 21:32:00	N	II
KQ2001485-24	Carbon, Total Organic	DUP	K2000730-008	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 22:01:00	N	II
KQ2001485-25	Carbon, Total Organic	DUP	K2000846-001	Water	3.78 mg/L	10 mL	3.78 mg/L	1	0.07	0.50		1	1/31/20 13:03:00	N	I
KQ2001485-26	Carbon, Total Organic	DUP	K2000846-002	Water	1.97 mg/L	10 mL	1.97 mg/L	1	0.07	0.50		4	1/31/20 13:31:00	N	I
KQ2001485-27	Carbon, Total Organic	DUP	K2000846-003	Water	1.91 mg/L	10 mL	1.91 mg/L	1	0.07	0.50		2	1/31/20 13:59:00	N	I
KQ2001485-28	Carbon, Total Organic	DUP	K2000846-004	Water	2.11 mg/L	10 mL	2.11 mg/L	1	0.07	0.50		<1	1/31/20 14:27:00	N	I
KQ2001485-29	Carbon, Total Organic	DUP	K2000846-005	Water	1.91 mg/L	10 mL	1.91 mg/L	1	0.07	0.50		3	1/31/20 14:55:00	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668441 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2000833-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	6.10 mg/L	10 mL	6.10 mg/L	1	0.07	0.50			1/31/20 22:43:00	N	II
K2000833-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	4.98 mg/L	10 mL	4.98 mg/L	1	0.07	0.50			1/31/20 23:12:00	N	II
K2000833-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.98 mg/L	10 mL	0.98 mg/L	1	0.07	0.50			1/31/20 23:40:00	N	II
K2000833-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	3.95 mg/L	10 mL	3.95 mg/L	1	0.07	0.50			2/1/20 00:08:00	N	II
K2000833-005	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			2/1/20 00:36:00	N	II
K2000833-006	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	3.85 mg/L	10 mL	3.85 mg/L	1	0.07	0.50			2/1/20 01:04:00	N	II
K2000833-007	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	5.64 mg/L	10 mL	5.64 mg/L	1	0.07	0.50			2/1/20 02:45:00	N	II
K2000833-008	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	5.16 mg/L	10 mL	5.16 mg/L	1	0.07	0.50			2/1/20 03:14:00	N	II
K2000833-009	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	5.32 mg/L	10 mL	5.32 mg/L	1	0.07	0.50			2/1/20 03:42:00	N	II
K2000833-010	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	3.32 mg/L	10 mL	3.32 mg/L	1	0.07	0.50			2/1/20 04:10:00	N	II
K2000833-011	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	5.11 mg/L	10 mL	5.11 mg/L	1	0.07	0.50			2/1/20 04:38:00	N	II
K2000833-012	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	3.95 mg/L	10 mL	3.95 mg/L	1	0.07	0.50			2/1/20 05:06:00	N	II
KQ2001486-01	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.37 mg/L	10 mL	24.4 mg/L	1					1/31/20 21:03:00	N	II
KQ2001486-02	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.53 mg/L	10 mL	24.5 mg/L	1					2/1/20 01:47:00	N	II
KQ2001486-03	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.21 mg/L	10 mL	24.2 mg/L	1					2/1/20 06:17:00	N	II
KQ2001486-04	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 21:18:00	N	II
KQ2001486-05	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 02:01:00	N	II
KQ2001486-06	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 06:31:00	N	II
KQ2001486-07	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 16:49:00	N	II
KQ2001486-08	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	26.55 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	106		1/31/20 17:03:00	N	II
KQ2001486-09	Carbon, Dissolved Organic (DOC)	MS	K2000833-001	Surface Water	29.49 mg/L	10 mL	59.0 mg/L	2	0.2	1.0	106		2/1/20 01:32:00	N	II
KQ2001486-10	Carbon, Dissolved Organic (DOC)	DUP	K2000833-001	Surface Water	5.93 mg/L	10 mL	5.93 mg/L	1	0.07	0.50		3	1/31/20 22:43:00	N	II
KQ2001486-11	Carbon, Dissolved Organic (DOC)	DUP	K2000833-002	Surface Water	4.88 mg/L	10 mL	4.88 mg/L	1	0.07	0.50		2	1/31/20 23:12:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

02/04/20

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668441 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ2001486-12	Carbon, Dissolved Organic (DOC)	DUP	K2000833-003	Surface Water	0.90 mg/L	10 mL	0.90 mg/L	1	0.07	0.50		8	1/31/20 23:40:00	N	II
KQ2001486-13	Carbon, Dissolved Organic (DOC)	DUP	K2000833-004	Surface Water	3.95 mg/L	10 mL	3.95 mg/L	1	0.07	0.50		<1	2/1/20 00:08:00	N	II
KQ2001486-14	Carbon, Dissolved Organic (DOC)	DUP	K2000833-005	Surface Water	2.02 mg/L	10 mL	2.02 mg/L	1	0.07	0.50		3	2/1/20 00:36:00	N	II
KQ2001486-15	Carbon, Dissolved Organic (DOC)	DUP	K2000833-006	Surface Water	3.91 mg/L	10 mL	3.91 mg/L	1	0.07	0.50		1	2/1/20 01:04:00	N	II
KQ2001486-16	Carbon, Dissolved Organic (DOC)	DUP	K2000833-007	Surface Water	5.54 mg/L	10 mL	5.54 mg/L	1	0.07	0.50		2	2/1/20 02:45:00	N	II
KQ2001486-17	Carbon, Dissolved Organic (DOC)	DUP	K2000833-008	Surface Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50		<1	2/1/20 03:14:00	N	II
KQ2001486-18	Carbon, Dissolved Organic (DOC)	DUP	K2000833-009	Surface Water	5.32 mg/L	10 mL	5.32 mg/L	1	0.07	0.50		<1	2/1/20 03:42:00	N	II
KQ2001486-19	Carbon, Dissolved Organic (DOC)	DUP	K2000833-010	Surface Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50		3	2/1/20 04:10:00	N	II
KQ2001486-20	Carbon, Dissolved Organic (DOC)	DUP	K2000833-011	Surface Water	5.07 mg/L	10 mL	5.07 mg/L	1	0.07	0.50		<1	2/1/20 04:38:00	N	II
KQ2001486-21	Carbon, Dissolved Organic (DOC)	DUP	K2000833-012	Surface Water	3.88 mg/L	10 mL	3.88 mg/L	1	0.07	0.50		2	2/1/20 05:06:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668442 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K2000866-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50			2/1/20 05:34:00	N	II
K2000866-002	Carbon, Dissolved Organic (DOC)	N/A		Water	1.45 mg/L	10 mL	1.45 mg/L	1	0.07	0.50			2/1/20 06:46:00	N	II
K2000866-003	Carbon, Dissolved Organic (DOC)	N/A		Water	1.33 mg/L	10 mL	1.33 mg/L	1	0.07	0.50			2/1/20 07:15:00	N	II
K2000866-004	Carbon, Dissolved Organic (DOC)	N/A		Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50			2/1/20 07:43:00	N	II
K2000866-005	Carbon, Dissolved Organic (DOC)	N/A		Water	1.00 mg/L	10 mL	1.00 mg/L	1	0.07	0.50			2/1/20 08:11:00	N	II
K2000866-006	Carbon, Dissolved Organic (DOC)	N/A		Water	0.76 mg/L	10 mL	0.76 mg/L	1	0.07	0.50			2/1/20 08:39:00	N	II
K2000866-007	Carbon, Dissolved Organic (DOC)	N/A		Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50			2/1/20 09:07:00	N	II
K2000866-008	Carbon, Dissolved Organic (DOC)	N/A		Water	1.02 mg/L	10 mL	1.02 mg/L	1	0.07	0.50			2/1/20 09:35:00	N	II
K2000866-009	Carbon, Dissolved Organic (DOC)	N/A		Water	0.92 mg/L	10 mL	0.92 mg/L	1	0.07	0.50			2/1/20 10:03:00	N	II
KQ2001487-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					2/1/20 01:47:00	N	II
KQ2001487-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.21 mg/L	10 mL	24.2 mg/L	1					2/1/20 06:17:00	N	II
KQ2001487-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.09 mg/L	10 mL	24.1 mg/L	1					2/1/20 10:46:00	N	II
KQ2001487-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 02:01:00	N	II
KQ2001487-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 06:31:00	N	II
KQ2001487-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 11:01:00	N	II
KQ2001487-07	Carbon, Dissolved Organic (DOC)	MS	K2000866-001	Water	28.00 mg/L	10 mL	28.0 mg/L	1	0.07	0.50	110		2/1/20 06:02:00	N	II
KQ2001487-08	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 02:16:00	N	II
KQ2001487-09	Carbon, Dissolved Organic (DOC)	LCS		Water	25.87 mg/L	10 mL	25.9 mg/L	1	0.07	0.50	103		2/1/20 02:31:00	N	II
KQ2001487-10	Carbon, Dissolved Organic (DOC)	DUP	K2000866-001	Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50		2	2/1/20 05:34:00	N	II
KQ2001487-11	Carbon, Dissolved Organic (DOC)	DUP	K2000866-002	Water	1.44 mg/L	10 mL	1.44 mg/L	1	0.07	0.50		<1	2/1/20 06:46:00	N	II
KQ2001487-12	Carbon, Dissolved Organic (DOC)	DUP	K2000866-003	Water	1.33 mg/L	10 mL	1.33 mg/L	1	0.07	0.50		<1	2/1/20 07:15:00	N	II
KQ2001487-13	Carbon, Dissolved Organic (DOC)	DUP	K2000866-004	Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50		<1	2/1/20 07:43:00	N	II
KQ2001487-14	Carbon, Dissolved Organic (DOC)	DUP	K2000866-005	Water	0.97 mg/L	10 mL	0.97 mg/L	1	0.07	0.50		3	2/1/20 08:11:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

02/04/20

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668442 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ2001487-15	Carbon, Dissolved Organic (DOC)	DUP	K2000866-006	Water	0.75 mg/L	10 mL	0.75 mg/L	1	0.07	0.50		2	2/1/20 08:39:00	N	II
KQ2001487-16	Carbon, Dissolved Organic (DOC)	DUP	K2000866-007	Water	0.50 mg/L	10 mL	0.50 mg/L	1	0.07	0.50		3	2/1/20 09:07:00	N	II
KQ2001487-17	Carbon, Dissolved Organic (DOC)	DUP	K2000866-008	Water	0.97 mg/L	10 mL	0.97 mg/L	1	0.07	0.50		5	2/1/20 09:35:00	N	II
KQ2001487-18	Carbon, Dissolved Organic (DOC)	DUP	K2000866-009	Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50		10	2/1/20 10:03:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

TOC: 668439, 668440
DOC: 668441, 668442

Schedule: 01302020

Version: 5
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/01/30 19:58 - Thursday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K2000719-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K2000749-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K2000749-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
7	Sample	K2000749-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2000749-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2000749-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K2000749-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2000749-006.01 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2000749-007.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K2000749-008.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K2000749-009.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2000534-016.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2000534-017.05 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K2000534-018.05 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K2000570-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K2000570-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K2000584-001.02 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K2000625-004.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K2000625-008.12 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K2000625-010.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K2000625-010.12 ms 4x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
26	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
27	Sample	K2000625-011.12 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K2000625-011.12 ms 100x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K2000625-012.12 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K2000625-012.12 ms 400x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
32	Sample	K2000846-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K2000846-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K2000846-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K2000846-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K2000846-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K2000670-002.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K2000695-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready

02/04/20

Schedule: 01302020

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K2000695-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K2000729-038.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K2000730-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K2000730-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K2000730-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K2000730-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K2000730-005.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K2000730-006.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K2000730-007.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K2000730-008.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	FB 1/29/20 1600	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
51	Sample	K2000833-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K2000833-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K2000833-003.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K2000833-004.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K2000833-005.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K2000833-006.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K2000833-001.01 ms doc 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	K2000833-007.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K2000833-008.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	K2000833-009.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K2000833-010.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K2000833-011.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K2000833-012.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K2000833-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K2000866-001.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	K2000866-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K2000866-003.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	K2000866-004.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
70	Sample	K2000866-005.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
71	Sample	K2000866-006.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	K2000866-007.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	K2000866-008.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K2000866-009.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 01302020
Thursday, January 30, 2020 07:58 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/02/01 12:38 - Saturday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	01302020	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v5)		
Comment:			

Report Results

02/04/20

Sample Type: Clean — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2020/01/30 19:58

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.84	16.66	3.82	49.60	05:22
2	TC Clean	12.96	16.71	3.75	50.11	04:04
3	TC Clean	7.40	11.36	3.96	50.12	03:47
4	TC Clean	6.84	10.71	3.87	50.04	03:53

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/30 20:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.28	13.20	3.92	50.11	10:29
2	TOC	0.0000	0.0000	8.49	12.52	4.03	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.6185 (IC) (v1344)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Clean From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/01/30 20:48

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.35	16.00	4.65	49.54	05:19
2	TC Clean	4.47	8.46	3.99	50.09	04:00
3	TC Clean	2.20	6.13	3.92	50.04	03:44
4	TC Clean	1.65	5.72	4.07	50.10	03:52

Sample Type: Clean From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/01/30 21:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.92	4.69	3.77	49.54	05:20
2	TC Clean	4.74	8.66	3.92	50.04	03:59
3	TC Clean	2.41	6.28	3.87	49.98	03:53
4	TC Clean	1.73	5.74	4.01	50.00	03:54

Sample Type: Blank (Creating v1345) From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/01/30 21:32

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.95	4.76	3.82	49.37	05:19
2	TC Clean	4.99	8.85	3.87	50.07	04:01
3	TC Clean	2.36	6.11	3.76	49.98	03:44
4	TC Clean	1.82	5.77	3.95	50.10	03:44
5	Reagent Blank	5.99	9.83	3.85	50.06	05:04
6	Acid Blank	1.47	5.28	3.81	49.70	05:27

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.1534 ppm	0.0000 ppm	0.0000%	2020/01/30 22:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1534	1.5340	10.55	14.41	3.86	50.07	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.8716 ppm (PASS)	0.0000 ppm	0%	2020/01/30 22:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8716	248.7162	167.46	171.33	3.87	50.07	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/30 22:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.69	12.47	3.78	50.08	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/30 22:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	7.91	11.66	3.75	50.06	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.6294 ppm (PASS)	0.0000 ppm	0%	2020/01/30 23:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.6294	266.2938	178.57	182.28	3.71	50.08	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.2124 ppm	0.0000 ppm	0.0000%	2020/01/30 23:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2124	2.1239	10.92	14.79	3.87	50.08	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2000719-001.01	1.9981 ppm	0.0365 ppm	1.8200%	2020/01/30 23:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0239	20.2392	22.38	26.21	3.84	50.05	10:29
2	TOC	1.9724	19.7236	22.05	25.70	3.65	50.07	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K2000749-001.01	20.8078 ppm	0.2950 ppm	1.4200%	2020/01/31 00:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.0164	210.1637	142.46	146.24	3.78	50.05	10:29

2	TOC	20.5992	205.9915	139.82	143.74	3.92	50.05	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	K2000749-001.01 ms	1.4882 ppm	0.0000 ppm	0.0000%	2020/01/31 00:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4882	14.8824	18.99	22.72	3.73	50.06	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 00:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.90	11.86	3.96	50.05	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K2000749-002.01	7.4834 ppm	0.1363 ppm	1.8200%	2020/01/31 00:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.5798	75.7982	57.50	61.02	3.51	50.08	10:28
2	TOC	7.3870	73.8703	56.29	60.08	3.80	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	K2000749-003.01	9.1803 ppm	0.2088 ppm	2.2700%	2020/01/31 01:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0327	90.3265	66.69	70.47	3.77	50.04	10:26
2	TOC	9.3279	93.2793	68.56	72.29	3.73	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	9	TOC	K2000749-004.01	8.9160 ppm	0.1269 ppm	1.4200%	2020/01/31 01:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0058	90.0576	66.52	70.35	3.83	50.04	10:29
2	TOC	8.8263	88.2626	65.39	69.25	3.86	50.06	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.5670 ppm (PASS)	0.0000 ppm	0%	2020/01/31 02:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.5670	255.6704	171.86	175.50	3.65	50.06	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 02:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.02	11.78	3.77	50.07	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2000749-005.01	6.6340 ppm	0.0939 ppm	1.4200%	2020/01/31 02:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7005	67.0047	51.94	55.69	3.75	50.04	10:29
2	TOC	6.5676	65.6762	51.10	54.81	3.70	50.04	10:28

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K2000749-006.01 1000x	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 03:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.36	13.21	3.85	50.04	10:31
2	TOC	0.0000	0.0000	8.91	12.77	3.86	50.05	10:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K2000749-007.01	10.4351 ppm	0.0659 ppm	0.6300%	2020/01/31 03:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.3885	103.8853	75.26	78.89	3.63	50.04	10:29
2	TOC	10.4817	104.8169	75.85	79.52	3.67	50.01	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K2000749-008.01	6.5320 ppm	0.0633 ppm	0.9700%	2020/01/31 04:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.5768	65.7679	51.16	54.99	3.83	50.06	10:27
2	TOC	6.4873	64.8727	50.60	54.24	3.64	50.03	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K2000749-009.01	4.8193 ppm	0.0842 ppm	1.7500%	2020/01/31 04:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8788	48.7881	40.43	44.29	3.86	50.02	10:26
2	TOC	4.7597	47.5972	39.67	43.46	3.79	50.02	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K2000534-016.05	17.2091 ppm	0.0389 ppm	0.2300%	2020/01/31 05:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	17.2366	172.3658	118.56	122.19	3.63	50.05	10:28
2	TOC	17.1815	171.8154	118.22	121.92	3.70	50.03	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K2000534-017.05 100x	1.4765 ppm	0.0825 ppm	5.5900%	2020/01/31 05:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5349	15.3490	19.28	22.95	3.67	50.02	10:26
2	TOC	1.4182	14.1818	18.55	22.32	3.77	50.06	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K2000534-018.05 100x	2.2967 ppm	0.0162 ppm	0.7100%	2020/01/31 06:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2852	22.8520	24.03	27.84	3.81	50.11	10:28
2	TOC	2.3081	23.0813	24.17	27.94	3.77	50.03	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K2000570-001.01	11.3581 ppm	0.0737 ppm	0.6500%	2020/01/31 06:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.3060	113.0600	81.06	84.70	3.63	49.99	10:27
2	TOC	11.4102	114.1023	81.72	85.39	3.67	49.94	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K2000570-002.01	10.7557 ppm	0.0368 ppm	0.3400%	2020/01/31 07:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.7297	107.2968	77.42	80.96	3.54	49.91	10:28
2	TOC	10.7817	107.8171	77.75	81.31	3.56	49.88	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC)	CAS_salt_010711	CAS_salt_010711

(v1345) (v4) (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.6295 ppm (PASS)	0.0000 ppm	0%	2020/01/31 07:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.6295	256.2951	172.25	175.97	3.72	49.86	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 07:48

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.18	11.87	3.69	49.83	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 08:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.85	11.31	3.46	49.79	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	27.9141 ppm (PASS)	0.0000 ppm	0%	2020/01/31 08:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	27.9141	279.1409	186.70	190.32	3.62	49.77	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K2000584-001.02 100x	0.9890 ppm	0.2654 ppm	26.8300%	2020/01/31 08:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1767	11.7667	17.02	20.76	3.74	49.73	10:26
2	TOC	0.8014	8.0137	14.65	18.29	3.64	49.70	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K2000625-004.12	4.5756 ppm	0.0394 ppm	0.8600%	2020/01/31 09:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6035	46.0346	38.69	42.62	3.94	49.70	10:27
2	TOC	4.5478	45.4779	38.33	42.04	3.71	49.72	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K2000625-008.12 10x	0.6445 ppm	0.0136 ppm	2.1200%	2020/01/31 09:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6541	6.5412	13.72	17.27	3.56	49.76	10:25
2	TOC	0.6348	6.3483	13.59	17.23	3.64	49.78	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K2000625-010.12	16.3623 ppm	0.3881 ppm	2.3700%	2020/01/31 09:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.0879	160.8788	111.30	115.08	3.78	49.80	10:27
2	TOC	16.6367	166.3669	114.77	118.32	3.55	49.80	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K2000625-010.12 ms 4x	32.3758 ppm	0.0000 ppm	0.0000%	2020/01/31 10:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.3758	323.7585	214.29	217.90	3.62	49.81	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 10:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.54	13.12	3.58	49.80	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K2000625-011.12 20x	5.2436 ppm	0.0055 ppm	0.1000%	2020/01/31 10:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2397	52.3973	42.71	46.37	3.66	49.82	10:30
2	TOC	5.2475	52.4748	42.76	46.44	3.69	49.82	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K2000625-011.12 ms 100x	27.9296 ppm	0.0000 ppm	0.0000%	2020/01/31 11:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.9296	279.2958	186.17	189.90	3.73	49.82	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9591 ppm (PASS)	0.0000 ppm	0%	2020/01/31 11:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9591	249.5908	168.01	171.73	3.71	49.81	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 11:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.67	11.49	3.82	49.82	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K2000625-012.12 100x	0.9263 ppm	0.0157 ppm	1.6900%	2020/01/31 12:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9374	9.3738	15.51	19.27	3.77	49.80	10:28
2	TOC	0.9152	9.1524	15.37	19.20	3.84	49.82	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K2000625-012.12 ms 400x	27.1527 ppm	0.0000 ppm	0.0000%	2020/01/31 12:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	27.1527	271.5271	181.26	185.01	3.74	49.81	10:36

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 12:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.64	11.48	3.85	49.82	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K2000846-001.01	3.7995 ppm	0.0323 ppm	0.8500%	2020/01/31 13:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8223	38.2232	33.75	37.50	3.75	49.81	10:30
2	TOC	3.7766	37.7662	33.46	37.20	3.74	49.79	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K2000846-002.01	2.0087 ppm	0.0544 ppm	2.7100%	2020/01/31 13:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0472	20.4717	22.52	26.25	3.72	49.79	10:25
2	TOC	1.9703	19.7031	22.04	25.73	3.69	49.80	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K2000846-003.01	1.9344 ppm	0.0309 ppm	1.6000%	2020/01/31 13:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9562	19.5623	21.95	25.64	3.70	49.81	10:28
2	TOC	1.9126	19.1258	21.67	25.43	3.76	49.80	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K2000846-004.01	2.1029 ppm	0.0091 ppm	0.4300%	2020/01/31 14:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	36	TOC	K2000846-005.01	1.9342 ppm	0.0412 ppm	2.1300%	2020/01/31 14:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9633	19.6335	21.99	25.74	3.75	49.81	10:26
2	TOC	1.9051	19.0514	21.62	25.31	3.69	49.82	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	37	TOC	K2000670-002.05	22.0878 ppm	0.3150 ppm	1.4300%	2020/01/31 15:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.8650	218.6504	147.83	151.58	3.76	49.83	10:26
2	TOC	22.3106	223.1057	150.65	154.40	3.76	49.83	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	38	TOC	K2000695-001.01	0.2547 ppm	0.0639 ppm	25.0700%	2020/01/31 15:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2998	2.9985	11.48	15.27	3.79	49.84	10:28
2	TOC	0.2095	2.0954	10.90	14.63	3.73	49.81	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6420 ppm (PASS)	0.0000 ppm	0%	2020/01/31 16:19

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
B	TOC	25 ppm	1	24.6420	246.4198	166.01	169.68	3.67	49.81	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 16:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.27	11.05	3.78	49.82	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 16:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.56	10.34	3.79	49.82	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	26.5543 ppm (PASS)	0.0000 ppm	0%	2020/01/31 17:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.5543	265.5425	178.10	181.77	3.67	49.81	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K2000695-002.01	0.2229 ppm	0.0489 ppm	21.9200%	2020/01/31 17:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2575	2.5746	11.21	15.06	3.85	49.80	10:31
2	TOC	0.1883	1.8835	10.77	14.53	3.76	49.80	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K2000729-038.01	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 17:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.67	10.41	3.74	49.82	10:27
2	TOC	0.0000	0.0000	6.56	10.09	3.53	49.83	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K2000730-001.03	0.5038 ppm	0.0075 ppm	1.4900%	2020/01/31 18:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4985	4.9850	12.73	16.38	3.65	49.83	10:28
2	TOC	0.5091	5.0909	12.80	16.53	3.73	49.84	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K2000730-002.02	0.4583 ppm	0.0215 ppm	4.6800%	2020/01/31 18:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4431	4.4314	12.38	16.33	3.95	49.87	10:26
2	TOC	0.4735	4.7351	12.57	16.33	3.75	49.85	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K2000730-003.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 19:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	9.46	13.09	3.63	49.86	10:28
2	TOC	0.0000	0.0000	9.33	13.04	3.71	49.87	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	K2000730-004.02	2.5669 ppm	0.0291 ppm	1.1300%	2020/01/31 19:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5874	25.8743	25.94	29.68	3.74	49.87	10:28
2	TOC	2.5463	25.4631	25.68	29.50	3.82	49.88	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	46	TOC	K2000730-005.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 20:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.26	10.93	3.67	49.88	10:27
2	TOC	0.0000	0.0000	7.09	10.82	3.73	49.88	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	47	TOC	K2000730-006.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 20:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.39	11.12	3.74	49.90	10:27
2	TOC	0.0000	0.0000	7.44	11.22	3.78	49.89	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3660 ppm (PASS)	0.0000 ppm	0%	2020/01/31 21:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3660	243.6599	164.26	168.06	3.80	49.89	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 21:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.78	10.52	3.73	49.91	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	K2000730-007.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 21:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.17	10.99	3.82	49.90	10:30
2	TOC	0.0000	0.0000	7.67	11.54	3.87	49.92	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K2000730-008.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 22:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.86	10.62	3.76	49.91	10:28
2	TOC	0.0000	0.0000	6.95	10.82	3.87	49.93	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	FB 1/29/20 1600	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 22:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.80	10.57	3.76	49.94	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	51	TOC	K2000833-001.01 doc	6.0117 ppm	0.1221 ppm	2.0300%	2020/01/31 22:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0980	60.9805	48.14	51.87	3.73	49.93	10:30
2	TOC	5.9253	59.2534	47.04	50.85	3.81	49.94	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K2000833-002.01 doc	4.9342 ppm	0.0718 ppm	1.4600%	2020/01/31 23:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.9849	49.8494	41.10	44.78	3.68	49.93	10:25
2	TOC	4.8834	48.8340	40.46	44.15	3.69	49.95	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K2000833-003.01 doc	0.9394 ppm	0.0526 ppm	5.6000%	2020/01/31 23:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9766	9.7660	15.75	19.44	3.69	49.94	10:32
2	TOC	0.9023	9.0227	15.28	19.04	3.76	49.96	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	K2000833-004.01 doc	3.9488 ppm	0.0006 ppm	0.0100%	2020/02/01 00:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9484	39.4838	34.54	38.16	3.61	49.96	10:25
2	TOC	3.9492	39.4917	34.55	38.37	3.82	49.95	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	K2000833-005.01 doc	1.9930 ppm	0.0431 ppm	2.1600%	2020/02/01 00:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9626	19.6256	21.99	25.62	3.63	49.97	10:30
2	TOC	2.0234	20.2345	22.37	26.00	3.63	49.97	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K2000833-006.01 doc	3.8770 ppm	0.0405 ppm	1.0400%	2020/02/01 01:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8484	38.4842	33.91	37.44	3.53	49.99	10:26
2	TOC	3.9057	39.0567	34.27	37.89	3.61	49.98	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K2000833-001.01 ms doc 2x	29.4855 ppm	0.0000 ppm	0.0000%	2020/02/01 01:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.4855	294.8553	196.01	199.72	3.71	49.97	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5308 ppm (PASS)	0.0000 ppm	0%	2020/02/01 01:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5308	245.3079	165.30	168.92	3.61	49.99	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0	0 / infinity	0.0000	0.0000	0%	2020/02/01 02:01

					ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.31	11.01	3.70	49.97	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2020/02/01 02:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.75	10.46	3.71	49.96	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.8663 ppm (PASS)	0.0000 ppm	0%	2020/02/01 02:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.8663	258.6627	173.75	177.43	3.68	49.97	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	59	TOC	K2000833-007.01 doc	5.5893 ppm	0.0701 ppm	1.2500%	2020/02/01 02:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.6389	56.3892	45.23	49.06	3.83	49.97	10:28
2	TOC	5.5398	55.3975	44.61	48.20	3.60	49.98	10:25

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	K2000833-008.01 doc	5.1761 ppm	0.0158 ppm	0.3000%	2020/02/01 03:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1649	51.6492	42.24	45.87	3.64	49.98	10:29
2	TOC	5.1872	51.8722	42.38	46.16	3.78	50.01	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	K2000833-009.01 doc	5.3191 ppm	0.0040 ppm	0.0800%	2020/02/01 03:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.3163	53.1628	43.19	46.92	3.72	50.00	10:29
2	TOC	5.3220	53.2197	43.23	47.18	3.95	50.03	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K2000833-010.01 doc	3.3628 ppm	0.0643 ppm	1.9100%	2020/02/01 04:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3173	33.1733	30.55	34.29	3.73	50.02	10:27
2	TOC	3.4083	34.0827	31.13	34.93	3.80	50.02	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	K2000833-011.01 doc	5.0911 ppm	0.0287 ppm	0.5600%	2020/02/01 04:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1115	51.1146	41.90	45.56	3.66	50.04	10:31
2	TOC	5.0708	50.7082	41.64	45.21	3.57	50.06	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K2000833-012.01 doc	3.9145 ppm	0.0510 ppm	1.3000%	2020/02/01 05:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9506	39.5059	34.56	38.34	3.78	50.04	10:28
2	TOC	3.8785	38.7847	34.10	37.96	3.85	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	K2000833-001.01 doc	0.5269 ppm	0.0084 ppm	1.5900%	2020/02/01 05:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5210	5.2095	12.87	16.63	3.76	50.09	10:32
2	TOC	0.5328	5.3282	12.95	16.72	3.77	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	K2000866-001.01 ms doc	28.0039 ppm	0.0000 ppm	0.0000%	2020/02/01 06:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.0039	280.0391	186.64	190.39	3.75	50.07	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2094 ppm (PASS)	0.0000 ppm	0%	2020/02/01 06:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2094	242.0942	163.27	167.17	3.90	50.03	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0	0 / infinity	0.0000	0.0000	0%	2020/02/01 06:31

					ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.34	11.10	3.76	50.07	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K2000866-002.01 doc	1.4433 ppm	0.0081 ppm	0.5600%	2020/02/01 06:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4490	14.4902	18.74	22.67	3.93	50.04	10:28
2	TOC	1.4376	14.3763	18.67	22.59	3.92	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K2000866-003.01 doc	1.3272 ppm	0.0025 ppm	0.1900%	2020/02/01 07:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3290	13.2898	17.98	22.05	4.06	50.03	10:29
2	TOC	1.3255	13.2550	17.96	21.75	3.79	50.06	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	K2000866-004.01 doc	1.4099 ppm	0.0064 ppm	0.4500%	2020/02/01 07:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4144	14.1438	18.52	22.40	3.88	50.03	10:29
2	TOC	1.4054	14.0537	18.46	22.40	3.93	50.03	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K2000866-005.01 doc	0.9858 ppm	0.0174 ppm	1.7700%	2020/02/01 08:11

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	0.9981	9.9811	15.89	19.67	3.78	50.04	10:25
2	TOC	0.9734	9.7344	15.73	19.66	3.92	50.02	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K2000866-006.01 doc	0.7543 ppm	0.0102 ppm	1.3500%	2020/02/01 08:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7615	7.6151	14.39	18.11	3.72	50.04	10:29
2	TOC	0.7471	7.4712	14.30	18.09	3.79	50.06	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K2000866-007.01 doc	0.5100 ppm	0.0117 ppm	2.3000%	2020/02/01 09:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5183	5.1826	12.86	16.76	3.91	50.03	10:27
2	TOC	0.5017	5.0166	12.75	16.72	3.97	50.07	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K2000866-008.01 doc	0.9984 ppm	0.0362 ppm	3.6300%	2020/02/01 09:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0241	10.2405	16.05	19.93	3.87	50.04	10:26
2	TOC	0.9728	9.7281	15.73	19.56	3.83	50.06	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K2000866-009.01 doc	0.8757 ppm	0.0615 ppm	7.0200%	2020/02/01 10:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9192	9.1919	15.39	19.12	3.72	50.06	10:28
2	TOC	0.8322	8.3221	14.84	18.61	3.77	50.05	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.39	10.03	3.64	50.06	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0948 ppm (PASS)	0.0000 ppm	0%	2020/02/01 10:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0948	240.9475	162.55	166.16	3.61	50.03	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/02/01 11:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.83	10.49	3.67	50.05	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent	Acid	DI IC	DI TC	DI TOC	Save Time	Operator

	(Abs)	(Abs)	(Abs)	(Abs)	(Abs)		
v1344	2.1923	1.5750	0.0000	0.0000	0.0000	2020/01/30 14:00	Fusion1 (Fusion1)
v1345	1.9953	1.4740	0.0000	0.0000	0.0000	2020/01/30 22:05	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v31
Calibration curve formula: TOC: y = 6.323x + 10.200
Ver Creation: 2020/01/07 14:30
r^2 value: TOC: r^2 = 0.99991
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5850	0.0000		2020/01/07 13:02
0.500 ppm	12.6160	0.5000		2020/01/07 13:17
1.0 ppm	15.6440	1.0000		2020/01/07 13:31
5.0 ppm	43.7700	5.0000		2020/01/07 13:45
10 ppm	73.2770	10.0000		2020/01/07 14:00
25 ppm	169.4210	25.0000		2020/01/07 14:14
50 ppm	325.6260	50.0000		2020/01/07 14:28

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Operator: Fusion1 (Fusion1)
Ver Creation: 2019/02/21 17:57
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5

SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/02/01 11:16

StarLIMS Run: 668439, 668440, 668441, 668442

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 1/7/2020

ICAL ID: 11-GEN-05-83-K->O/84-A/11-GEN-05-84-C->H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-2-M

21 % H3PO4: 19-GEN-08-2-L

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: KCS	Date Analyzed: 2/1/20
Reviewed By:	Date Reviewed: 02/04/20

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS20030390

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20030390-01	16IW20-200309	Water		09-Mar-2020 08:15	10-Mar-2020 09:00	☐
HS20030390-02	16EW01-200309	Water		09-Mar-2020 09:15	10-Mar-2020 09:00	☐
HS20030390-03	16EW02-200309	Water		09-Mar-2020 10:15	10-Mar-2020 09:00	☐
HS20030390-04	16EW04-200309	Water		09-Mar-2020 11:15	10-Mar-2020 09:00	☐
HS20030390-05	16RW03-200309	Water		09-Mar-2020 12:05	10-Mar-2020 09:00	☐
HS20030390-06	16RW04-200309	Water		09-Mar-2020 12:55	10-Mar-2020 09:00	☐
HS20030390-07	16WW26-200309	Water		09-Mar-2020 13:50	10-Mar-2020 09:00	☐

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16IW20-200309
Collection Date: 09-Mar-2020 08:15

ANALYTICAL REPORT
WorkOrder:HS20030390
Lab ID:HS20030390-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**10.7**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 17:25
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Bromide	**13.4**		**0.150**	**0.500**	**0.500**	**mg/L**	5	11-Mar-2020 08:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW01-200309
Collection Date: 09-Mar-2020 09:15

ANALYTICAL REPORT
WorkOrder:HS20030390
Lab ID:HS20030390-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**13.4**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 17:38
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**3.39**		**0.300**	**1.00**	**1.00**	**mg/L**	10	17-Mar-2020 16:14
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	10-Mar-2020 18:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW02-200309
Collection Date: 09-Mar-2020 10:15

ANALYTICAL REPORT
WorkOrder:HS20030390
Lab ID:HS20030390-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**6.48**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 17:11
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**2.06**		**0.600**	**2.00**	**2.00**	**mg/L**	20	17-Mar-2020 16:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16EW04-200309
Collection Date: 09-Mar-2020 11:15

ANALYTICAL REPORT
WorkOrder:HS20030390
Lab ID:HS20030390-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**3.40**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 19:03
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Bromide	**0.637**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	10-Mar-2020 19:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16RW03-200309
Collection Date: 09-Mar-2020 12:05

ANALYTICAL REPORT
WorkOrder:HS20030390
Lab ID:HS20030390-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**1.04**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 19:17
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Bromide	**0.792**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	10-Mar-2020 19:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16RW04-200309
Collection Date: 09-Mar-2020 12:55

ANALYTICAL REPORT
WorkOrder:HS20030390
Lab ID:HS20030390-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**3.17**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 19:32
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Bromide	**0.430**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	10-Mar-2020 20:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16WW26-200309
Collection Date: 09-Mar-2020 13:50

ANALYTICAL REPORT
WorkOrder:HS20030390
Lab ID:HS20030390-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**2.27**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 19:45
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Bromide	**0.258**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	10-Mar-2020 20:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

PRELIMINARY

RIGHT SOLUTIONS | RIGHT PARTNER

APTIM

COC ID: LHAAP16-Effectiveness_ALSHT-2020- | TURNAROUND TIME: 5 Business Days | RUSH: 5 Business Days | Page 9 of 10

PROJECT/CLIENT INFO				LABORATORY					
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com	
Project Number	501032			Lab Contact	RJ Modashia				
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com	
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang	
	PMB 202							4005 Port Chicago Hwy	
City	Marshall	State	TX	City	Houston	State	TX	Concord	State CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country USA
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656				
Project Manager	Praveen Srivastav								

SAMPLE DETAILS								ANALYSIS REQUESTED										
								Containers and Preservative		1-250 ml HDPE, Ice	2X40ml Voa Vials / H2SO4							
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Bromide by SW9056	TOC by SM5310							
16IW20-200309	LHAAP 16				WG	3/9/20	0845	3		X	X							
16EW01-200309	LHAAP 16				WG	3/9/20	0945	3		X	X							
16EW02-200309	LHAAP 16				WG	3/9/20	1015	3		X	X							
16EW04-200309	LHAAP 16				WG	3/9/20	1115	3		X	X							
16RW03-200309	LHAAP 16				WG	3/9/20	1205	3		X	X							
16RW04-200309	LHAAP 16				WG	3/9/20	1255	3		X	X							
16WW26-200309	LHAAP 16				WG	3/9/20	1350	3		X	X							

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Jeetu Bhatt / BHATT	3/9/20 1500	J. Muguntan	3/10/20 09.00

HS20030390

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant LHAAP-16

Cooler - 45498
Temp 1.7
1025
CF 0.0

RIGHT SOLUTIONS | RIGHT PARTNER

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45498

CUSTODY SEAL

Date: 3/9/20 Time: 1500
Name: Scott Beesinger
Company: BHMTG

Seal Broken By:
Date: 03/10/20

45498

Must Deliver Next Business Day
Time and Temperature Sensitive!

45498

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 02MAR20
ACTWGT: 1.00 LB MAN
CAD: 3001130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 16 - RJ

RMA:

FedEx Express

TRK# 8221 1251 0294 9854

TUE - 10 MAR 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID 371191 05MAR20 CGCA 568C2/64F8/05A2

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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March 19, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20030472**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP-16**

Dear Susan,

ALS Environmental received 8 sample(s) on Mar 11, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS20030472

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20030472-01	16PM14-200310	Groundwater		10-Mar-2020 08:25	11-Mar-2020 08:53	☐
HS20030472-02	16IW04-200310	Groundwater		10-Mar-2020 09:20	11-Mar-2020 08:53	☐
HS20030472-03	16PM06-200310	Groundwater		10-Mar-2020 10:10	11-Mar-2020 08:53	☐
HS20030472-04	16PM09-200310	Groundwater		10-Mar-2020 11:00	11-Mar-2020 08:53	☐
HS20030472-05	16WW42-200310	Groundwater		10-Mar-2020 12:00	11-Mar-2020 08:53	☐
HS20030472-06	16WW42-200310-FD	Groundwater		10-Mar-2020 12:00	11-Mar-2020 08:53	☐
HS20030472-07	16RW12-200310	Groundwater		10-Mar-2020 12:55	11-Mar-2020 08:53	☐
HS20030472-08	16WW40-200310	Groundwater		10-Mar-2020 13:45	11-Mar-2020 08:53	☐

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS20030472

WetChemistry by Method SW9056

Batch ID: R358445

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R358074,R358104

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16PM14-200310
Collection Date: 10-Mar-2020 08:25

ANALYTICAL REPORT
WorkOrder:HS20030472
Lab ID:HS20030472-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**10.5**		**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 21:24
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**2.65**		**0.300**	**1.00**	**1.00**	**mg/L**	10	18-Mar-2020 20:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16IW04-200310
Collection Date: 10-Mar-2020 09:20

ANALYTICAL REPORT
WorkOrder:HS20030472
Lab ID:HS20030472-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**7.68**		**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 21:37
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**4.82**		**0.300**	**1.00**	**1.00**	**mg/L**	10	18-Mar-2020 20:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16PM06-200310
Collection Date: 10-Mar-2020 10:10

ANALYTICAL REPORT
WorkOrder:HS20030472
Lab ID:HS20030472-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**8.00**		**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 23:16
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**2.26**		**0.300**	**1.00**	**1.00**	**mg/L**	10	18-Mar-2020 21:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16PM09-200310
Collection Date: 10-Mar-2020 11:00

ANALYTICAL REPORT
WorkOrder:HS20030472
Lab ID:HS20030472-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**3.33**		**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 23:30
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**0.266**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	18-Mar-2020 22:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16WW42-200310
Collection Date: 10-Mar-2020 12:00

ANALYTICAL REPORT
WorkOrder:HS20030472
Lab ID:HS20030472-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**1.73**		**0.500**	**1.00**	**1.00**	**mg/L**	1	12-Mar-2020 23:45
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**1.36**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	18-Mar-2020 23:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16WW42-200310-FD
Collection Date: 10-Mar-2020 12:00

ANALYTICAL REPORT
WorkOrder:HS20030472
Lab ID:HS20030472-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**1.68**		**0.500**	**1.00**	**1.00**	**mg/L**	1	13-Mar-2020 00:00
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**1.35**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	18-Mar-2020 23:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16RW12-200310
Collection Date: 10-Mar-2020 12:55

ANALYTICAL REPORT
WorkOrder:HS20030472
Lab ID:HS20030472-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**2.56**		**0.500**	**1.00**	**1.00**	**mg/L**	1	13-Mar-2020 00:15
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**4.30**		**0.300**	**1.00**	**1.00**	**mg/L**	10	19-Mar-2020 00:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Sample ID: 16WW40-200310
Collection Date: 10-Mar-2020 13:45

ANALYTICAL REPORT
WorkOrder:HS20030472
Lab ID:HS20030472-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**9.79**		**0.500**	**1.00**	**1.00**	**mg/L**	1	13-Mar-2020 00:31
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**4.20**		**0.300**	**1.00**	**1.00**	**mg/L**	10	19-Mar-2020 00:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS20030472

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R358074 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS20030472-01	16PM14-200310	10 Mar 2020 08:25			12 Mar 2020 21:24	1
HS20030472-02	16IW04-200310	10 Mar 2020 09:20			12 Mar 2020 21:37	1
Batch ID: R358104 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS20030472-03	16PM06-200310	10 Mar 2020 10:10			12 Mar 2020 23:16	1
HS20030472-04	16PM09-200310	10 Mar 2020 11:00			12 Mar 2020 23:30	1
HS20030472-05	16WW42-200310	10 Mar 2020 12:00			12 Mar 2020 23:45	1
HS20030472-06	16WW42-200310-FD	10 Mar 2020 12:00			13 Mar 2020 00:00	1
HS20030472-07	16RW12-200310	10 Mar 2020 12:55			13 Mar 2020 00:15	1
HS20030472-08	16WW40-200310	10 Mar 2020 13:45			13 Mar 2020 00:31	1
Batch ID: R358445 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20030472-01	16PM14-200310	10 Mar 2020 08:25			18 Mar 2020 20:23	10
HS20030472-02	16IW04-200310	10 Mar 2020 09:20			18 Mar 2020 20:59	10
HS20030472-03	16PM06-200310	10 Mar 2020 10:10			18 Mar 2020 21:35	10
HS20030472-04	16PM09-200310	10 Mar 2020 11:00			18 Mar 2020 22:11	1
HS20030472-05	16WW42-200310	10 Mar 2020 12:00			18 Mar 2020 23:24	1
HS20030472-06	16WW42-200310-FD	10 Mar 2020 12:00			18 Mar 2020 23:42	1
HS20030472-07	16RW12-200310	10 Mar 2020 12:55			19 Mar 2020 00:00	10
HS20030472-08	16WW40-200310	10 Mar 2020 13:45			19 Mar 2020 00:36	10

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS20030472

QC BATCH REPORT

Batch ID: R358074 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW2-031220** Units: **mg/L** Analysis Date: **12-Mar-2020 18:21**
Client ID: Run ID: **TOC_02_358074** SeqNo: **5510414** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW2-031220** Units: **mg/L** Analysis Date: **12-Mar-2020 18:37**
Client ID: Run ID: **TOC_02_358074** SeqNo: **5510415** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.417	1.00	10	0	94.2	85 - 115				

LCSD Sample ID: **WLCSDW2-031220** Units: **mg/L** Analysis Date: **12-Mar-2020 18:50**
Client ID: Run ID: **TOC_02_358074** SeqNo: **5510416** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	8.929	1.00	10	0	89.3	85 - 115	9.417	5.32	20	

MS Sample ID: **HS20030462-01MS** Units: **mg/L** Analysis Date: **12-Mar-2020 21:52**
Client ID: Run ID: **TOC_02_358074** SeqNo: **5510429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	23.44	1.00	10	12.34	111	80 - 120				

The following samples were analyzed in this batch: HS20030472-01 HS20030472-02

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS20030472

QC BATCH REPORT

Batch ID: R358104 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW3-031220** Units: **mg/L** Analysis Date: **12-Mar-2020 22:35**
Client ID: Run ID: **TOC_02_358104** SeqNo: **5511336** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW3-031220** Units: **mg/L** Analysis Date: **12-Mar-2020 22:50**
Client ID: Run ID: **TOC_02_358104** SeqNo: **5511337** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.155	1.00	10	0	91.6	85 - 115				

LCSD Sample ID: **WLCSDW3-031220** Units: **mg/L** Analysis Date: **12-Mar-2020 23:03**
Client ID: Run ID: **TOC_02_358104** SeqNo: **5511338** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.907	1.00	10	0	99.1	85 - 115	9.155	7.89	20	

MS Sample ID: **HS20030472-03MS** Units: **mg/L** Analysis Date: **13-Mar-2020 17:16**
Client ID: **16PM06-200310** Run ID: **TOC_02_358104** SeqNo: **5516775** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	18.22	1.00	10	8.005	102	80 - 120				

The following samples were analyzed in this batch: HS20030472-03 HS20030472-04 HS20030472-05 HS20030472-06 HS20030472-07 HS20030472-08

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS20030472

QC BATCH REPORT

Batch ID: R358445 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WMBLKW1-031820** Units: **mg/L** Analysis Date: **18-Mar-2020 19:28**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519255** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-031820** Units: **mg/L** Analysis Date: **18-Mar-2020 19:46**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519256** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.677	0.100	4	0	91.9	80 - 120				

LCSD Sample ID: **WLCSDW1-031820** Units: **mg/L** Analysis Date: **18-Mar-2020 20:04**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519257** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.652	0.100	4	0	91.3	80 - 120	3.677	0.674	20	

MS Sample ID: **HS20030502-03MS** Units: **mg/L** Analysis Date: **19-Mar-2020 04:13**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519284** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	88.13	5.00	100	5.705	82.4	80 - 120				

MS Sample ID: **HS20030502-03MS** Units: **mg/L** Analysis Date: **19-Mar-2020 03:19**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519281** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.51	1.00	20	4.865	83.2	80 - 120				

MSD Sample ID: **HS20030502-03MSD** Units: **mg/L** Analysis Date: **19-Mar-2020 03:37**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519282** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.64	1.00	20	4.865	83.9	80 - 120	21.51	0.57	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: HS20030472

QC BATCH REPORT

Batch ID: R358445 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS20030502-03MSD** Units: **mg/L** Analysis Date: **19-Mar-2020 04:31**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519285** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	88.07	5.00	100	5.705	82.4	80 - 120	88.13	0.0681	20	

The following samples were analyzed in this batch:

HS20030472-01	HS20030472-02	HS20030472-03	HS20030472-04
HS20030472-05	HS20030472-06	HS20030472-07	HS20030472-08

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
WorkOrder: **HS20030472**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-16
Work Order: HS20030472

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20030472-01	16PM14-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed
HS20030472-01	16PM14-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed
HS20030472-02	16IW04-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed
HS20030472-02	16IW04-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed
HS20030472-03	16PM06-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed
HS20030472-03	16PM06-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed
HS20030472-04	16PM09-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed
HS20030472-04	16PM09-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed
HS20030472-05	16WW42-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed
HS20030472-05	16WW42-200310	Login	3/11/2020 6:11:05 PM	AC	Disposed

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS20030472

Date/Time Received: **11-Mar-2020 08:53**
Received by: **AC**

Checklist completed by: *Asad Chaudhry* eSignature — 11-Mar-2020 Date

Reviewed by: *RJ Modashia* eSignature — 12-Mar-2020 Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.3c U/C	IR 25
Cooler(s)/Kit(s):	45112	
Date/Time sample(s) sent to storage:	03/11/2020 18:20	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-Effectiveness_ALSHT-2020-

TURNAROUND TIME: 5 Business Days

RUSH: 5 Business Days

PROJECT/CLIENT INFO

Facility Name	Longhorn AAP
Project Number	501032
	LHAAP-16
Address	1203-B East Grand Avenue
	PMB 202
City	Marshall
State	TX
Postal Code	75670
Country	USA
Phone Number	713.243.7264
Project Manager	Praveen Srivastav

LABORATORY

Lab Name	ALS Laboratories
Lab Contact	RJ Modashia
Email	RJ.Modashia@alsgl
Address	10450 Stancliff Rd.,
City	Houston
Postal Code	77099
Phone Number	281.575.2279 or 28

HS20030472

Aptim Environmental & Infrastucture, Inc.

Longhorn Army Ammunition Plant LHAAP-16

A

SAMPLE DETAILS

ANALYSIS REQUESTED

Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	Containers and Preservative	1-250 ml HDPE, Ice: Bromide by SW9056	2X40ml Voa Vials / H2SO4: TOC by SM5310
16PW14-200310	LHAAP 16				WG	3/10/20	0825	3	ANALYSIS	X	X
16IW04-200310	LHAAP16				WG	3/10/20	0920	3		X	X
16PM06-200310	LHAAP 16				WG	3/10/20	1010	3		X	X
16PM09-200310	LHAAP 16				WG	3/10/20	1100	3		X	X
16WW42-200310	LHAAP16				WG	3/10/20	1200	3		X	X
16WW42-200310-FD	LHAAP16				WG	3/10/20	1200	3		X	X
16RW12-200310	LHAAP 16				WG	3/10/20	1255	3		X	X
16WW40-200310	LHAAP 16				WG	3/10/20	1345	3		X	X

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Sean Bussey / BHATE	3/10/20 1432	AC / ALS	3/11/2020 08:53

c/c 2.3 IR#25 CF#: 45112

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

45112

CUSTODY SEAL

Date: 3/10/20 Time: 1430
Name: Scott Beesinger
Company: BAyat

Seal Broken By: [illegible]
Date: 03/11/20

45112

Must Deliver Next Business Day
Time and Tempature Sensitive!

45112

ALS

ORIGIN ID:SGRA (903) 930 6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 25FEB20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

10 CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 533-6605
REF: LHAAF 16 - BO 70505-33
RMA:

FedEx Express

E

FedEx
TRK# 0221 1251 0294 7932

WED - 11 MAR 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

FID 510/232 10MAR20 GGGA 56BC2/64E0/05A2

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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March 19, 2020

Susan Huang
Aptim Environmental & Infrastucture, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS20030502**

Laboratory Results for: **Longhorn Army Ammunition Plant - 16**

Dear Susan,

ALS Environmental received 4 sample(s) on Mar 12, 2020 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
Work Order: HS20030502

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20030502-01	16WW12-200311	Groundwater		11-Mar-2020 08:15	12-Mar-2020 08:50	☐
HS20030502-02	16RW10-200311	Groundwater		11-Mar-2020 09:05	12-Mar-2020 08:50	☐
HS20030502-03	16RW09-200311	Groundwater		11-Mar-2020 10:00	12-Mar-2020 08:50	☐
HS20030502-04	16RW08-200311	Groundwater		11-Mar-2020 10:55	12-Mar-2020 08:50	☐

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
Work Order: HS20030502

CASE NARRATIVE

WetChemistry by Method SW9056

Batch ID: R358445

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM5310B

Batch ID: R358346,R358436

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
Sample ID: 16WW12-200311
Collection Date: 11-Mar-2020 08:15

ANALYTICAL REPORT
WorkOrder:HS20030502
Lab ID:HS20030502-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**7.08**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	17-Mar-2020 00:04
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**3.71**		**0.300**	**1.00**	**1.00**	**mg/L**	10	19-Mar-2020 01:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
Sample ID: 16RW10-200311
Collection Date: 11-Mar-2020 09:05

ANALYTICAL REPORT
WorkOrder:HS20030502
Lab ID:HS20030502-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**4.08**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Mar-2020 14:22
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**3.33**		**0.300**	**1.00**	**1.00**	**mg/L**	10	19-Mar-2020 01:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
Sample ID: 16RW09-200311
Collection Date: 11-Mar-2020 10:00

ANALYTICAL REPORT
WorkOrder:HS20030502
Lab ID:HS20030502-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**2.56**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Mar-2020 14:35
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**4.86**		**0.300**	**1.00**	**1.00**	**mg/L**	10	19-Mar-2020 03:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
Sample ID: 16RW08-200311
Collection Date: 11-Mar-2020 10:55

ANALYTICAL REPORT
WorkOrder:HS20030502
Lab ID:HS20030502-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B		**Method:SM5310B**						Analyst: GR
Organic Carbon, Total	**2.60**	a	**0.500**	**1.00**	**1.00**	**mg/L**	1	18-Mar-2020 14:50
ANIONS BY SW9056A		**Method:SW9056**						Analyst: GR
Bromide	**5.10**		**0.300**	**1.00**	**1.00**	**mg/L**	10	19-Mar-2020 04:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
WorkOrder: HS20030502

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R358346 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS20030502-01	16WW12-200311	11 Mar 2020 08:15			17 Mar 2020 00:04	1
Batch ID: R358436 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B				**Matrix:** Groundwater	
HS20030502-02	16RW10-200311	11 Mar 2020 09:05			18 Mar 2020 14:22	1
HS20030502-03	16RW09-200311	11 Mar 2020 10:00			18 Mar 2020 14:35	1
HS20030502-04	16RW08-200311	11 Mar 2020 10:55			18 Mar 2020 14:50	1
Batch ID: R358445 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS20030502-01	16WW12-200311	11 Mar 2020 08:15			19 Mar 2020 01:12	10
HS20030502-02	16RW10-200311	11 Mar 2020 09:05			19 Mar 2020 01:48	10
HS20030502-03	16RW09-200311	11 Mar 2020 10:00			19 Mar 2020 03:01	10
HS20030502-04	16RW08-200311	11 Mar 2020 10:55			19 Mar 2020 04:50	10

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
WorkOrder: HS20030502

QC BATCH REPORT

Batch ID: R358346 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW4-031620** Units: **mg/L** Analysis Date: **16-Mar-2020 20:37**
Client ID: Run ID: **TOC_02_358346** SeqNo: **5516678** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW4-031620** Units: **mg/L** Analysis Date: **16-Mar-2020 20:52**
Client ID: Run ID: **TOC_02_358346** SeqNo: **5516679** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	8.594	1.00	10	0	85.9	85 - 115				

LCSD Sample ID: **WLCSDW4-031620** Units: **mg/L** Analysis Date: **16-Mar-2020 21:06**
Client ID: Run ID: **TOC_02_358346** SeqNo: **5516680** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	8.751	1.00	10	0	87.5	85 - 115	8.594	1.81	20	

MS Sample ID: **HS20030483-33MS** Units: **mg/L** Analysis Date: **16-Mar-2020 23:51**
Client ID: Run ID: **TOC_02_358346** SeqNo: **5516692** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	11.18	1.00	10	1.863	93.2	80 - 120				

The following samples were analyzed in this batch: HS20030502-01

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
WorkOrder: HS20030502

QC BATCH REPORT

Batch ID: R358436 (0) **Instrument: TOC_02** **Method: TOTAL ORGANIC CARBON - SM5310B**

MBLK Sample ID: **WBLKW2-031720** Units: **mg/L** Analysis Date: **18-Mar-2020 13:24**
Client ID: Run ID: **TOC_02_358436** SeqNo: **5518865** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **WLCSW2-031720** Units: **mg/L** Analysis Date: **18-Mar-2020 13:40**
Client ID: Run ID: **TOC_02_358436** SeqNo: **5518866** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.483	1.00	10	0	94.8	85 - 115				

LCSD Sample ID: **WLCSDW2-031720** Units: **mg/L** Analysis Date: **18-Mar-2020 13:53**
Client ID: Run ID: **TOC_02_358436** SeqNo: **5518867** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	9.497	1.00	10	0	95.0	85 - 115	9.483	0.148	20	

MS Sample ID: **HS20030502-03MS** Units: **mg/L** Analysis Date: **19-Mar-2020 09:48**
Client ID: **16RW09-200311** Run ID: **TOC_02_358436** SeqNo: **5520428** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	13.35	1.00	10	2.562	108	80 - 120				

The following samples were analyzed in this batch: HS20030502-02 HS20030502-03 HS20030502-04

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
WorkOrder: HS20030502

QC BATCH REPORT

Batch ID: R358445 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WMBLKW1-031820** Units: **mg/L** Analysis Date: **18-Mar-2020 19:28**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519255** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.100	0.100								U

LCS Sample ID: **WLCSW1-031820** Units: **mg/L** Analysis Date: **18-Mar-2020 19:46**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519256** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.677	0.100	4	0	91.9	80 - 120				

LCSD Sample ID: **WLCSDW1-031820** Units: **mg/L** Analysis Date: **18-Mar-2020 20:04**
Client ID: Run ID: **ICS-Integrion_358445** SeqNo: **5519257** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.652	0.100	4	0	91.3	80 - 120	3.677	0.674	20	

MS Sample ID: **HS20030502-03MS** Units: **mg/L** Analysis Date: **19-Mar-2020 04:13**
Client ID: **16RW09-200311** Run ID: **ICS-Integrion_358445** SeqNo: **5519284** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	88.13	5.00	100	5.705	82.4	80 - 120				

MS Sample ID: **HS20030502-03MS** Units: **mg/L** Analysis Date: **19-Mar-2020 03:19**
Client ID: **16RW09-200311** Run ID: **ICS-Integrion_358445** SeqNo: **5519281** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.51	1.00	20	4.865	83.2	80 - 120				

MSD Sample ID: **HS20030502-03MSD** Units: **mg/L** Analysis Date: **19-Mar-2020 03:37**
Client ID: **16RW09-200311** Run ID: **ICS-Integrion_358445** SeqNo: **5519282** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	21.64	1.00	20	4.865	83.9	80 - 120	21.51	0.57	20	

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
WorkOrder: HS20030502

QC BATCH REPORT

Batch ID: **R358445 (0)** **Instrument:** **ICS-Integrion** **Method:** **ANIONS BY SW9056A**

MSD Sample ID: **HS20030502-03MSD** Units: **mg/L** Analysis Date: **19-Mar-2020 04:31**
Client ID: **16RW09-200311** Run ID: **ICS-Integrion_358445** SeqNo: **5519285** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	88.07	5.00	100	5.705	82.4	80 - 120	88.13	0.0681	20	

The following samples were analyzed in this batch: HS20030502-01 HS20030502-02 HS20030502-03 HS20030502-04

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
WorkOrder: **HS20030502**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Client: Aptim Environmental & Infrastucture, Inc.
Project: Longhorn Army Ammunition Plant - 16
Work Order: HS20030502

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20030502-01	16WW12-200311	Login	3/12/2020 12:34:30 PM	PMG	Sub
HS20030502-01	16WW12-200311	Login	3/12/2020 12:34:30 PM	PMG	VOA012

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS20030502
Date/Time Received: **12-Mar-2020 08:50**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature 12-Mar-2020 Date
Reviewed by: *RJ Modashia* eSignature 12-Mar-2020 Date

Matrices: **GW**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.8c U/C	IR25
Cooler(s)/Kit(s):	44977	
Date/Time sample(s) sent to storage:	3/12/2020 12:50	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

APTIM

COC ID: LHAAP16-Effectiveness_ ALSHT-2020-

TURNAROUND TIME: 5 Business Days

RUSH: 5 Business Days

Page 1 of

PROJECT/CLIENT INFO				LABORATORY						
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Fedinvoices @aptim.com		
Project Number	501032			Lab Contact	RJ Modashia					
	LHAAP-16			Email	RJ.Modashia@alsglobal.com			Susan.Huang@aptim.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Susan Huang		
	PMB 202							4005 Port Chicago Hwy		
City	Marshall	State	TX	City	Houston	State	TX	Concord	State	CA
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	94520	Country	USA
Phone Number	713 243.7264			Phone Number	281.575.2279 or 281.530.5656					
Project Manager	Praveen Srivastav									

SAMPLE DETAILS / ANALYSIS REQUESTED

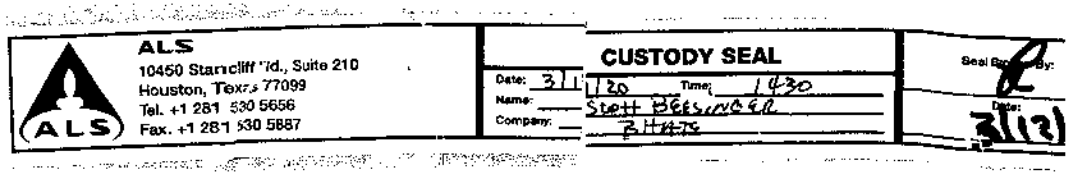
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Bromide by SW9056 (1-250 ml HDPE, Ice)	TOC by SM5310 (2X40ml Vox Vials / H2SO4)
16WW12-200311	LHAAP16				WG	3/11/20	0815	3		X	X
16RW10-200311	LHAAP16				WG	3/11/20	0905	3		X	X
16RW09-200311	LHAAP16				WG	3/11/20	1000	3		X	X
16RW09-200311-MS	LHAAP16				WG	3/11/20	1000	3		X	X
16RW09-200311-MSD	LHAAP16				WG	3/11/20	1000	3		X	X
16RW08-200311	LHAAP16				WG	3/11/20	1055	3		X	X

HS20030502

Aptim Environmental & Infrastucture, Inc.
Longhorn Army Ammunition Plant - 16

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Scott Bersinger / BHATE	3/11/20 1430	AC / ALS	3/12/2020 08:50

U/C 1.8 IR #25 CF0.0 44977


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 3/11/20
Time: 1430
Name: Scott BEESINGER
Company: BHATS
Seal Broken By:
Date: 3/12

FedEx
TRK# 0221 1251 0294 7895
THU - 12 MAR 10:30A
PRIORITY OVERNIGHT
AB SGRA
44911
77099
TX-US
IAH