LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 2

2021

Bate Stamp Numbers
01009293 – 01011063

Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976–2021

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX

VOLUME 2

2021

A. Title: (cont'd) Report – Level IV DOD to Final Sixth Annual Remedial Action Operation Report, LHAAP-50 Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas, February 2021
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
Date: February 4, 2021
Bate Stamp: 01009293 – 01010816

B. Title: Transmittal Letter – Draft Remedial Action Completion Report, LHAAP-03 Former Waste Collection Pad, Building 722-P Paint Shop, Longhorn Army Ammunition Plant, Karnack, Texas, February 2021
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency
Date: February 10, 2021
Bate Stamp: 01010817 – 01010817

C. Title: Transmittal Letter – Draft Remedial Action Completion Report, LHAAP-03 Former Waste Collection Pad, Building 722-P Paint Shop, Longhorn Army Ammunition Plant, Karnack, Texas, February 2021
Author(s): Department of the Army
Recipient: Texas Commission on Environmental Quality
Date: February 10, 2021
Bate Stamp: 01010818 – 01010818

D. Title: Work Plan – Final Pre-Design Investigation Work Plan for LHAAP-29, Former TNT Production Area Group 2 Longhorn Army Ammunition Plant, Karnack, Texas, February 2021
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
Date: February 16, 2021
Bate Stamp: 01010819 – 01010861

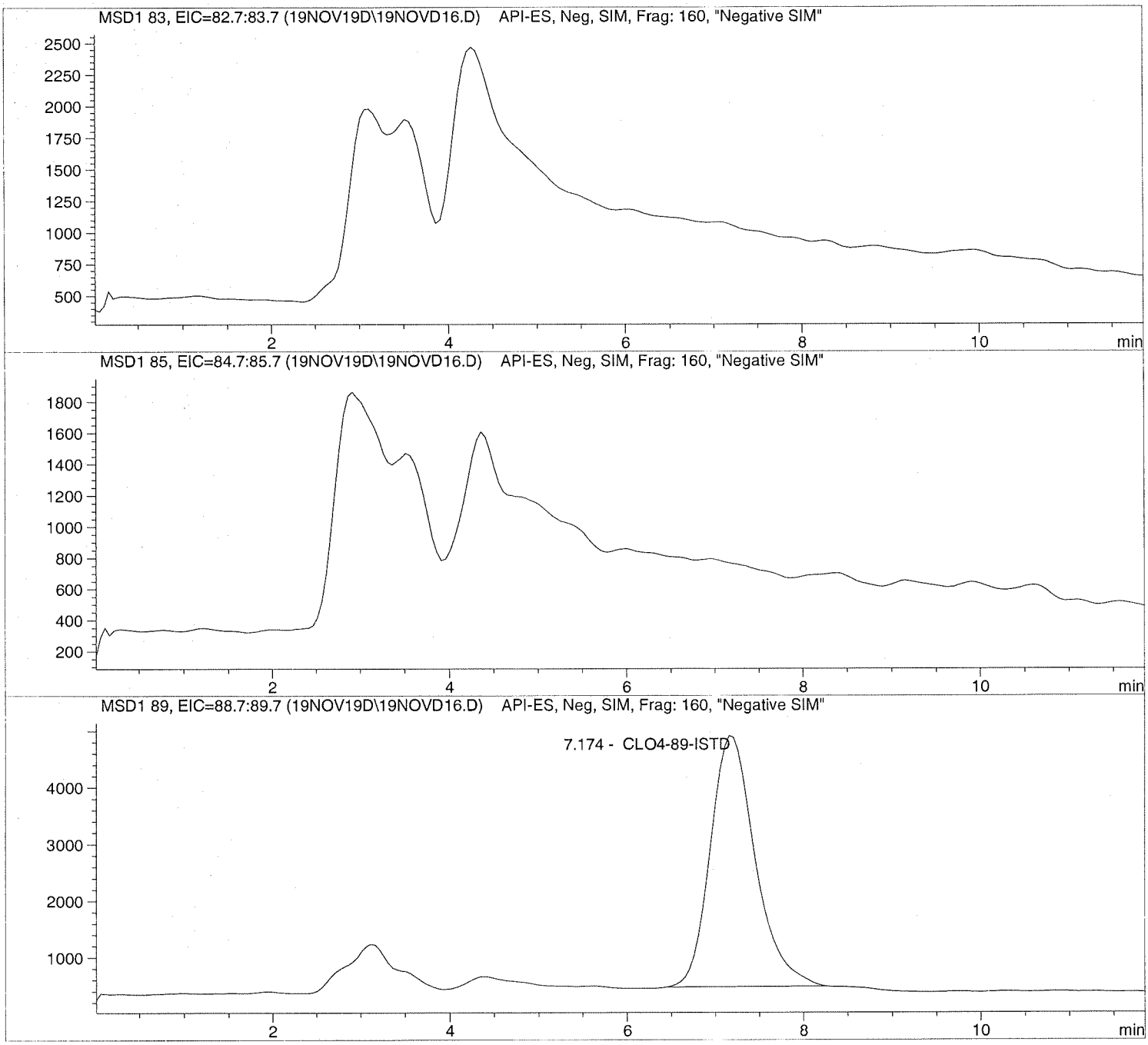
E. Title: Report – Final Post Screening Investigation Addendum No. 2 Report for LHAAP-47, Plant 3 Area, Solid Rocket Motor Fuel Production Longhorn Army Ammunition Plant, Karnack, Texas, February 2021
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
Date: February 23, 2021
Bate Stamp: 01010862 – 01011063

Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD16.D Sample Name: 1931753011

Injection Date:	11/19/2019 12:17:41	Seq Line:	16
Sample Name:	1931753011	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: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD16.D Sample Name: 1931753011

Injection Date:	11/19/2019 12:17:41	Seq Line:	16
Sample Name:	1931753011	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: 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:	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
7.174	BBA	157072.7	5.0000	CLO4-89-ISTD

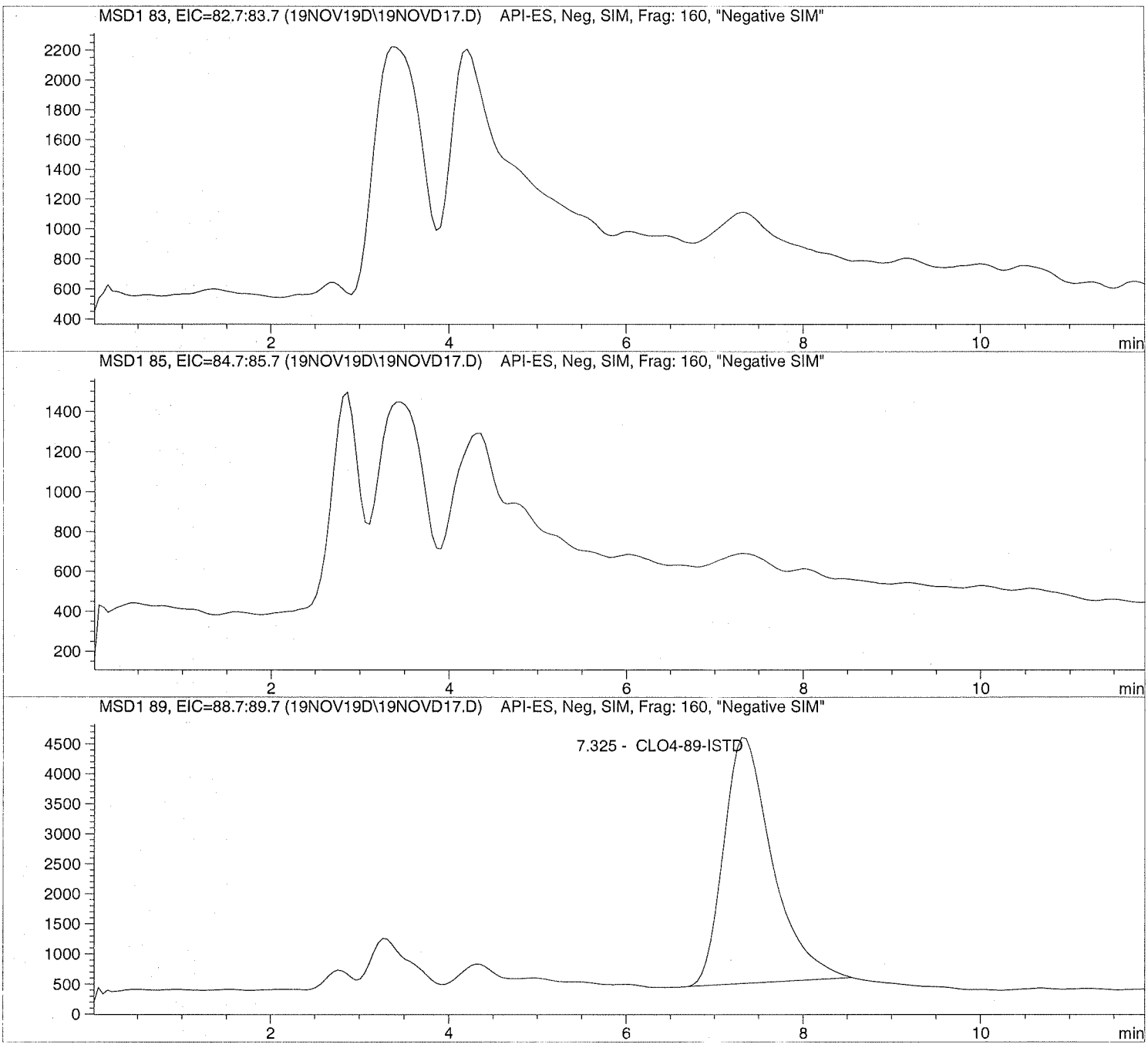
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Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD17.D Sample Name: 1931753012

Injection Date:	11/19/2019 12:31:25	Seq Line:	17
Sample Name:	1931753012	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: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD17.D Sample Name: 1931753012

Injection Date:	11/19/2019 12:31:25	Seq Line:	17
Sample Name:	1931753012	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: 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:	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
7.325	PBA	156727.4	5.0000	CLO4-89-ISTD

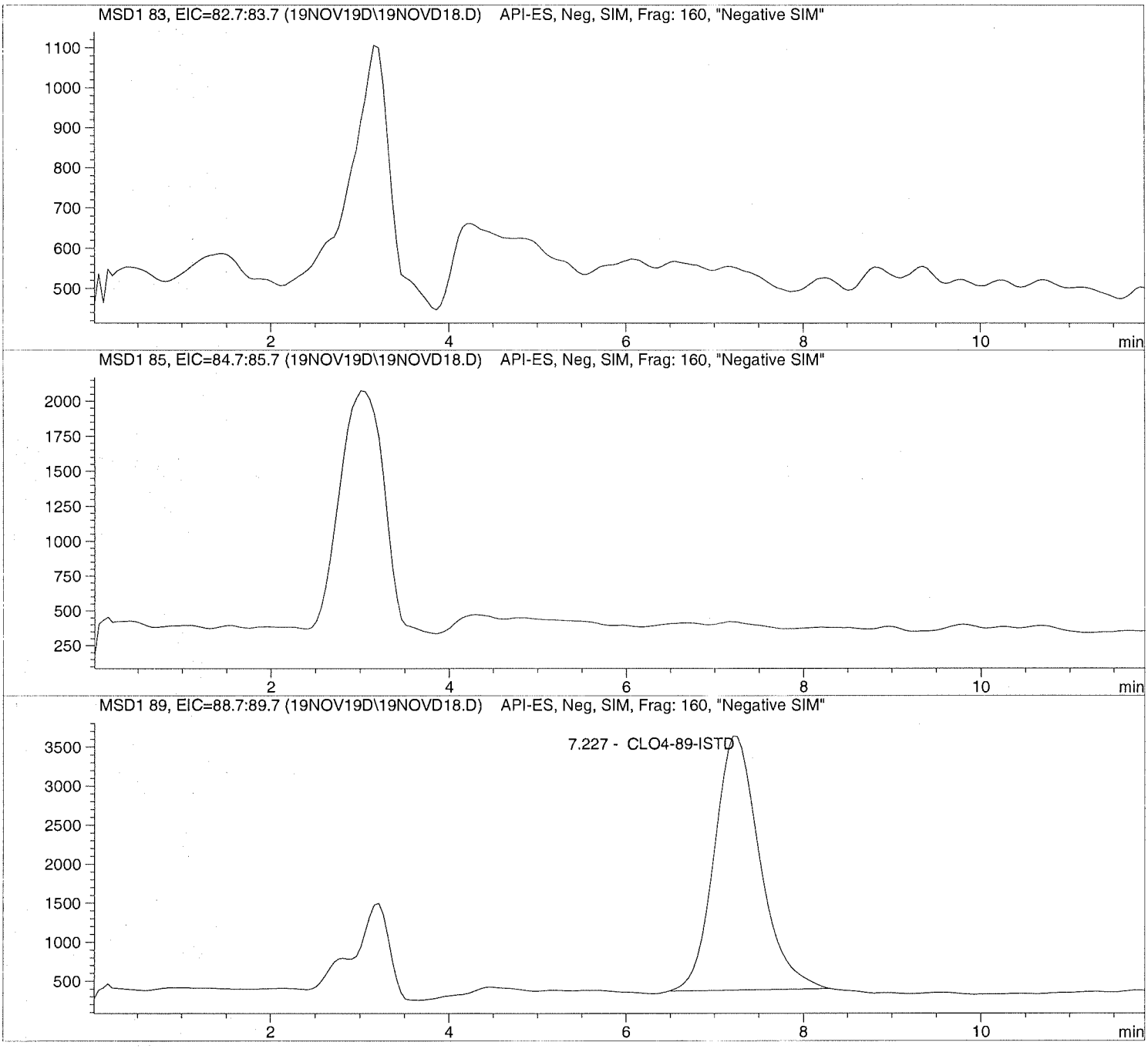
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Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD18.D Sample Name: 1931753013

Injection Date:	11/19/2019 12:45:09	Seq Line:	18
Sample Name:	1931753013	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: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD18.D Sample Name: 1931753013

Injection Date:	11/19/2019 12:45:09	Seq Line:	18
Sample Name:	1931753013	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: 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:	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
7.227	BBA	116311.5	5.0000	CLO4-89-ISTD

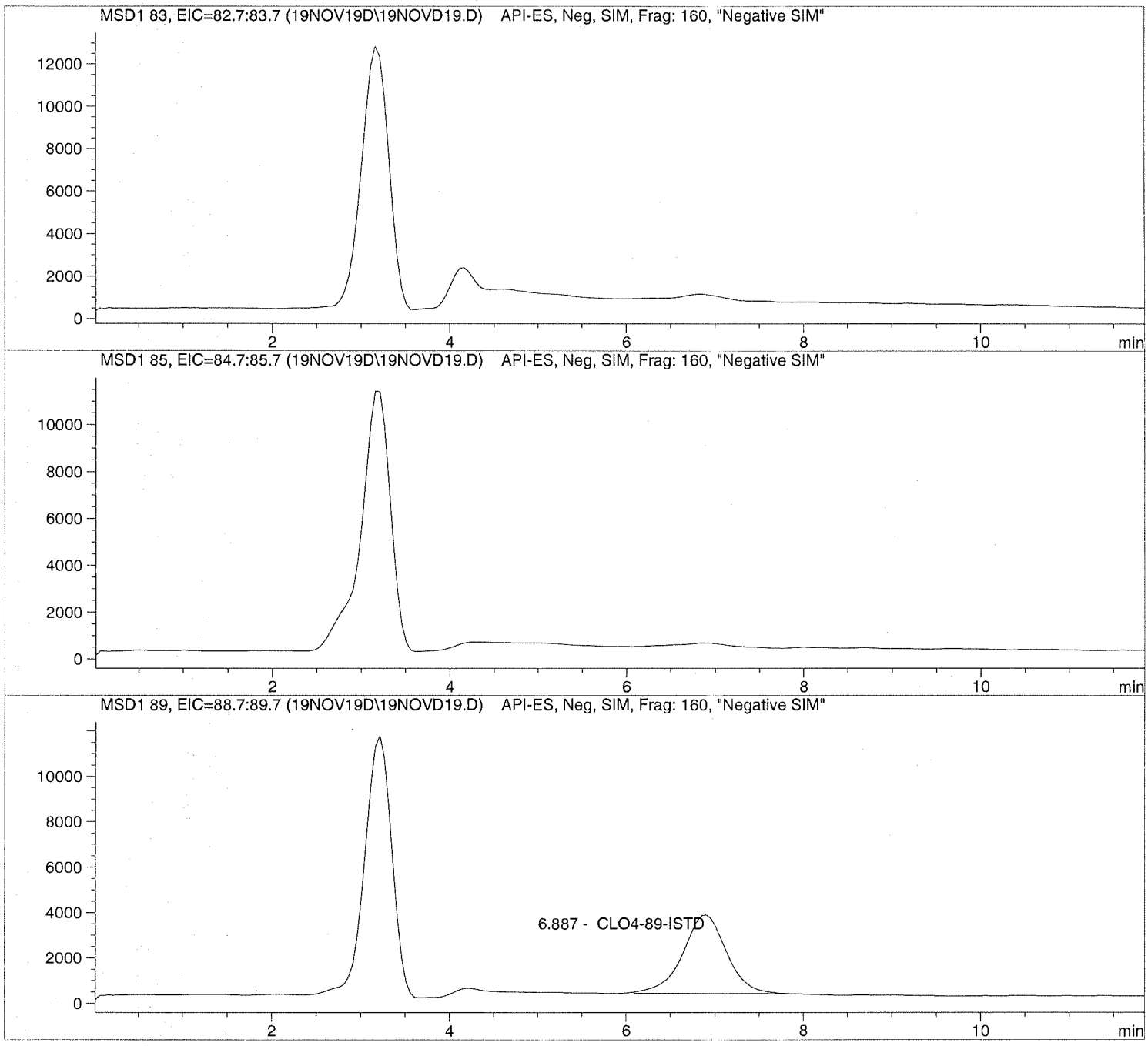
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Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD19.D Sample Name: 1932010001

Injection Date:	11/19/2019 12:58:54	Seq Line:	19
Sample Name:	1932010001	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: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD19.D Sample Name: 1932010001

Injection Date:	11/19/2019 12:58:54	Seq Line:	19
Sample Name:	1932010001	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:	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:	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
6.887	BBA	118043.7	5.0000	CLO4-89-ISTD

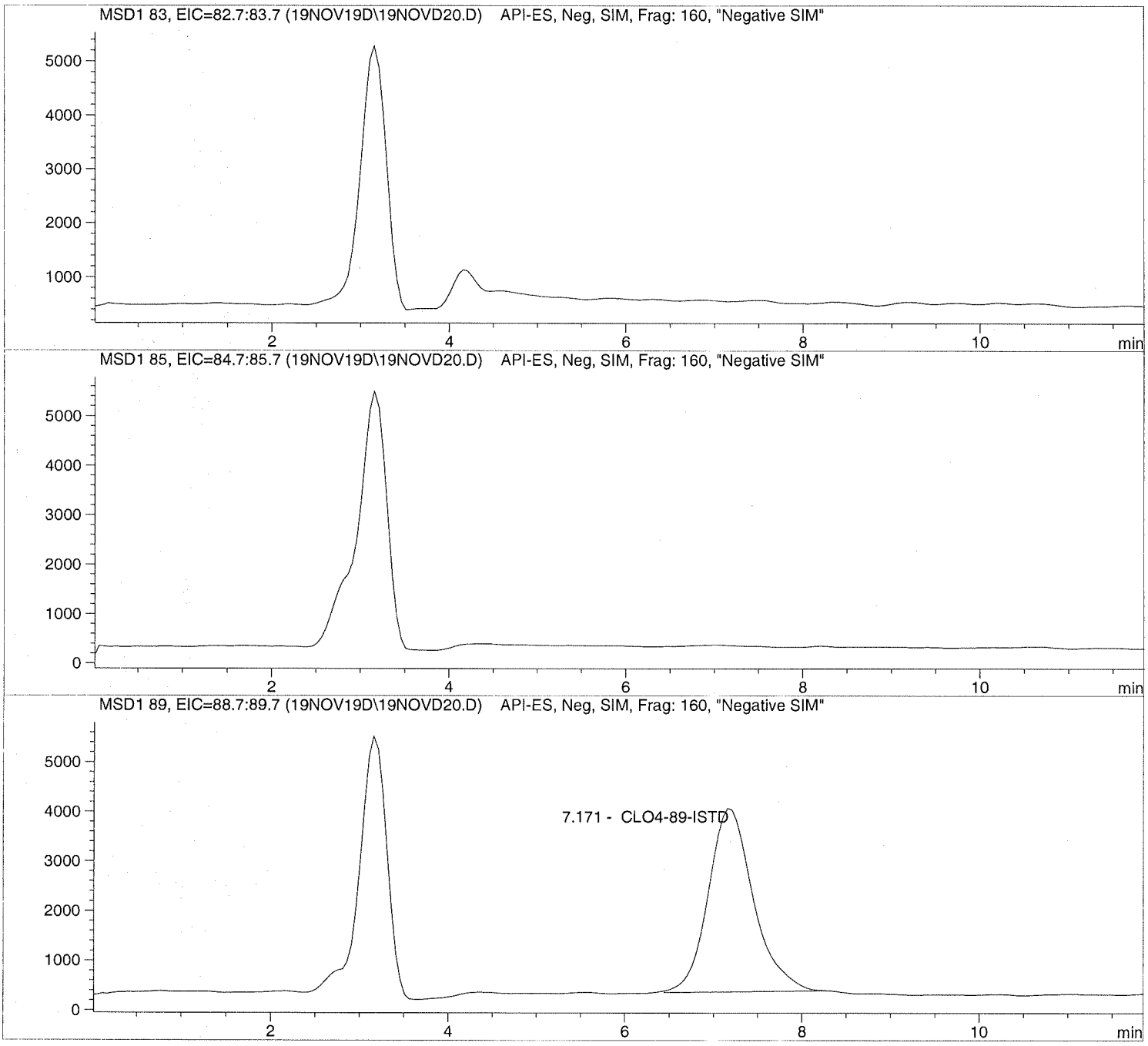
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Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD20.D Sample Name: 1932010002

Injection Date:	11/19/2019 13:12:42	Seq Line:	20
Sample Name:	1932010002	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: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD20.D Sample Name: 1932010002

Injection Date:	11/19/2019 13:12:42	Seq Line:	20
Sample Name:	1932010002	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: 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:	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
7.171	BBA	130569.2	5.0000	CLO4-89-ISTD

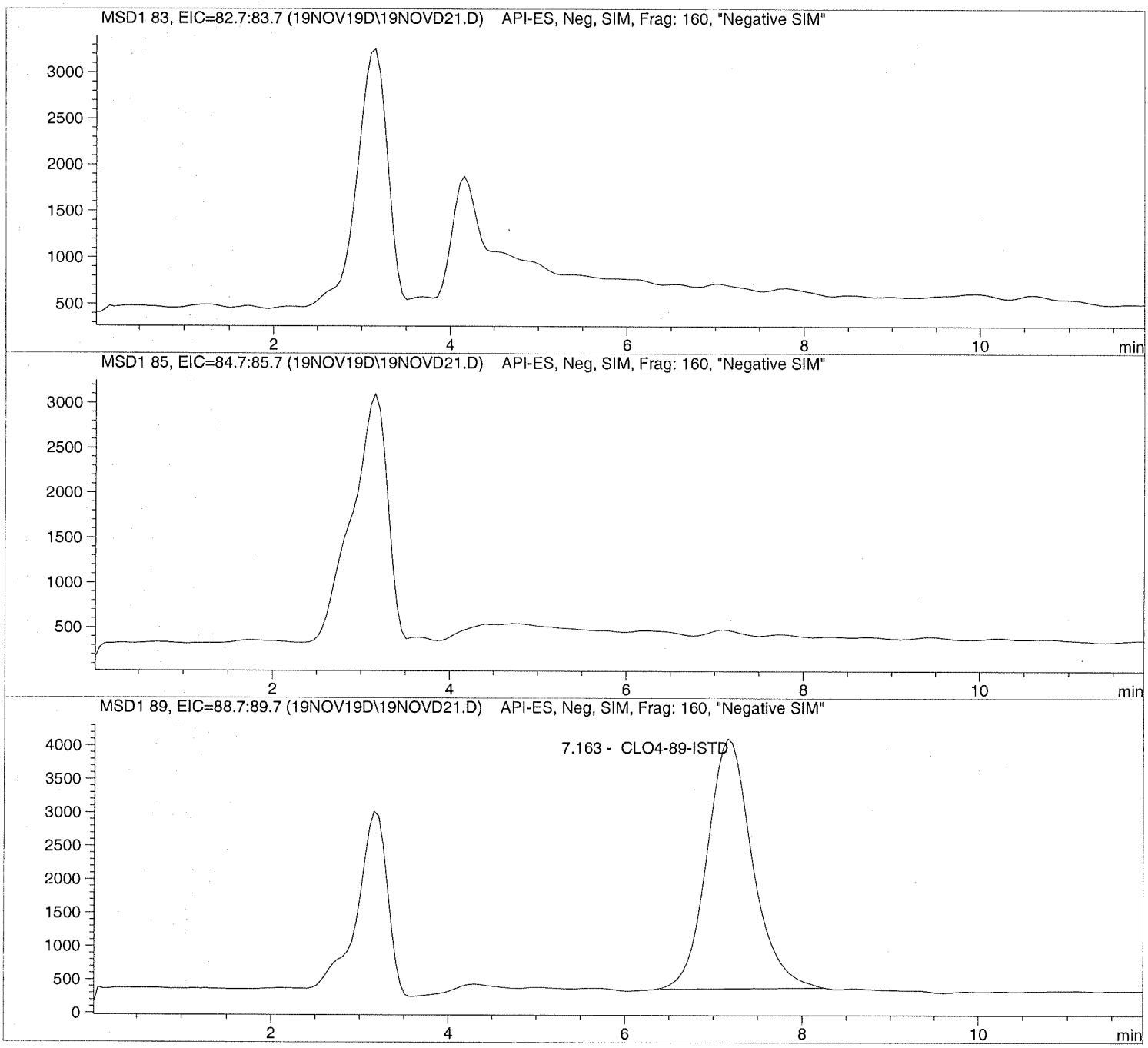
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Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD21.D Sample Name: 1932010003

Injection Date:	11/19/2019 13:26:30	Seq Line:	21
Sample Name:	1932010003	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: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD21.D Sample Name: 1932010003

Injection Date:	11/19/2019 13:26:30	Seq Line:	21
Sample Name:	1932010003	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: 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:	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
7.163	PBA	133641.2	5.0000	CLO4-89-ISTD

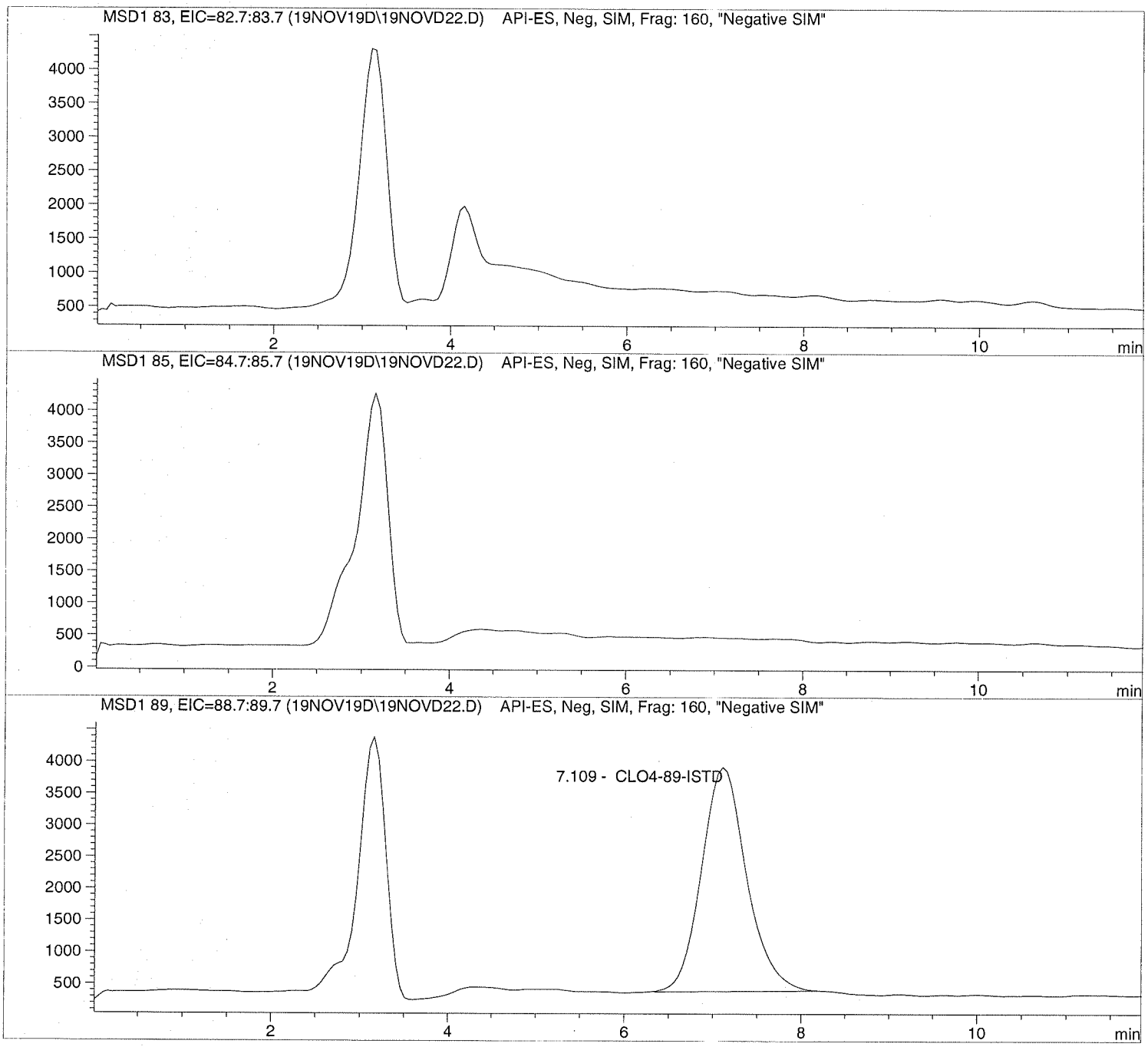
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Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD22.D Sample Name: 1932010004

Injection Date:	11/19/2019 13:40:18	Seq Line:	22
Sample Name:	1932010004	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: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD22.D Sample Name: 1932010004

Injection Date:	11/19/2019 13:40:18	Seq Line:	22
Sample Name:	1932010004	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: 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:	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
7.109	BBA	124695.0	5.0000	CLO4-89-ISTD

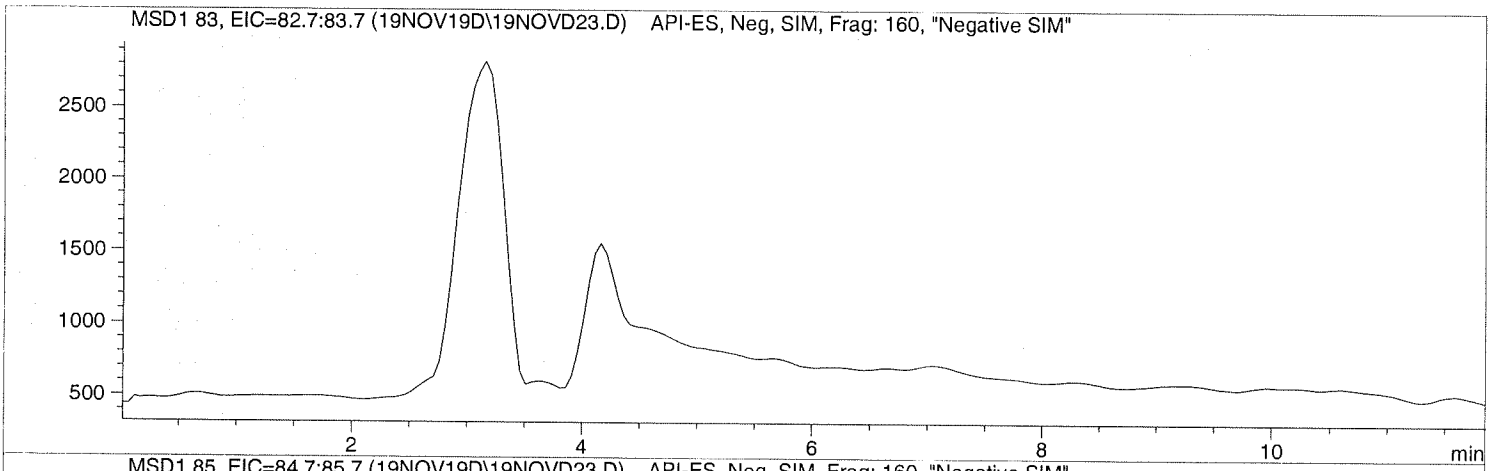
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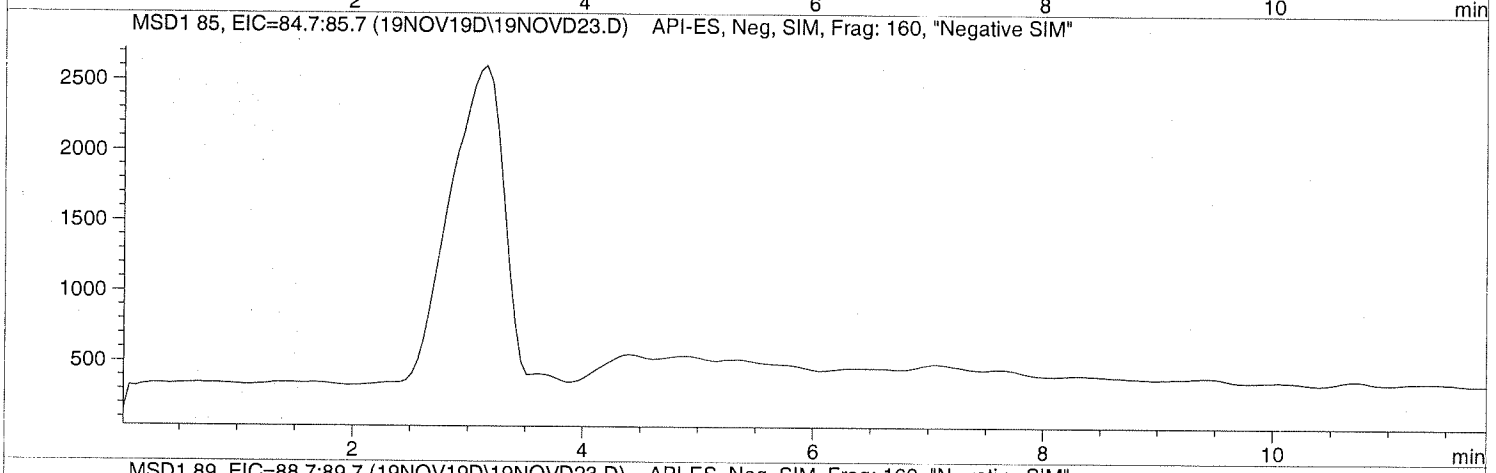
Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD23.D Sample Name: 1932010005

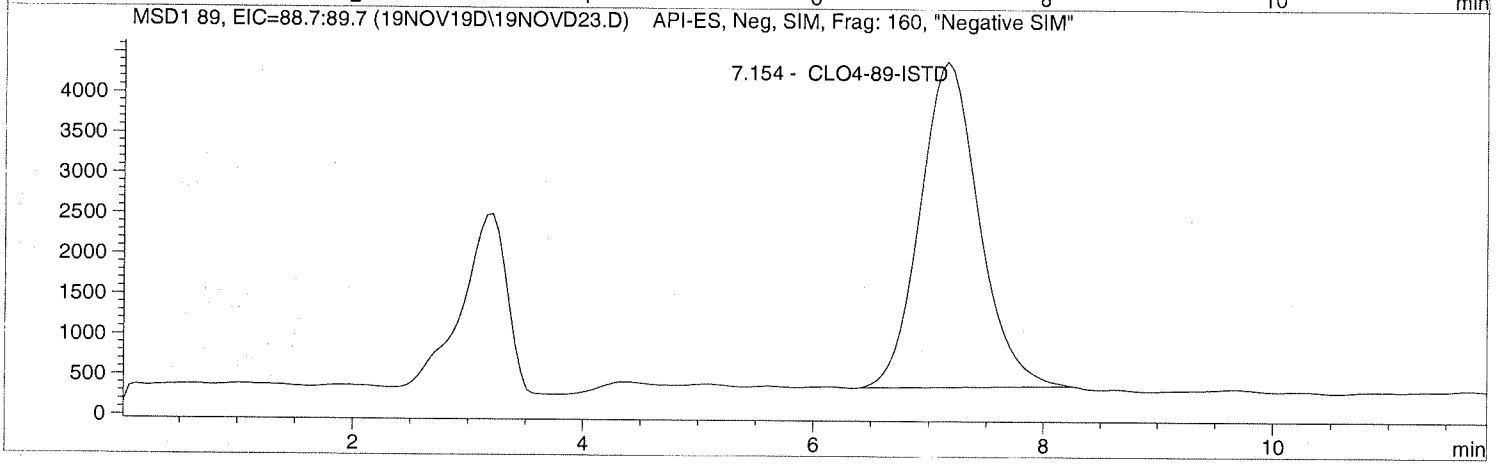
Injection Date:	11/19/2019 13:54:05	Seq Line:	23
Sample Name:	1932010005	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD23.D Sample Name: 1932010005

Injection Date:	11/19/2019 13:54:05	Seq Line:	23
Sample Name:	1932010005	Location:	Vial 92
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:	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:	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
7.154	PBA	143110.0	5.0000	CLO4-89-ISTD

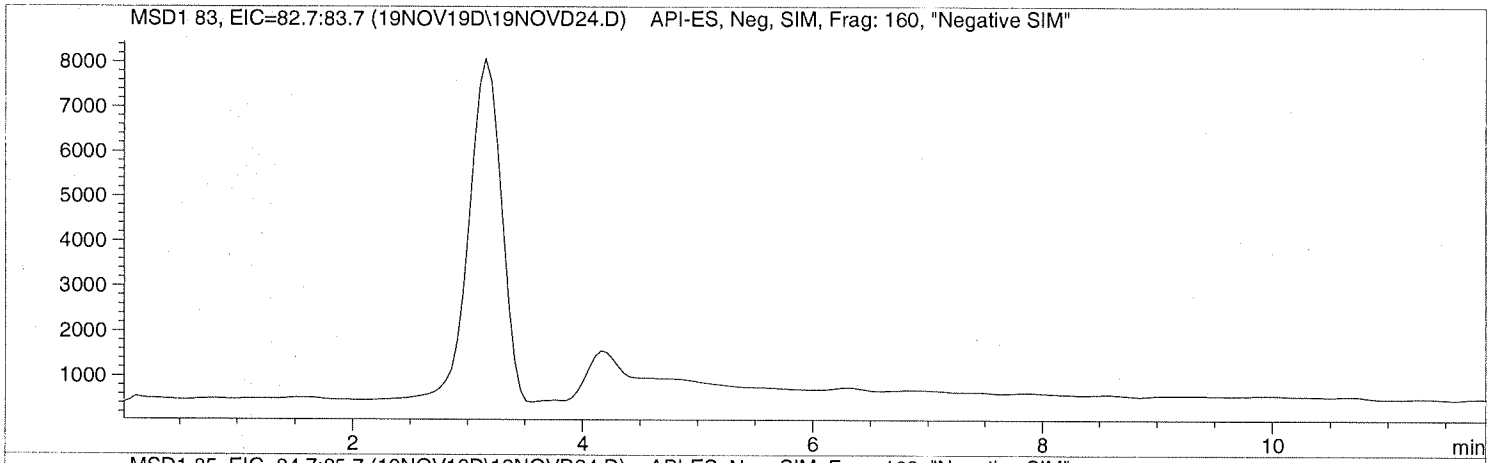
*** End of Report ***

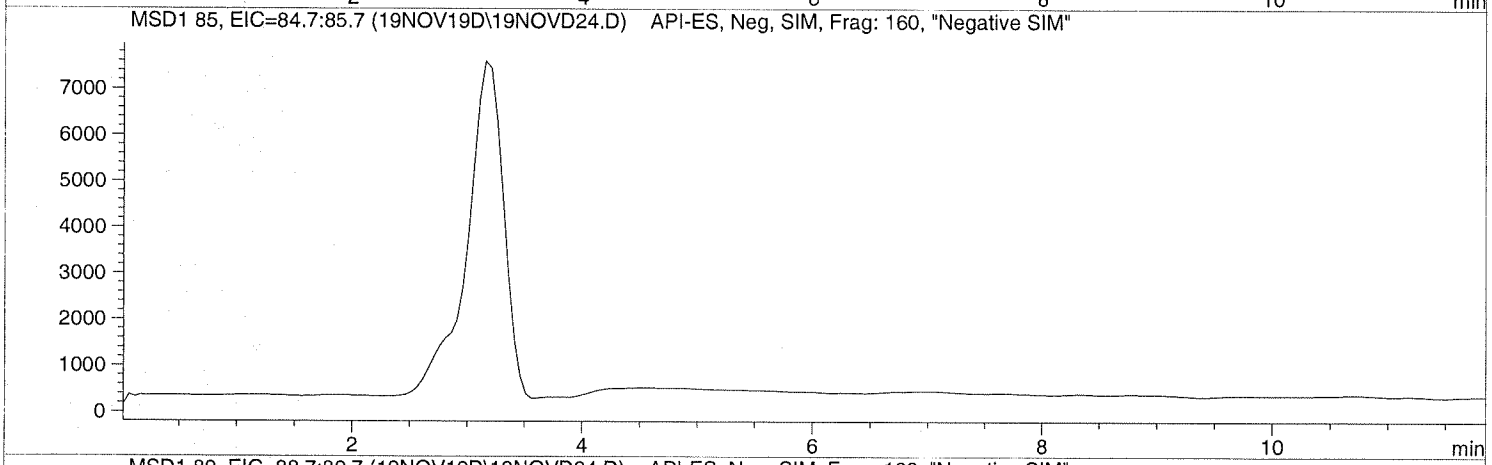
Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD24.D Sample Name: 1932010006

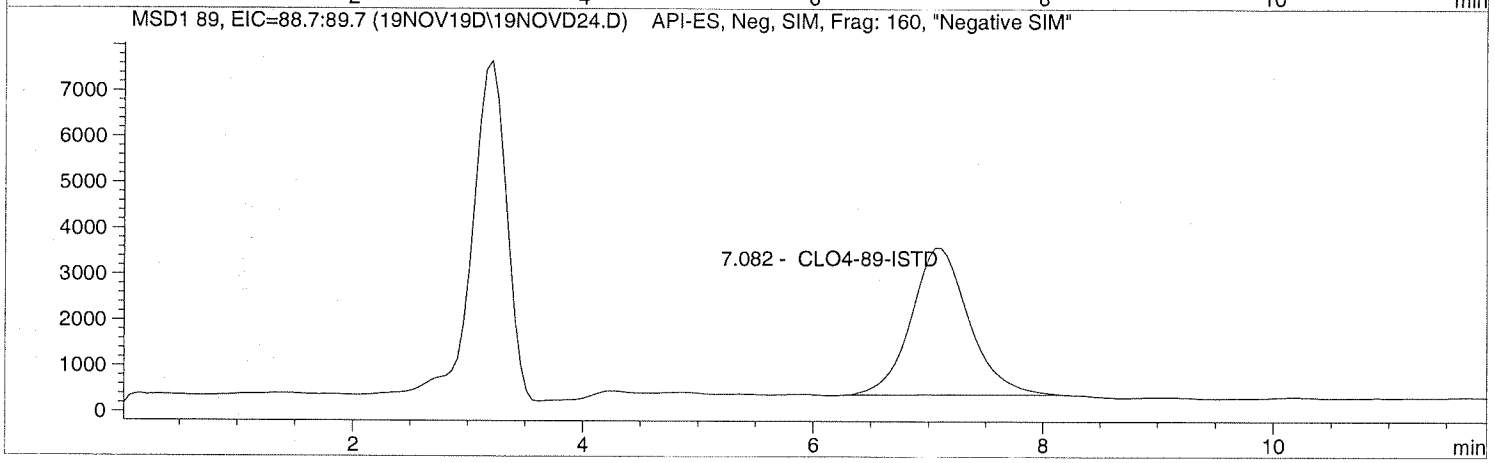
Injection Date:	11/19/2019 14:07:50	Seq Line:	24
Sample Name:	1932010006	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD24.D Sample Name: 1932010006

Injection Date:	11/19/2019 14:07:50	Seq Line:	24
Sample Name:	1932010006	Location:	Vial 93
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:	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:	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
7.082	BBA	112592.4	5.0000	CLO4-89-ISTD

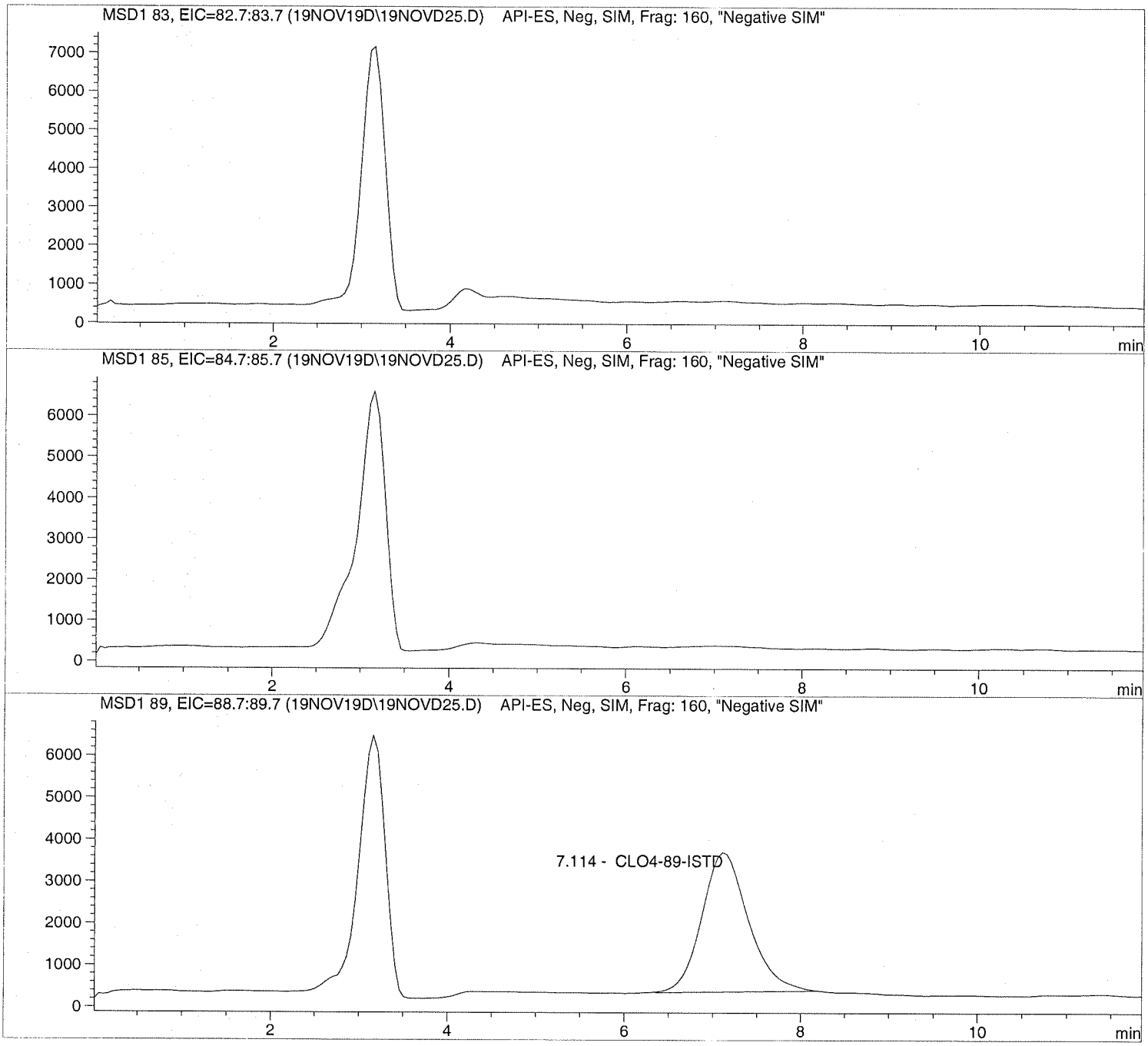
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD25.D Sample Name: 1932010007

Injection Date:	11/19/2019 14:21:39	Seq Line:	25
Sample Name:	1932010007	Location:	Vial 94
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: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD25.D Sample Name: 1932010007

Injection Date:	11/19/2019 14:21:39	Seq Line:	25
Sample Name:	1932010007	Location:	Vial 94
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: 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:	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	BBA	122347.6	5.0000	CLO4-89-ISTD

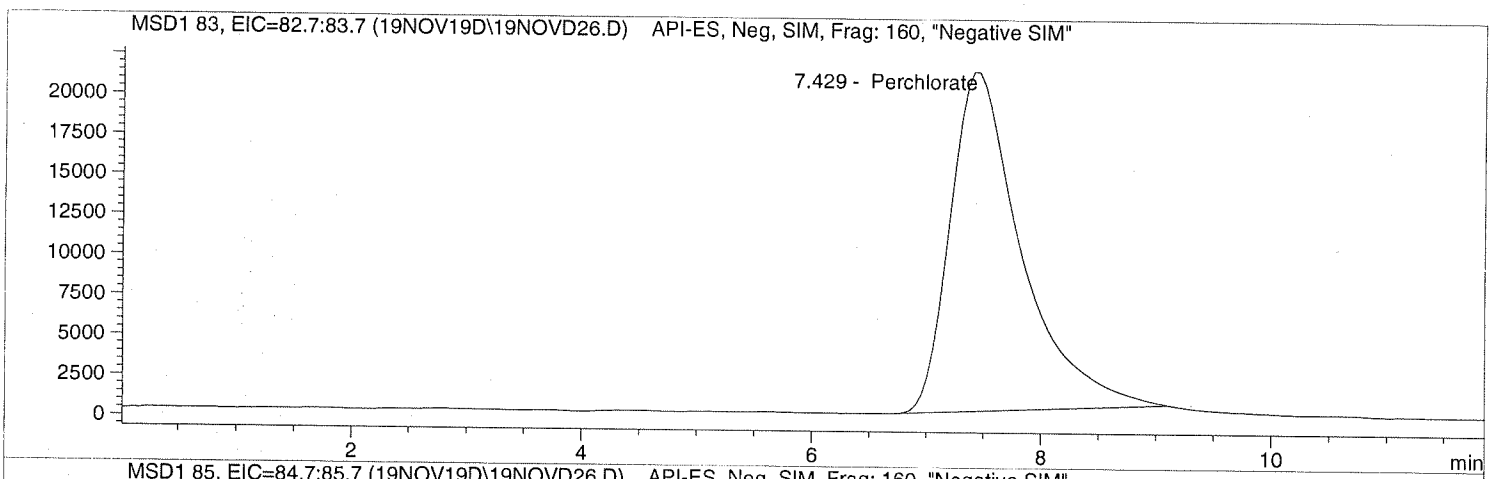
*** End of Report ***

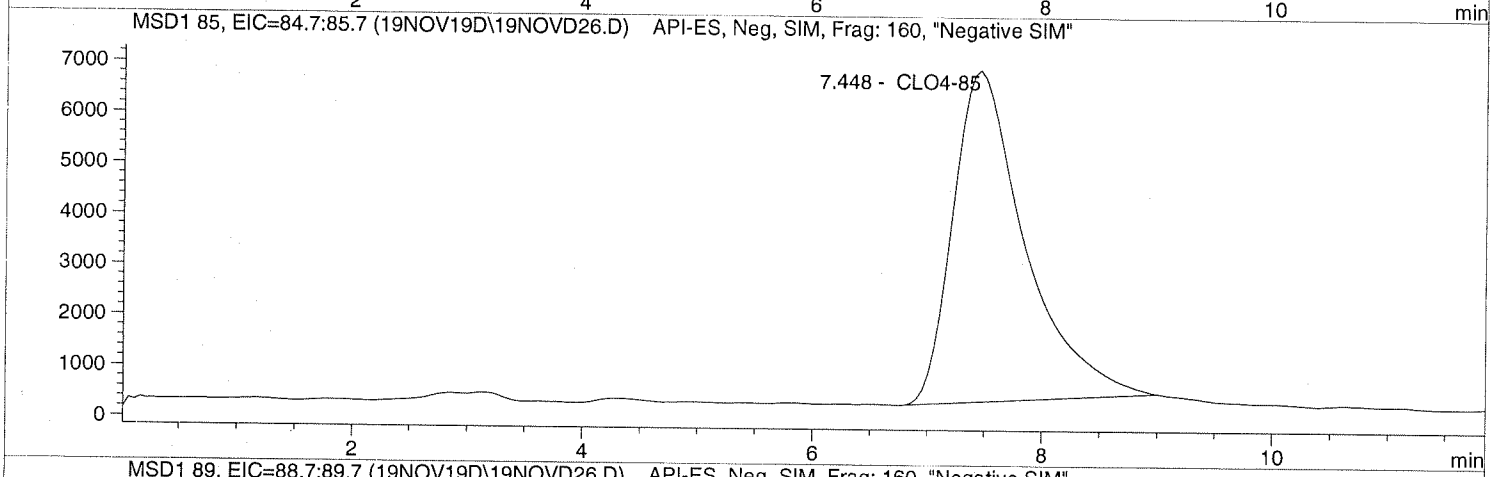
Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD26.D Sample Name: 684810 CCV@25

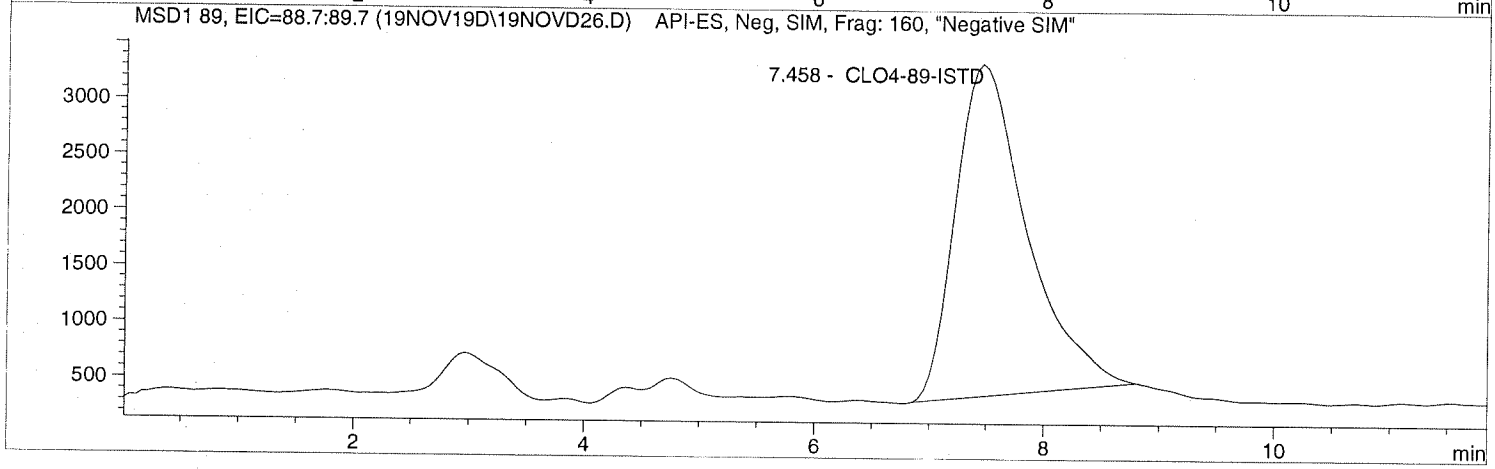
Injection Date:	11/19/2019 14:35:25	Seq Line:	26
Sample Name:	684810 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD26.D Sample Name: 684810 CCV@25

Injection Date:	11/19/2019 14:35:25	Seq Line:	26
Sample Name:	684810 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: 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
7.429	PBA	908551.0	24.2316	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	285244.9	24.8806	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.458	PBA	128522.3	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			

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

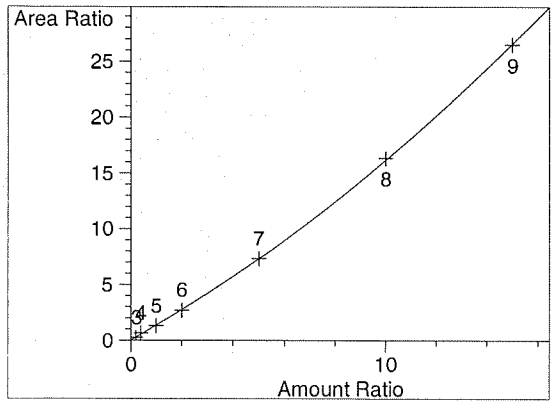
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

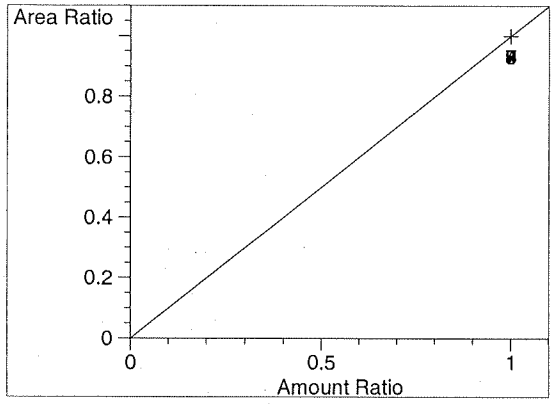
Peak Sum Table

No Entries in table

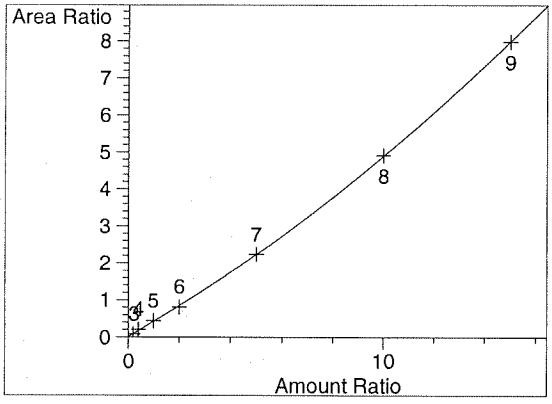
Calibration Curves



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 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:

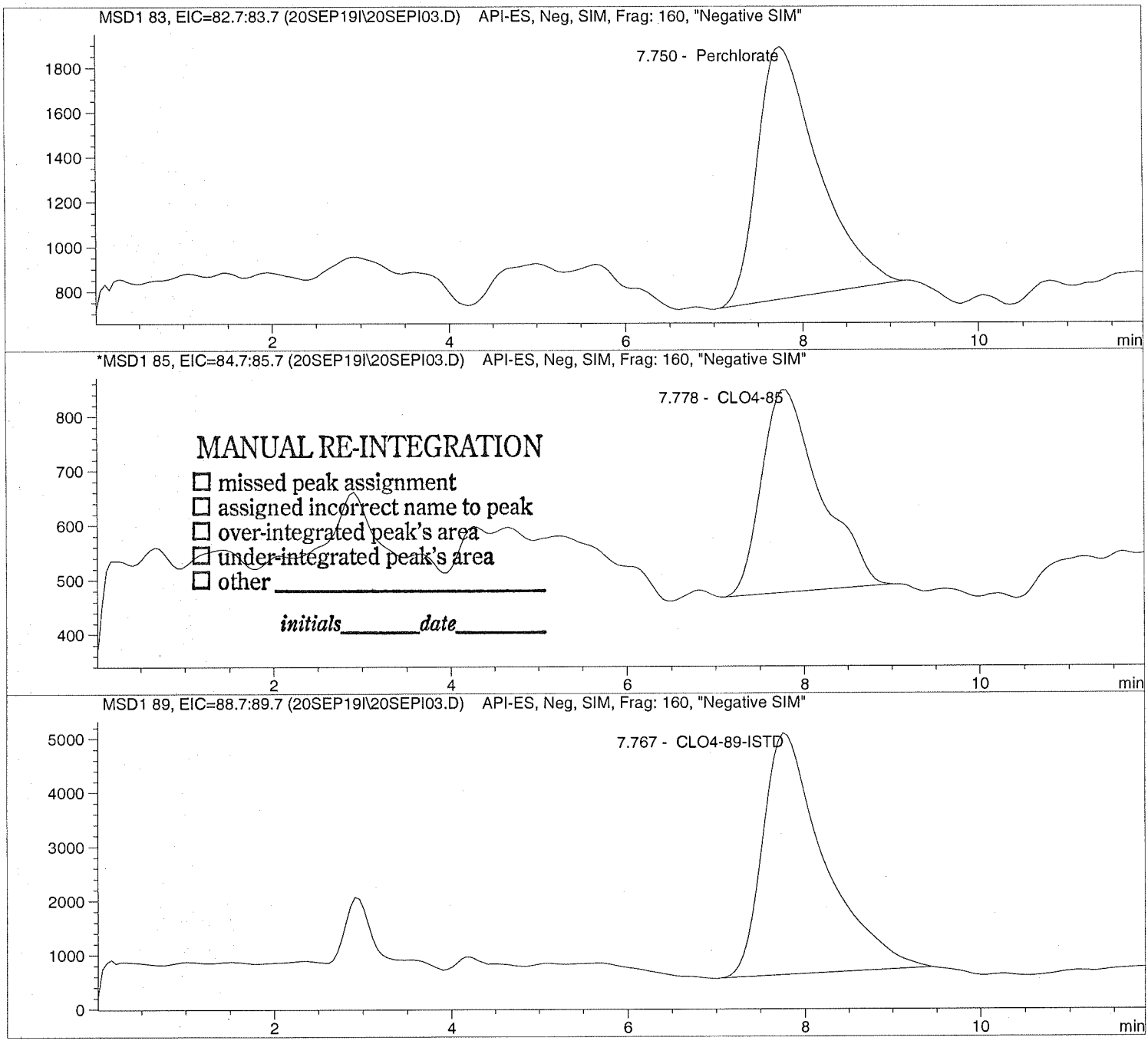
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

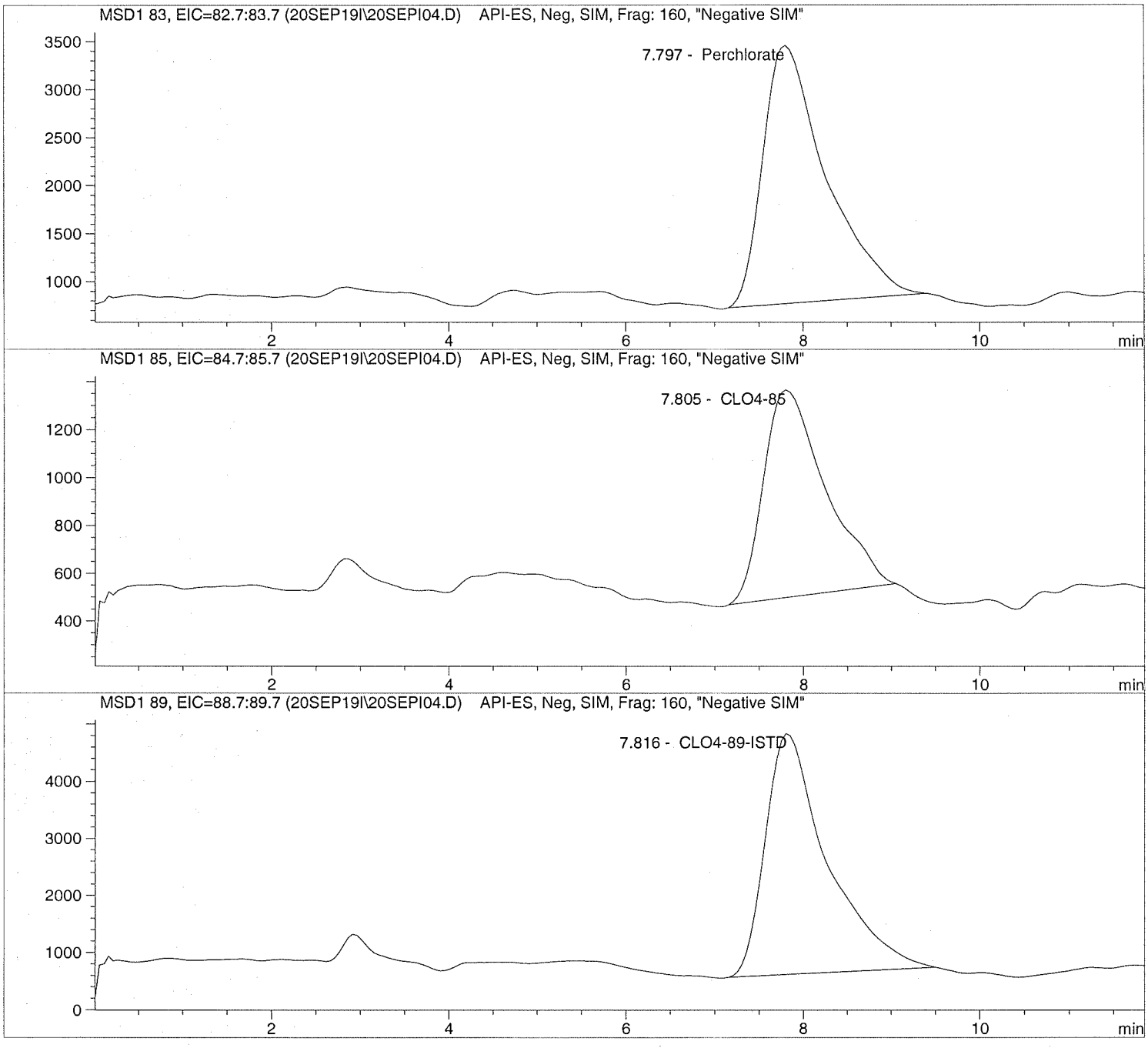
*** End of Report ***

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

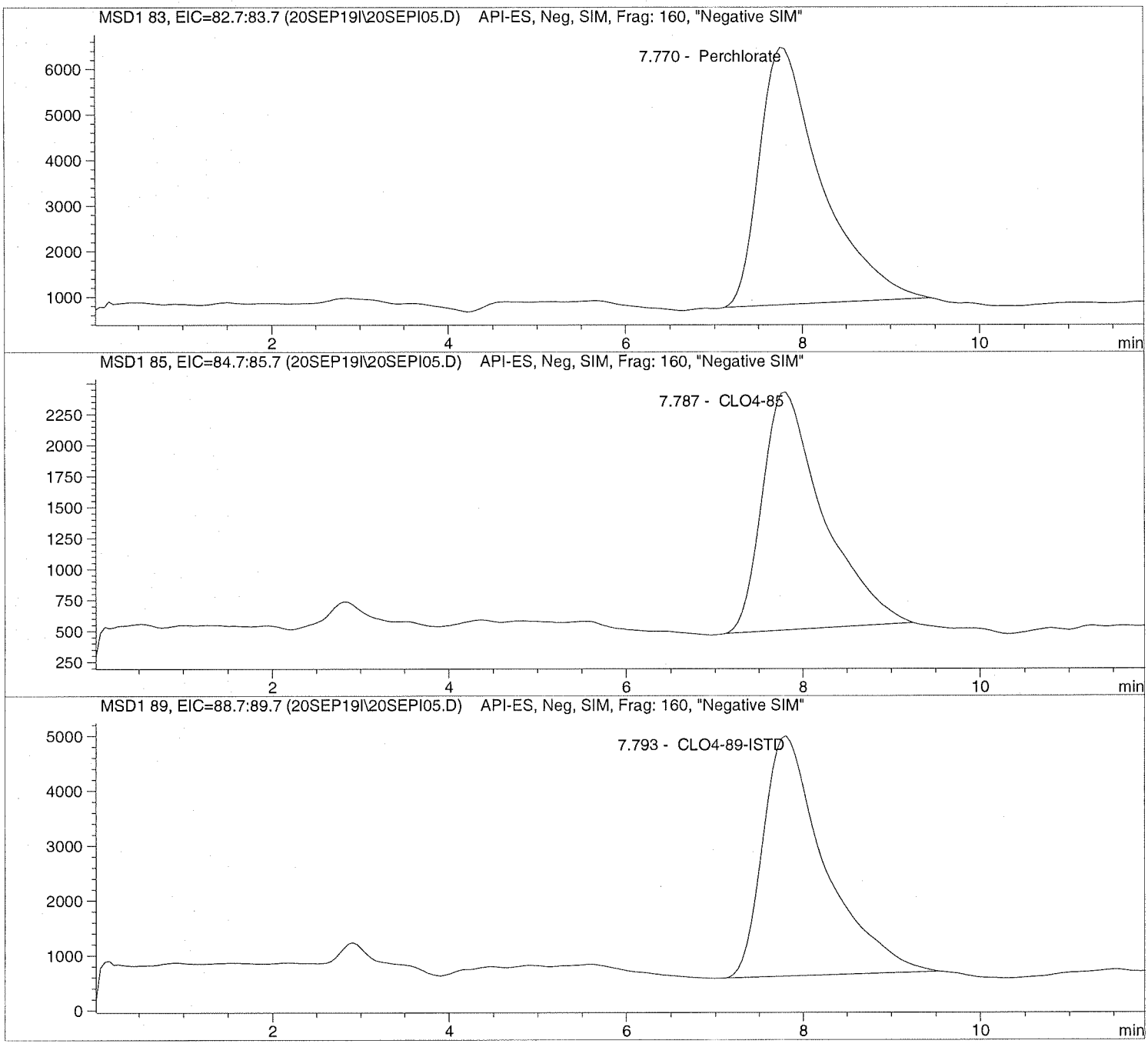
*** End of Report ***

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

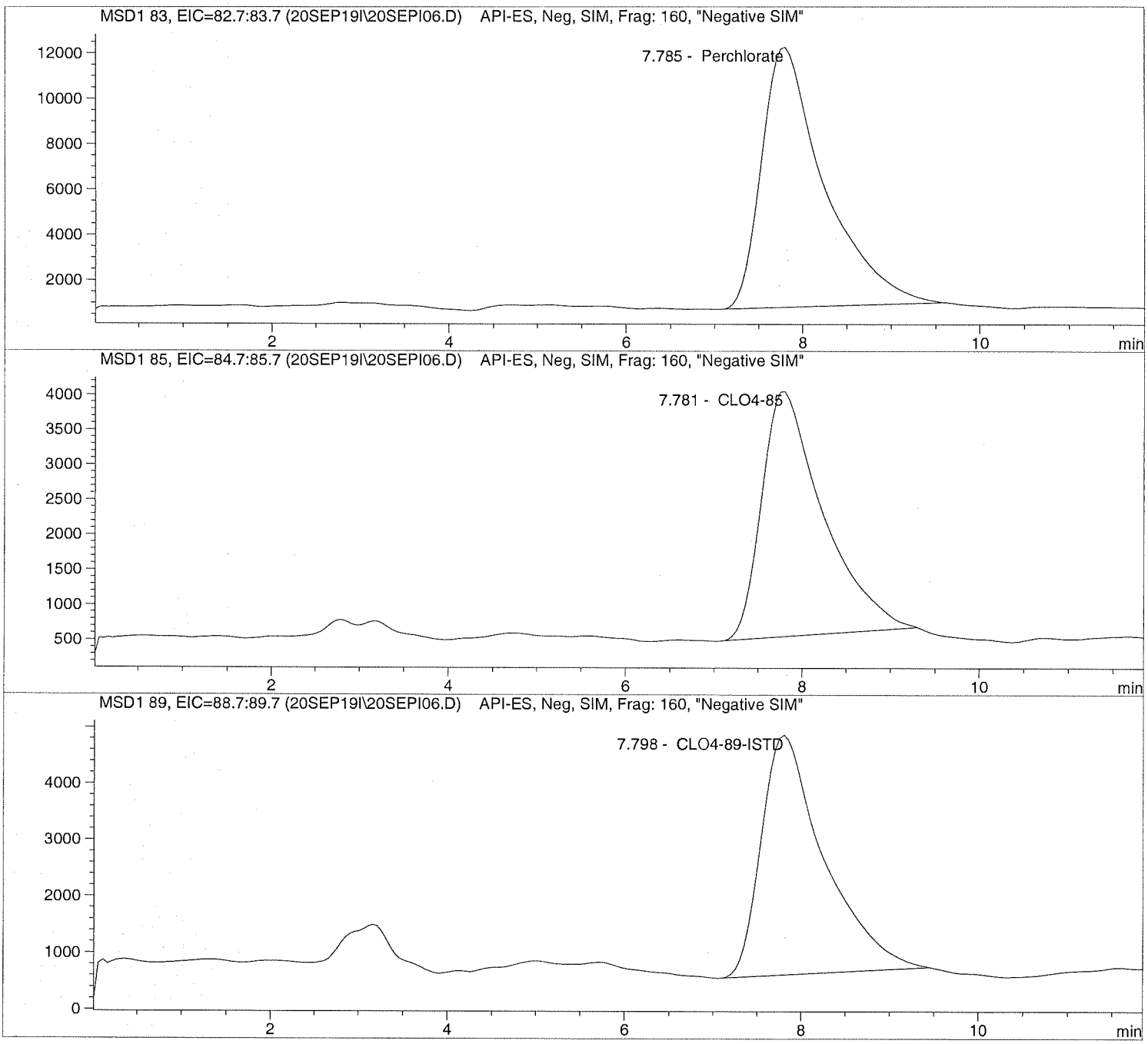
*** End of Report ***

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

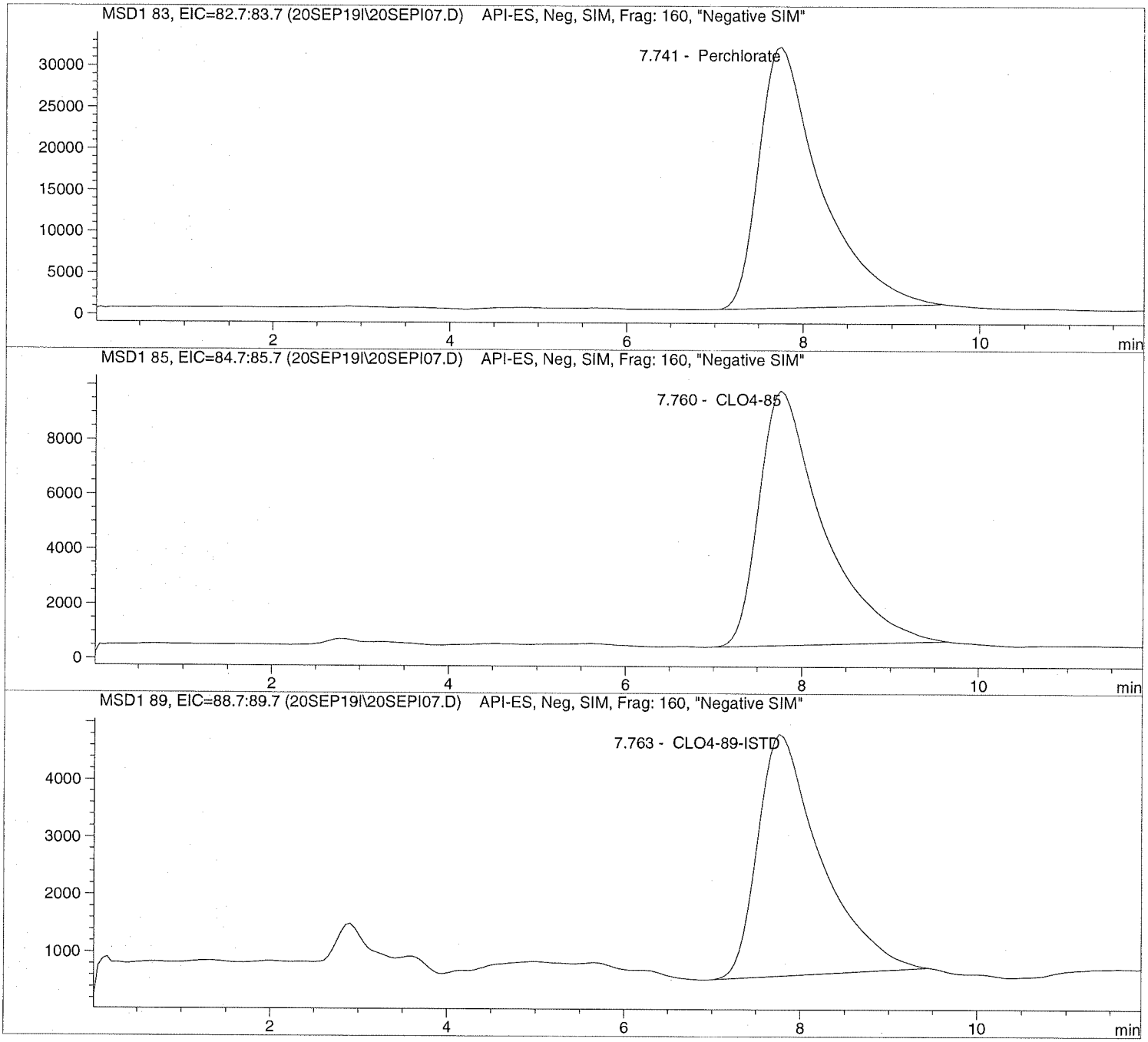
*** End of Report ***

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

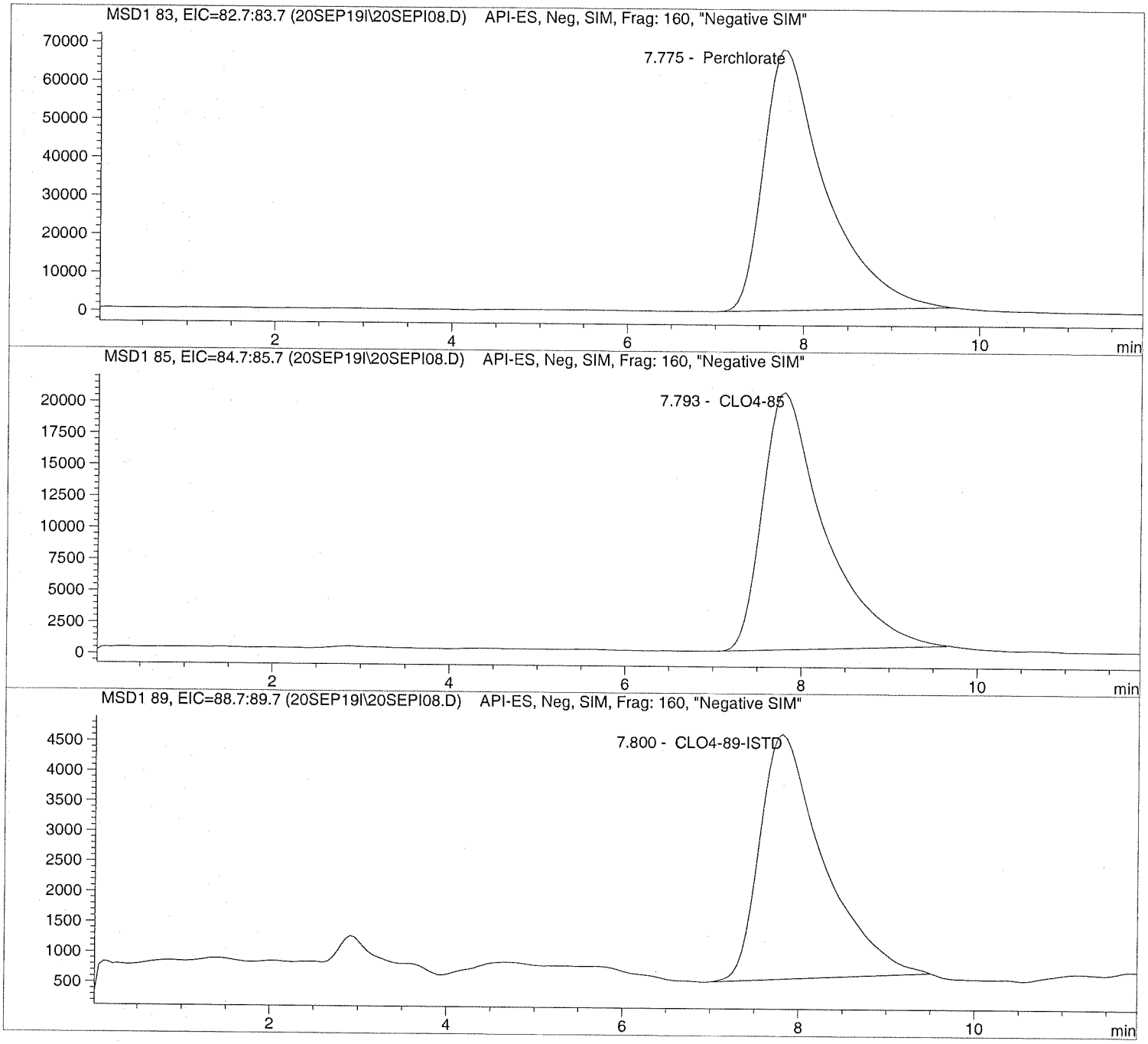
*** End of Report ***

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

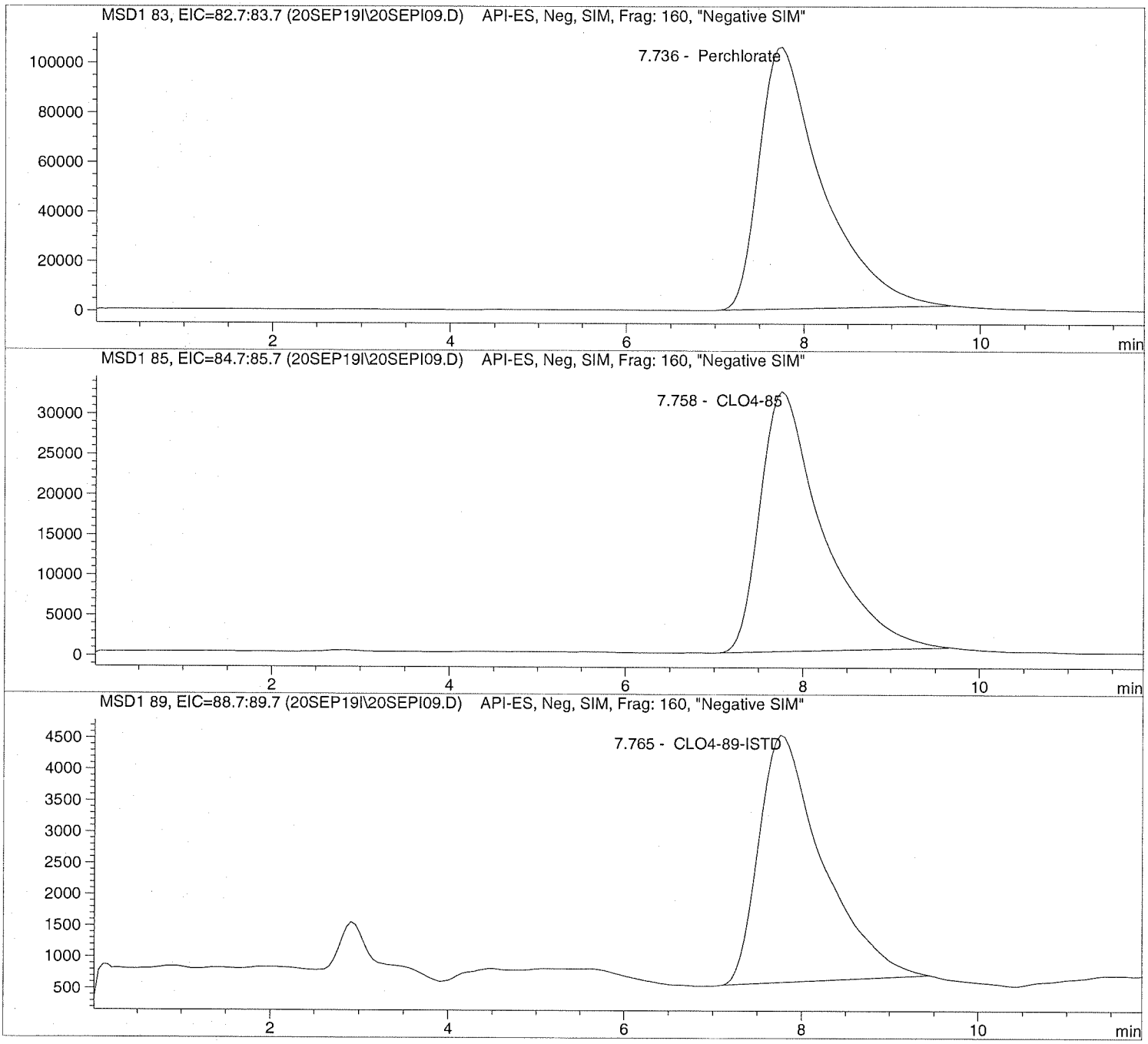
*** End of Report ***

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

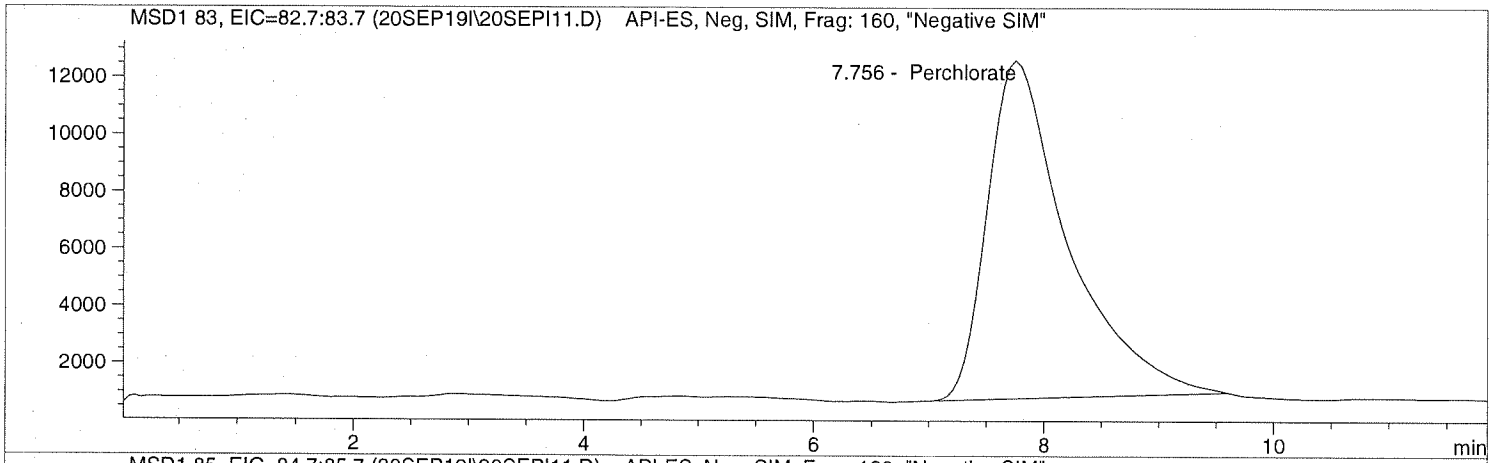
*** End of Report ***

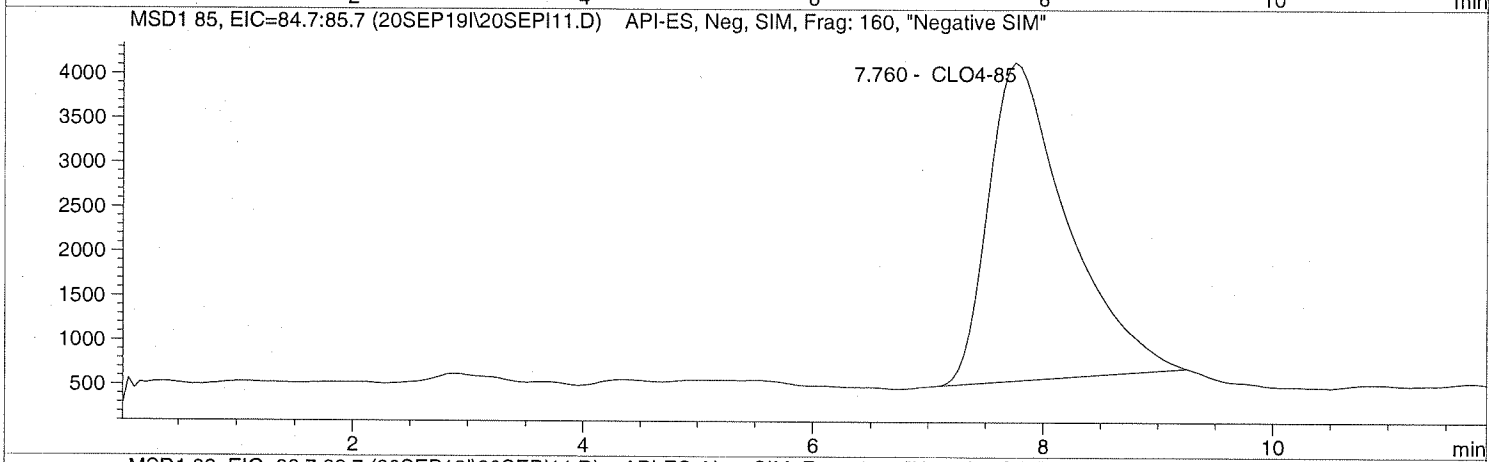
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

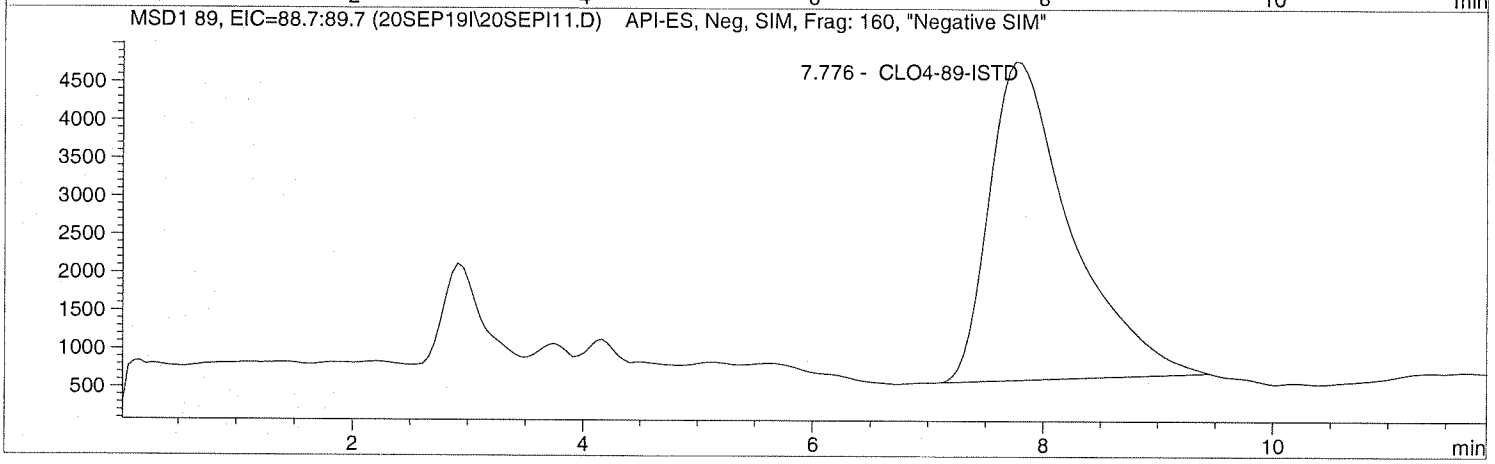
Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

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

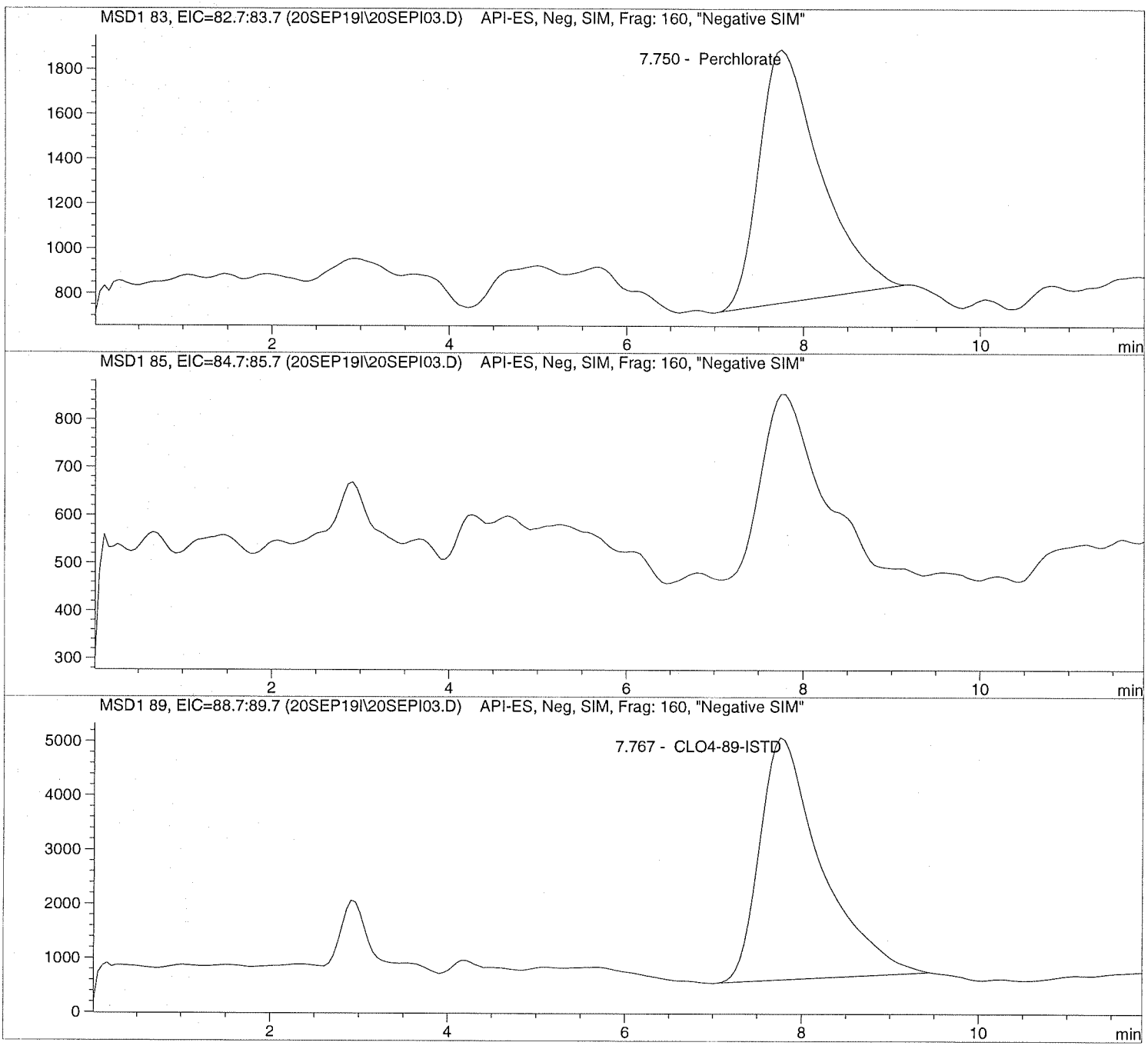
Unmodified

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

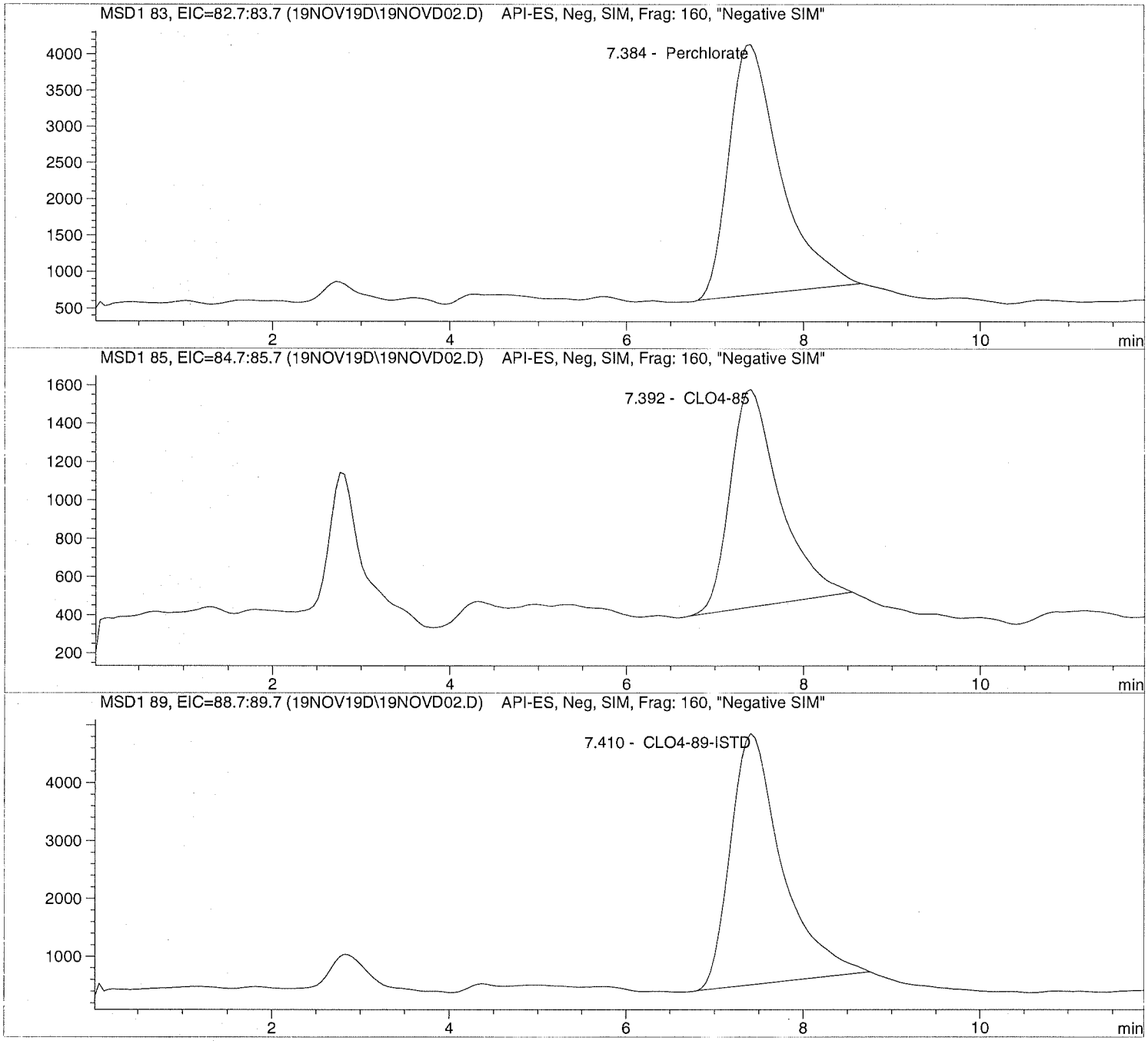
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD02.D Sample Name: 684805 QC@3.0

Injection Date:	11/19/2019 09:04:34	Seq Line:	2
Sample Name:	684805 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: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19NOV19D\19NOVD02.D Sample Name: 684805 QC@3.0

Injection Date:	11/19/2019 09:04:34	Seq Line:	2
Sample Name:	684805 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: 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
7.384	PBA	139068.9	2.9298	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.392	PBA	44210.1	2.9647	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.410	PBA	174596.2	5.0000	CLO4-89-ISTD

*** End of Report ***

HS19110486 8260 Raw Data

ALS WO# HS19110486

MSVOA09 -Logbook

Batch: 38377
Date: 11-12-2019
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	11-12-2019 10:52 am	1.00	0.00 mL	0.00 mL	U111201.D	Liquid	Y	NA
	Auto find/purged									
2	VSTD000.25	ICAL1	11-12-2019 11:16 am	1.00	5.00 mL	0.00 mL	U111202.D	Liquid	Y	NA
3	VSTD000.5	ICAL2	11-12-2019 11:40 am	1.00	5.00 mL	0.00 mL	U111203.D	Liquid	Y	NA
4	VSTD001	ICAL3	11-12-2019 12:28 pm	1.00	5.00 mL	0.00 mL	U111204.D	Liquid	Y	NA
5	VSTD002	ICAL4	11-12-2019 12:52 pm	1.00	5.00 mL	0.00 mL	U111205.D	Liquid	Y	NA
6	VSTD005	ICAL5	11-12-2019 01:17 pm	1.00	5.00 mL	0.00 mL	U111206.D	Liquid	Y	NA
7	VSTD020	ICAL6	11-12-2019 01:41 pm	1.00	5.00 mL	0.00 mL	U111207.D	Liquid	Y	NA
8	VSTD050	ICAL7	11-12-2019 02:05 pm	1.00	5.00 mL	0.00 mL	U111208.D	Liquid	Y	NA
9	VSTD100	ICAL8	11-12-2019 02:29 pm	1.00	5.00 mL	0.00 mL	U111209.D	Liquid	Y	NA
10	VSTD150	ICAL9	11-12-2019 02:53 pm	1.00	5.00 mL	0.00 mL	U111210.D	Liquid	Y	NA
11	VSTD200	ICAL	11-12-2019 03:17 pm	1.00	5.00 mL	0.00 mL	U111211.D	Liquid	Y	NA
12	BLANK	SAMP	11-12-2019 03:41 pm	1.00	5.00 mL	0.00 mL	U111212.D	Liquid	Y	NA
13	BLANK	SAMP	11-12-2019 04:06 pm	1.00	5.00 mL	0.00 mL	U111213.D	Liquid	Y	NA
14	ICV	ICV	11-12-2019 04:30 pm	1.00	5.00 mL	0.00 mL	U111214.D	Liquid	Y	NA
15	VSTD050	SAMP	11-12-2019 04:54 pm	1.00	5.00 mL	0.00 mL	U111215.D	Liquid	Y	NA
16	VLCSW-191112	LCS	11-12-2019 05:18 pm	1.00	5.00 mL	0.00 mL	U111216.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
17	BLANK	SAMP	11-12-2019 05:43 pm	1.00	5.00 mL	0.00 mL	U111217.D	Liquid	Y	NA
18	VBLKW-191112	MBLK	11-12-2019 06:07 pm	1.00	5.00 mL	0.00 mL	U111218.D	Liquid	Y	NA
19	HS19110280-01	SAMP	11-12-2019 06:31 pm	1.00	5.00 mL	0.00 mL	U111219.D	Liquid	Y	NA
20	HS19110280-02	SAMP	11-12-2019 06:56 pm	1.00	5.00 mL	0.00 mL	U111220.D	Liquid	Y	NA
21	HS19110280-01MS	MS	11-12-2019 07:20 pm	1.00	5.00 mL	0.00 mL	U111221.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
22	HS19110280-01MSD	MSD	11-12-2019 07:44 pm	1.00	5.00 mL	0.00 mL	U111222.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
23	HS19110445-03	SAMP	11-12-2019 08:08 pm	1.00	5.00 mL	0.00 mL	U111223.D	Liquid	Y	NA
24	HS19110569-01	SAMP	11-12-2019 08:33 pm	1.00	5.00 mL	0.00 mL	U111224.D	Liquid	Y	NA
25	HS19110569-02	SAMP	11-12-2019 08:57 pm	1.00	5.00 mL	0.00 mL	U111225.D	Liquid	Y	NA
26	HS19110353-01	SAMP	11-12-2019 09:21 pm	1.00	5.00 mL	0.00 mL	U111226.D	Liquid	Y	NA
27	HS19110353-02	SAMP	11-12-2019 09:45 pm	1.00	5.00 mL	0.00 mL	U111227.D	Liquid	Y	NA
28	HS19110352-01	SAMP	11-12-2019 10:10 pm	1.00	5.00 mL	0.00 mL	U111228.D	Liquid	Y	NA
29	BFB	TUNE	11-12-2019 10:34 pm	1.00	0.00 mL	0.00 mL	V111201a.D	Liquid	Y	NA
	Auto find/purged									
30	BFB	TUNE	11-12-2019 10:58 pm	1.00	0.00 mL	0.00 mL	V111202.D	Liquid	Y	NA
	Auto find/purged									
31	VSTD050	CCV	11-12-2019 11:22 pm	1.00	5.00 mL	0.00 mL	V111203.D	Liquid	Y	NA
	10 uL cal/50 mL DI									
32	VLCSW-191112	LCS	11-12-2019 11:46 pm	1.00	5.00 mL	0.00 mL	V111204.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
33	BLANK	SAMP	11-13-2019 12:11 am	1.00	5.00 mL	0.00 mL	V111205.D	Liquid	Y	NA
34	VBLKW-191112	MBLK	11-13-2019 12:35 am	1.00	5.00 mL	0.00 mL	V111206.D	Liquid	Y	NA
35	HS19110353-03	SAMP	11-13-2019 12:59 am	1.00	5.00 mL	0.00 mL	V111207.D	Liquid	Y	NA
36	HS19110349-01	SAMP	11-13-2019 01:23 am	1.00	5.00 mL	0.00 mL	V111208.D	Liquid	Y	NA
37	HS19110349-02	SAMP	11-13-2019 01:48 am	1.00	5.00 mL	0.00 mL	V111209.D	Liquid	Y	NA

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
38	HS19110353-03MS	MS	11-13-2019 02:12 am	1.00	5.00 mL	0.00 mL	V111210.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
39	HS19110353-03MSD	MSD	11-13-2019 02:36 am	1.00	5.00 mL	0.00 mL	V111211.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
40	HS19110445-04	SAMP	11-13-2019 03:00 am	1.00	5.00 mL	0.00 mL	V111212.D	Liquid	Y	NA
41	MBLK-147407	MBLK	11-13-2019 03:25 am	20.00	5.00 mL	0.00 mL	V111213.D	Liquid	Y	NA
42	HS19110336-01	SAMP	11-13-2019 03:49 am	20.00	5.00 mL	0.00 mL	V111214.D	Liquid	Y	NA
43	HS19110353-04	SAMP	11-13-2019 04:13 am	1.00	5.00 mL	0.00 mL	V111215.D	Liquid	Y	NA
44	HS19110353-05	SAMP	11-13-2019 04:37 am	1.00	5.00 mL	0.00 mL	V111216.D	Liquid	Y	NA
45	HS19110353-06	SAMP	11-13-2019 05:01 am	1.00	5.00 mL	0.00 mL	V111217.D	Liquid	Y	NA
46	HS19110353-07	SAMP	11-13-2019 05:26 am	1.00	5.00 mL	0.00 mL	V111218.D	Liquid	Y	NA
47	HS19110452-02	SAMP	11-13-2019 05:50 am	1.00	5.00 mL	0.00 mL	V111219.D	Liquid	Y	NA
48	HS19110452-03	SAMP	11-13-2019 06:14 am	1.00	5.00 mL	0.00 mL	V111220.D	Liquid	Y	NA
49	HS19110452-01	SAMP	11-13-2019 06:38 am	5.00	5.00 mL	0.00 mL	V111221.D	Liquid	Y	NA
50	HS19110445-05	SAMP	11-13-2019 07:03 am	1.00	5.00 mL	0.00 mL	V111222.D	Liquid	Y	NA
51	HS19110445-06	SAMP	11-13-2019 07:27 am	1.00	5.00 mL	0.00 mL	V111223.D	Liquid	Y	NA
52	MBLK-147383	MBLK	11-13-2019 07:51 am	20.00	5.00 mL	0.00 mL	V111224.D	Liquid	Y	NA
53	HS19110437-01	SAMP	11-13-2019 08:15 am	100.0(	5.00 mL	0.00 mL	V111225.D	Liquid	Y	NA
54	HS19110454-01	SAMP	11-13-2019 08:39 am	1000.0	5.00 mL	0.00 mL	V111226.D	Liquid	Y	NA
55	HS19110441-01	SAMP	11-13-2019 09:04 am	100.0(	5.00 mL	0.00 mL	V111227.D	Liquid	Y	NA
56	HS19110447-01	SAMP	11-13-2019 09:28 am	1.00	5.00 mL	0.00 mL	V111228.D	Liquid	Y	NA
57	HS19110447-02	SAMP	11-13-2019 09:52 am	1.00	5.00 mL	0.00 mL	V111229.D	Liquid	Y	NA
58	HS19110452-01	SAMP	11-13-2019 10:16 am	25.00	5.00 mL	0.00 mL	V111230.D	Liquid	Y	NA

Chemical	Value
SURR SPK ID	31106-03-03
IS ID	31106-03-04
ICV STD ID	30603-91-01
LCS/MS ID	30603-91-01
CAL STD ID	31106-03-01/02
BFB ID	31106-04-03
pH Paper	634-64-11

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	50.00	57.35	115	80-120
trans-1,3-Dichloroprope	50.00	50.30	101	80-120
1,3-Dichlorobenzene	50.00	45.02	90	80-120
2,2-Dichloropropane	50.00	50.54	101	80-120
1,1-Dichloropropene	50.00	46.93	94	80-120
Dibromomethane	50.00	49.20	98	80-120
1,2-Dibromoethane	50.00	48.58	97	80-120
trans-1,2-Dichloroethen	50.00	45.31	91	80-120
1,1,1,2-Tetrachloroetha	50.00	48.22	96	80-120
1,1,1-Trichloroethane	50.00	45.72	91	80-120
1,1,2,2-Tetrachloroetha	50.00	48.94	98	80-120
Toluene	50.00	45.89	92	80-120
1,1,2-Trichloroethane	50.00	49.47	99	80-120
1,1-Dichloroethane	50.00	46.96	94	80-120
1,1-Dichloroethene	50.00	45.43	91	80-120
Trichlorofluoromethane	50.00	44.90	90	80-120
1,2,3-Trichlorobenzene	50.00	50.53	101	80-120
Tetrachloroethene	50.00	43.61	87	80-120
1,2,4-Trichlorobenzene	50.00	46.29	92	80-120
1,2,4-Trimethylbenzene	50.00	47.08	94	80-120
tert-Butylbenzene	50.00	45.31	91	80-120
Trichloroethene	50.00	48.06	96	80-120
1,2-Dichlorobenzene	50.00	47.46	95	80-120
1,2-Dichloroethane	50.00	46.11	92	80-120
1,2-Dichloropropane	50.00	53.86	108	80-120
1,3,5-Trimethylbenzene	50.00	45.82	92	80-120
1,3-Dichloropropane	50.00	50.82	102	80-120
1,4-Dichlorobenzene	50.00	45.38	91	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
2-Butanone	100.00	105.96	106	80-120
2-Chlorotoluene	50.00	47.72	95	80-120
2-Hexanone	100.00	92.98	93	80-120
4-Chlorotoluene	50.00	46.94	94	80-120
Styrene	50.00	49.38	99	80-120
4-Methyl-2-Pentanone	100.00	100.38	100	80-120
Acetone	100.00	111.32	111	80-120
Benzene	50.00	48.55	97	80-120
Bromobenzene	50.00	45.93	92	80-120
Bromochloromethane	50.00	48.14	96	80-120
Bromodichloromethane	50.00	52.64	105	80-120
Bromoform	50.00	46.55	93	80-120
Bromomethane	50.00	49.94	100	80-120
Carbon Disulfide	100.00	96.51	96	80-120
Carbon Tetrachloride	50.00	49.39	99	80-120
Chlorobenzene	50.00	45.35	91	80-120
Chloroethane	50.00	50.73	101	80-120
Chloroform	50.00	47.79	96	80-120
Chloromethane	50.00	51.64	103	80-120
cis-1,2-Dichloroethene	50.00	45.14	90	80-120
Dibromochloromethane	50.00	45.49	91	80-120
Dichlorodifluoromethane	50.00	44.52	89	80-120
Ethylbenzene	50.00	46.31	93	80-120
Hexachlorobutadiene	50.00	40.15	80	80-120
Isopropylbenzene	50.00	46.27	92	80-120
m,p-Xylenes	100.00	95.27	95	80-120
Methylene Chloride	50.00	48.55	97	80-120
n-Butylbenzene	50.00	44.21	88	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
n-Propylbenzene	50.00	45.67	91	80-120
Naphthalene	50.00	53.09	106	80-120
o-Xylene	50.00	46.63	93	80-120
sec-Butylbenzene	50.00	43.65	87	80-120
Vinyl Chloride	50.00	44.20	88	80-120
1,2,3-Trichloropropane	50.00	50.71	101	80-120
p-Isopropyltoluene	50.00	43.66	87	80-120
1,2-Dibromo-3-Chloropro	50.00	45.46	91	80-120
Freon TF	50.00	43.88	88	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Lab File ID: U111201 BFB Injection Date: 11/12/19

Instrument ID: VOA9 BFB Injection Time: 1052

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	51.3
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	0.0 (0.0)1
174	Greater than 50.0% of mass 95	120.4
175	5.0 - 9.0% of mass 174	10.3 (8.5)1
176	95.0 - 101.0% of mass 174	115.1 (95.7)1
177	5.0 - 9.0% of mass 176	7.7 (6.7)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	U111202	11/12/19	1116
02	VSTD000.5	VSTD000.5	U111203	11/12/19	1140
03	VSTD001	VSTD001	U111204	11/12/19	1228
04	VSTD002	VSTD002	U111205	11/12/19	1252
05	VSTD005	VSTD005	U111206	11/12/19	1317
06	VSTD020	VSTD020	U111207	11/12/19	1341
07	VSTD050	VSTD050	U111208	11/12/19	1405
08	VSTD100	VSTD100	U111209	11/12/19	1429
09	VSTD150	VSTD150	U111210	11/12/19	1453
10	VSTD200	VSTD200	U111211	11/12/19	1517
11	ICV	ICV	U111214	11/12/19	1630
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

LAB FILE ID: RF0.25: U111202 RF0.5: U111203 RF1: U111204
RF2: U111205 RF5: U111206 RF20: U111207

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
cis-1,3-Dichloropropene		0.287	0.356	0.298	0.341	0.399
trans-1,3-Dichloropropene		938	2761	4967	12829	62161
1,3-Dichlorobenzene		1.754	1.722	1.349	1.313	1.446
2,2-Dichloropropane		0.500	0.534	0.558	0.529	0.594
1,1-Dichloropropene		0.331	0.386	0.334	0.356	0.352
Dibromomethane		0.267	0.173	0.220	0.185	0.211
1,2-Dibromoethane		0.374	0.376	0.317	0.370	0.358
trans-1,2-Dichloroethene		1321	3398	4204	10913	45366
1,1,1,2-Tetrachloroethane		768	2340	4139	10434	49905
1,1,1-Trichloroethane		0.816	0.685	0.653	0.720	0.717
1,1,2,2-Tetrachloroethane		0.732	1.118	0.769	0.901	0.872
Toluene		1.560	1.598	1.356	1.441	1.398
1,1,2-Trichloroethane		0.232	0.298	0.244	0.265	0.262
1,1-Dichloroethane		0.667	0.810	0.732	0.748	0.709
1,1-Dichloroethene		1.121	1.341	1.174	1.245	1.181
Trichlorofluoromethane		2.080	2.413	2.199	2.385	2.206
1,2,3-Trichlorobenzene		0.612	0.705	0.717	0.834	0.855
Tetrachloroethene		0.356	0.377	0.409	0.397	0.366
1,2,4-Trichlorobenzene		0.766	1.035	0.851	0.864	0.877
1,2,4-Trimethylbenzene		2.142	2.522	2.174	2.274	2.327
tert-Butylbenzene		1.633	1.834	1.748	1.954	1.906
Trichloroethene		0.379	0.360	0.347	0.327	0.340
1,2-Dichlorobenzene		1.492	1.471	1.298	1.532	1.498
1,2-Dichloroethane		0.405	0.477	0.391	0.396	0.377
1,2-Dichloropropane		968	3031	3974	11076	42821
1,3,5-Trimethylbenzene		1.960	2.359	1.976	2.144	2.103
1,3-Dichloropropane		0.506	0.550	0.512	0.511	0.534
1,4-Dichlorobenzene		2.147	1.764	1.567	1.442	1.478
2-Butanone		1976	2961	4562	8511	39572
2-Chlorotoluene		1.427	1.731	1.567	1.626	1.638
2-Hexanone		0.252	0.236	0.200	0.201	0.226
4-Chlorotoluene		1.810	2.411	1.724	2.089	2.004
Styrene		0.902	1.018	0.940	1.083	1.057
4-Methyl-2-Pentanone		0.264	0.332	0.263	0.282	0.294
Acetone		9998	14328	15326	26993	85175
Benzene		1.039	1.277	1.036	1.156	1.109
Bromobenzene		1.125	1.091	0.807	0.781	0.853
Bromochloromethane		0.374	0.321	0.278	0.284	0.284
Bromodichloromethane		0.228	0.402	0.298	0.350	0.358
Bromoform		440	1218	2995	5749	35985
Bromomethane		4824	9435	16415	41828	145407
Carbon Disulfide		1.008	1.135	1.040	1.066	1.119
Carbon Tetrachloride		0.362	0.310	0.314	0.341	0.351
Chlorobenzene		1.097	1.105	0.970	1.022	0.941

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911048

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

LAB FILE ID: RF0.25: U111202 RF0.5: U111203 RF1: U111204
RF2: U111205 RF5: U111206 RF20: U111207

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
Chloroethane		1992	4623	7971	24112	80331
Chloroform		0.931	0.888	0.685	0.912	0.844
Chloromethane		1635	2772	5474	13392	54009
cis-1,2-Dichloroethene		0.595	0.648	0.613	0.542	0.555
Dibromochloromethane		924	2173	3565	10232	50243
Dichlorodifluoromethane		0.470	0.527	0.598	0.486	0.504
Ethylbenzene		0.458	0.576	0.456	0.518	0.492
Hexachlorobutadiene		0.412	0.303	0.267	0.291	0.285
Isopropylbenzene		1.328	1.420	1.317	1.417	1.412
m,p-Xylenes		0.506	0.594	0.540	0.612	0.601
Methylene Chloride		1984	2559	4577	11941	45816
n-Butylbenzene		2.183	1.857	1.660	1.917	1.848
n-Propylbenzene		2.723	3.157	2.712	3.019	2.944
Naphthalene		1.996	1.971	1.946	2.312	2.548
o-Xylene		0.644	0.567	0.525	0.610	0.621
sec-Butylbenzene		2.534	2.445	2.316	2.420	2.463
Vinyl Chloride		1.127	1.377	1.222	1.200	1.135
1,2,3-Trichloropropane		0.744	0.898	0.789	0.871	0.835
p-Isopropyltoluene		2.433	2.450	2.101	2.320	2.278
1,2-Dibromo-3-Chloropropane		18	416	995	2891	12005
Freon TF		0.906	1.152	1.246	1.267	1.181
4-Bromofluorobenzene		3090	4537	6587	15194	57298
Dibromofluoromethane		2954	4336	7231	13696	52362
Toluene-d8		10912	14345	24741	50004	186186
1,2-Dichloroethane-d4		3547	4108	6889	15774	52733

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911048

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

LAB FILE ID: RF50: U111208 RF100: U111209 RF150: U111210
RF200: U111211

COMPOUND	RF50	RF100	RF150	RF200
cis-1,3-Dichloropropene	0.417	0.395	0.399	0.383
trans-1,3-Dichloropropene	188731	454991	757873	1110034
1,3-Dichlorobenzene	1.413	1.370	1.476	1.472
2,2-Dichloropropane	0.586	0.588	0.638	0.634
1,1-Dichloropropene	0.334	0.308	0.316	0.300
Dibromomethane	0.208	0.190	0.190	0.180
1,2-Dibromoethane	0.360	0.387	0.412	0.433
trans-1,2-Dichloroethene	123828	275617	467765	682070
1,1,1,2-Tetrachloroethane	141983	338539	563042	826765
1,1,1-Trichloroethane	0.749	0.744	0.793	0.816
1,1,2,2-Tetrachloroethane	0.872	0.870	0.924	0.924
Toluene	1.447	1.510	1.627	1.639
1,1,2-Trichloroethane	0.265	0.250	0.264	0.257
1,1-Dichloroethane	0.674	0.670	0.692	0.683
1,1-Dichloroethene	1.137	1.109	1.102	1.101
Trichlorofluoromethane	2.126	1.961	1.989	1.950
1,2,3-Trichlorobenzene	0.814	0.807	0.855	0.879
Tetrachloroethene	0.371	0.364	0.392	0.380
1,2,4-Trichlorobenzene	0.891	0.865	0.922	0.940
1,2,4-Trimethylbenzene	2.283	2.270	2.438	2.440
tert-Butylbenzene	1.860	1.813	1.957	1.950
Trichloroethene	0.330	0.305	0.302	0.288
1,2-Dichlorobenzene	1.550	1.498	1.602	1.613
1,2-Dichloroethane	0.350	0.324	0.326	0.304
1,2-Dichloropropane	112389	248467	401214	597030
1,3,5-Trimethylbenzene	2.148	2.172	2.330	2.416
1,3-Dichloropropane	0.515	0.514	0.520	0.513
1,4-Dichlorobenzene	1.458	1.468	1.541	1.554
2-Butanone	100156	220020	338930	478432
2-Chlorotoluene	1.634	1.607	1.672	1.675
2-Hexanone	0.206	0.214	0.216	0.215
4-Chlorotoluene	2.020	2.012	2.135	2.178
Styrene	1.096	1.173	1.258	1.268
4-Methyl-2-Pentanone	0.292	0.292	0.302	0.304
Acetone	193875	378076	558030	787633
Benzene	1.074	1.018	1.035	0.982
Bromobenzene	0.834	0.830	0.912	0.903
Bromochloromethane	0.278	0.279	0.278	0.281
Bromodichloromethane	0.348	0.342	0.349	0.325
Bromoform	110280	292511	516985	787561
Bromomethane	367813	972459	2416063	
Carbon Disulfide	1.125	1.100	1.178	1.210
Carbon Tetrachloride	0.372	0.351	0.371	0.357
Chlorobenzene	0.966	0.973	1.017	1.023

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911048

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

LAB FILE ID: RF50: U111208 RF100: U111209 RF150: U111210
RF200: U111211

COMPOUND	RF50	RF100	RF150	RF200
Chloroethane	198912	424128	642369	907418
Chloroform	0.824	0.817	0.854	0.853
Chloromethane	127356	262348	396602	595821
cis-1,2-Dichloroethene	0.528	0.529	0.551	0.564
Dibromochloromethane	150176	353574	614850	900839
Dichlorodifluoromethane	0.492	0.478	0.510	0.510
Ethylbenzene	0.488	0.497	0.529	0.528
Hexachlorobutadiene	0.293	0.278	0.283	0.298
Isopropylbenzene	1.435	1.459	1.551	1.542
m,p-Xylenes	0.626	0.656	0.699	0.725
Methylene Chloride	122034	271871	438580	642406
n-Butylbenzene	1.959	1.949	2.083	2.109
n-Propylbenzene	2.901	2.831	3.011	3.007
Naphthalene	2.552	2.554	2.674	2.737
o-Xylene	0.628	0.639	0.690	0.710
sec-Butylbenzene	2.418	2.362	2.526	2.554
Vinyl Chloride	1.065	0.984	0.974	0.924
1,2,3-Trichloropropane	0.859	0.806	0.926	0.916
p-Isopropyltoluene	2.342	2.210	2.406	2.435
1,2-Dibromo-3-Chloropropane	39470	96733	149466	223916
Freon TF	1.097	1.062	1.066	1.062
4-Bromofluorobenzene	152807	362804	602187	874895
Dibromofluoromethane	136408	301818	489495	
Toluene-d8	511889	1157985	1922403	2782744
1,2-Dichloroethane-d4	139459	285285	476109	653758

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911048

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
cis-1,3-Dichloropropene	AVRG		0.36398456		12.910	20.000
trans-1,3-Dichloropropene	LINR	1.485e-002	2.39198748		0.9992784	0.9900000
1,3-Dichlorobenzene	AVRG		1.47940538		10.585	20.000
2,2-Dichloropropane	AVRG		0.57340937		8.243	20.000
1,1-Dichloropropene	AVRG		0.33530760		7.872	20.000
Dibromomethane	AVRG		0.20260872		14.125	20.000
1,2-Dibromoethane	AVRG		0.37625847		8.818	20.000
trans-1,2-Dichloroethene	LINR	3.751e-002	1.98170980		0.9978714	0.9900000
1,1,1,2-Tetrachloroethane	LINR	3.471e-002	2.69823867		0.9992695	0.9900000
1,1,1-Trichloroethane	AVRG		0.74377178		7.649	20.000
1,1,2,2-Tetrachloroethane	AVRG		0.88695306		12.295	20.000
Toluene	AVRG		1.50868344		6.851	20.000
1,1,2-Trichloroethane	AVRG		0.25977925		6.958	20.000
1,1-Dichloroethane	AVRG		0.70956192		6.655	20.000
1,1-Dichloroethene	AVRG		1.16786627		6.876	20.000
Trichlorofluoromethane	AVRG		2.14547710		8.024	20.000
1,2,3-Trichlorobenzene	AVRG		0.78647962		11.328	20.000
Tetrachloroethene	AVRG		0.37901683		4.568	20.000
1,2,4-Trichlorobenzene	AVRG		0.89018539		8.226	20.000
1,2,4-Trimethylbenzene	AVRG		2.31897147		5.455	20.000
tert-Butylbenzene	AVRG		1.85052530		5.886	20.000
Trichloroethene	AVRG		0.33104681		8.901	20.000
1,2-Dichlorobenzene	AVRG		1.50614619		6.111	20.000
1,2-Dichloroethane	AVRG		0.37219248		14.335	20.000
1,2-Dichloropropane	LINR	-3.18e-002	4.51075036		0.9993649	0.9900000
1,3,5-Trimethylbenzene	AVRG		2.17862341		7.401	20.000
1,3-Dichloropropane	AVRG		0.51950990		2.637	20.000
1,4-Dichlorobenzene	AVRG		1.60207214		14.132	20.000
2-Butanone	LINR	-3.46e-002	5.58542659		0.9998758	0.9900000
2-Chlorotoluene	AVRG		1.61978943		5.302	20.000
2-Hexanone	AVRG		0.21837891		7.880	20.000
4-Chlorotoluene	AVRG		2.04262018		9.845	20.000
Styrene	AVRG		1.08839940		11.760	20.000
4-Methyl-2-Pentanone	AVRG		0.29169112		7.193	20.000
Acetone	LINR	-0.2272548	3.45512163		0.9983713	0.9900000
Benzene	AVRG		1.08071887		8.317	20.000
Bromobenzene	AVRG		0.90414435		13.636	20.000
Bromochloromethane	AVRG		0.29516302		10.977	20.000
Bromodichloromethane	AVRG		0.33333052		14.439	20.000
Bromoform	2ORDR	3.921e-002	3.53248395	-0.5323046	0.9989115	0.9900000
Bromomethane	2ORDR	-1.63e-002	0.79991937	-5.3e-002	0.9996198	0.9900000
Carbon Disulfide	AVRG		1.10899983		5.788	20.000
Carbon Tetrachloride	AVRG		0.34754013		6.416	20.000
Chlorobenzene	AVRG		1.01251164		5.708	20.000

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911048

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
Chloroethane	LINR	-3.5e-002	1.47514259		0.9995353	0.9900000
Chloroform	AVRG		0.84525572		8.430	20.000
Chloromethane	LINR	-2.44e-002	2.29809224		0.9986837	0.9900000
cis-1,2-Dichloroethene	AVRG		0.56953074		7.187	20.000
Dibromochloromethane	LINR	5.094e-002	2.47504203		0.9981488	0.9900000
Dichlorodifluoromethane	AVRG		0.50849627		7.468	20.000
Ethylbenzene	AVRG		0.50478352		7.513	20.000
Hexachlorobutadiene	AVRG		0.30124535		14.301	20.000
Isopropylbenzene	AVRG		1.43142287		5.621	20.000
m,p-Xylenes	AVRG		0.61772271		11.313	20.000
Methylene Chloride	LINR	1.803e-002	2.10716037		0.9991743	0.9900000
n-Butylbenzene	AVRG		1.95170837		8.127	20.000
n-Propylbenzene	AVRG		2.92274678		5.026	20.000
Naphthalene	AVRG		2.36540339		13.438	20.000
o-Xylene	AVRG		0.62592762		9.050	20.000
sec-Butylbenzene	AVRG		2.44870763		3.270	20.000
Vinyl Chloride	AVRG		1.11193907		12.878	20.000
1,2,3-Trichloropropane	AVRG		0.84953496		7.203	20.000
p-Isopropyltoluene	AVRG		2.33069251		5.072	20.000
1,2-Dibromo-3-Chloropropane	LINR	3.196e-002	5.55801281		0.9994699	0.9900000
Freon TF	AVRG		1.11541989		9.939	20.000
4-Bromofluorobenzene	LINR	1.311e-002	2.55439365		0.9993154	0.9900000
Dibromofluoromethane	2ORDR	-2.2e-002	2.13469600	-0.1301322	0.9999436	0.9900000
Toluene-d8	LINR	2.619e-003	0.80352398		0.9995727	0.9900000
1,2-Dichloroethane-d4	LINR	-1.9e-002	2.03958425		0.9990326	0.9900000

FORM VI VOA

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111201.D Page 1

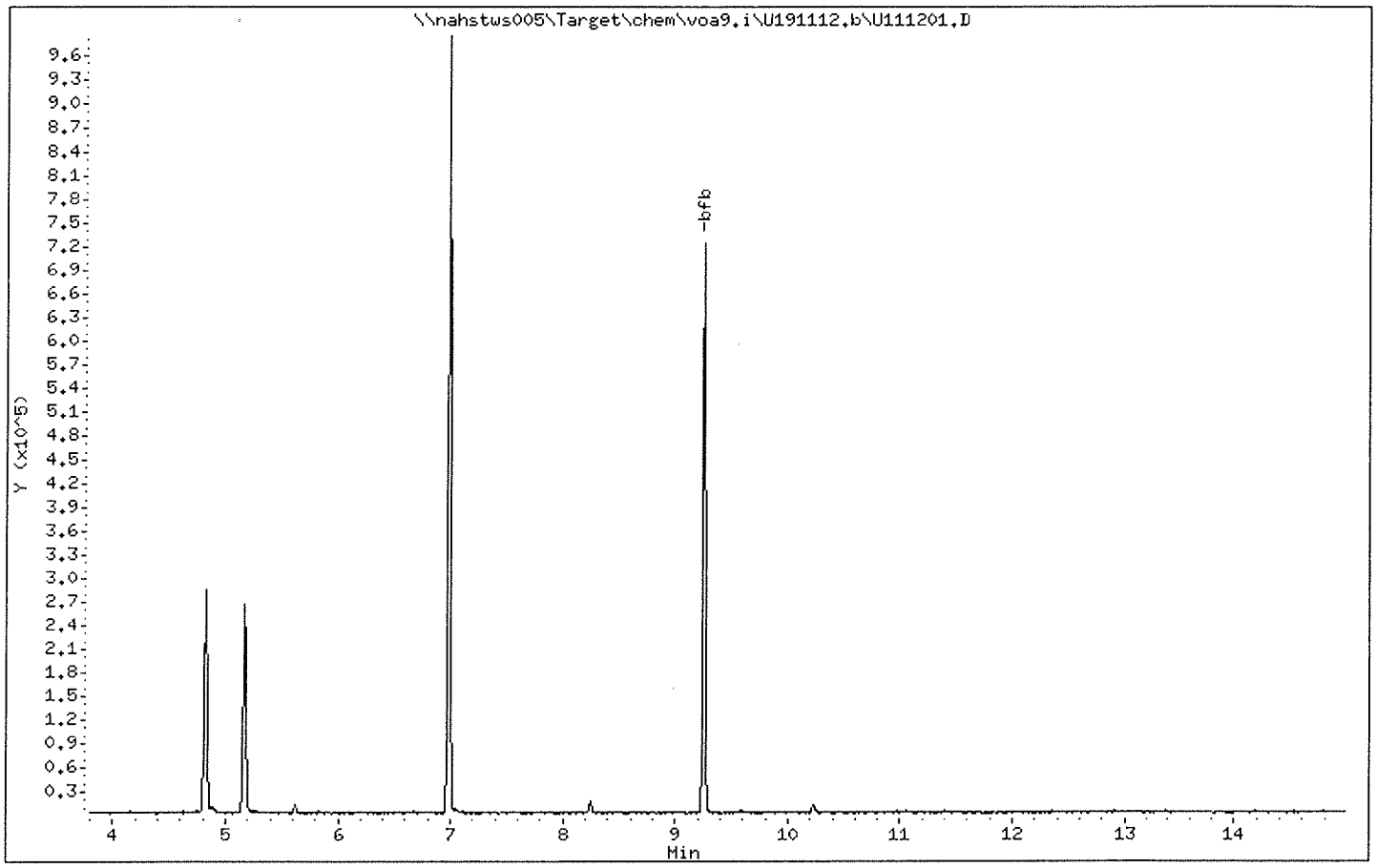
Date : 12-NOV-2019 10:52

Client ID: BFB Instrument: VOA9.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\voa9.i\U191112.b\U111201.D

Date : 12-NOV-2019 10:52

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

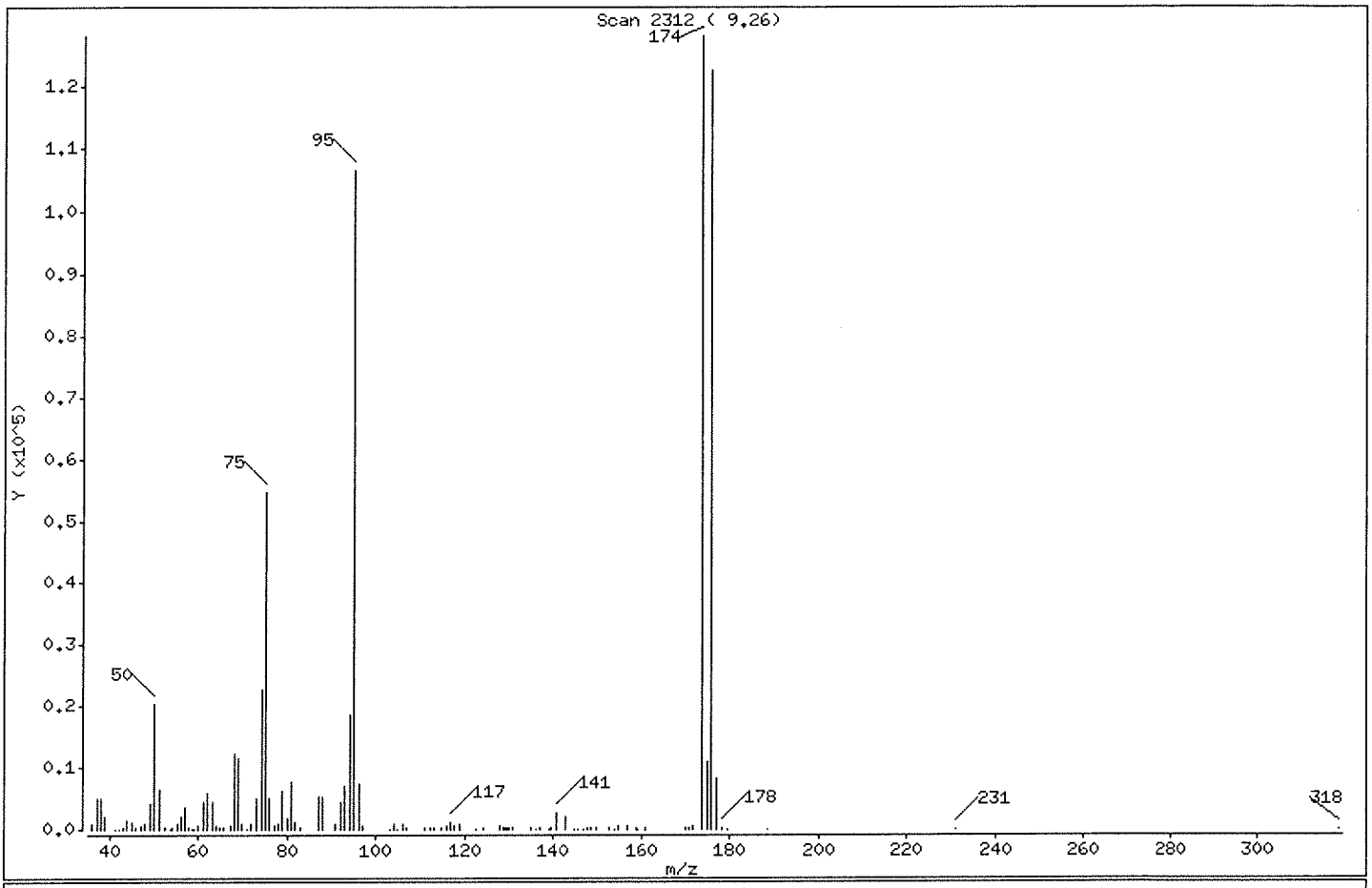
Volume Injected (uL): 2.0

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	18.97
75	30.00 - 60.00% of mass 95	51.27
96	5.00 - 9.00% of mass 95	7.01
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	120.35
175	5.00 - 9.00% of mass 174	10.28 (8.55)
176	95.00 - 101.00% of mass 174	115.13 (95.66)
177	5.00 - 9.00% of mass 176	7.67 (6.67)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111201.D

Date : 12-NOV-2019 10:52

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: U111201.D
Spectrum: Scan 2312 (9.26)
Location of Maximum: 173.90
Number of points: 111

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	897	63.10	4500	96.00	7481	140.80	2621
37.00	5026	64.00	622	97.00	459	142.90	2000
38.00	5134	64.80	163	103.00	131	145.00	88
39.00	1978	65.80	165	104.00	801	145.70	118
41.40	106	67.20	707	104.80	147	146.80	63
42.20	137	68.00	12253	106.10	897	147.80	354
43.00	204	69.00	11545	107.00	220	148.70	241
43.90	1363	69.90	978	111.00	419	149.70	411
44.90	1055	71.10	91	112.10	193	152.90	285
46.00	268	72.00	919	113.10	264	154.00	114
47.10	675	73.10	5073	114.80	344	154.90	574
48.00	895	74.10	22776	115.90	686	157.00	622
49.00	4065	75.00	54688	116.90	1104	158.90	236
50.00	20240	76.00	5057	117.70	579	159.50	58
51.00	6590	77.00	583	118.90	1030	160.90	223
52.30	317	77.90	761	122.70	69	170.20	313
52.60	400	78.90	6205	124.10	157	171.00	157
53.70	124	79.90	1633	127.90	707	171.60	480
54.20	200	80.90	7619	128.60	388	173.90	128384
55.20	790	81.90	1307	129.00	390	175.00	10971
56.00	2059	82.80	399	129.70	382	176.00	122808
57.00	3648	87.00	5227	130.00	395	176.90	8187
57.90	227	88.00	5399	130.70	230	178.10	180
58.60	62	90.90	1022	134.90	431	179.40	74
59.10	102	92.00	4356	136.10	123	188.80	145
60.00	590	93.00	7185	136.90	226	230.90	110
61.00	4419	94.10	18448	139.00	116	318.40	113
62.00	5840	95.00	106672	139.70	320		

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111202.D Page 1
Report Date: 05-Dec-2019 15:54

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111202.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 12-NOV-2019 11:16
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.25;VSTD000.25;1;1;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 11:16 Cal File: U112102.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
*	1 Pentafluorobenzene	168	4.894	4.894	(1.000)	272635	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	427777	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	383752	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	194223	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	3693	0.25000	0.43(Ta)
$	69 4-Bromofluorobenzene	95	9.250	9.253	(1.122)	3643	0.25000	1.86(a)
$	30 Dibromofluoromethane	113	4.834	4.826	(0.988)	3086	0.25000	0.10(a)
$	48 Toluene-d8	98	6.986	6.989	(0.847)	9629	0.25000	1.13(a)
	60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	540	0.25000	1.92(aM)
	31 1,1,1-Trichloroethane	97	4.823	4.826	(0.985)	927	0.25000	0.22(a)
	68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	795	0.25000	0.23(aM)
	138 Freon TF	101	2.412	2.397	(0.493)	1859	0.25000	0.30(a)
	53 1,1,2-Trichloroethane	83	7.413	7.417	(0.899)	416	0.25000	0.20(aM)
	22 1,1-Dichloroethane	63	3.593	3.600	(0.734)	885	0.25000	0.22(aM)
	11 1,1-Dichloroethene	96	2.405	2.397	(0.491)	1632	0.25000	0.25(aM)
	32 1,1-Dichloropropene	75	4.999	5.002	(0.889)	737	0.25000	0.25(a)
	93 1,2,3-Trichlorobenzene	180	12.328	12.331	(1.205)	555	0.25000	0.18(aM)
	71 1,2,3-Trichloropropane	75	9.419	9.426	(0.921)	990	0.25000	0.30(a)
	90 1,2,4-Trichlorobenzene	180	11.923	11.919	(1.165)	922	0.25000	0.26(aM)
	79 1,2,4-Trimethylbenzene	105	9.936	9.939	(0.971)	2251	0.25000	0.24(a)
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	667	0.25000	0.23(aM)
	88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	1446	0.25000	0.24(a)
	33 1,2-Dichloroethane	62	5.254	5.250	(0.935)	1147	0.25000	0.36(a)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111202.D Page 2
Report Date: 05-Dec-2019 15:54

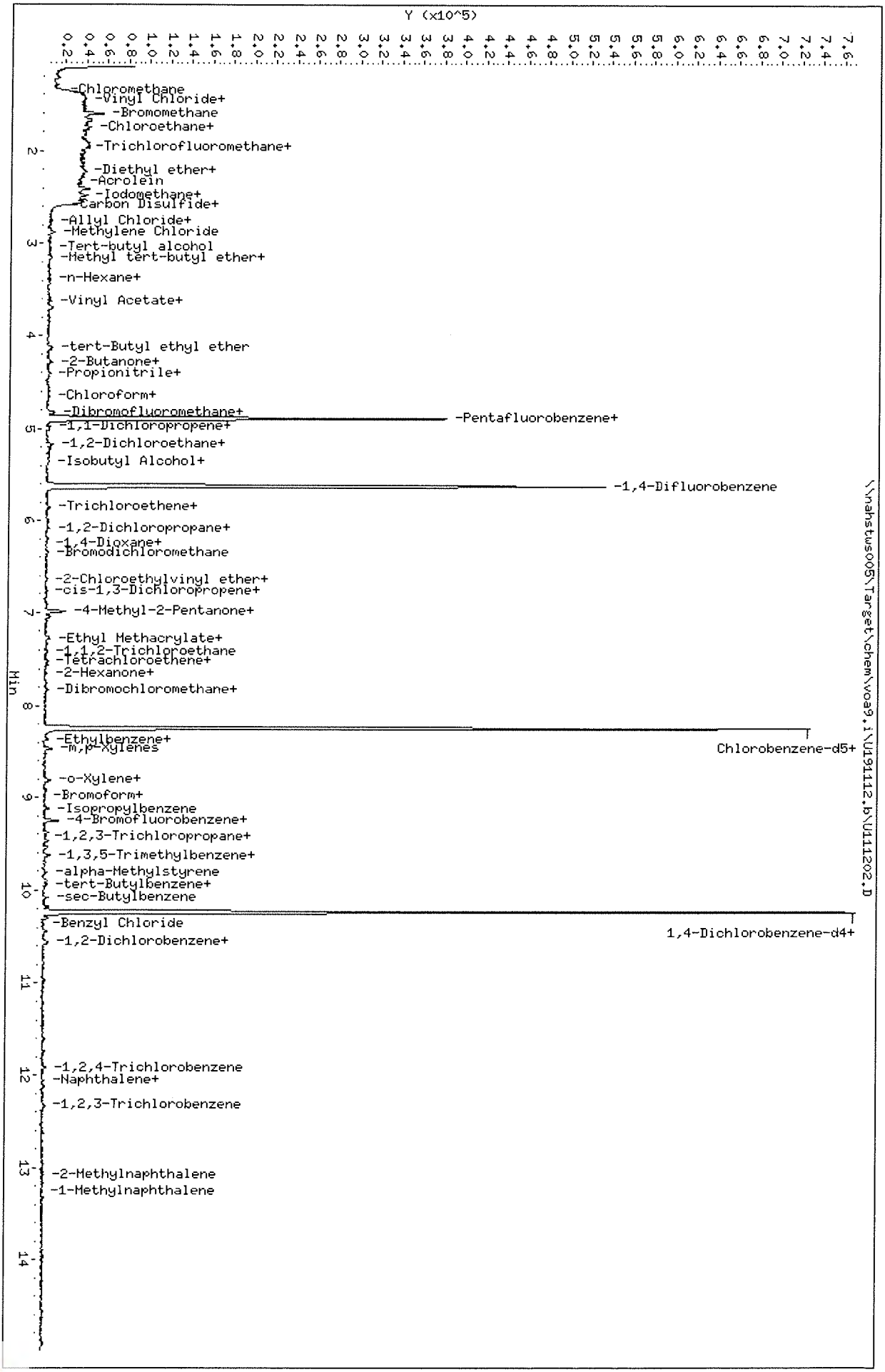
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
42	1,2-Dichloropropane	63	6.079	6.078	(1.081)	738	0.25000	(aM)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	1922	0.25000	0.22(a)
83	1,3-Dichlorobenzene	146	10.172	10.179	(0.994)	1748	0.25000	0.30(a)
54	1,3-Dichloropropane	76	7.555	7.563	(0.916)	1356	0.25000	0.34(aM)
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	1351	0.25000	0.21(a)
26	2,2-Dichloropropane	77	4.287	4.271	(0.876)	1109	0.25000	0.35(aM)
24	2-Butanone	43	4.335	4.339	(0.886)	618	0.50000	(aM)
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	1560	0.25000	0.24(a)
52	2-Hexanone	43	7.649	7.649	(0.928)	1096	0.50000	0.65(Ta)
77	4-Chlorotoluene	91	9.632	9.636	(0.941)	2024	0.25000	0.25(a)
82	p-Isopropyltoluene	119	10.202	10.209	(0.997)	2014	0.25000	0.22(aM)
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	1254	0.50000	0.56(a)
10	Acetone	43	2.480	2.483	(0.507)	6397	0.50000	(aM)
37	Benzene	78	5.220	5.216	(0.929)	2248	0.25000	0.24(a)
74	Bromobenzene	156	9.385	9.381	(0.917)	590	0.25000	0.16(aM)
29	Bromochloromethane	128	4.557	4.553	(0.931)	253	0.25000	0.15(aM)
39	Bromodichloromethane	83	6.352	6.344	(1.130)	590	0.25000	0.20(aM)
66	Bromoform	173	8.980	8.984	(1.089)	297	0.25000	2.09(aM)
6	Bromomethane	94	1.678	1.659	(0.343)	3249	0.25000	(a)
19	Carbon Disulfide	76	2.585	2.584	(0.528)	4159	0.50000	0.68(a)
34	Carbon Tetrachloride	117	4.995	4.995	(0.889)	532	0.25000	0.17(aM)
59	Chlorobenzene	112	8.271	8.271	(1.003)	2173	0.25000	0.27(a)
7	Chloroethane	64	1.753	1.741	(0.358)	1323	0.25000	(aM)
28	Chloroform	83	4.665	4.654	(0.953)	1035	0.25000	0.22(a)
3	Chloromethane	50	1.344	1.340	(0.275)	931	0.25000	(aM)
27	cis-1,2-Dichloroethene	96	4.305	4.283	(0.880)	1124	0.25000	0.36(aM)
46	cis-1,3-Dichloropropene	75	6.765	6.757	(1.203)	998	0.25000	0.32(aM)
55	Dibromochloromethane	129	7.750	7.758	(0.940)	383	0.25000	2.67(aM)
44	Dibromomethane	93	6.191	6.187	(1.101)	544	0.25000	0.31(aM)
2	Dichlorodifluoromethane	85	1.213	1.205	(0.248)	827	0.25000	0.29(aM)
61	Ethylbenzene	106	8.365	8.369	(1.015)	664	0.25000	0.17(a)
91	Hexachlorobutadiene	225	12.050	12.061	(1.178)	315	0.25000	0.26(aM)
67	Isopropylbenzene	105	9.122	9.126	(1.106)	2866	0.25000	0.26(a)
62	m,p-Xylenes	106	8.463	8.470	(1.026)	2799	0.50000	0.59(a)
17	Methylene Chloride	84	2.877	2.869	(0.588)	992	0.25000	1.28(aM)
87	n-Butylbenzene	91	10.551	10.554	(1.031)	2089	0.25000	0.27(aM)
73	n-Propylbenzene	91	9.471	9.475	(0.926)	3397	0.25000	0.29(a)
92	Naphthalene	128	12.129	12.129	(1.185)	1738	0.25000	0.18(a)
63	o-Xylene	106	8.808	8.807	(1.068)	1080	0.25000	0.22(a)
81	sec-Butylbenzene	105	10.078	10.086	(0.985)	2083	0.25000	0.21(aM)
64	Styrene	104	8.830	8.822	(1.071)	1824	0.25000	0.21(aM)
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	1801	0.25000	0.25(Ta)
56	Tetrachloroethene	166	7.522	7.522	(0.912)	883	0.25000	0.30(aM)
50	Toluene	91	7.049	7.045	(0.855)	3151	0.25000	0.27(a)
20	trans-1,2-Dichloroethene	96	3.151	3.139	(0.644)	672	0.25000	2.11(Ta)
51	trans-1,3-Dichloropropene	75	7.256	7.259	(1.291)	950	0.25000	1.00(aM)
38	Trichloroethene	130	5.854	5.861	(1.041)	853	0.25000	0.30(a)
8	Trichlorofluoromethane	101	1.959	1.951	(0.400)	2765	0.25000	0.23(a)
5	Vinyl Chloride	62	1.419	1.419	(0.290)	1085	0.25000	0.17(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

QC Flag Legend

M - Compound response manually integrated.



Data File: \\nahstws005\Target\chem\voa9,i\U191112,b\U111202,D
Date : 12-NOV-2019 11:16
Client ID: VSTD000,25
Sample Info: VSTD000,25;VSTD000,25;1;1;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D Page 1
Report Date: 05-Dec-2019 15:54

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D
Lab Smp Id: VSTD000.5 Client Smp ID: VSTD000.5
Inj Date : 12-NOV-2019 11:40
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.5;VSTD000.5;1;2;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 11:40 Cal File: U112103A.D
Als bottle: 3 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

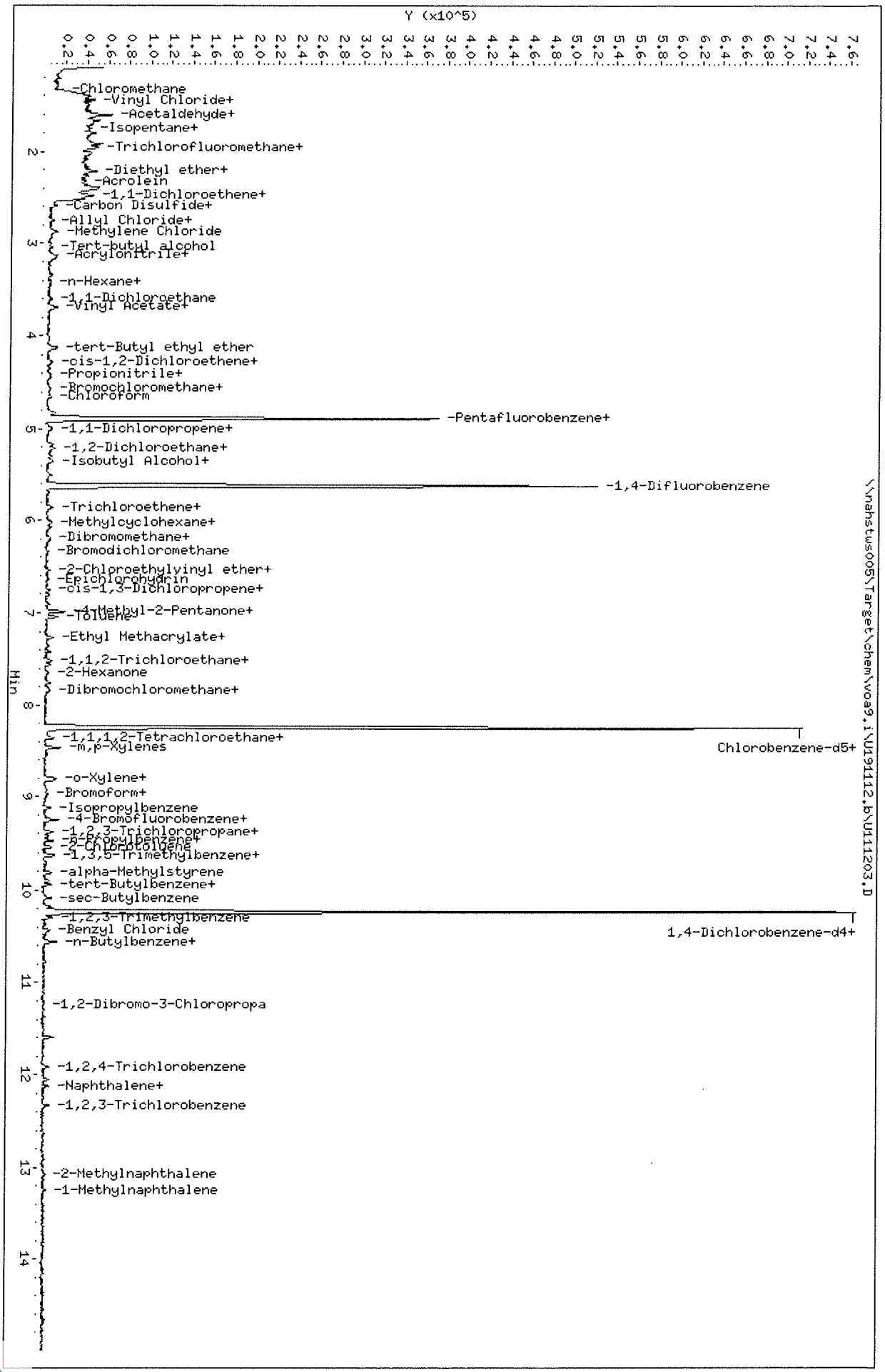
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.890	4.894	(1.000)	259604	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	402953	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	364213	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	183749	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.058)	3547	0.50000	0.44(a)
$	69 4-Bromofluorobenzene	95	9.257	9.253	(1.123)	3090	0.50000	1.73(a)
$	30 Dibromofluoromethane	113	4.830	4.826	(0.988)	2954	0.50000	0.11(a)
$	48 Toluene-d8	98	6.982	6.989	(0.847)	10912	0.50000	1.33(a)
	60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	768	0.50000	2.01(a)
	31 1,1,1-Trichloroethane	97	4.823	4.826	(0.986)	2118	0.50000	0.54(a)
	68 1,1,2,2-Tetrachloroethane	83	9.385	9.388	(0.917)	1345	0.50000	0.41(aM)
	138 Freon TF	101	2.397	2.397	(0.490)	2351	0.50000	0.40(a)
	53 1,1,2-Trichloroethane	83	7.420	7.417	(0.900)	847	0.50000	0.44(a)
	22 1,1-Dichloroethane	63	3.608	3.600	(0.738)	1732	0.50000	0.47(Ta)
	11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	2911	0.50000	0.48(a)
	32 1,1-Dichloropropene	75	4.991	5.002	(0.888)	1334	0.50000	0.49(a)
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	1124	0.50000	0.38(aM)
	71 1,2,3-Trichloropropane	75	9.418	9.426	(0.921)	1368	0.50000	0.43(a)
	90 1,2,4-Trichlorobenzene	180	11.923	11.919	(1.165)	1408	0.50000	0.43(aM)
	79 1,2,4-Trimethylbenzene	105	9.936	9.939	(0.971)	3937	0.50000	0.46(a)
	89 1,2-Dibromo-3-Chloropropane	155	11.237	11.229	(1.098)	18	0.50000	1.62(aM)
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	1362	0.50000	0.49(a)
	88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	2742	0.50000	0.49(a)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D Page 2
Report Date: 05-Dec-2019 15:54

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.250	(0.933)	1632	0.50000	0.54(a)
42	1,2-Dichloropropane	63	6.071	6.078	(1.080)	968	0.50000	(aM)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	3602	0.50000	0.44(a)
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	3223	0.50000	0.59(a)
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	1842	0.50000	0.48(a)
84	1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	3945	0.50000	0.67(a)
26	2,2-Dichloropropane	77	4.268	4.271	(0.873)	1297	0.50000	0.43(aM)
24	2-Butanone	43	4.350	4.339	(0.890)	1976	1.00000	0.39(aM)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	2622	0.50000	0.44(a)
52	2-Hexanone	43	7.645	7.649	(0.927)	1840	1.00000	1.15(a)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	3326	0.50000	0.44(a)
82	p-Isopropyltoluene	119	10.209	10.209	(0.998)	4471	0.50000	0.52(a)
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	1926	1.00000	0.90(a)
10	Acetone	43	2.480	2.483	(0.507)	9998	1.00000	(aM)
37	Benzene	78	5.212	5.216	(0.927)	4188	0.50000	0.48(a)
74	Bromobenzene	156	9.377	9.381	(0.916)	2068	0.50000	0.62(a)
29	Bromochloromethane	128	4.549	4.553	(0.930)	970	0.50000	0.63(a)
39	Bromodichloromethane	83	6.341	6.344	(1.128)	918	0.50000	0.34(aM)
66	Bromoform	173	8.972	8.984	(1.088)	440	0.50000	2.17(aM)
6	Bromomethane	94	1.670	1.659	(0.342)	4824	0.50000	(aM)
19	Carbon Disulfide	76	2.588	2.584	(0.529)	5232	1.00000	0.90(a)
34	Carbon Tetrachloride	117	4.995	4.995	(0.889)	1457	0.50000	0.52(aM)
59	Chlorobenzene	112	8.271	8.271	(1.003)	3996	0.50000	0.54(a)
7	Chloroethane	64	1.749	1.741	(0.358)	1992	0.50000	(aM)
28	Chloroform	83	4.658	4.654	(0.952)	2416	0.50000	0.55(a)
3	Chloromethane	50	1.340	1.340	(0.274)	1635	0.50000	(a)
27	cis-1,2-Dichloroethene	96	4.279	4.283	(0.875)	1544	0.50000	0.52(a)
46	cis-1,3-Dichloropropene	75	6.749	6.757	(1.201)	1155	0.50000	0.39(aM)
55	Dibromochloromethane	129	7.754	7.758	(0.940)	924	0.50000	2.86(a)
44	Dibromomethane	93	6.180	6.187	(1.099)	1075	0.50000	0.65(a)
2	Dichlorodifluoromethane	85	1.201	1.205	(0.246)	1221	0.50000	0.46(aM)
61	Ethylbenzene	106	8.373	8.369	(1.015)	1668	0.50000	0.45(a)
91	Hexachlorobutadiene	225	12.058	12.061	(1.178)	758	0.50000	0.68(aM)
67	Isopropylbenzene	105	9.122	9.126	(1.106)	4837	0.50000	0.46(a)
62	m,p-Xylenes	106	8.466	8.470	(1.027)	3686	1.00000	0.81(a)
17	Methylene Chloride	84	2.870	2.869	(0.587)	1984	0.50000	1.70(a)
87	n-Butylbenzene	91	10.554	10.554	(1.032)	4011	0.50000	0.55(a)
73	n-Propylbenzene	91	9.471	9.475	(0.926)	5003	0.50000	0.46(a)
92	Naphthalene	128	12.125	12.129	(1.185)	3667	0.50000	0.42(a)
63	o-Xylene	106	8.807	8.807	(1.068)	2347	0.50000	0.51(a)
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	4656	0.50000	0.51(a)
64	Styrene	104	8.822	8.822	(1.070)	3285	0.50000	0.41(a)
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	3000	0.50000	0.44(a)
56	Tetrachloroethene	166	7.510	7.522	(0.911)	1296	0.50000	0.46(a)
50	Toluene	91	7.046	7.045	(0.855)	5683	0.50000	0.51(a)
20	trans-1,2-Dichloroethene	96	3.128	3.139	(0.640)	1321	0.50000	2.37(TaM)
51	trans-1,3-Dichloropropene	75	7.252	7.259	(1.290)	938	0.50000	1.02(a)
38	Trichloroethene	130	5.857	5.861	(1.042)	1529	0.50000	0.57(a)
8	Trichlorofluoromethane	101	1.955	1.951	(0.400)	5400	0.50000	0.48(a)
5	Vinyl Chloride	62	1.419	1.419	(0.290)	2925	0.50000	0.50(a)

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.



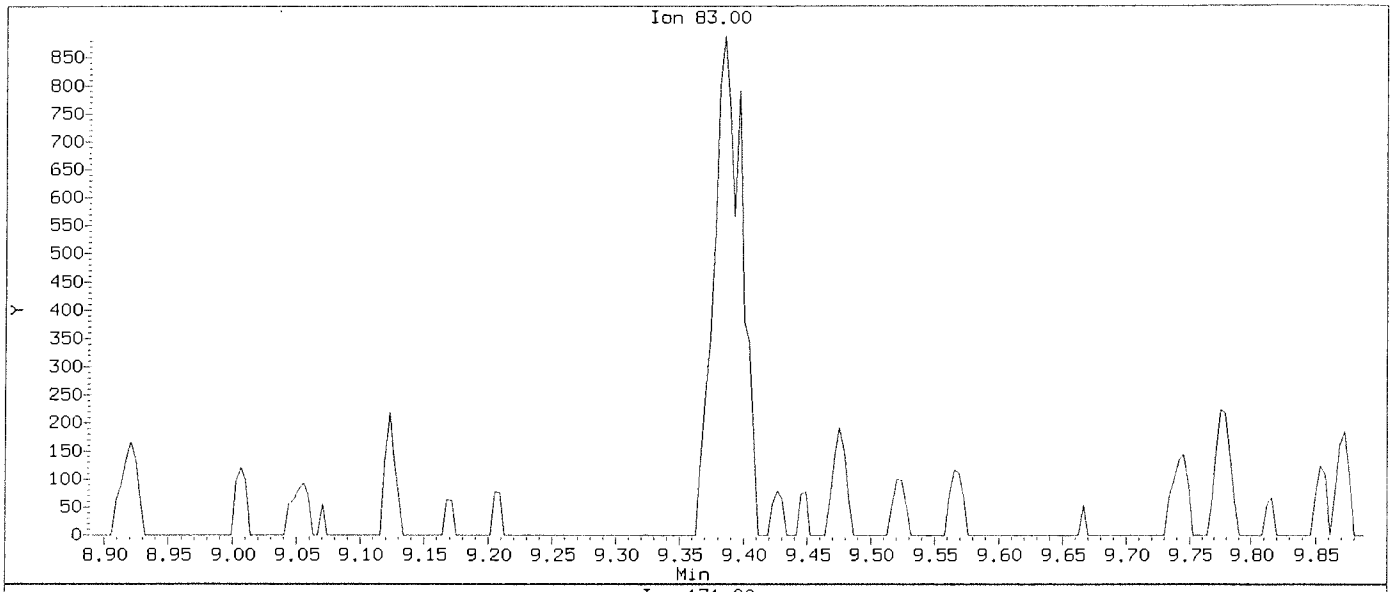
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Sample Info: VSTD000.5;VSTD000.5;1;2;
Purge Volume: 5.0
Column phase: DB624

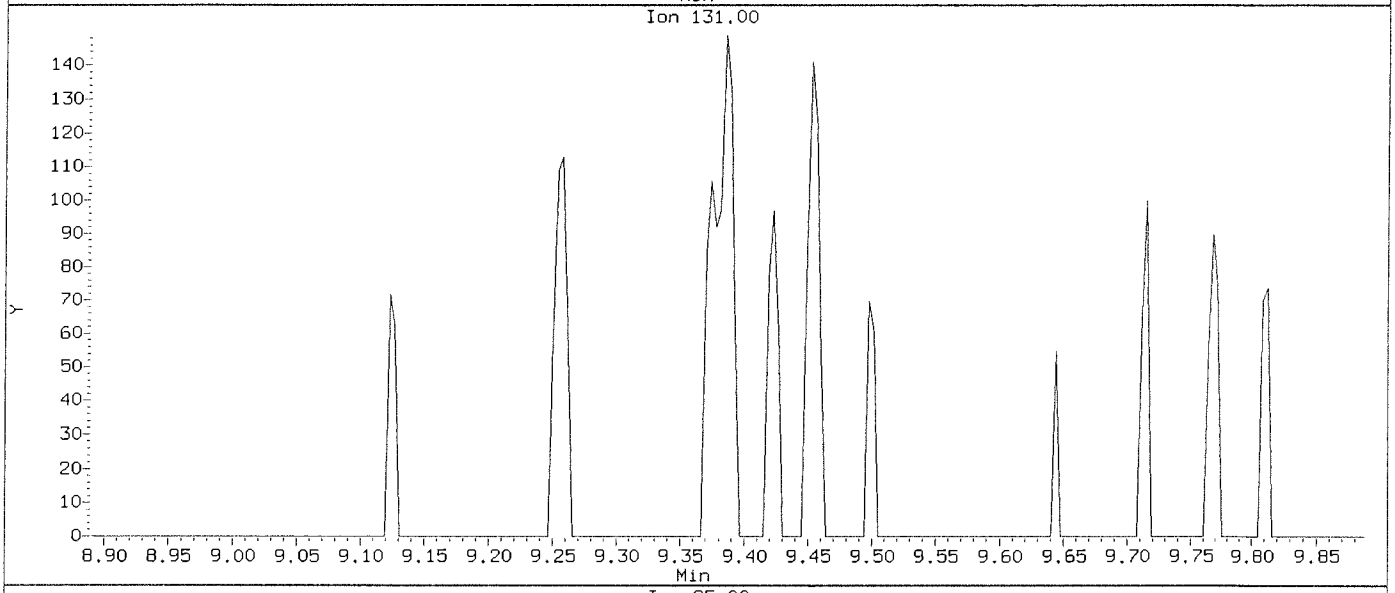
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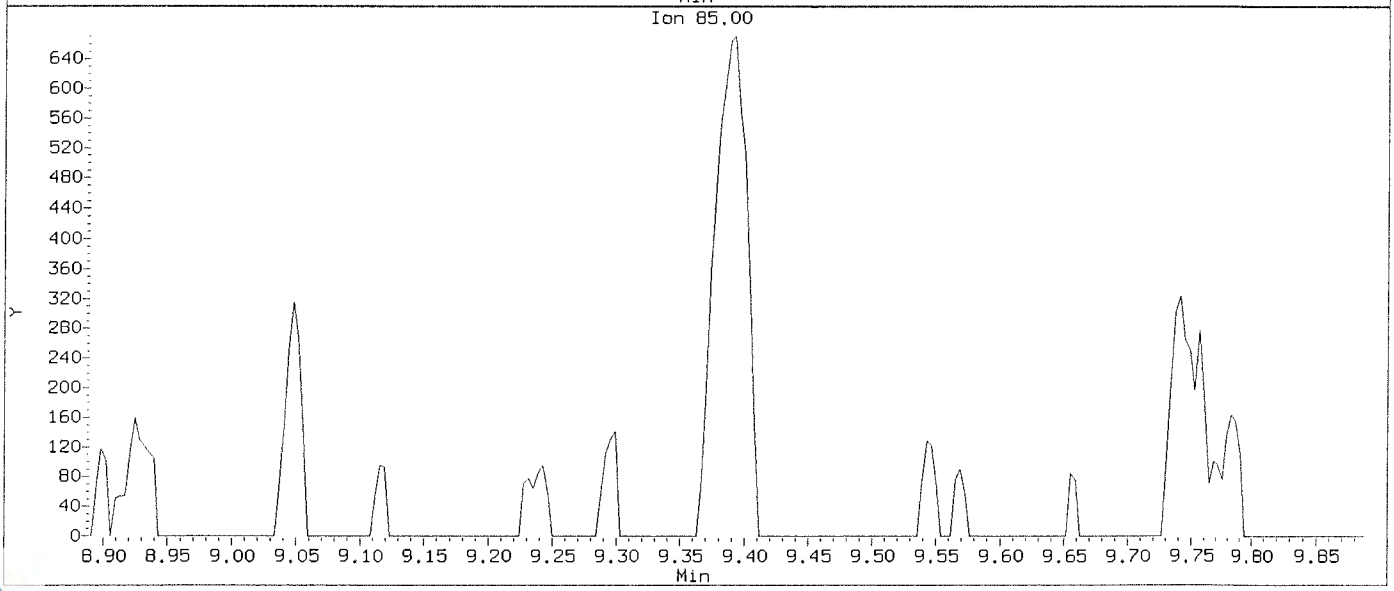
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Operator: PC
Column diameter: 0.18

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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

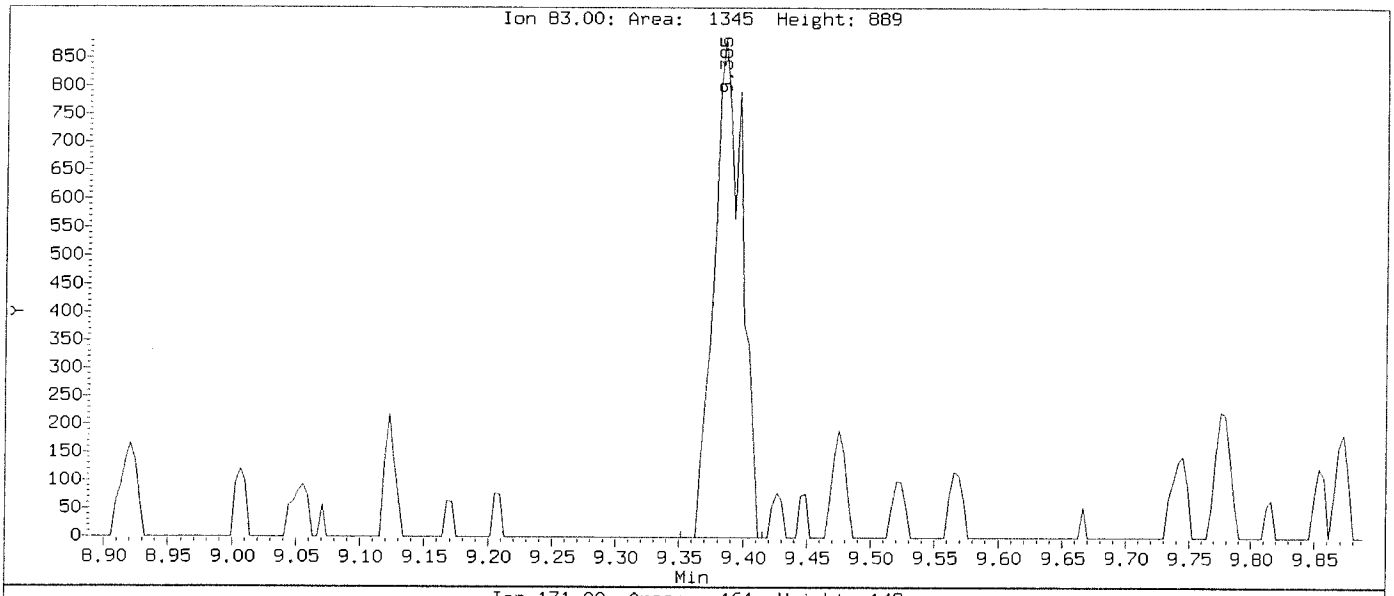


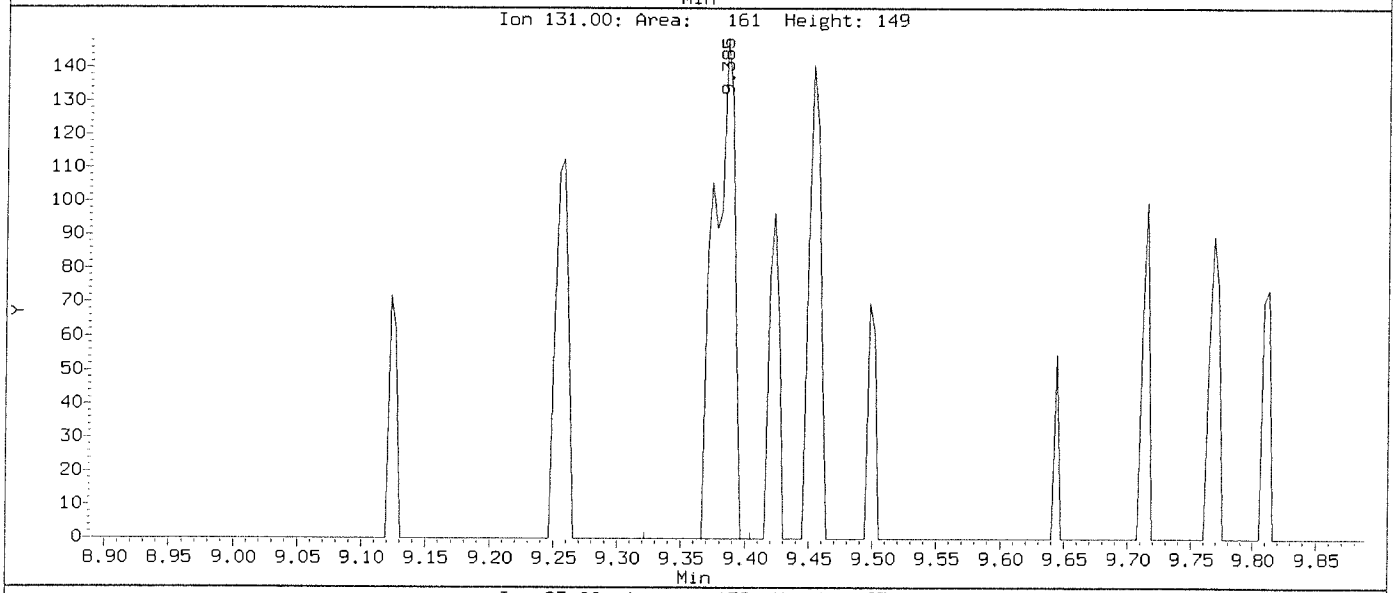


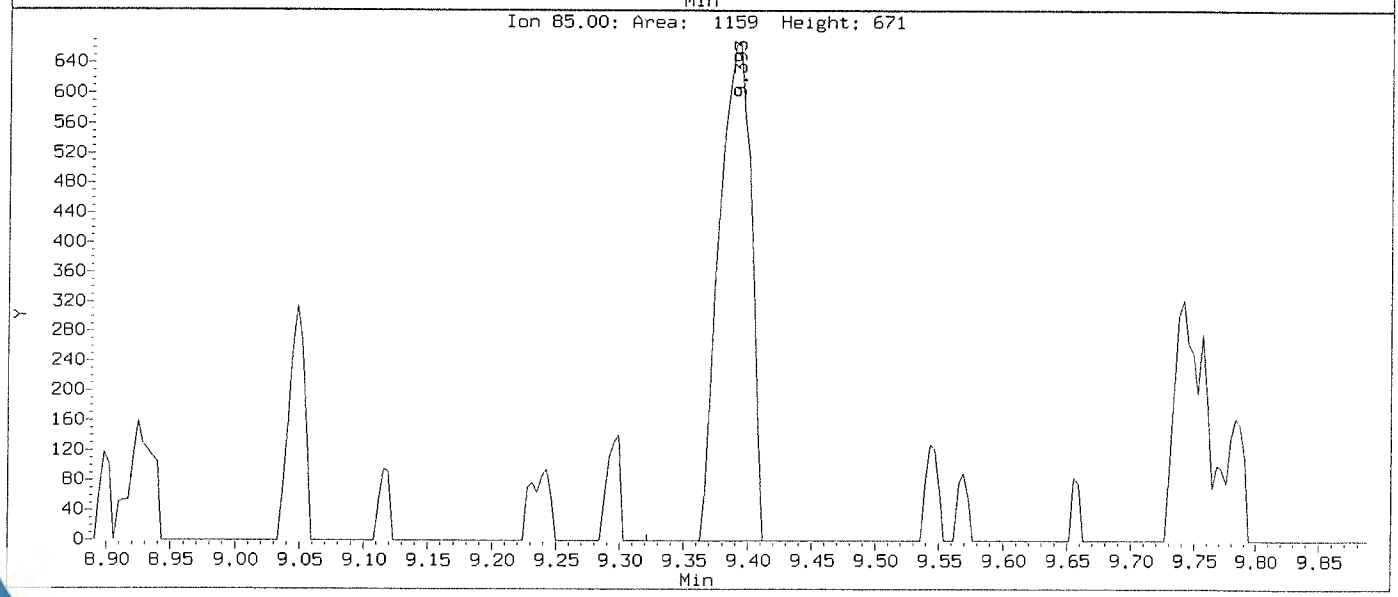


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Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

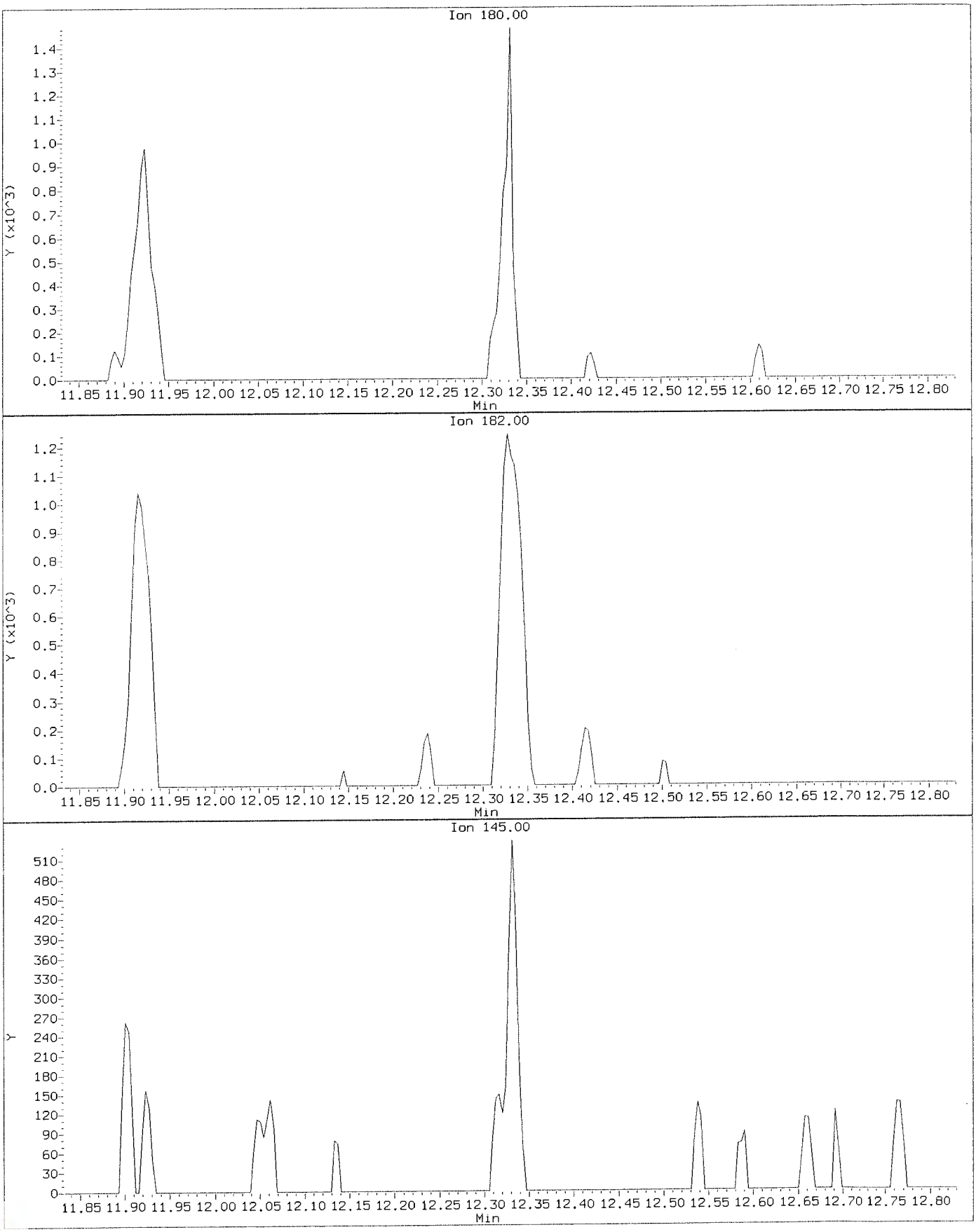






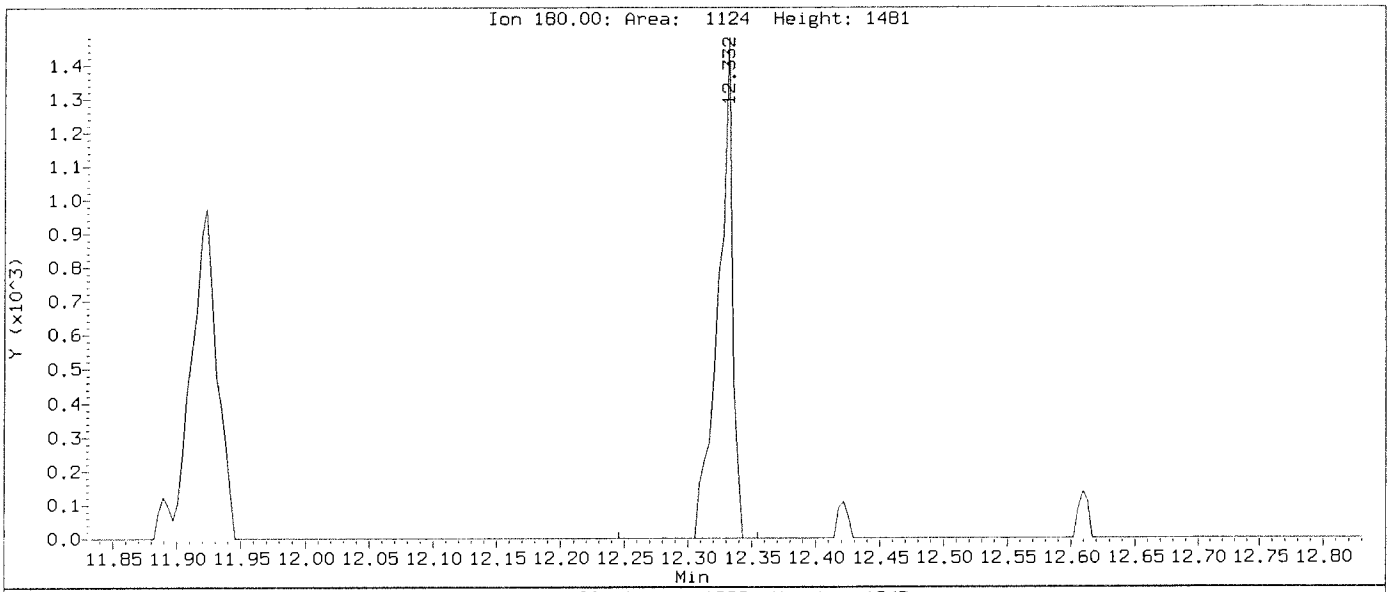
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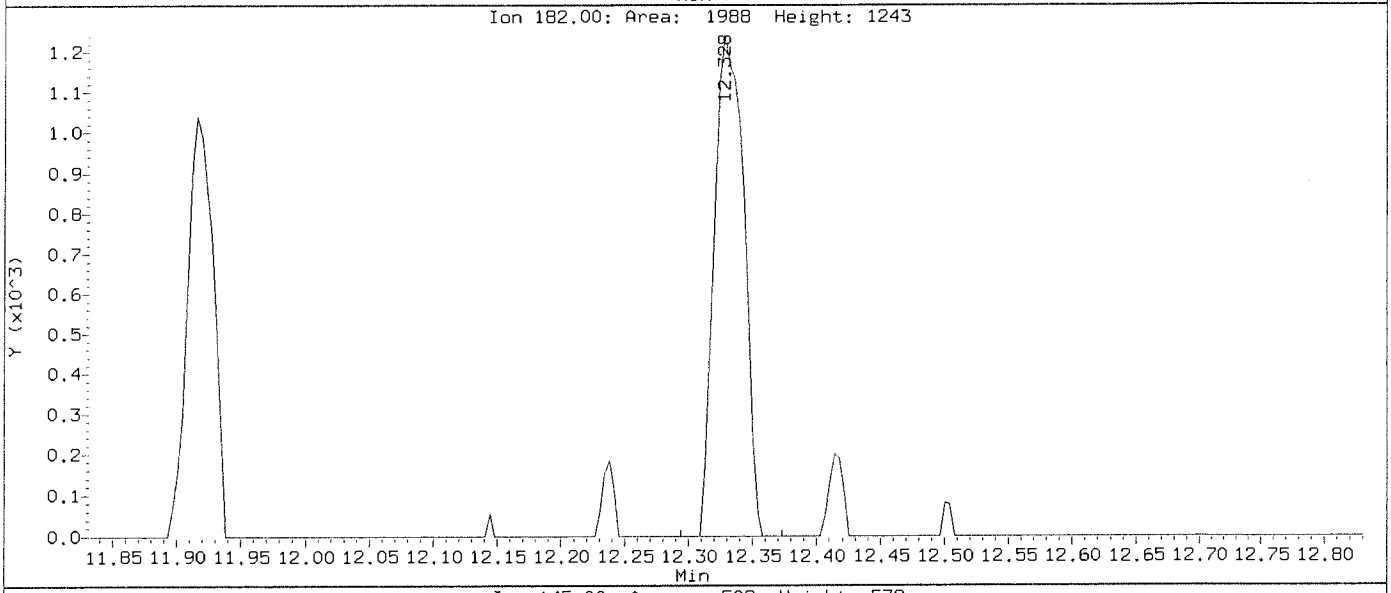
Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6

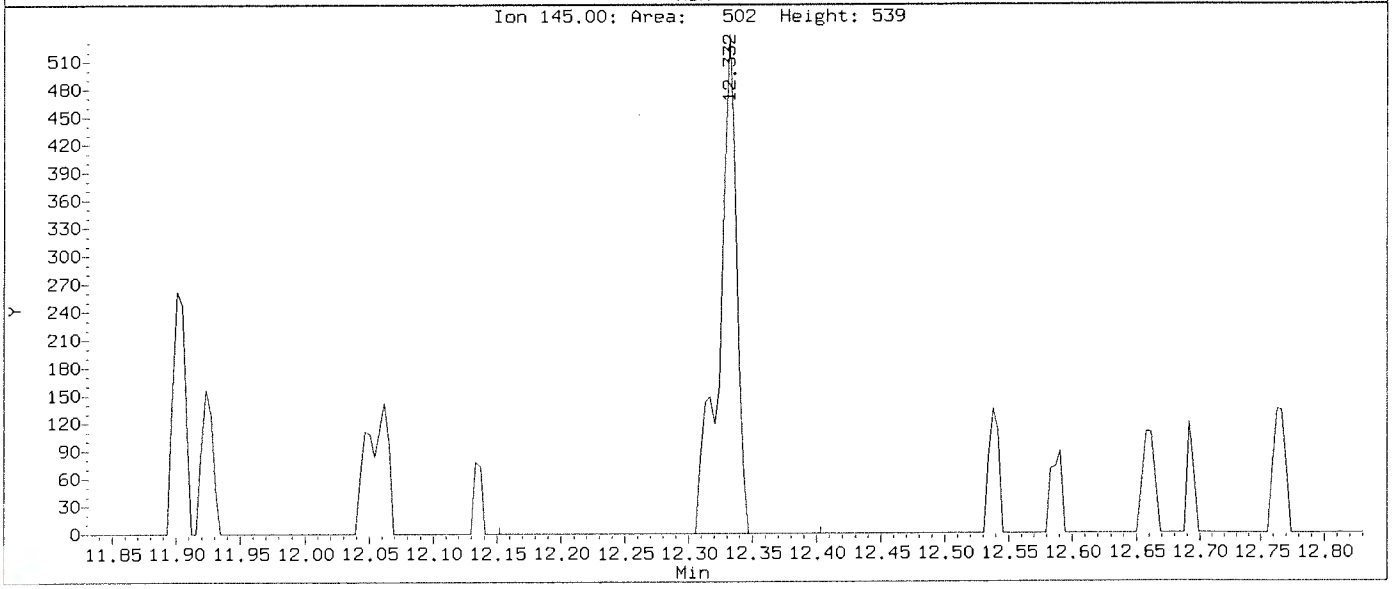


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Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6

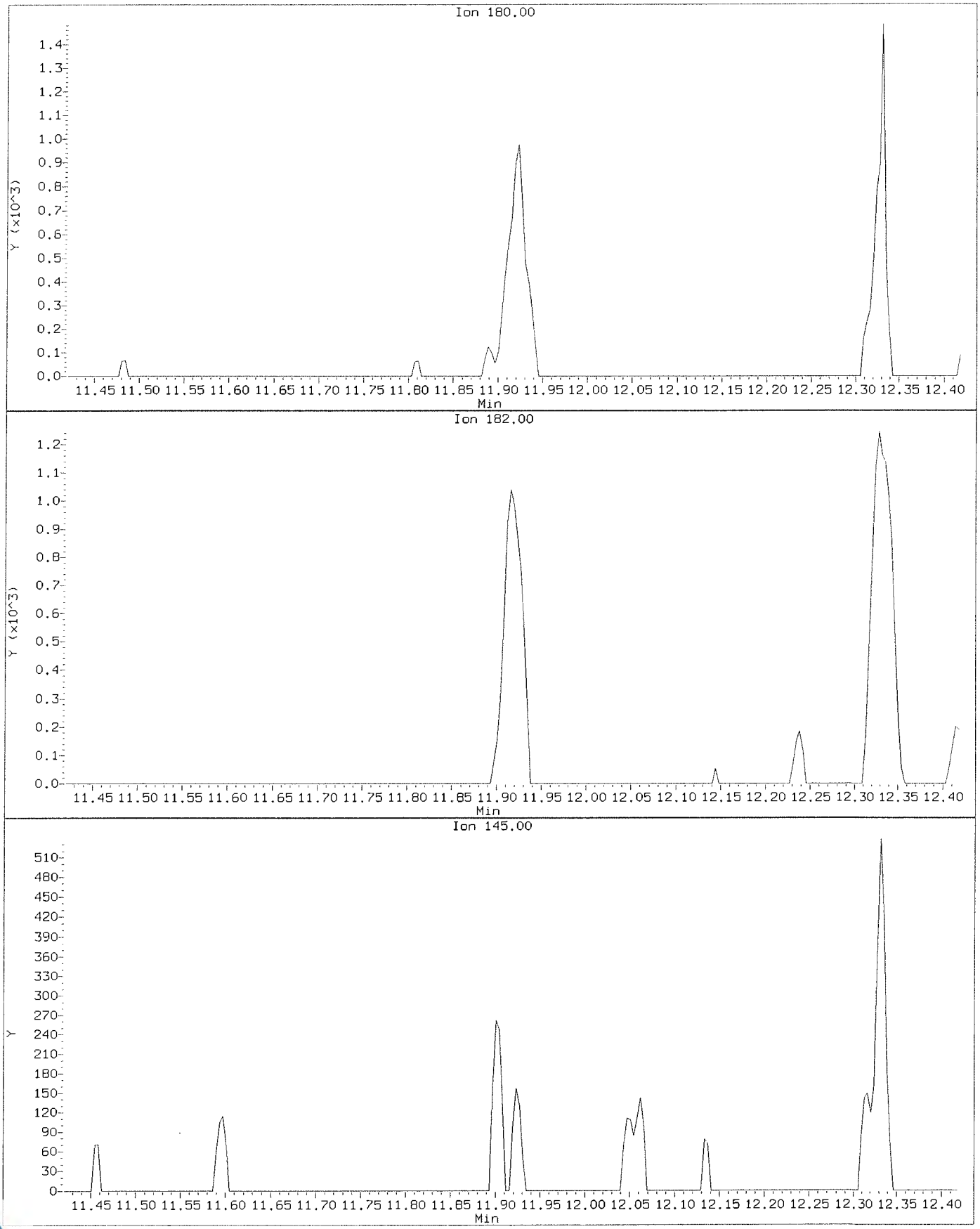






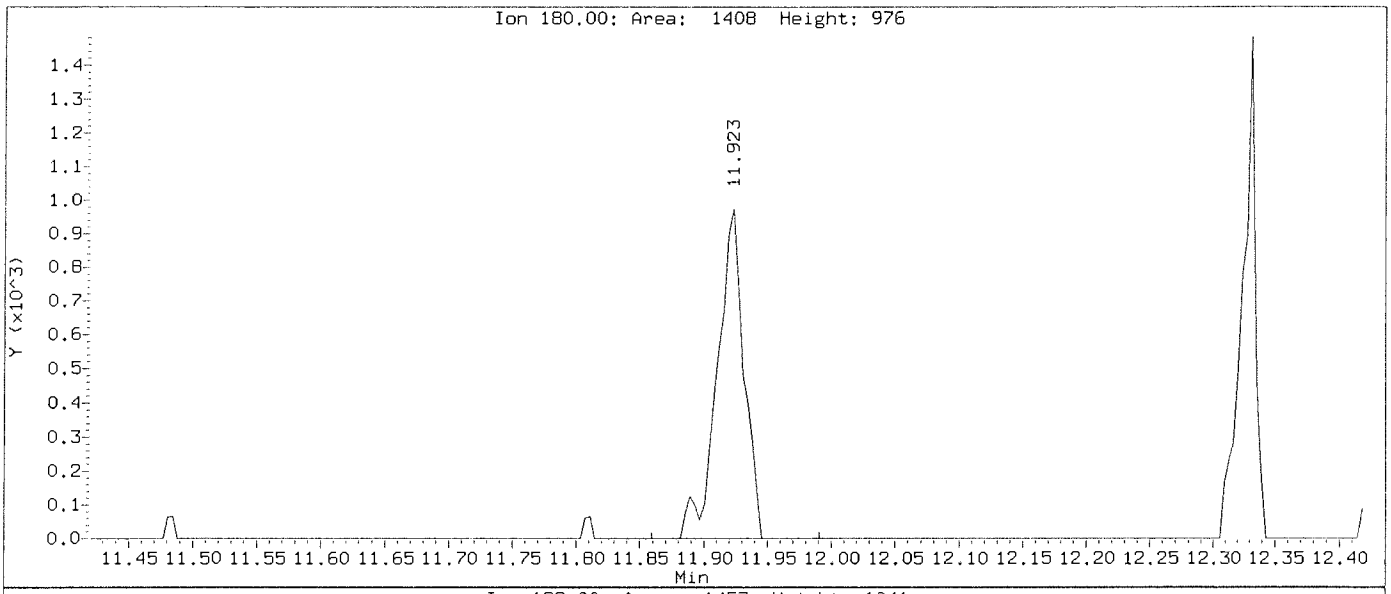
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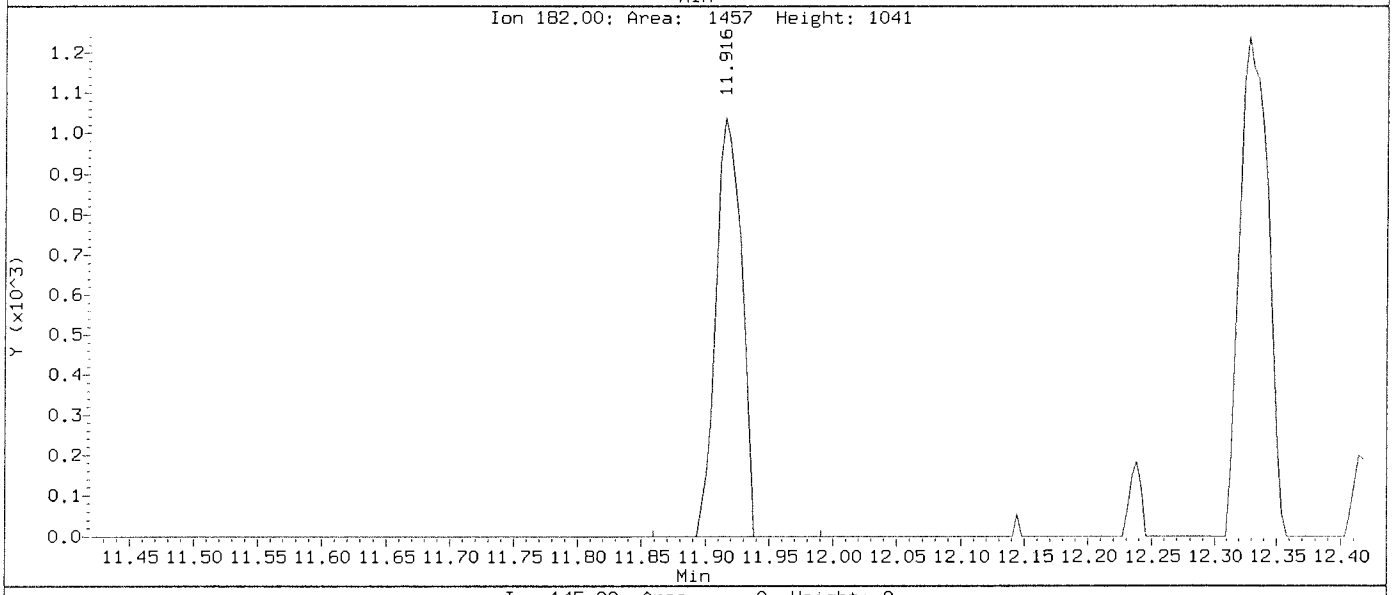
Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1

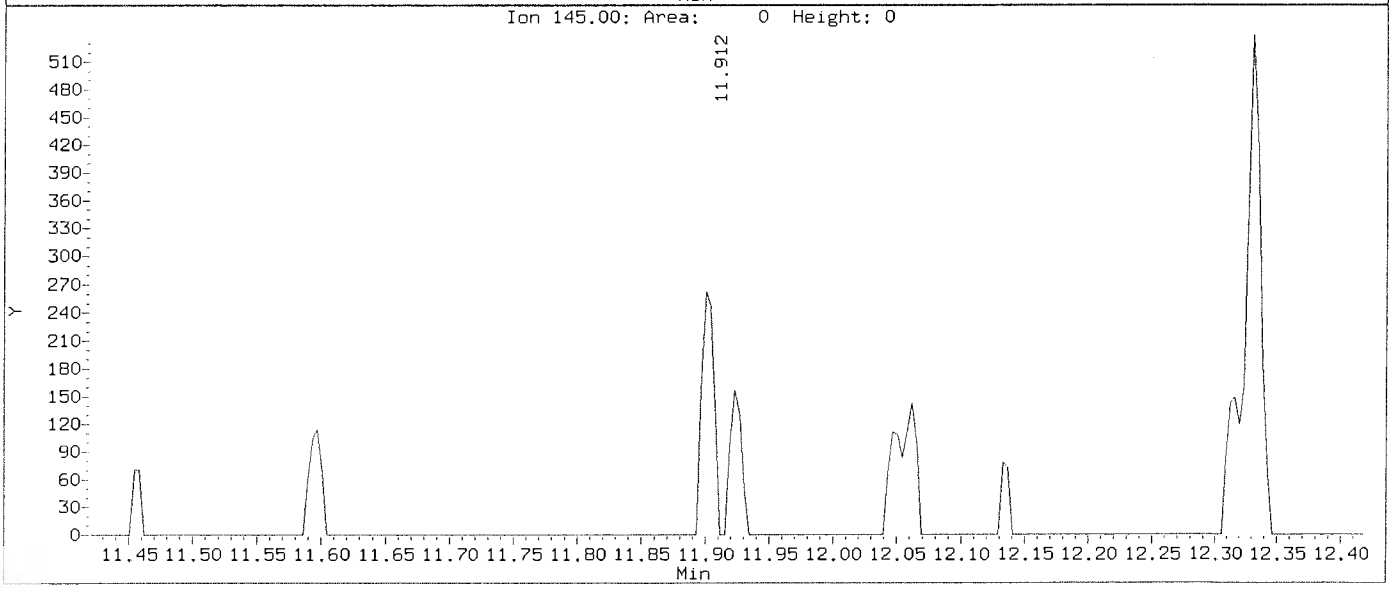


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Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1

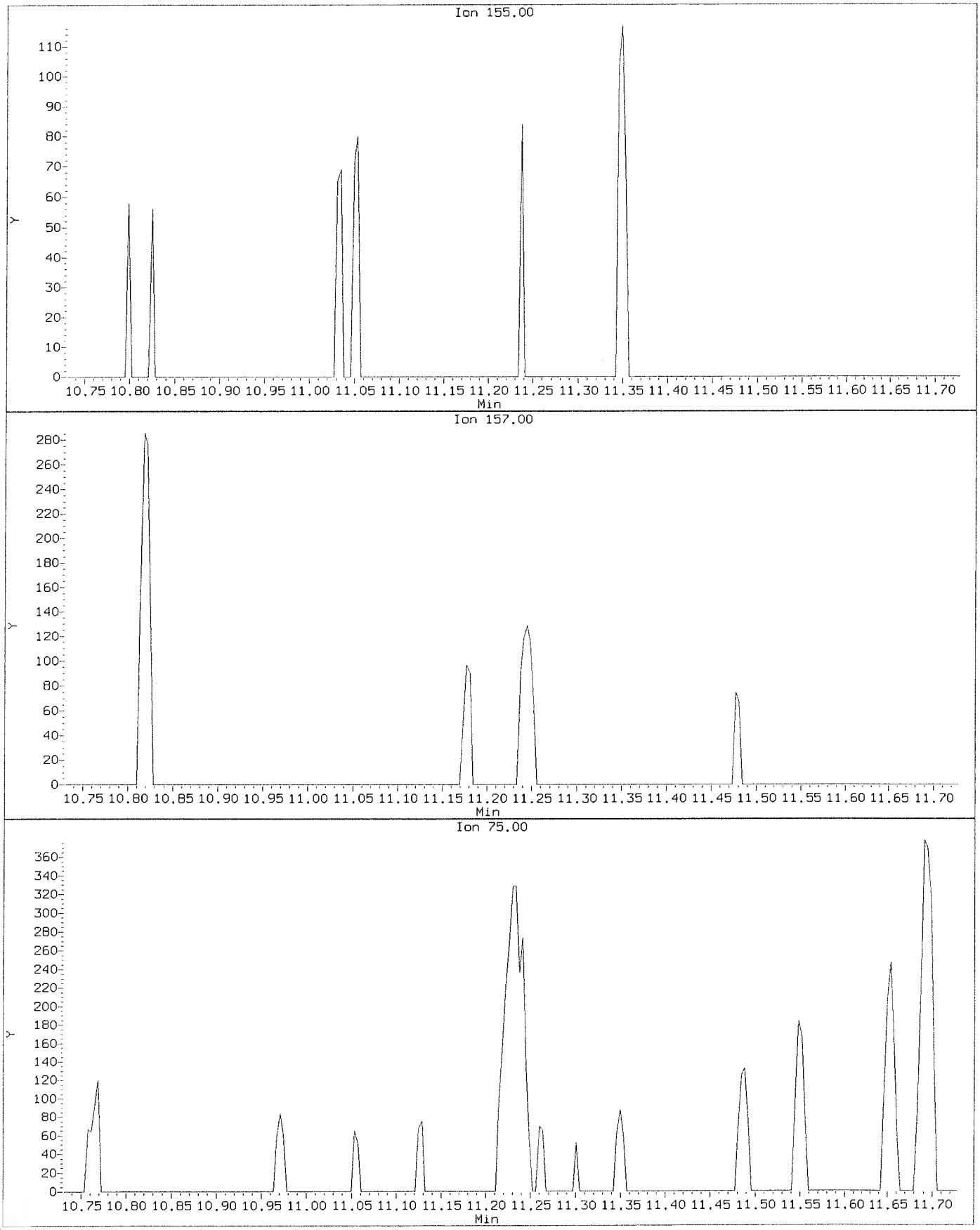






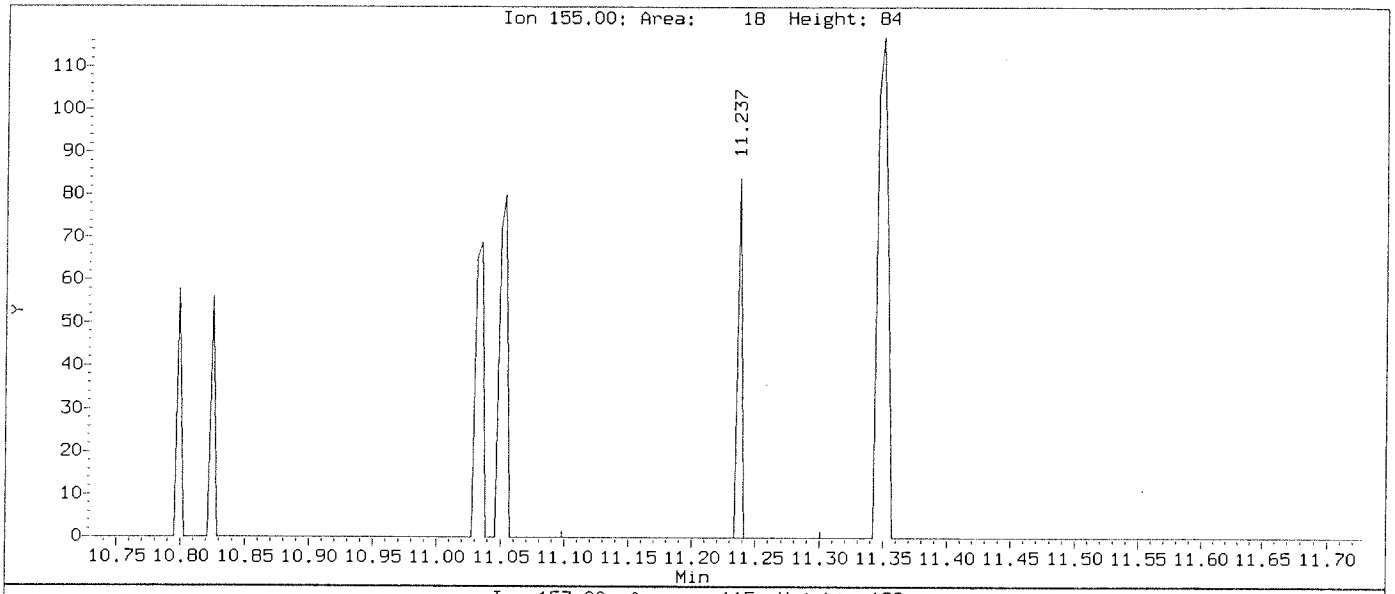
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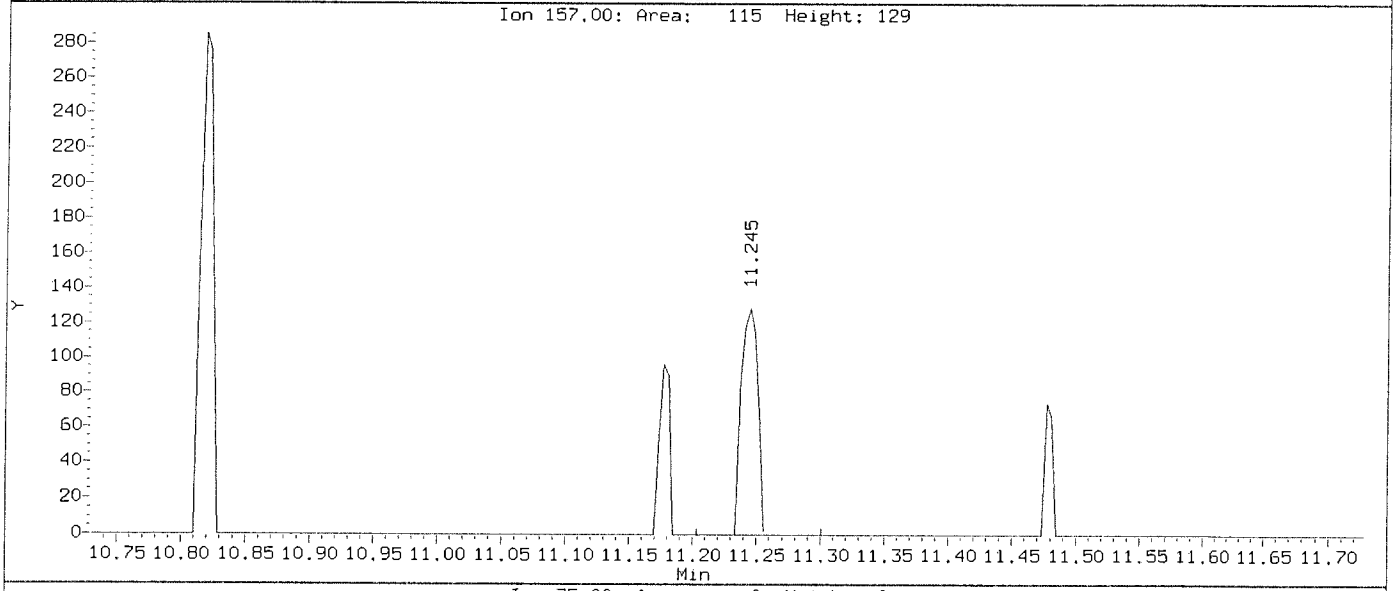
Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

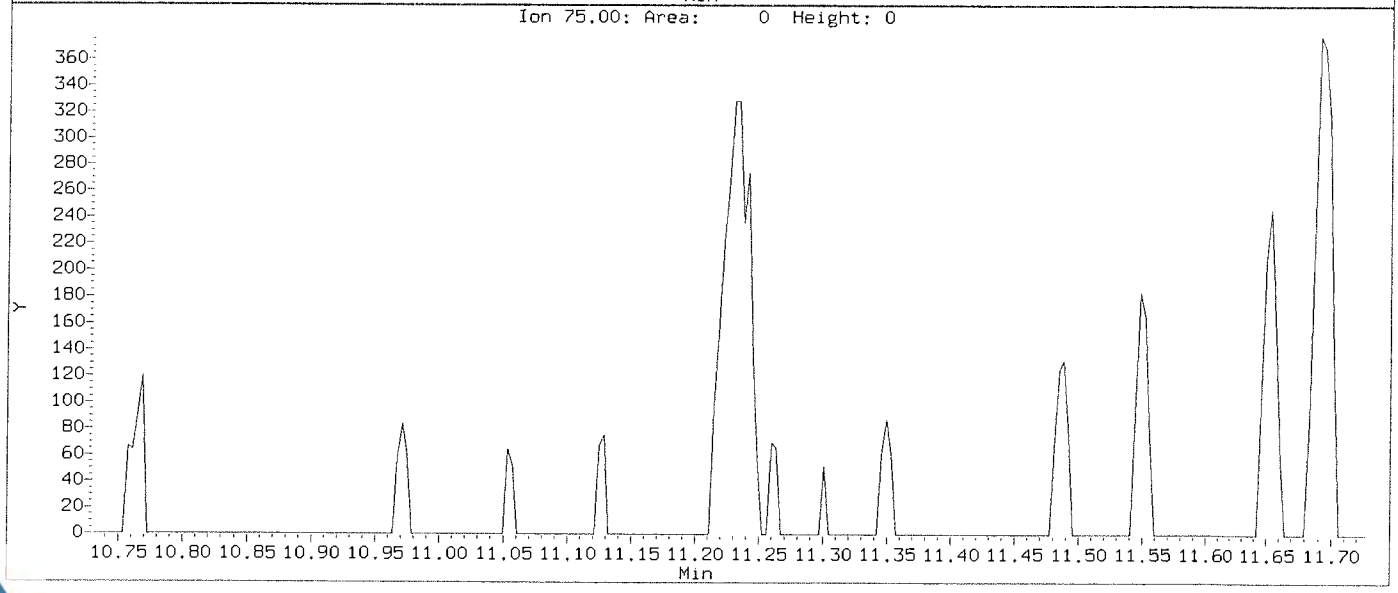


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Client Sample ID: VSTD000.5

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

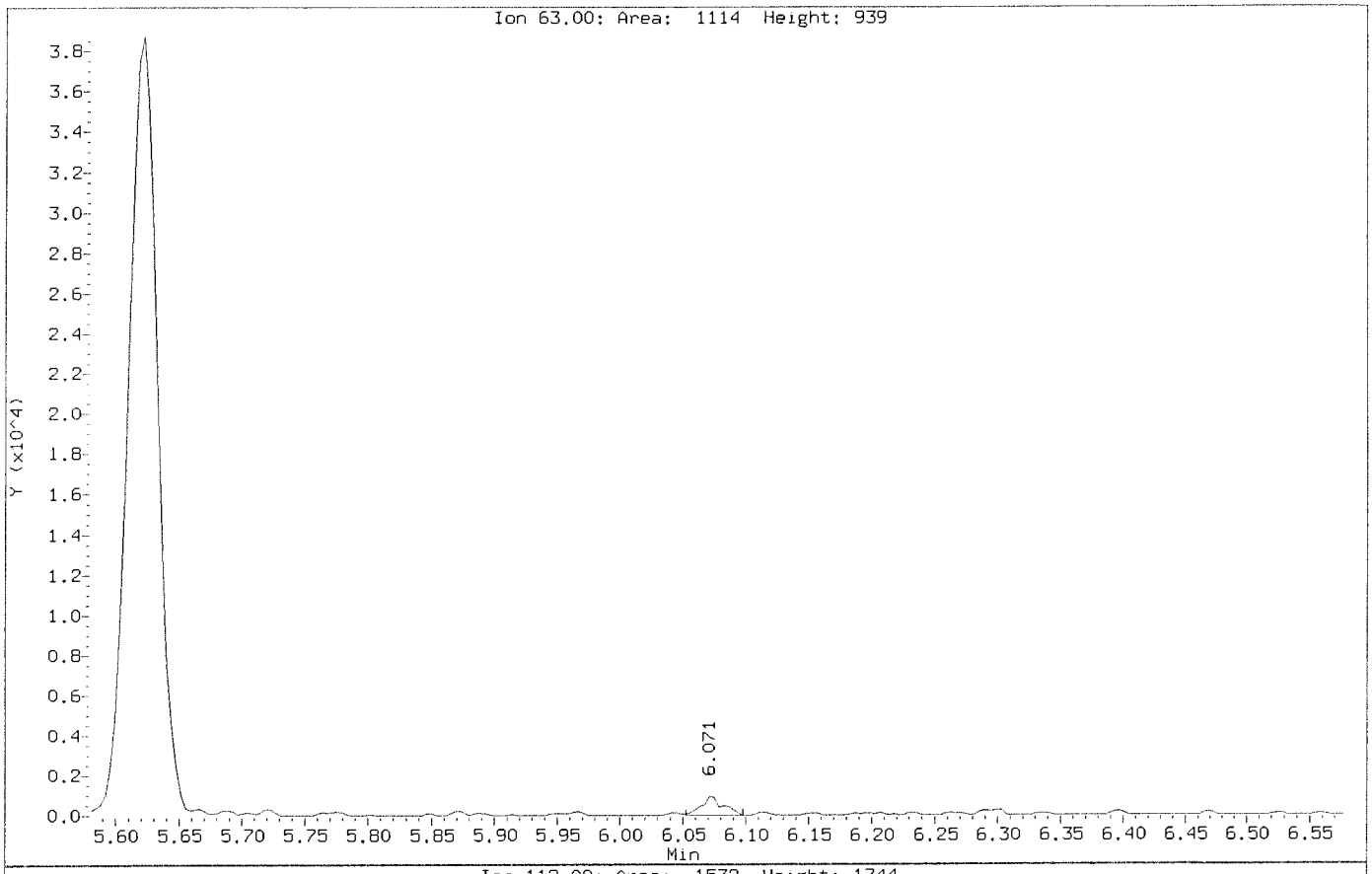


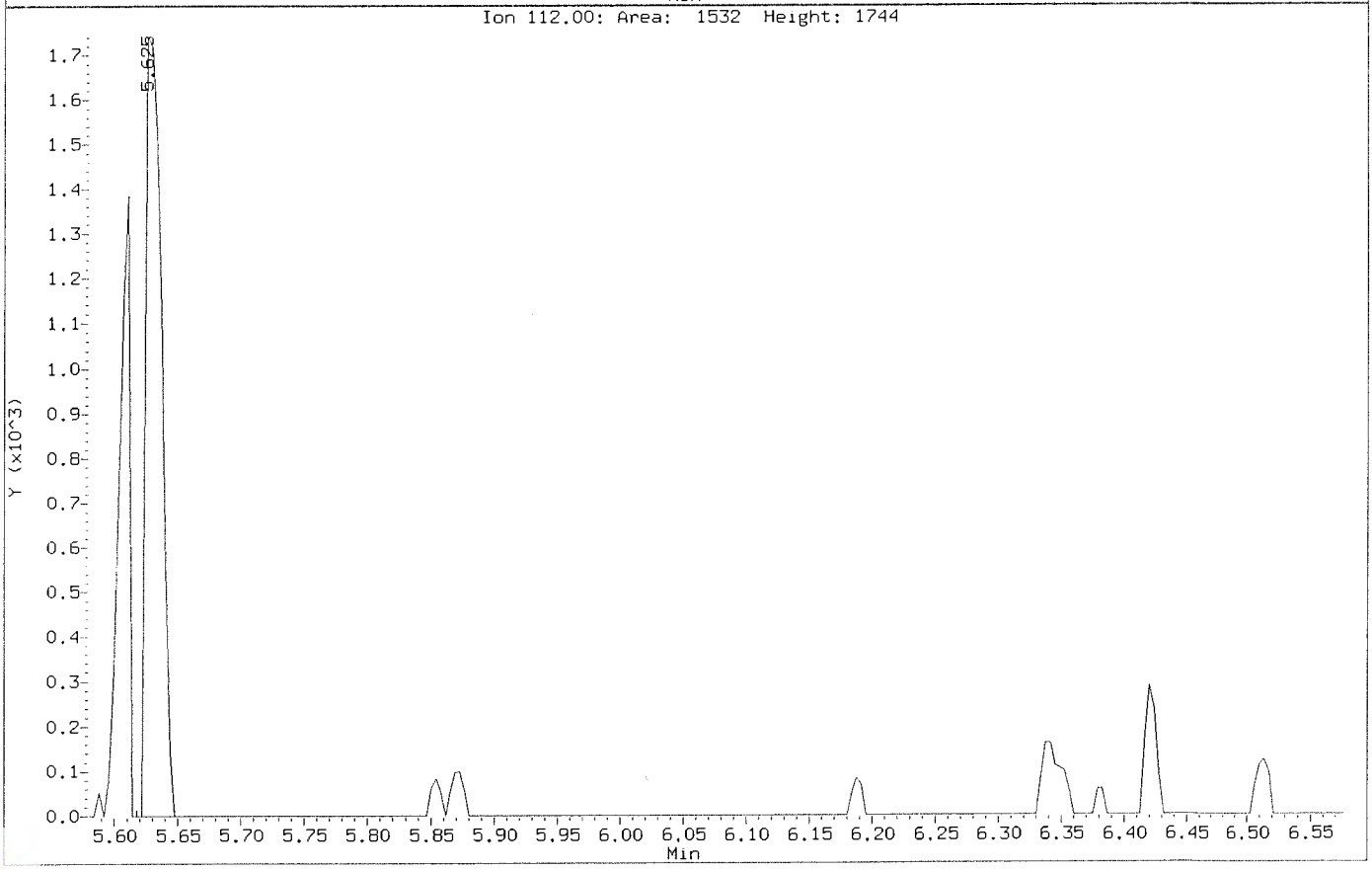




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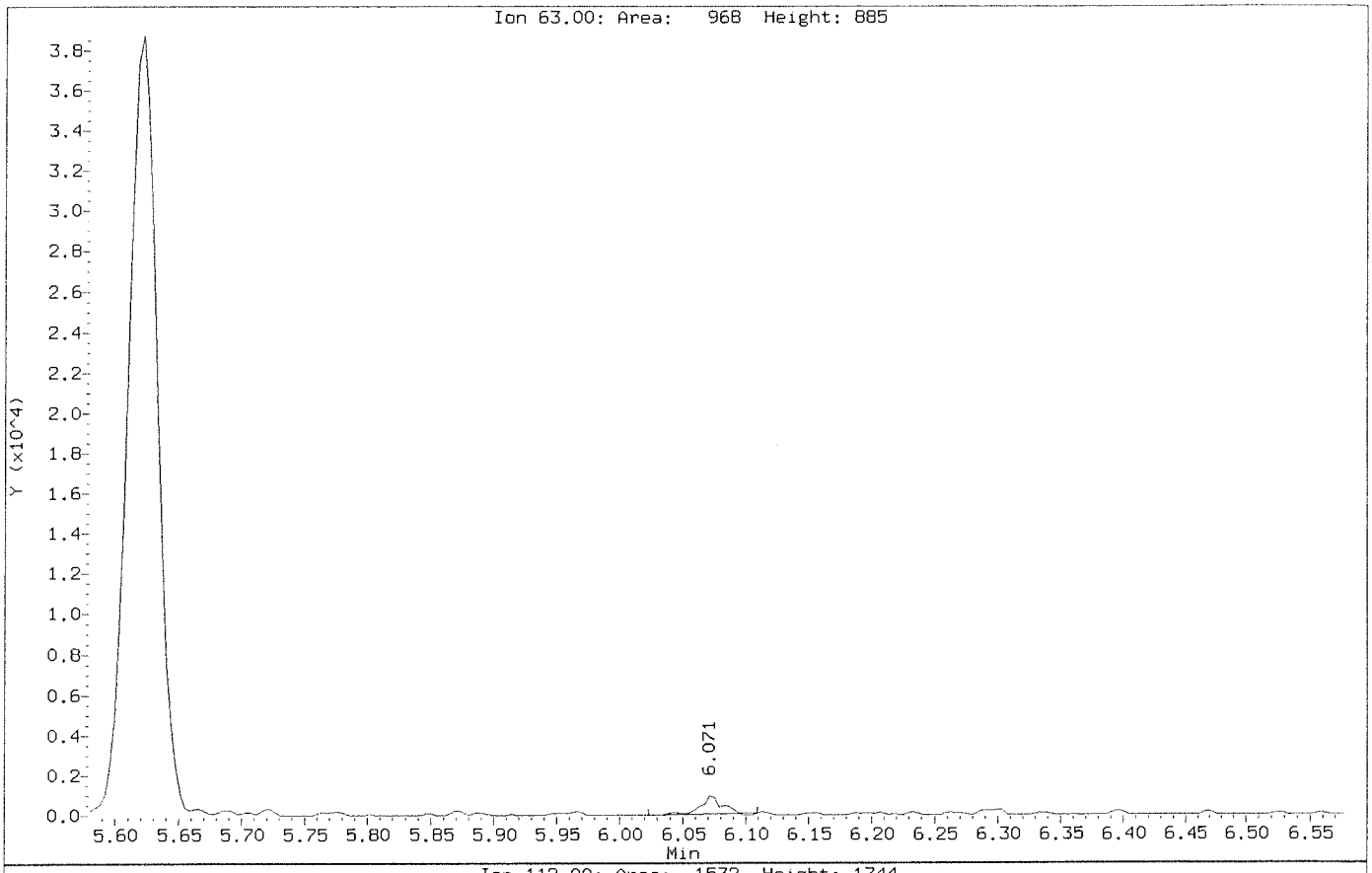
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

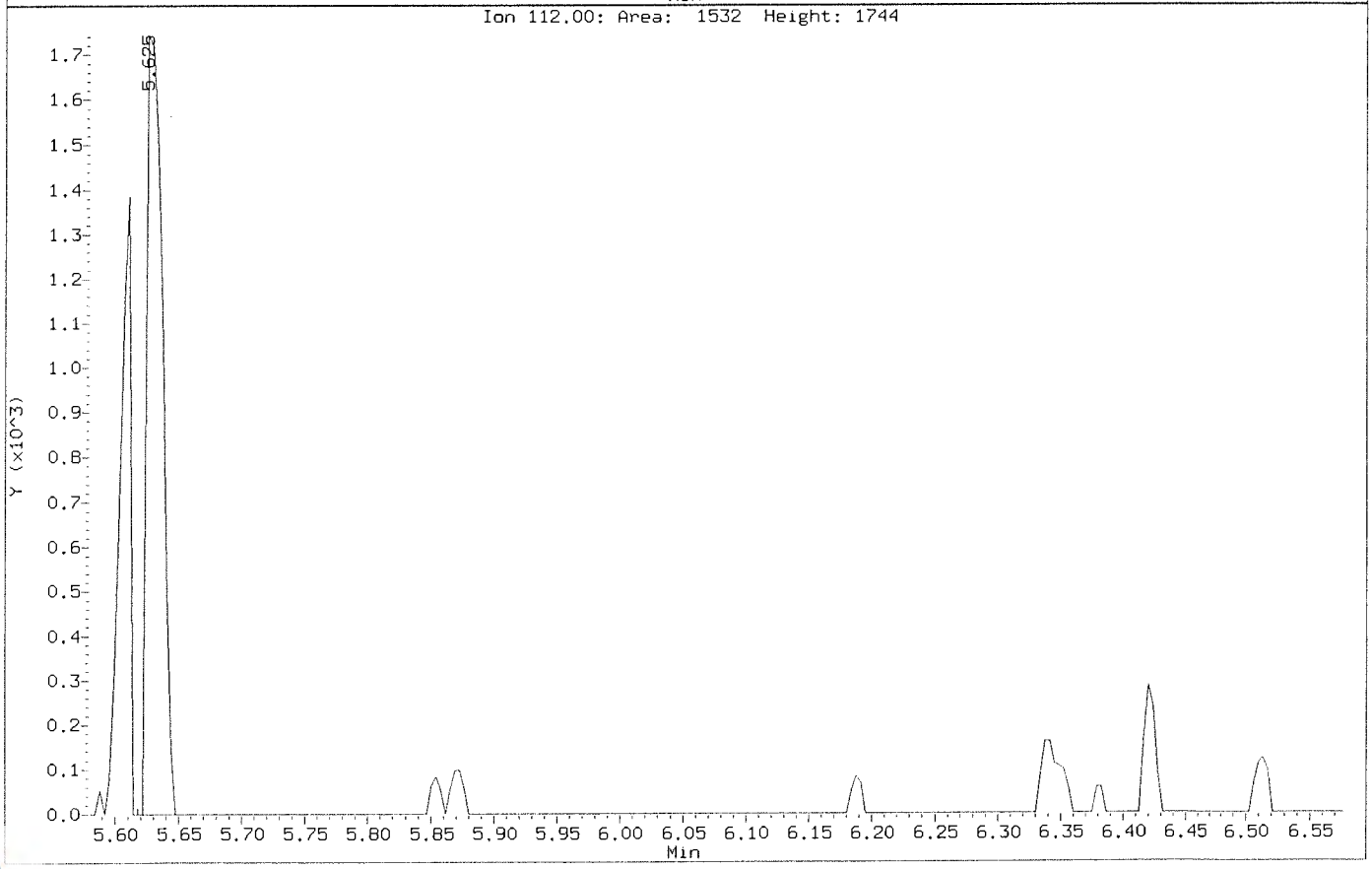




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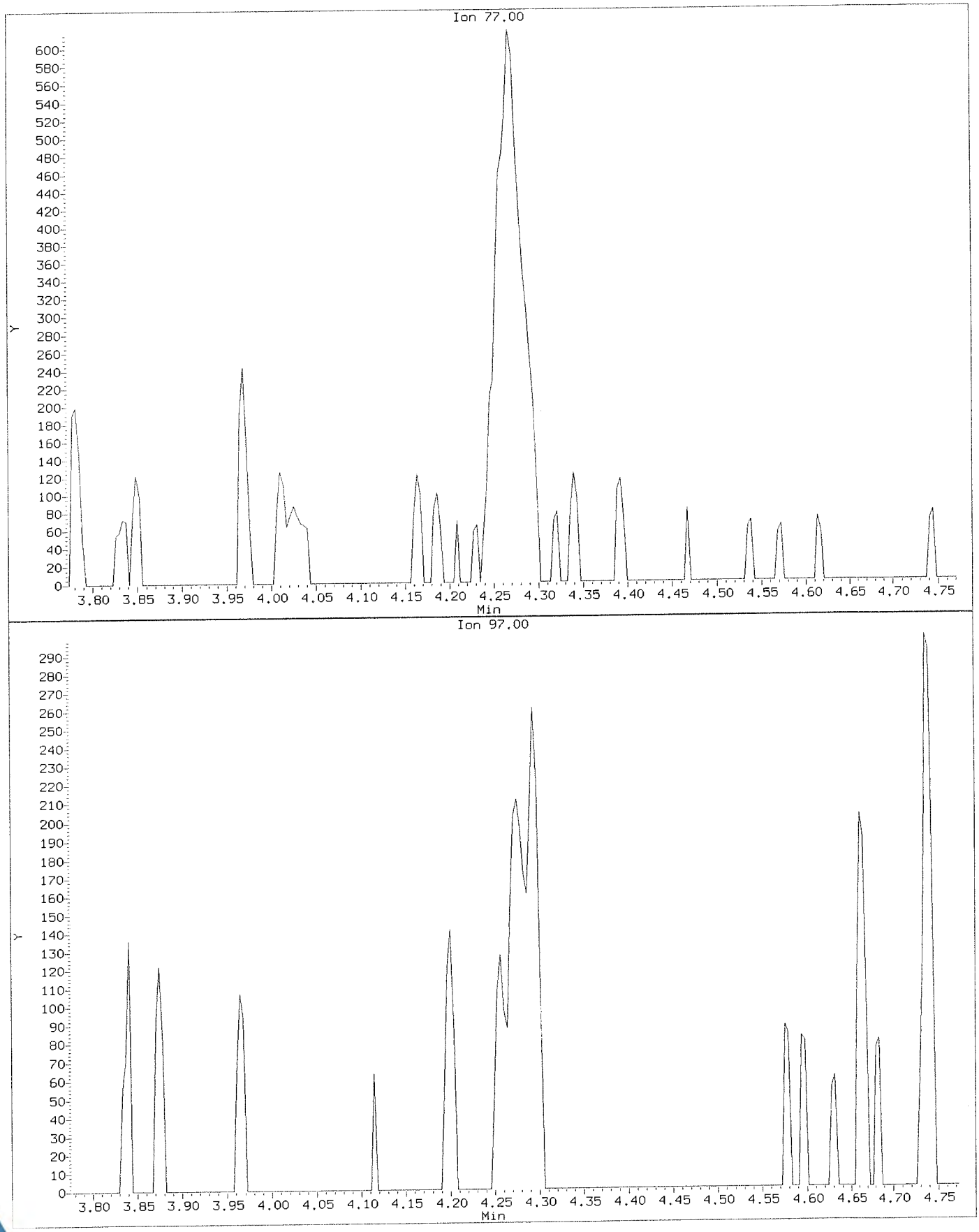
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5





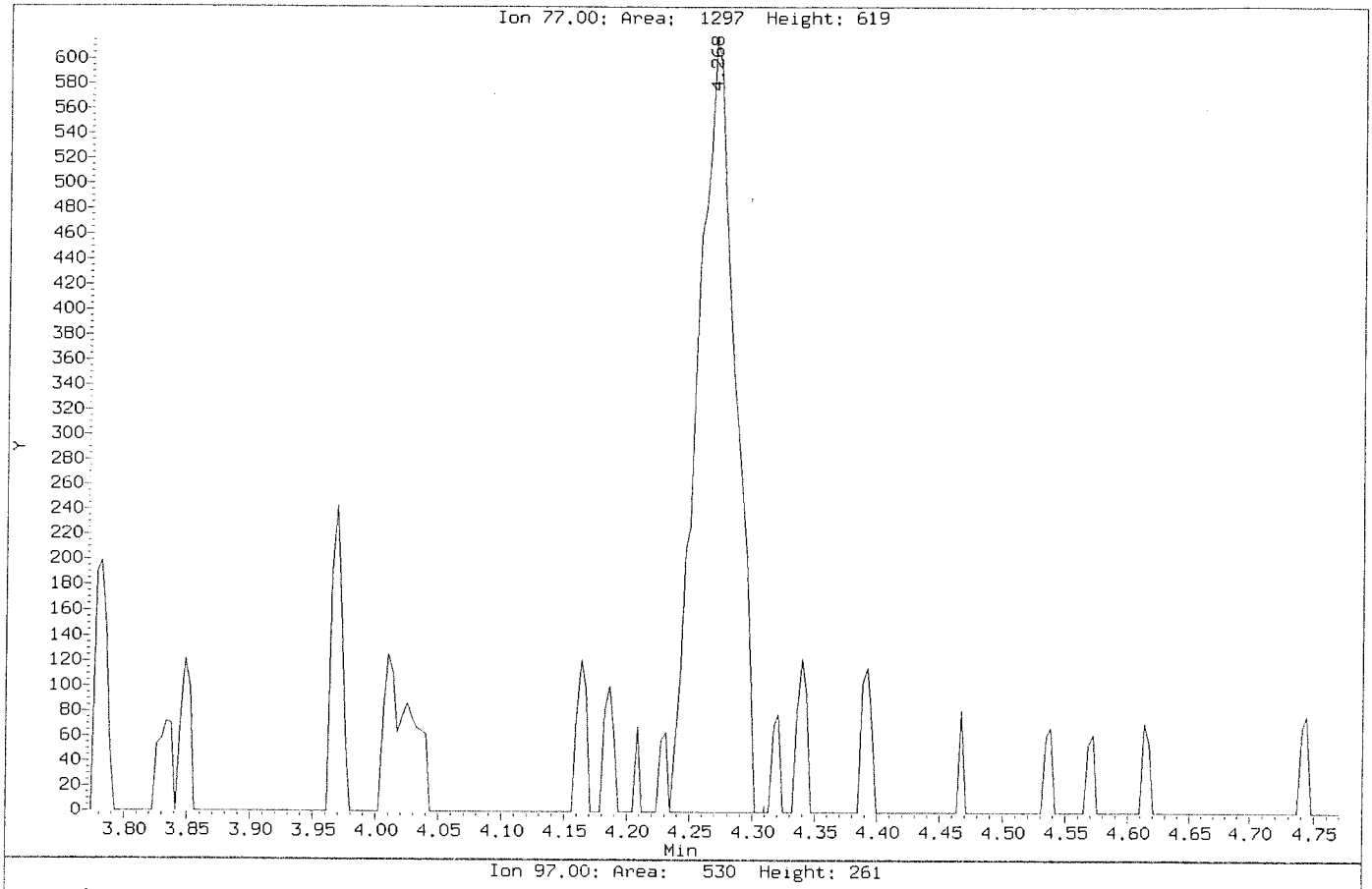
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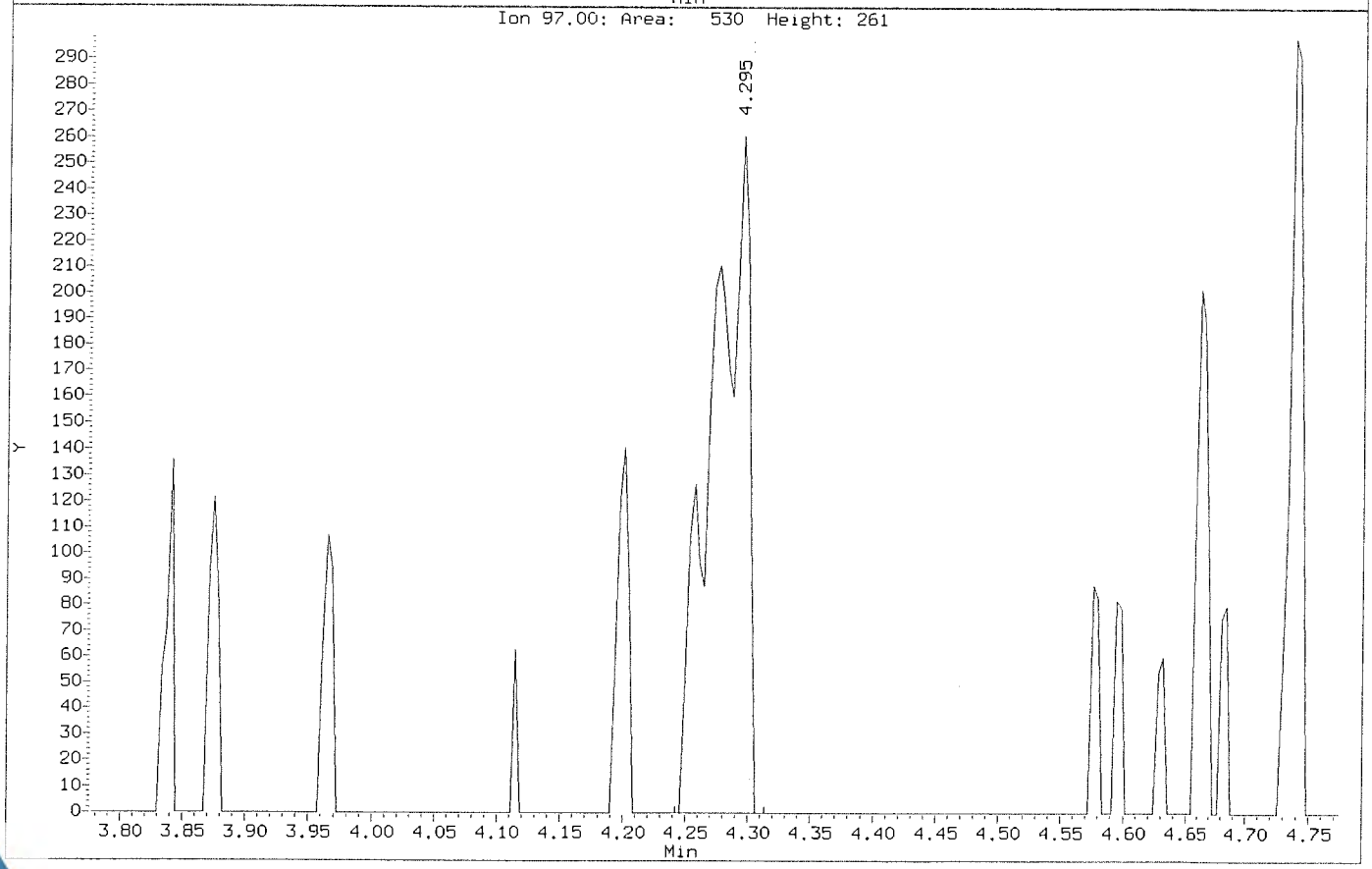
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7



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Instrument: VOA9.i
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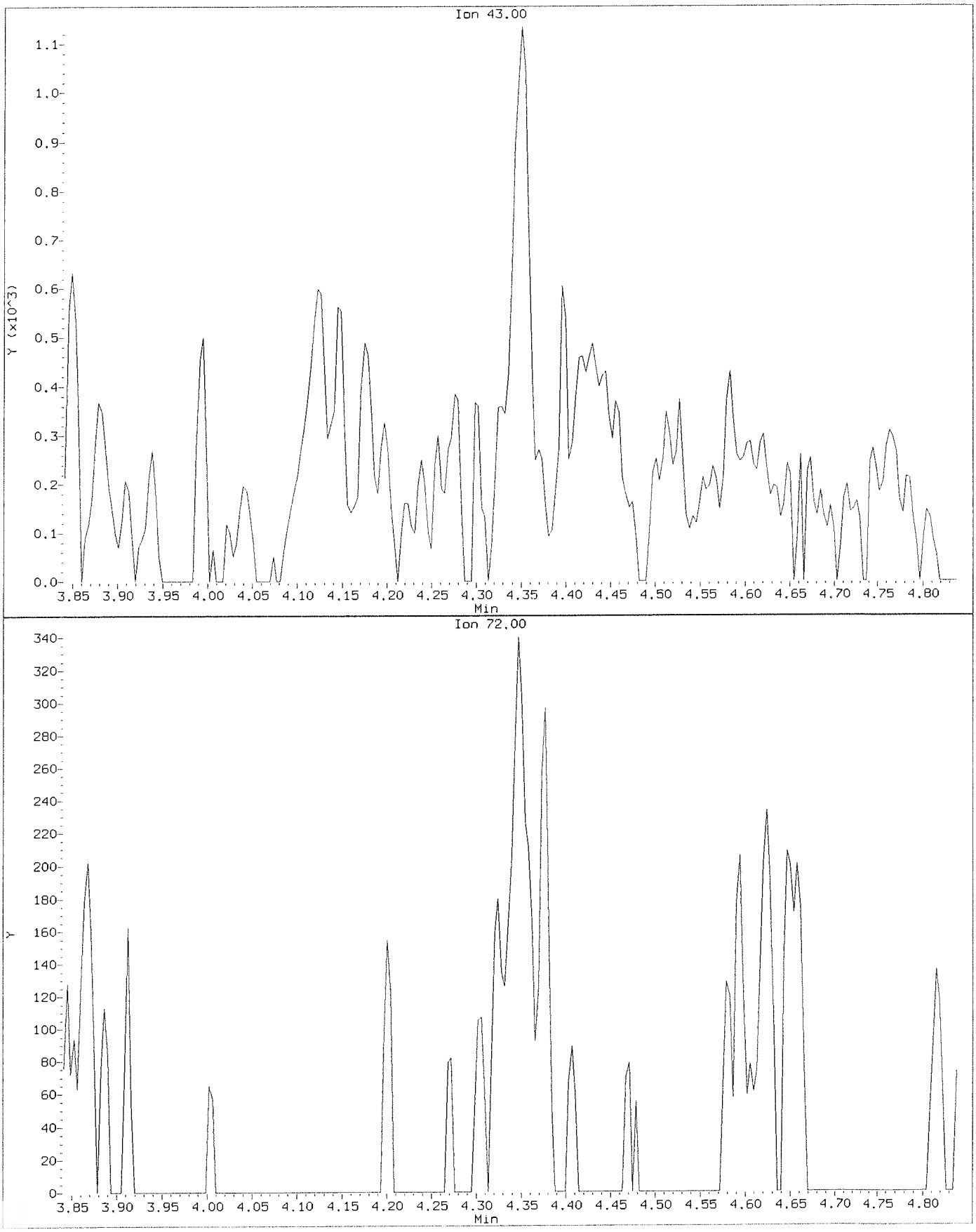
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





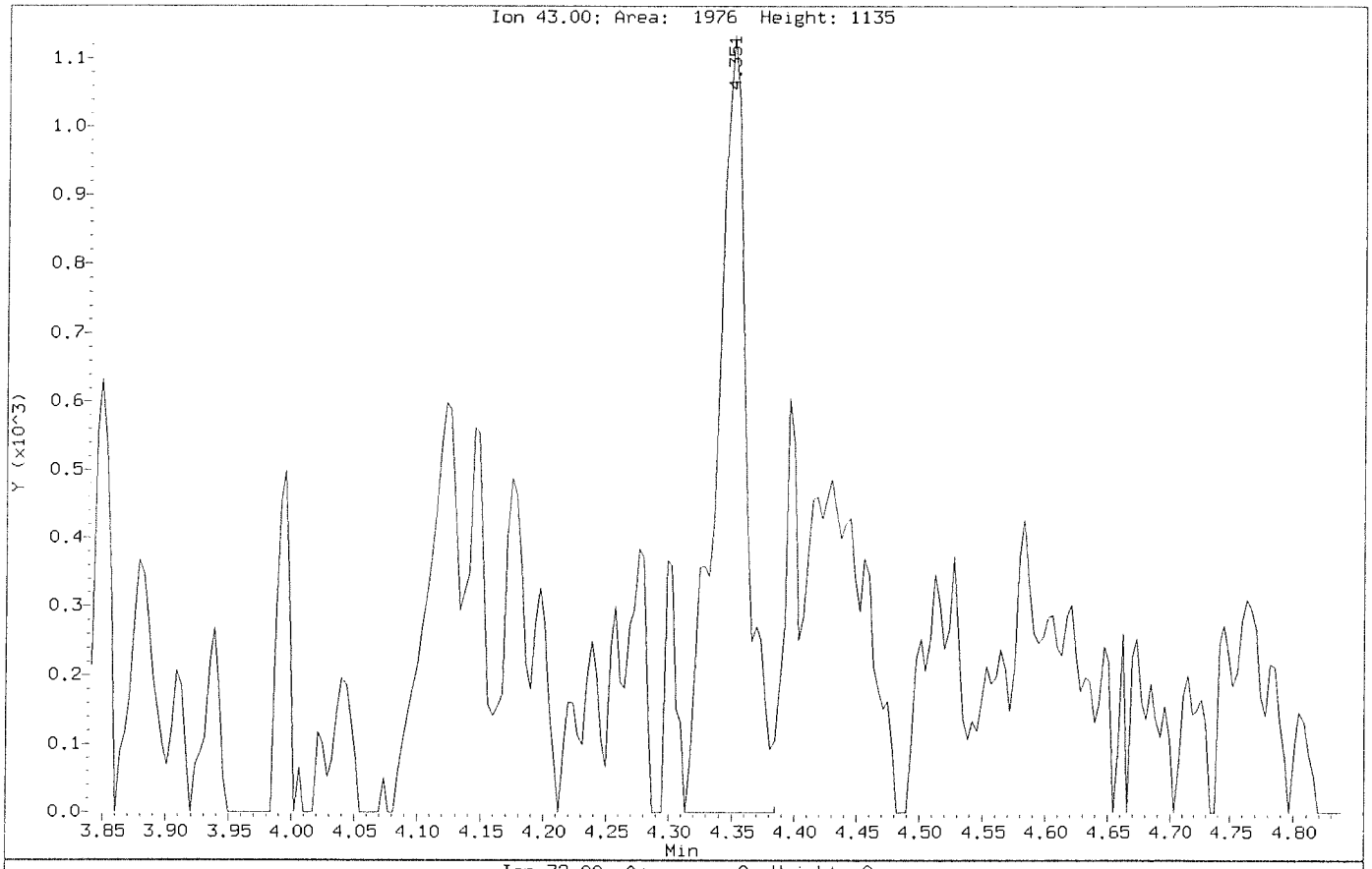
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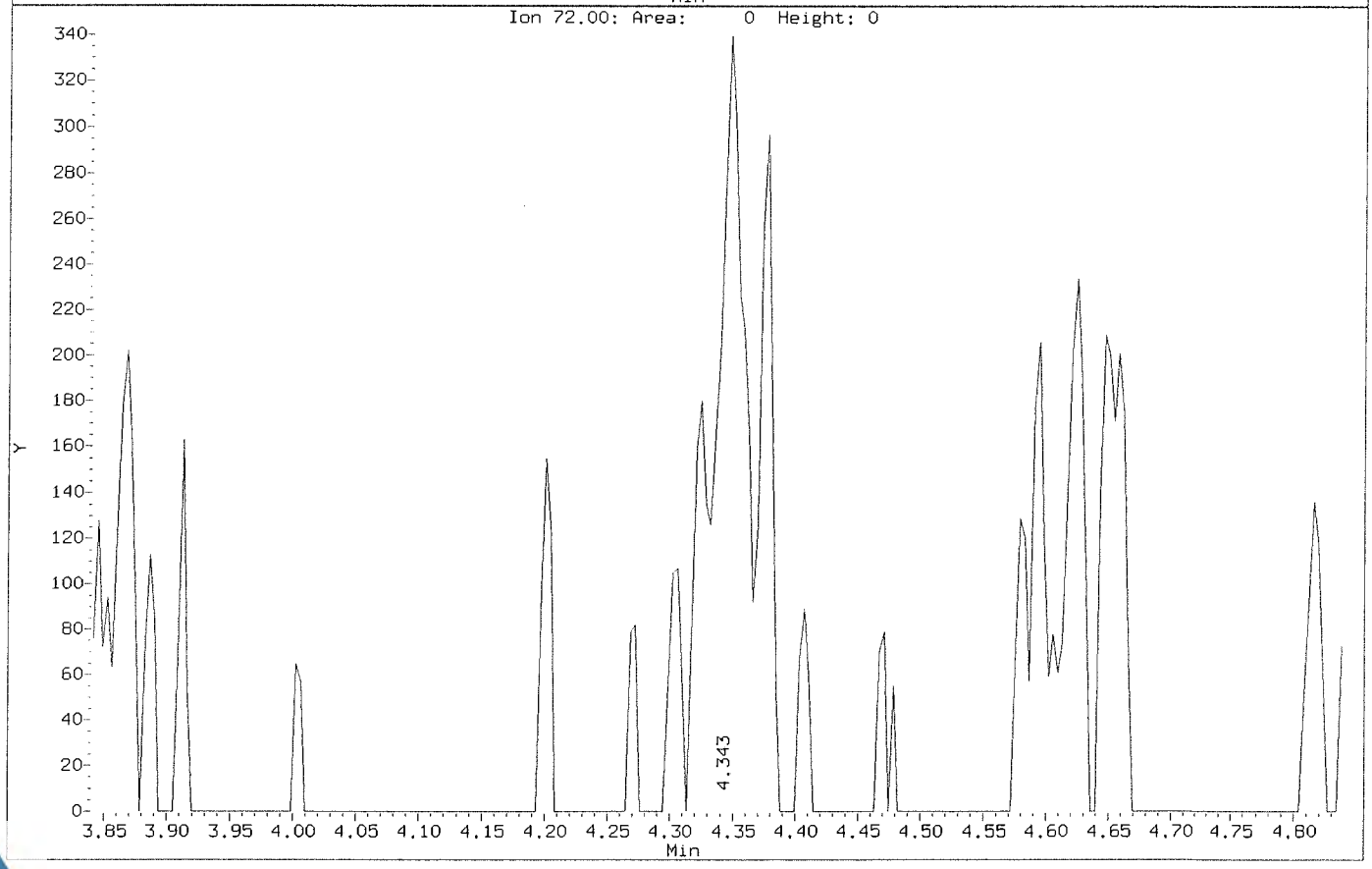
Compound: 2-Butanone
CAS Number: 78-93-3



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Instrument: VOA9.i
Client Sample ID: VSTD000.5

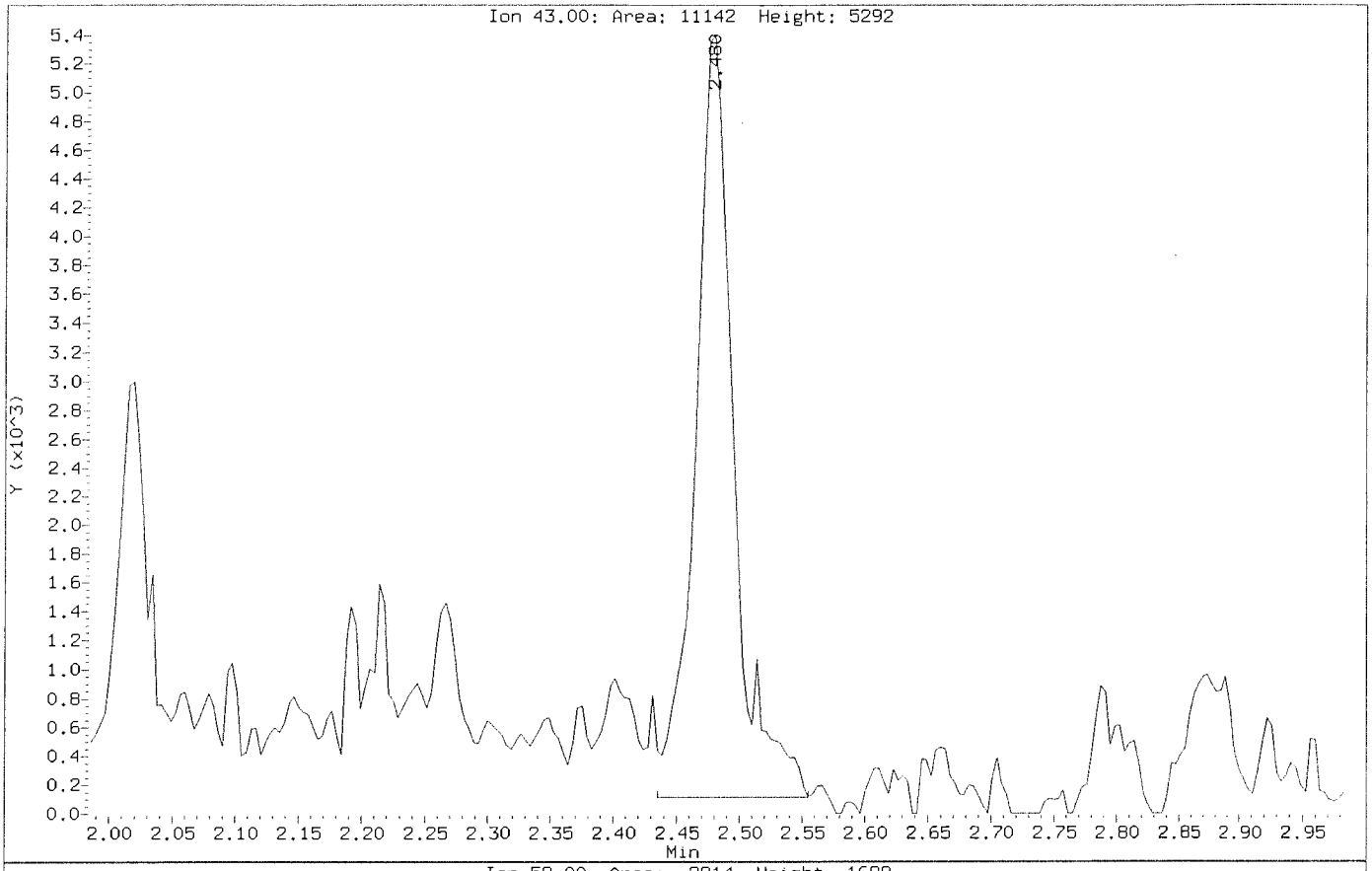
Compound: 2-Butanone
CAS Number: 78-93-3

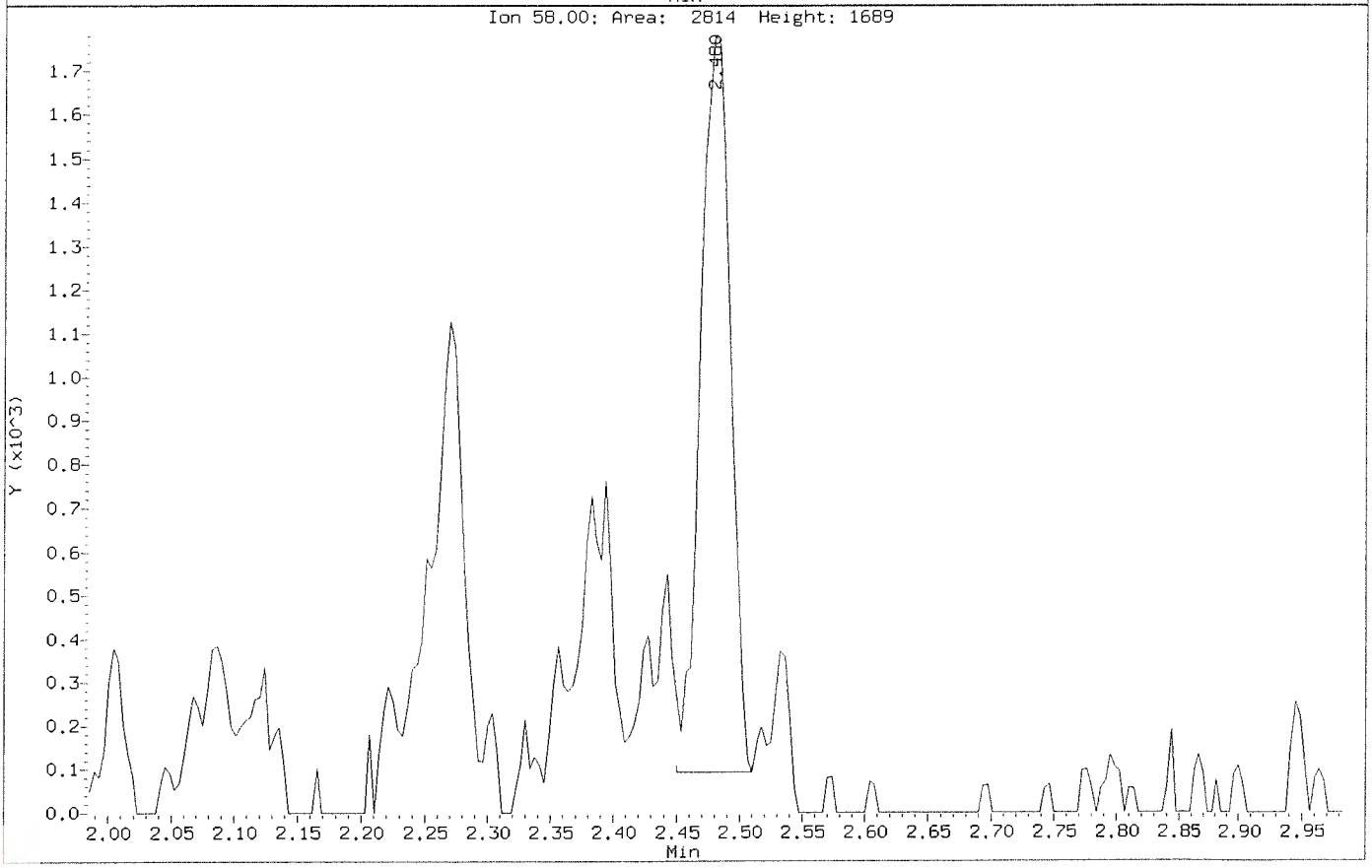




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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

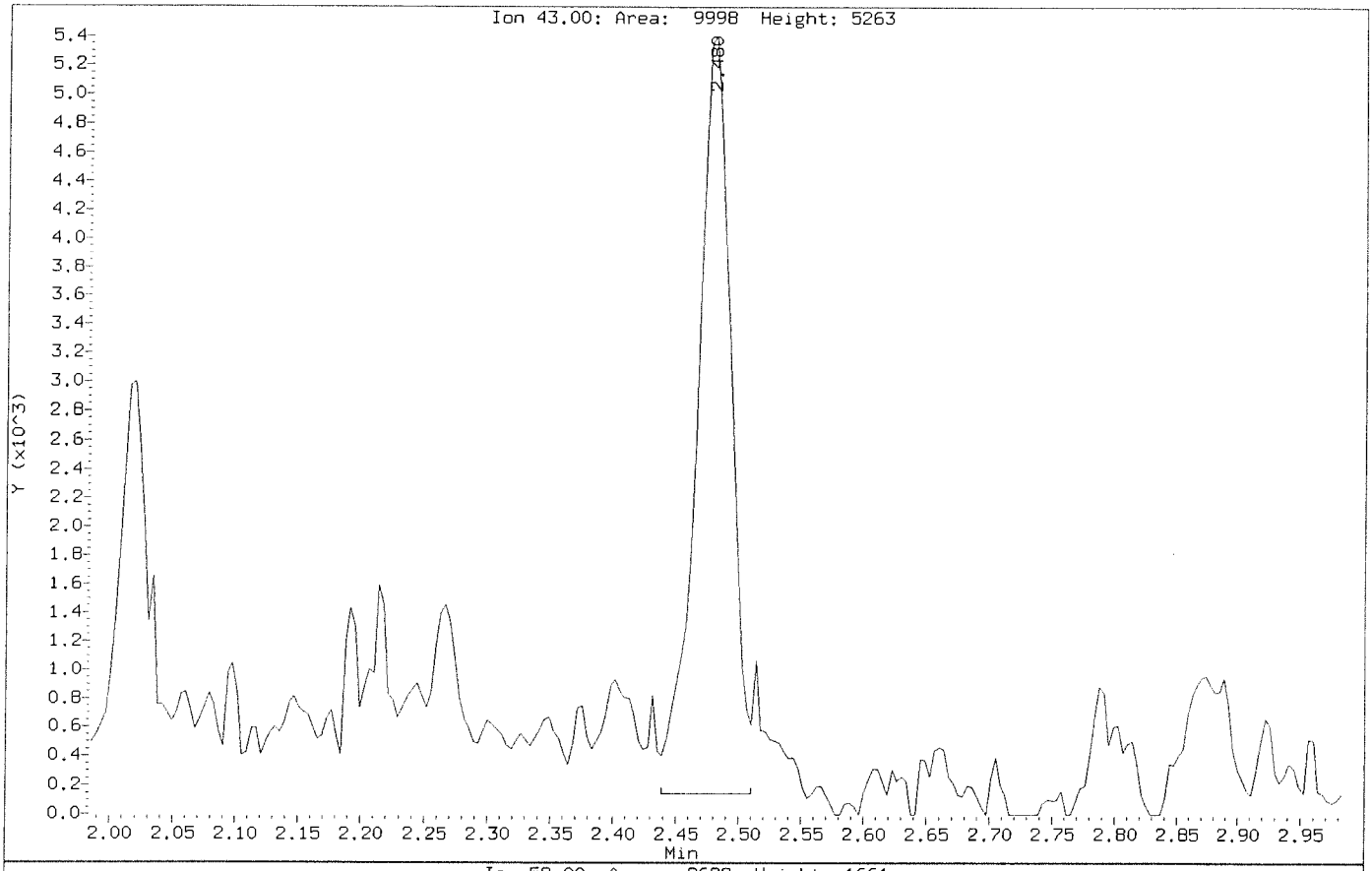
Compound: Acetone
CAS Number: 67-64-1

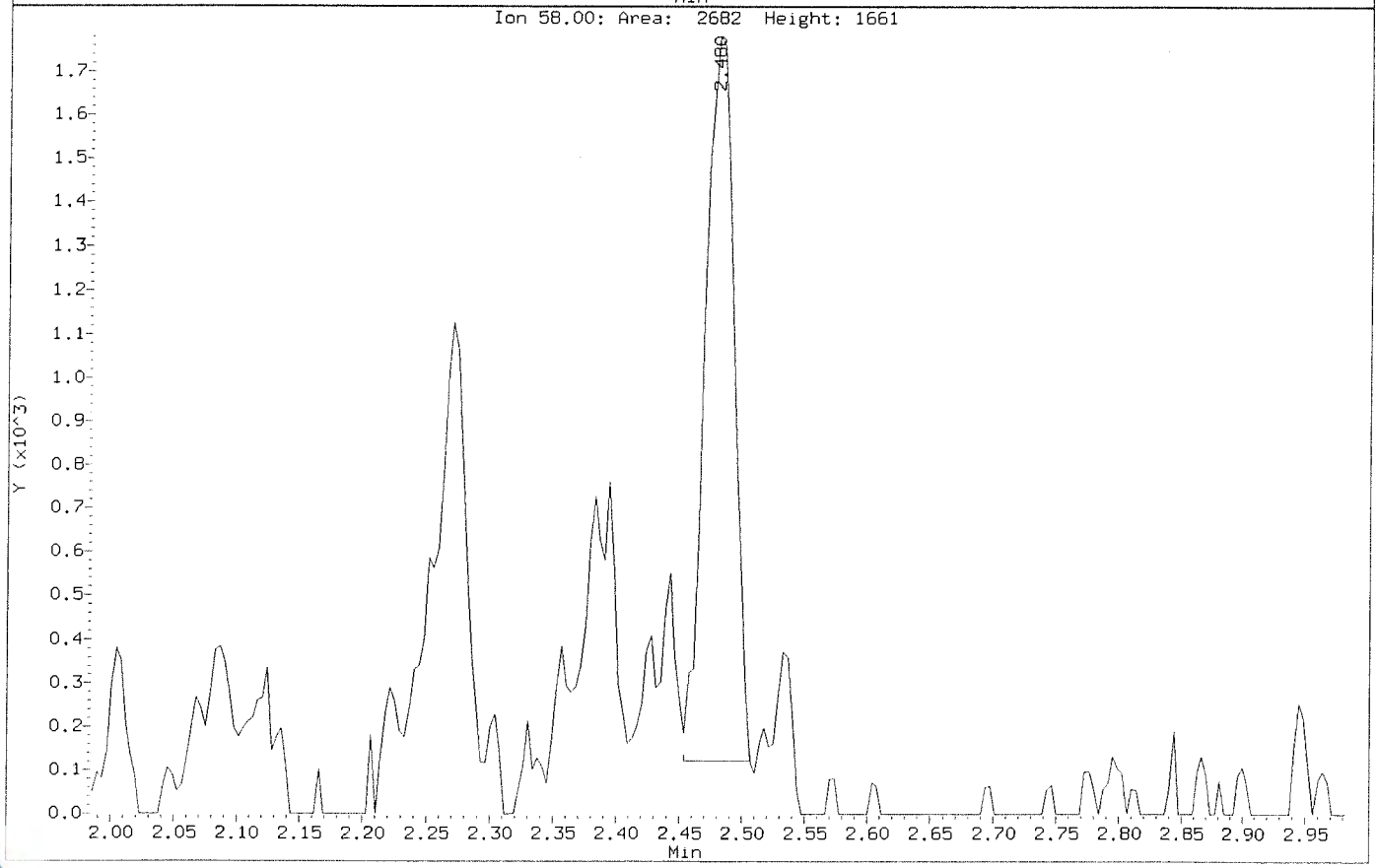




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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

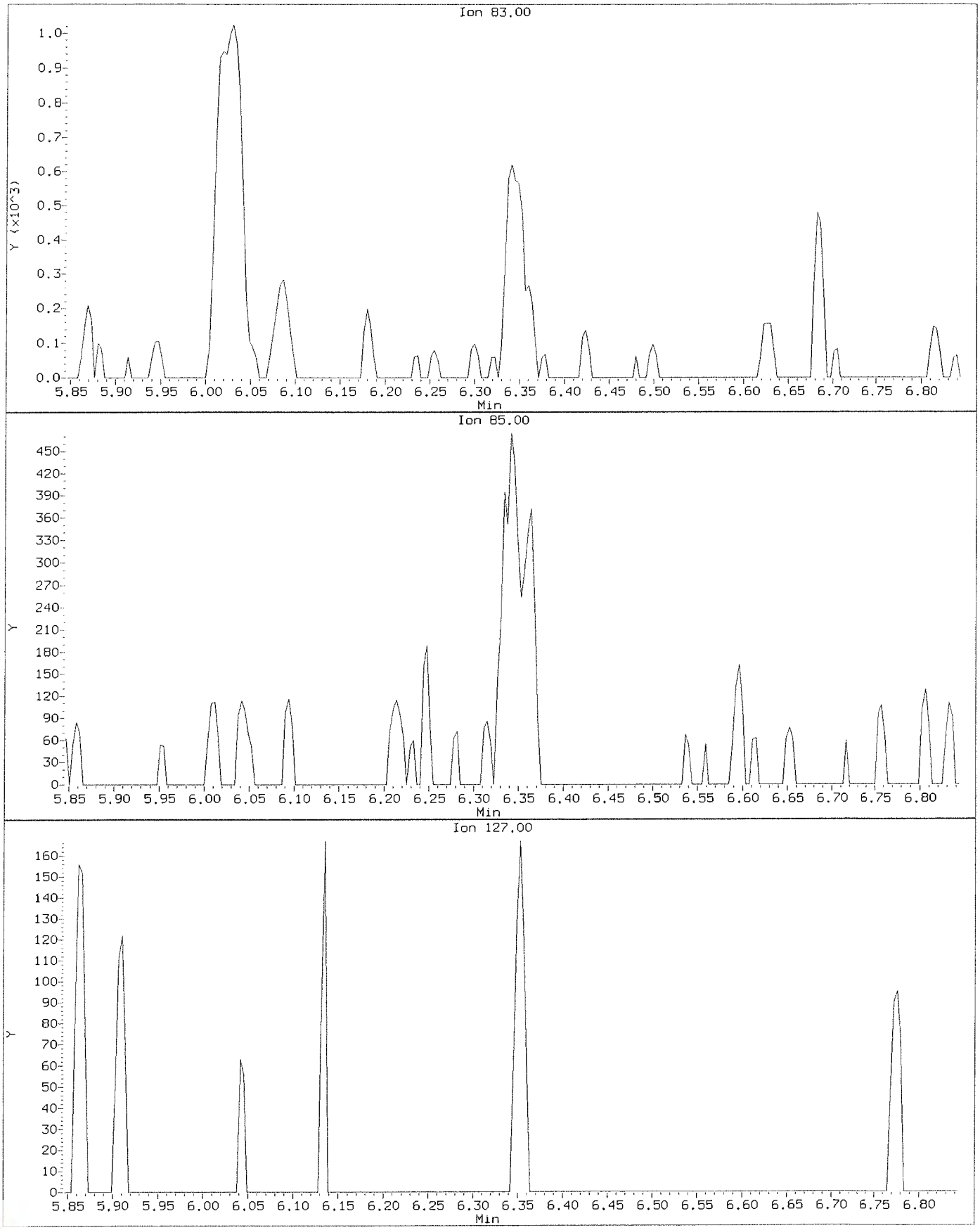
Compound: Acetone
CAS Number: 67-64-1





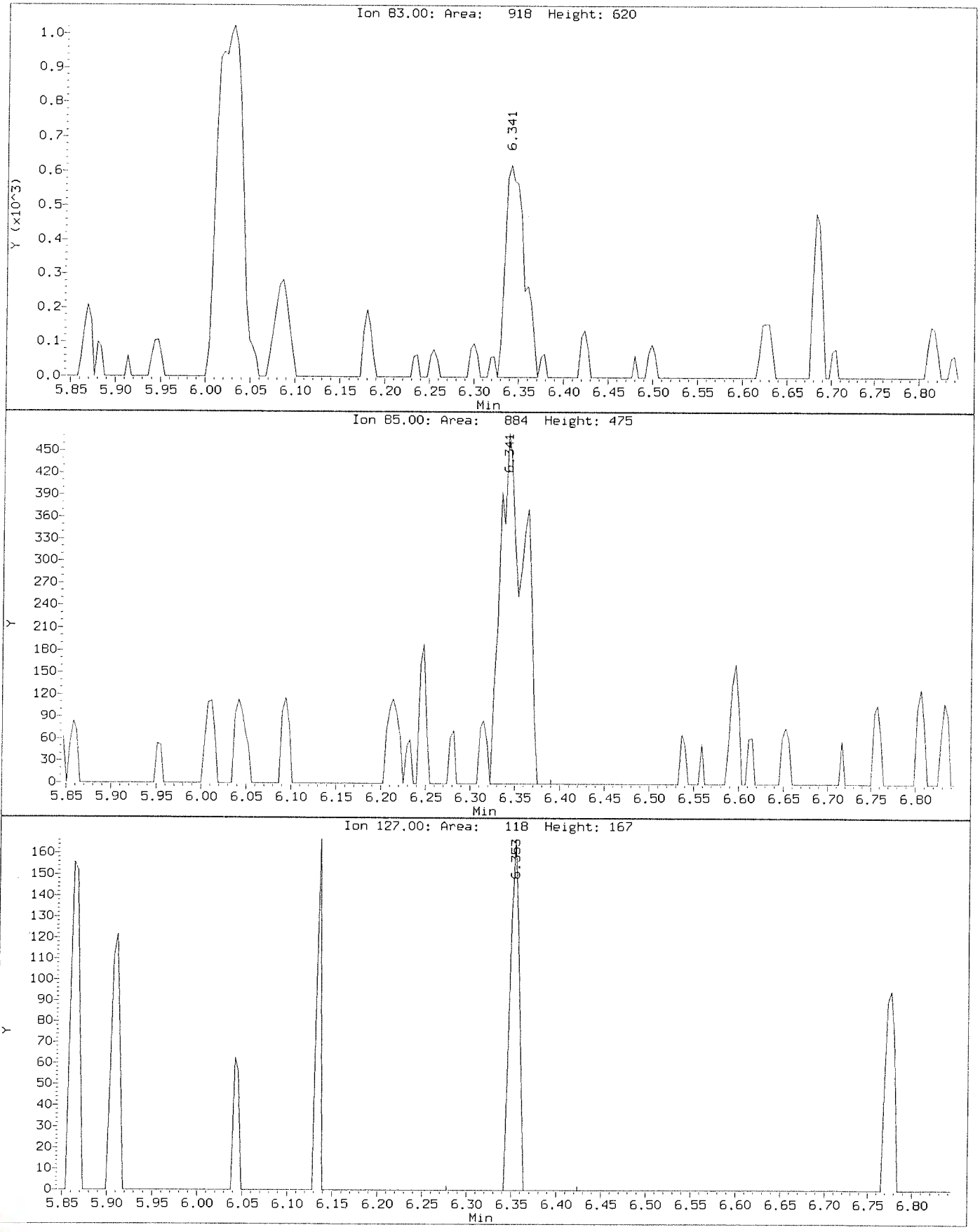
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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromodichloromethane
CAS Number: 75-27-4



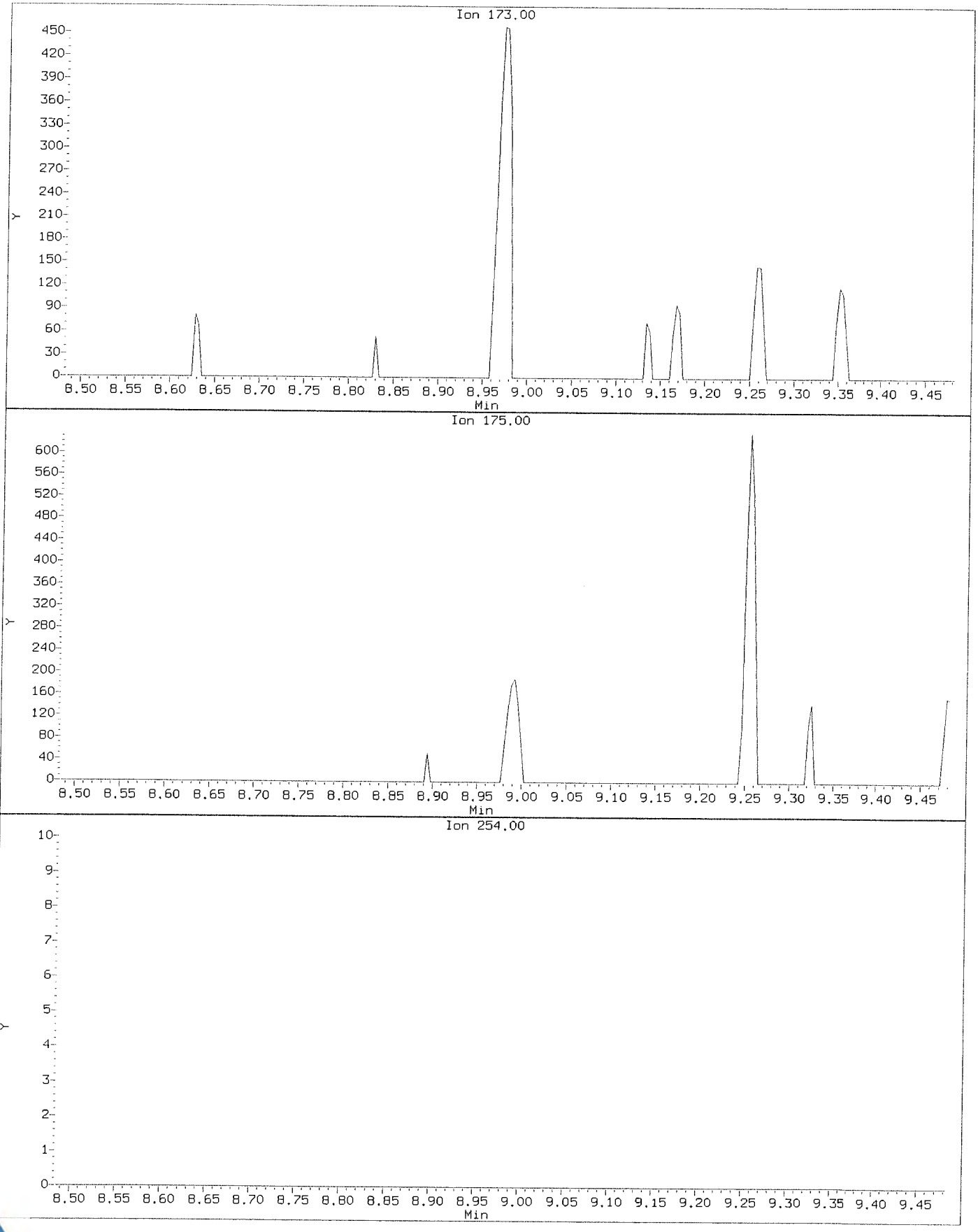
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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromodichloromethane
CAS Number: 75-27-4



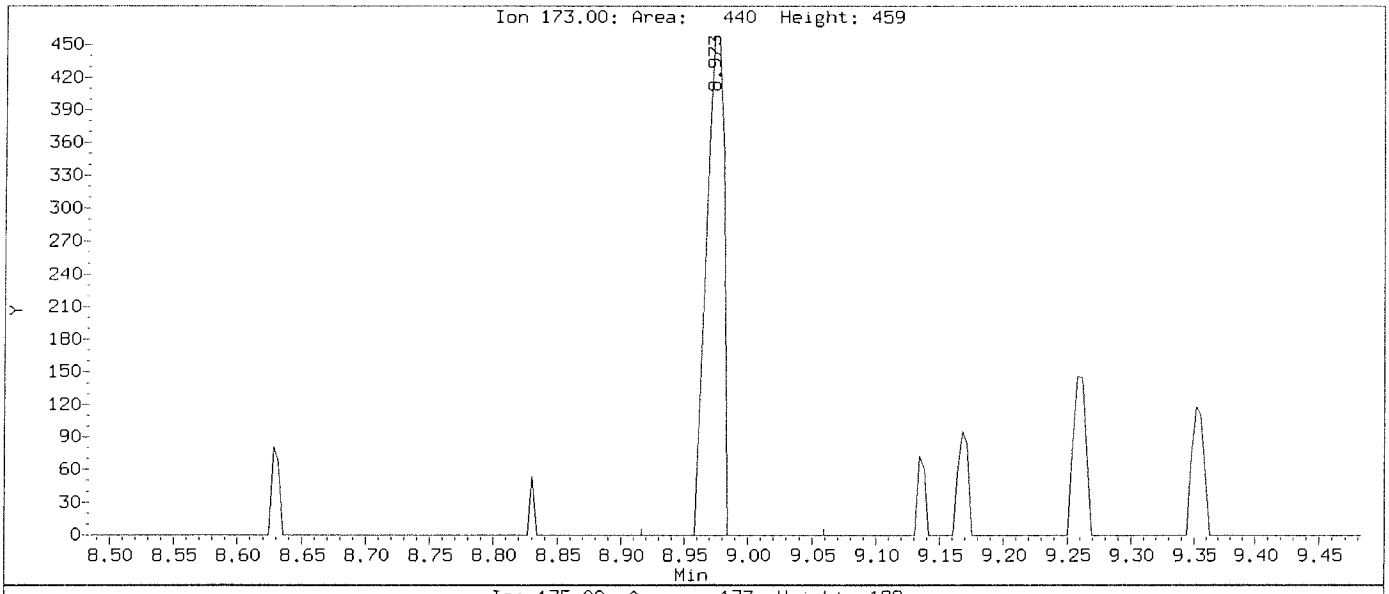
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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

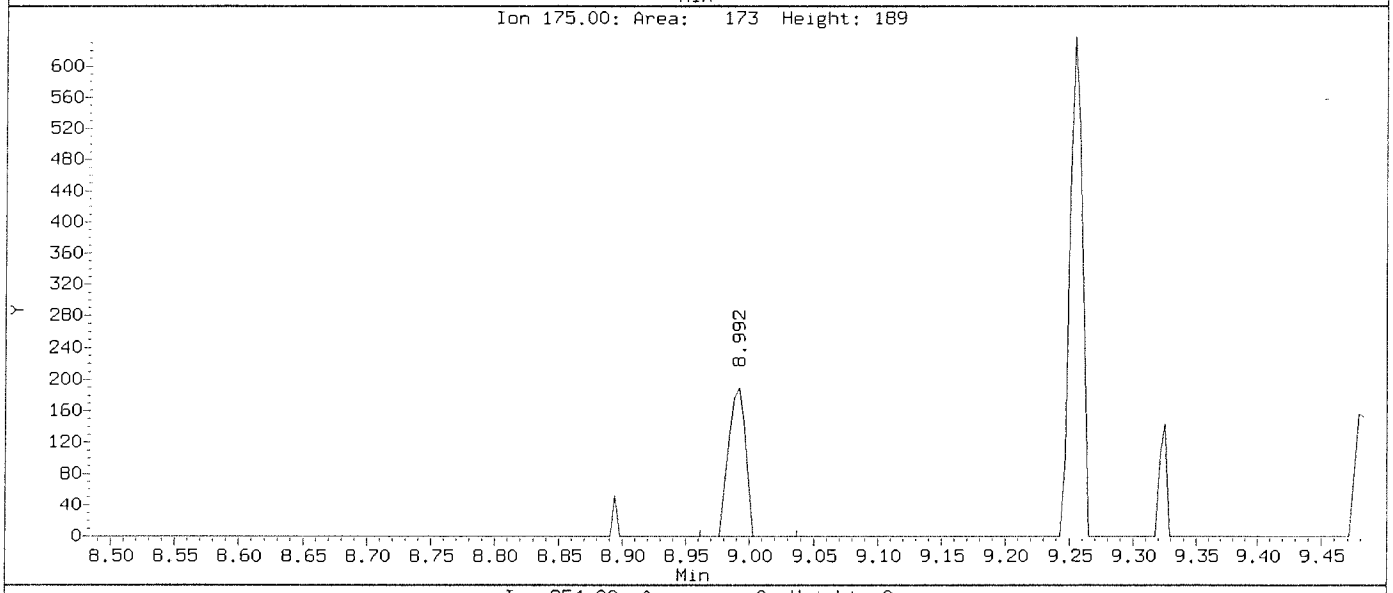
Compound: Bromoform
CAS Number: 75-25-2

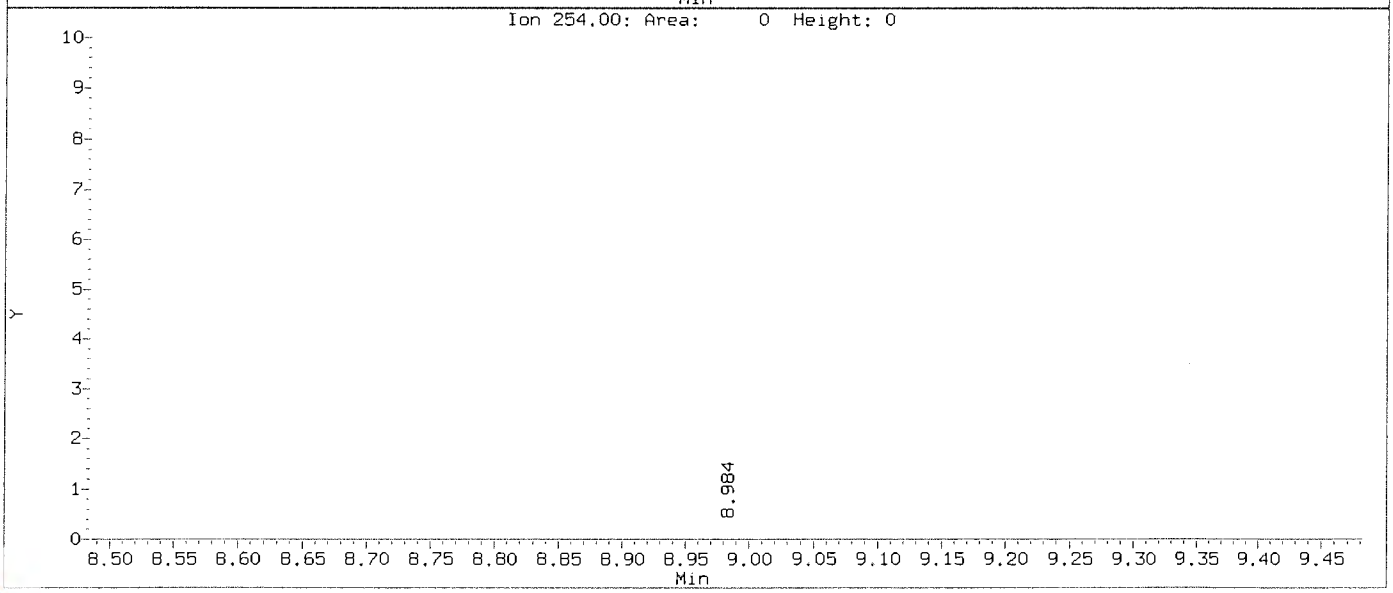


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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromoform
CAS Number: 75-25-2

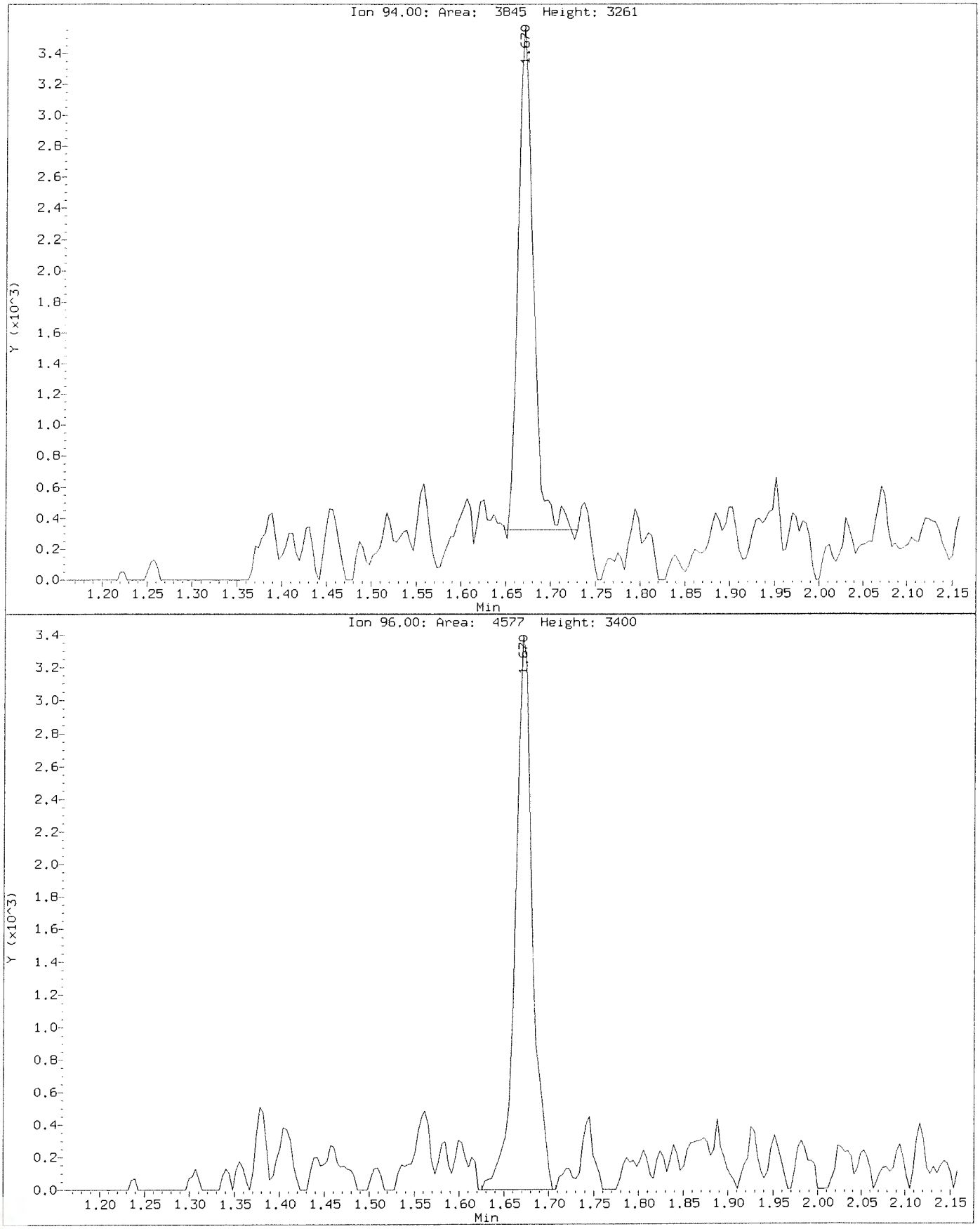






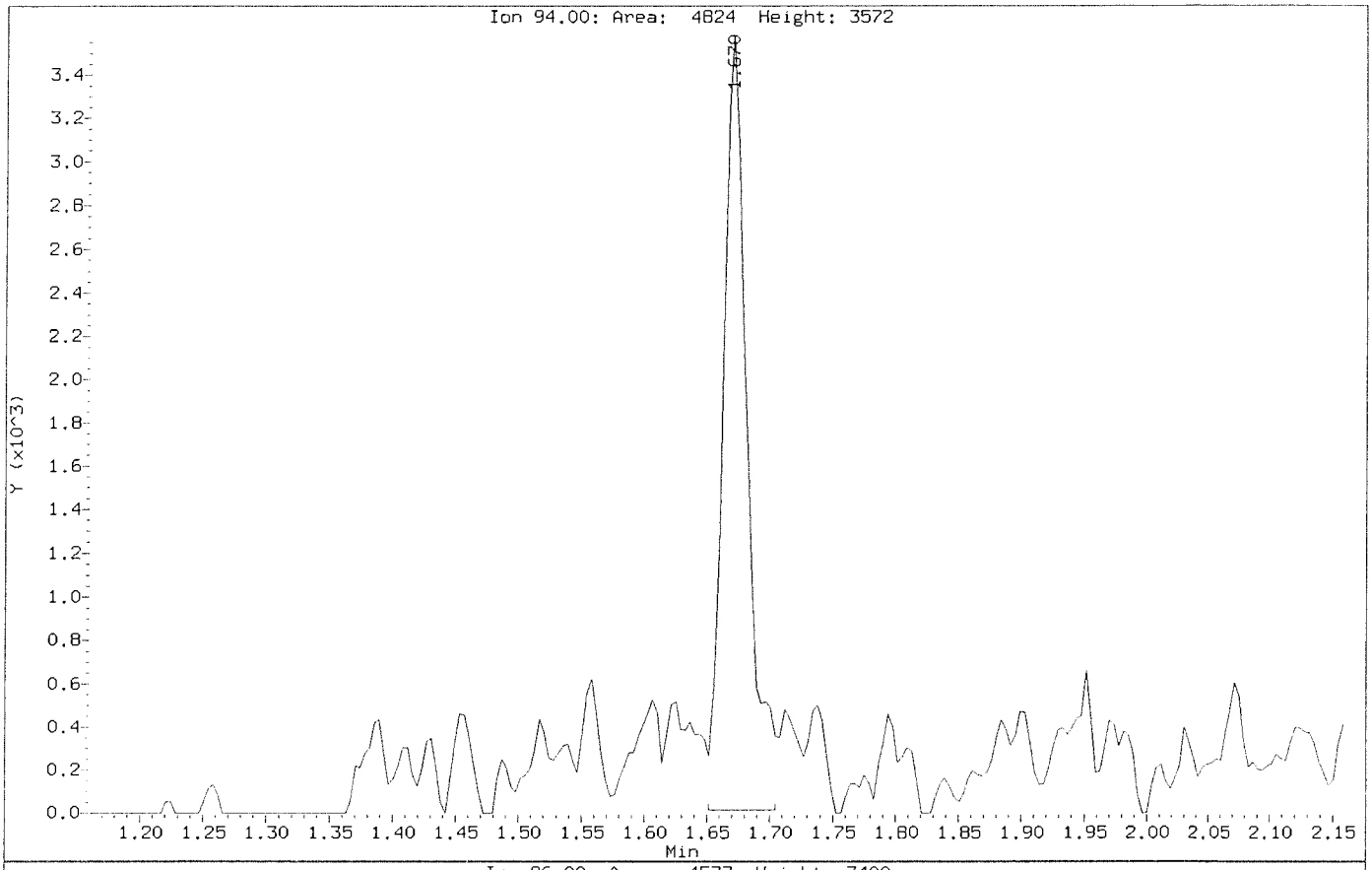
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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

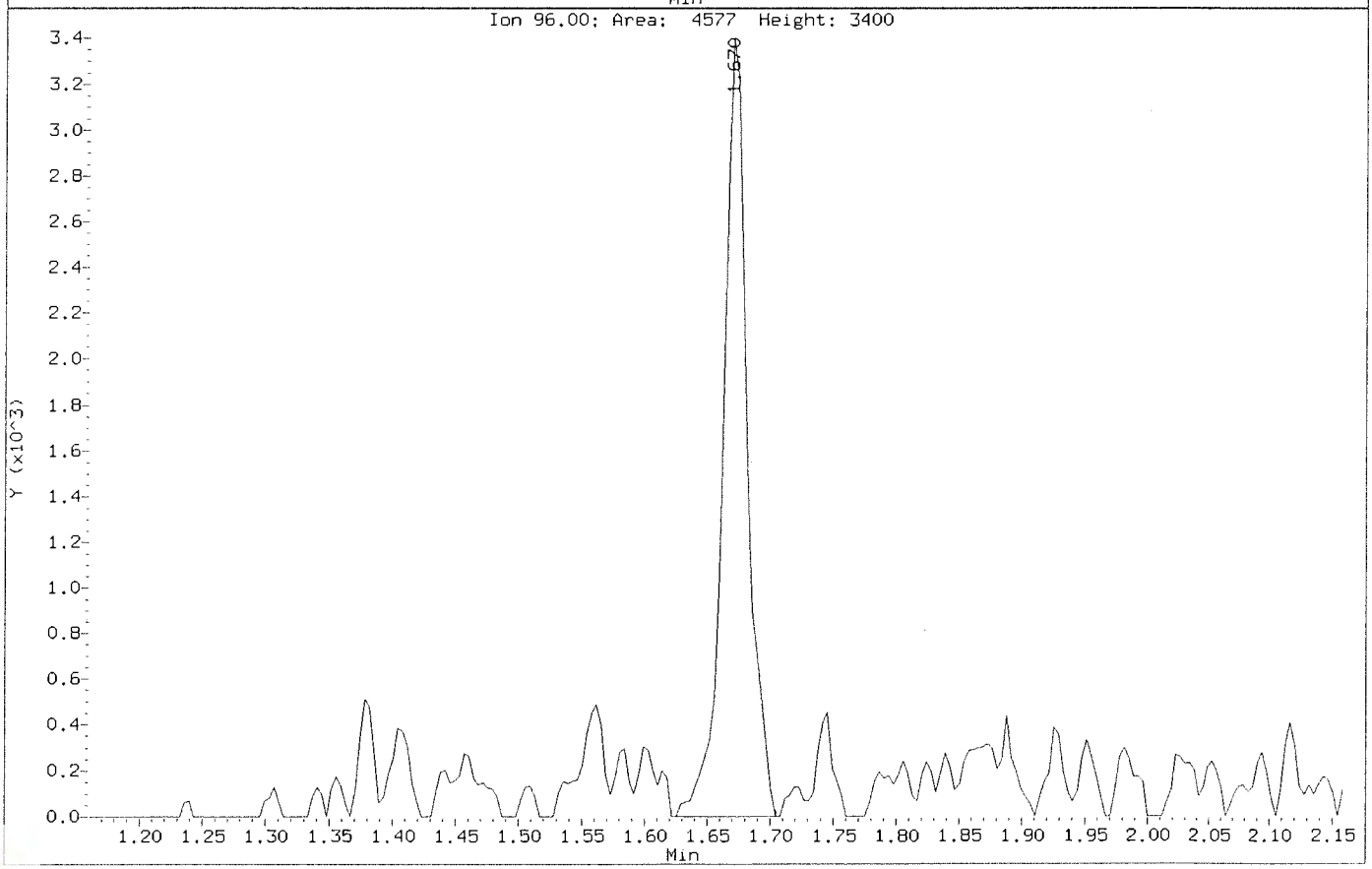
Compound: Bromomethane
CAS Number: 74-83-9



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D
Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

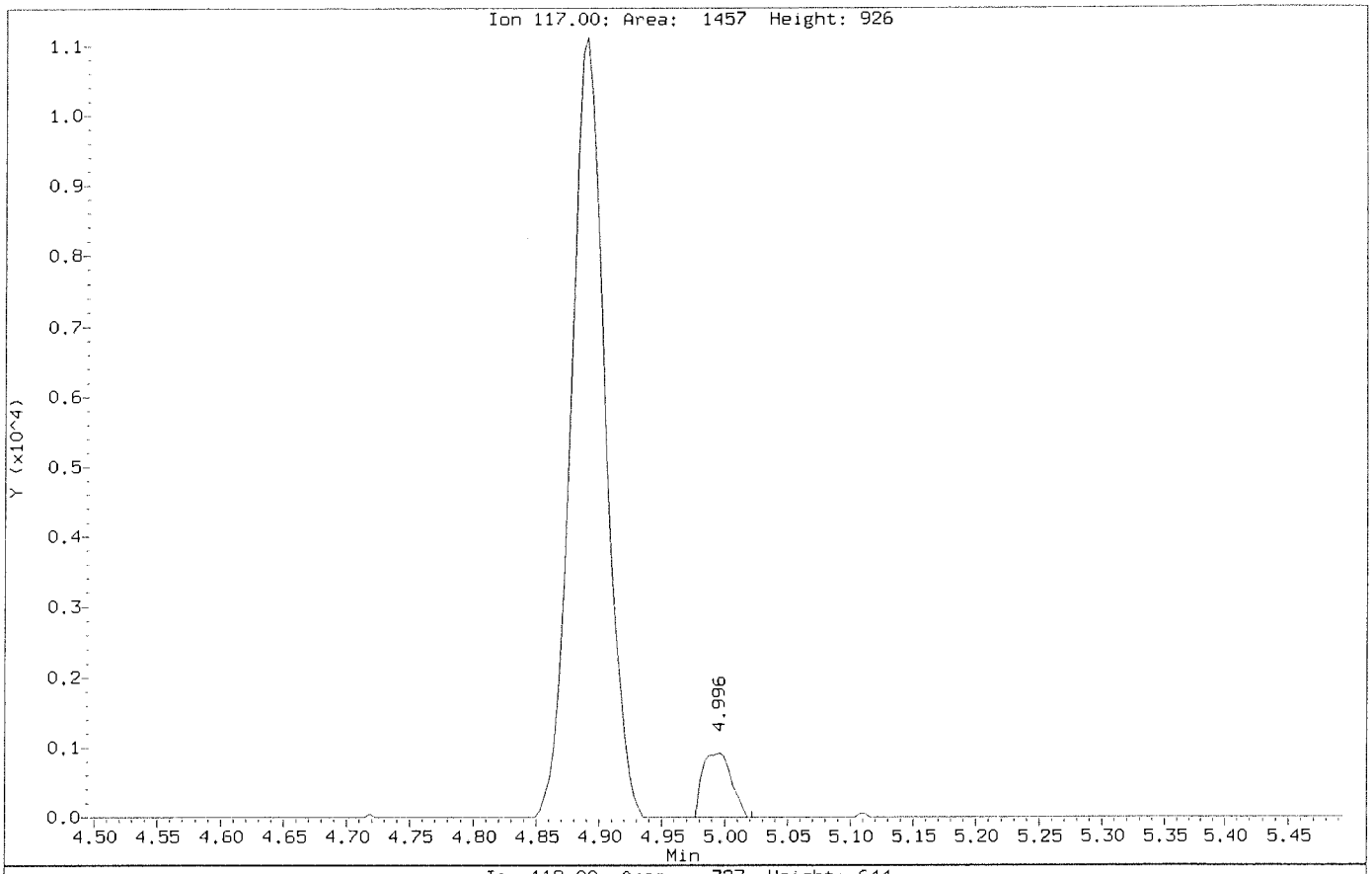
Compound: Bromomethane
CAS Number: 74-83-9

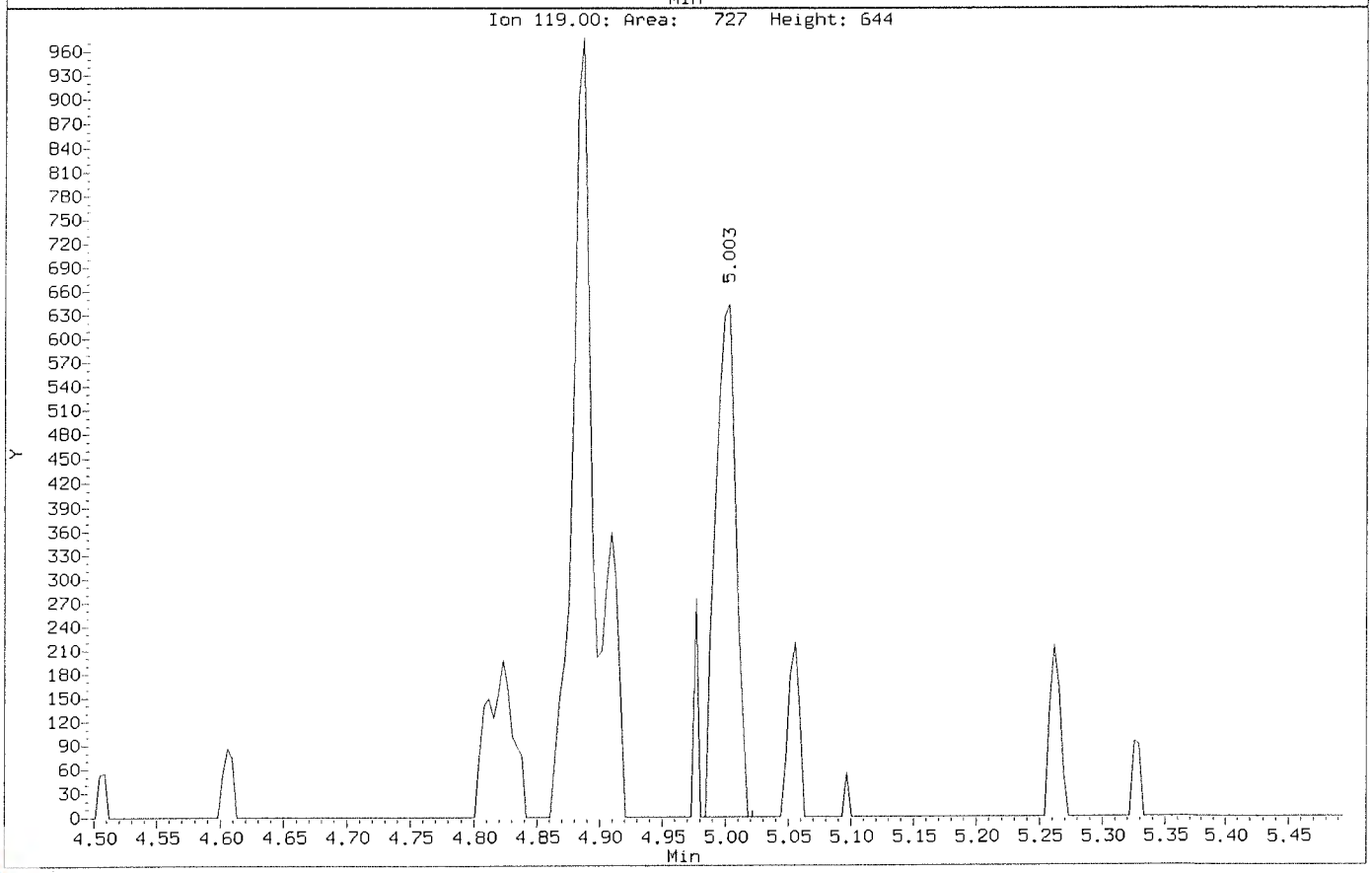




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Instrument: VOA9.i
Client Sample ID: VSTD000.5

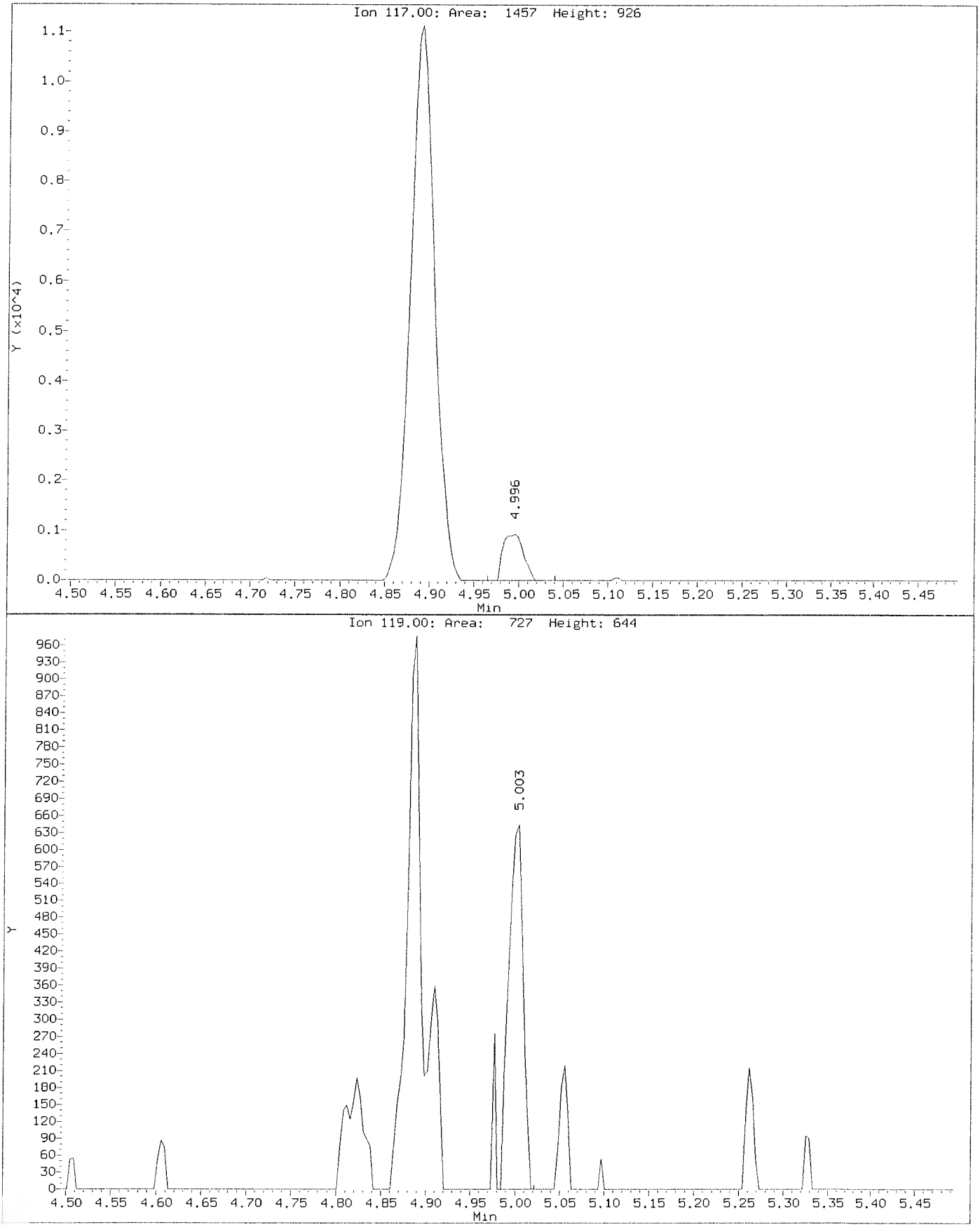
Compound: Carbon Tetrachloride
CAS Number: 56-23-5





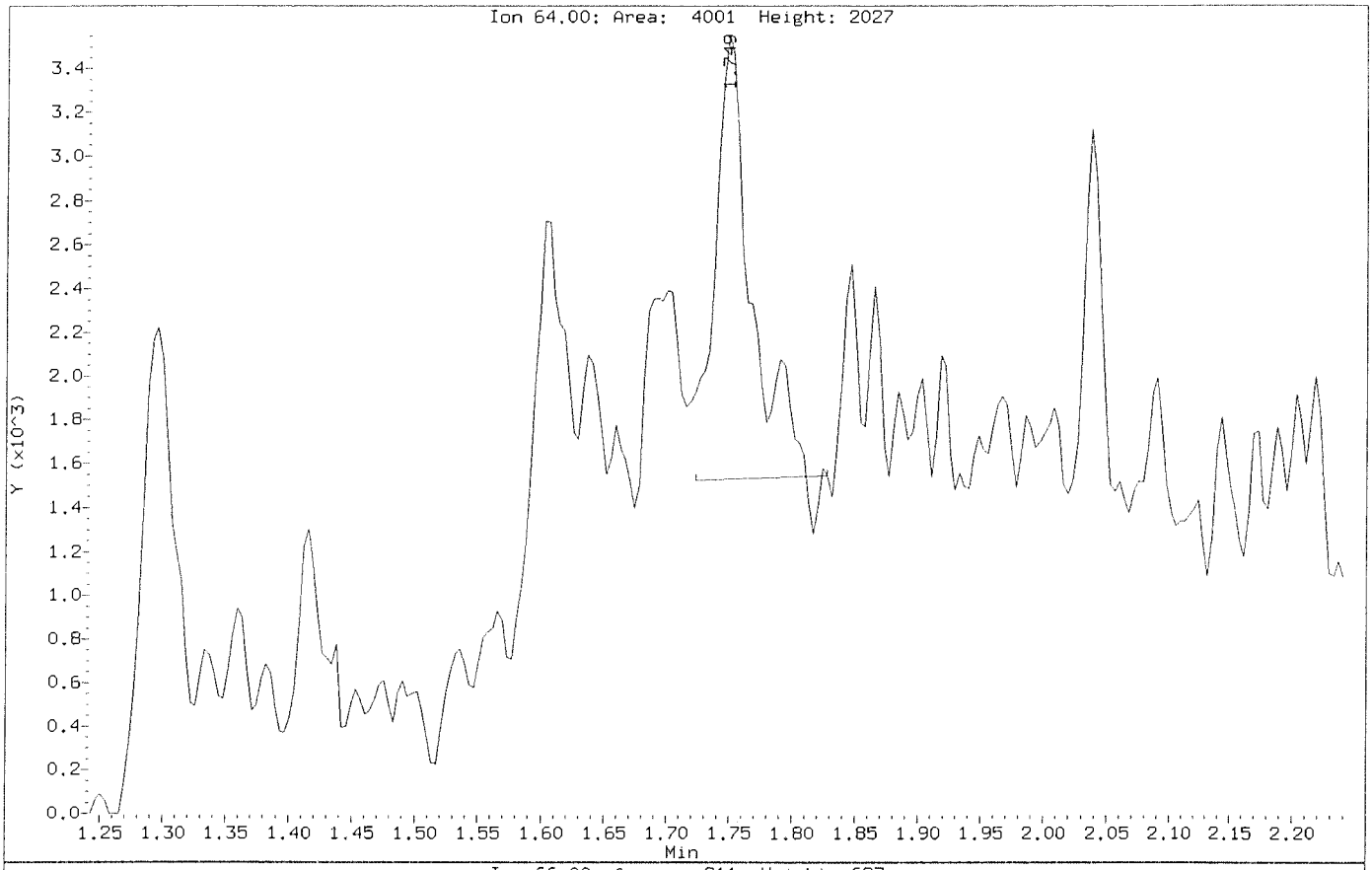
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

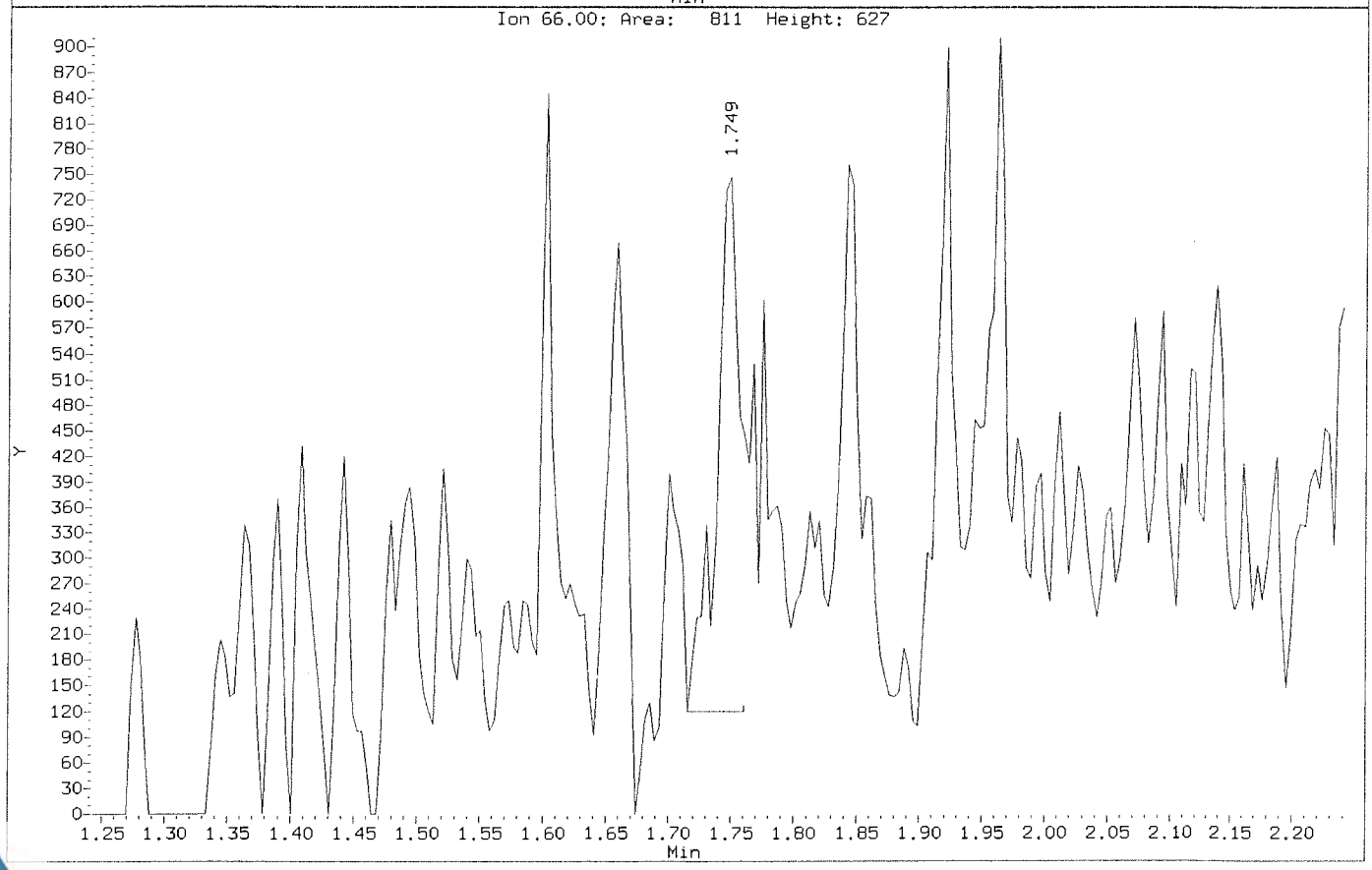
Compound: Carbon Tetrachloride
CAS Number: 56-23-5



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111203.D
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

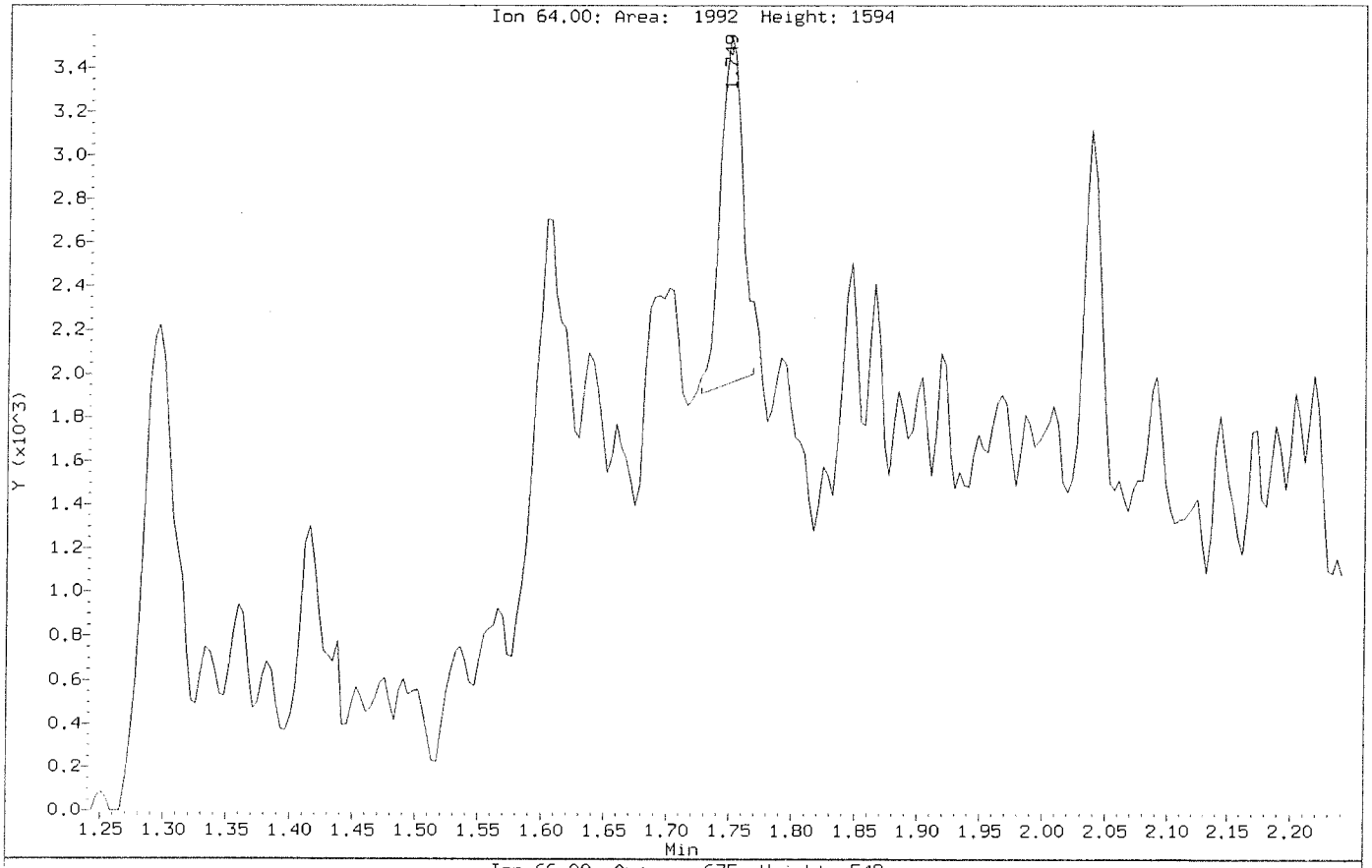
Compound: Chloroethane
CAS Number: 75-00-3

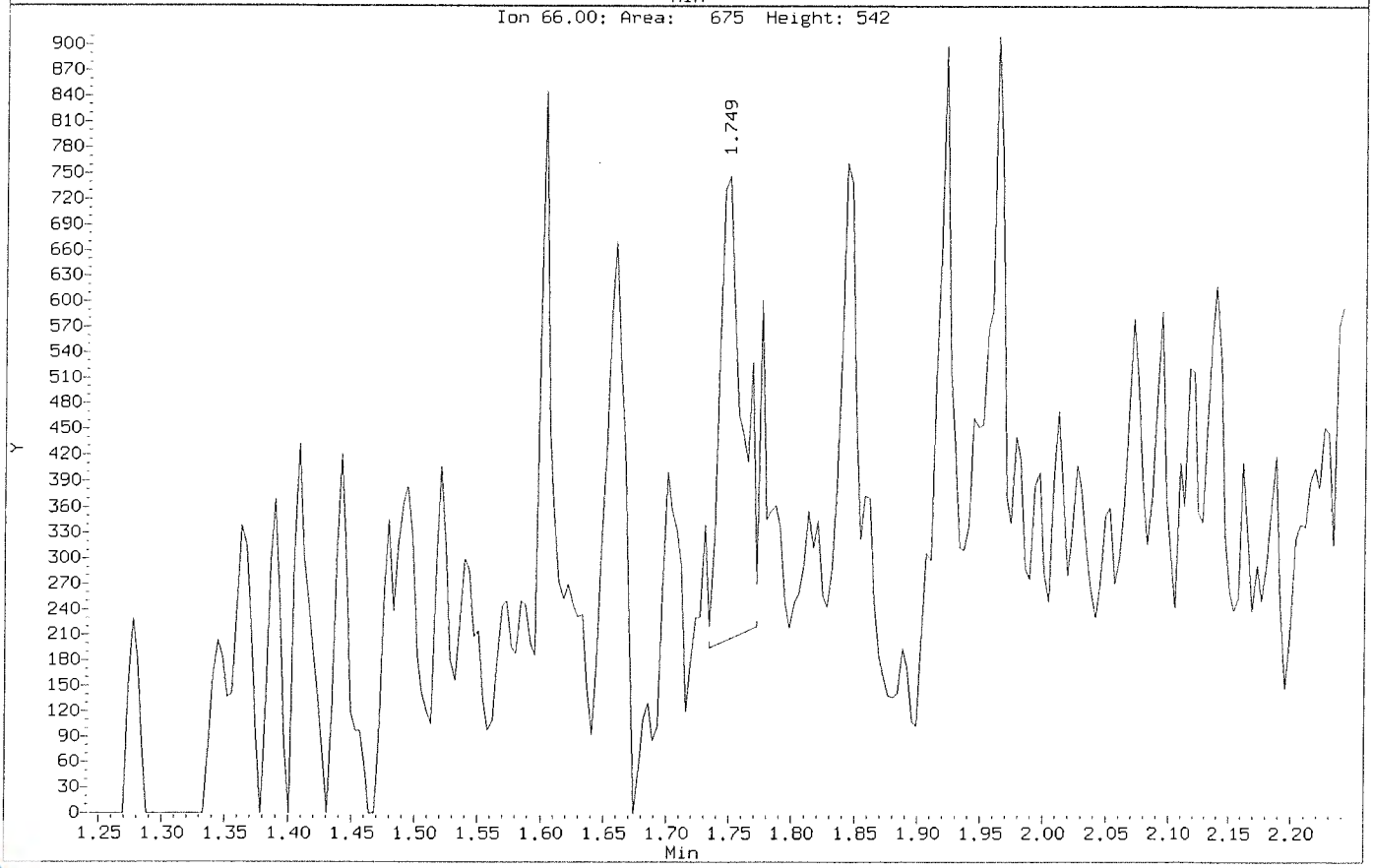




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Instrument: VOA9.i
Client Sample ID: VSTD000.5

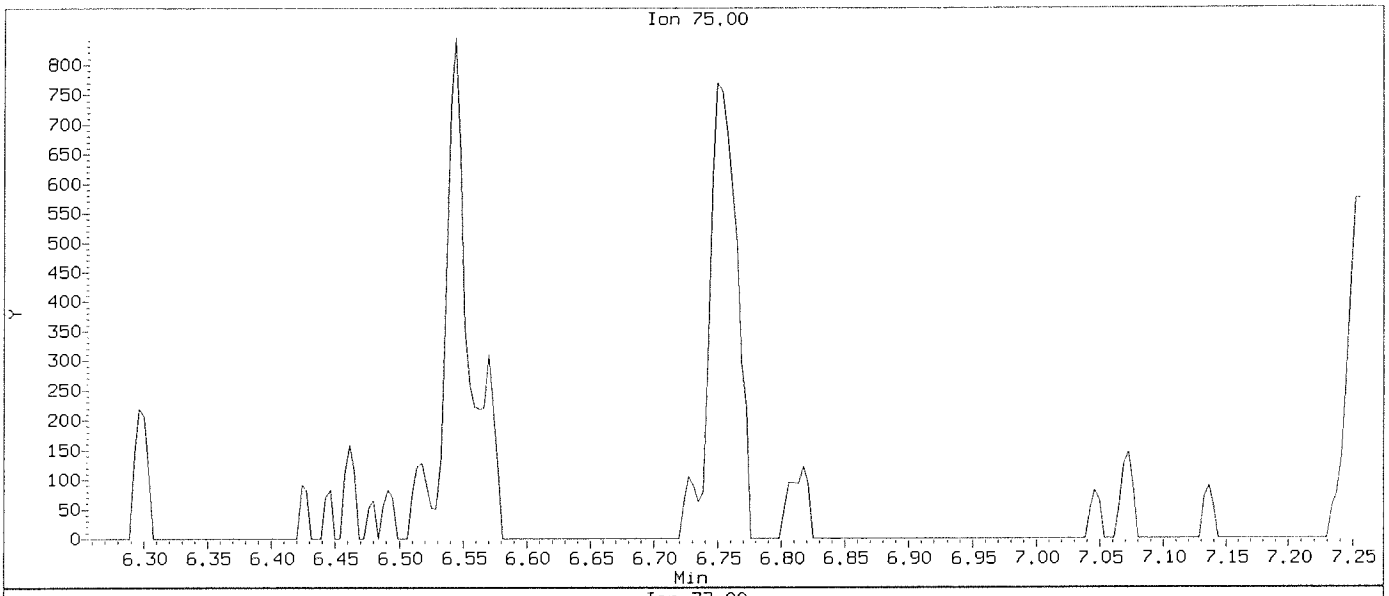
Compound: Chloroethane
CAS Number: 75-00-3

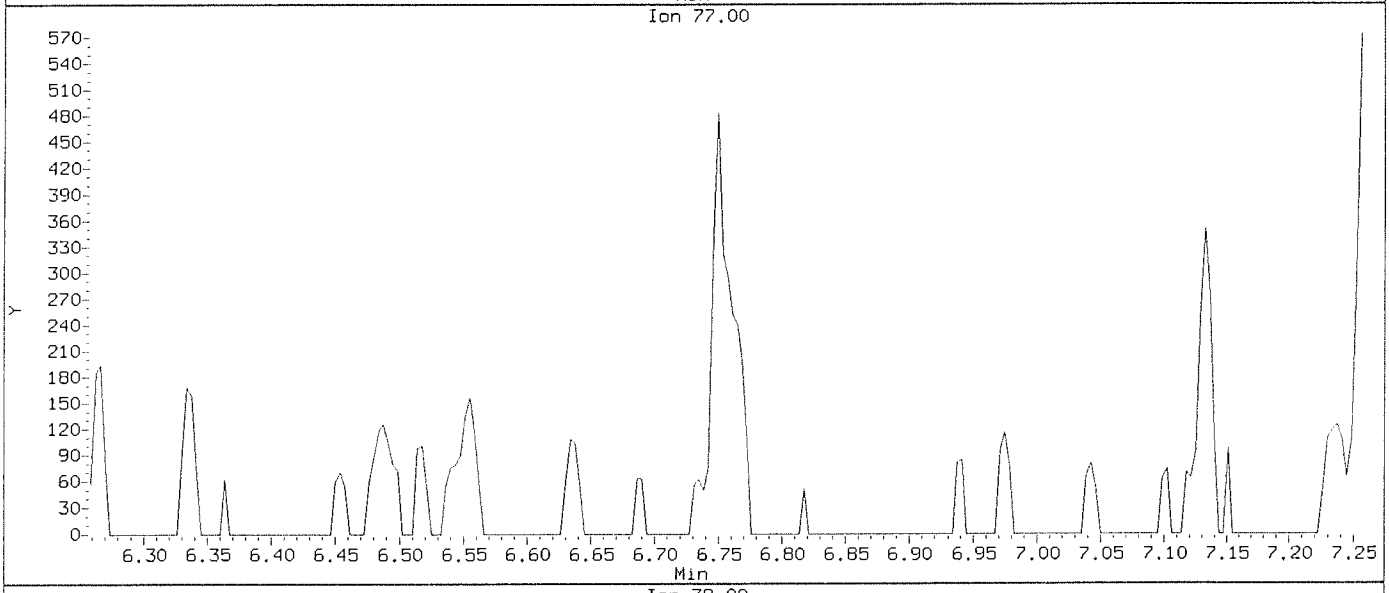


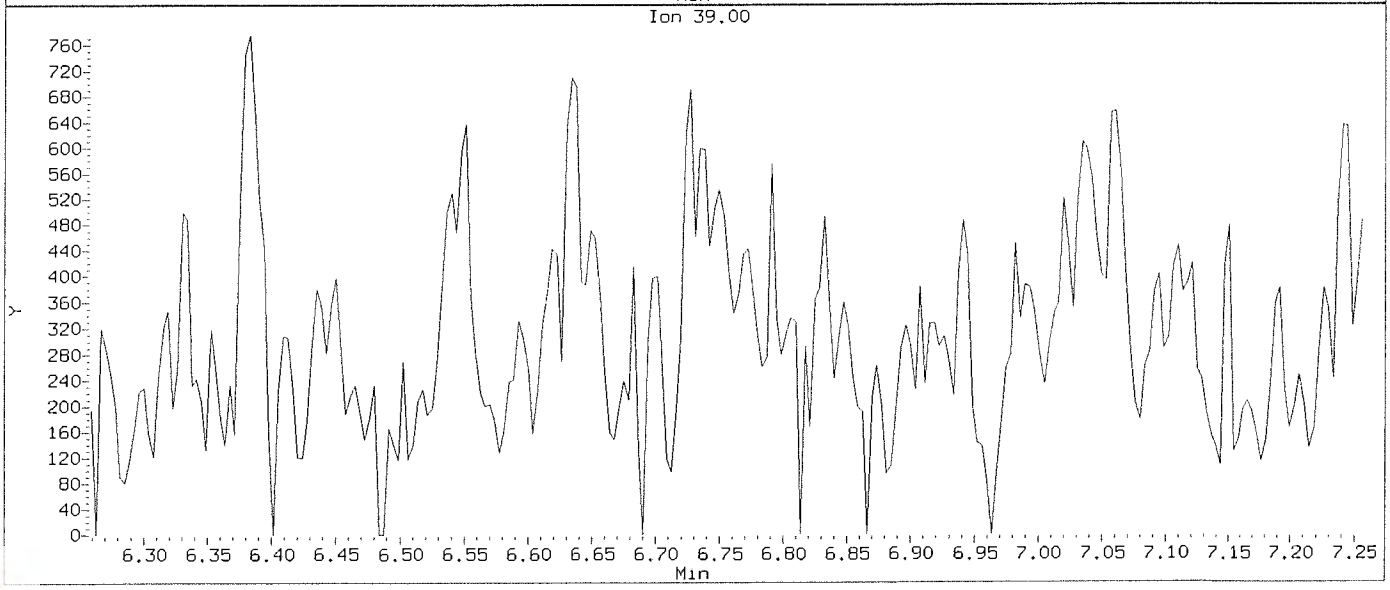


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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5

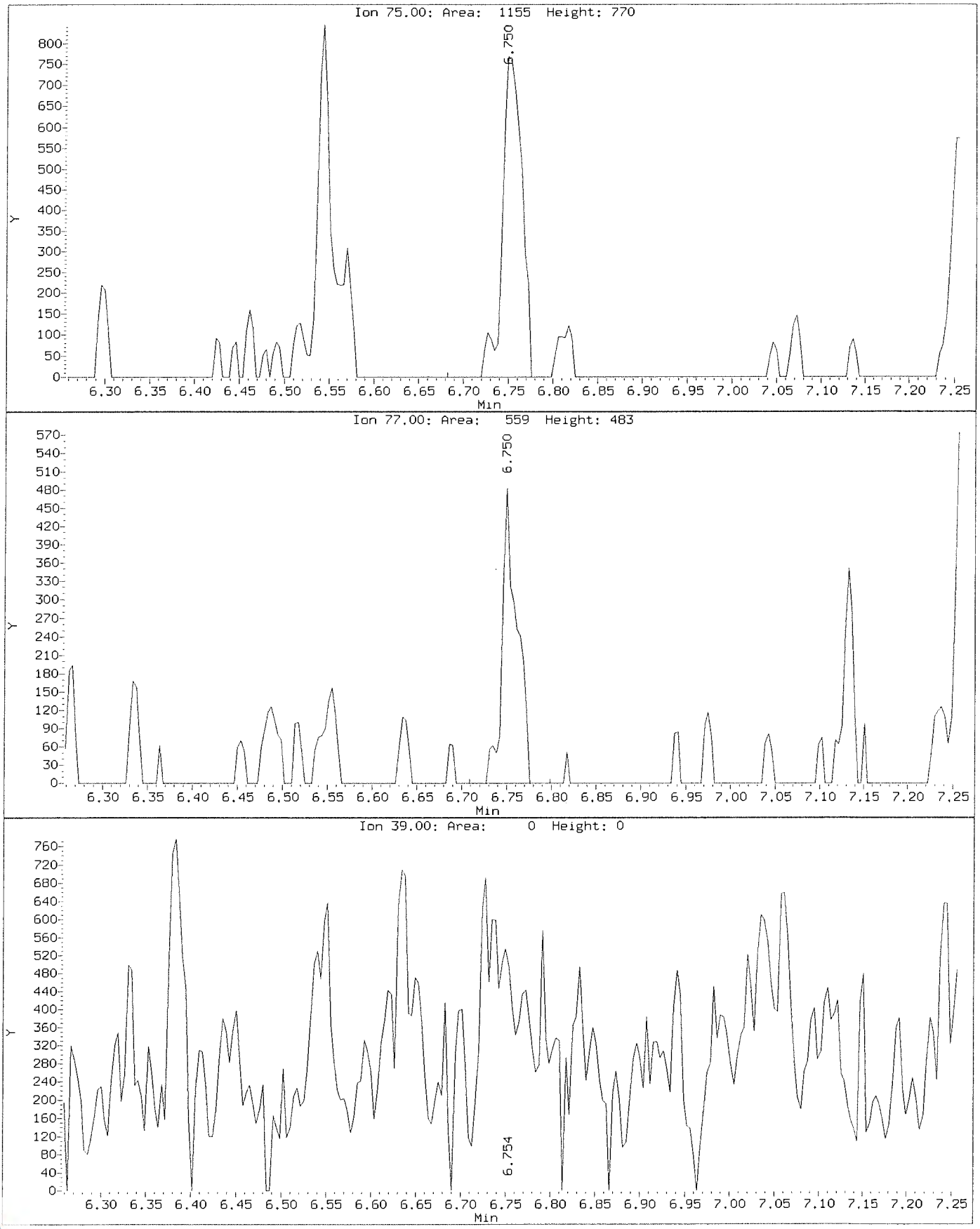






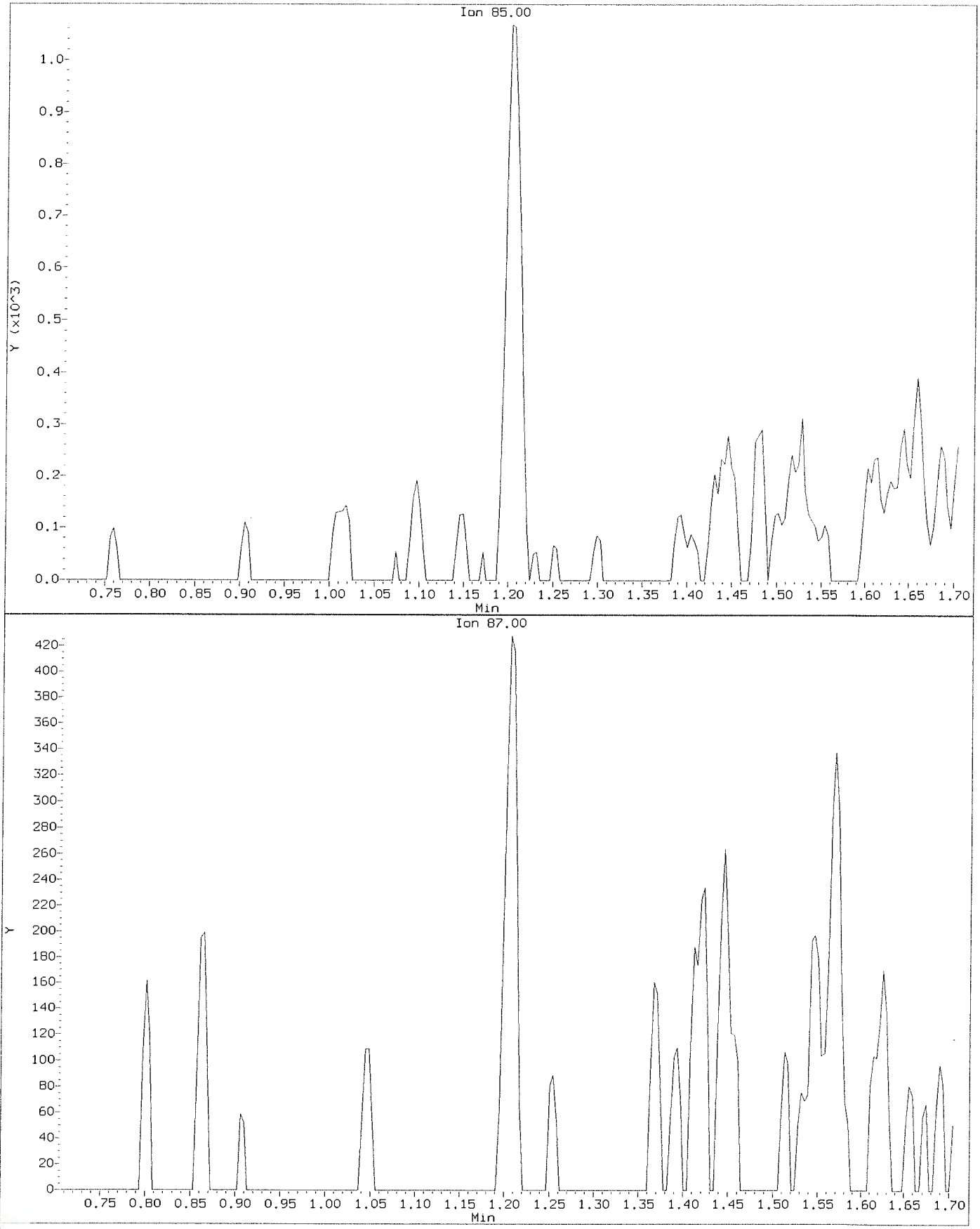
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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5



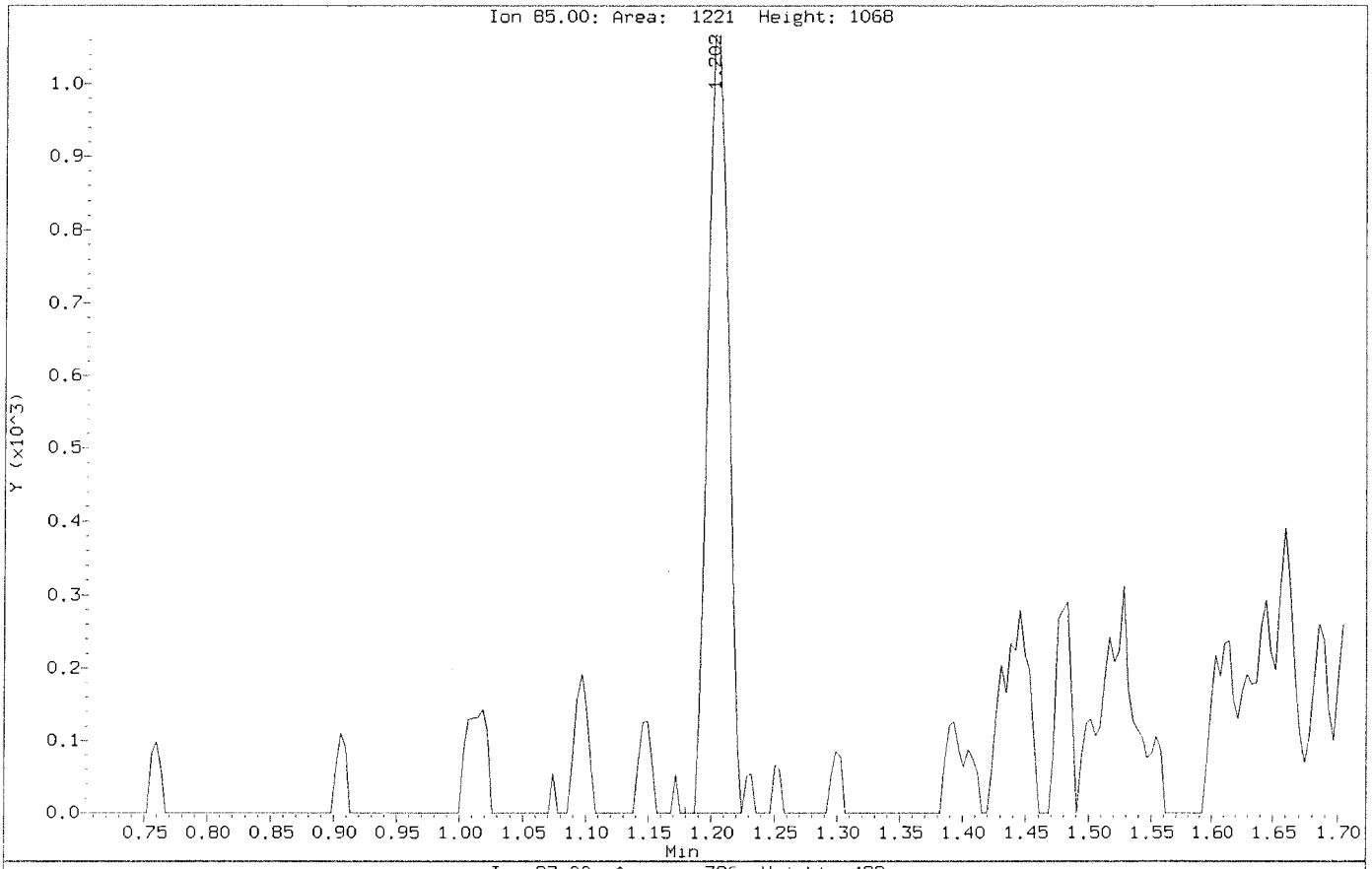
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

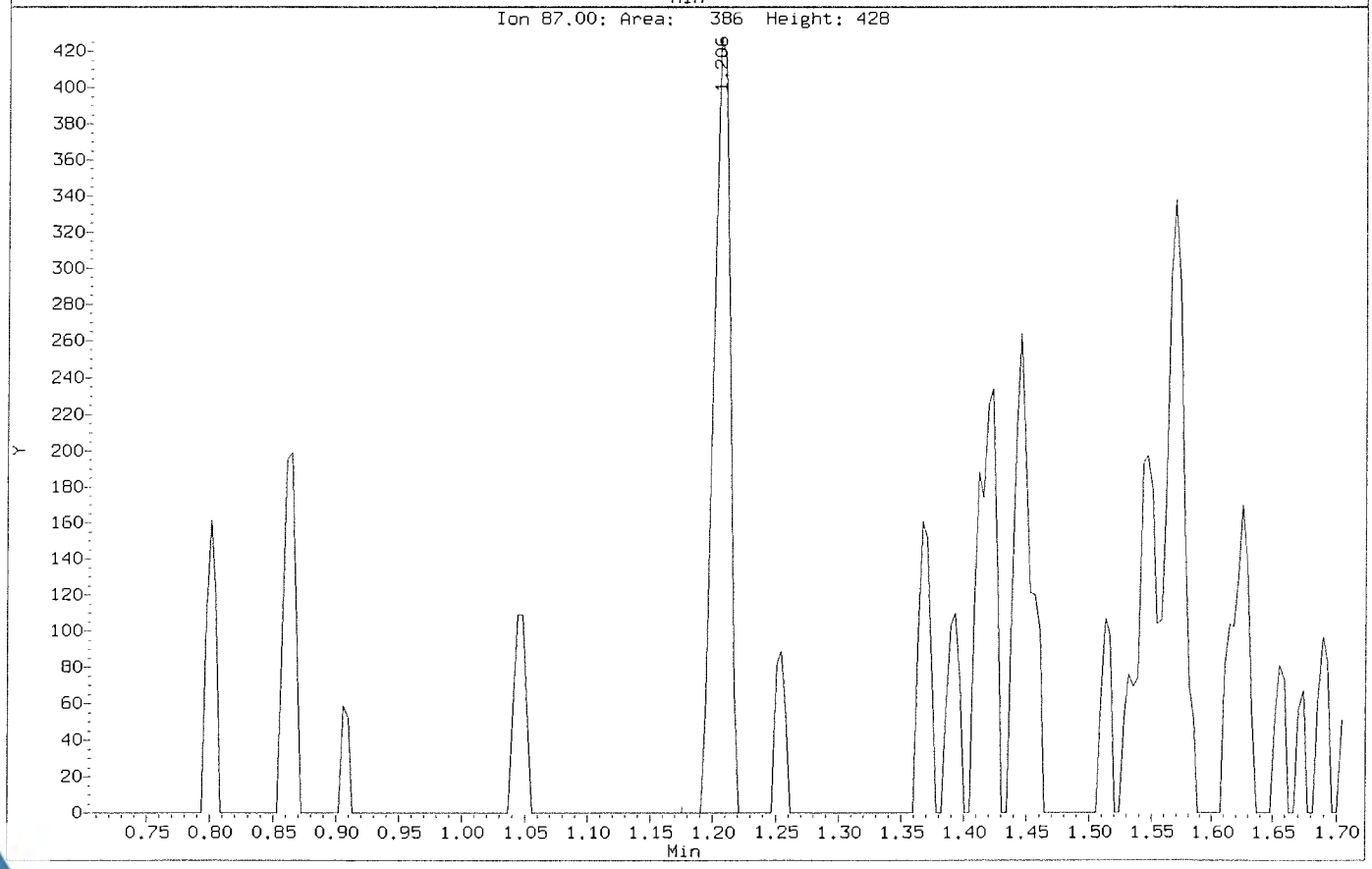
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

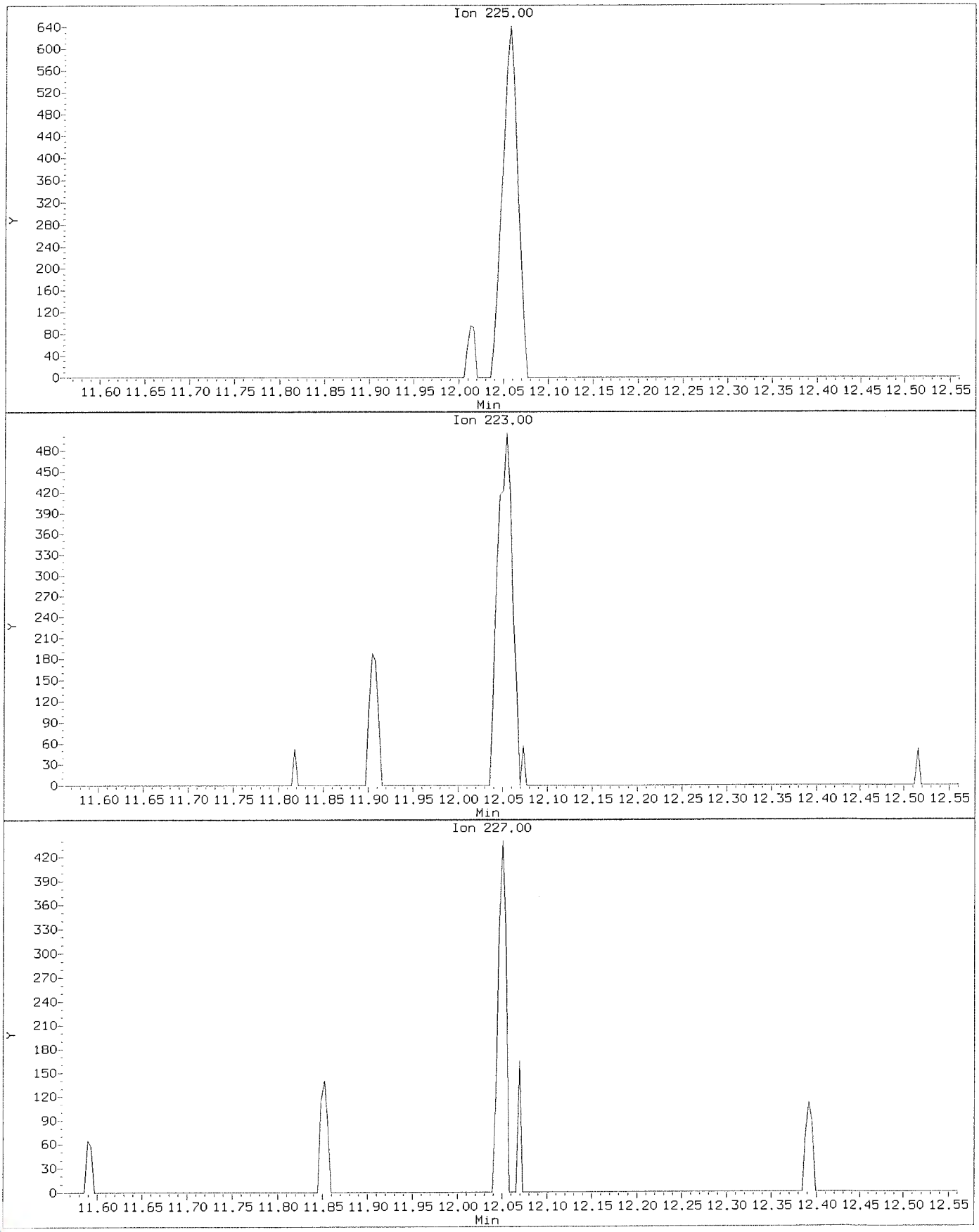
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





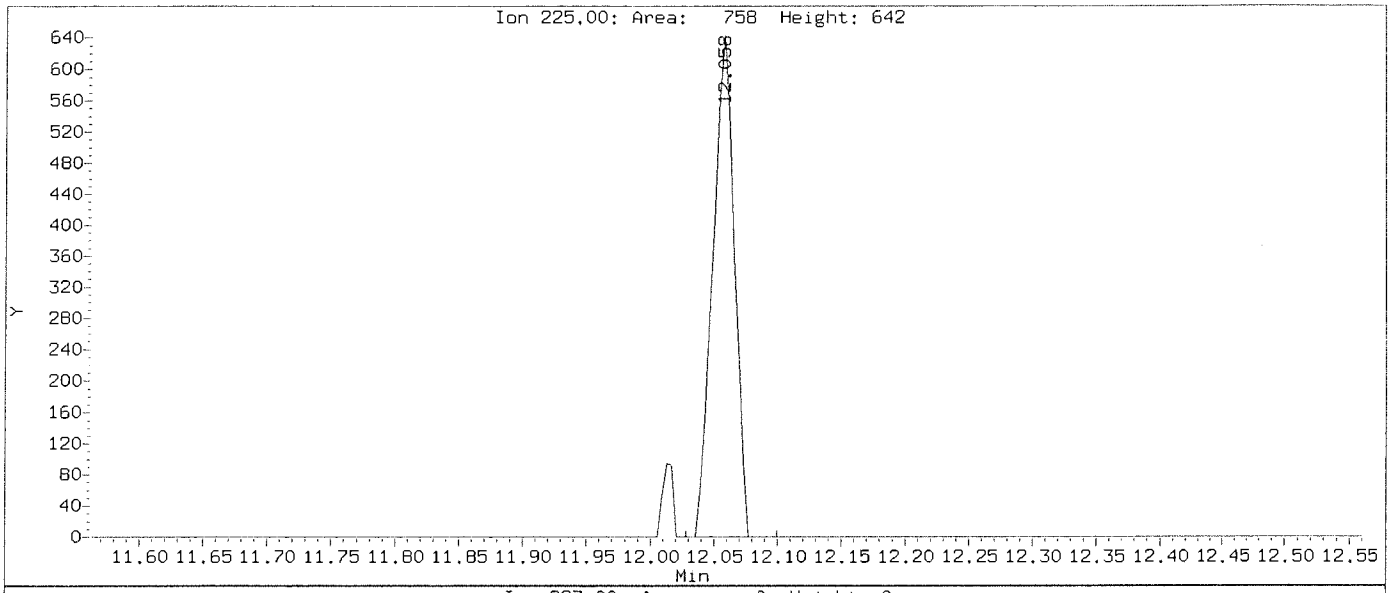
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Client Sample ID: VSTD000.5

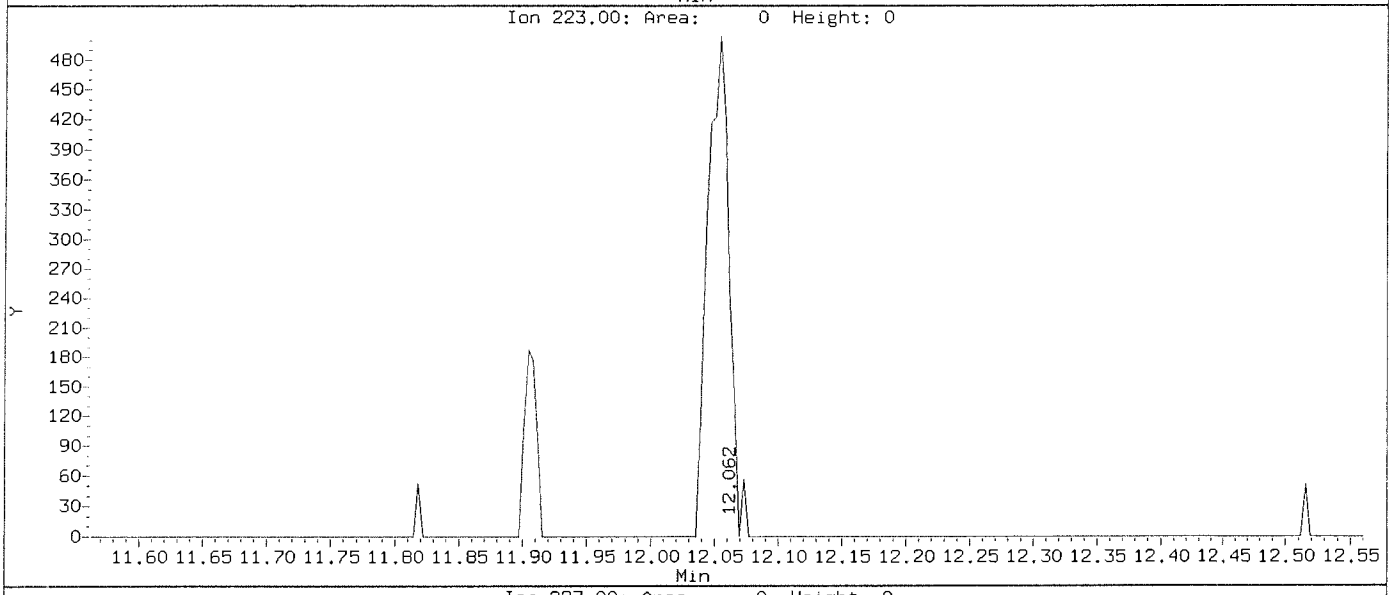
Compound: Hexachlorobutadiene
CAS Number: 87-68-3

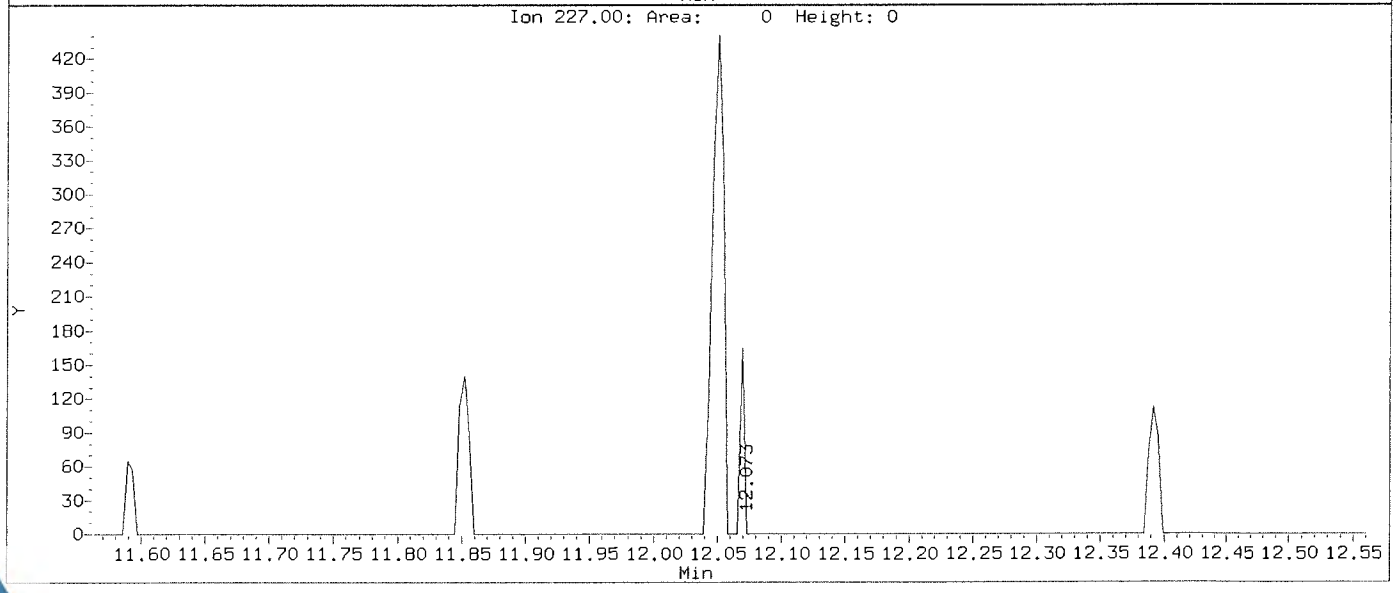


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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Hexachlorobutadiene
CAS Number: 87-68-3

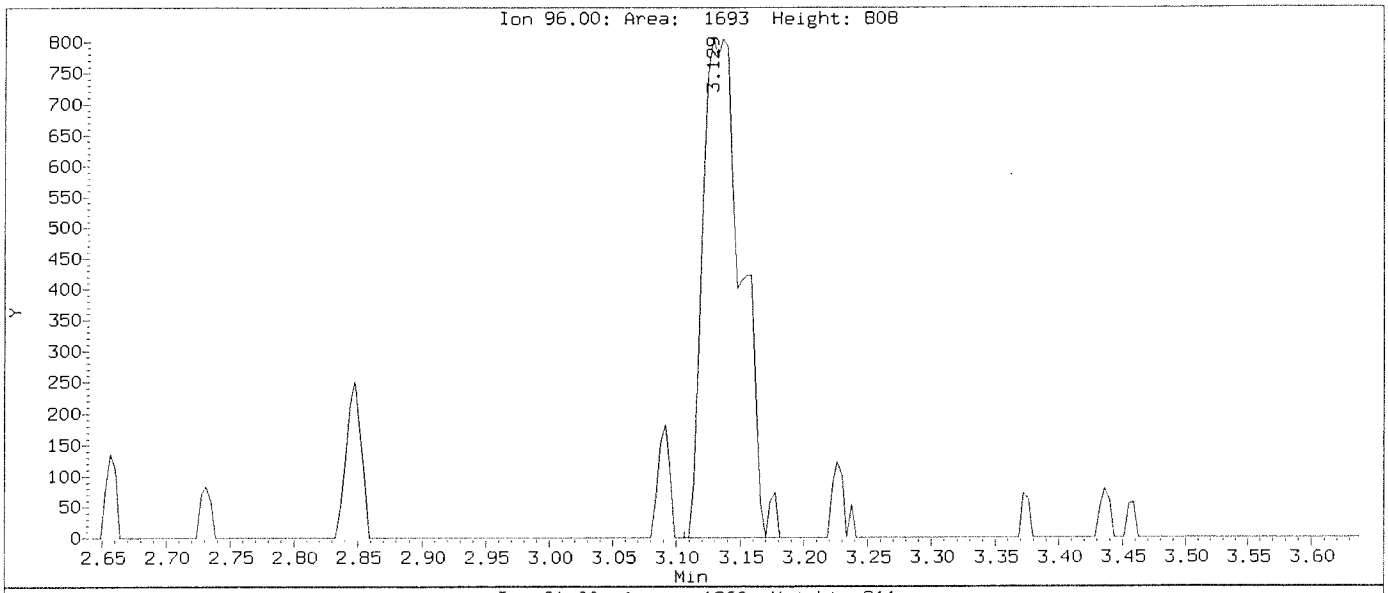


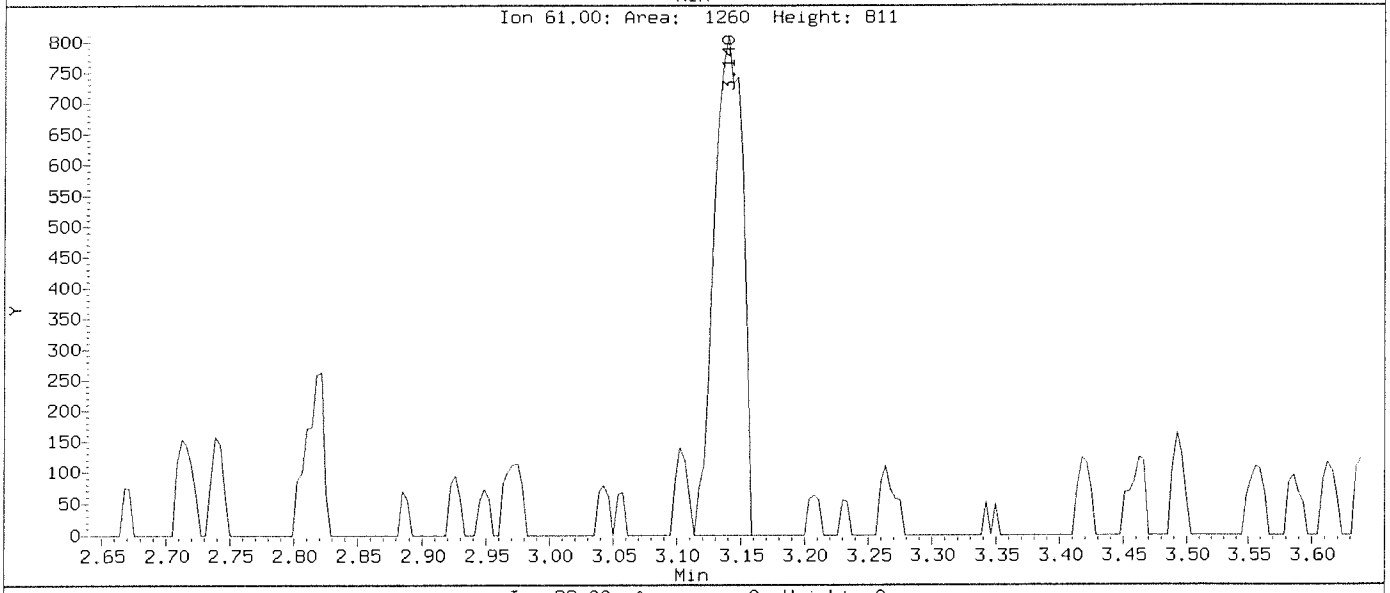


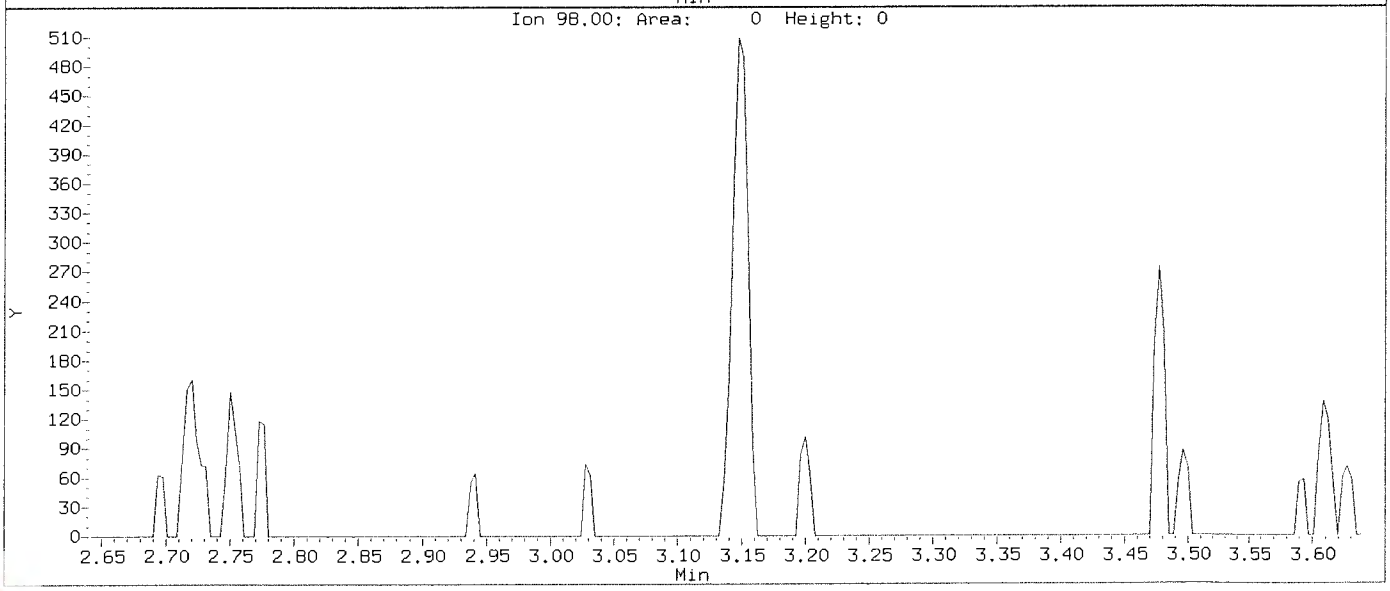


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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: trans-1,2-Dichloroethene
CAS Number: 156-60-5

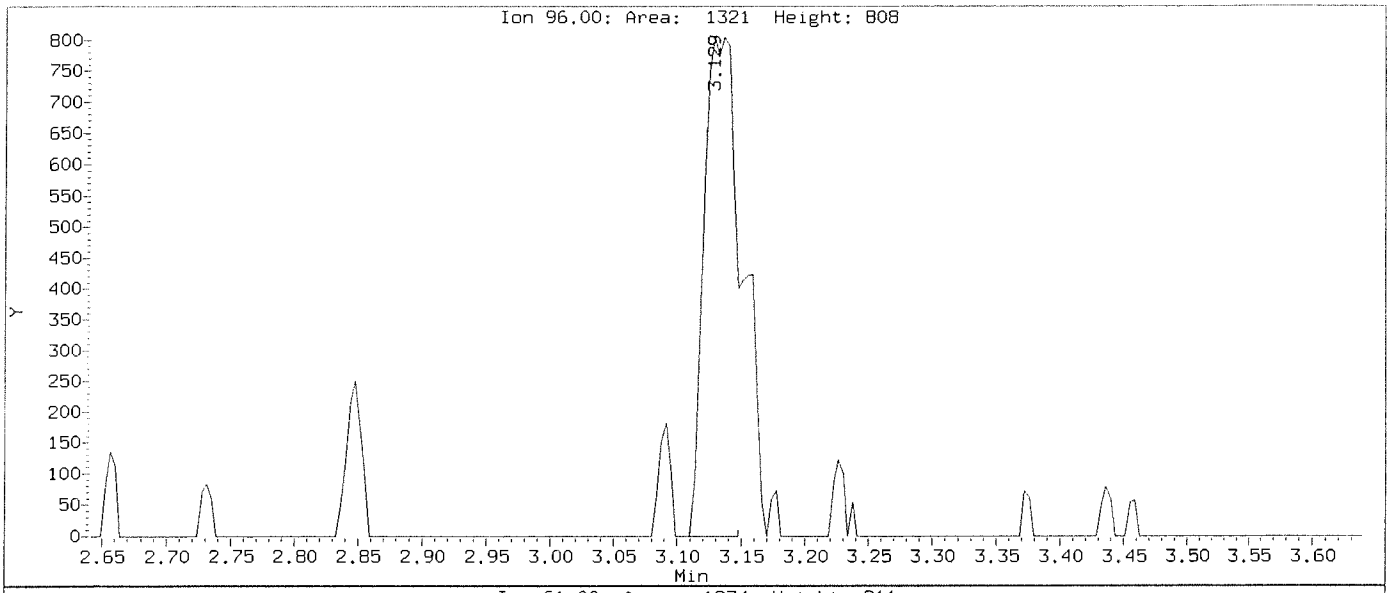


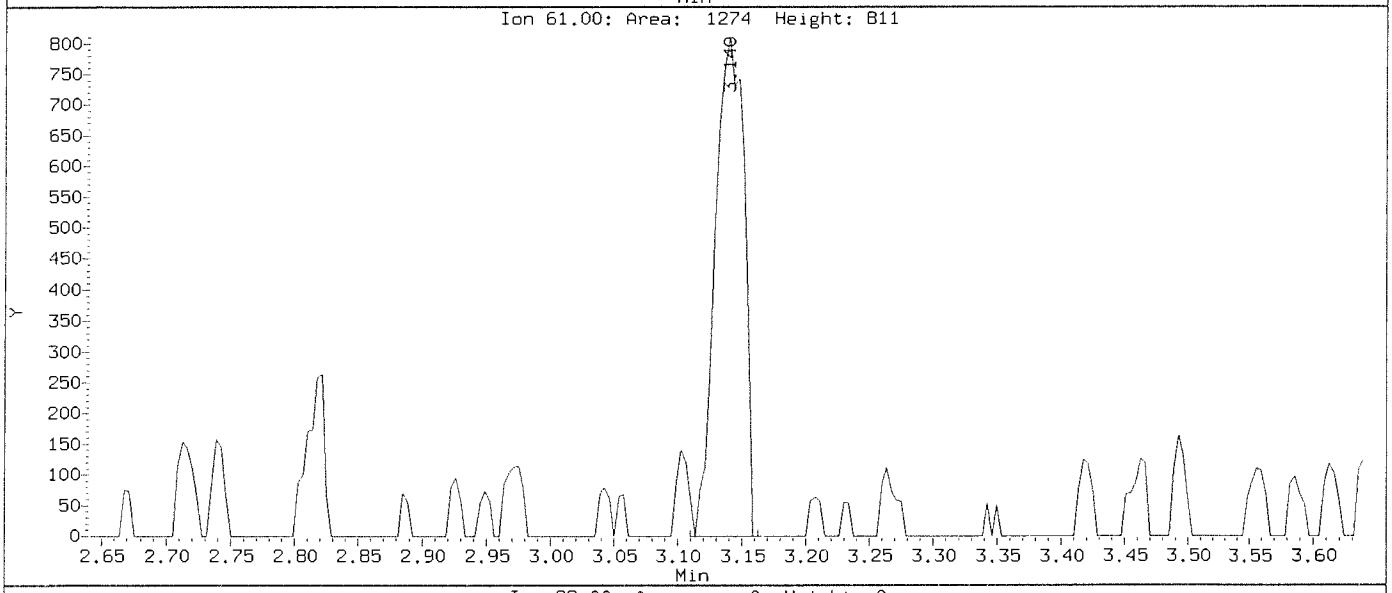


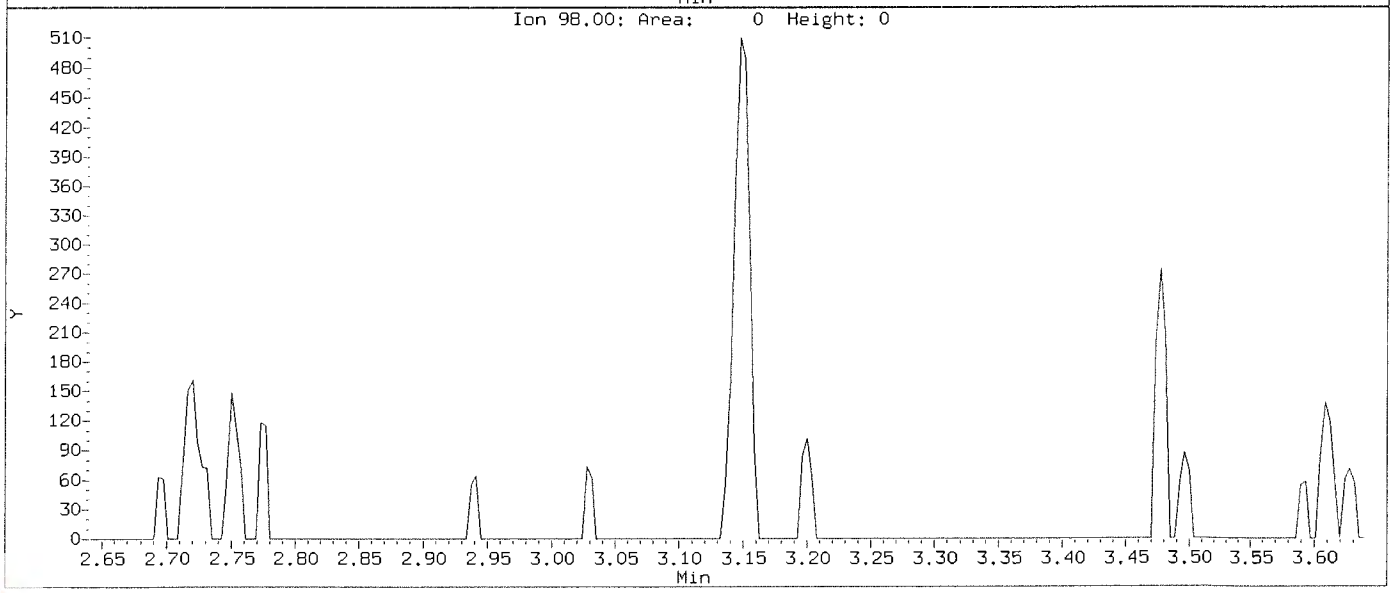


Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D
Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: trans-1,2-Dichloroethene
CAS Number: 156-60-5







Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111204.D Page 1
Report Date: 05-Dec-2019 15:54

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111204.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 12-NOV-2019 12:28
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD001;VSTD001;1;3;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 12:28 Cal File: U112104.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

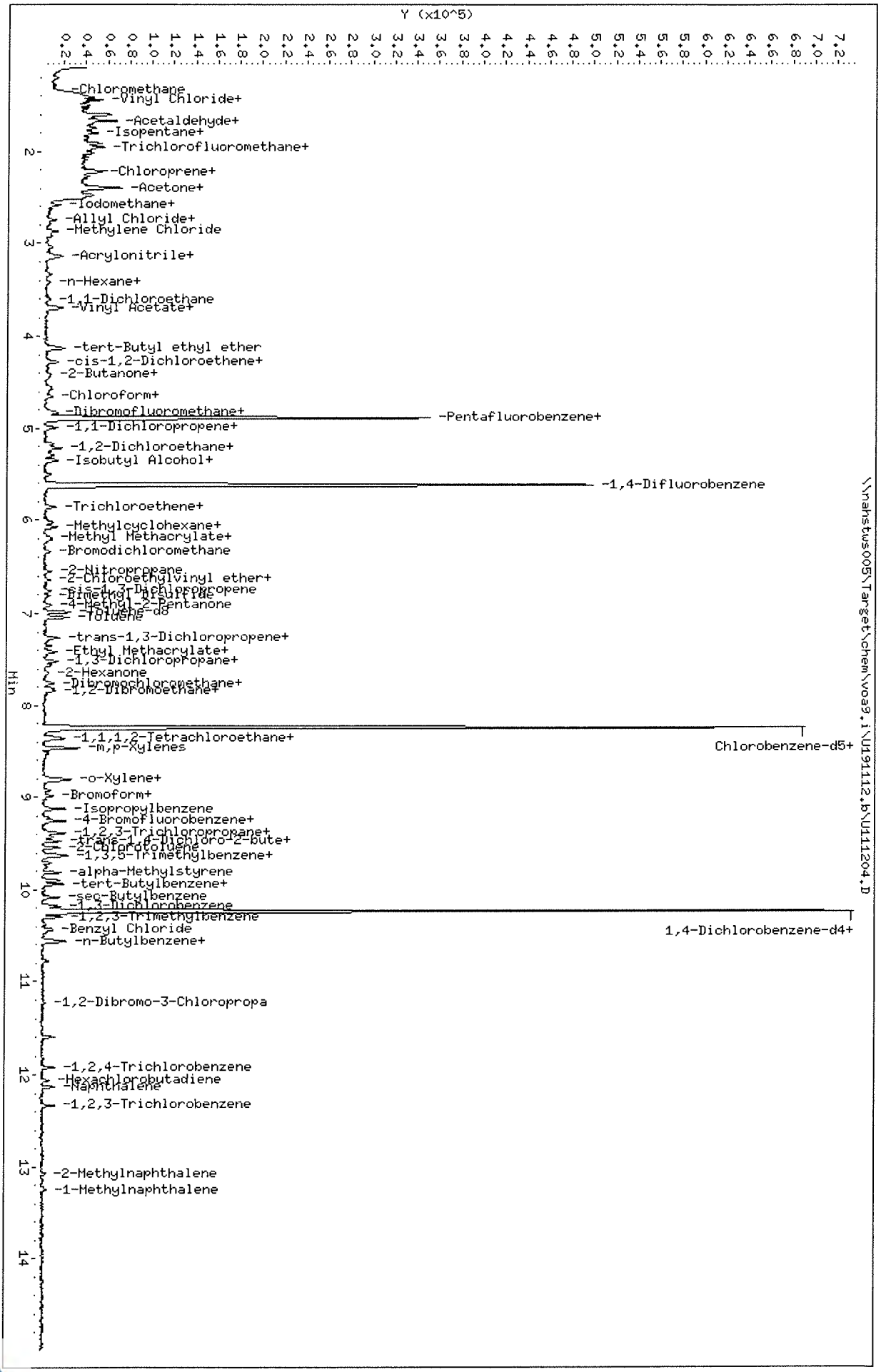
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	245751	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	396596	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	356611	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	180182	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	4108	1.00000	0.75(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.253	(1.123)	4537	1.00000	2.28(a)
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.988)	4336	1.00000	0.78(a)
$ 48 Toluene-d8	98	6.985	6.989	(0.847)	14345	1.00000	1.74(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.346	(1.013)	2340	1.00000	2.62(a)
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.987)	3369	1.00000	0.92(a)
68 1,1,2,2-Tetrachloroethane	83	9.388	9.388	(0.918)	4030	1.00000	1.26(aM)
138 Freon TF	101	2.397	2.397	(0.490)	5665	1.00000	1.03(a)
53 1,1,2-Trichloroethane	83	7.416	7.417	(0.900)	2126	1.00000	1.14(a)
22 1,1-Dichloroethane	63	3.593	3.600	(0.735)	3983	1.00000	1.14(a)
11 1,1-Dichloroethene	96	2.401	2.397	(0.491)	6591	1.00000	1.14(a)
32 1,1-Dichloropropene	75	4.995	5.002	(0.889)	3059	1.00000	1.15(a)
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	2541	1.00000	0.89(a)
71 1,2,3-Trichloropropane	75	9.418	9.426	(0.920)	3238	1.00000	1.05(a)
90 1,2,4-Trichlorobenzene	180	11.922	11.919	(1.165)	3730	1.00000	1.16(a)
79 1,2,4-Trimethylbenzene	105	9.939	9.939	(0.971)	9088	1.00000	1.08(a)
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	416	1.00000	2.23(aM)
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	2681	1.00000	0.99(a)
88 1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	5302	1.00000	0.97(a)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111204.D Page 2
Report Date: 05-Dec-2019 15:54

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33 1,2-Dichloroethane	62	5.250	5.250	(0.934)	3786	1.00000	1.28(a)
42 1,2-Dichloropropane	63	6.071	6.078	(1.080)	3031	1.00000	0.13(aM)
75 1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	8502	1.00000	1.08(a)
83 1,3-Dichlorobenzene	146	10.175	10.179	(0.995)	6204	1.00000	1.16(a)
54 1,3-Dichloropropane	76	7.555	7.563	(0.916)	3920	1.00000	1.05(a)
84 1,4-Dichlorobenzene	146	10.250	10.254	(1.002)	6357	1.00000	1.10(a)
26 2,2-Dichloropropane	77	4.279	4.271	(0.875)	2623	1.00000	0.93(aM)
24 2-Butanone	43	4.350	4.339	(0.890)	2961	2.00000	1.63(a)
76 2-Chlorotoluene	91	9.542	9.546	(0.933)	6239	1.00000	1.06(a)
52 2-Hexanone	43	7.645	7.649	(0.927)	3361	2.00000	2.15(a)
77 4-Chlorotoluene	91	9.636	9.636	(0.942)	8689	1.00000	1.18(a)
82 p-Isopropyltoluene	119	10.209	10.209	(0.998)	8829	1.00000	1.05(a)
45 4-Methyl-2-Pentanone	43	6.910	6.914	(0.838)	4734	2.00000	2.27(a)
10 Acetone	43	2.479	2.483	(0.507)	14328	2.00000	(a)
37 Benzene	78	5.216	5.216	(0.928)	10131	1.00000	1.18(a)
74 Bromobenzene	156	9.381	9.381	(0.917)	3932	1.00000	1.20(a)
29 Bromochloromethane	128	4.556	4.553	(0.932)	1576	1.00000	1.08(a)
39 Bromodichloromethane	83	6.341	6.344	(1.128)	3185	1.00000	1.20(aM)
66 Bromoform	173	8.980	8.984	(1.089)	1218	1.00000	2.56(Ta)
6 Bromomethane	94	1.670	1.659	(0.342)	9435	1.00000	0.71(aM)
19 Carbon Disulfide	76	2.584	2.584	(0.529)	11154	2.00000	2.04(a)
34 Carbon Tetrachloride	117	4.991	4.995	(0.888)	2463	1.00000	0.89(aM)
59 Chlorobenzene	112	8.267	8.271	(1.003)	7883	1.00000	1.09(a)
7 Chloroethane	64	1.745	1.741	(0.357)	4623	1.00000	(aM)
28 Chloroform	83	4.646	4.654	(0.950)	4367	1.00000	1.05(a)
3 Chloromethane	50	1.340	1.340	(0.274)	2772	1.00000	0.07(aM)
27 cis-1,2-Dichloroethene	96	4.283	4.283	(0.876)	3187	1.00000	1.13(a)
46 cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	2828	1.00000	0.97(a)
55 Dibromochloromethane	129	7.754	7.758	(0.940)	2173	1.00000	3.30(a)
44 Dibromomethane	93	6.187	6.187	(1.101)	1371	1.00000	0.85(a)
2 Dichlorodifluoromethane	85	1.201	1.205	(0.246)	2591	1.00000	1.03(a)
61 Ethylbenzene	106	8.365	8.369	(1.015)	4110	1.00000	1.14(a)
91 Hexachlorobutadiene	225	12.057	12.061	(1.178)	1091	1.00000	1.00(aM)
67 Isopropylbenzene	105	9.122	9.126	(1.106)	10132	1.00000	0.99(a)
62 m,p-Xylenes	106	8.470	8.470	(1.027)	8469	2.00000	1.92(a)
17 Methylene Chloride	84	2.866	2.869	(0.586)	2559	1.00000	1.99(a)
87 n-Butylbenzene	91	10.550	10.554	(1.031)	6691	1.00000	0.95(a)
73 n-Propylbenzene	91	9.471	9.475	(0.926)	11376	1.00000	1.08(a)
92 Naphthalene	128	12.129	12.129	(1.185)	7102	1.00000	0.83(a)
63 o-Xylene	106	8.803	8.807	(1.068)	4042	1.00000	0.90(a)
81 sec-Butylbenzene	105	10.082	10.086	(0.985)	8812	1.00000	0.99(a)
64 Styrene	104	8.822	8.822	(1.070)	7262	1.00000	0.93(a)
78 tert-Butylbenzene	119	9.898	9.898	(0.967)	6608	1.00000	0.99(a)
56 Tetrachloroethene	166	7.514	7.522	(0.911)	2686	1.00000	0.99(a)
50 Toluene	91	7.045	7.045	(0.855)	11400	1.00000	1.05(a)
20 trans-1,2-Dichloroethene	96	3.132	3.139	(0.640)	3398	1.00000	3.24(a)
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	2761	1.00000	1.57(a)
38 Trichloroethene	130	5.857	5.861	(1.042)	2859	1.00000	1.08(a)
8 Trichlorofluoromethane	101	1.951	1.951	(0.399)	11861	1.00000	1.12(a)
5 Vinyl Chloride	62	1.415	1.419	(0.289)	6769	1.00000	1.23(a)

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.

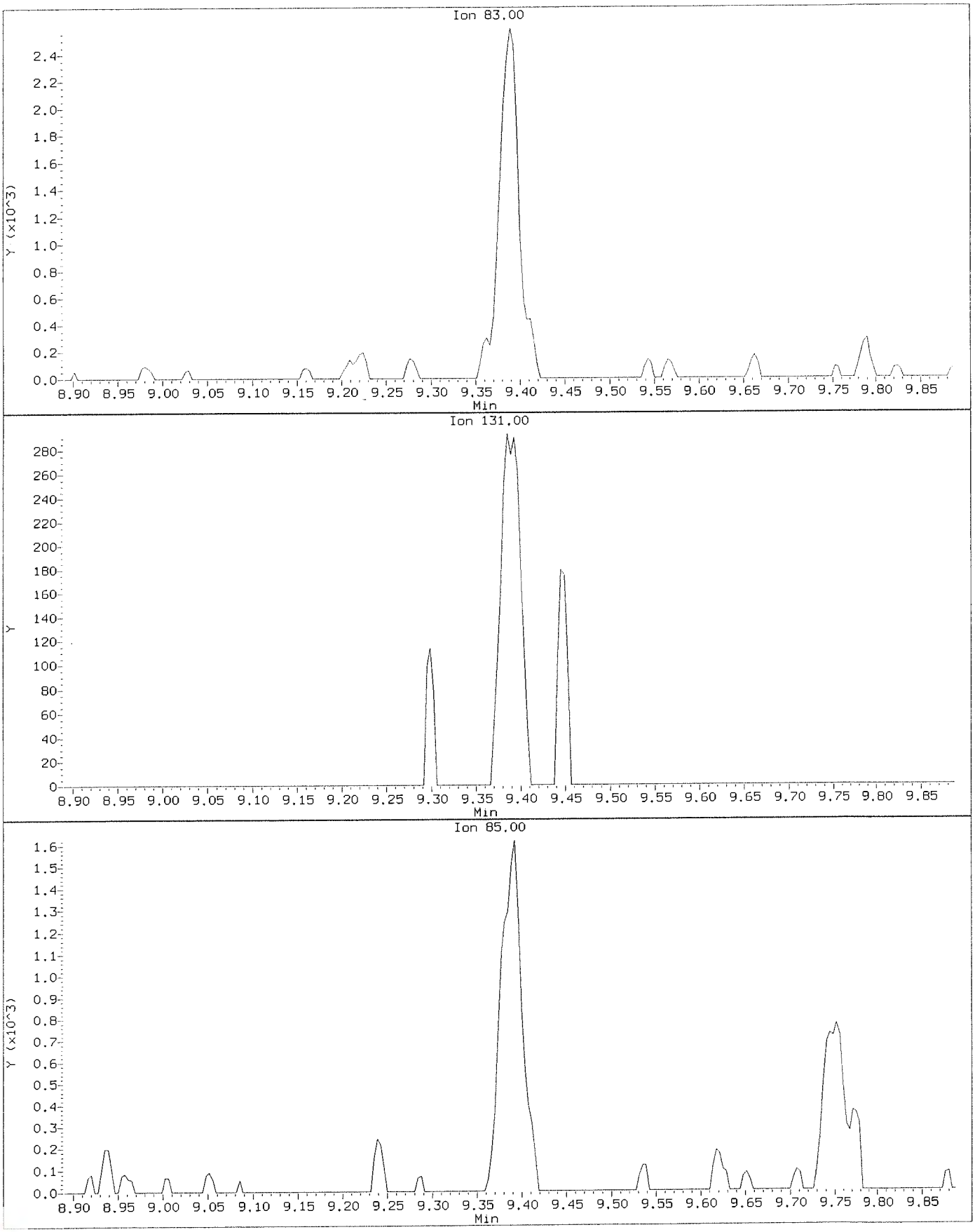


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Client ID: VSTD001
Sample Info: VSTD001,VSTD001,1,3;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

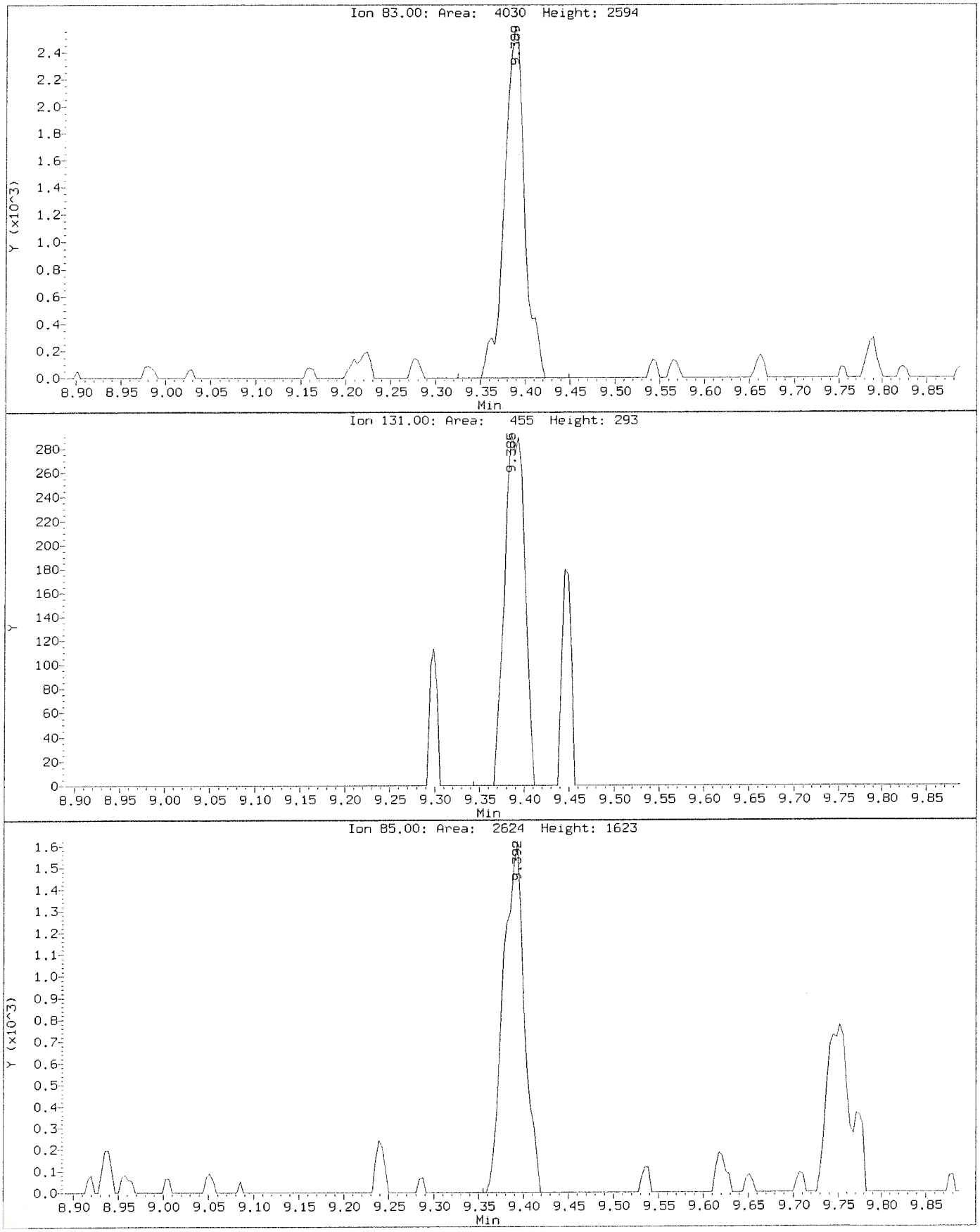
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Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



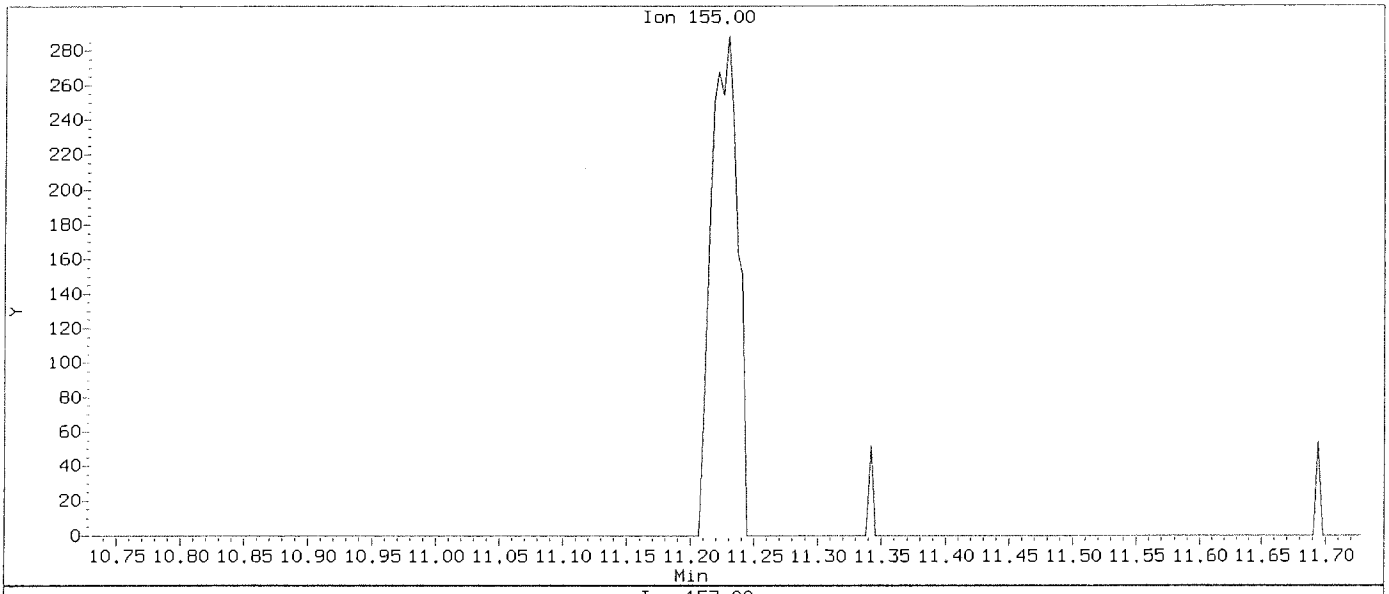
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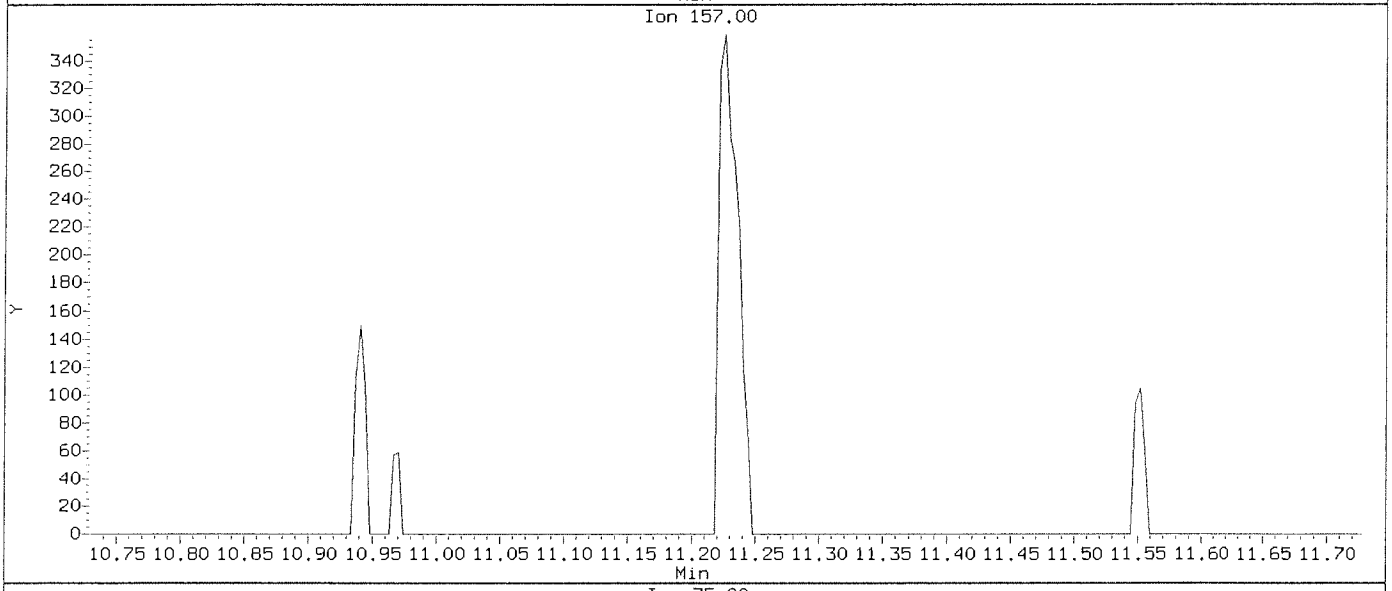
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CAS Number: 79-34-5

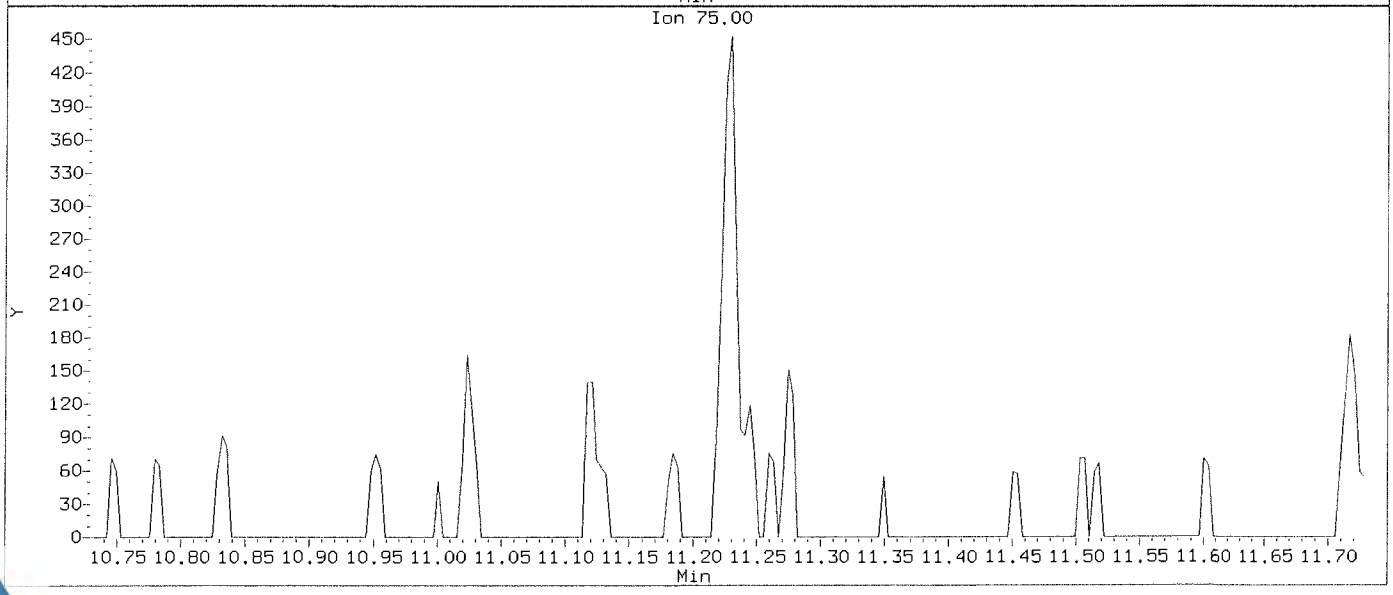


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Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

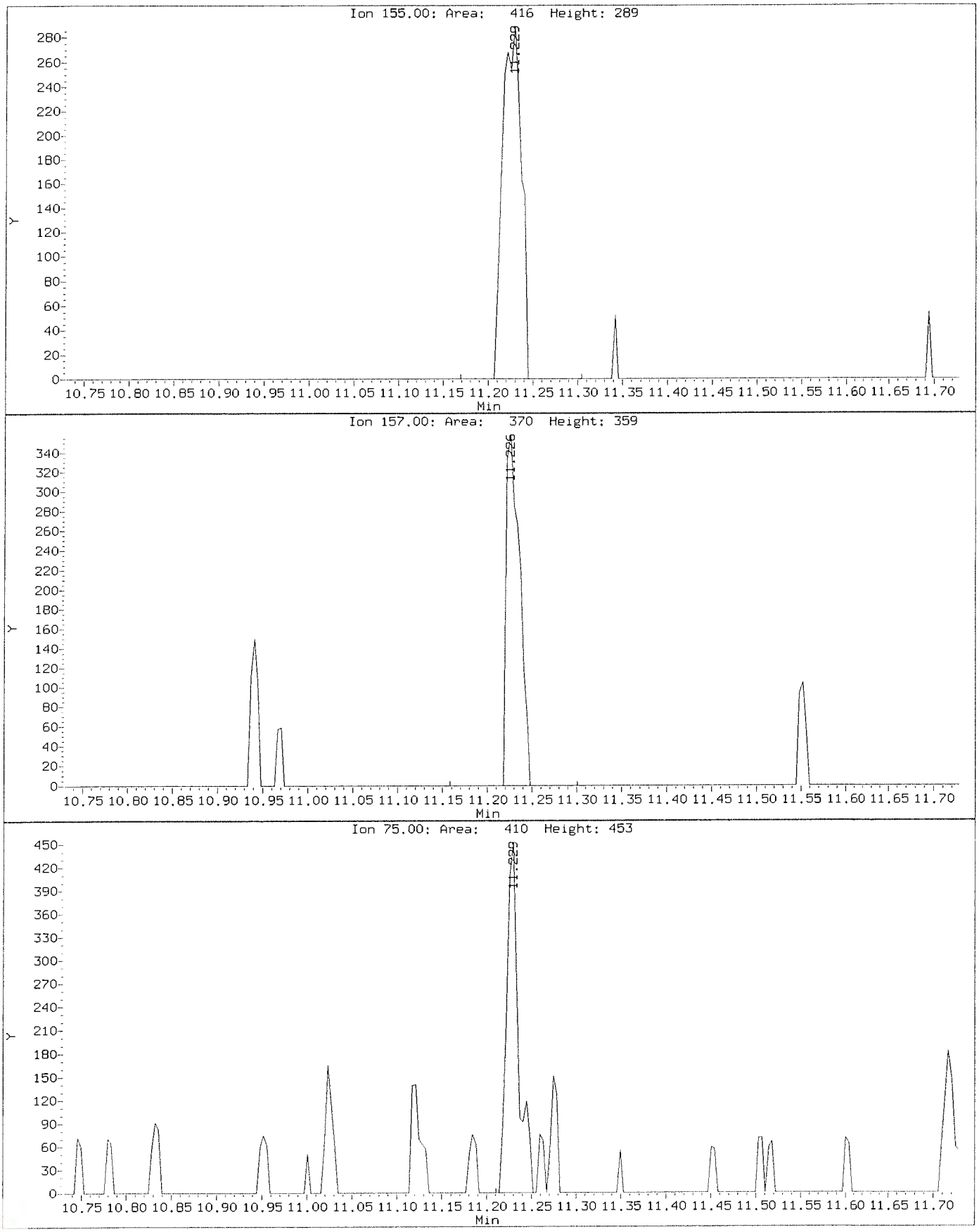






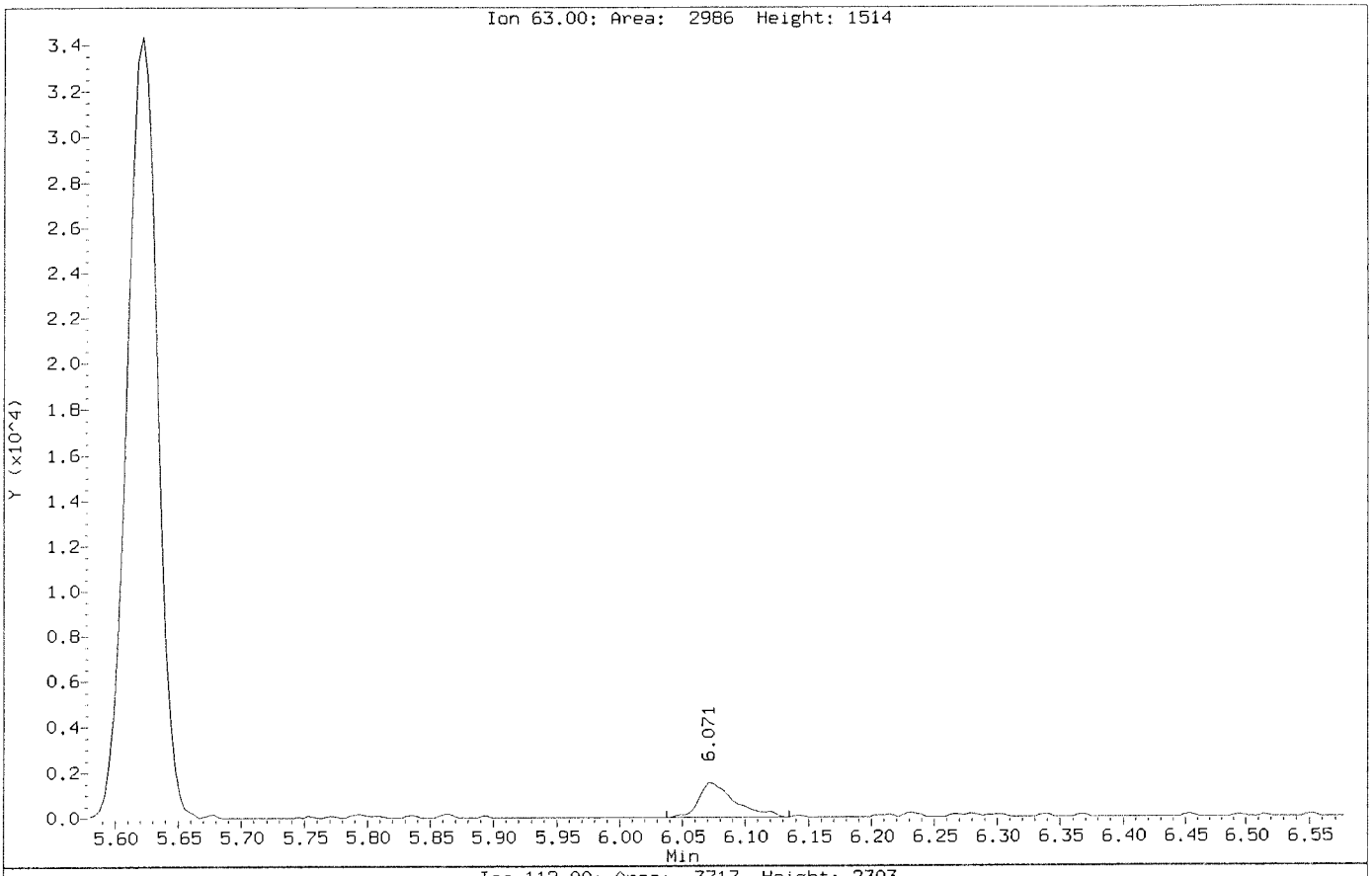
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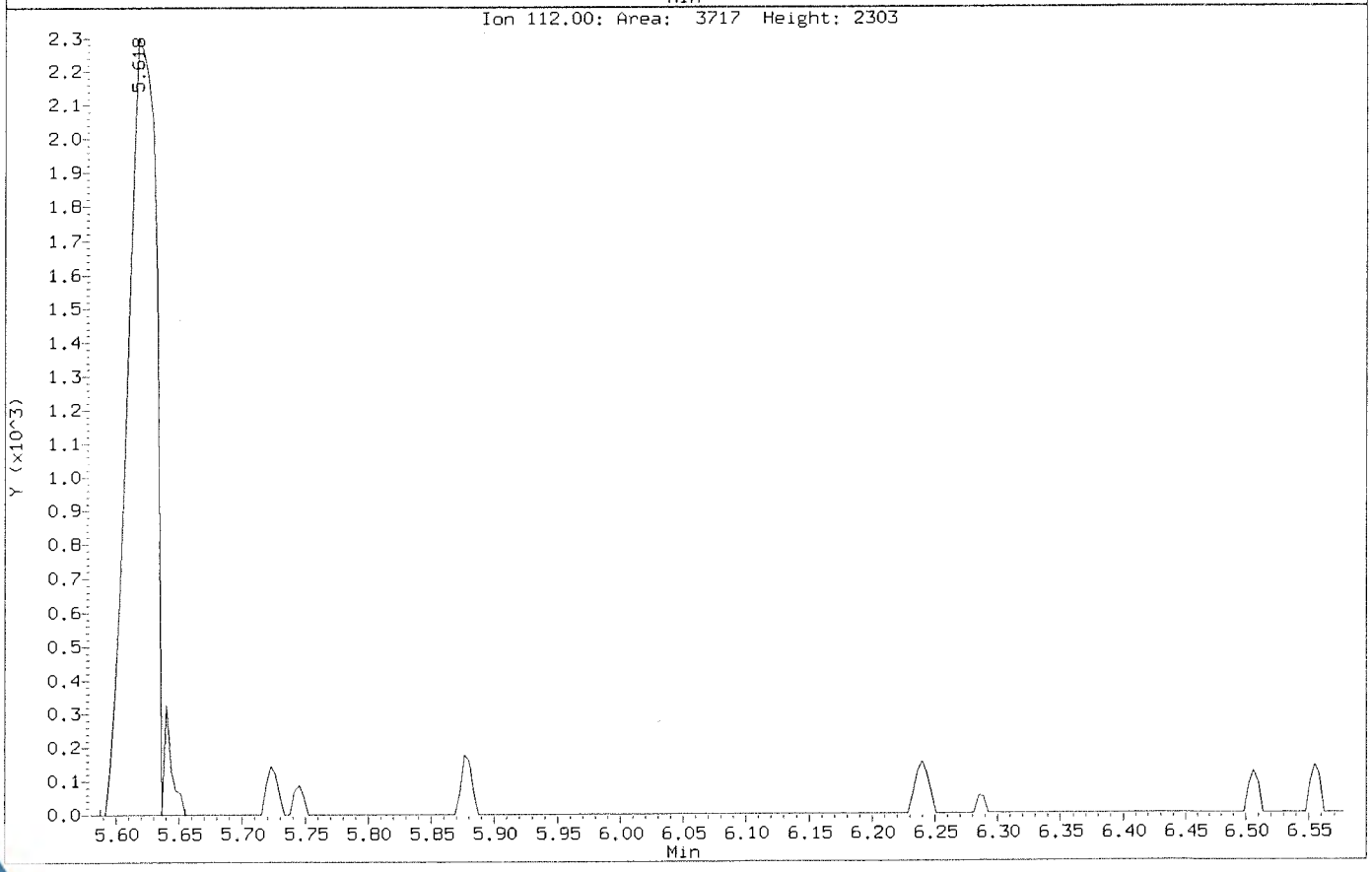
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CAS Number: 96-12-8



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Instrument: VOA9.i
Client Sample ID: VSTD001

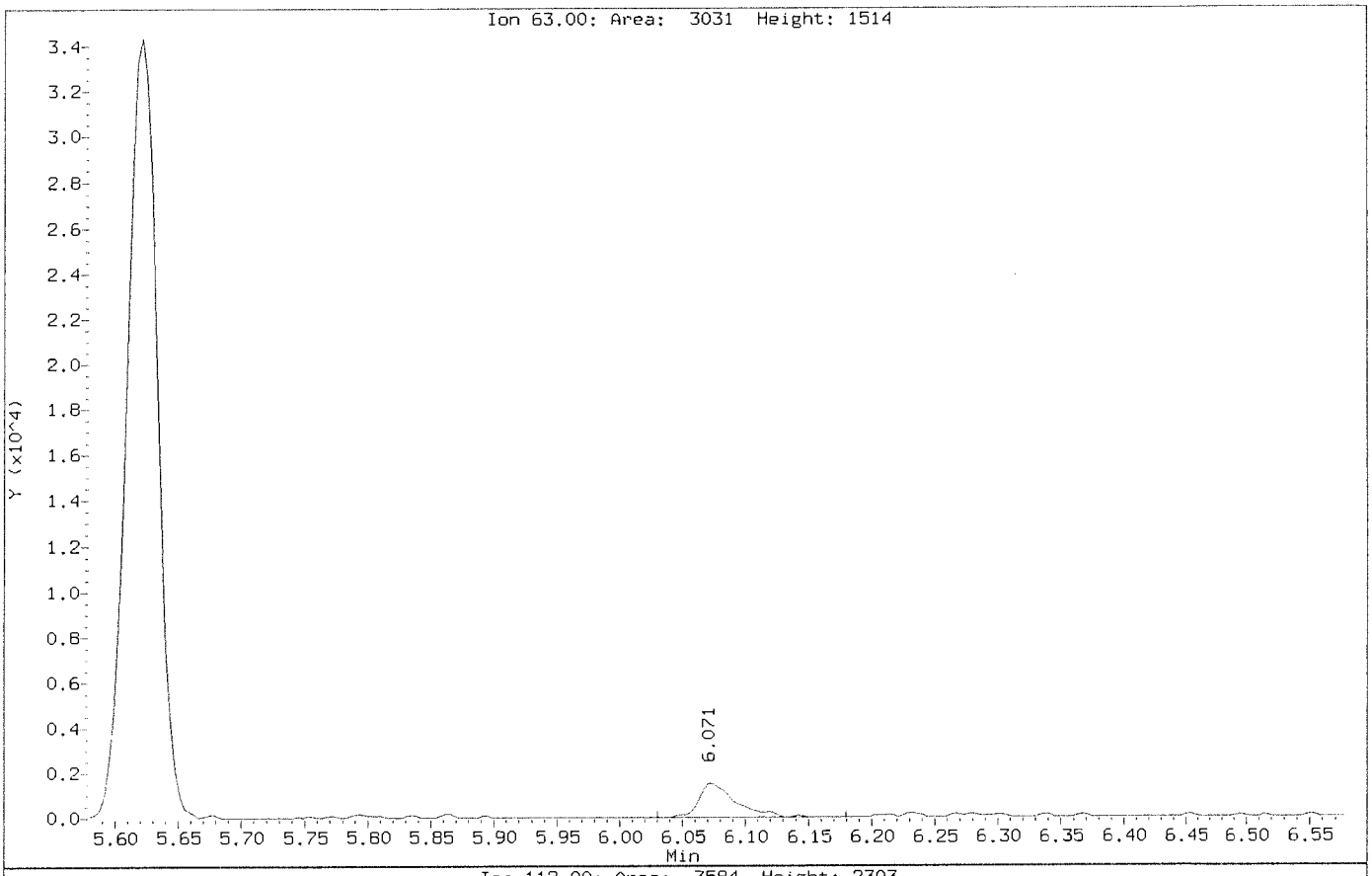
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CAS Number: 78-87-5

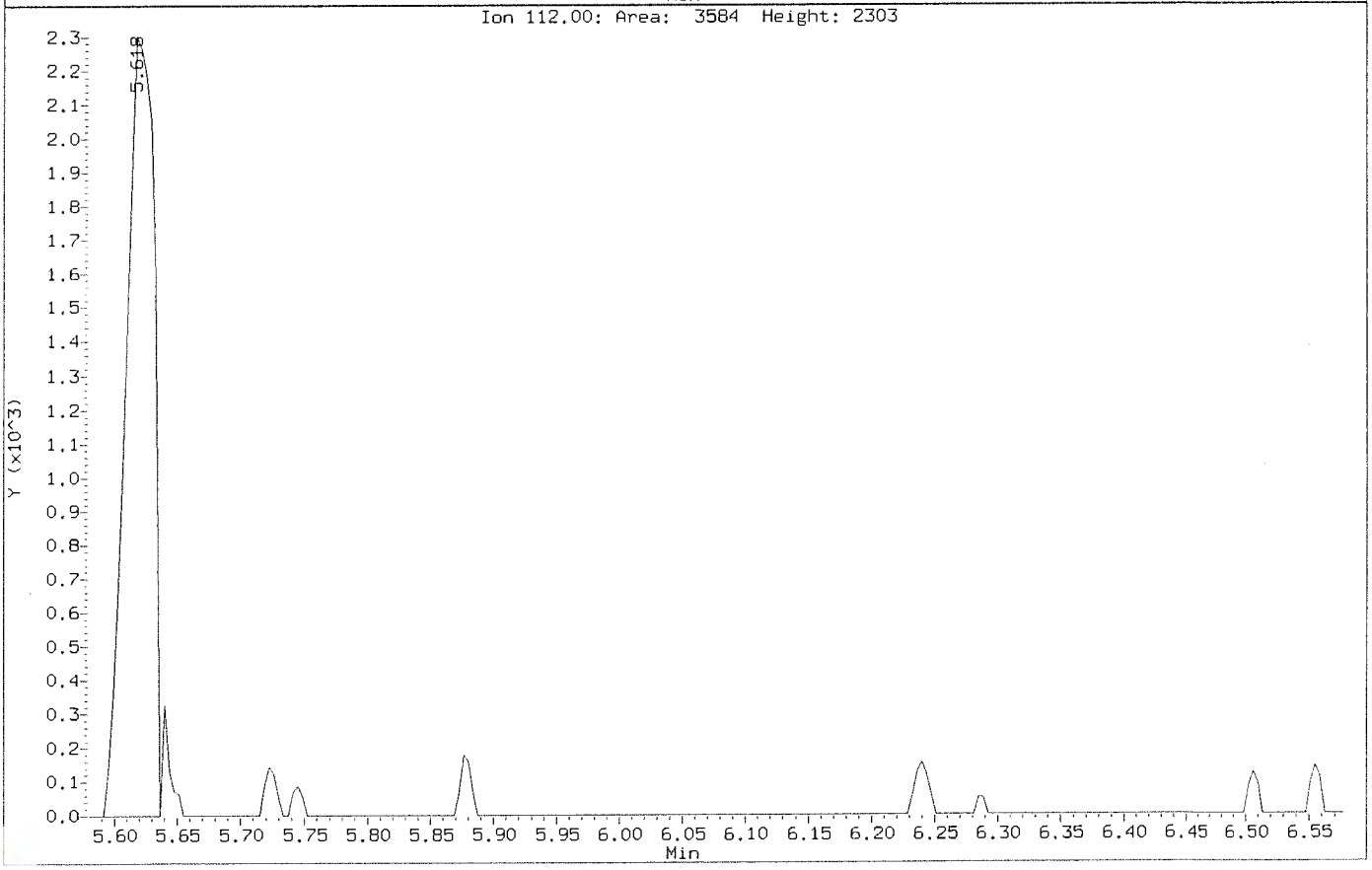




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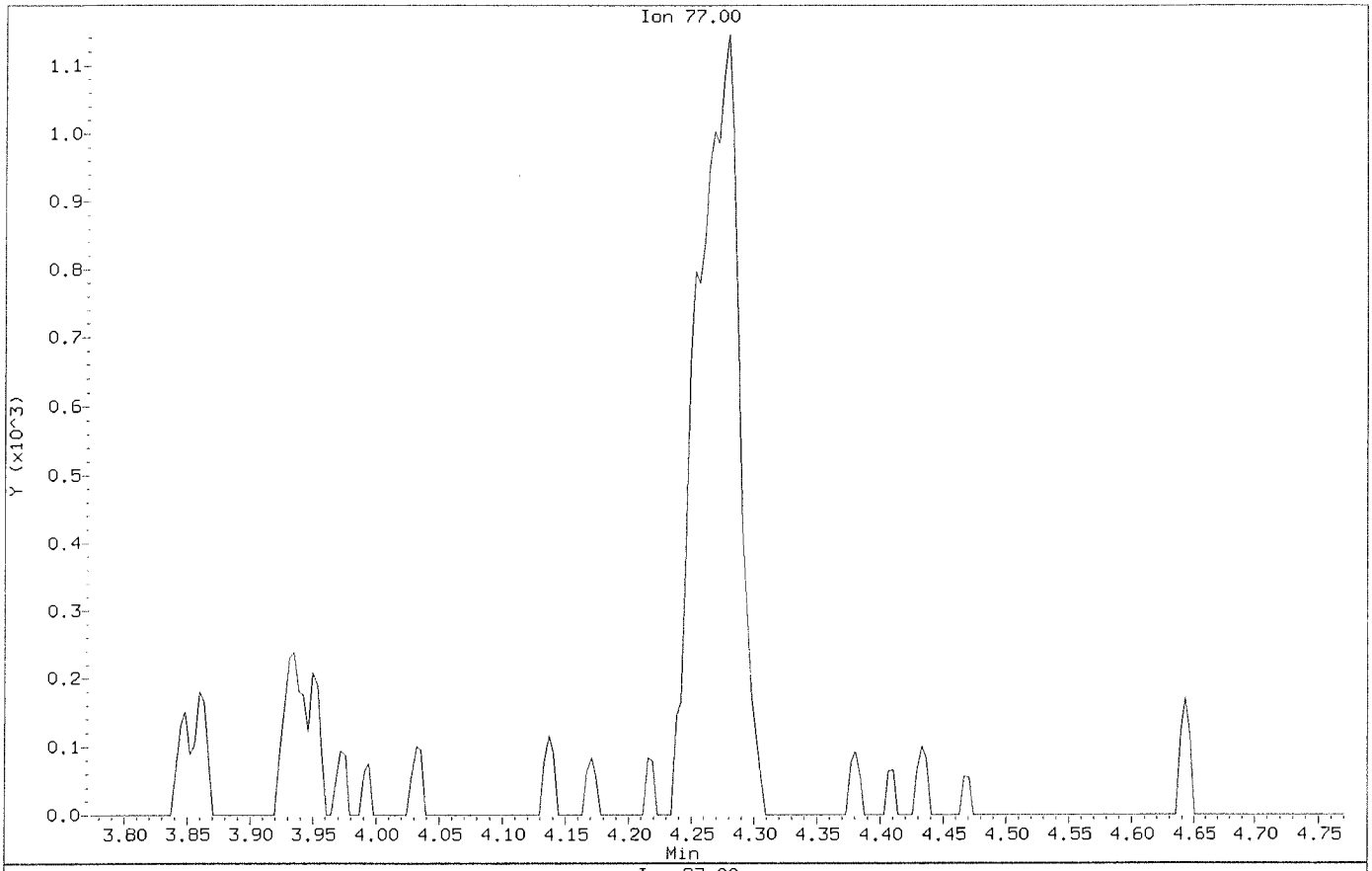
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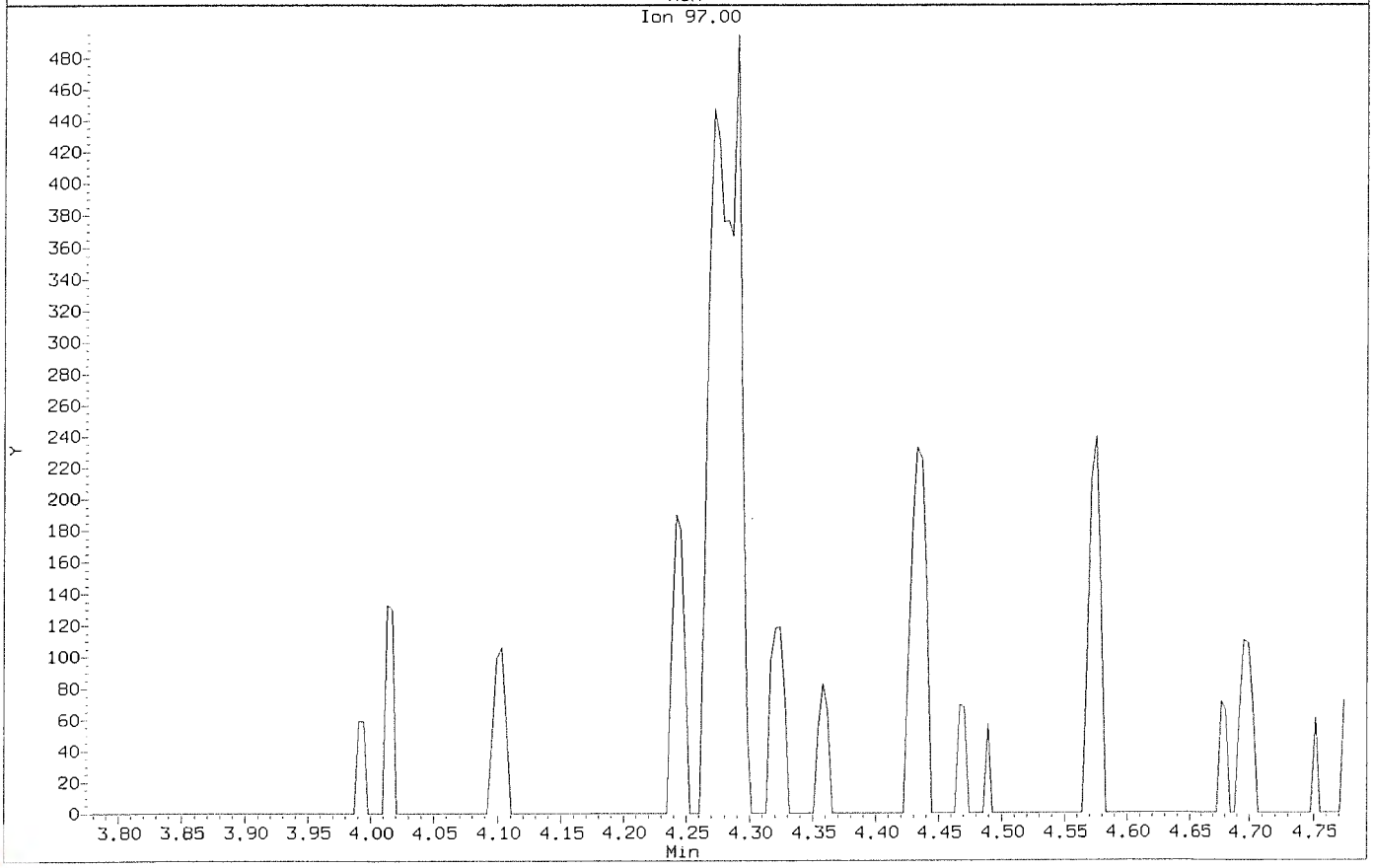




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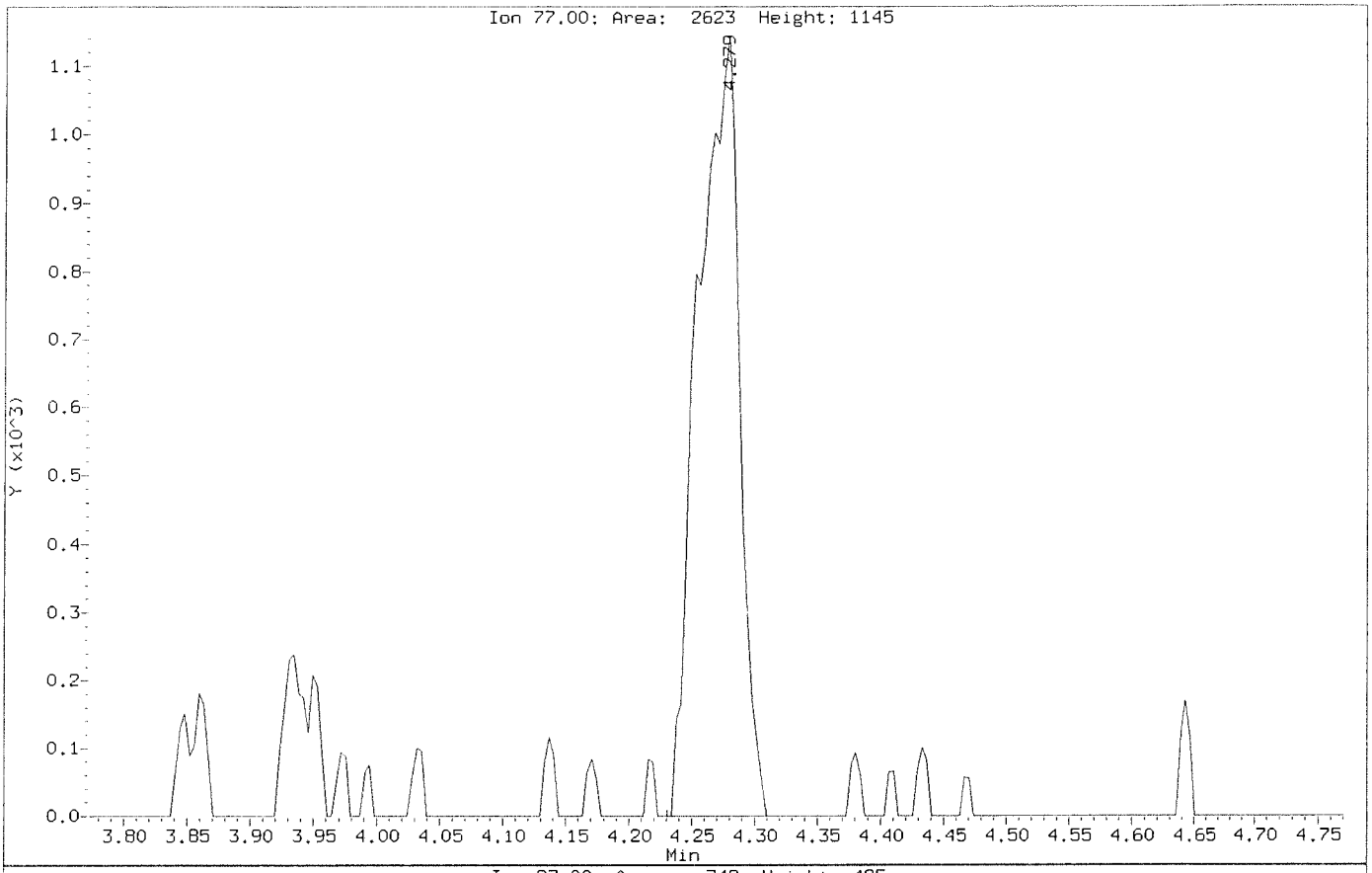
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7

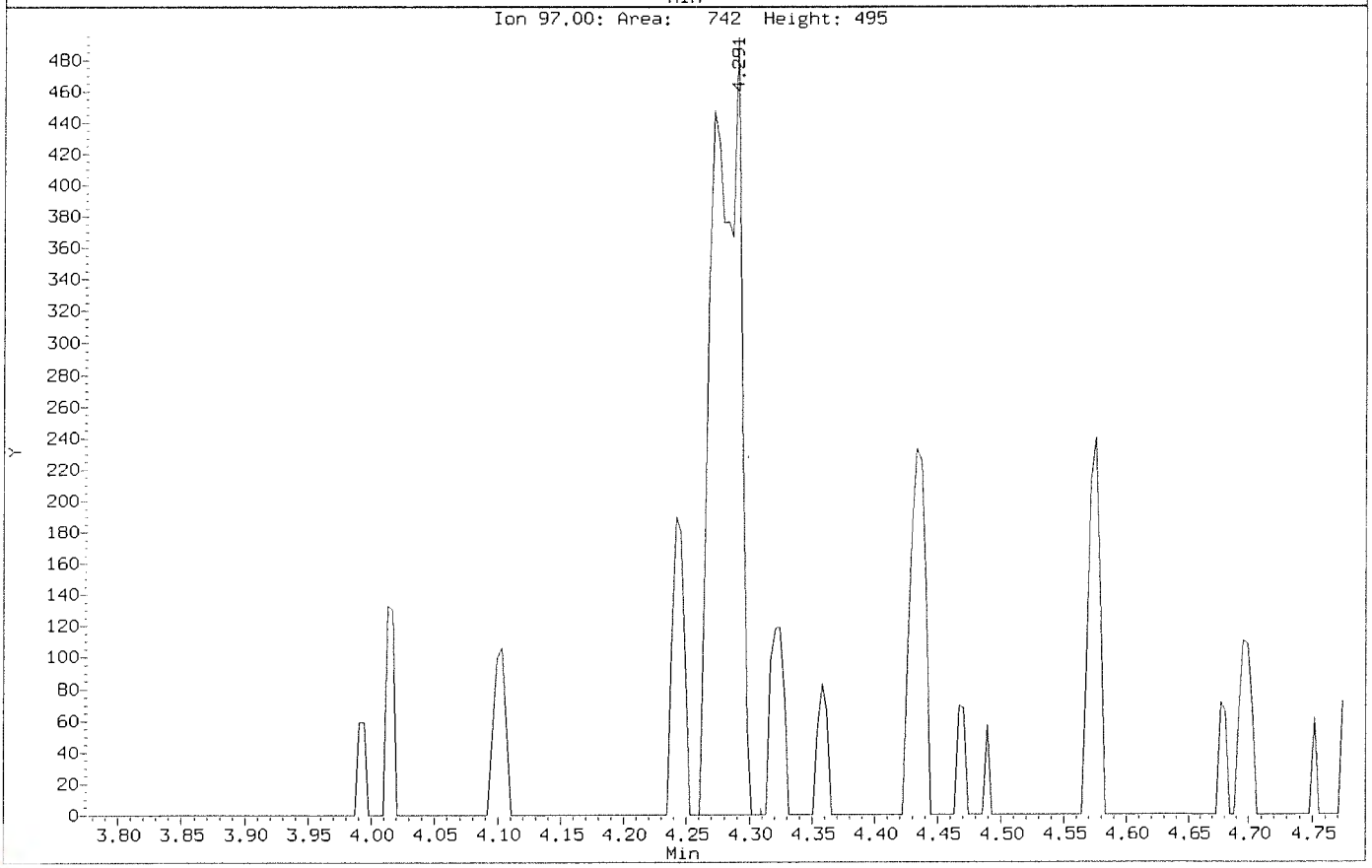




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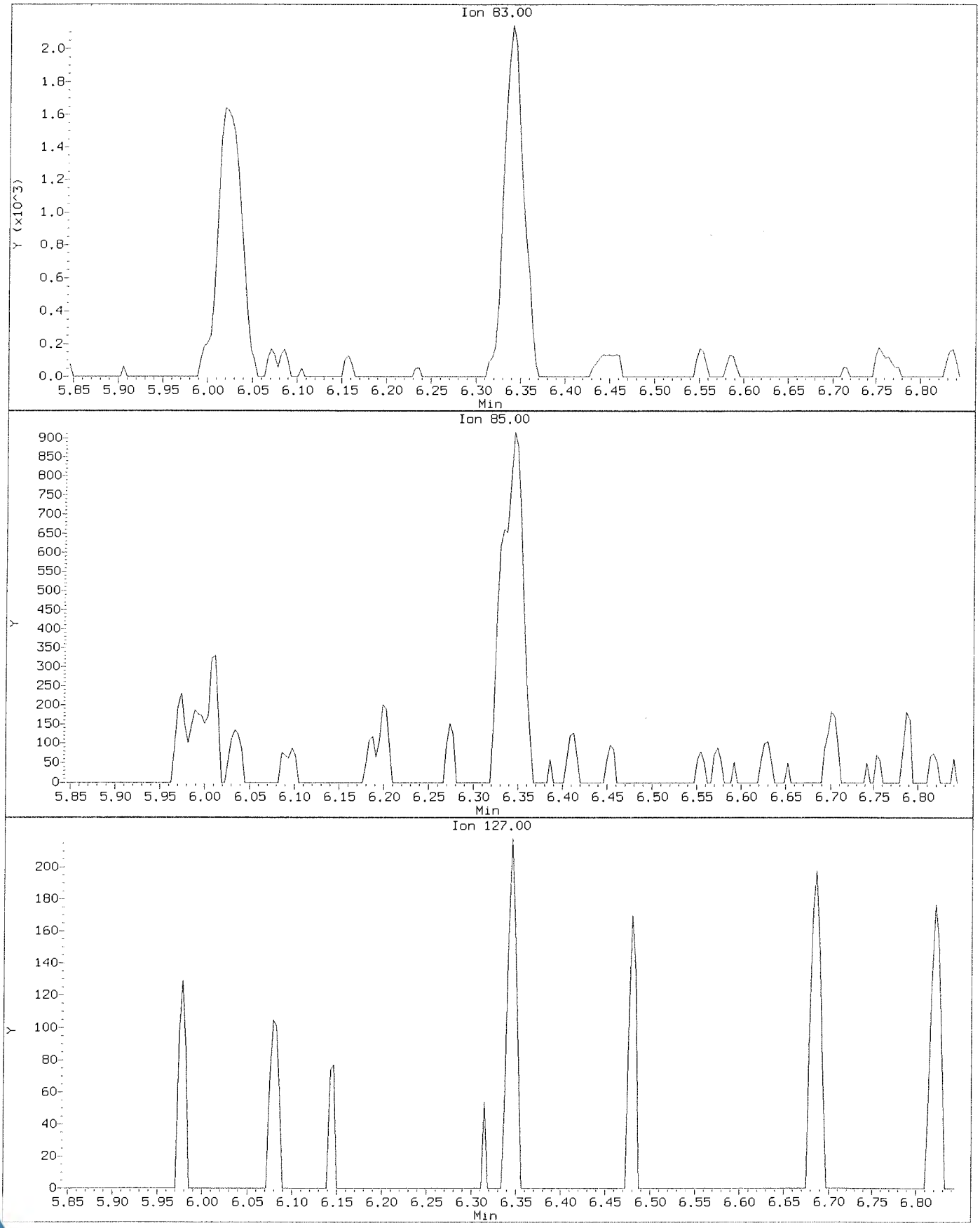
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





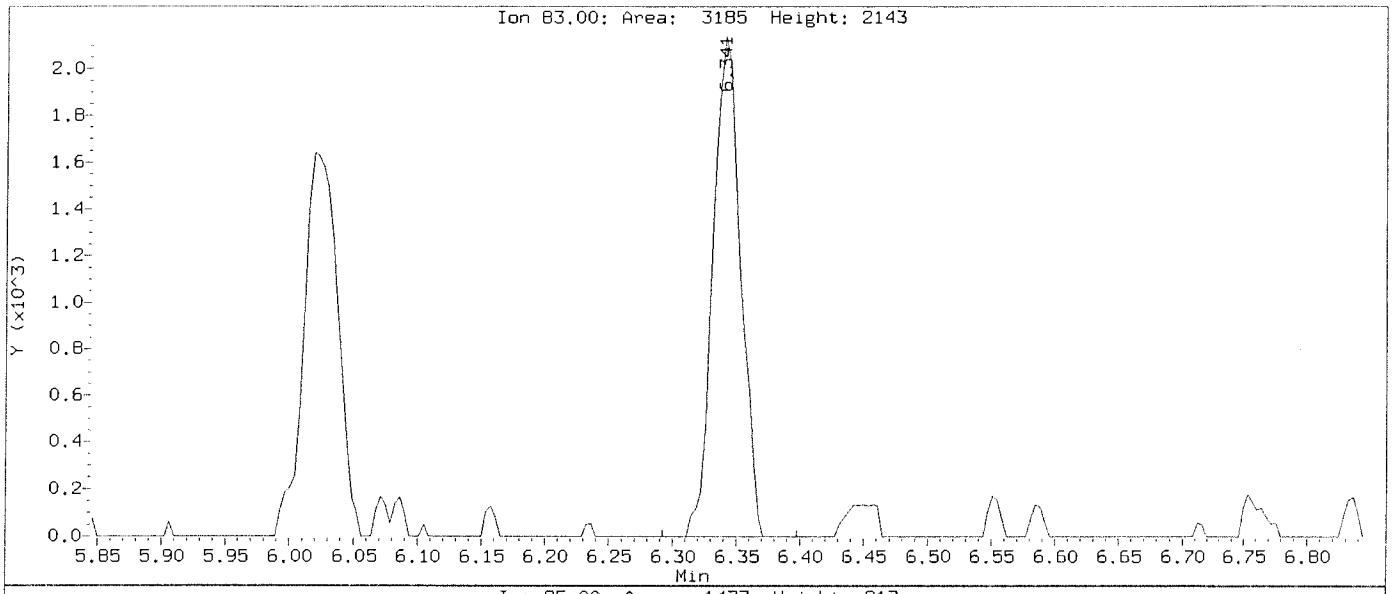
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Client Sample ID: VSTD001

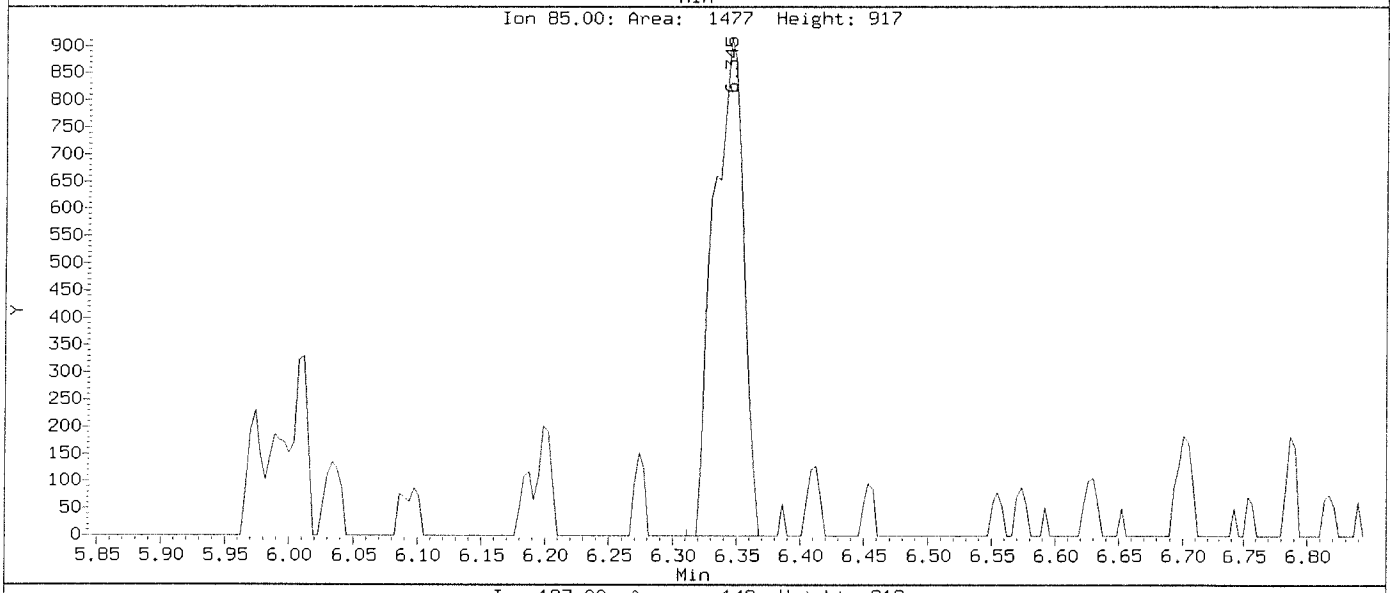
Compound: Bromodichloromethane
CAS Number: 75-27-4

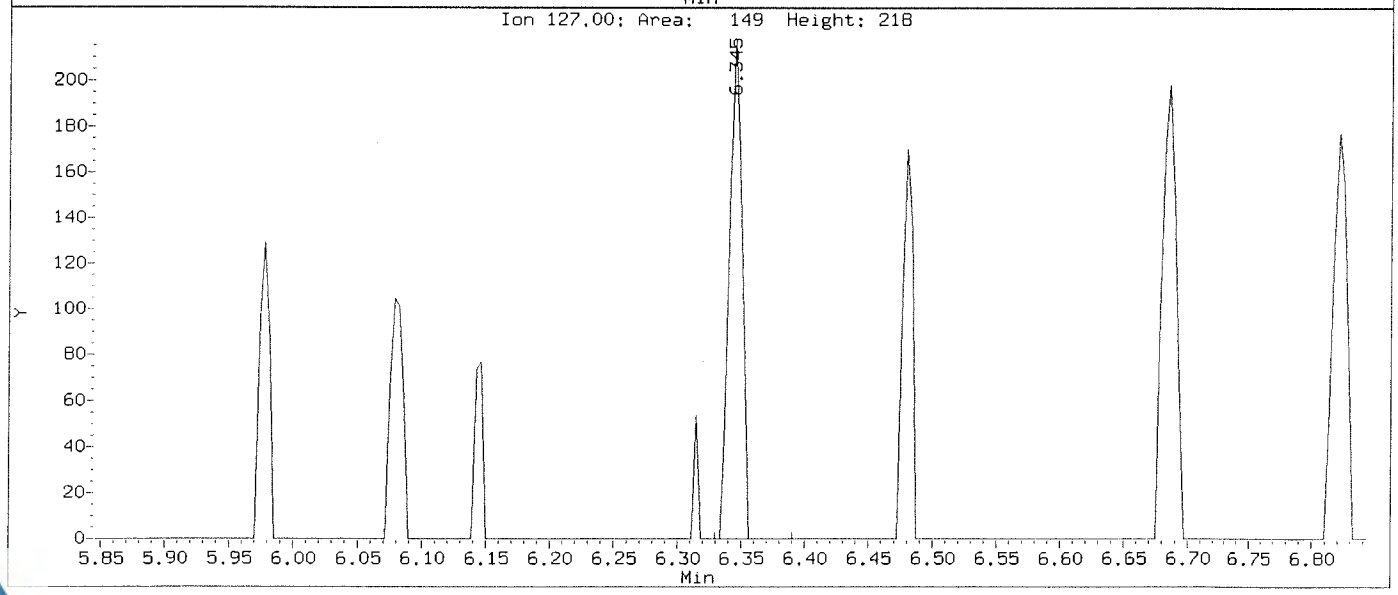


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Instrument: VOA9.i
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Compound: Bromodichloromethane
CAS Number: 75-27-4

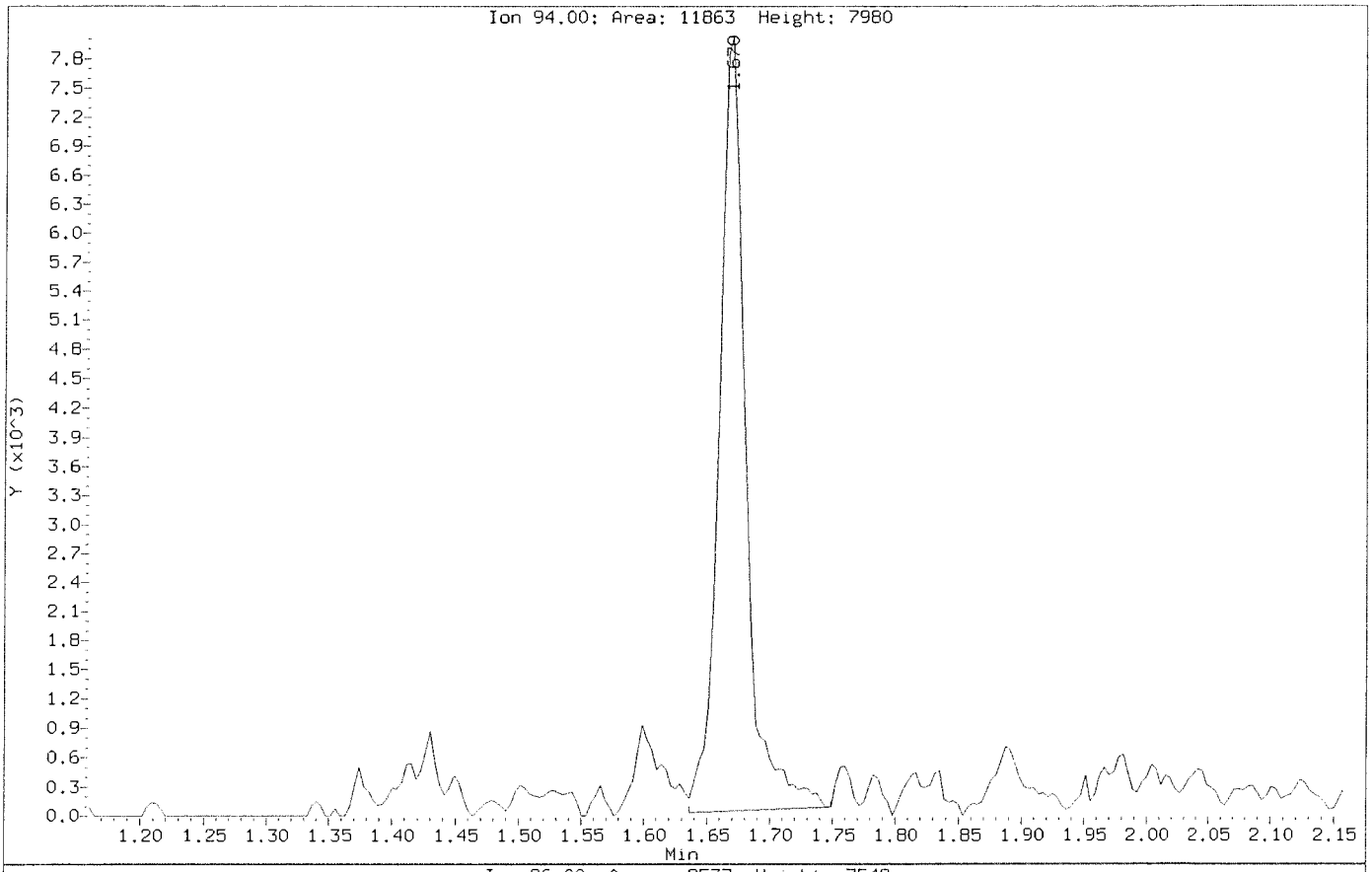


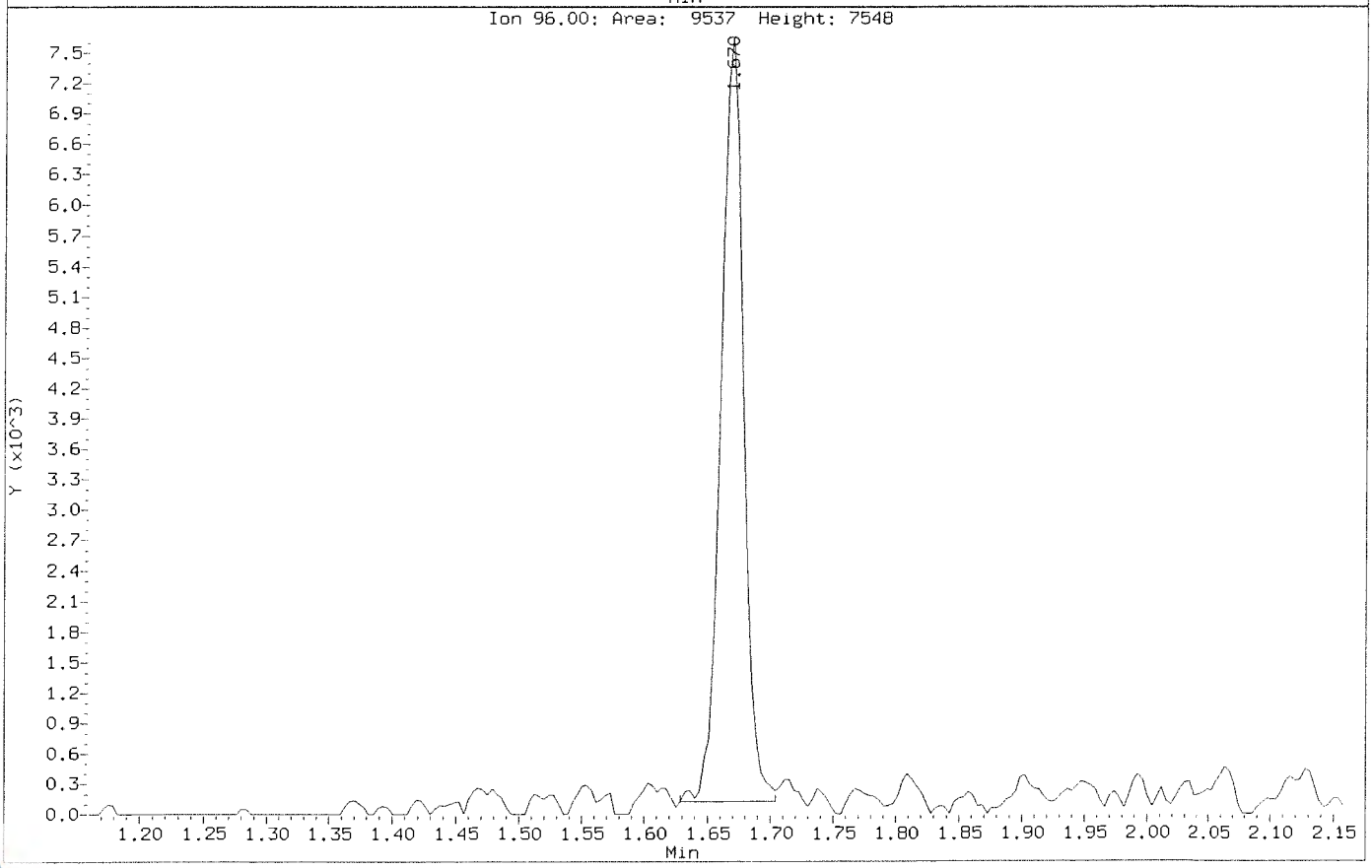




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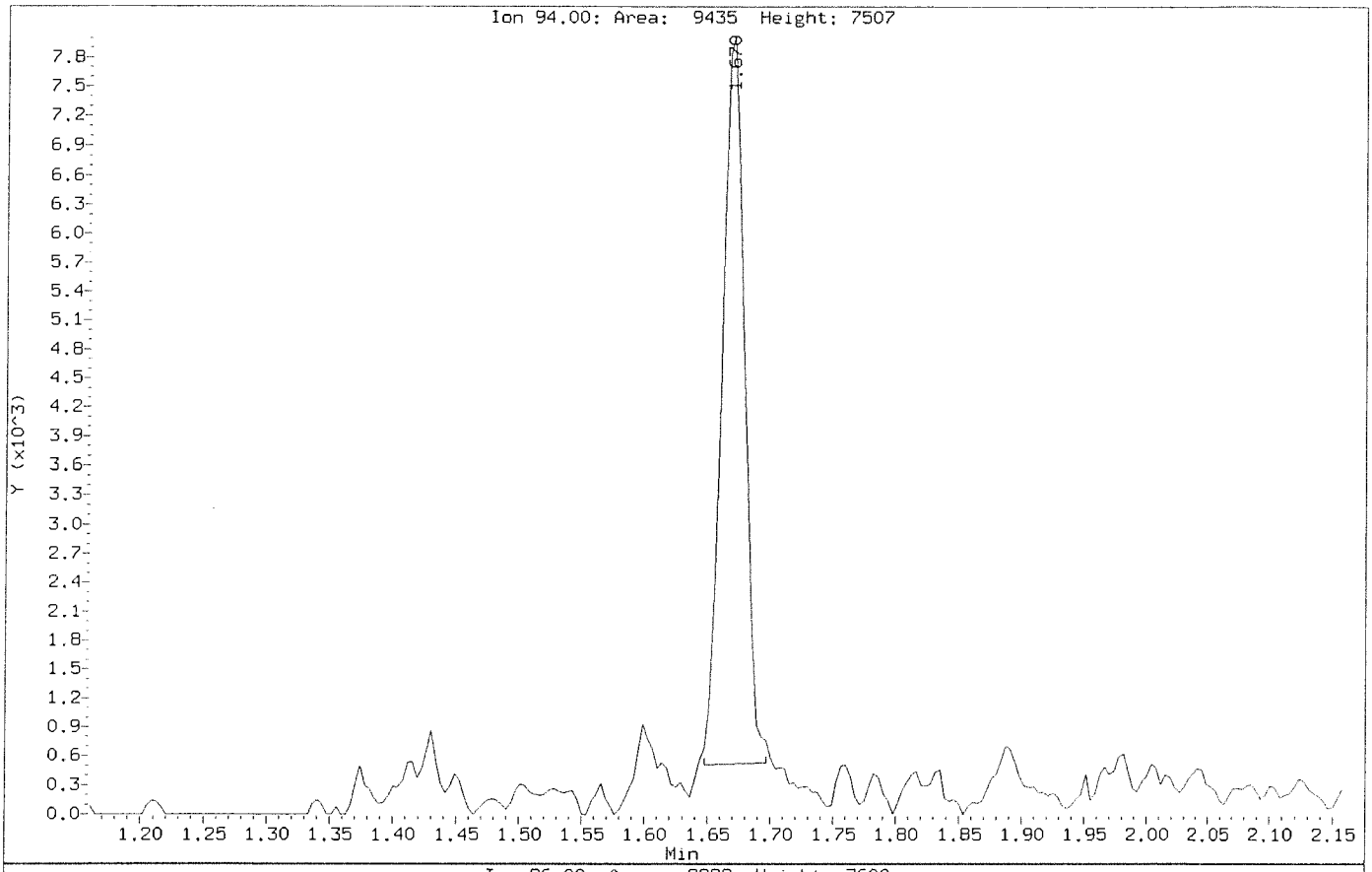
Compound: Bromomethane
CAS Number: 74-83-9

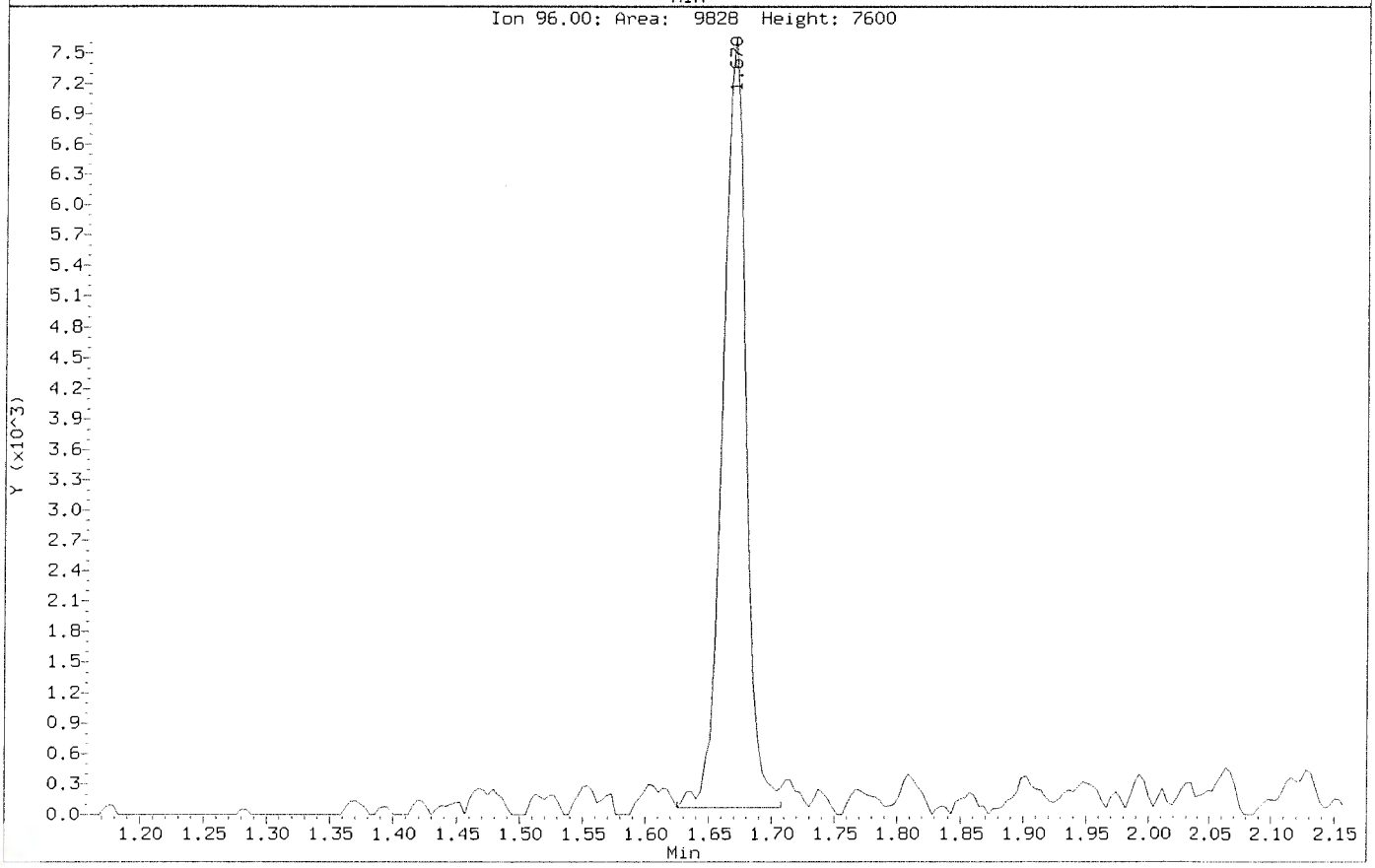




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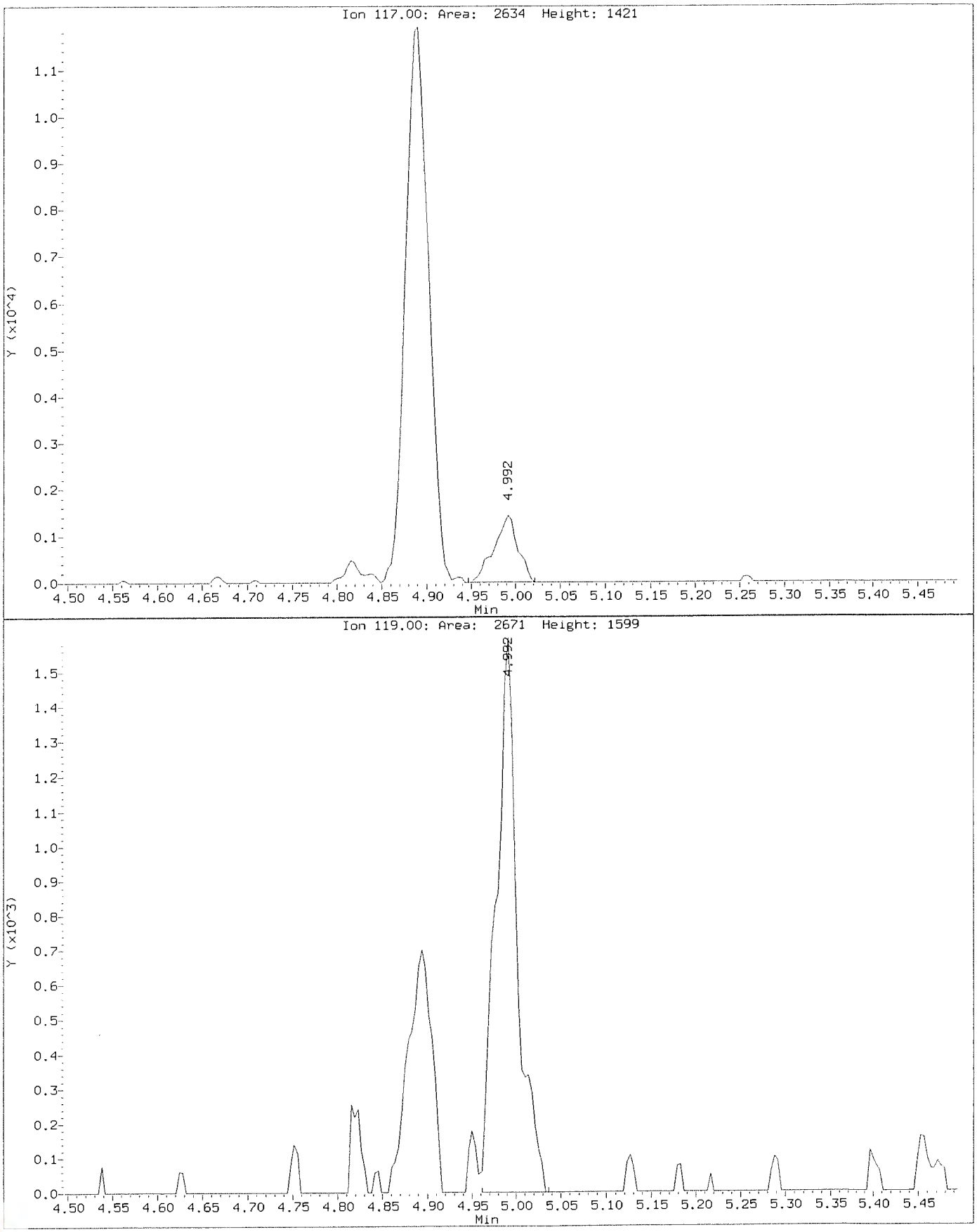
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CAS Number: 74-83-9





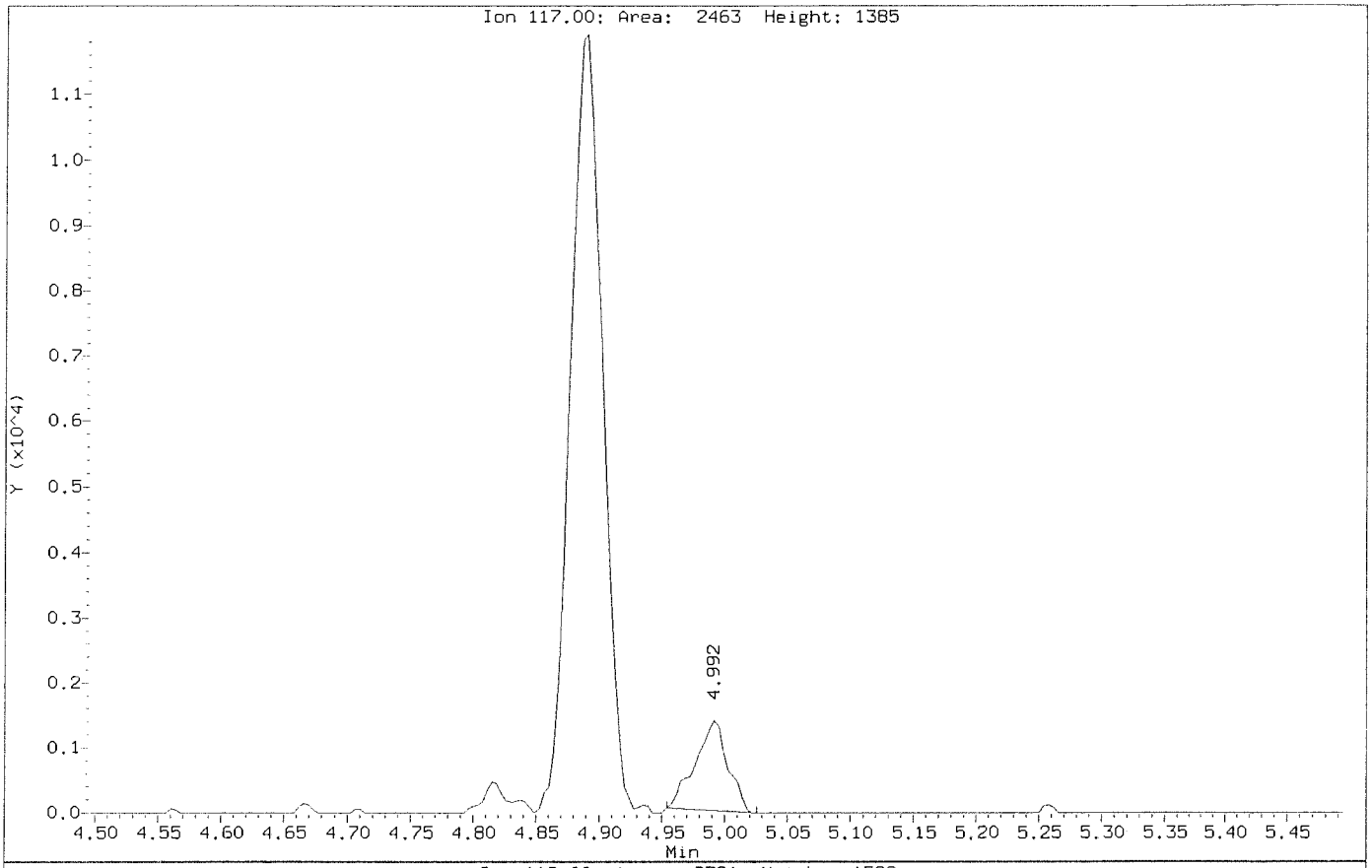
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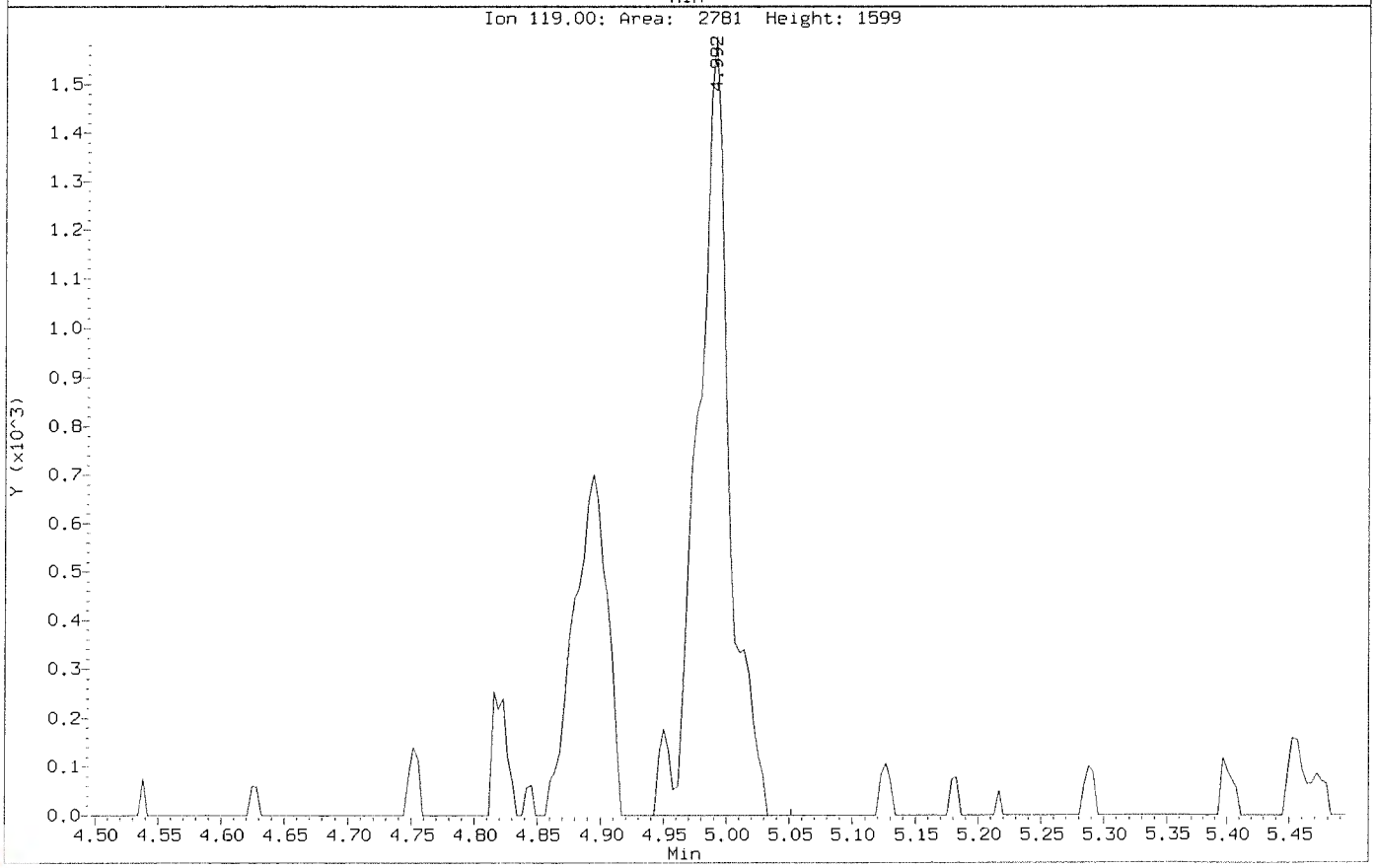
Compound: Carbon Tetrachloride
CAS Number: 56-23-5



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Instrument: VOA9.i
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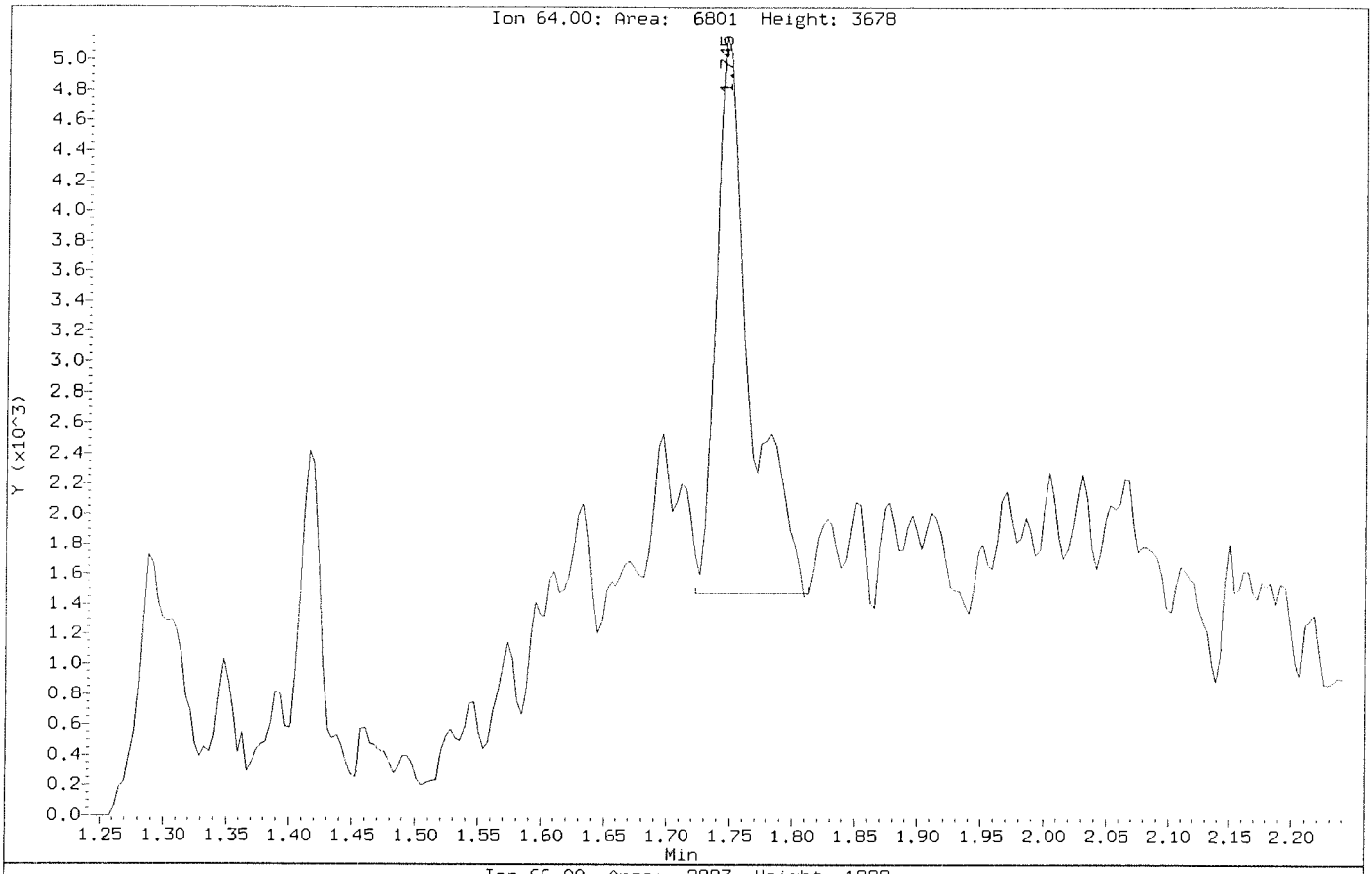
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

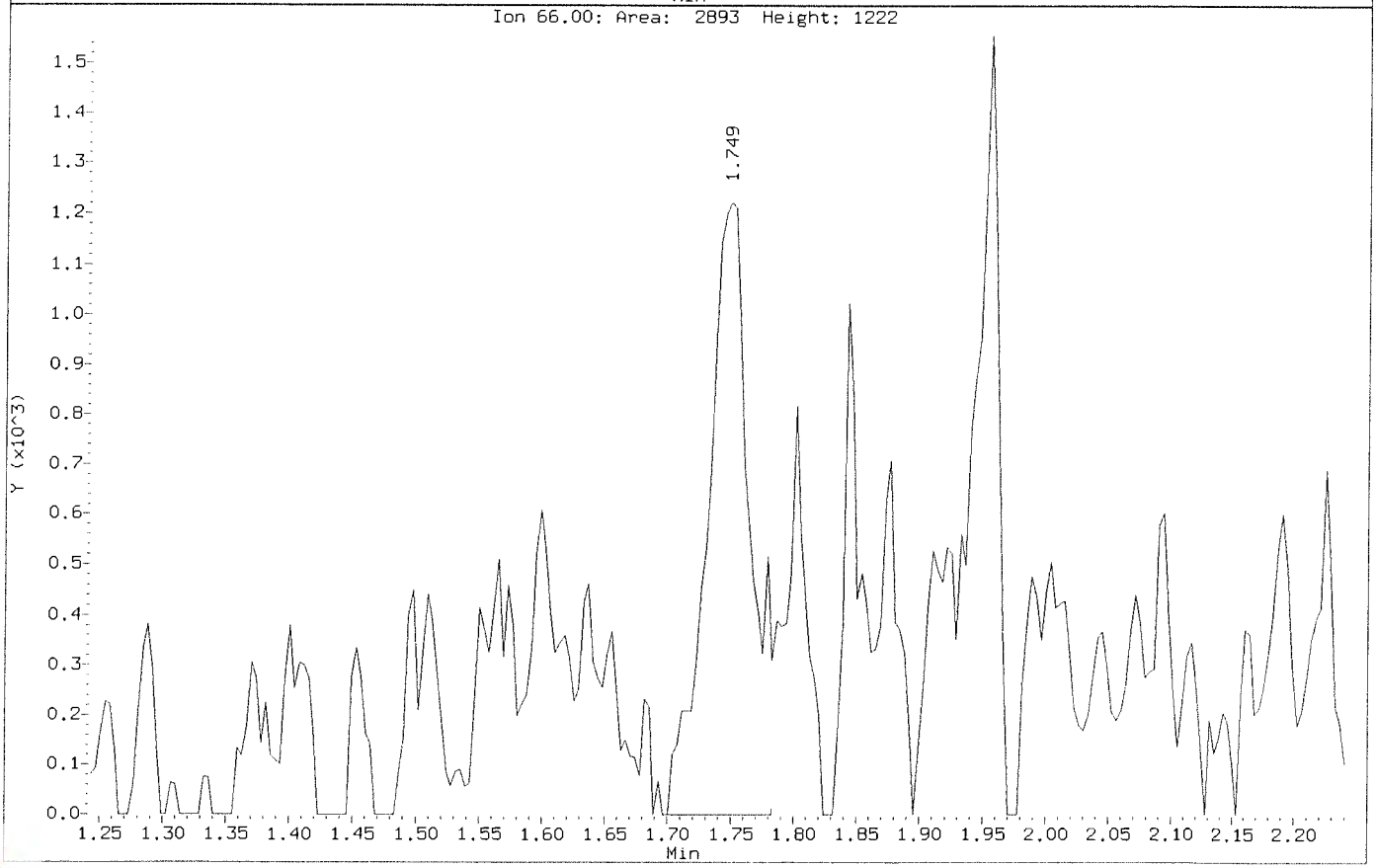




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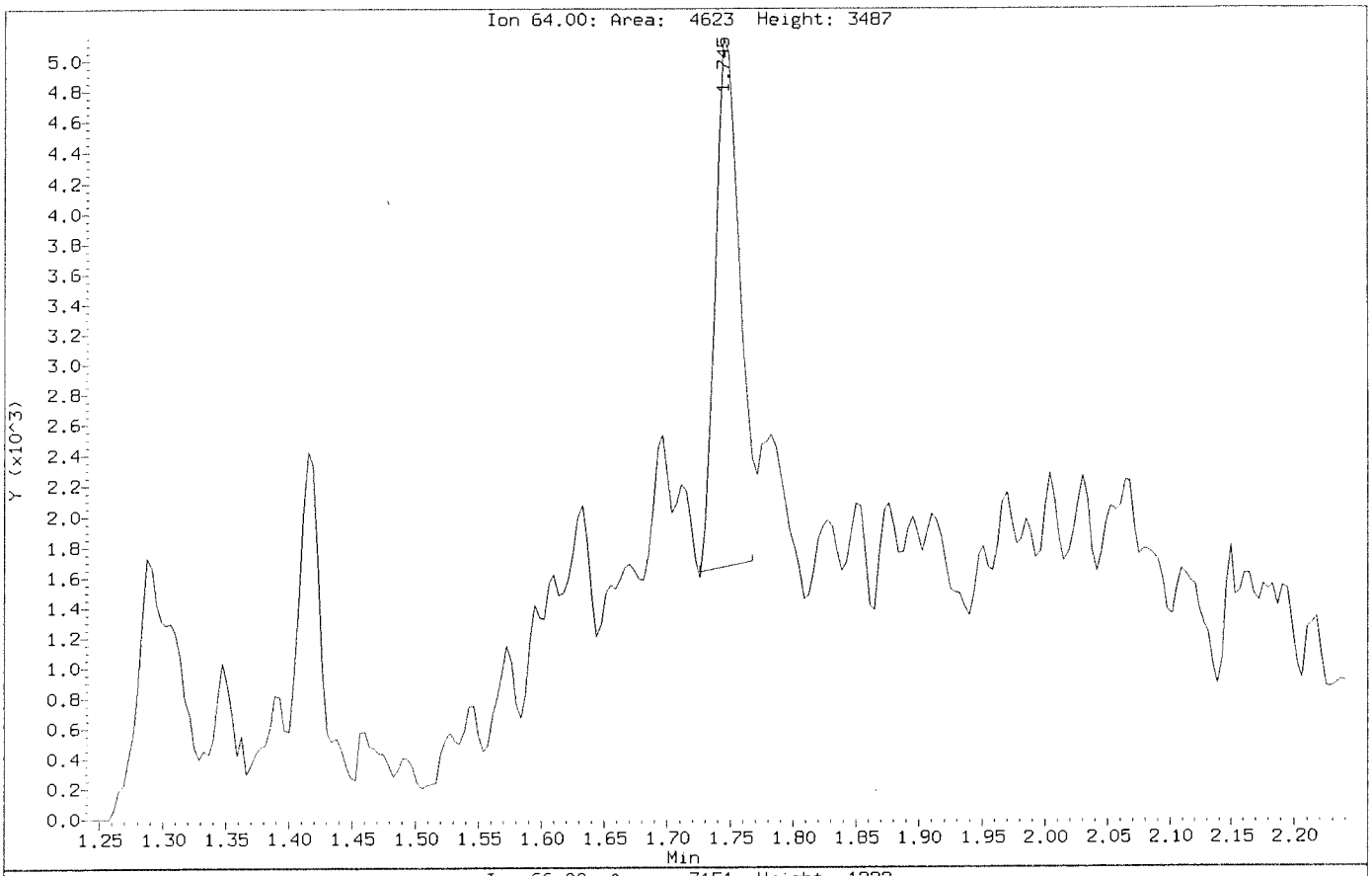
Compound: Chloroethane
CAS Number: 75-00-3

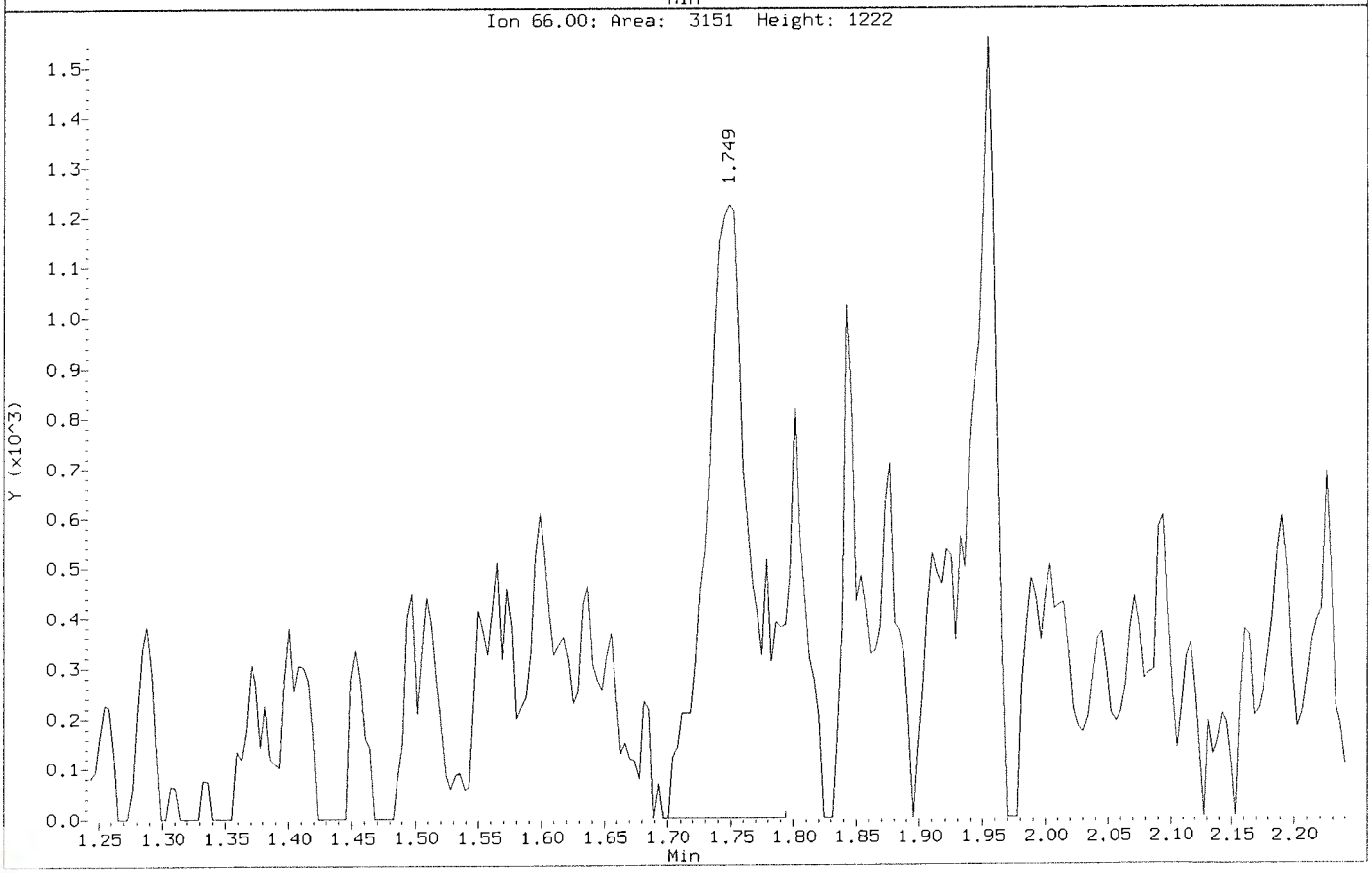




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Client Sample ID: VSTD001

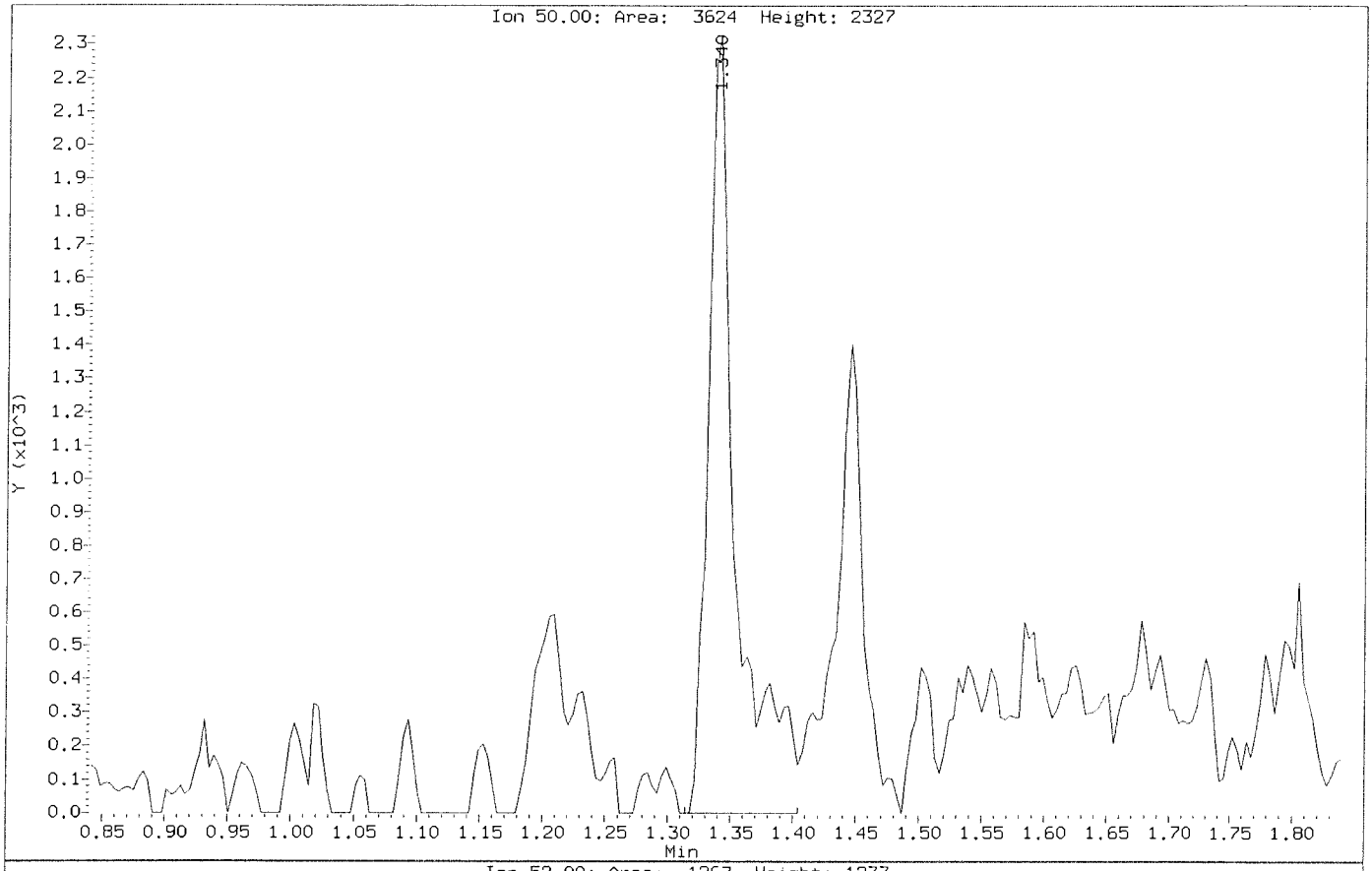
Compound: Chloroethane
CAS Number: 75-00-3

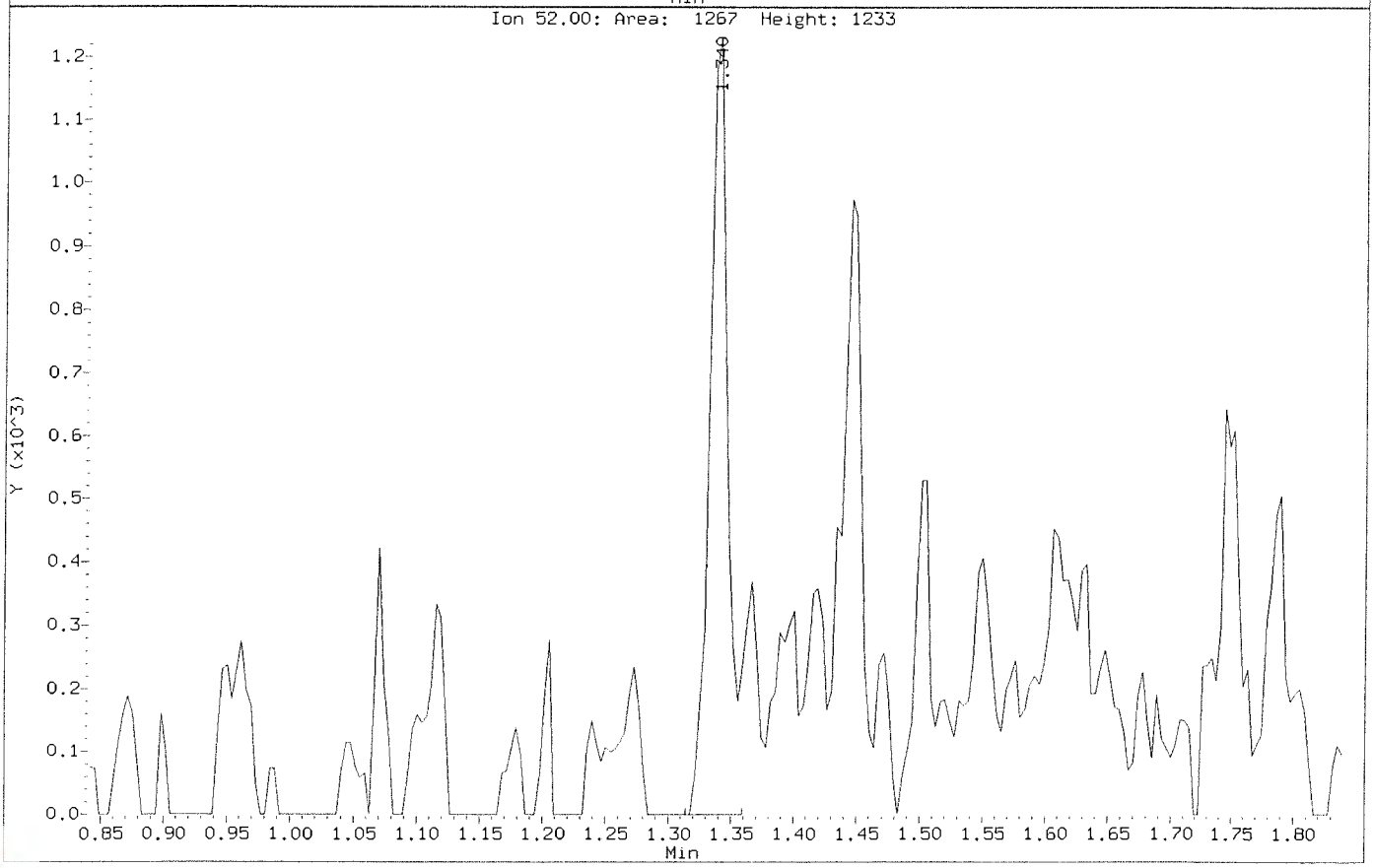




Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111204.D
Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

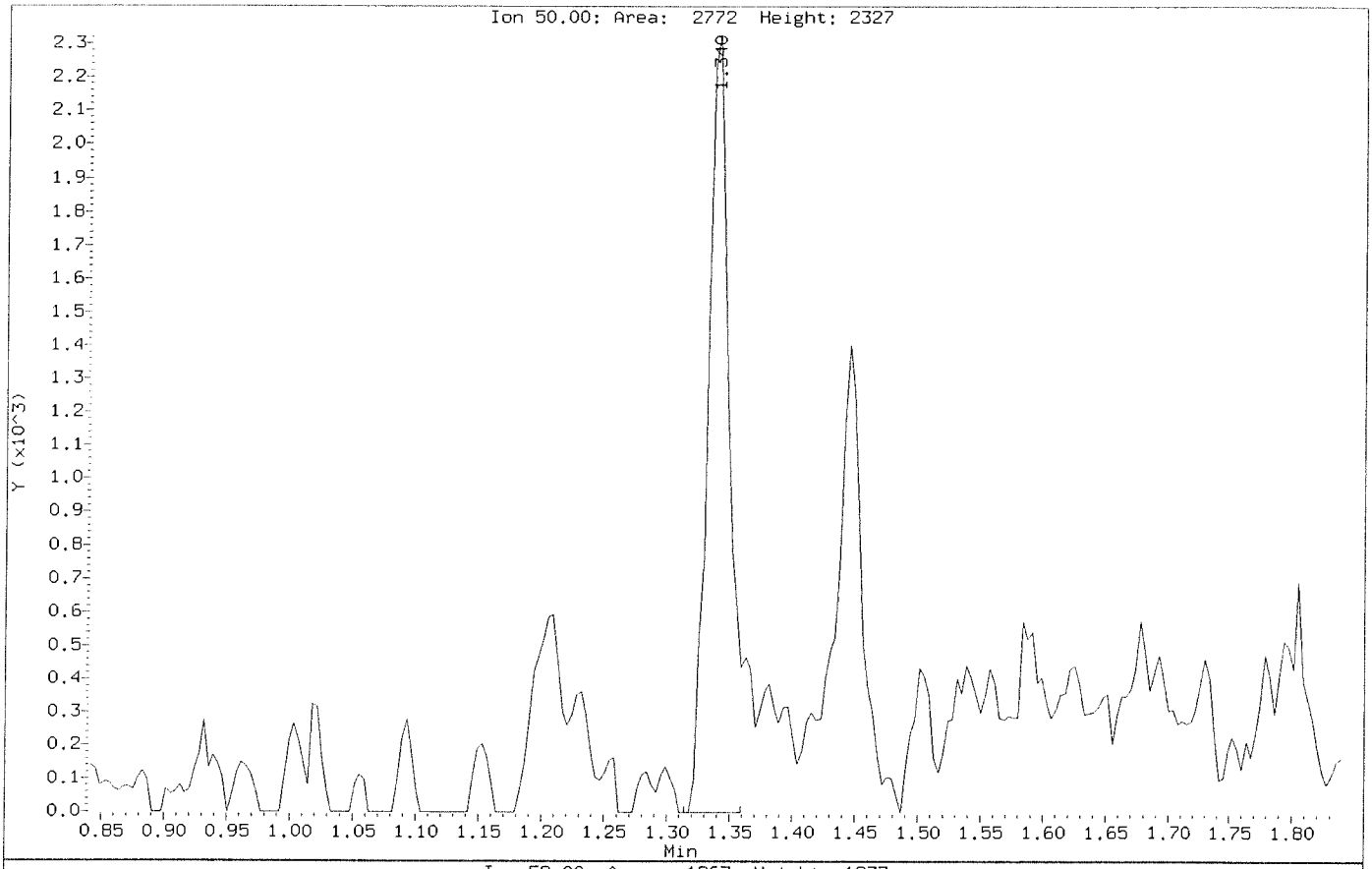
Compound: Chloromethane
CAS Number: 74-87-3

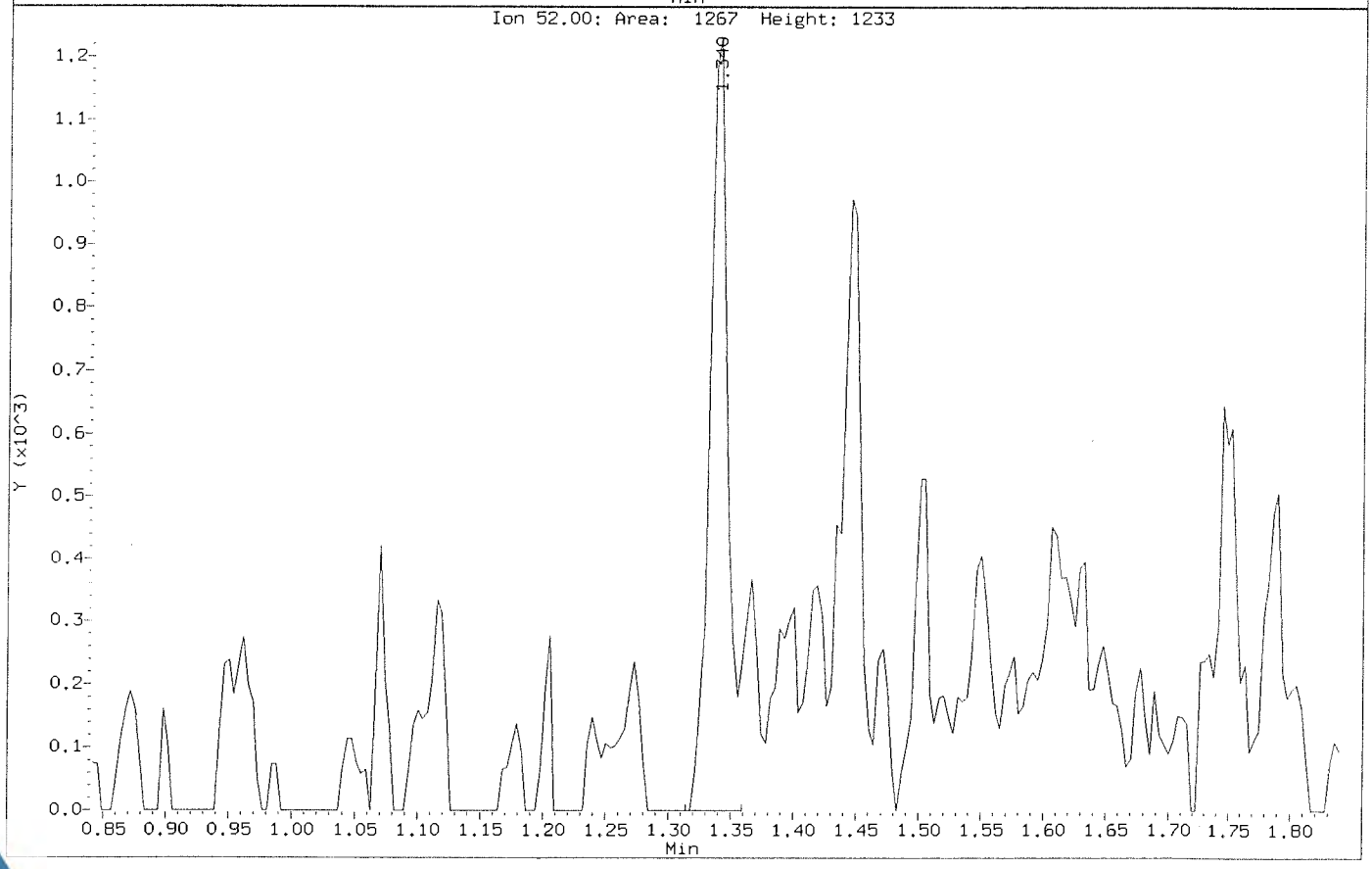




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Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

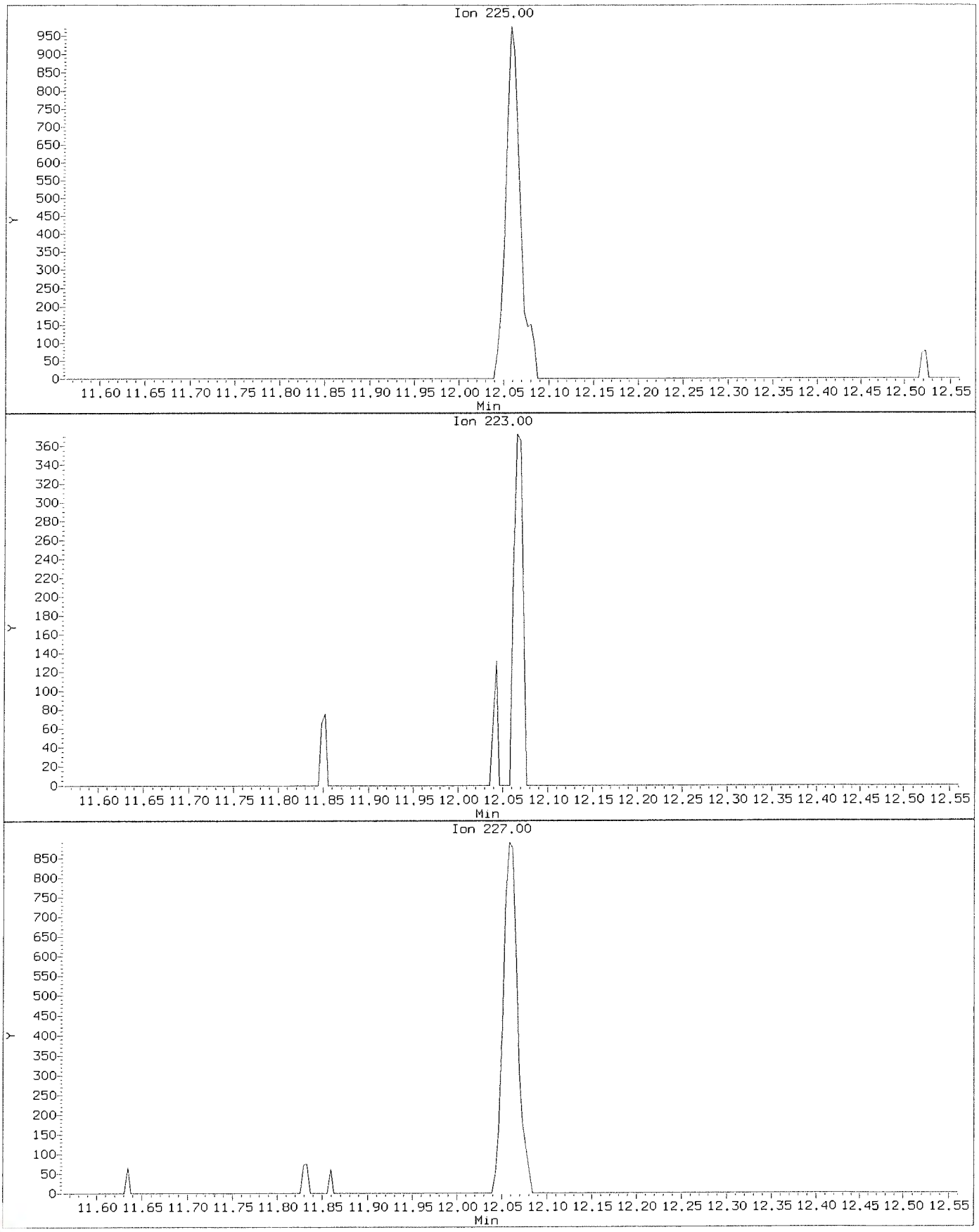
Compound: Chloromethane
CAS Number: 74-87-3





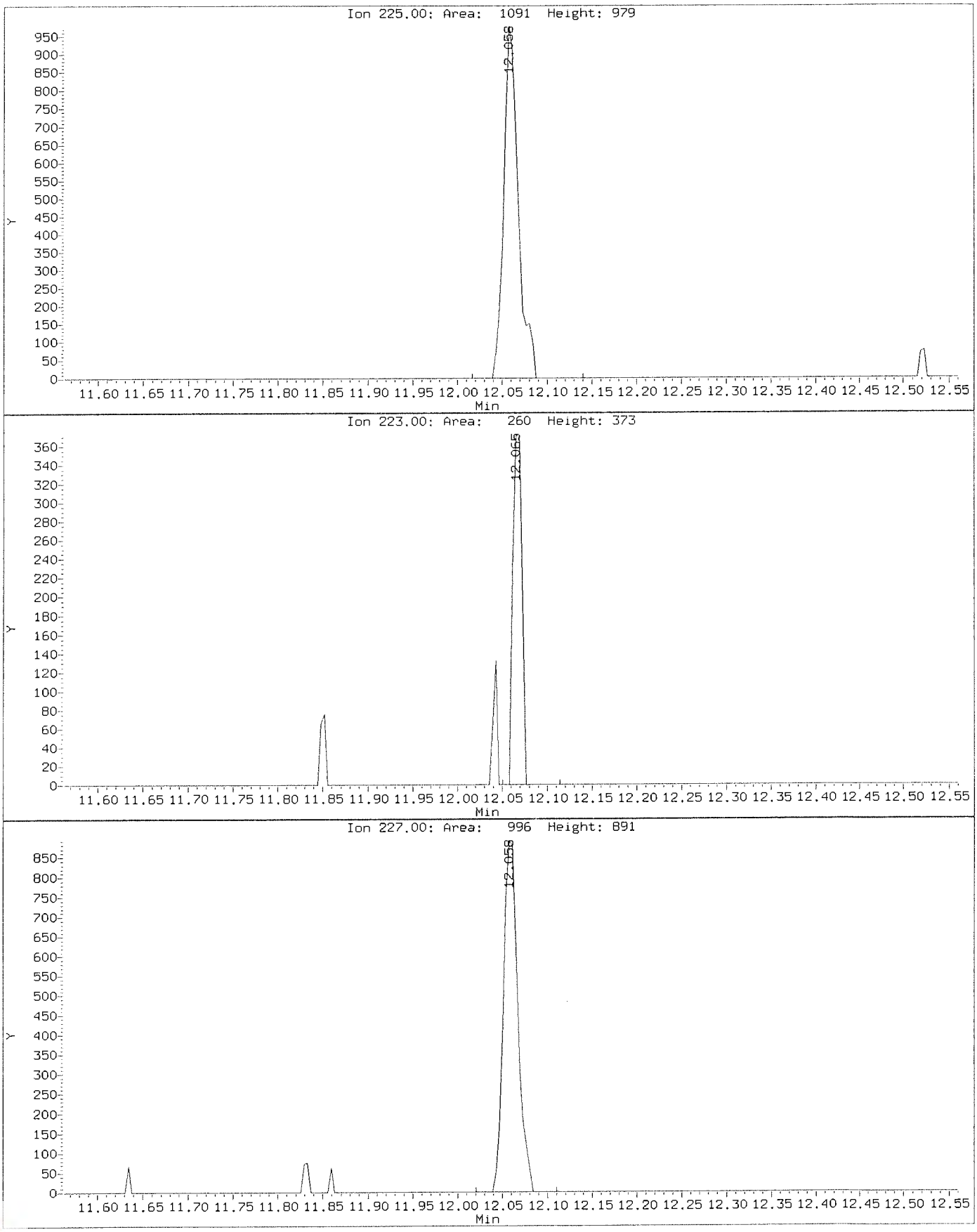
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Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111204.D
Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111205.D Page 1
Report Date: 05-Dec-2019 15:54

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Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111205.D
Lab Smp Id: VSTD002 Client Smp ID: VSTD002
Inj Date : 12-NOV-2019 12:52
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD002;VSTD002;1;4;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 12:52 Cal File: U112105.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

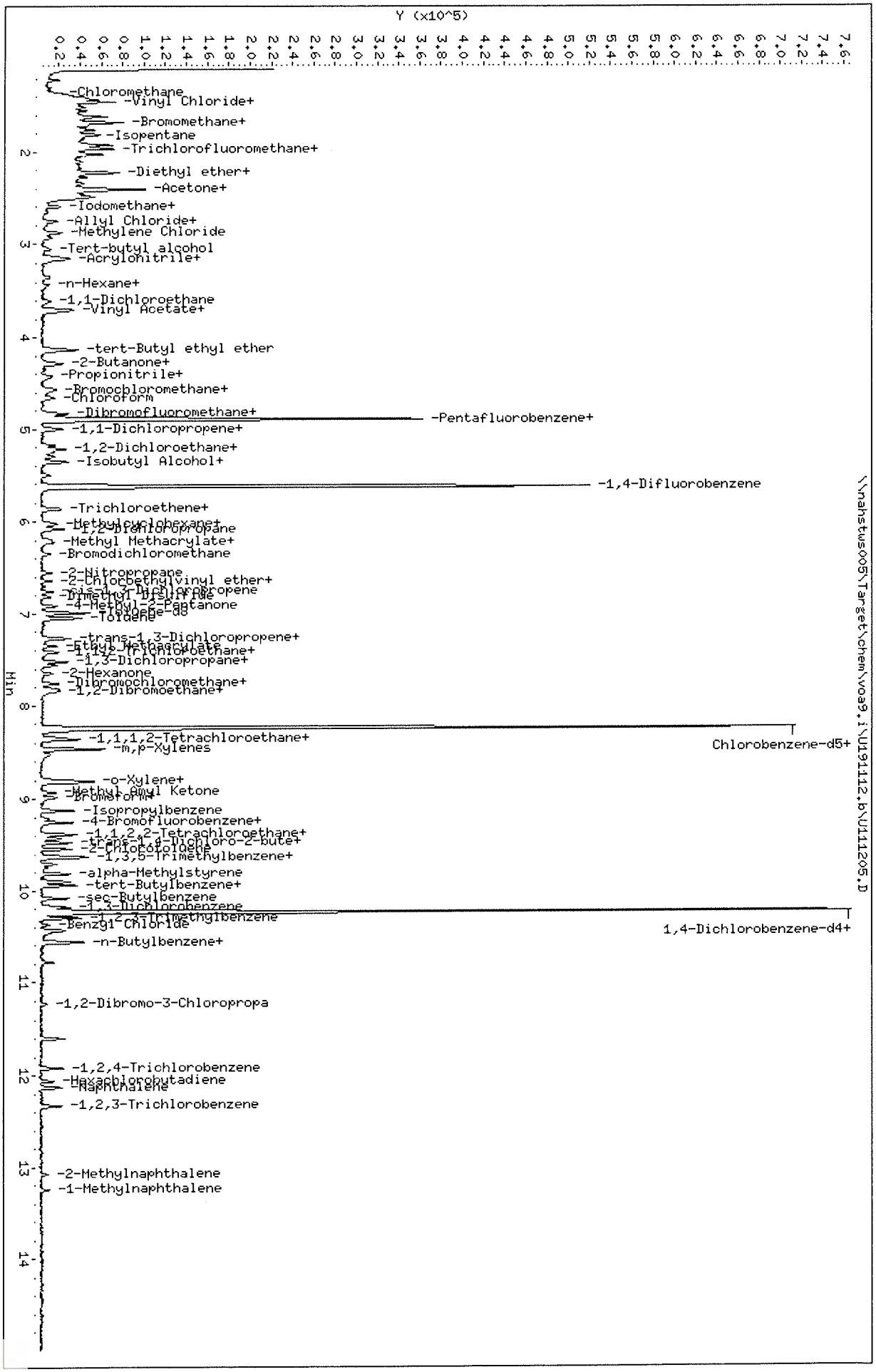
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	251708	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	409900	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	368054	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	189809	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	6889	2.00000	1.84(a)
$ 69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	6587	2.00000	2.94(a)
$ 30 Dibromofluoromethane	113	4.834	4.826	(0.988)	7231	2.00000	1.96(a)
$ 48 Toluene-d8	98	6.986	6.989	(0.847)	24741	2.00000	2.83(a)
60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	4139	2.00000	3.25(a)
31 1,1,1-Trichloroethane	97	4.830	4.826	(0.987)	6571	2.00000	1.75(a)
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	5838	2.00000	1.73(a)
138 Freon TF	101	2.412	2.397	(0.493)	12548	2.00000	2.23(a)
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	3597	2.00000	1.88(a)
22 1,1-Dichloroethane	63	3.601	3.600	(0.736)	7371	2.00000	2.06(a)
11 1,1-Dichloroethene	96	2.409	2.397	(0.492)	11818	2.00000	2.01(a)
32 1,1-Dichloropropene	75	5.003	5.002	(0.889)	5481	2.00000	1.99(a)
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	5442	2.00000	1.82(a)
71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	5994	2.00000	1.85(a)
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	6462	2.00000	1.91(a)
79 1,2,4-Trimethylbenzene	105	9.936	9.939	(0.971)	16506	2.00000	1.87(a)
89 1,2-Dibromo-3-Chloropropane	155	11.226	11.229	(1.097)	995	2.00000	3.05(a)
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	4671	2.00000	1.68(a)
88 1,2-Dichlorobenzene	146	10.570	10.569	(1.033)	9858	2.00000	1.72(a)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111205.D Page 2
Report Date: 05-Dec-2019 15:54

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.254	5.250	(0.934)	6419	2.00000	2.10(a)
42	1,2-Dichloropropane	63	6.079	6.078	(1.081)	3974	2.00000	0.59(aM)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	15005	2.00000	1.81(a)
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	10245	2.00000	1.82(a)
54	1,3-Dichloropropane	76	7.559	7.563	(0.917)	7536	2.00000	1.97(a)
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	11896	2.00000	1.95(a)
26	2,2-Dichloropropane	77	4.272	4.271	(0.873)	5617	2.00000	1.94(a)
24	2-Butanone	43	4.347	4.339	(0.888)	4562	4.00000	3.32(a)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	11897	2.00000	1.93(a)
52	2-Hexanone	43	7.649	7.649	(0.928)	5875	4.00000	3.65(a)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	13088	2.00000	1.68(a)
82	p-Isopropyltoluene	119	10.206	10.209	(0.997)	15950	2.00000	1.80(a)
45	4-Methyl-2-Pentanone	43	6.915	6.914	(0.839)	7754	4.00000	3.61(a)
10	Acetone	43	2.487	2.483	(0.508)	15326	4.00000	(a)
37	Benzene	78	5.216	5.216	(0.927)	16996	2.00000	1.91(a)
74	Bromobenzene	156	9.377	9.381	(0.916)	6126	2.00000	1.78(a)
29	Bromochloromethane	128	4.557	4.553	(0.931)	2799	2.00000	1.88(a)
39	Bromodichloromethane	83	6.349	6.344	(1.129)	4892	2.00000	1.79(aM)
66	Bromoform	173	8.976	8.984	(1.089)	2995	2.00000	3.39(Ta)
6	Bromomethane	94	1.678	1.659	(0.343)	16415	2.00000	1.78(a)
19	Carbon Disulfide	76	2.596	2.584	(0.530)	20943	4.00000	3.75(a)
34	Carbon Tetrachloride	117	5.003	4.995	(0.889)	5143	2.00000	1.80(aM)
59	Chlorobenzene	112	8.272	8.271	(1.003)	14274	2.00000	1.91(a)
7	Chloroethane	64	1.760	1.741	(0.360)	7971	2.00000	0.58(a)
28	Chloroform	83	4.658	4.654	(0.952)	6898	2.00000	1.62(a)
3	Chloromethane	50	1.348	1.340	(0.275)	5474	2.00000	1.28(a)
27	cis-1,2-Dichloroethene	96	4.294	4.283	(0.877)	6169	2.00000	2.15(a)
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	4878	2.00000	1.63(a)
55	Dibromochloromethane	129	7.754	7.758	(0.940)	3565	2.00000	3.74(a)
44	Dibromomethane	93	6.184	6.187	(1.099)	3603	2.00000	2.16(aM)
2	Dichlorodifluoromethane	85	1.213	1.205	(0.248)	6022	2.00000	2.35(a)
61	Ethylbenzene	106	8.365	8.369	(1.015)	6710	2.00000	1.80(a)
91	Hexachlorobutadiene	225	12.054	12.061	(1.178)	2029	2.00000	1.77(a)
67	Isopropylbenzene	105	9.123	9.126	(1.106)	19396	2.00000	1.84(a)
62	m,p-Xylenes	106	8.470	8.470	(1.027)	15903	4.00000	3.49(a)
17	Methylene Chloride	84	2.877	2.869	(0.588)	4577	2.00000	2.81(a)
87	n-Butylbenzene	91	10.555	10.554	(1.032)	12607	2.00000	1.70(a)
73	n-Propylbenzene	91	9.471	9.475	(0.926)	20591	2.00000	1.85(a)
92	Naphthalene	128	12.133	12.129	(1.186)	14773	2.00000	1.64(a)
63	o-Xylene	106	8.808	8.807	(1.068)	7729	2.00000	1.67(a)
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	17582	2.00000	1.89(a)
64	Styrene	104	8.819	8.822	(1.070)	13838	2.00000	1.72(a)
78	tert-Butylbenzene	119	9.899	9.898	(0.967)	13268	2.00000	1.88(a)
56	Tetrachloroethene	166	7.522	7.522	(0.912)	6017	2.00000	2.15(a)
50	Toluene	91	7.046	7.045	(0.855)	19969	2.00000	1.79(a)
20	trans-1,2-Dichloroethene	96	3.147	3.139	(0.643)	4204	2.00000	3.53(a)
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	4967	2.00000	2.19(a)
38	Trichloroethene	130	5.861	5.861	(1.042)	5688	2.00000	2.09(a)
8	Trichlorofluoromethane	101	1.963	1.951	(0.401)	22144	2.00000	2.05(a)
5	Vinyl Chloride	62	1.426	1.419	(0.292)	12300	2.00000	2.19(a)

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.



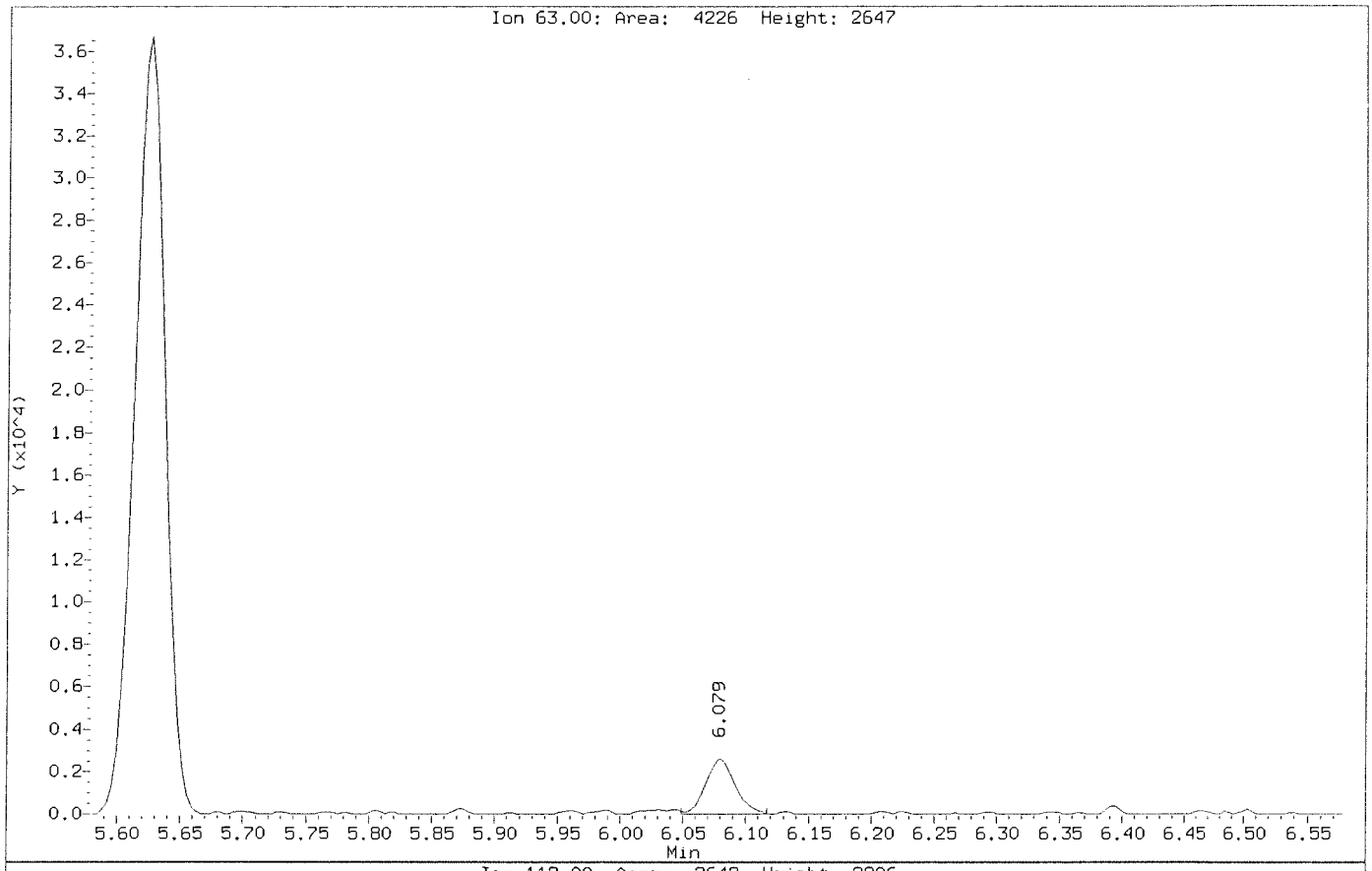
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Client ID: VSTD002
Sample Info: VSTD002;VSTD002;1;4;
Purge Volume: 5.0
Column phase: DB624

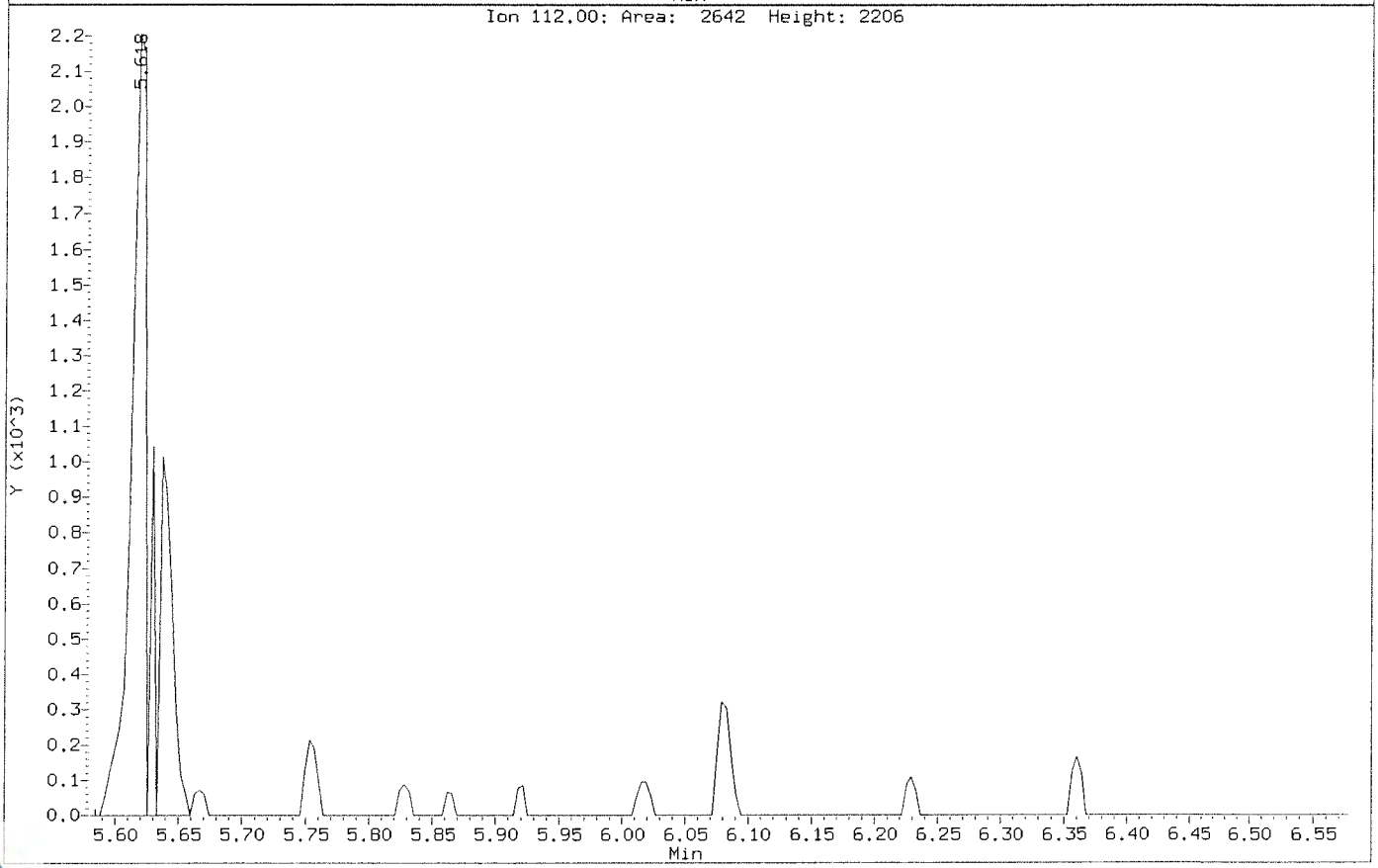
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Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111205.D
Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

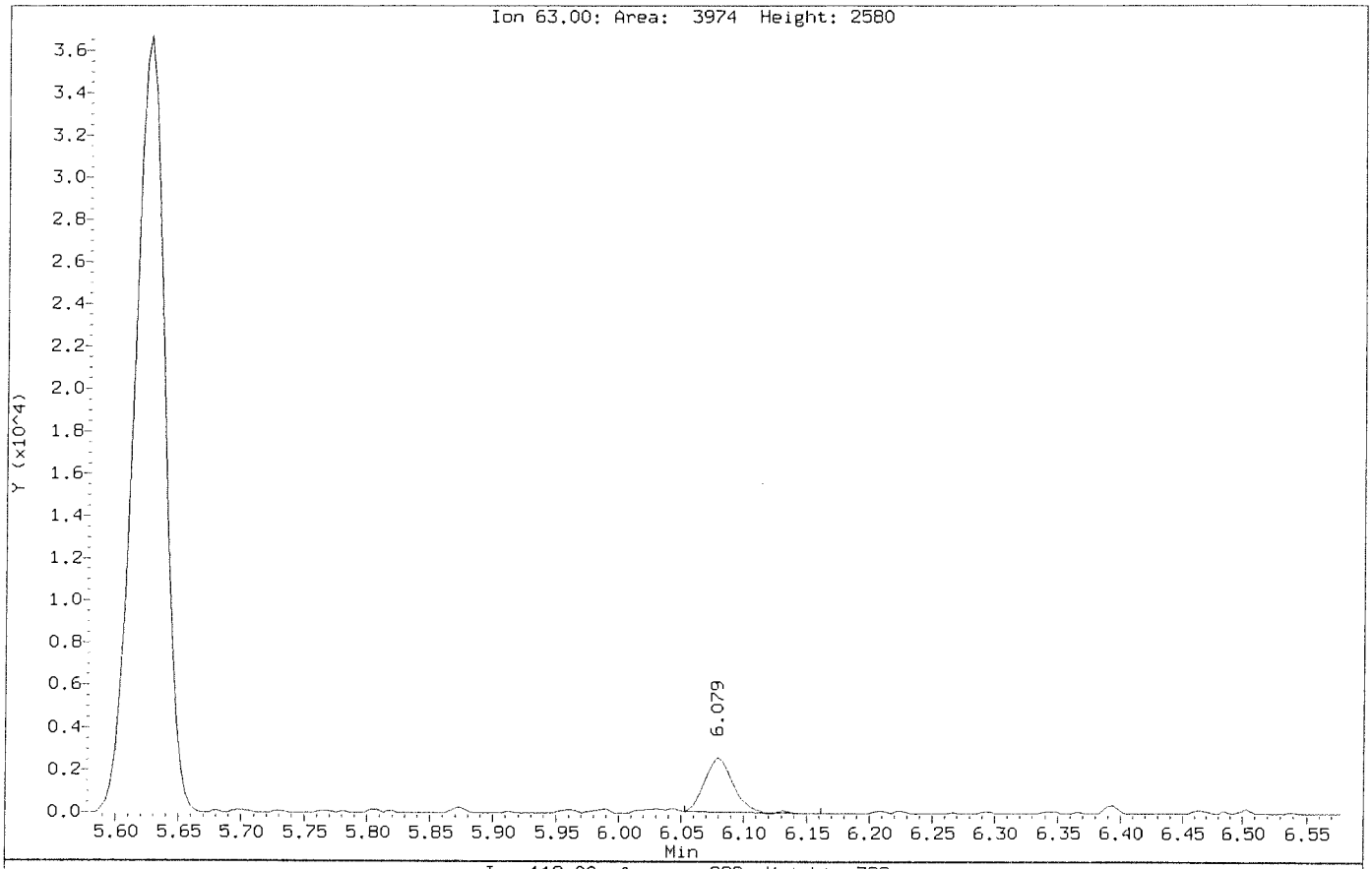
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

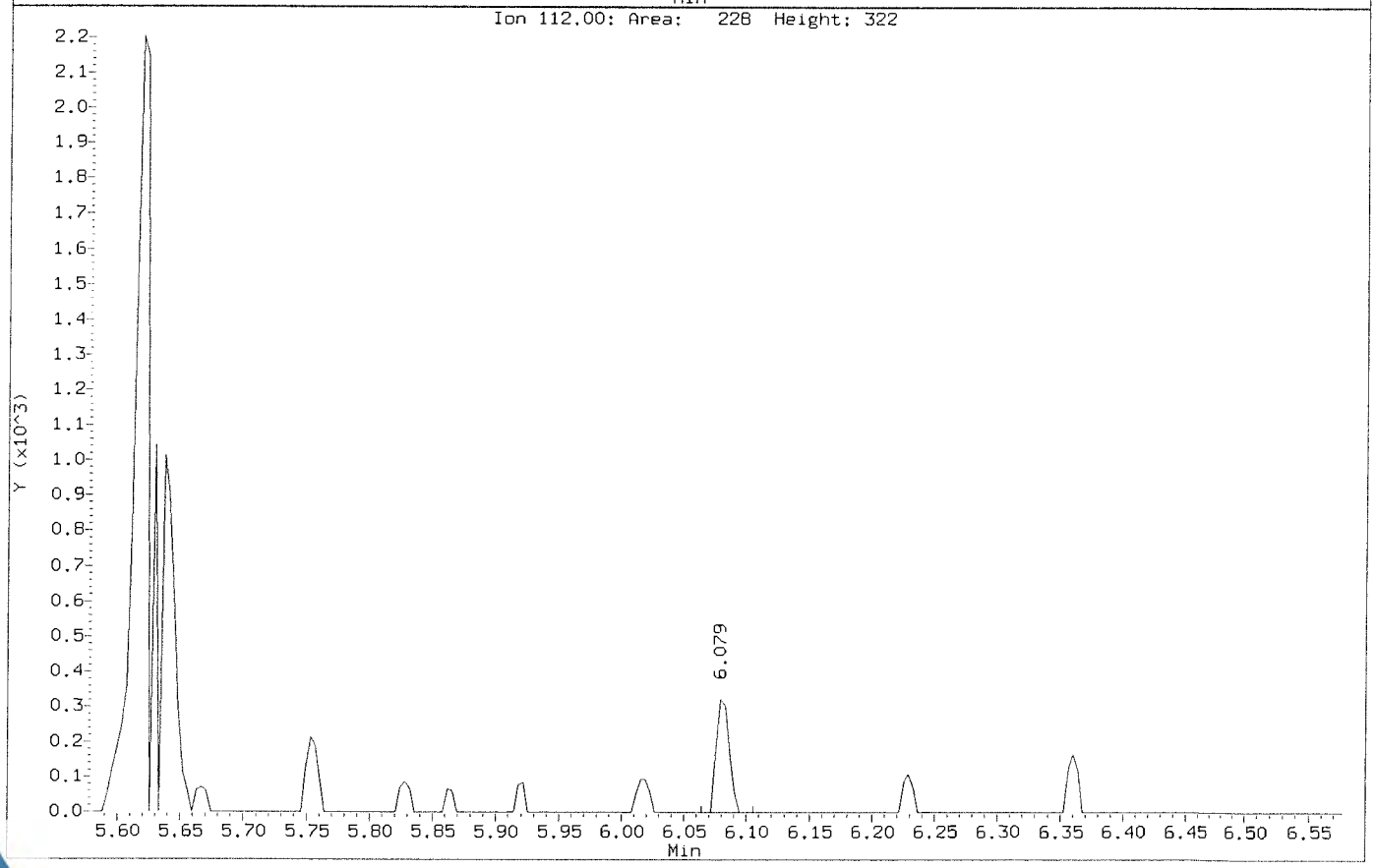




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Instrument: VOA9.i
Client Sample ID: VSTD002

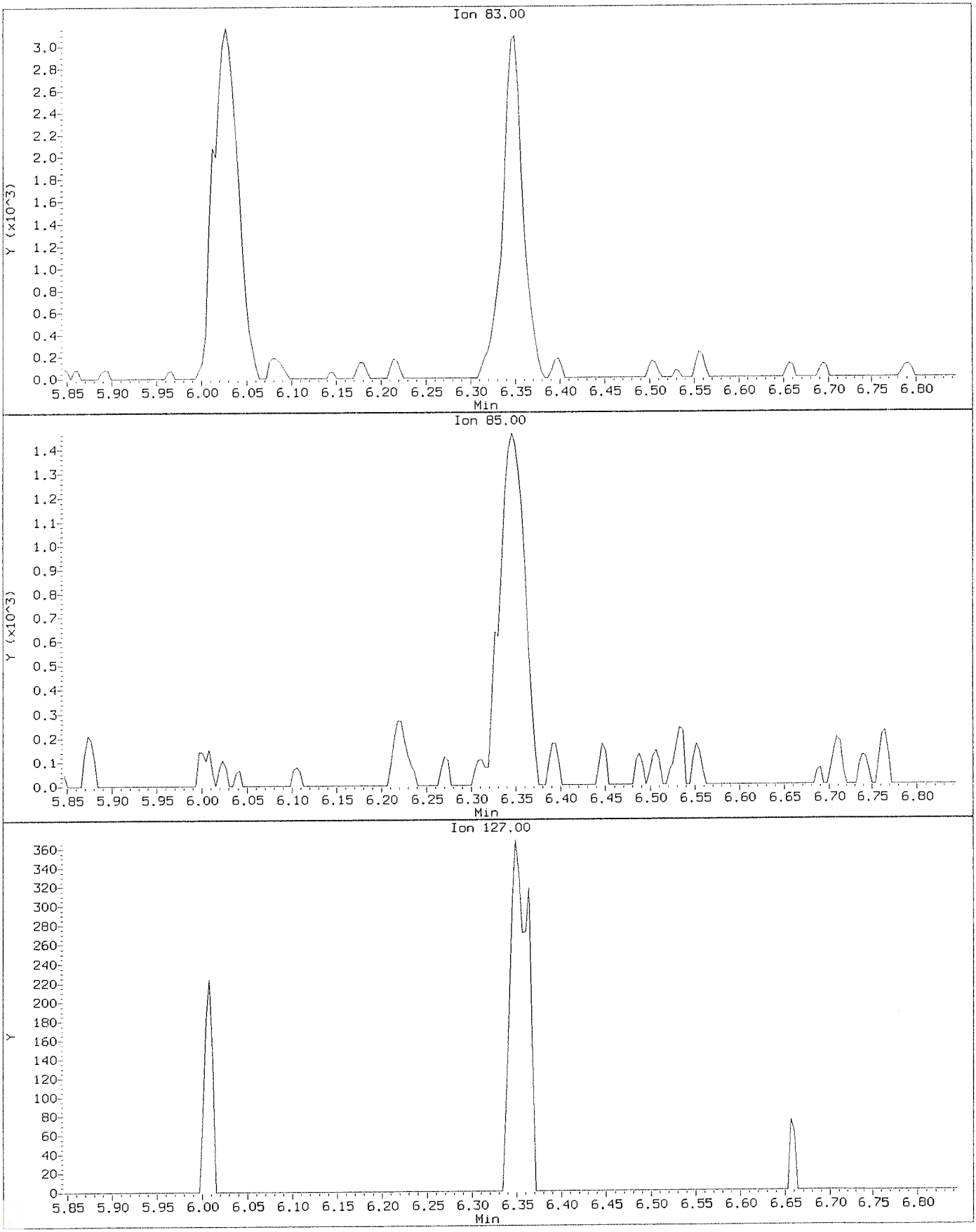
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5





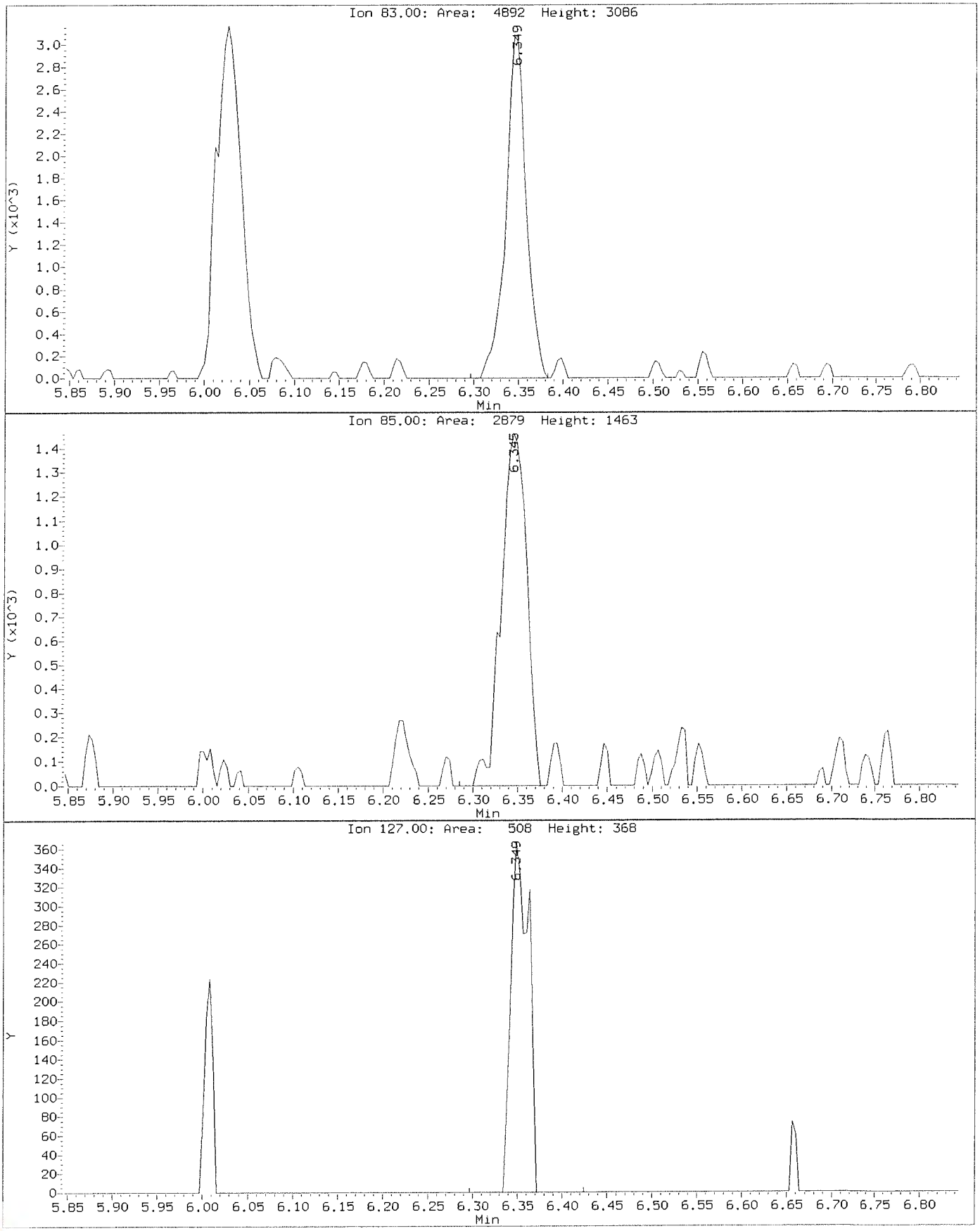
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Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Bromodichloromethane
CAS Number: 75-27-4



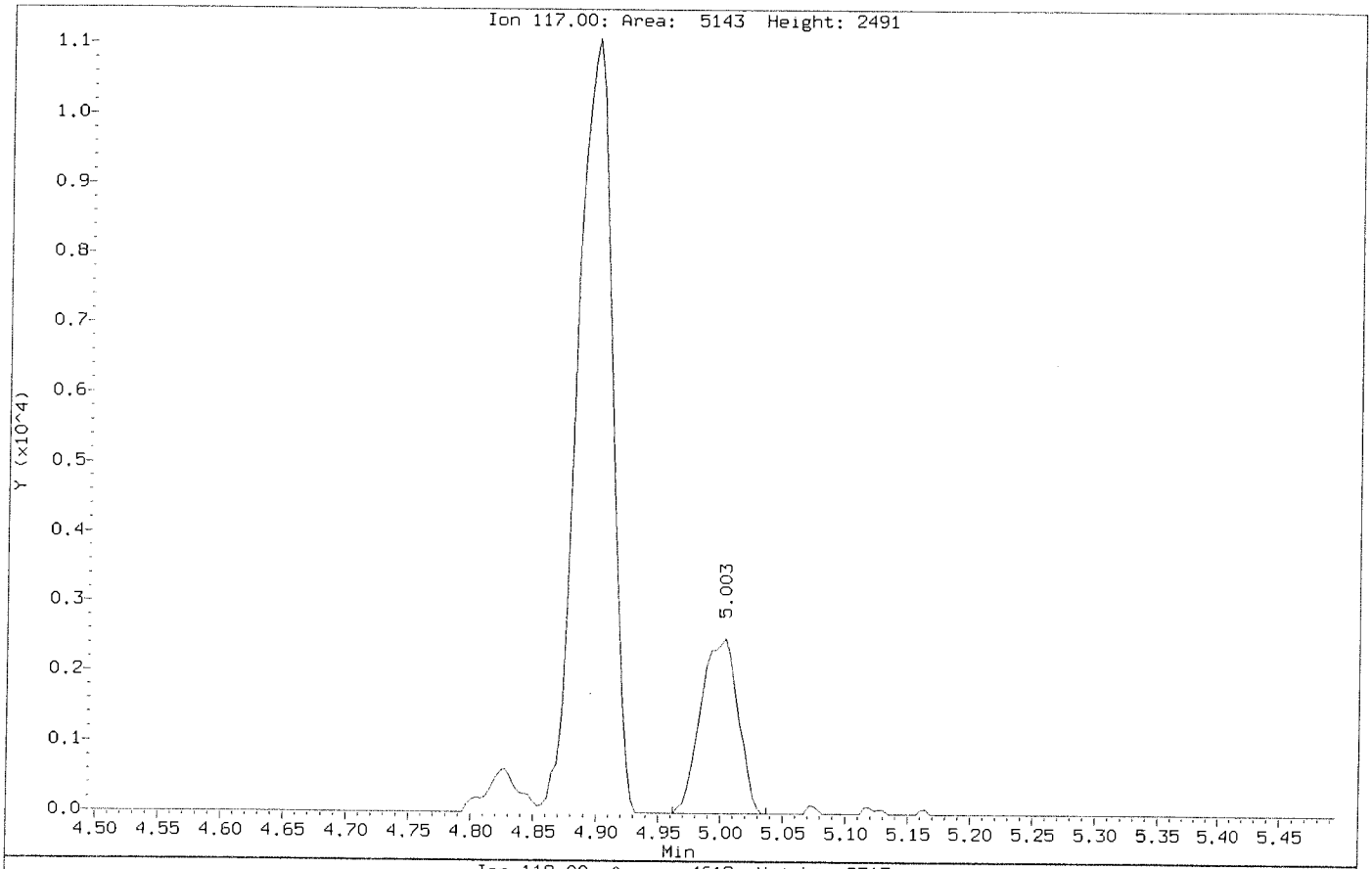
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Instrument: VOA9.i
Client Sample ID: VSTD002

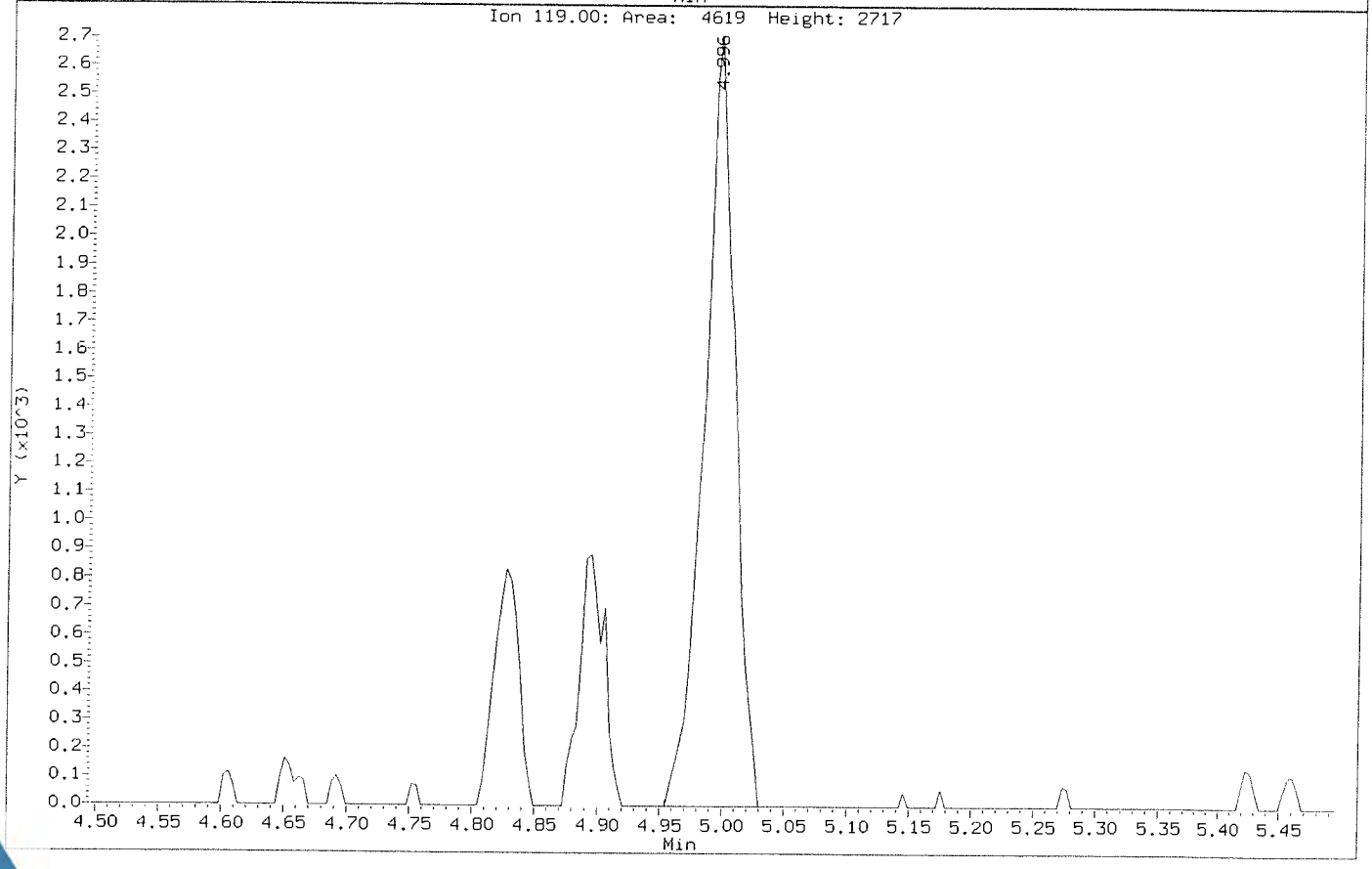
Compound: Bromodichloromethane
CAS Number: 75-27-4



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111205.D
Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

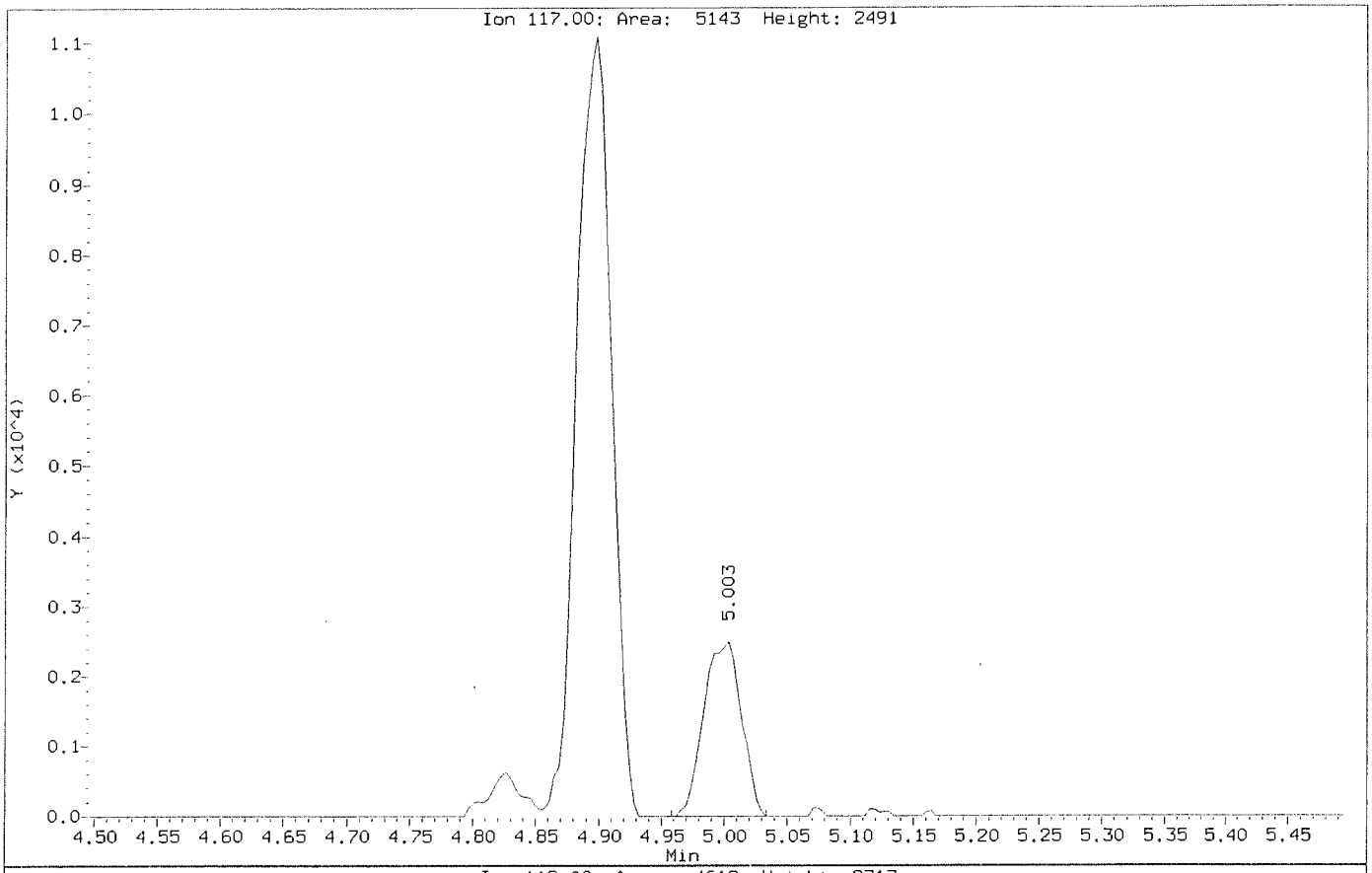
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

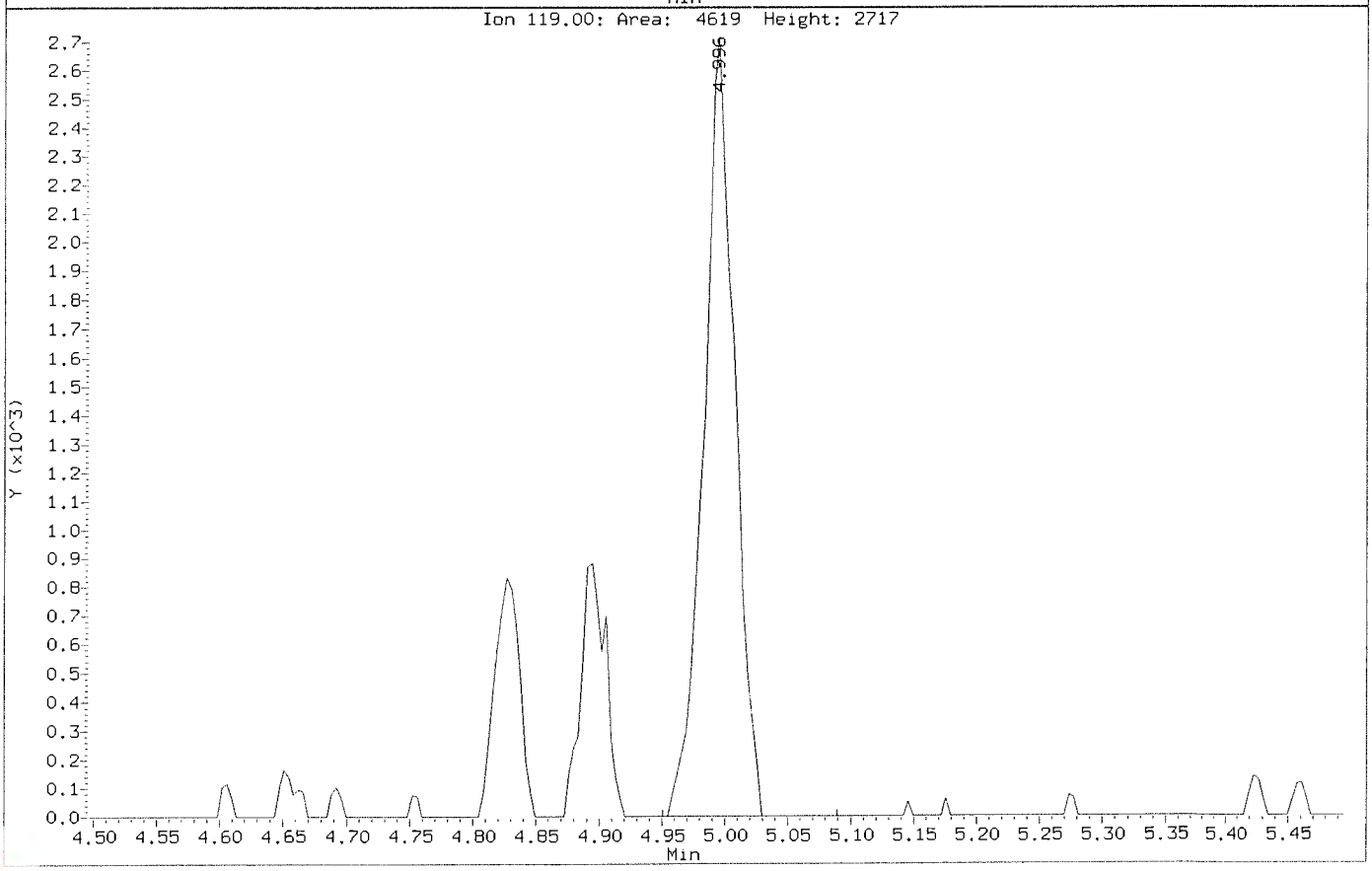




Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111205.D
Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

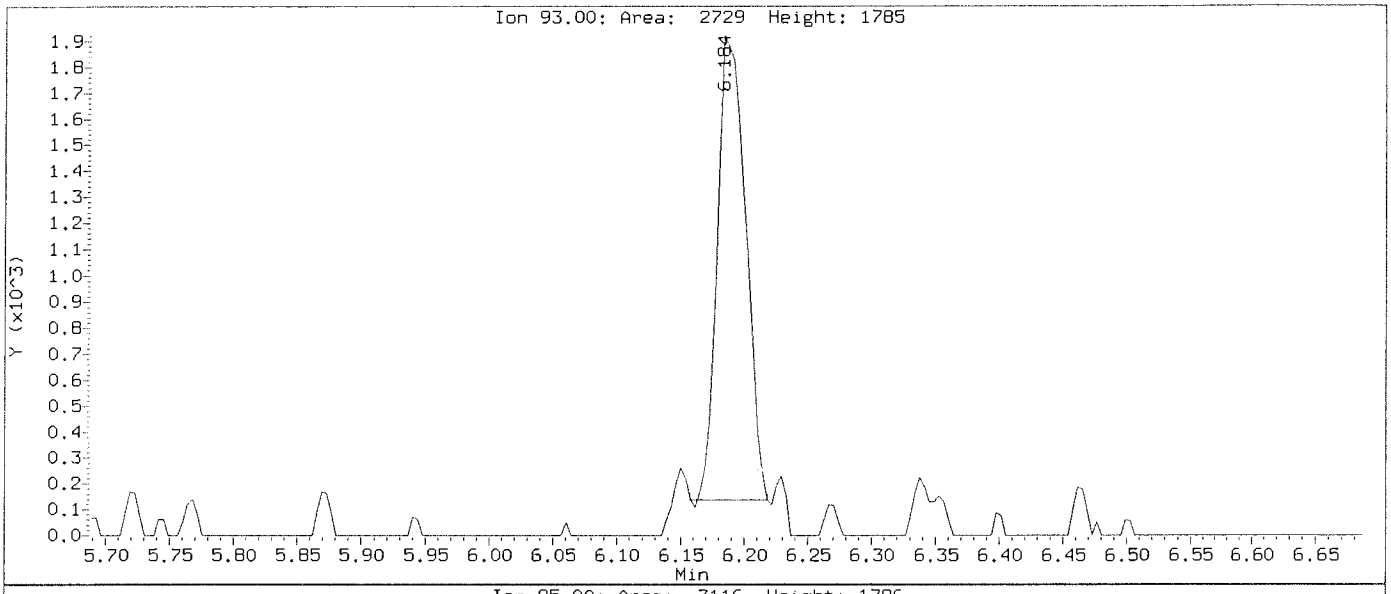
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

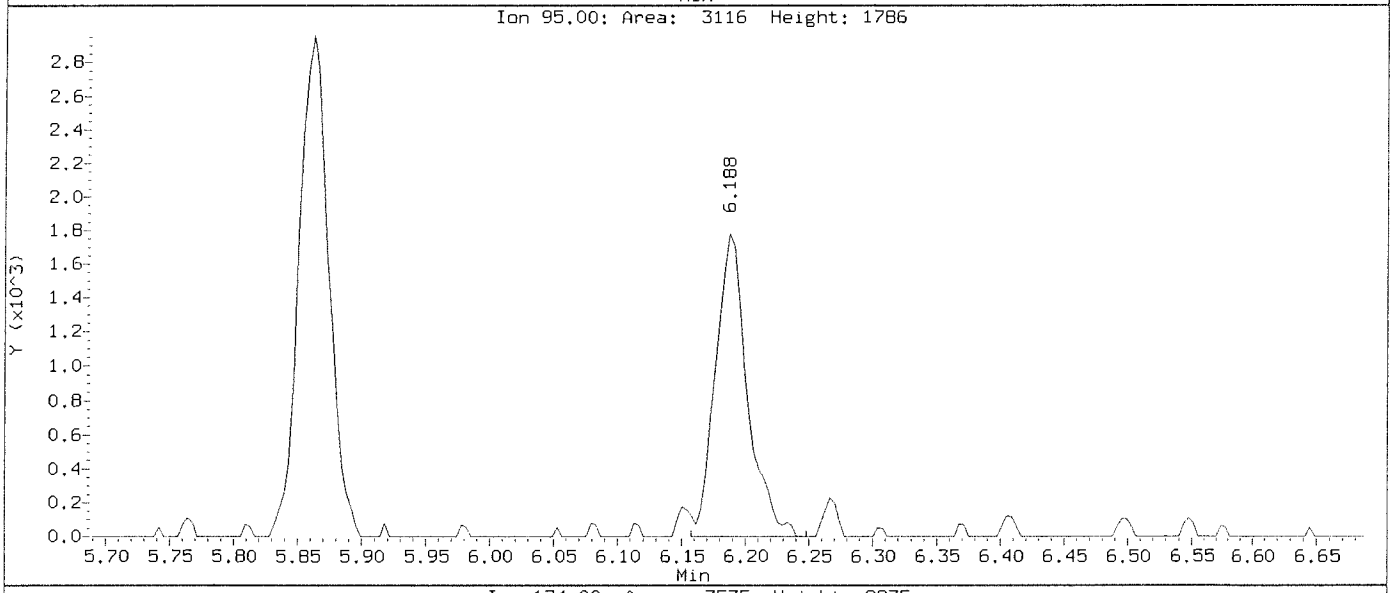


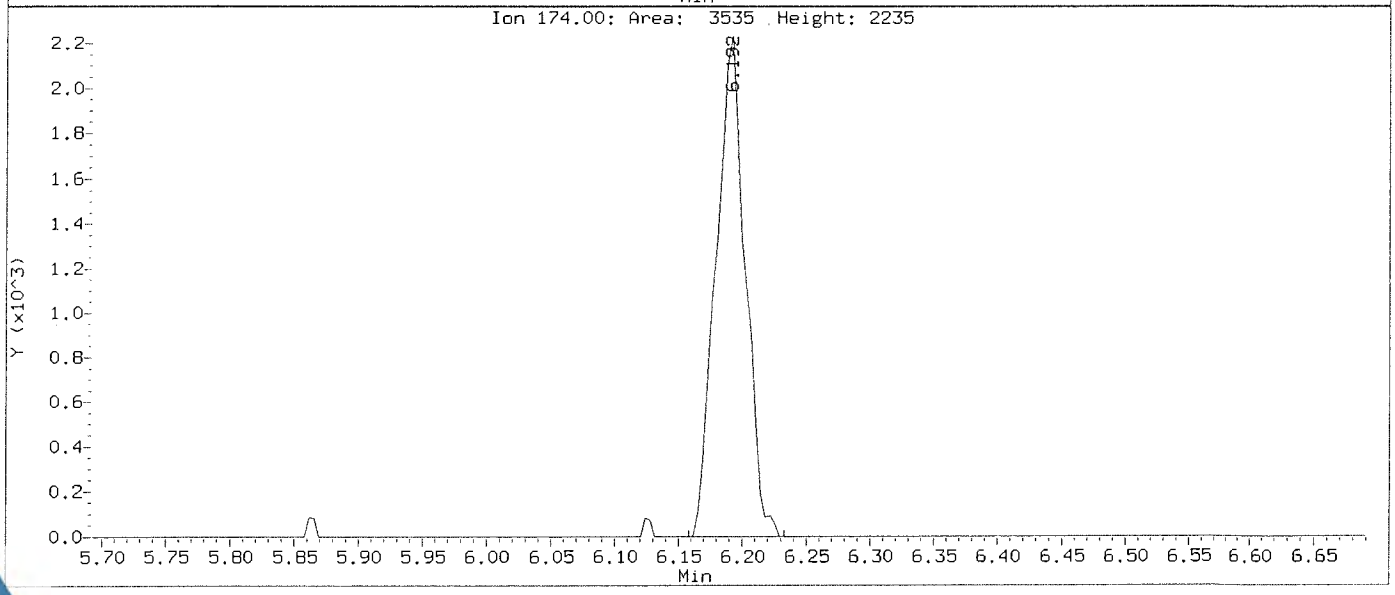


Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111205.D
Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Dibromomethane
CAS Number: 74-95-3

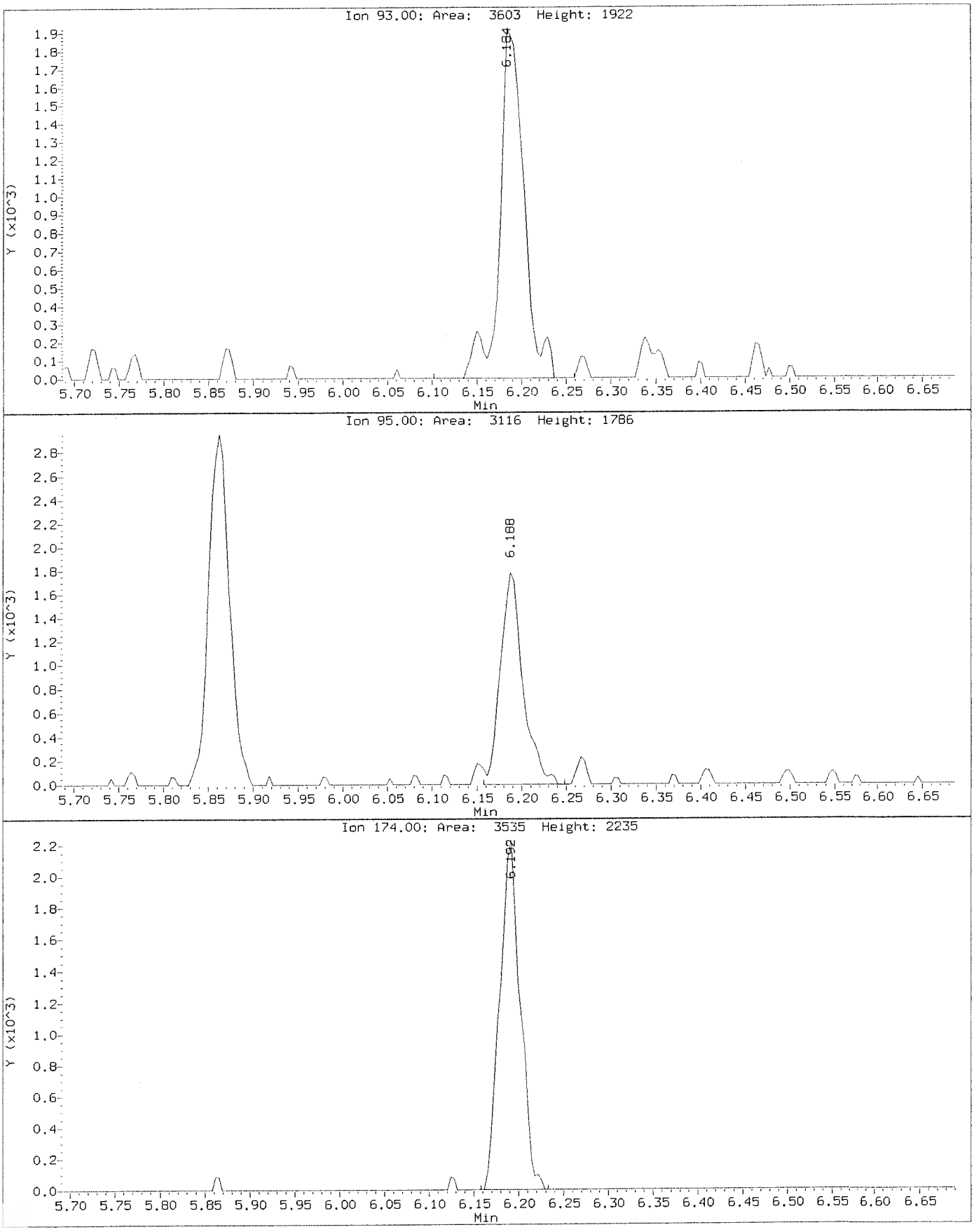






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Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Dibromomethane
CAS Number: 74-95-3



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111206.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111206.D
Lab Smp Id: VSTD005 Client Smp ID: VSTD005
Inj Date : 12-NOV-2019 13:17
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD005;VSTD005;1;5;
Misc Info : 180315V9;WATER;0;1;
Comment :
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Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 13:17 Cal File: U112106.D
Als bottle: 7 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

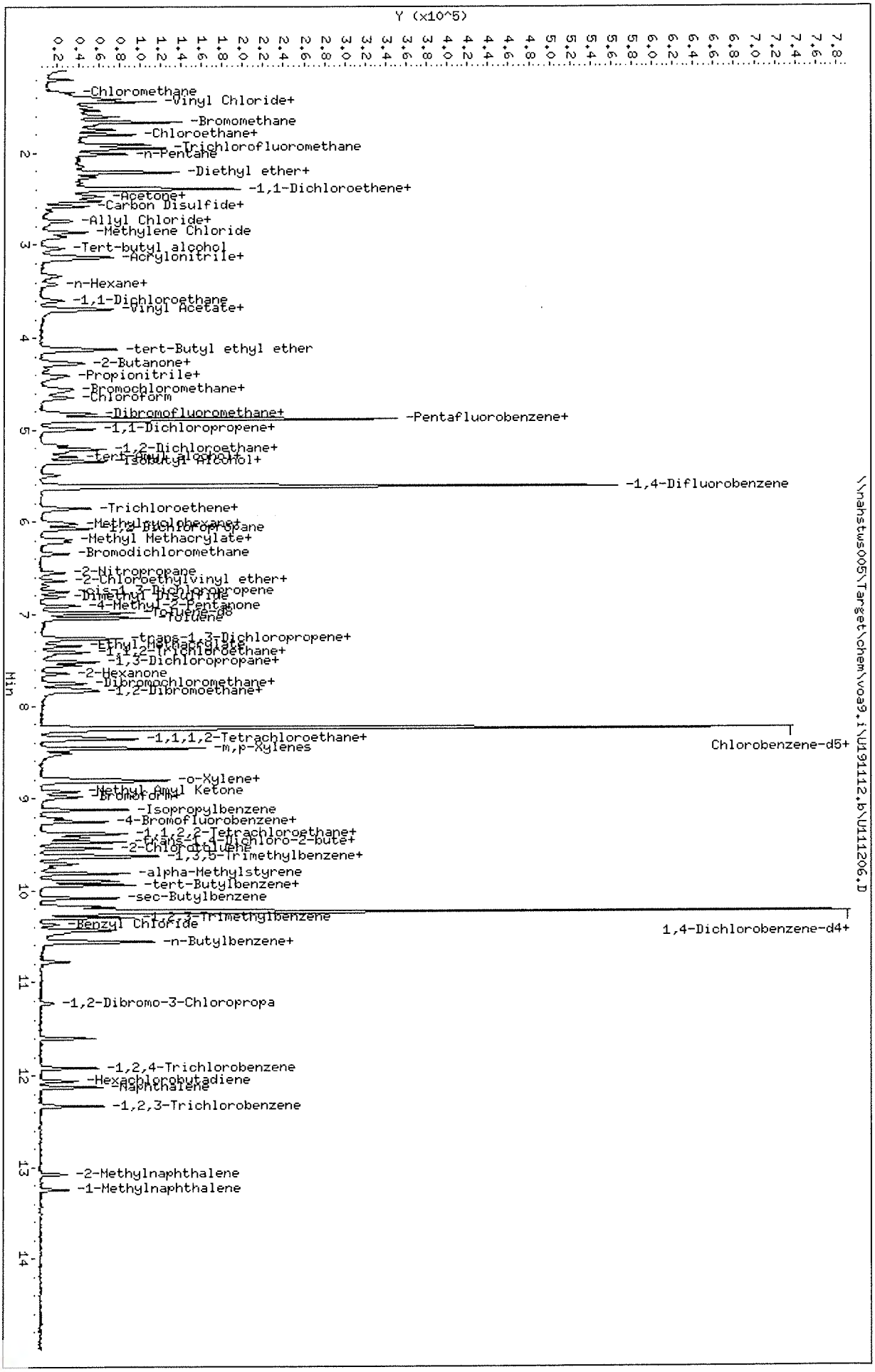
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.890	4.894	(1.000)	238428	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	405677	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	364050	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	191978	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	15774	5.00000	5.79
$	69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	15194	5.00000	5.98
$	30 Dibromofluoromethane	113	4.823	4.826	(0.986)	13696	5.00000	5.01
$	48 Toluene-d8	98	6.986	6.989	(0.847)	50004	5.00000	5.64
	60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	10434	5.00000	5.60
	31 1,1,1-Trichloroethane	97	4.826	4.826	(0.987)	17175	5.00000	4.84(a)
	68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	17306	5.00000	5.08
	138 Freon TF	101	2.397	2.397	(0.490)	30204	5.00000	5.67
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	9665	5.00000	5.10
	22 1,1-Dichloroethane	63	3.597	3.600	(0.736)	17840	5.00000	5.27
	11 1,1-Dichloroethene	96	2.394	2.397	(0.490)	29690	5.00000	5.33
	32 1,1-Dichloropropene	75	4.995	5.002	(0.889)	14445	5.00000	5.30
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	16005	5.00000	5.30
	71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	16719	5.00000	5.12
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	16585	5.00000	4.85(a)
	79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	43657	5.00000	4.90(a)
	89 1,2-Dibromo-3-Chloropropane	155	11.225	11.229	(1.097)	2891	5.00000	5.78
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	13453	5.00000	4.91(a)
	88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	29413	5.00000	5.08

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111206.D Page 2
Report Date: 05-Dec-2019 15:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
33 1,2-Dichloroethane	62	5.250	5.250	(0.934)	16072	5.00000	5.32
42 1,2-Dichloropropane	63	6.078	6.078	(1.081)	11076	5.00000	4.56(aM)
75 1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	41154	5.00000	4.91(a)
83 1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	25204	5.00000	4.43(a)
54 1,3-Dichloropropane	76	7.559	7.563	(0.917)	18612	5.00000	4.92(a)
84 1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	27683	5.00000	4.50(a)
26 2,2-Dichloropropane	77	4.268	4.271	(0.873)	12618	5.00000	4.61(a)
24 2-Butanone	43	4.339	4.339	(0.887)	8511	10.0000	8.23
76 2-Chlorotoluene	91	9.542	9.546	(0.933)	31211	5.00000	5.01
52 2-Hexanone	43	7.645	7.649	(0.927)	14647	10.0000	9.21
77 4-Chlorotoluene	91	9.636	9.636	(0.942)	40107	5.00000	5.11
82 p-Isopropyltoluene	119	10.206	10.209	(0.997)	44546	5.00000	4.97(a)
45 4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	20503	10.0000	9.65
10 Acetone	43	2.472	2.483	(0.506)	26993	10.0000	8.19
37 Benzene	78	5.213	5.216	(0.927)	46900	5.00000	5.34
74 Bromobenzene	156	9.377	9.381	(0.916)	14994	5.00000	4.31(a)
29 Bromochloromethane	128	4.553	4.553	(0.931)	6772	5.00000	4.81(a)
39 Bromodichloromethane	83	6.341	6.344	(1.128)	14190	5.00000	5.24
66 Bromoform	173	8.984	8.984	(1.090)	5749	5.00000	4.74(Ta)
6 Bromomethane	94	1.666	1.659	(0.341)	41828	5.00000	6.11
19 Carbon Disulfide	76	2.581	2.584	(0.528)	50830	10.0000	9.61
34 Carbon Tetrachloride	117	4.988	4.995	(0.887)	13853	5.00000	4.91(aM)
59 Chlorobenzene	112	8.271	8.271	(1.003)	37197	5.00000	5.04
7 Chloroethane	64	1.745	1.741	(0.357)	24112	5.00000	5.70
28 Chloroform	83	4.650	4.654	(0.951)	21736	5.00000	5.39
3 Chloromethane	50	1.336	1.340	(0.273)	13392	5.00000	5.23
27 cis-1,2-Dichloroethene	96	4.279	4.283	(0.875)	12916	5.00000	4.75(a)
46 cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	13834	5.00000	4.68(a)
55 Dibromochloromethane	129	7.754	7.758	(0.940)	10232	5.00000	6.02
44 Dibromomethane	93	6.183	6.187	(1.100)	7516	5.00000	4.57(a)
2 Dichlorodifluoromethane	85	1.198	1.205	(0.245)	11592	5.00000	4.78(a)
61 Ethylbenzene	106	8.365	8.369	(1.015)	18853	5.00000	5.12
91 Hexachlorobutadiene	225	12.058	12.061	(1.178)	5585	5.00000	4.82(a)
67 Isopropylbenzene	105	9.122	9.126	(1.106)	51577	5.00000	4.94(a)
62 m,p-Xylenes	106	8.466	8.470	(1.027)	44540	10.0000	9.90
17 Methylene Chloride	84	2.866	2.869	(0.586)	11941	5.00000	6.17
87 n-Butylbenzene	91	10.551	10.554	(1.031)	36803	5.00000	4.91(a)
73 n-Propylbenzene	91	9.471	9.475	(0.926)	57962	5.00000	5.16
92 Naphthalene	128	12.129	12.129	(1.185)	44381	5.00000	4.88(a)
63 o-Xylene	106	8.808	8.807	(1.068)	22203	5.00000	4.87(a)
81 sec-Butylbenzene	105	10.082	10.086	(0.985)	46463	5.00000	4.94(a)
64 Styrene	104	8.823	8.822	(1.070)	39434	5.00000	4.97(a)
78 tert-Butylbenzene	119	9.898	9.898	(0.967)	37509	5.00000	5.27
56 Tetrachloroethene	166	7.522	7.522	(0.912)	14449	5.00000	5.23
50 Toluene	91	7.042	7.045	(0.854)	52477	5.00000	4.77(a)
20 trans-1,2-Dichloroethene	96	3.136	3.139	(0.641)	10913	5.00000	6.41
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	12829	5.00000	4.52(a)
38 Trichloroethene	130	5.857	5.861	(1.042)	13269	5.00000	4.94(a)
8 Trichlorofluoromethane	101	1.947	1.951	(0.398)	56856	5.00000	5.55
5 Vinyl Chloride	62	1.411	1.419	(0.289)	28621	5.00000	5.39

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.

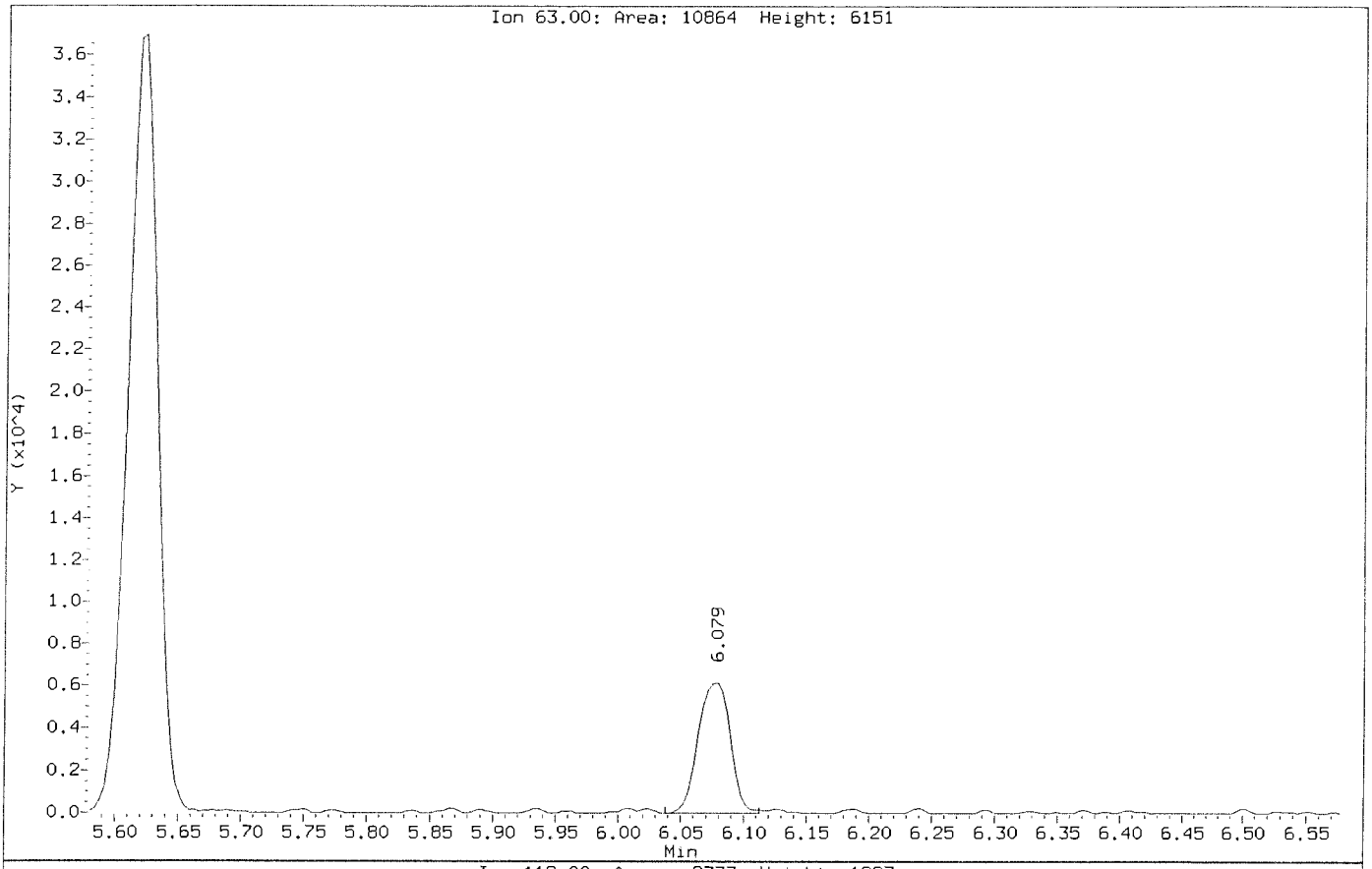


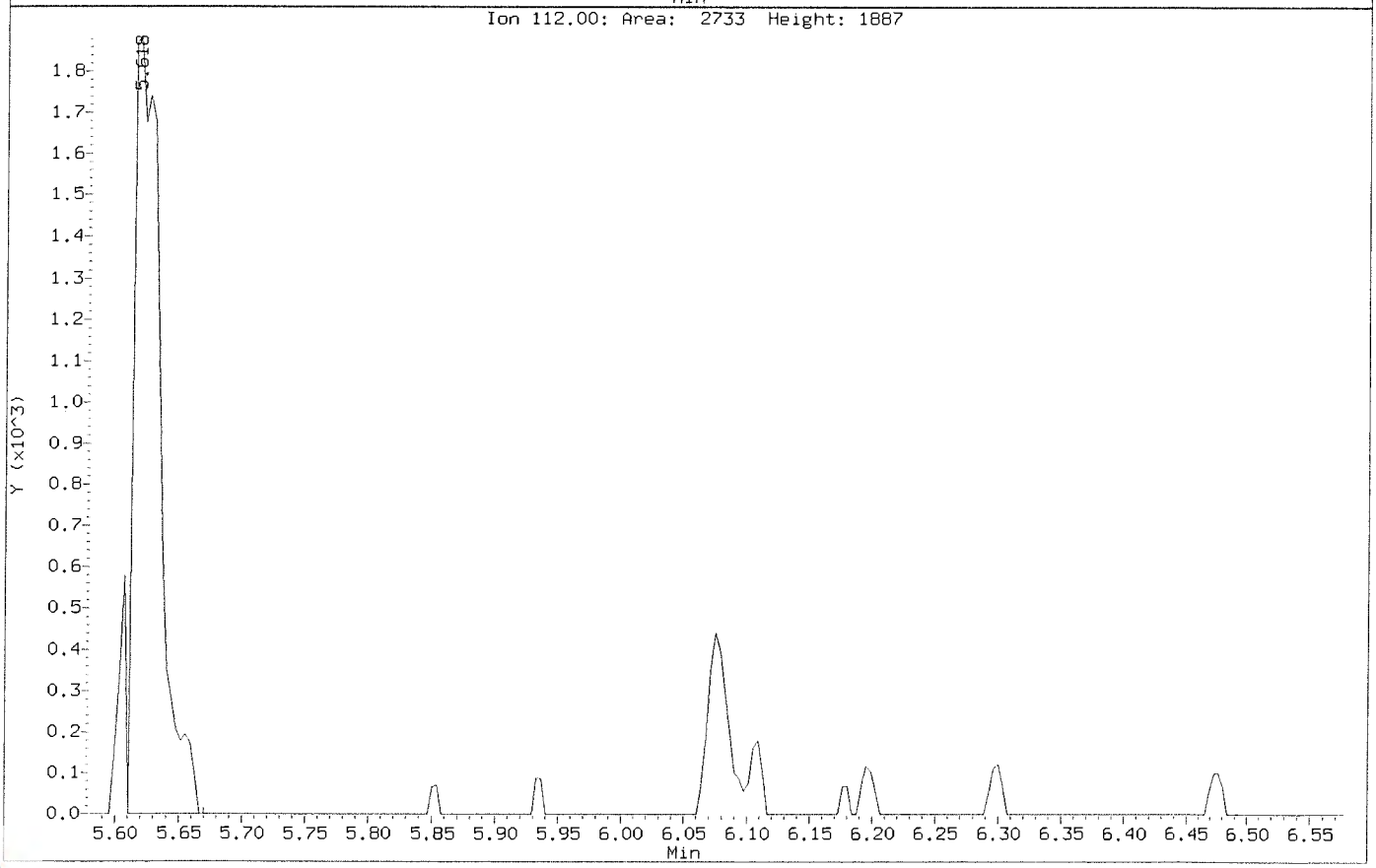
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Client ID: VSTD005
Sample Info: VSTD005;VSTD005;1;5;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111206.D
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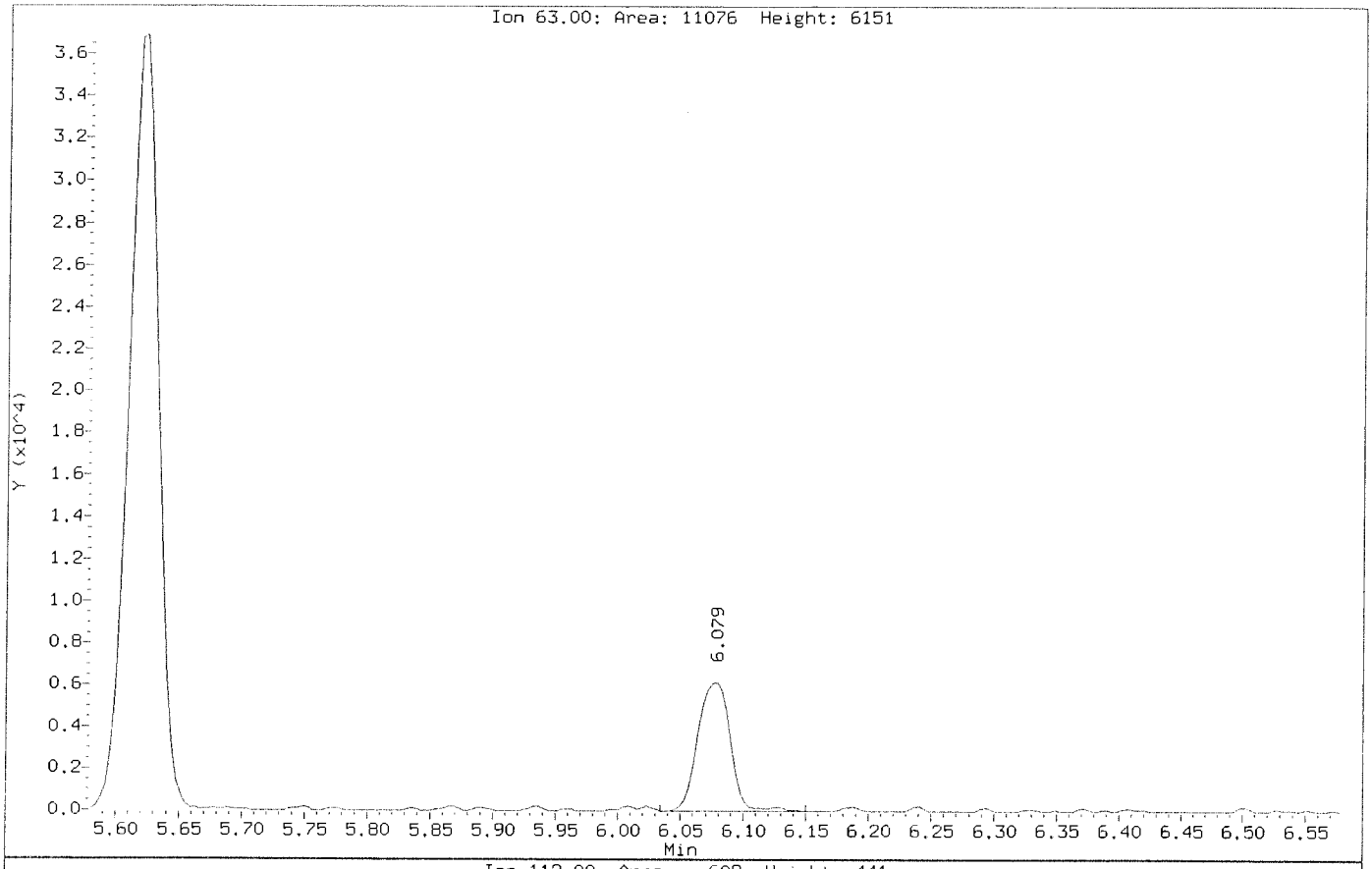
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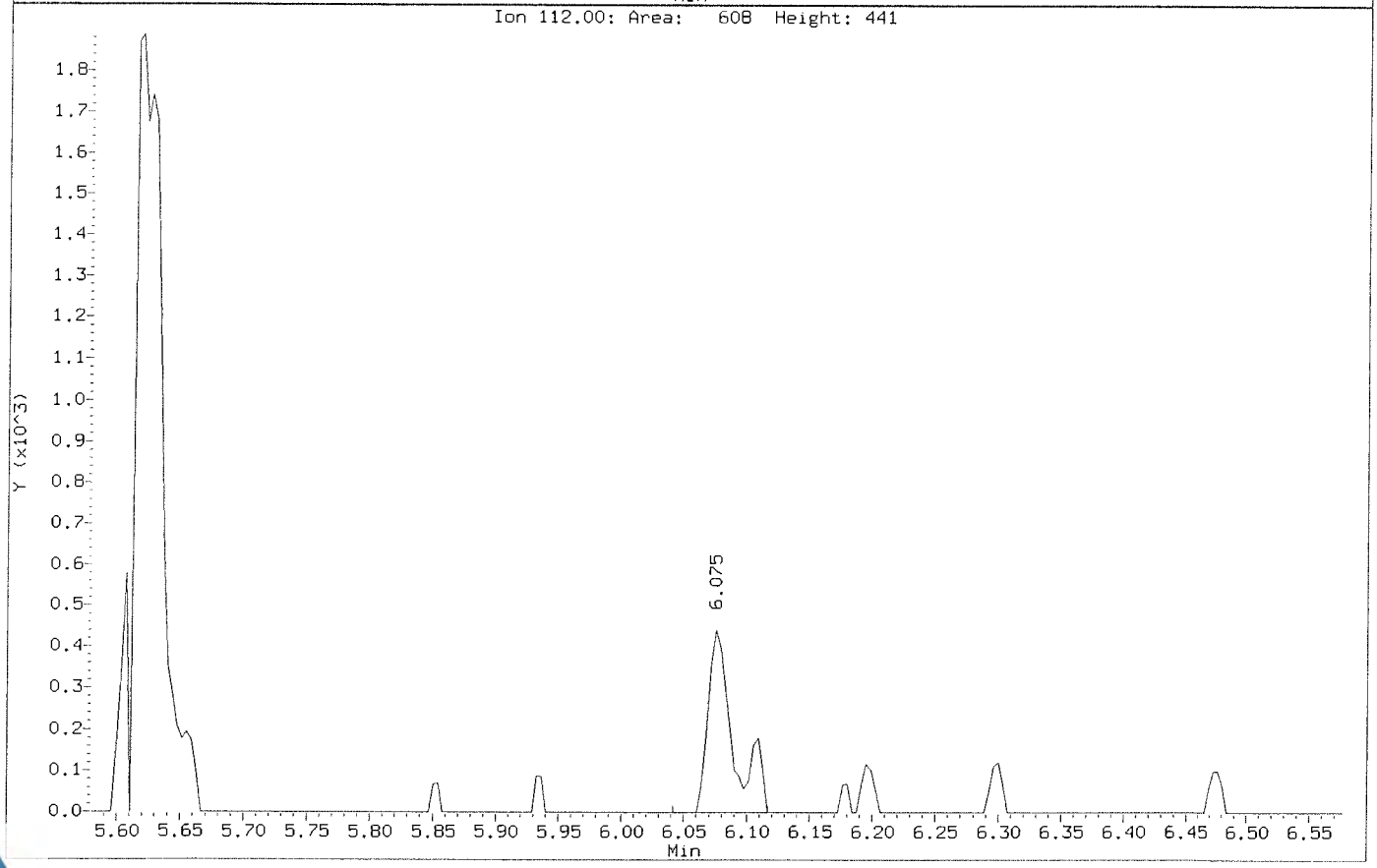




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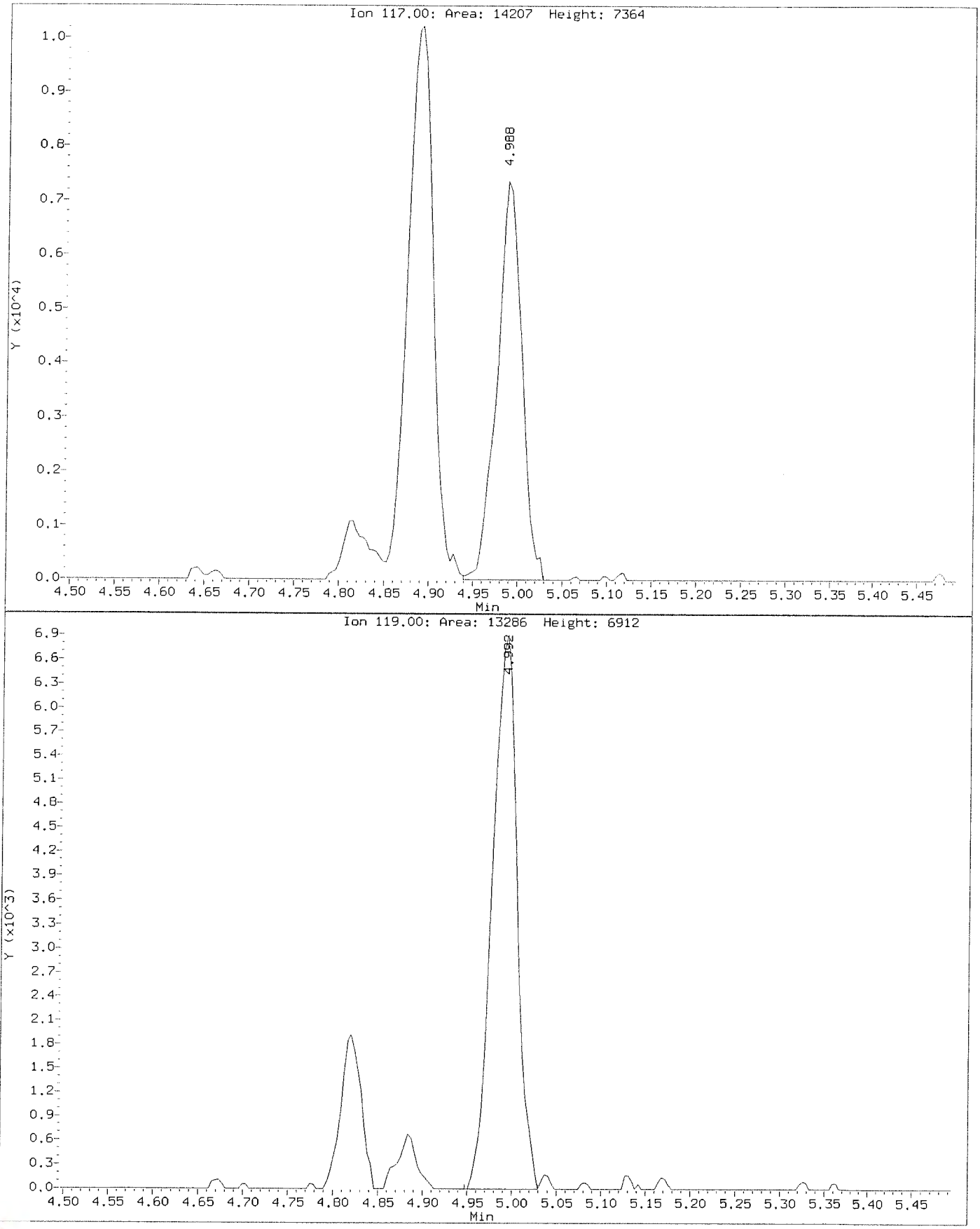
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5





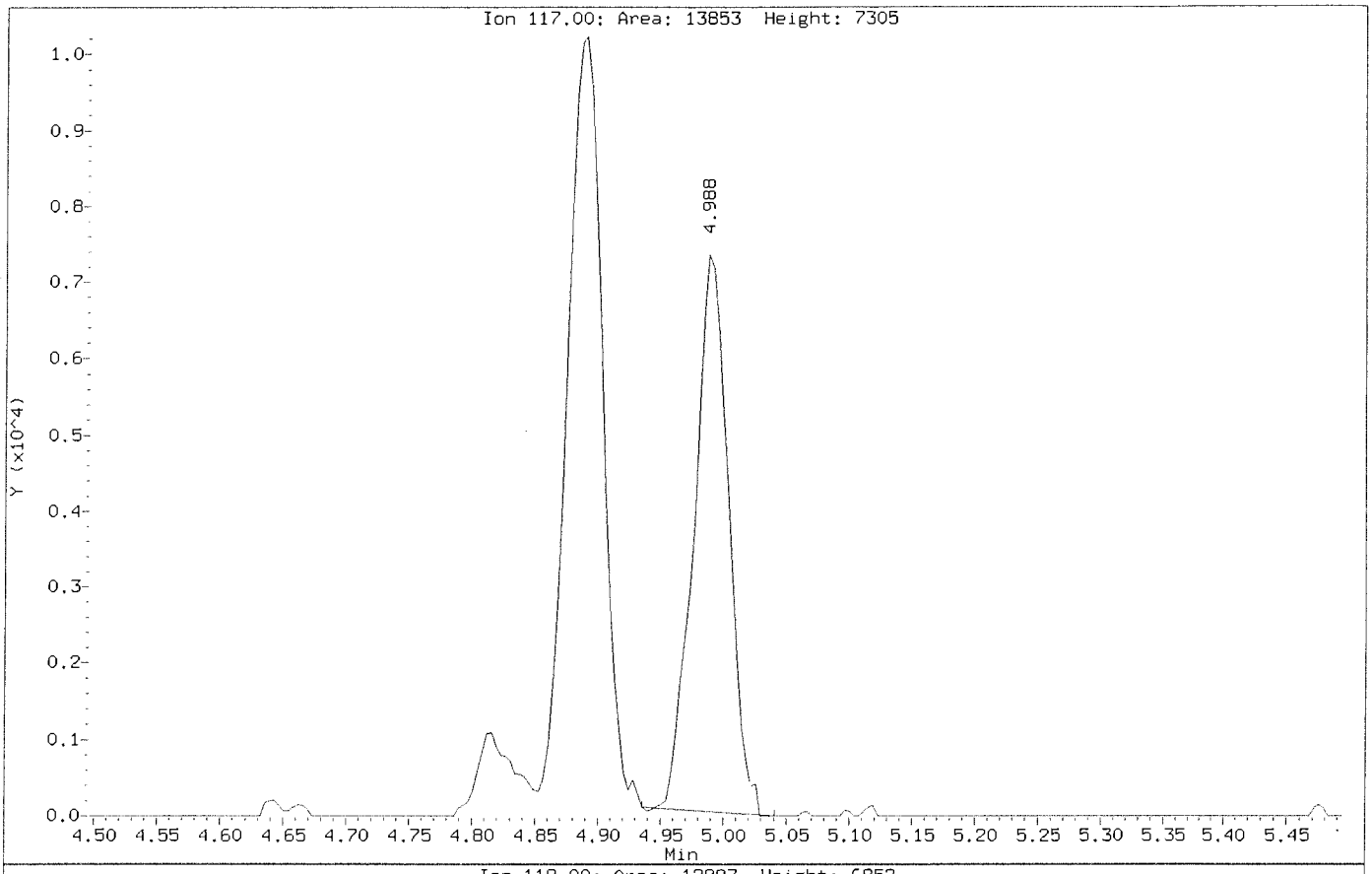
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Client Sample ID: VSTD005

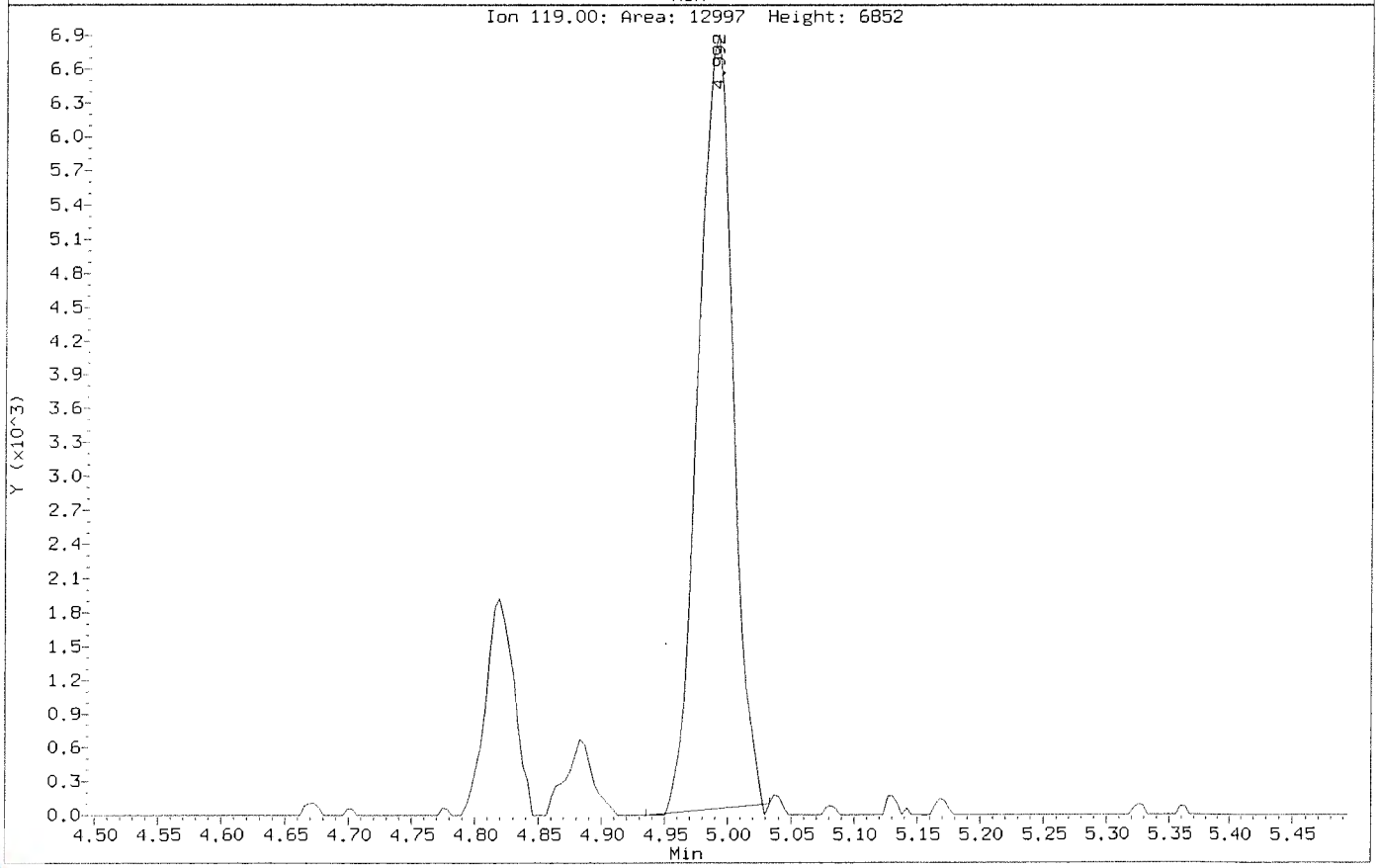
Compound: Carbon Tetrachloride
CAS Number: 56-23-5



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Injection Date: 12-NOV-2019 13:17
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111207.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111207.D
Lab Smp Id: VSTD020 Client Smp ID: VSTD020
Inj Date : 12-NOV-2019 13:41
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD020;VSTD020;1;6;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 13:41 Cal File: U112107.D
Als bottle: 8 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

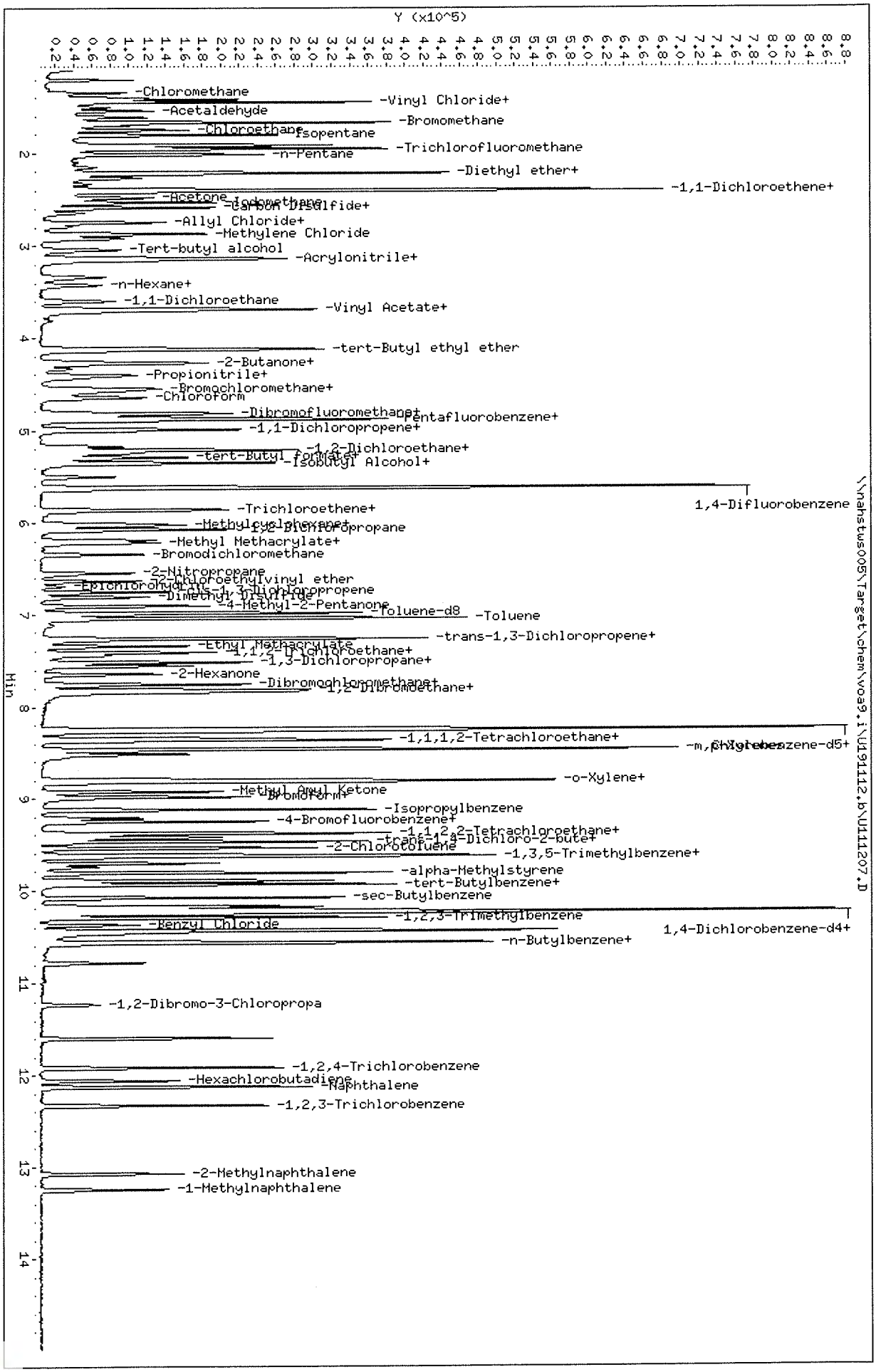
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	252365	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	426364	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	393720	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	207703	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	52733	20.0000	20.35
$ 69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	57298	20.0000	19.24
$ 30 Dibromofluoromethane	113	4.827	4.826	(0.987)	52362	20.0000	20.76
$ 48 Toluene-d8	98	6.986	6.989	(0.847)	186186	20.0000	19.12
60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	49905	20.0000	18.83
31 1,1,1-Trichloroethane	97	4.823	4.826	(0.986)	72360	20.0000	19.27
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	72455	20.0000	19.66
138 Freon TF	101	2.397	2.397	(0.490)	119226	20.0000	21.17
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	41199	20.0000	20.14
22 1,1-Dichloroethane	63	3.601	3.600	(0.736)	71605	20.0000	19.99
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	119195	20.0000	20.22
32 1,1-Dichloropropene	75	4.999	5.002	(0.889)	59990	20.0000	20.98
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	71068	20.0000	21.75
71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	69380	20.0000	19.65
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	72888	20.0000	19.71
79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	193360	20.0000	20.07
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	12005	20.0000	17.66
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	56331	20.0000	19.01
88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	124504	20.0000	19.89

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111207.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.250	(0.933)	64241	20.0000	20.24
42	1,2-Dichloropropane	63	6.079	6.078	(1.081)	42821	20.0000	21.06 (M)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	174754	20.0000	19.30
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	120102	20.0000	19.54
54	1,3-Dichloropropane	76	7.559	7.563	(0.917)	84028	20.0000	20.54
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	122825	20.0000	18.45
26	2,2-Dichloropropane	77	4.272	4.271	(0.874)	60002	20.0000	20.73
24	2-Butanone	43	4.336	4.339	(0.887)	39572	40.0000	42.05
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	136106	20.0000	20.22
52	2-Hexanone	43	7.646	7.649	(0.927)	71069	40.0000	41.32
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	166537	20.0000	19.62
82	p-Isopropyltoluene	119	10.206	10.209	(0.997)	189235	20.0000	19.54
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	92447	40.0000	40.24
10	Acetone	43	2.476	2.483	(0.506)	85175	40.0000	46.94
37	Benzene	78	5.213	5.216	(0.927)	189103	20.0000	20.51
74	Bromobenzene	156	9.378	9.381	(0.916)	70845	20.0000	18.86
29	Bromochloromethane	128	4.553	4.553	(0.931)	28635	20.0000	19.22
39	Bromodichloromethane	83	6.341	6.344	(1.128)	61138	20.0000	21.50
66	Bromoform	173	8.980	8.984	(1.089)	35985	20.0000	17.88
6	Bromomethane	94	1.666	1.659	(0.341)	145407	20.0000	21.34
19	Carbon Disulfide	76	2.585	2.584	(0.529)	225887	40.0000	40.35
34	Carbon Tetrachloride	117	4.992	4.995	(0.888)	59830	20.0000	20.18 (M)
59	Chlorobenzene	112	8.272	8.271	(1.003)	148149	20.0000	18.58
7	Chloroethane	64	1.749	1.741	(0.358)	80331	20.0000	21.72
28	Chloroform	83	4.654	4.654	(0.952)	85208	20.0000	19.97
3	Chloromethane	50	1.340	1.340	(0.274)	54009	20.0000	23.37
27	cis-1,2-Dichloroethene	96	4.279	4.283	(0.875)	56053	20.0000	19.49
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	68022	20.0000	21.91
55	Dibromochloromethane	129	7.754	7.758	(0.940)	50243	20.0000	18.33
44	Dibromomethane	93	6.184	6.187	(1.100)	36038	20.0000	20.85
2	Dichlorodifluoromethane	85	1.202	1.205	(0.246)	50854	20.0000	19.81
61	Ethylbenzene	106	8.369	8.369	(1.015)	77455	20.0000	19.48
91	Hexachlorobutadiene	225	12.058	12.061	(1.178)	23698	20.0000	18.93
67	Isopropylbenzene	105	9.123	9.126	(1.106)	222410	20.0000	19.73
62	m,p-Xylenes	106	8.470	8.470	(1.027)	189422	40.0000	38.94
17	Methylene Chloride	84	2.866	2.869	(0.586)	45816	20.0000	20.02
87	n-Butylbenzene	91	10.551	10.554	(1.031)	153530	20.0000	18.93
73	n-Propylbenzene	91	9.471	9.475	(0.926)	244573	20.0000	20.14
92	Naphthalene	128	12.129	12.129	(1.185)	211657	20.0000	21.54
63	o-Xylene	106	8.808	8.807	(1.068)	97807	20.0000	19.84
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	204634	20.0000	20.11
64	Styrene	104	8.819	8.822	(1.070)	166410	20.0000	19.41
78	tert-Butylbenzene	119	9.899	9.898	(0.967)	158372	20.0000	20.60
56	Tetrachloroethene	166	7.522	7.522	(0.912)	57583	20.0000	19.29
50	Toluene	91	7.042	7.045	(0.854)	220147	20.0000	18.53
20	trans-1,2-Dichloroethene	96	3.136	3.139	(0.641)	45366	20.0000	19.68
51	trans-1,3-Dichloropropene	75	7.256	7.259	(1.291)	62161	20.0000	18.17
38	Trichloroethene	130	5.857	5.861	(1.042)	58073	20.0000	20.57
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	222709	20.0000	20.56
5	Vinyl Chloride	62	1.415	1.419	(0.289)	114548	20.0000	20.41

QC Flag Legend

M - Compound response manually integrated.

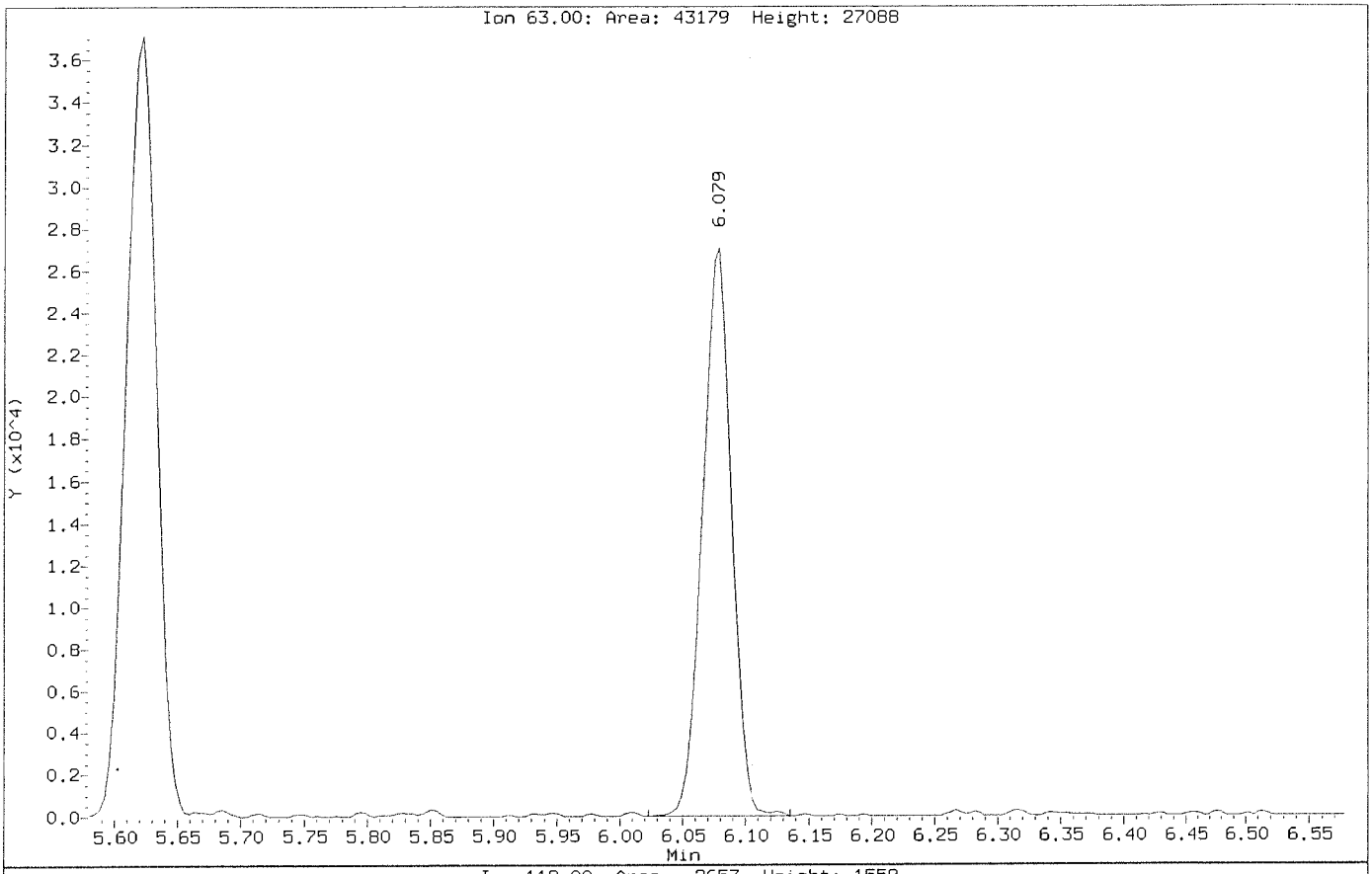


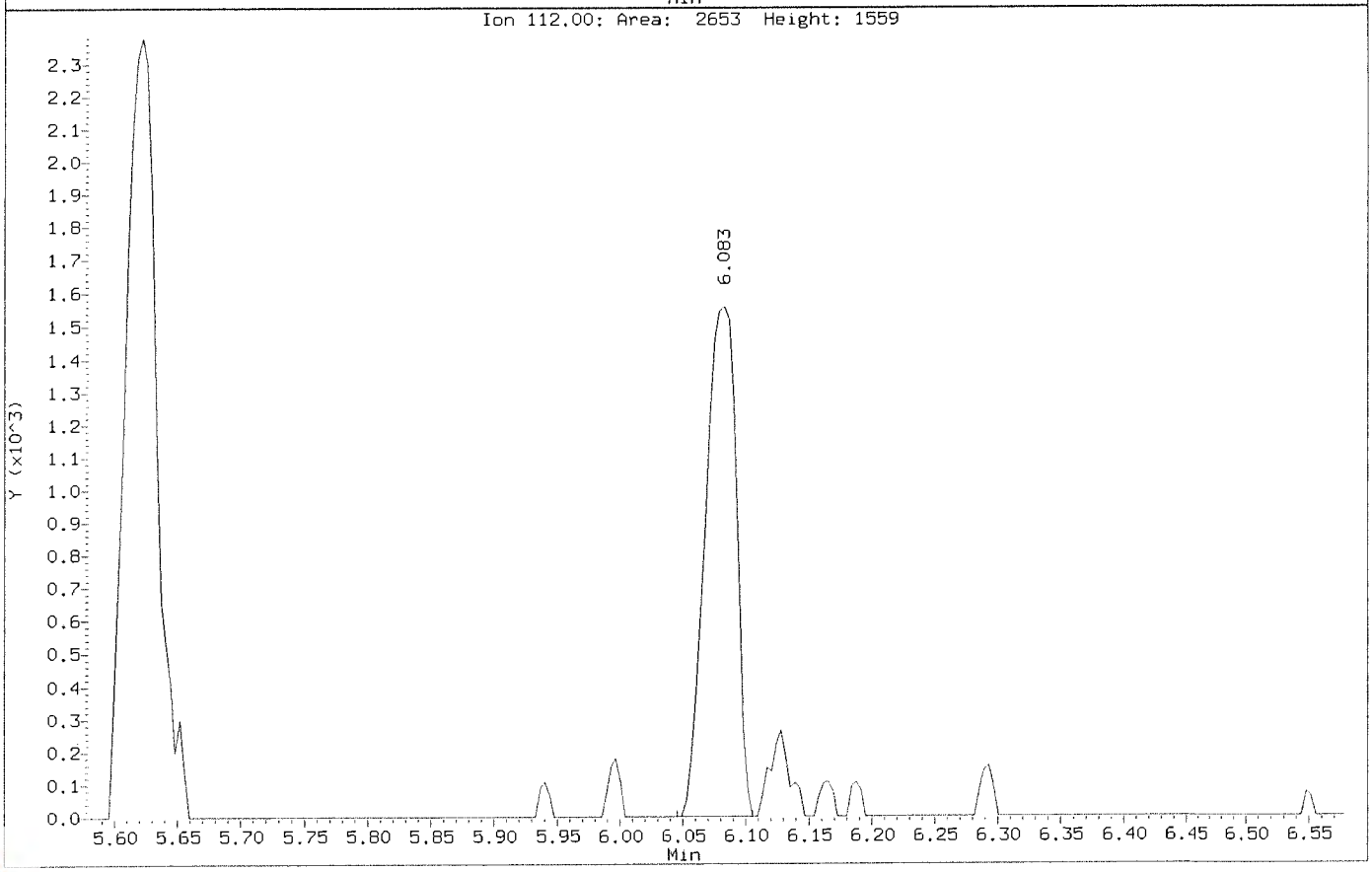
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Sample Info: VSTD020;VSTD020;1;6;
Purge Volume: 5.0
Column phase: DB624

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Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111207.D
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Instrument: VOA9.i
Client Sample ID: VSTD020

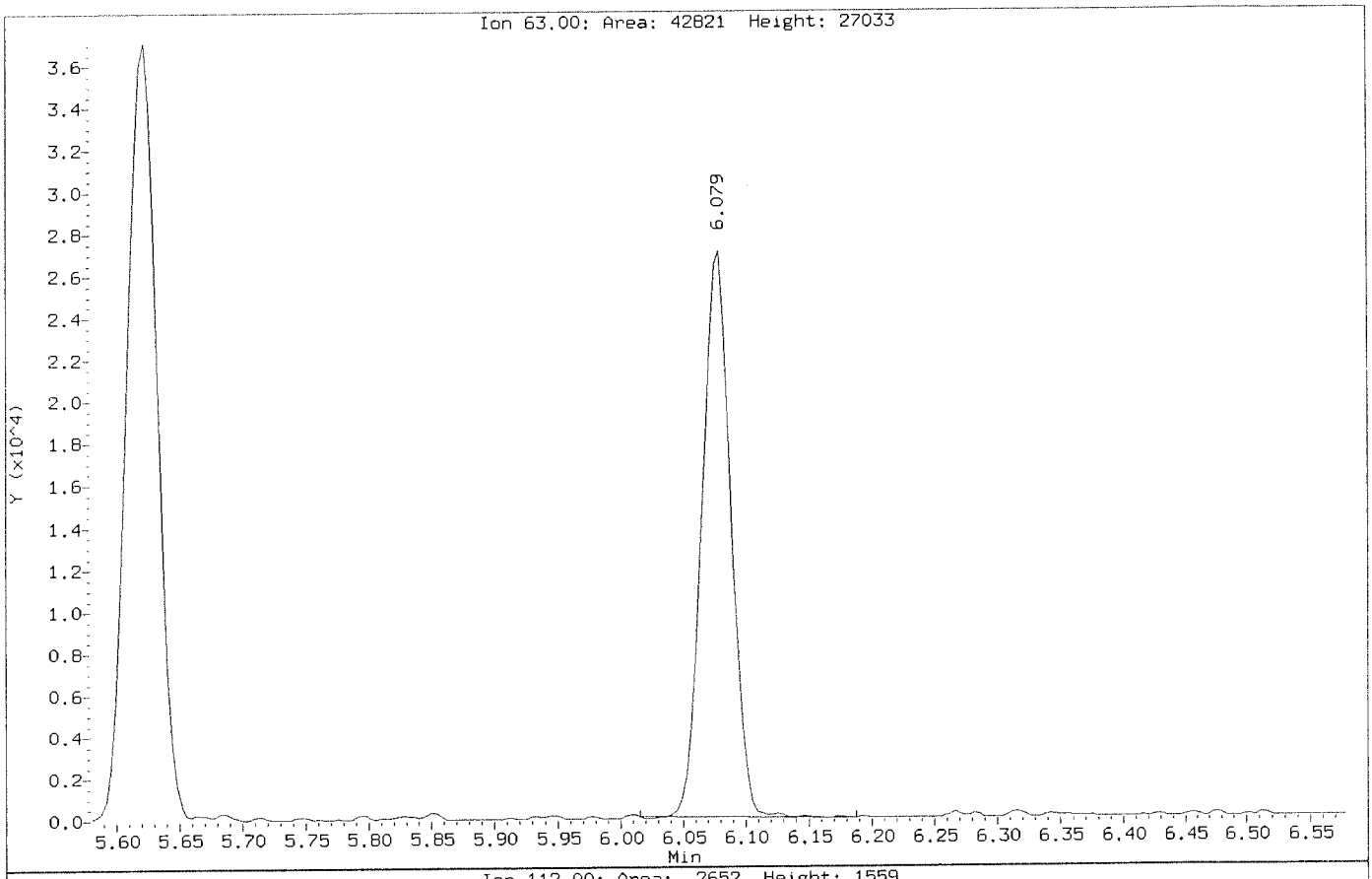
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CAS Number: 78-87-5

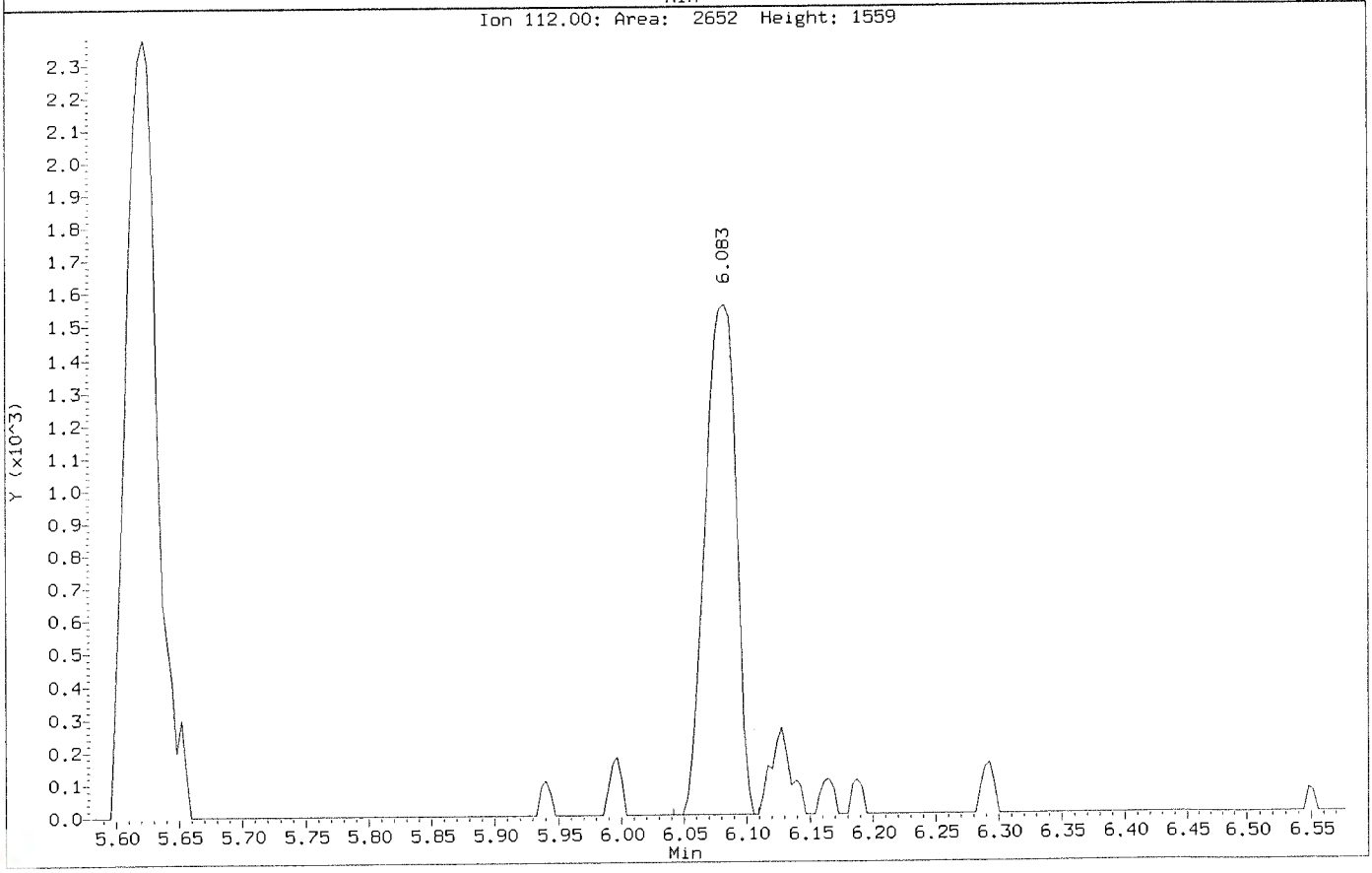




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Client Sample ID: VSTD020

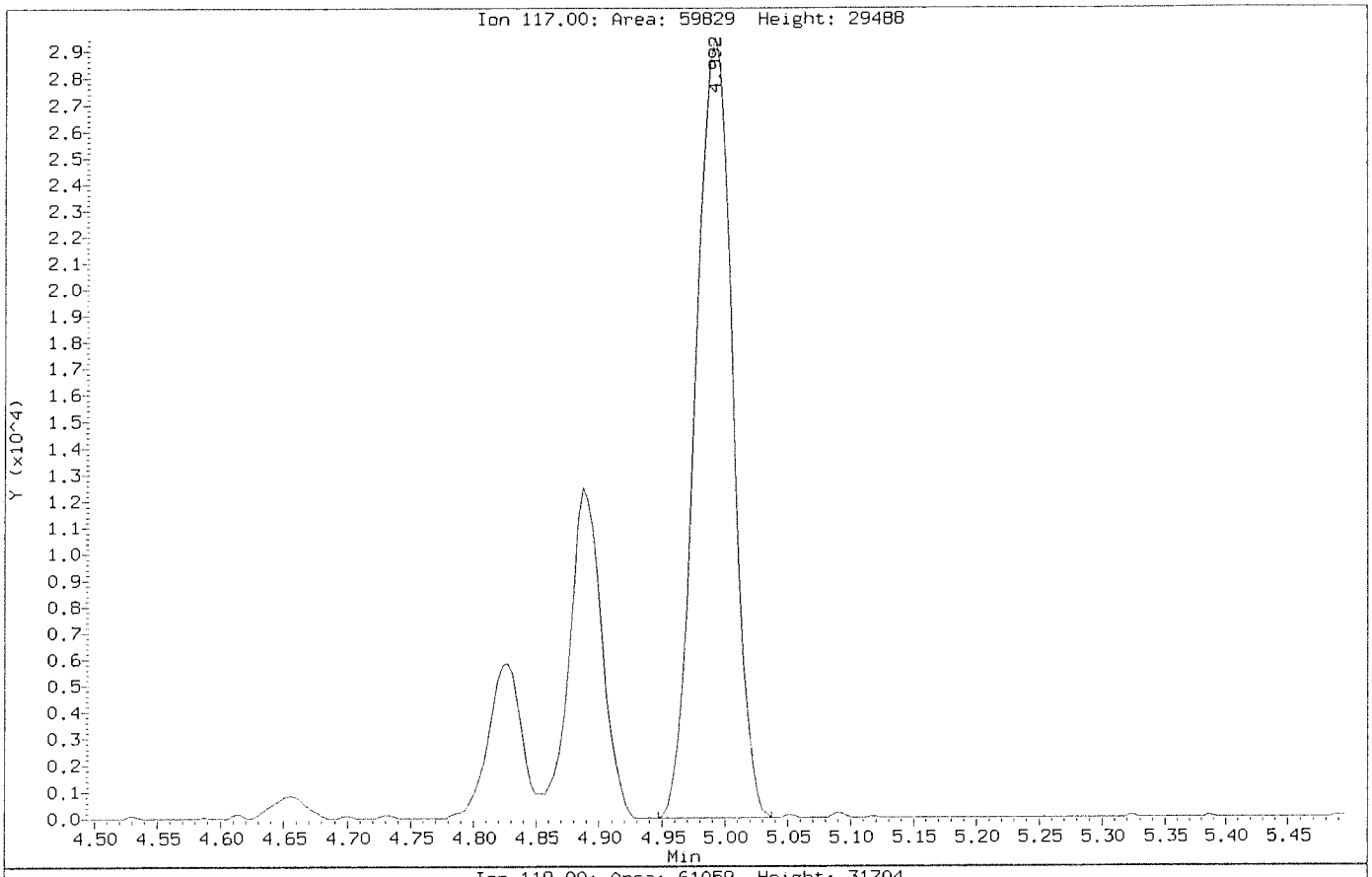
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CAS Number: 78-87-5

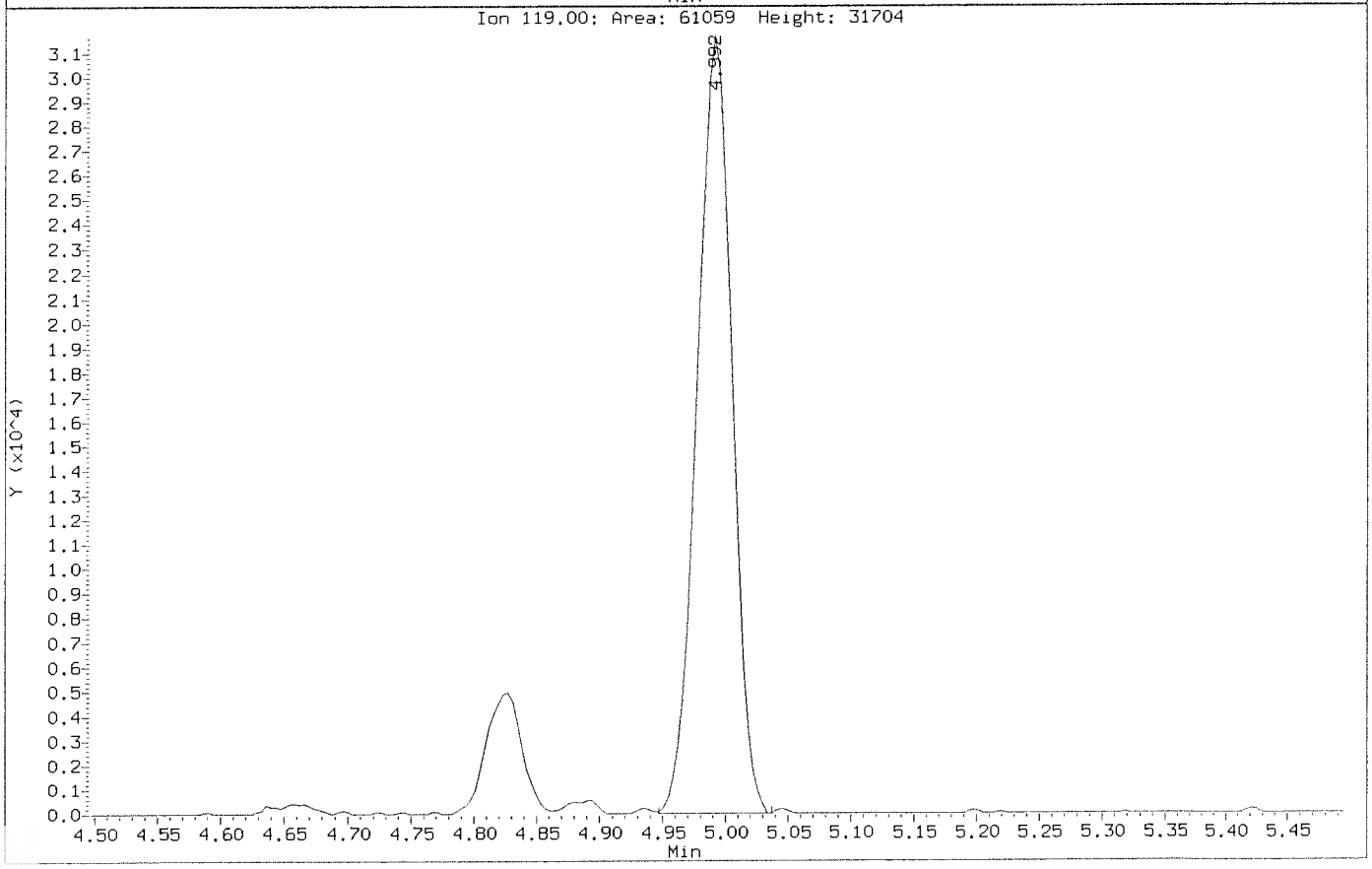




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Client Sample ID: VSTD020

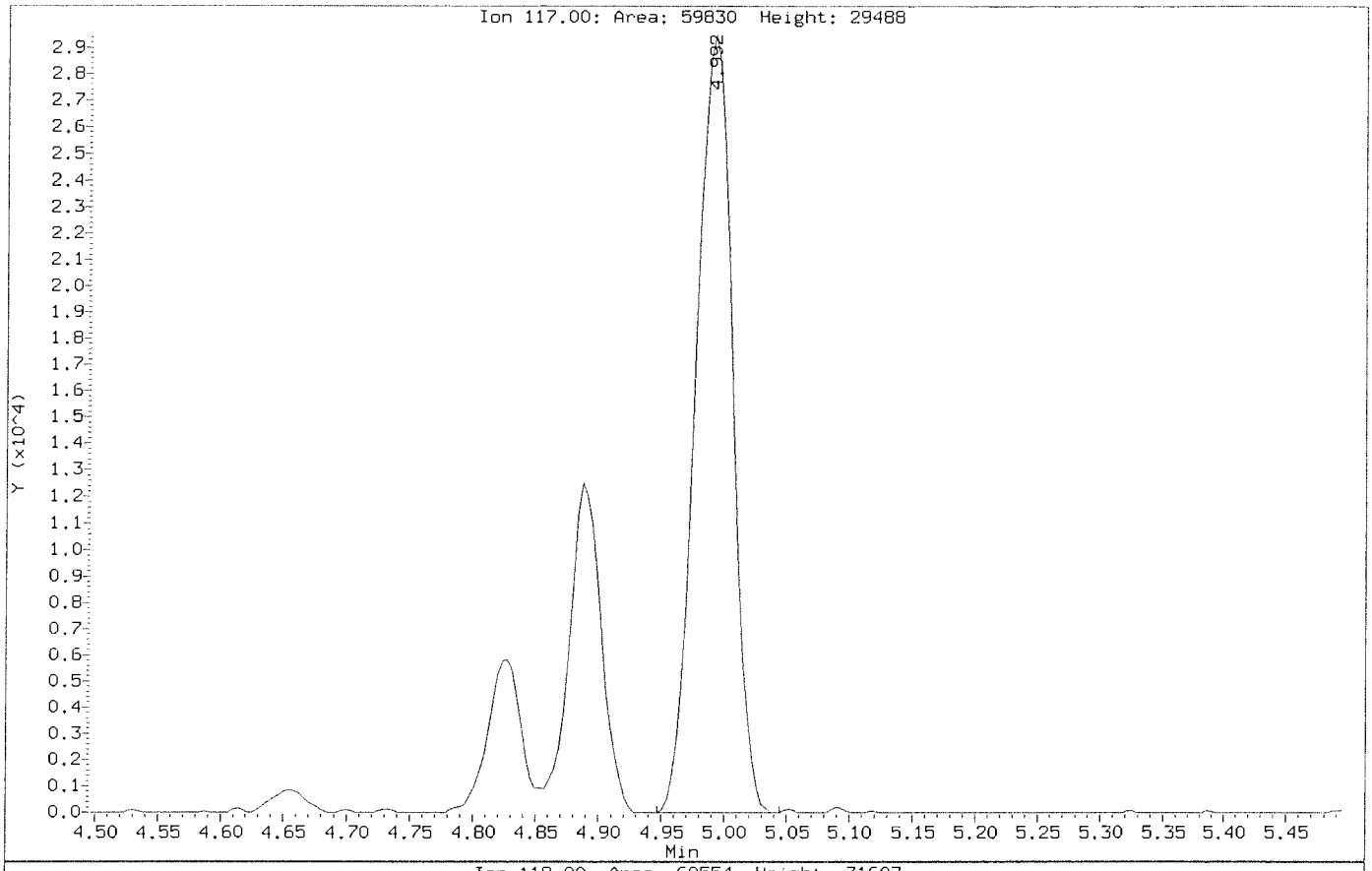
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

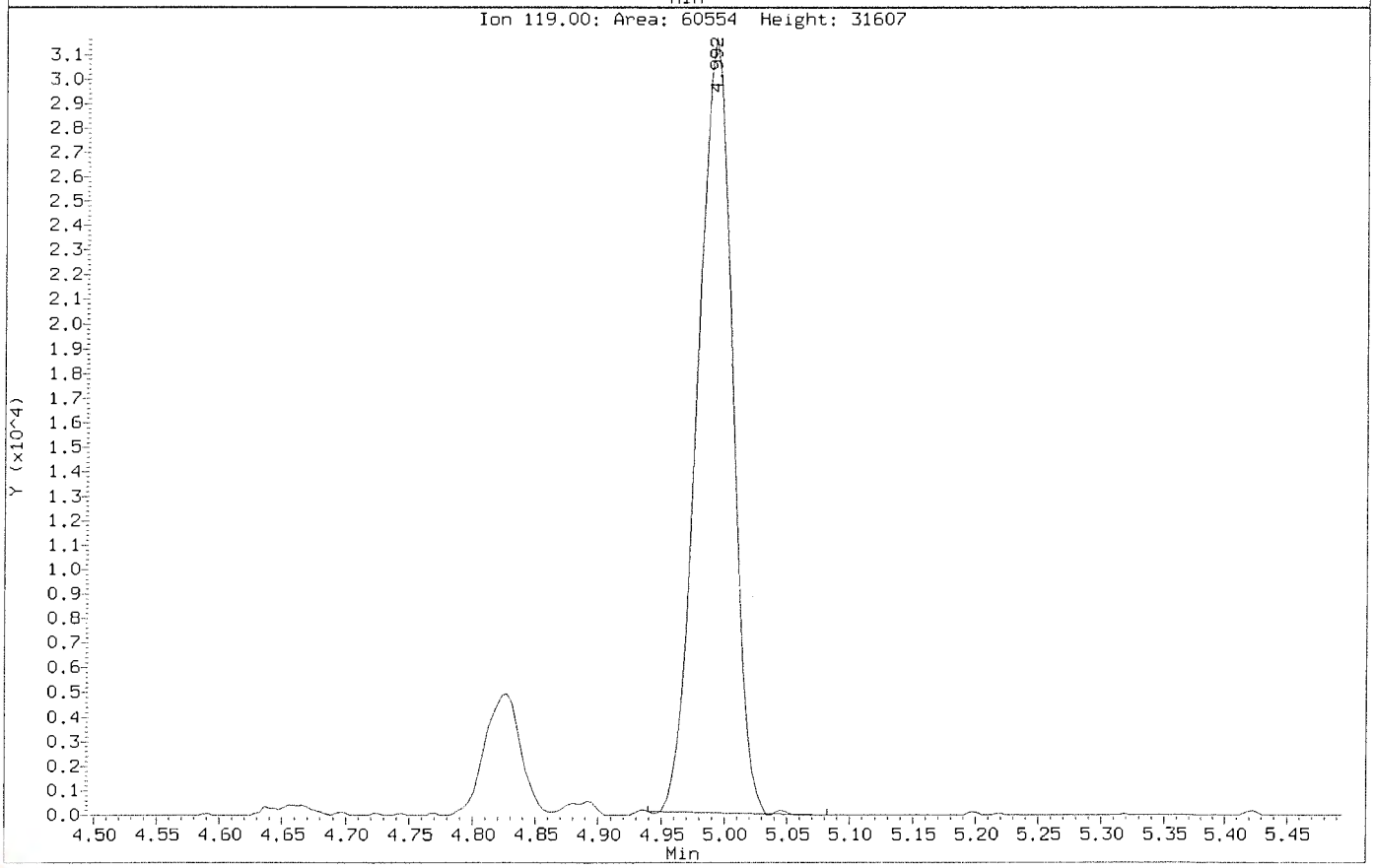




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Injection Date: 12-NOV-2019 13:41
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111208.D Page 1
Report Date: 05-Dec-2019 15:55

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Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111208.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 12-NOV-2019 14:05
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;1;7;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U112108.D
Als bottle: 9 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

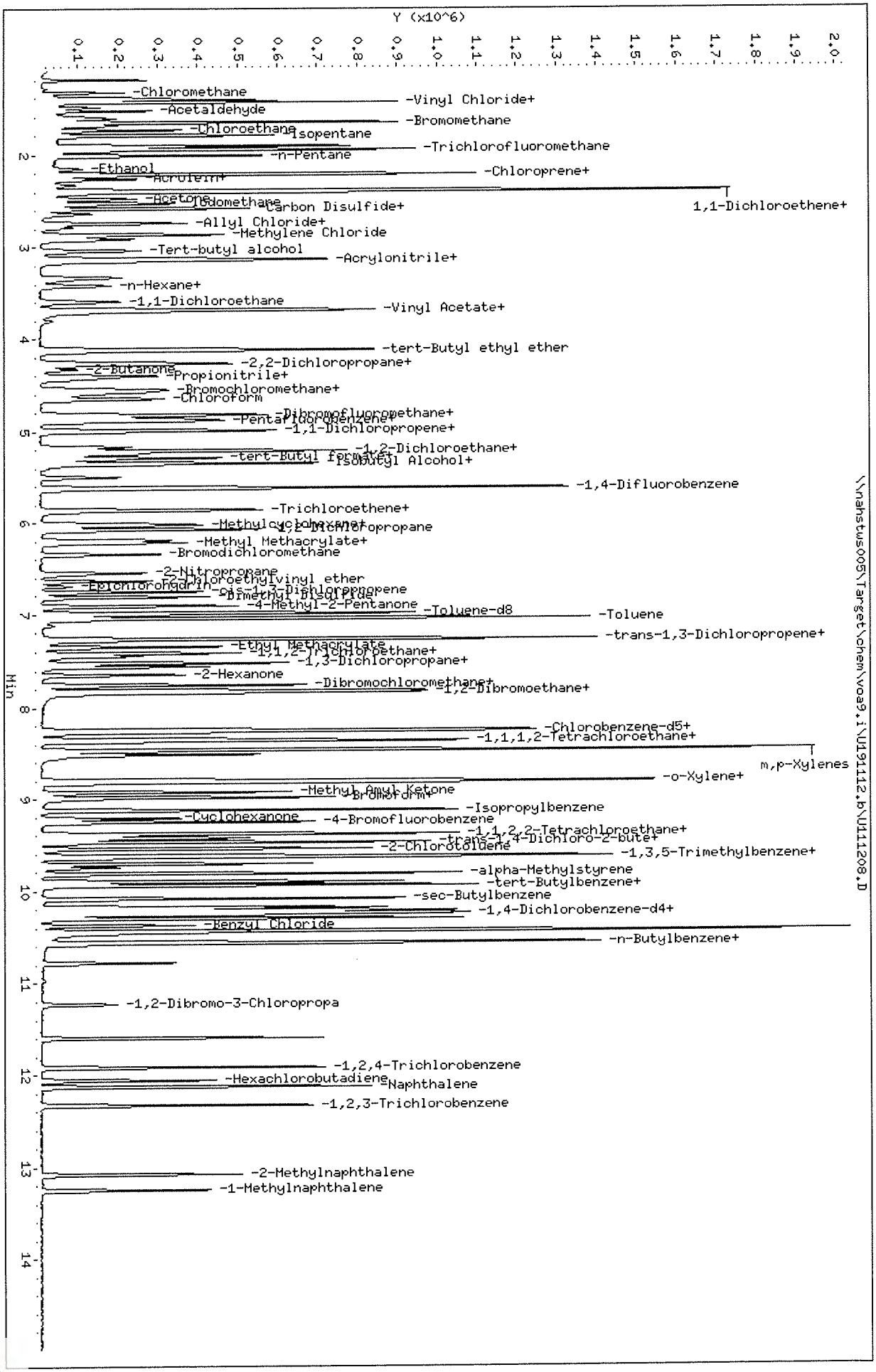
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.886	4.894	(1.000)	274984	50.0000	
*	36 1,4-Difluorobenzene	114	5.617	5.625	(1.000)	462686	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	425551	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	234180	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.168	5.175	(1.058)	139459	50.0000	50.76
$	69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	152807	50.0000	46.51
$	30 Dibromofluoromethane	113	4.823	4.826	(0.987)	136408	50.0000	50.24
$	48 Toluene-d8	98	6.986	6.989	(0.847)	511889	50.0000	48.45
	60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	141983	50.0000	46.74
	31 1,1,1-Trichloroethane	97	4.819	4.826	(0.986)	206054	50.0000	50.37
	68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	204249	50.0000	49.16
	138 Freon TF	101	2.394	2.397	(0.490)	301725	50.0000	49.18
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	112669	50.0000	50.95
	22 1,1-Dichloroethane	63	3.593	3.600	(0.735)	185329	50.0000	47.49
	11 1,1-Dichloroethene	96	2.390	2.397	(0.489)	312659	50.0000	48.67
	32 1,1-Dichloropropene	75	4.999	5.002	(0.890)	154684	50.0000	49.85
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	190715	50.0000	51.77
	71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	201165	50.0000	50.55
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	208615	50.0000	50.03
	79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	534556	50.0000	49.21
	89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	39470	50.0000	48.43
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	153059	50.0000	47.79
	88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	362890	50.0000	51.44

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111208.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.250	(0.934)	161783	50.0000	46.97
42	1,2-Dichloropropane	63	6.075	6.078	(1.081)	112389	50.0000	53.19(M)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	502987	50.0000	49.29
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	330950	50.0000	47.76
54	1,3-Dichloropropane	76	7.559	7.563	(0.917)	219357	50.0000	49.61
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	341529	50.0000	45.51
26	2,2-Dichloropropane	77	4.268	4.271	(0.873)	161244	50.0000	51.13
24	2-Butanone	43	4.328	4.339	(0.886)	100156	100.000	99.98
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	382775	50.0000	50.45
52	2-Hexanone	43	7.646	7.649	(0.927)	175084	100.000	94.20
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	472934	50.0000	49.43
82	p-Isopropyltoluene	119	10.206	10.209	(0.997)	548499	50.0000	50.24
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	248819	100.000	100.22
10	Acetone	43	2.472	2.483	(0.506)	193875	100.000	110.43
37	Benzene	78	5.213	5.216	(0.928)	496740	50.0000	49.67
74	Bromobenzene	156	9.377	9.381	(0.916)	195409	50.0000	46.14
29	Bromochloromethane	128	4.545	4.553	(0.930)	76376	50.0000	47.04
39	Bromodichloromethane	83	6.341	6.344	(1.129)	161027	50.0000	52.20
66	Bromoform	173	8.980	8.984	(1.089)	110280	50.0000	45.94
6	Bromomethane	94	1.655	1.659	(0.339)	367813	50.0000	47.93(M)
19	Carbon Disulfide	76	2.581	2.584	(0.528)	618744	100.000	101.44
34	Carbon Tetrachloride	117	4.988	4.995	(0.888)	172023	50.0000	53.48(M)
59	Chlorobenzene	112	8.272	8.271	(1.003)	411095	50.0000	47.70
7	Chloroethane	64	1.741	1.741	(0.356)	198912	50.0000	51.60
28	Chloroform	83	4.650	4.654	(0.952)	226516	50.0000	48.72
3	Chloromethane	50	1.333	1.340	(0.273)	127356	50.0000	51.99
27	cis-1,2-Dichloroethene	96	4.275	4.283	(0.875)	145273	50.0000	46.37
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.202)	193167	50.0000	57.35
55	Dibromochloromethane	129	7.754	7.758	(0.940)	150176	50.0000	46.21
44	Dibromomethane	93	6.184	6.187	(1.101)	96316	50.0000	51.37
2	Dichlorodifluoromethane	85	1.198	1.205	(0.245)	135245	50.0000	48.36
61	Ethylbenzene	106	8.365	8.369	(1.015)	207872	50.0000	48.38
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	68602	50.0000	48.62
67	Isopropylbenzene	105	9.123	9.126	(1.106)	610611	50.0000	50.12
62	m,p-Xylenes	106	8.466	8.470	(1.027)	532797	100.000	101.34
17	Methylene Chloride	84	2.862	2.869	(0.586)	122034	50.0000	47.65
87	n-Butylbenzene	91	10.555	10.554	(1.032)	458736	50.0000	50.18
73	n-Propylbenzene	91	9.471	9.475	(0.926)	679374	50.0000	49.62
92	Naphthalene	128	12.129	12.129	(1.185)	597688	50.0000	53.94
63	o-Xylene	106	8.808	8.807	(1.068)	267074	50.0000	50.13
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	566279	50.0000	49.37
64	Styrene	104	8.819	8.822	(1.070)	466594	50.0000	50.36
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	435678	50.0000	50.26
56	Tetrachloroethene	166	7.522	7.522	(0.912)	157812	50.0000	48.92
50	Toluene	91	7.042	7.045	(0.854)	615947	50.0000	47.96
20	trans-1,2-Dichloroethene	96	3.132	3.139	(0.641)	123828	50.0000	46.49
51	trans-1,3-Dichloropropene	75	7.256	7.259	(1.292)	188731	50.0000	49.52
38	Trichloroethene	130	5.857	5.861	(1.043)	152615	50.0000	49.81
8	Trichlorofluoromethane	101	1.944	1.951	(0.398)	584721	50.0000	49.55
5	Vinyl Chloride	62	1.411	1.419	(0.289)	292963	50.0000	47.90

QC Flag Legend

M - Compound response manually integrated.

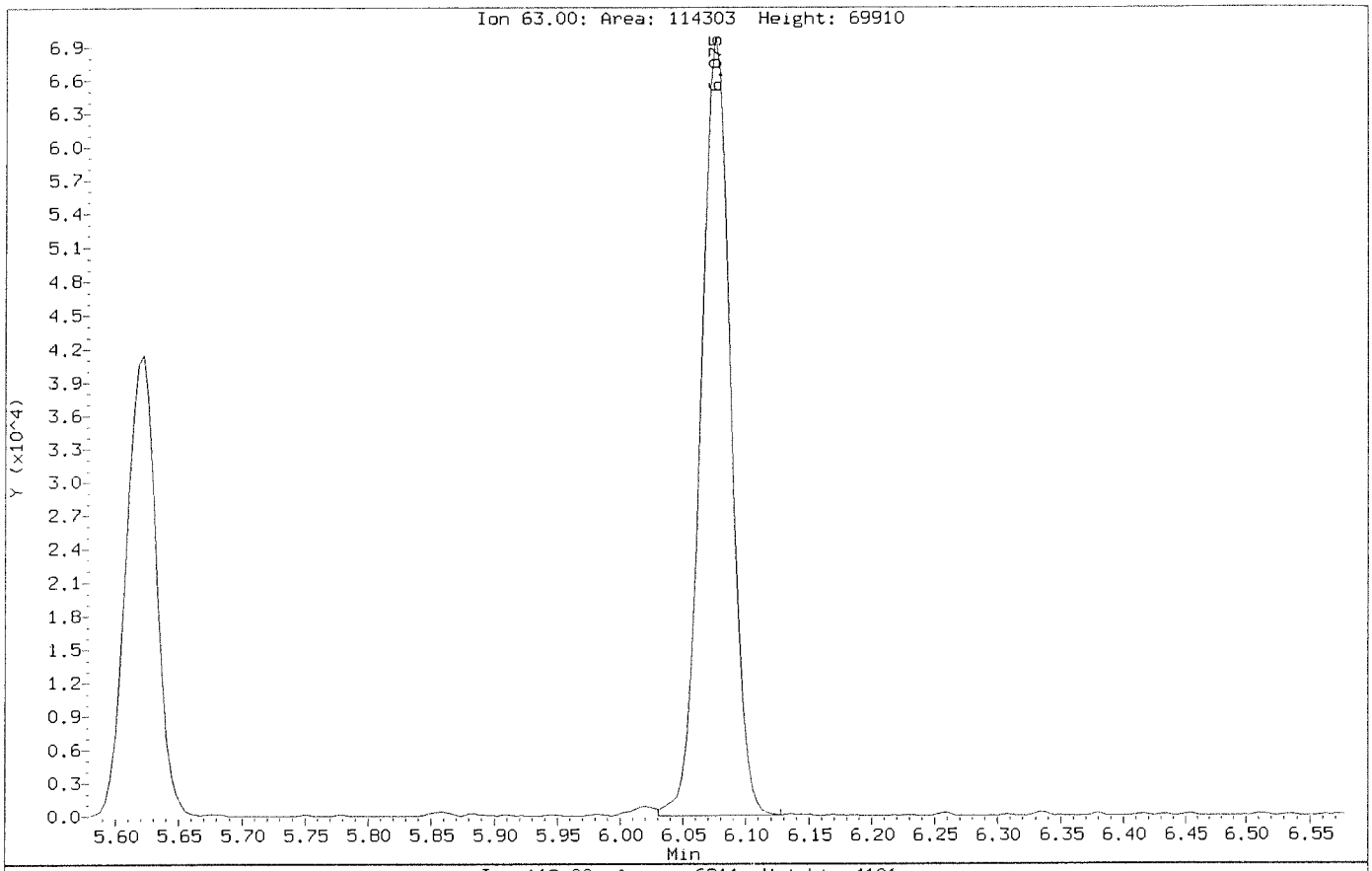


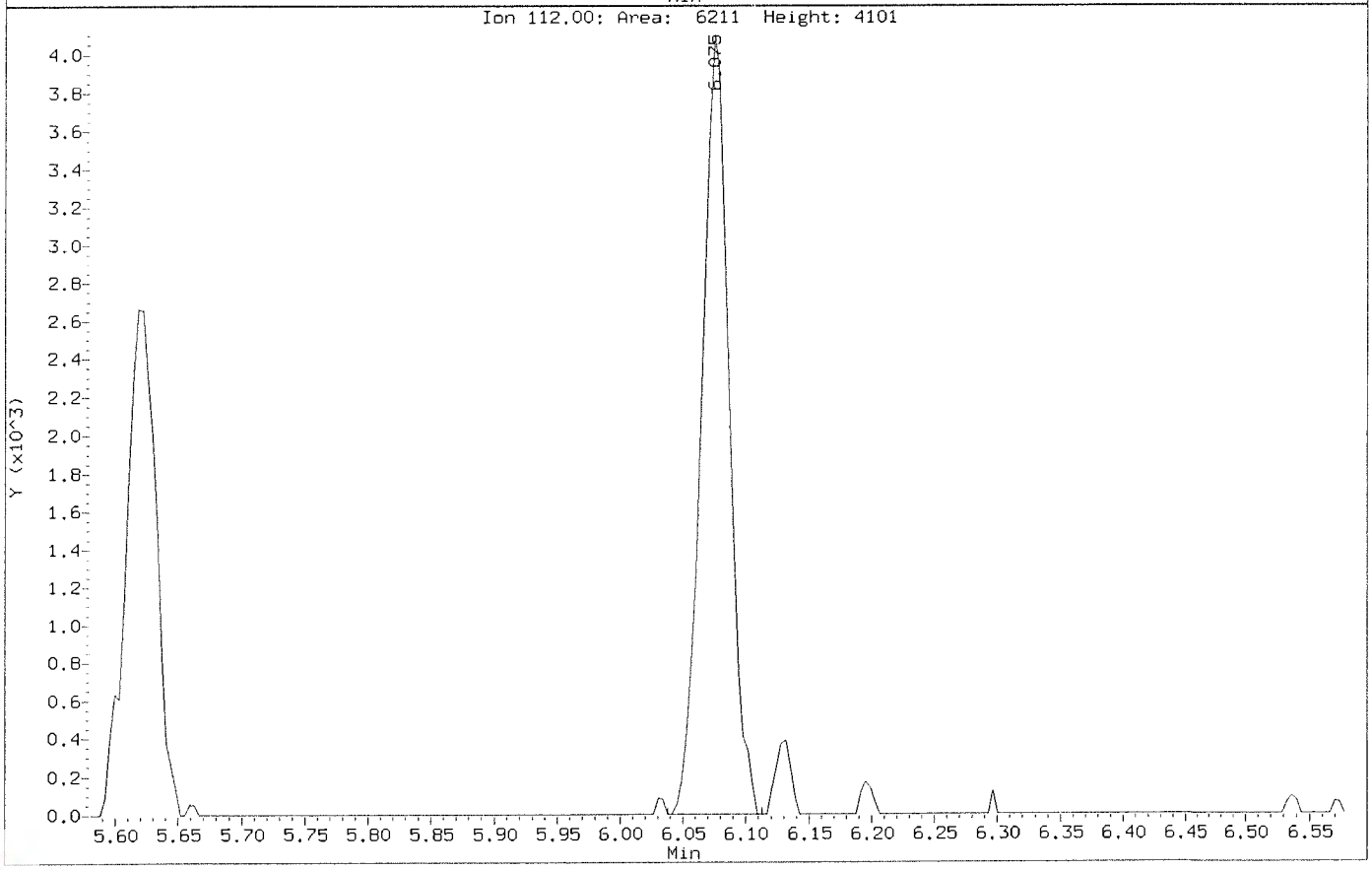
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Date : 12-NOV-2019 14:05
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;1;7;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111208.D
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Instrument: VOA9.i
Client Sample ID: VSTD050

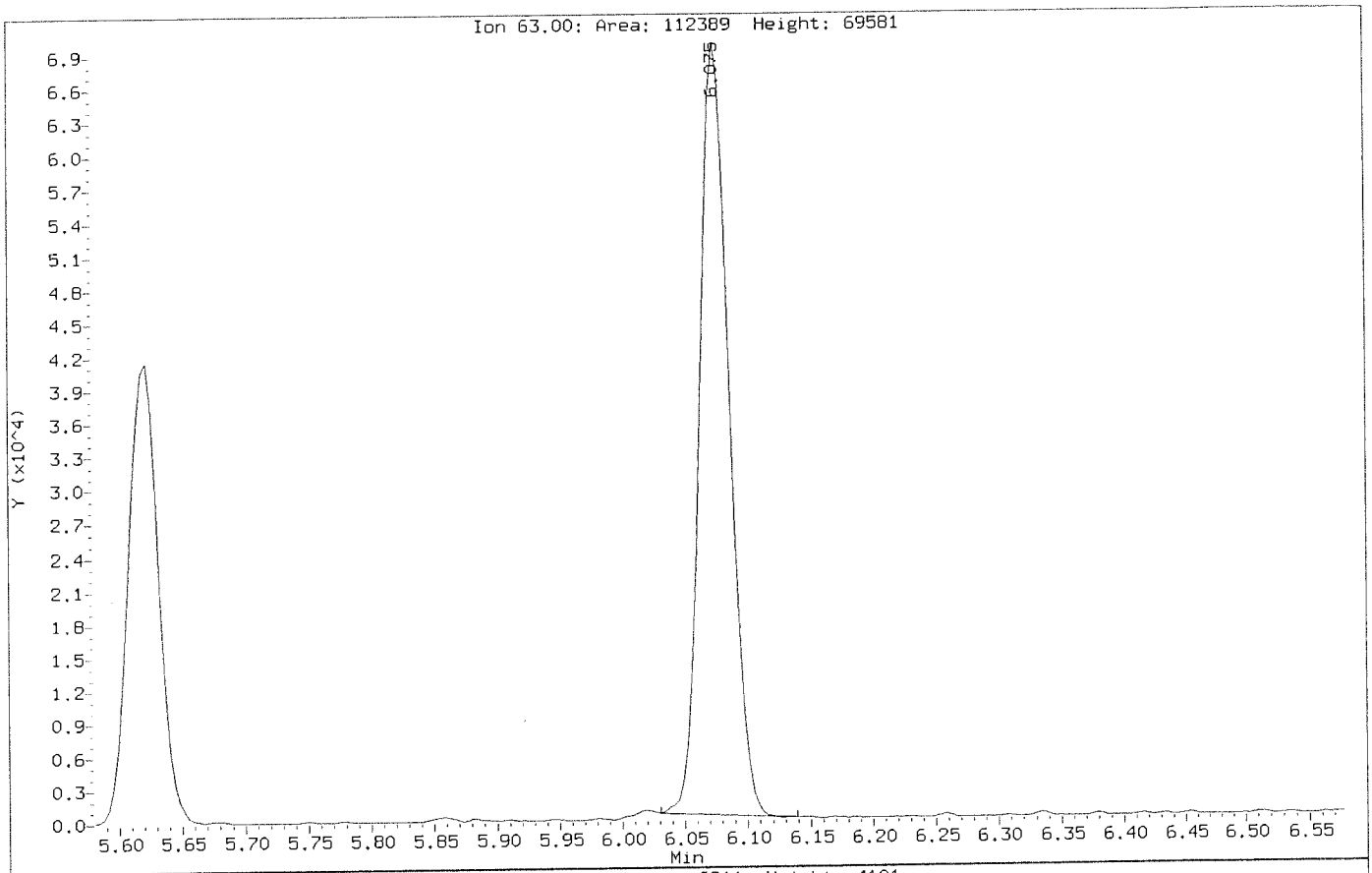
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CAS Number: 78-87-5

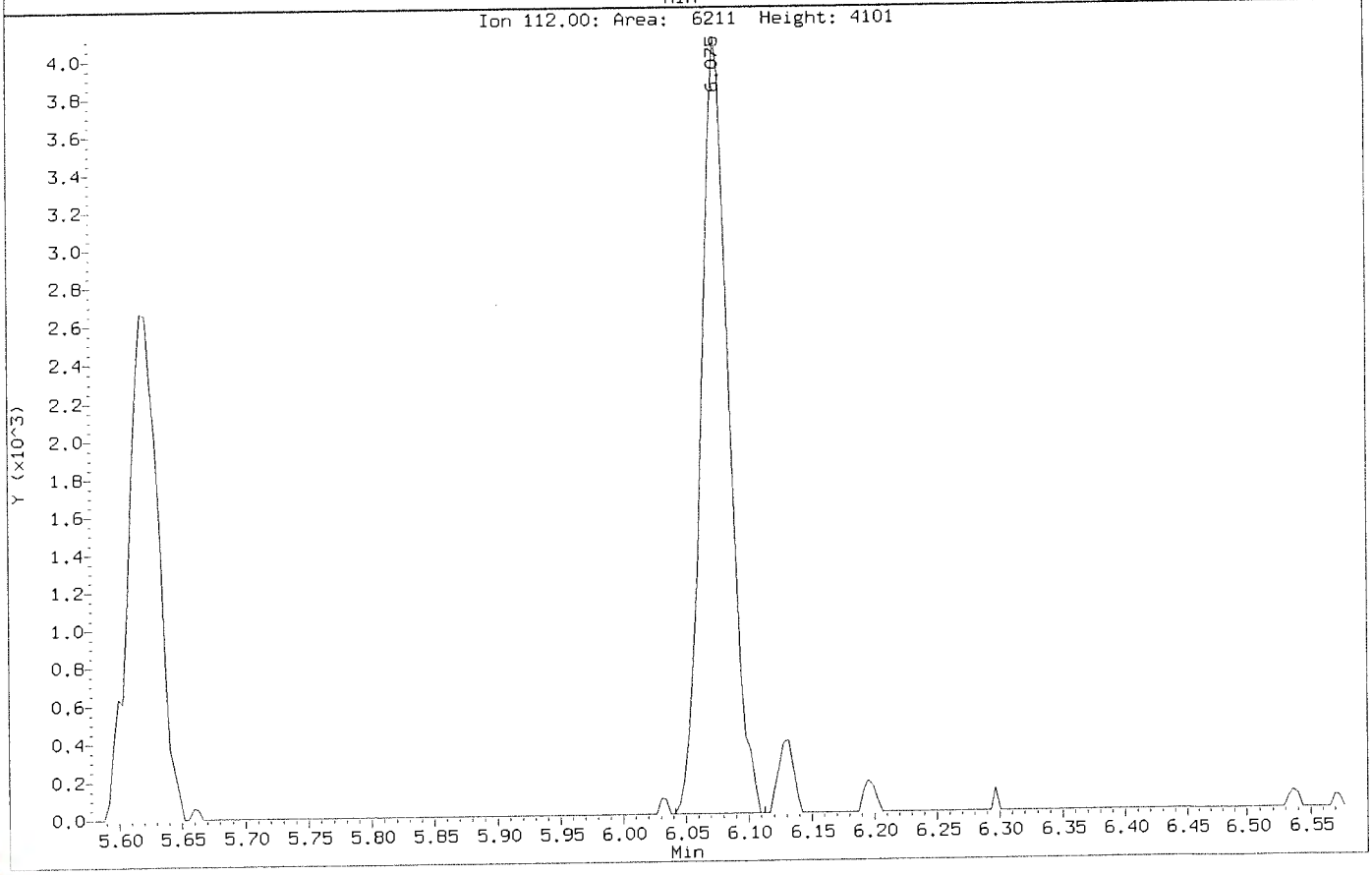




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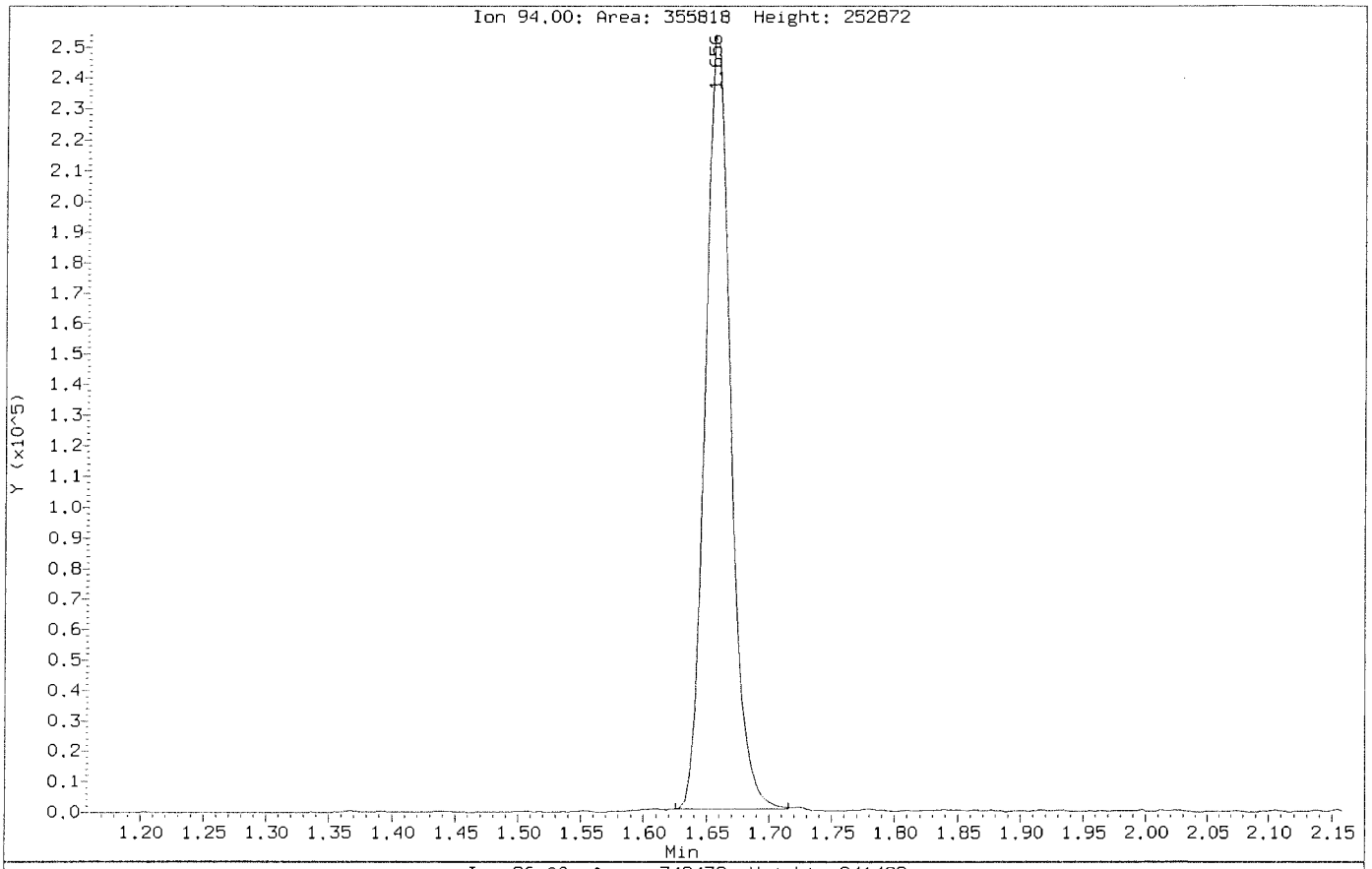
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

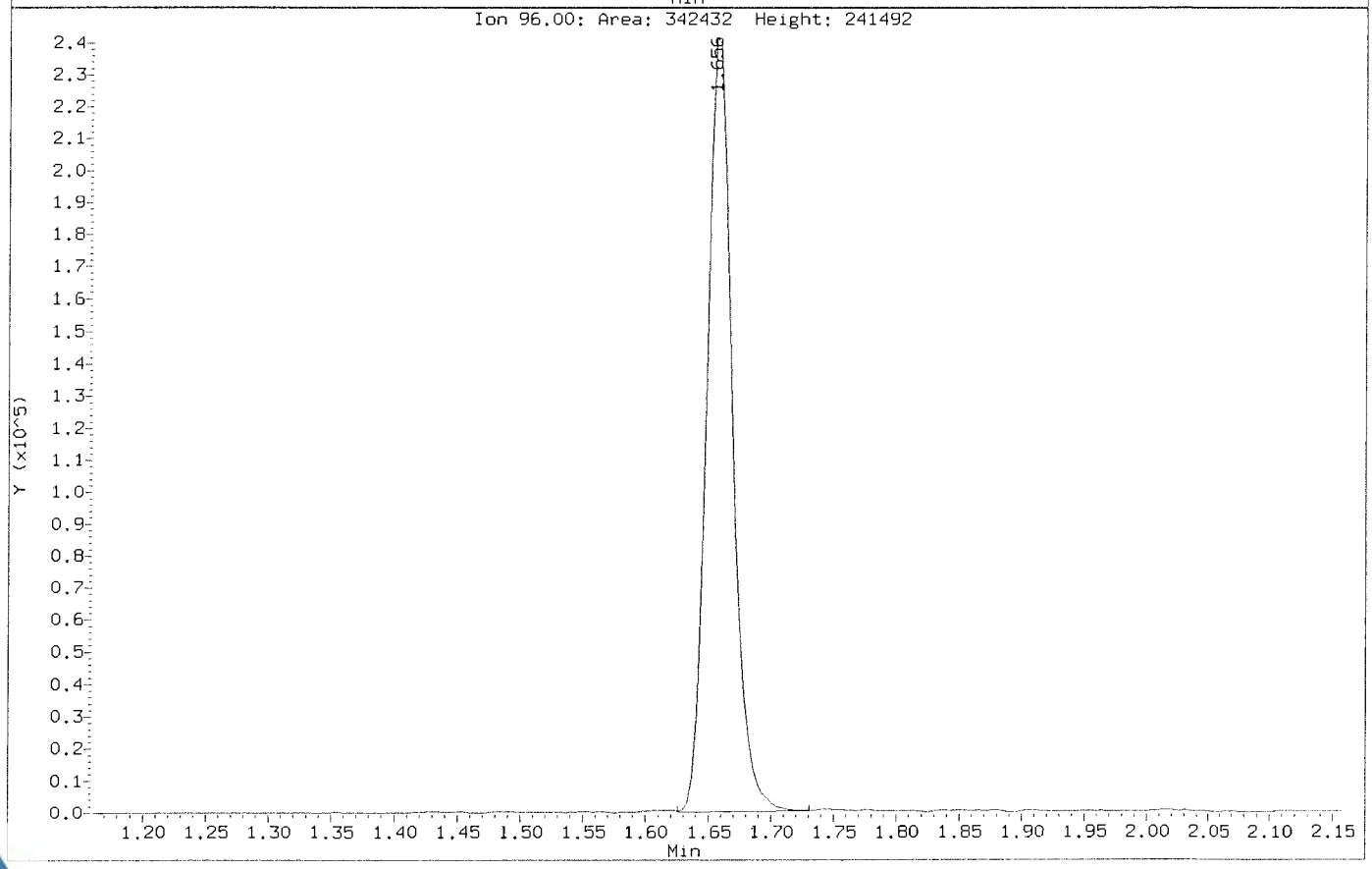




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Injection Date: 12-NOV-2019 14:05
Instrument: VOA9.i
Client Sample ID: VSTD050

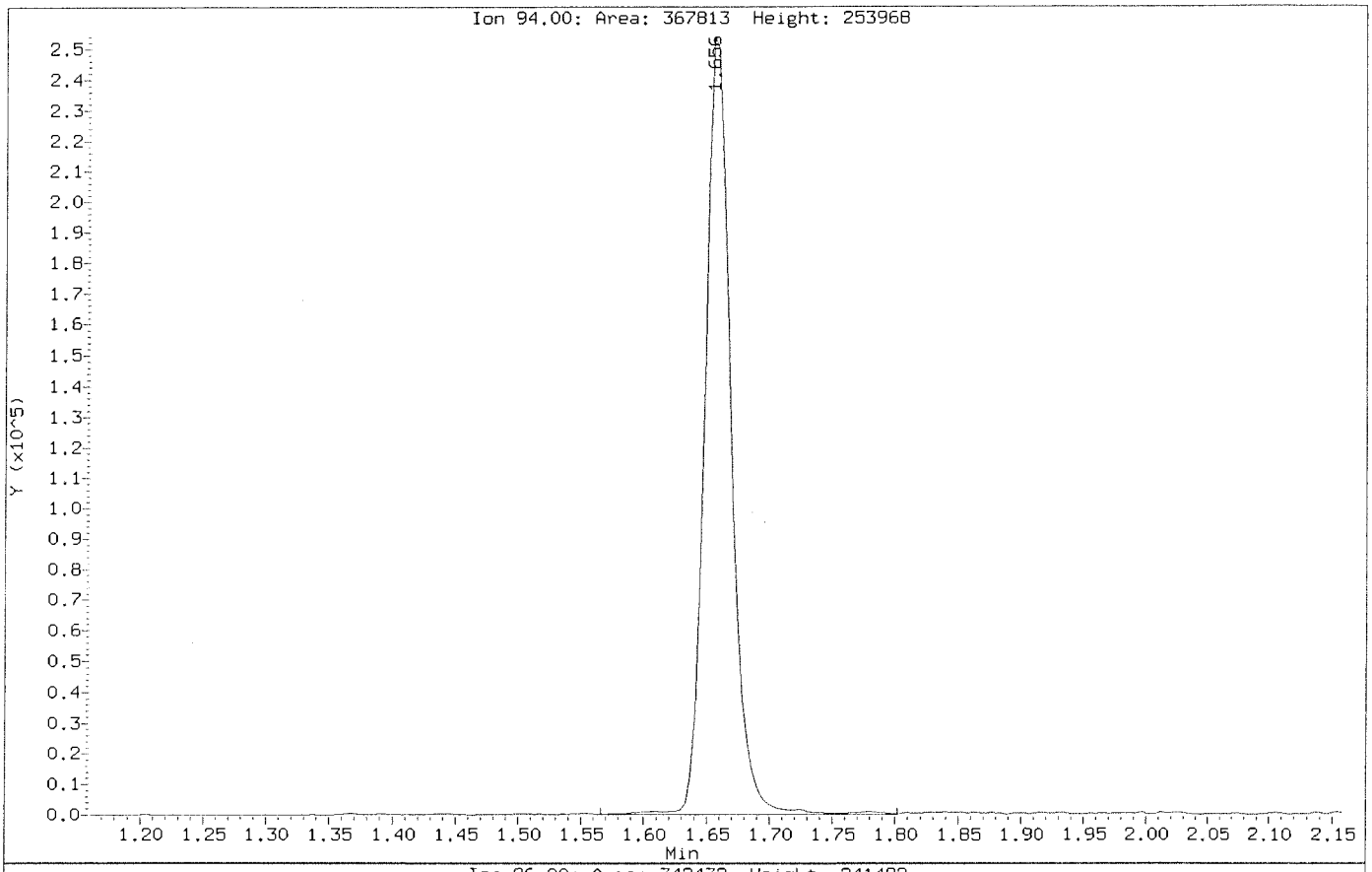
Compound: Bromomethane
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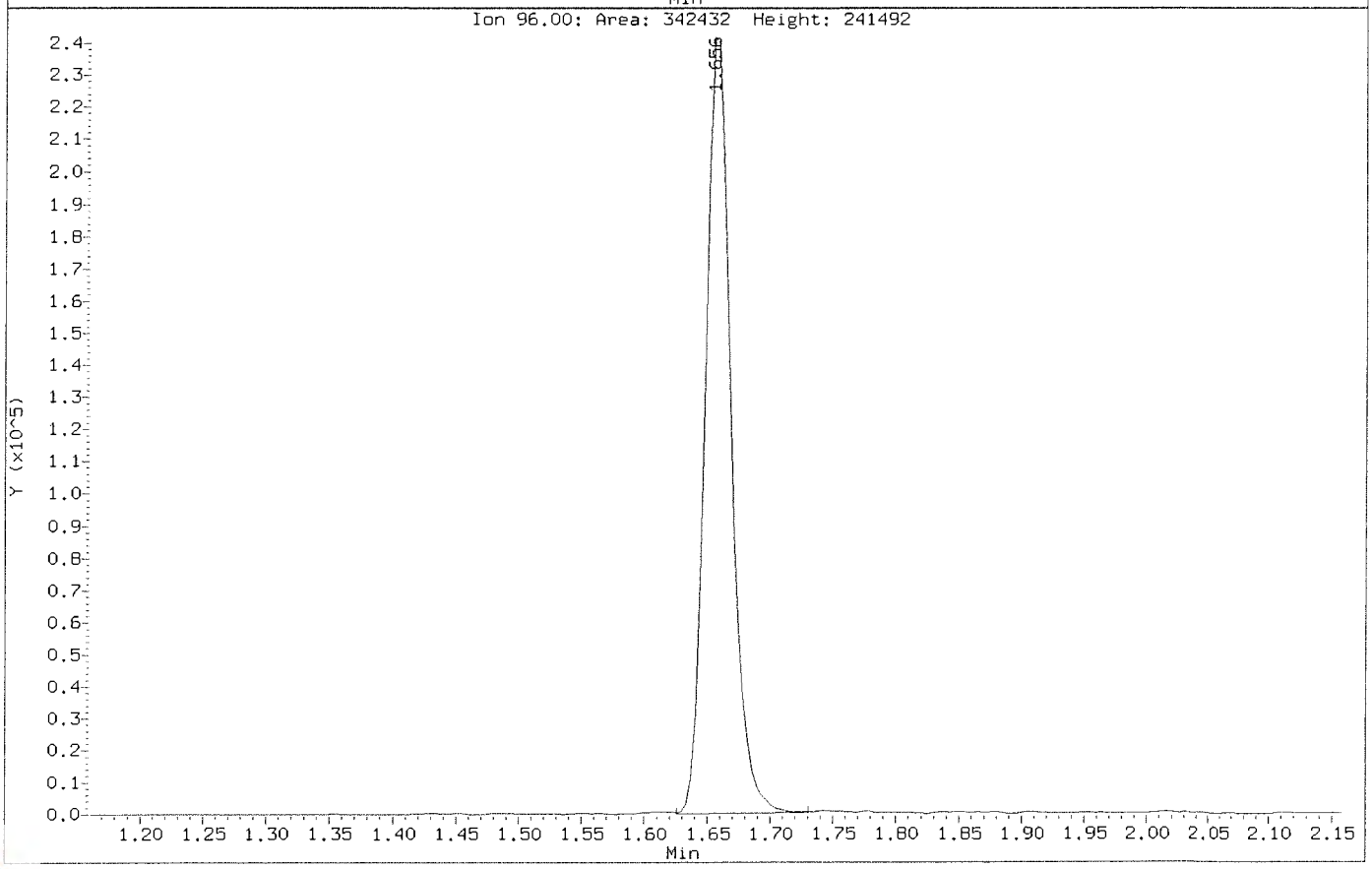




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Client Sample ID: VSTD050

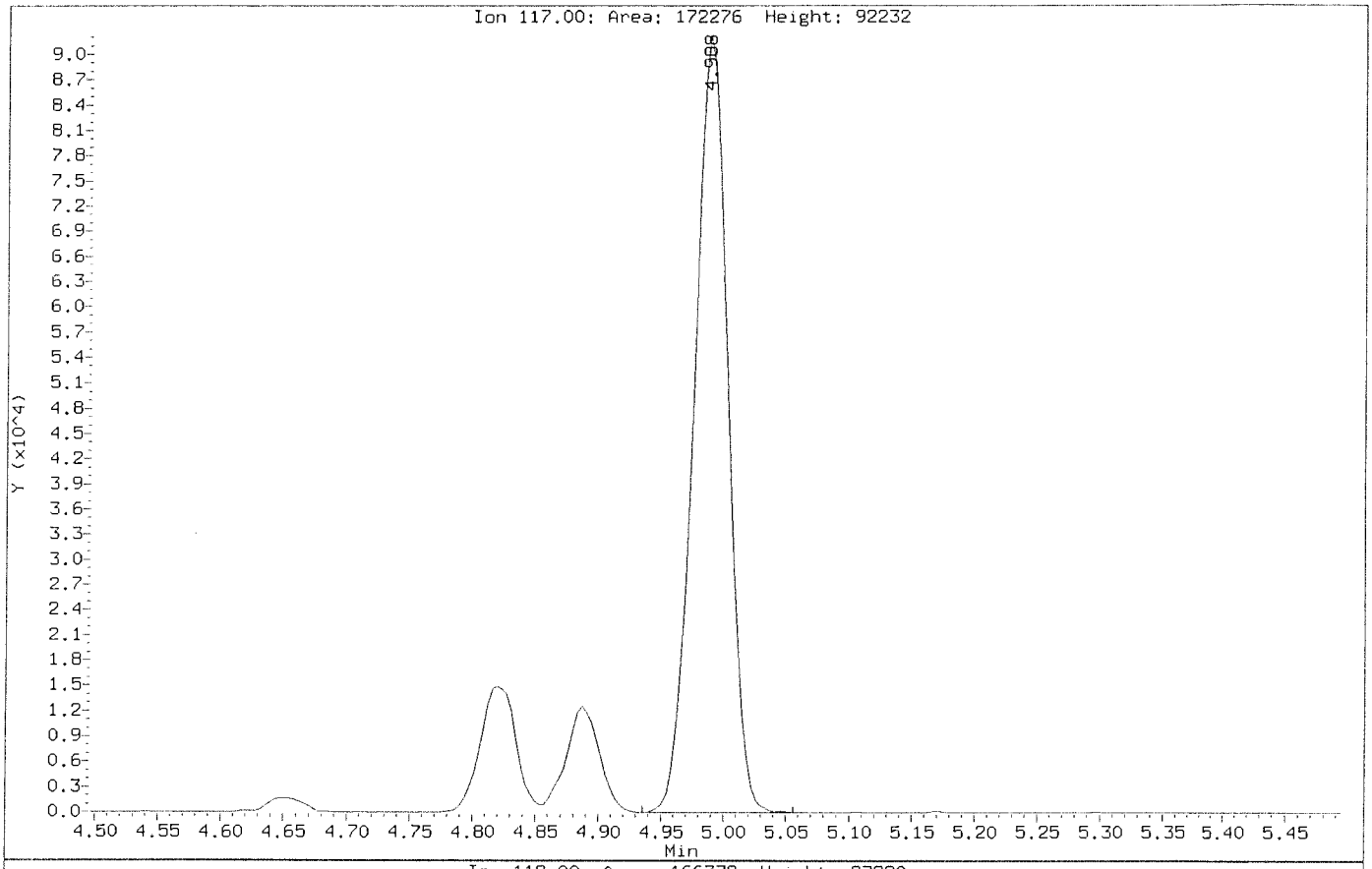
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CAS Number: 74-83-9

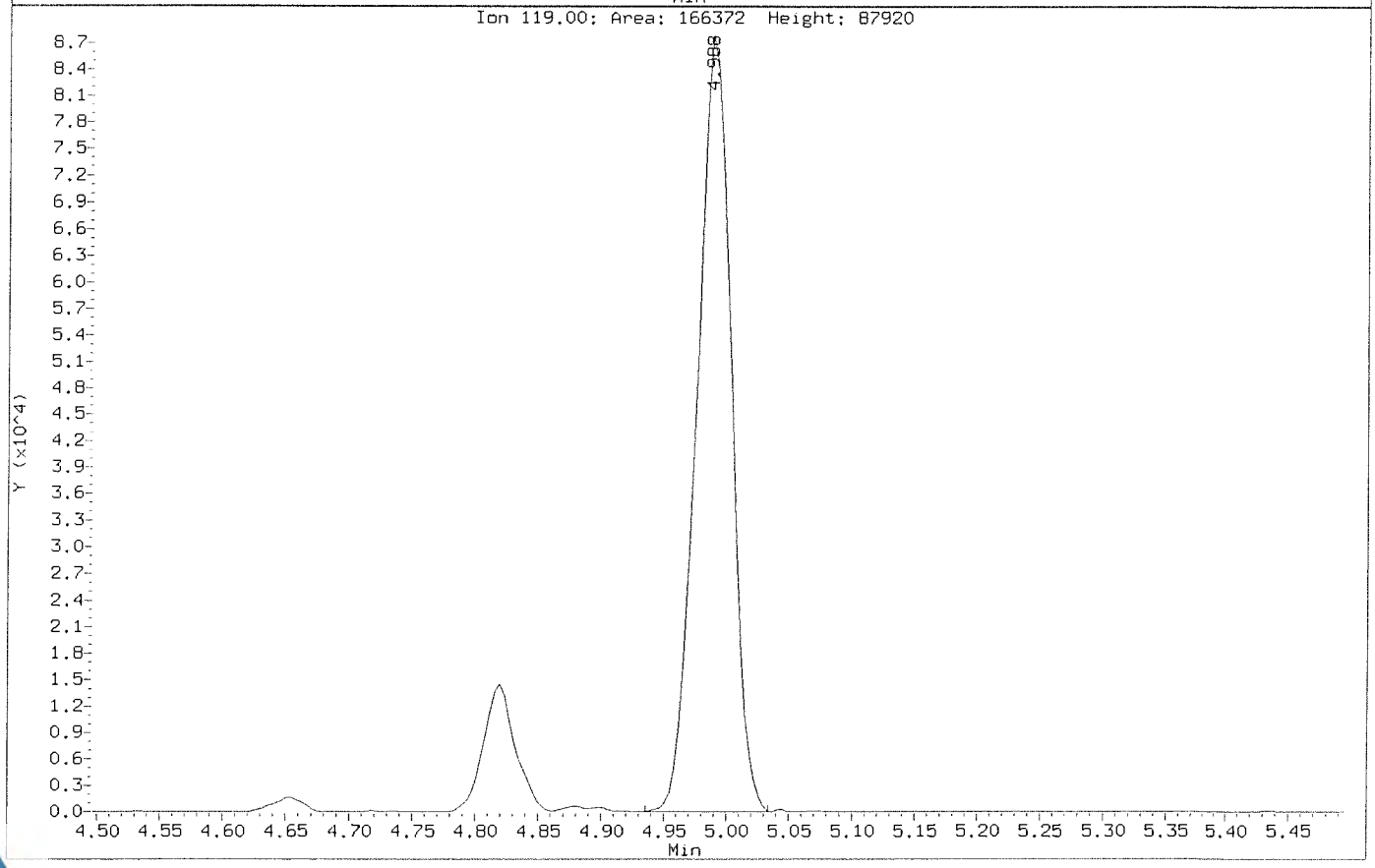




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Instrument: VOA9.i
Client Sample ID: VSTD050

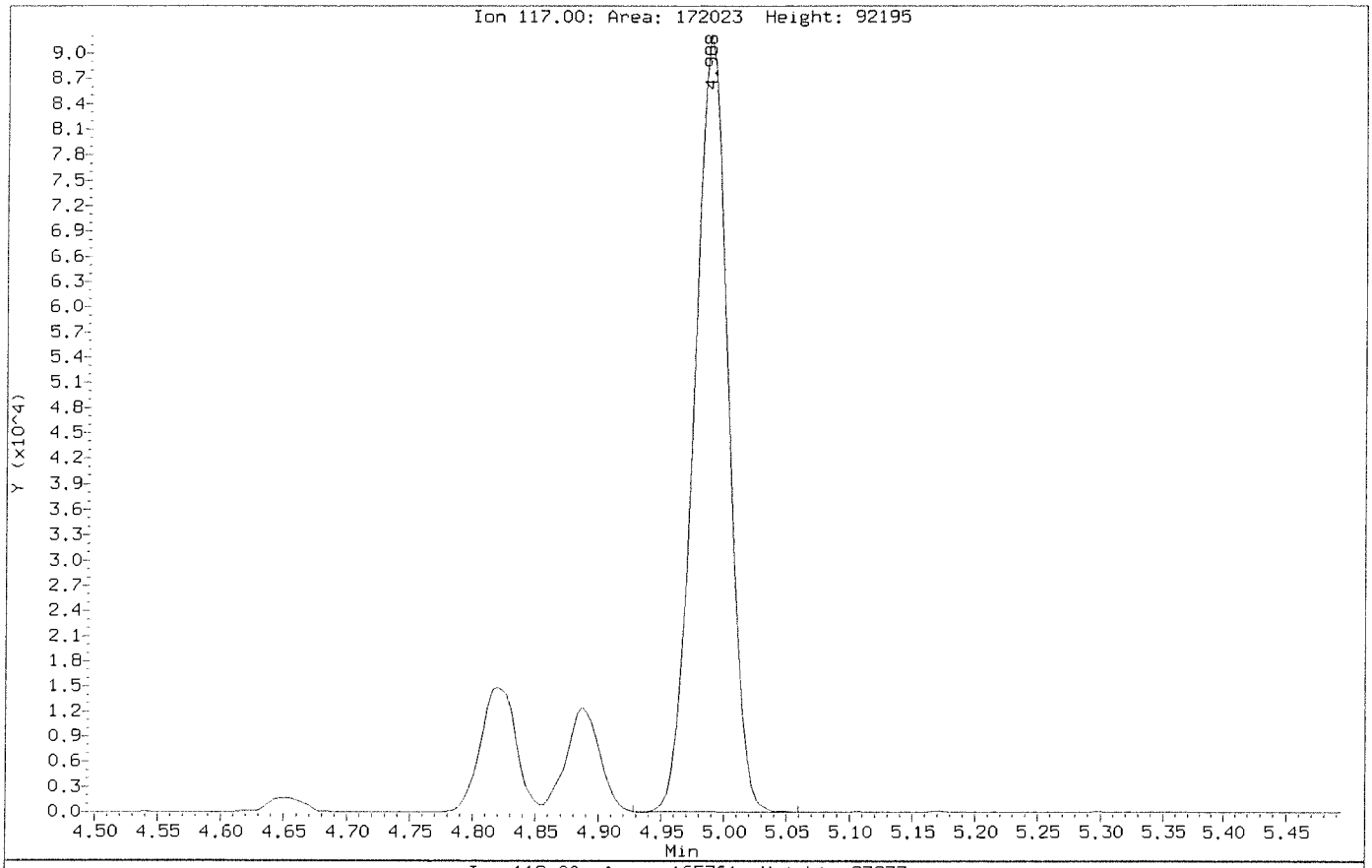
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

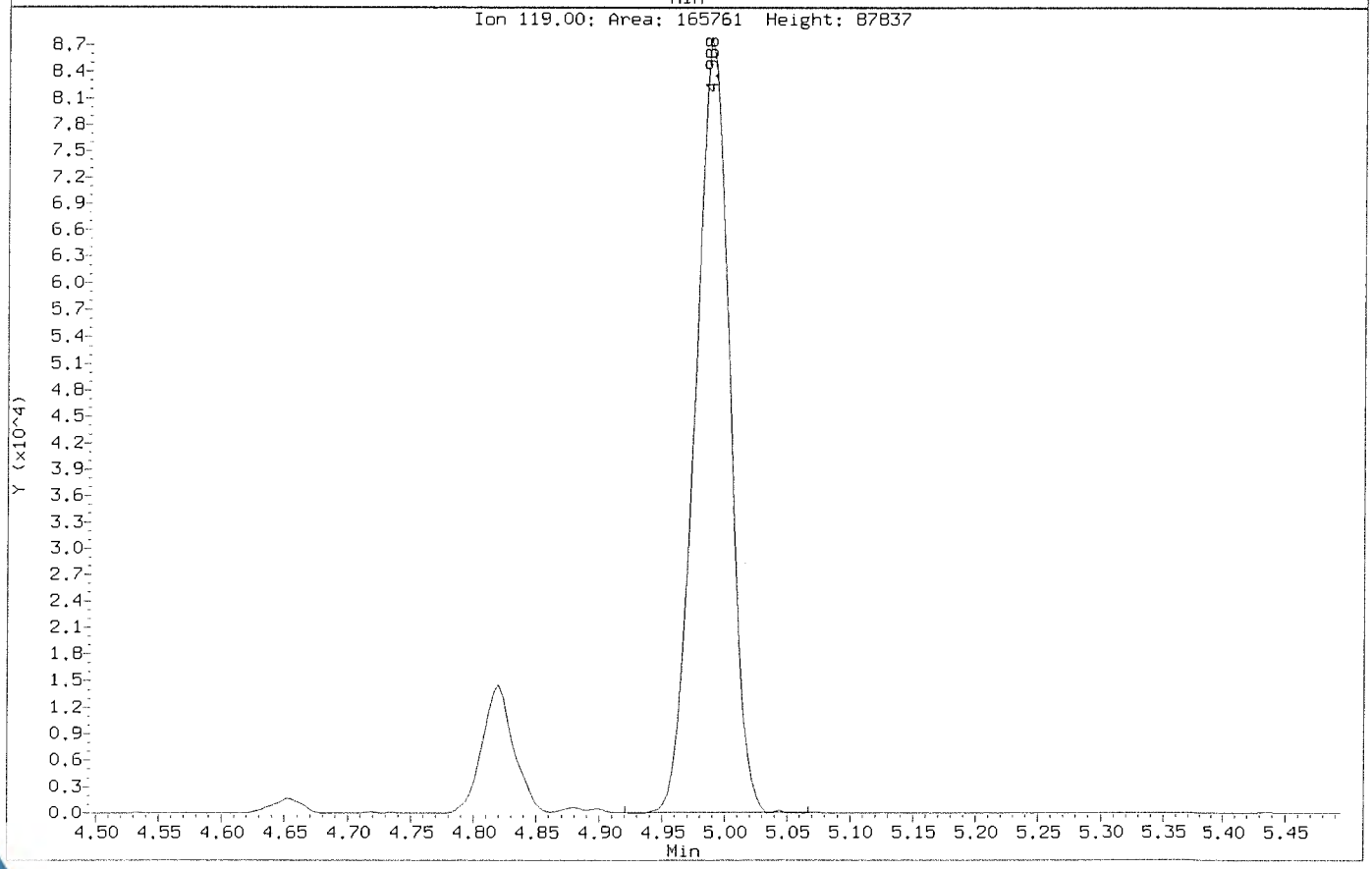




Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111208.D
Injection Date: 12-NOV-2019 14:05
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111209.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111209.D
Lab Smp Id: VSTD100 Client Smp ID: VSTD100
Inj Date : 12-NOV-2019 14:29
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD100;VSTD100;1;8;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:29 Cal File: U112109.D
Als bottle: 10 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

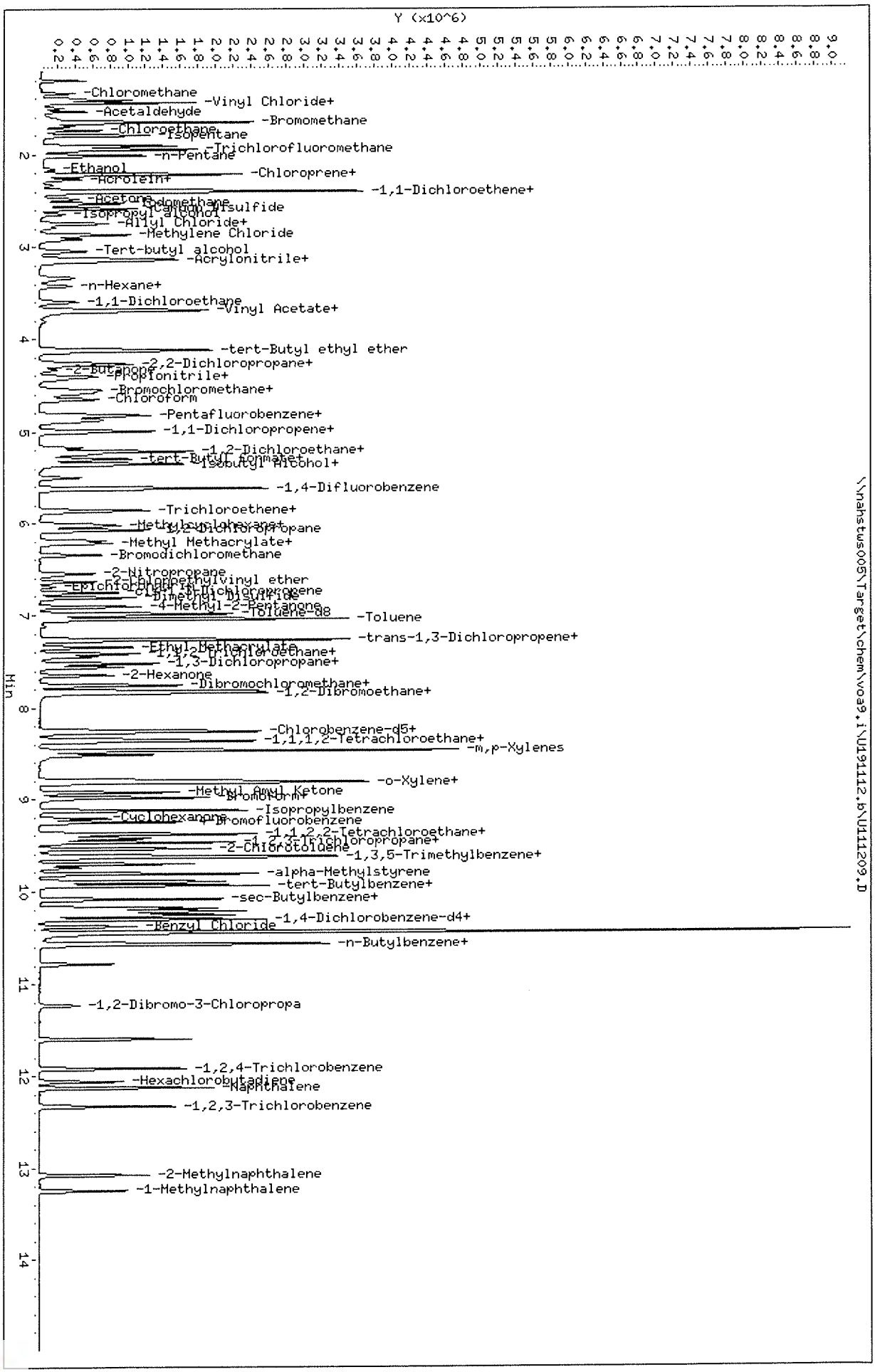
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.890	4.894	(1.000)	300922	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	544824	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	480390	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	274263	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	285285	100.000	95.73
$	69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	362804	100.000	97.11
$	30 Dibromofluoromethane	113	4.823	4.826	(0.986)	301818	100.000	99.40
$	48 Toluene-d8	98	6.986	6.989	(0.847)	1157985	100.000	96.97
	60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	338539	100.000	96.81
	31 1,1,1-Trichloroethane	97	4.823	4.826	(0.986)	447831	100.000	100.04
	68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	477140	100.000	98.07
	138 Freon TF	101	2.393	2.397	(0.490)	638869	100.000	95.16
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.899)	240719	100.000	96.44
	22 1,1-Dichloroethane	63	3.597	3.600	(0.736)	402984	100.000	94.36
	11 1,1-Dichloroethene	96	2.393	2.397	(0.490)	667300	100.000	94.93
	32 1,1-Dichloropropene	75	4.999	5.002	(0.889)	336009	100.000	91.96
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	442676	100.000	102.61
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	442241	100.000	94.90
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	474342	100.000	97.14
	79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	1245043	100.000	97.87
	89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	96733	100.000	99.61
	57 1,2-Dibromoethane	107	7.848	7.848	(0.951)	371512	100.000	102.76
	88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	821917	100.000	99.48

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111209.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.250	(0.933)	352611	100.000	86.94
42	1,2-Dichloropropane	63	6.075	6.078	(1.081)	248467	100.000	101.26(M)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	1191246	100.000	99.68
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	751741	100.000	92.63
54	1,3-Dichloropropane	76	7.559	7.563	(0.916)	494160	100.000	99.00
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	805087	100.000	91.61
26	2,2-Dichloropropane	77	4.268	4.271	(0.873)	353587	100.000	102.45
24	2-Butanone	43	4.332	4.339	(0.886)	220020	200.000	202.45(A)
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	881402	100.000	99.20
52	2-Hexanone	43	7.649	7.649	(0.927)	410859	200.000	195.82
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	1103642	100.000	98.50
82	p-Isopropyltoluene	119	10.206	10.209	(0.997)	1212445	100.000	94.83
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	561832	200.000	200.47(A)
10	Acetone	43	2.476	2.483	(0.506)	378076	200.000	205.68(A)
37	Benzene	78	5.212	5.216	(0.927)	1109034	100.000	94.17
74	Bromobenzene	156	9.381	9.381	(0.917)	455377	100.000	91.81
29	Bromochloromethane	128	4.549	4.553	(0.930)	168162	100.000	94.66
39	Bromodichloromethane	83	6.345	6.344	(1.129)	372904	100.000	102.66
66	Bromoform	173	8.980	8.984	(1.089)	292511	100.000	99.63
6	Bromomethane	94	1.655	1.659	(0.339)	972459	100.000	100.74
19	Carbon Disulfide	76	2.581	2.584	(0.528)	1324595	200.000	198.45
34	Carbon Tetrachloride	117	4.988	4.995	(0.887)	382151	100.000	100.91(M)
59	Chlorobenzene	112	8.271	8.271	(1.003)	934530	100.000	96.06
7	Chloroethane	64	1.741	1.741	(0.356)	424128	100.000	102.20
28	Chloroform	83	4.650	4.654	(0.951)	491588	100.000	96.63
3	Chloromethane	50	1.336	1.340	(0.273)	262348	100.000	98.95
27	cis-1,2-Dichloroethene	96	4.279	4.283	(0.875)	318400	100.000	92.89
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	430904	100.000	108.64
55	Dibromochloromethane	129	7.754	7.758	(0.940)	353574	100.000	93.63
44	Dibromomethane	93	6.187	6.187	(1.101)	206920	100.000	93.72
2	Dichlorodifluoromethane	85	1.198	1.205	(0.245)	288007	100.000	94.10
61	Ethylbenzene	106	8.369	8.369	(1.015)	477942	100.000	98.54
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	152536	100.000	92.31
67	Isopropylbenzene	105	9.122	9.126	(1.106)	1402159	100.000	101.95
62	m,p-Xylenes	106	8.470	8.470	(1.027)	1261599	200.000	212.57(A)
17	Methylene Chloride	84	2.862	2.869	(0.585)	271871	100.000	96.08
87	n-Butylbenzene	91	10.554	10.554	(1.032)	1069283	100.000	99.88
73	n-Propylbenzene	91	9.471	9.475	(0.926)	1552935	100.000	96.86
92	Naphthalene	128	12.129	12.129	(1.185)	1400730	100.000	107.95
63	o-Xylene	106	8.807	8.807	(1.068)	613623	100.000	102.03
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	1295898	100.000	96.47
64	Styrene	104	8.822	8.822	(1.070)	1127032	100.000	107.77
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	994487	100.000	97.97
56	Tetrachloroethene	166	7.522	7.522	(0.912)	349766	100.000	96.04
50	Toluene	91	7.046	7.045	(0.854)	1450936	100.000	100.09
20	trans-1,2-Dichloroethene	96	3.136	3.139	(0.641)	275617	100.000	92.62
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	454991	100.000	100.62
38	Trichloroethene	130	5.857	5.861	(1.042)	332739	100.000	92.24
8	Trichlorofluoromethane	101	1.947	1.951	(0.398)	1180049	100.000	91.38
5	Vinyl Chloride	62	1.415	1.419	(0.289)	592169	100.000	88.48

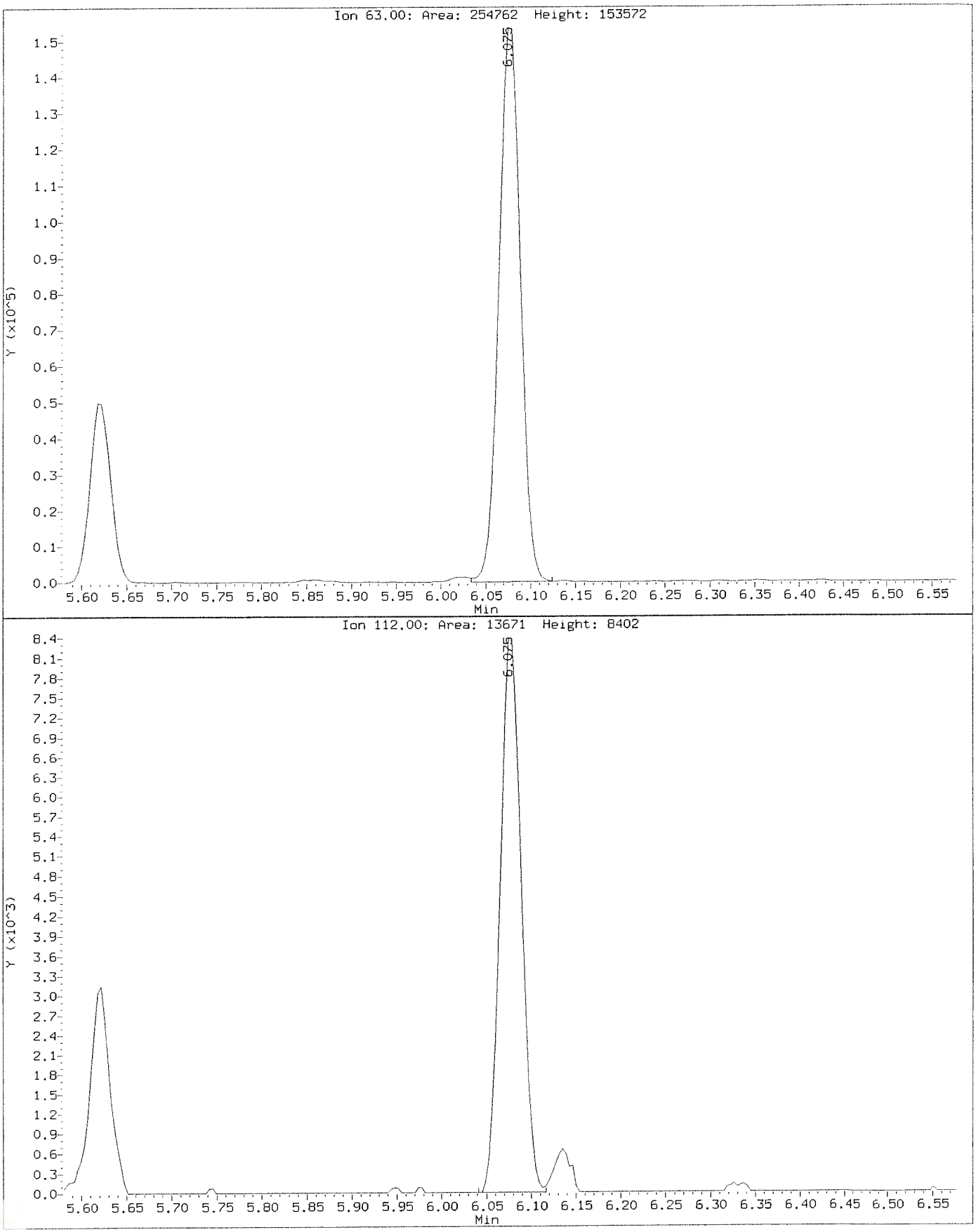
QC Flag Legend

A - Target compound detected but, quantitated amount
exceeded maximum amount.
M - Compound response manually integrated.


Y (x10^6)
Min
-Chloromethane
-Vinyl Chloride+
-Acetaldehyde
-Bromomethane
-Chloroethane
-Isopentane
-Trichlorofluoromethane
-n-Pentane
-Ethanol
-Chloroprene+
-Acrolein+
-1,1-Dichloroethene+
-Acetone
-Iodomethane
-Carbon disulfide
-Isopropyl alcohol
-Allyl Chloride+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-n-Hexane+
-1,1-Dichloroethane
-Vinyl Acetate+
-tert-Butyl ethyl ether
-2-Butanone
-2,2-Dichloropropane+
-Propionitrile+
-Bromochloromethane+
-Chloroform
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-tert-Butyl Formate+
-Isobutyl Alcohol+
-1,4-Difluorobenzene
-Trichloroethene+
-Methylcyclohexane+
-1,2-Dichloropropane
-Methyl Methacrylate+
-Bromodichloromethane
-2-Nitropropane
-2-Chloroethylvinyl ether
-cis-1,3-Dichloropropene
-Dibromomethane
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene
-trans-1,3-Dichloropropene+
-Ethyl Methacrylate
-1,1,2-Trichloroethane+
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane+
-1,2-Dibromoethane+
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes
-o-Xylene+
-Methyl Amyl Ketone
-Bromoform+
-Isopropylbenzene
-Cyclohexanone
-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-1,2,3-Trichloropropane+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene+
-sec-Butylbenzene+
-1,4-Dichlorobenzene-d4+
-Benzyl Chloride
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
-2-Methylnaphthalene
-1-Methylnaphthalene
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Date : 12-NOV-2019 14:29
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Purge Volume: 5.0
Column phase: DB624
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18
Page 4

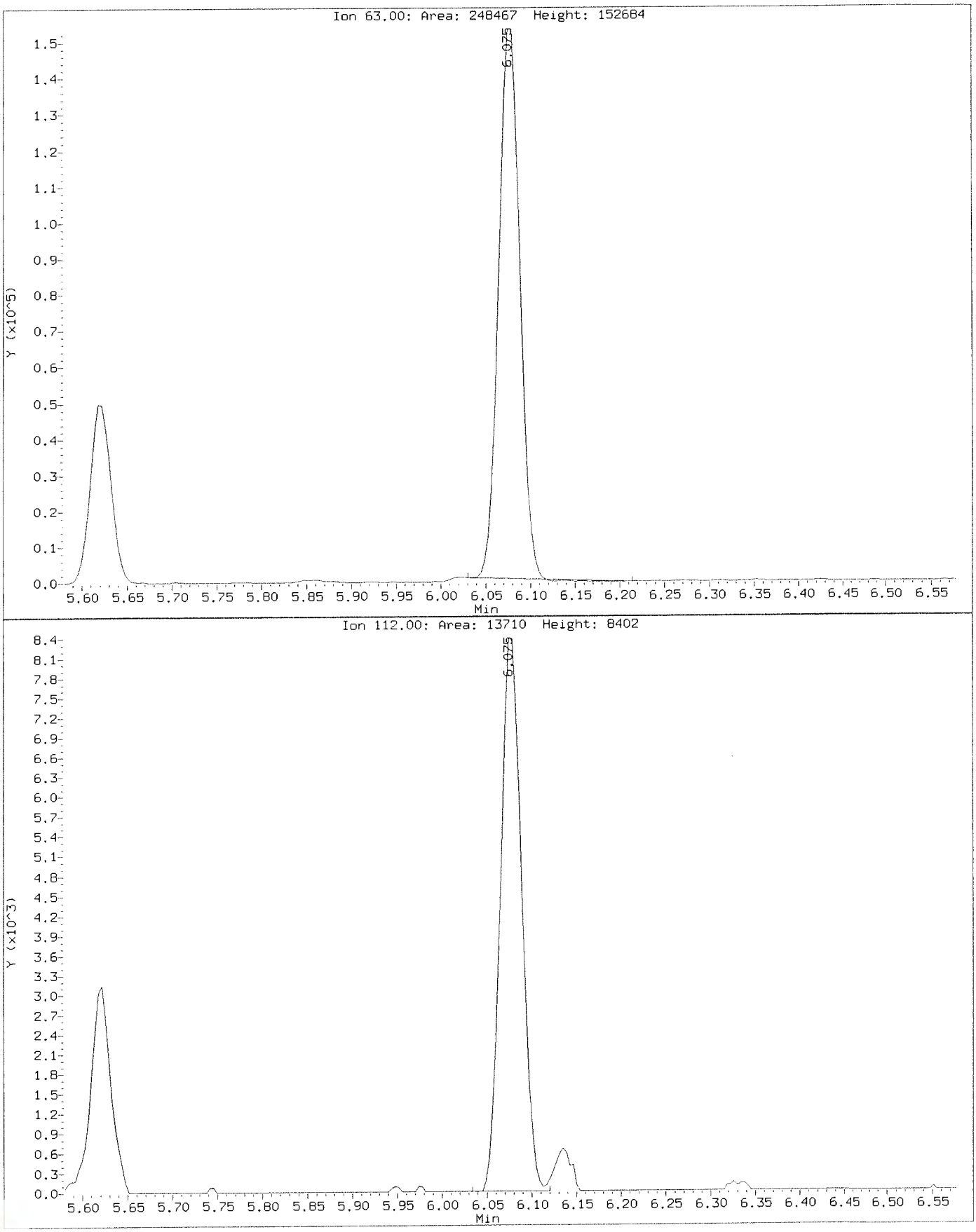
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Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: 1,2-Dichloropropane
CAS Number: 78-87-5



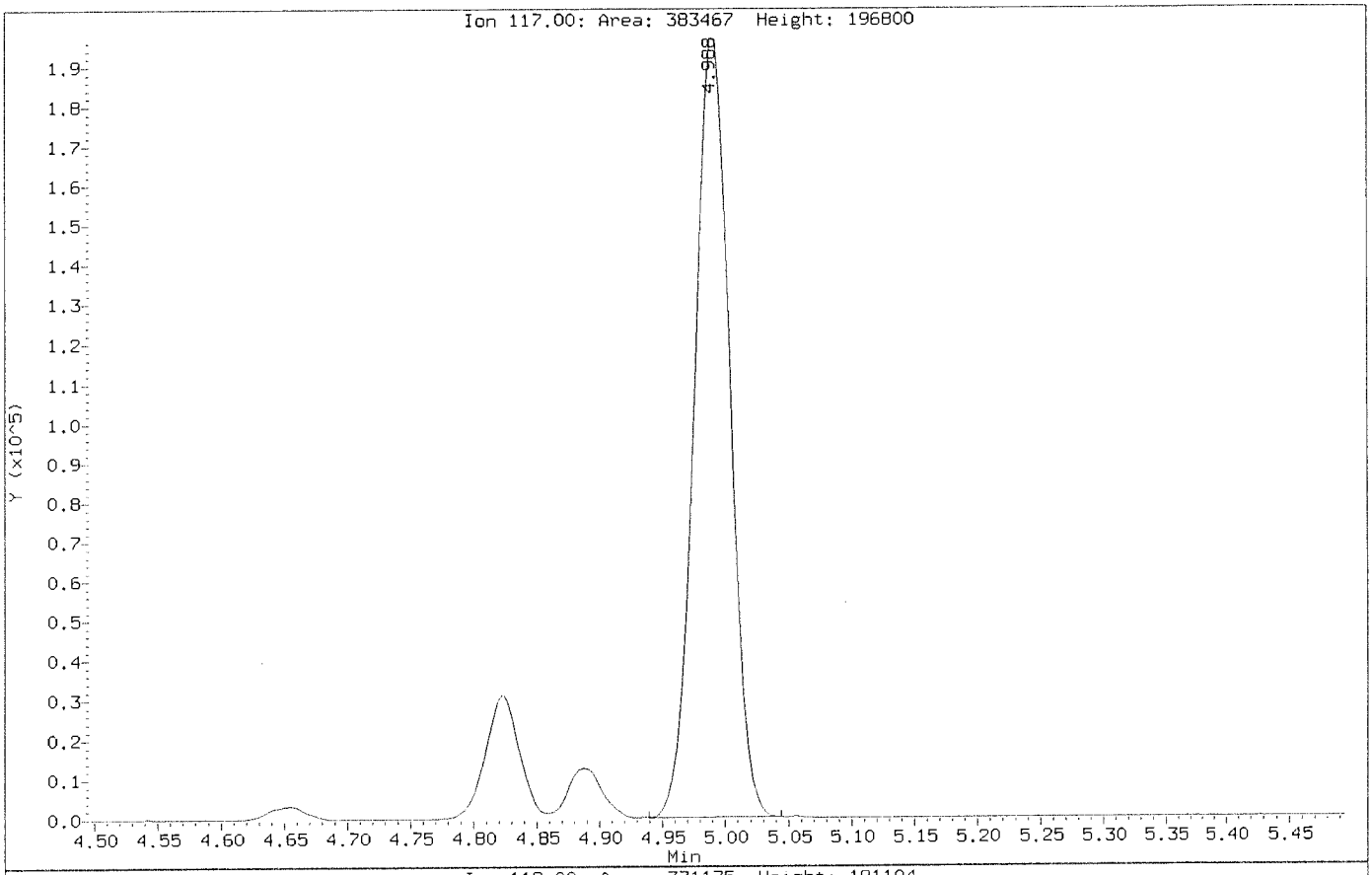
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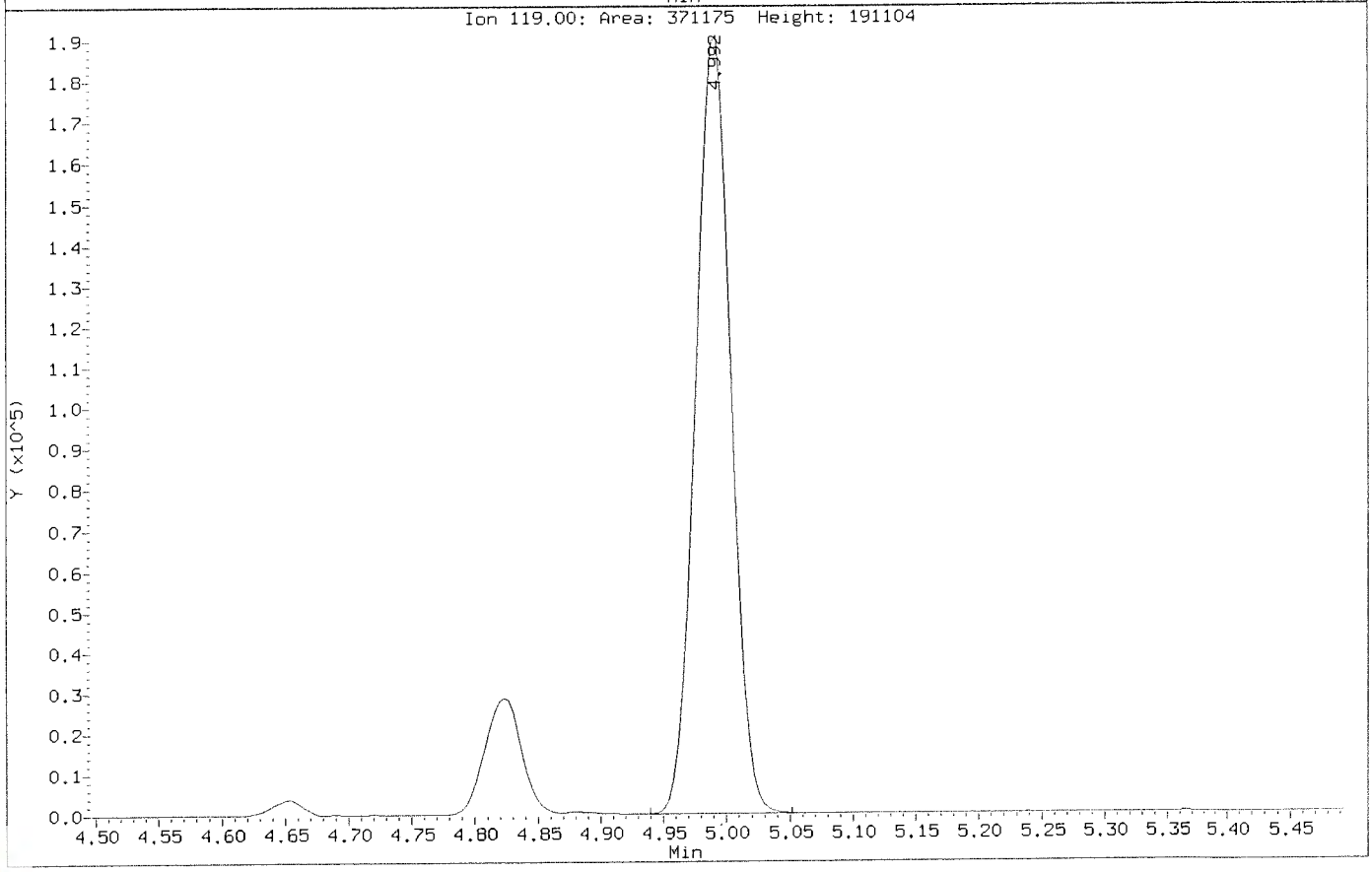
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5



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Instrument: VOA9.i
Client Sample ID: VSTD100

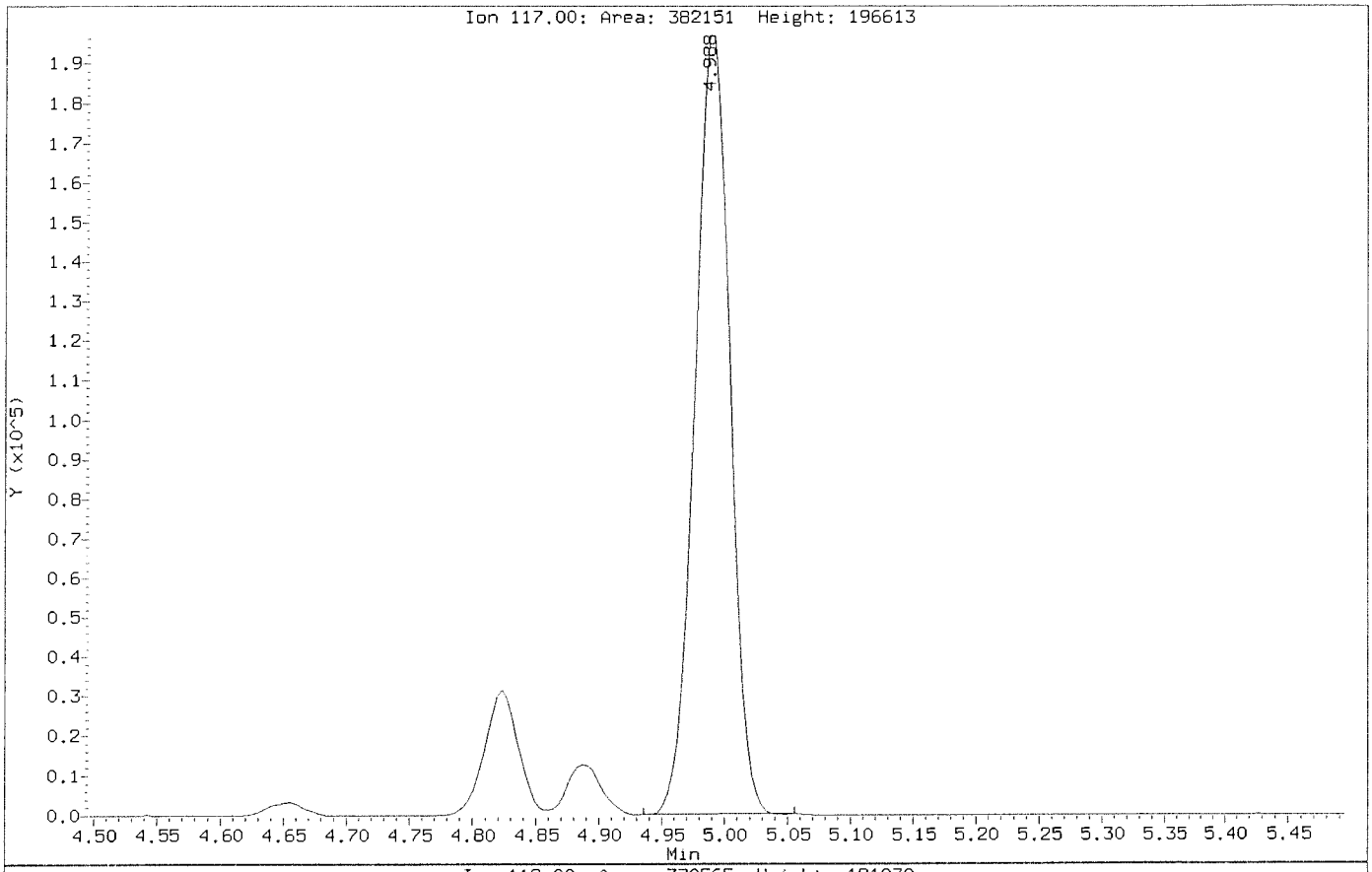
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

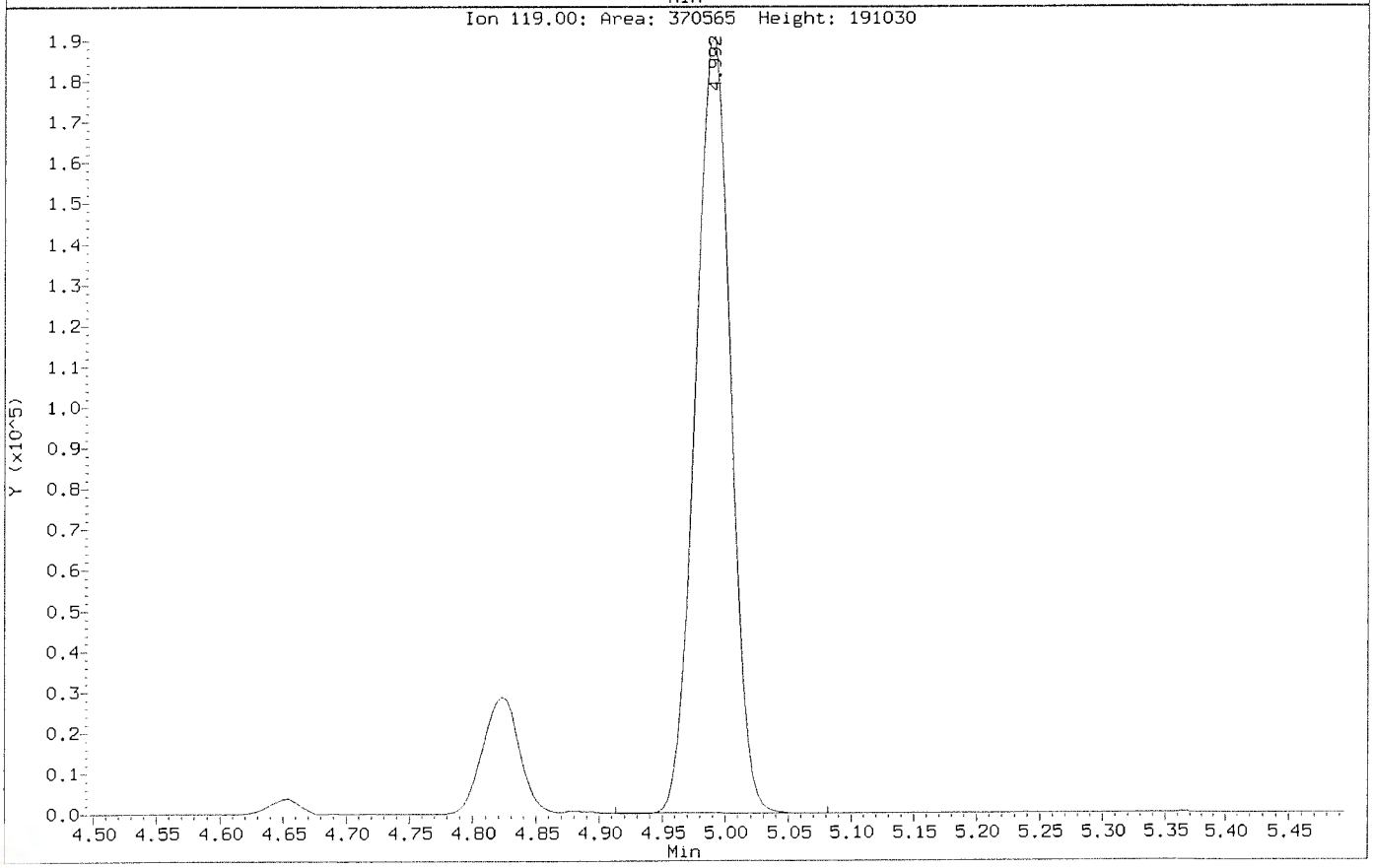




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Injection Date: 12-NOV-2019 14:29
Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111210.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111210.D
Lab Smp Id: VSTD150 Client Smp ID: VSTD150
Inj Date : 12-NOV-2019 14:53
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD150;VSTD150;1;9;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:53 Cal File: U112110.D
Als bottle: 11 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

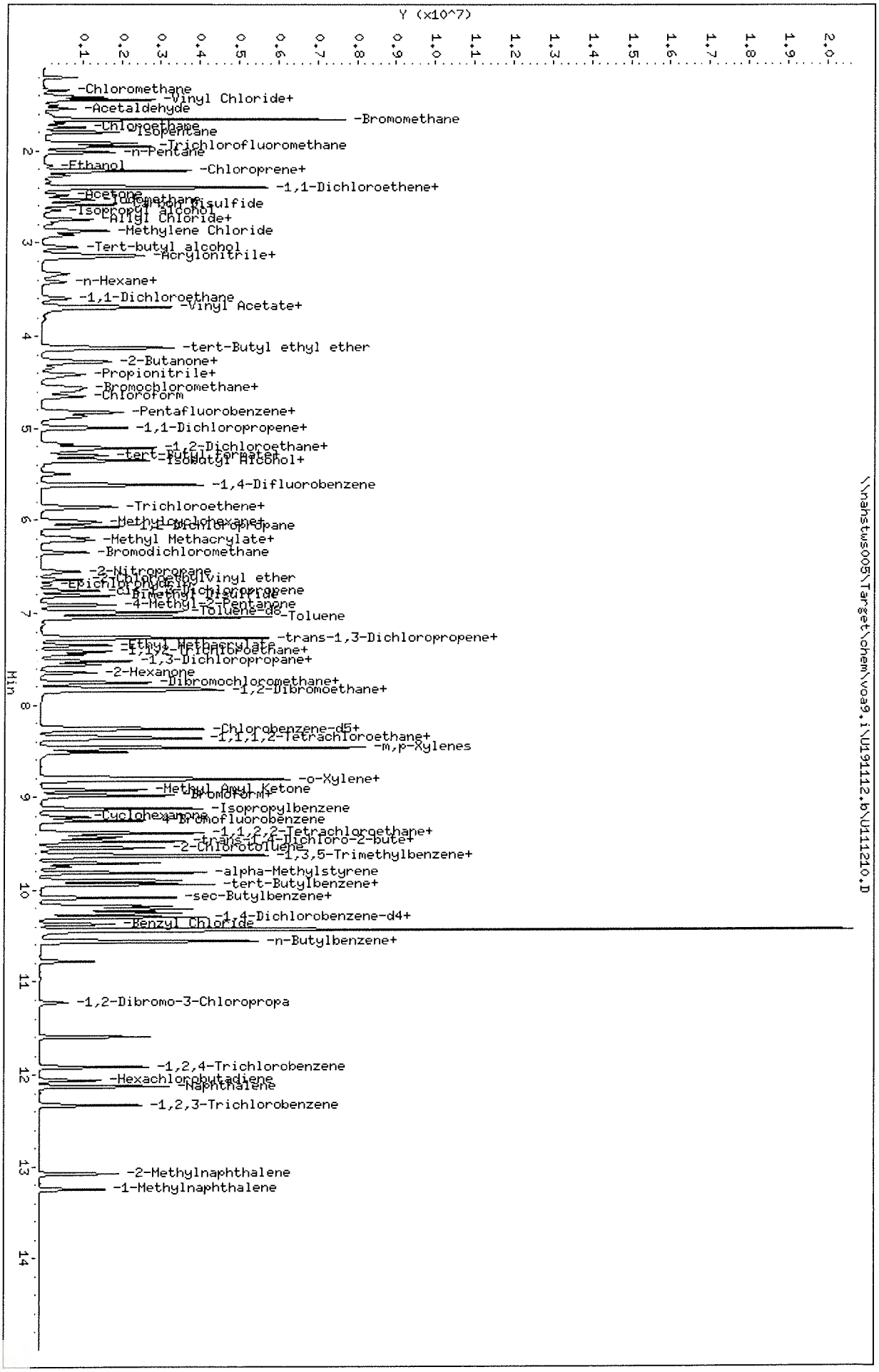
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

		QUANT SIG					AMOUNTS	
	Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.890	4.894	(1.000)	312318	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	591064	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	508377	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	284288	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	476109	150.000	154.51
$	69 4-Bromofluorobenzene	95	9.253	9.253	(1.122)	602187	150.000	151.94
$	30 Dibromofluoromethane	113	4.826	4.826	(0.987)	489495	150.000	150.20
$	48 Toluene-d8	98	6.986	6.989	(0.847)	1922403	150.000	152.05
	60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	563042	150.000	151.15
	31 1,1,1-Trichloroethane	97	4.823	4.826	(0.986)	743329	150.000	159.99
	68 1,1,2,2-Tetrachloroethane	83	9.388	9.388	(0.918)	787815	150.000	156.21
	138 Freon TF	101	2.397	2.397	(0.490)	998632	150.000	143.33
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.899)	401889	150.000	152.15
	22 1,1-Dichloroethane	63	3.600	3.600	(0.736)	648899	150.000	146.40
	11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	1032754	150.000	141.57
	32 1,1-Dichloropropene	75	4.999	5.002	(0.889)	559734	150.000	141.21
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	729086	150.000	163.04
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	790058	150.000	163.56
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	786608	150.000	155.41
	79 1,2,4-Trimethylbenzene	105	9.939	9.939	(0.971)	2079681	150.000	157.72
	89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	149466	150.000	147.70
	57 1,2-Dibromoethane	107	7.848	7.848	(0.951)	629032	150.000	164.42
	88 1,2-Dichlorobenzene	146	10.565	10.569	(1.033)	1365995	150.000	159.51

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.934)	577895	150.000	131.34
42	1,2-Dichloropropane	63	6.078	6.078	(1.081)	401214	150.000	151.50(M)
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.941)	1986758	150.000	160.38
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	1258692	150.000	149.63
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	793707	150.000	150.26
84	1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	1313959	150.000	144.24
26	2,2-Dichloropropane	77	4.271	4.271	(0.874)	597572	150.000	166.83
24	2-Butanone	43	4.335	4.339	(0.887)	338930	300.000	301.33(A)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	1426072	150.000	154.84
52	2-Hexanone	43	7.649	7.649	(0.927)	659222	300.000	296.89(A)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	1820976	150.000	156.79
82	p-Isopropyltoluene	119	10.209	10.209	(0.998)	2052153	150.000	154.85
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	920575	300.000	310.39(A)
10	Acetone	43	2.480	2.483	(0.507)	558030	300.000	297.30(A)
37	Benzene	78	5.216	5.216	(0.928)	1835912	150.000	143.70
74	Bromobenzene	156	9.381	9.381	(0.917)	777921	150.000	151.32
29	Bromochloromethane	128	4.553	4.553	(0.931)	260463	150.000	141.27
39	Bromodichloromethane	83	6.344	6.344	(1.129)	619016	150.000	157.09
66	Bromoform	173	8.980	8.984	(1.089)	516985	150.000	154.05
6	Bromomethane	94	1.655	1.659	(0.338)	2416063	150.000	149.92
19	Carbon Disulfide	76	2.585	2.584	(0.529)	2208091	300.000	318.75(A)
34	Carbon Tetrachloride	117	4.991	4.995	(0.888)	657302	150.000	159.99(M)
59	Chlorobenzene	112	8.271	8.271	(1.003)	1550733	150.000	150.63
7	Chloroethane	64	1.741	1.741	(0.356)	642369	150.000	149.95
28	Chloroform	83	4.654	4.654	(0.952)	799796	150.000	151.48
3	Chloromethane	50	1.340	1.340	(0.274)	396602	150.000	144.69
27	cis-1,2-Dichloroethene	96	4.283	4.283	(0.876)	516477	150.000	145.18
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.202)	707974	150.000	164.53
55	Dibromochloromethane	129	7.754	7.758	(0.940)	614850	150.000	152.21
44	Dibromomethane	93	6.187	6.187	(1.101)	336119	150.000	140.33
2	Dichlorodifluoromethane	85	1.205	1.205	(0.247)	477888	150.000	150.45
61	Ethylbenzene	106	8.369	8.369	(1.015)	806599	150.000	157.15
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	241383	150.000	140.92
67	Isopropylbenzene	105	9.122	9.126	(1.106)	2366152	150.000	162.57
62	m,p-Xylenes	106	8.470	8.470	(1.027)	2132020	300.000	339.45(A)
17	Methylene Chloride	84	2.866	2.869	(0.586)	438580	150.000	148.85
87	n-Butylbenzene	91	10.554	10.554	(1.032)	1776457	150.000	160.08
73	n-Propylbenzene	91	9.475	9.475	(0.926)	2567960	150.000	154.52
92	Naphthalene	128	12.129	12.129	(1.185)	2280838	150.000	169.59
63	o-Xylene	106	8.807	8.807	(1.068)	1051971	150.000	165.29
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	2154156	150.000	154.72
64	Styrene	104	8.822	8.822	(1.070)	1918737	150.000	173.38
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	1668815	150.000	158.60
56	Tetrachloroethene	166	7.522	7.522	(0.912)	598635	150.000	155.34
50	Toluene	91	7.045	7.045	(0.854)	2481749	150.000	161.78
20	trans-1,2-Dichloroethene	96	3.139	3.139	(0.642)	467765	150.000	150.27
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	757873	150.000	154.09
38	Trichloroethene	130	5.857	5.861	(1.042)	536044	150.000	136.97
8	Trichlorofluoromethane	101	1.947	1.951	(0.398)	1863654	150.000	139.06
5	Vinyl Chloride	62	1.419	1.419	(0.290)	912225	150.000	131.33

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

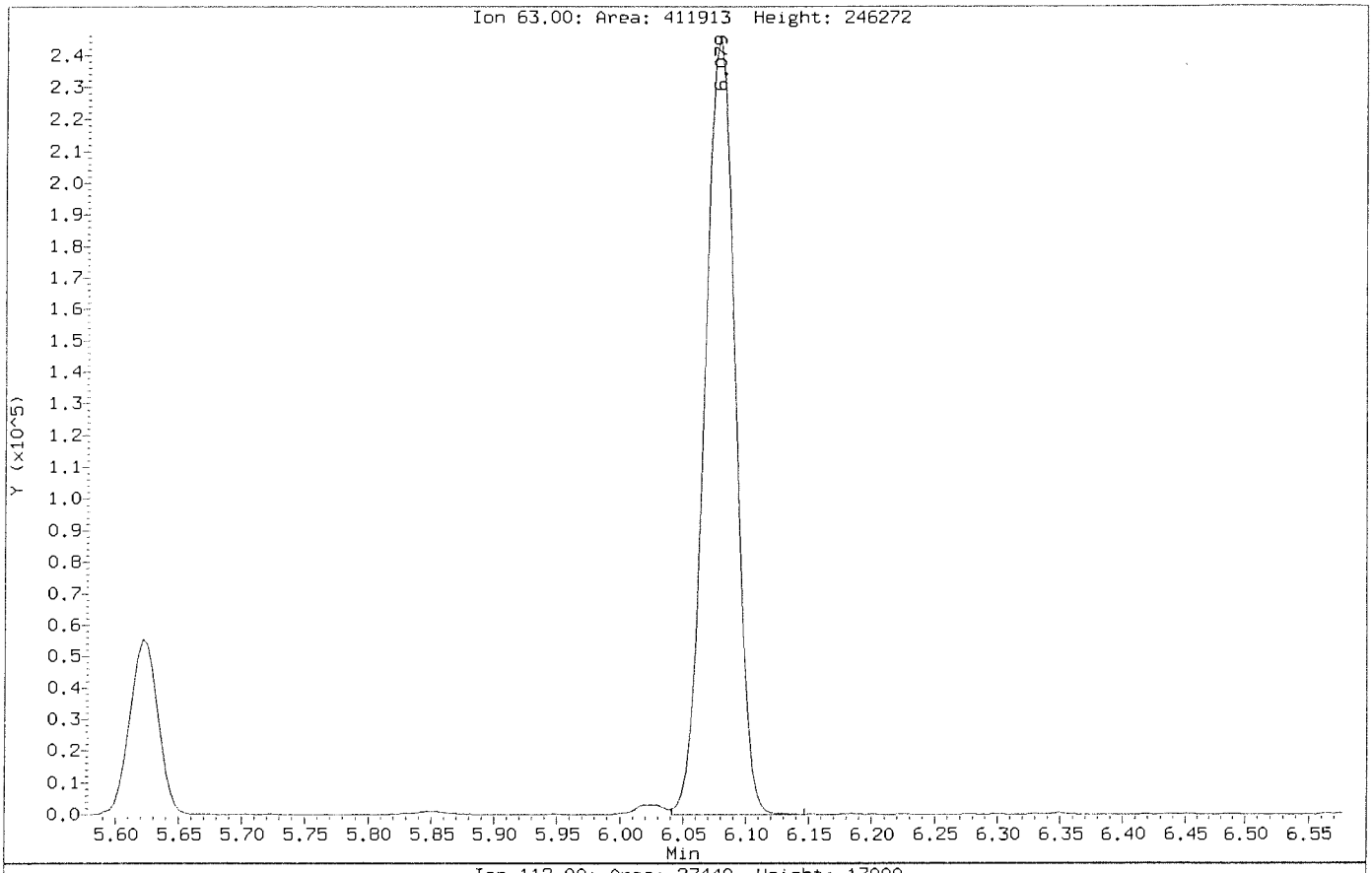


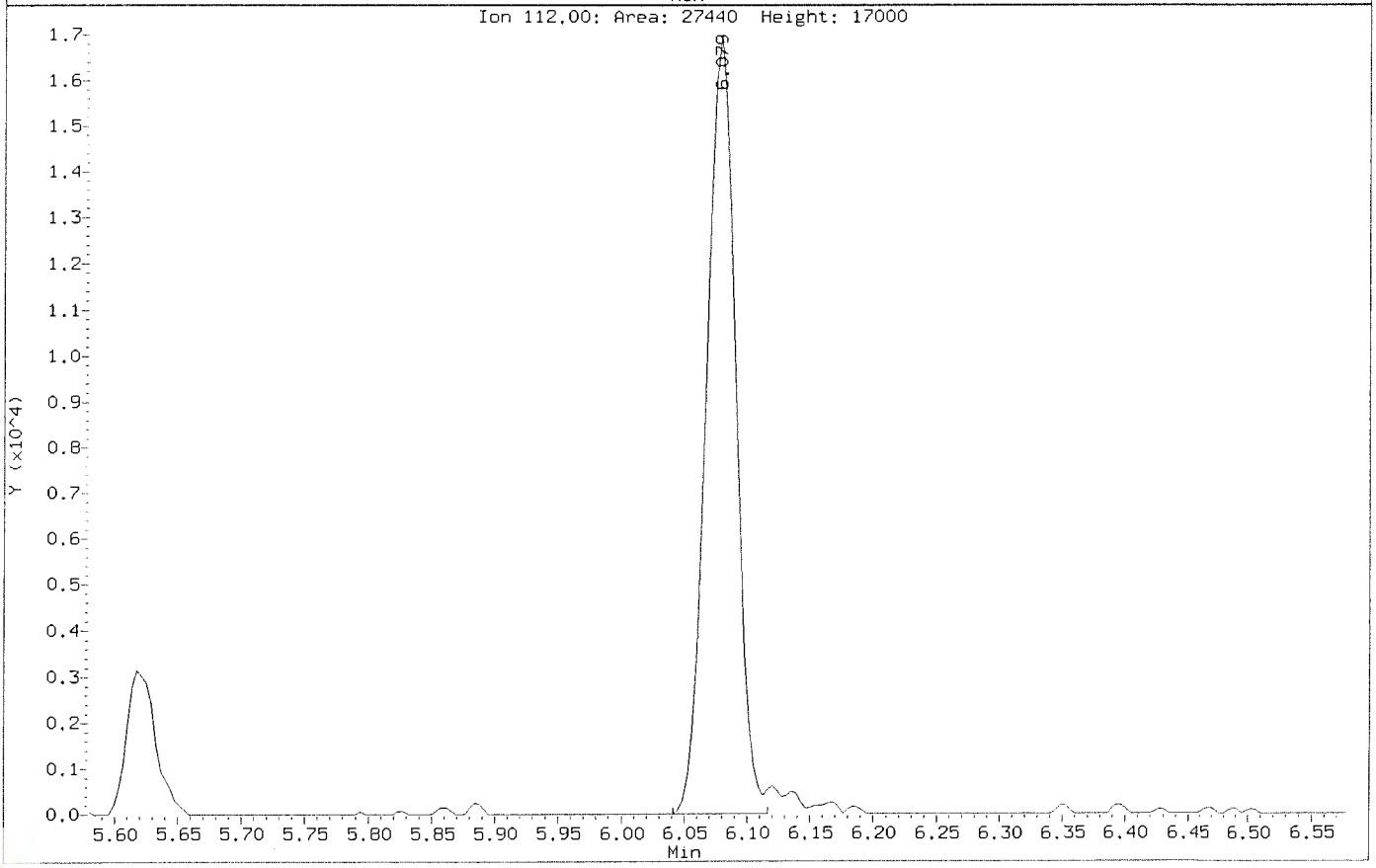
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Date : 12-NOV-2019 14:53
Client ID: VSTD150
Sample Info: VSTD150;VSTD150;1;9;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111210.D
Injection Date: 12-NOV-2019 14:53
Instrument: VOA9.i
Client Sample ID: VSTD150

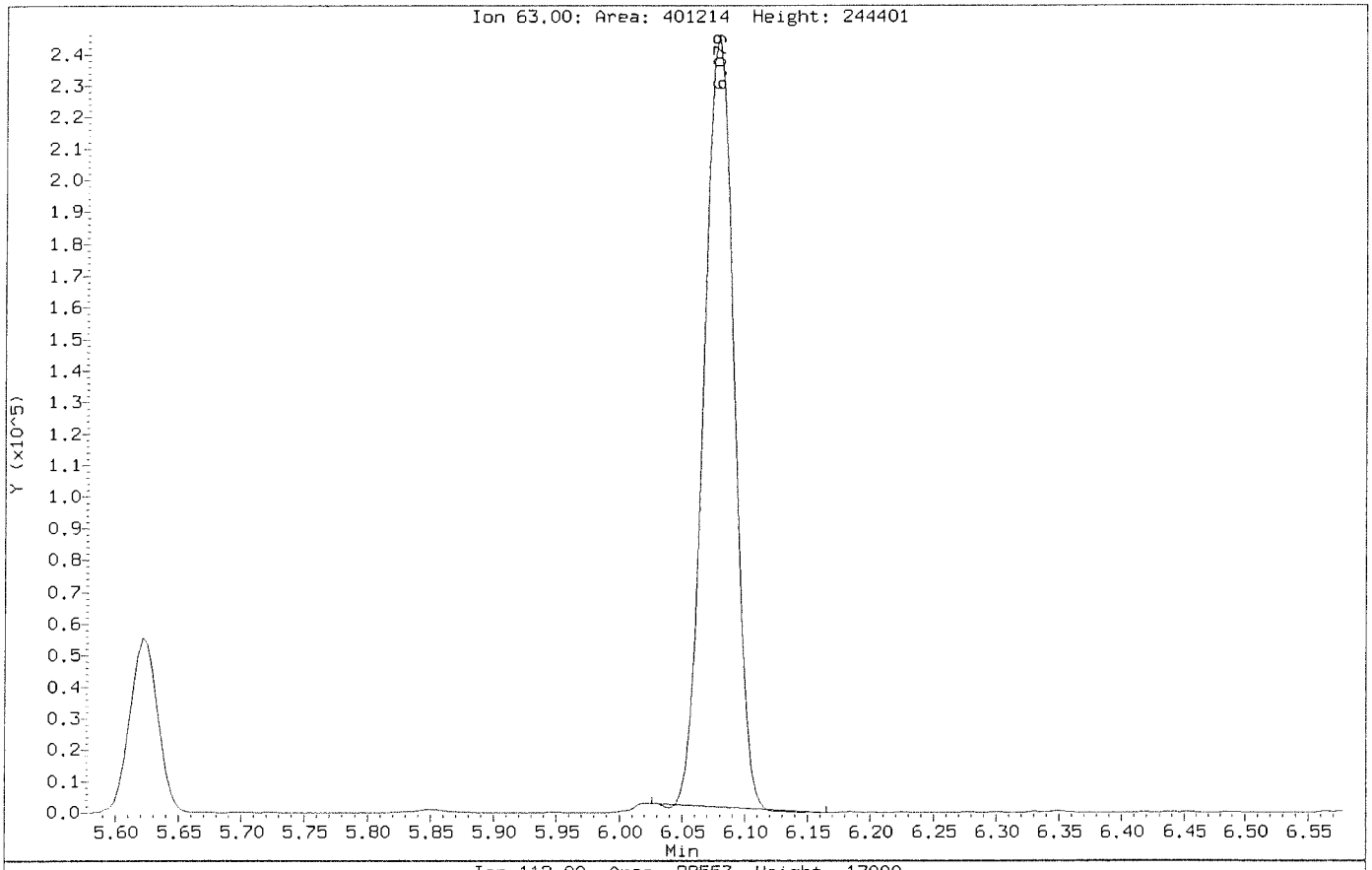
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

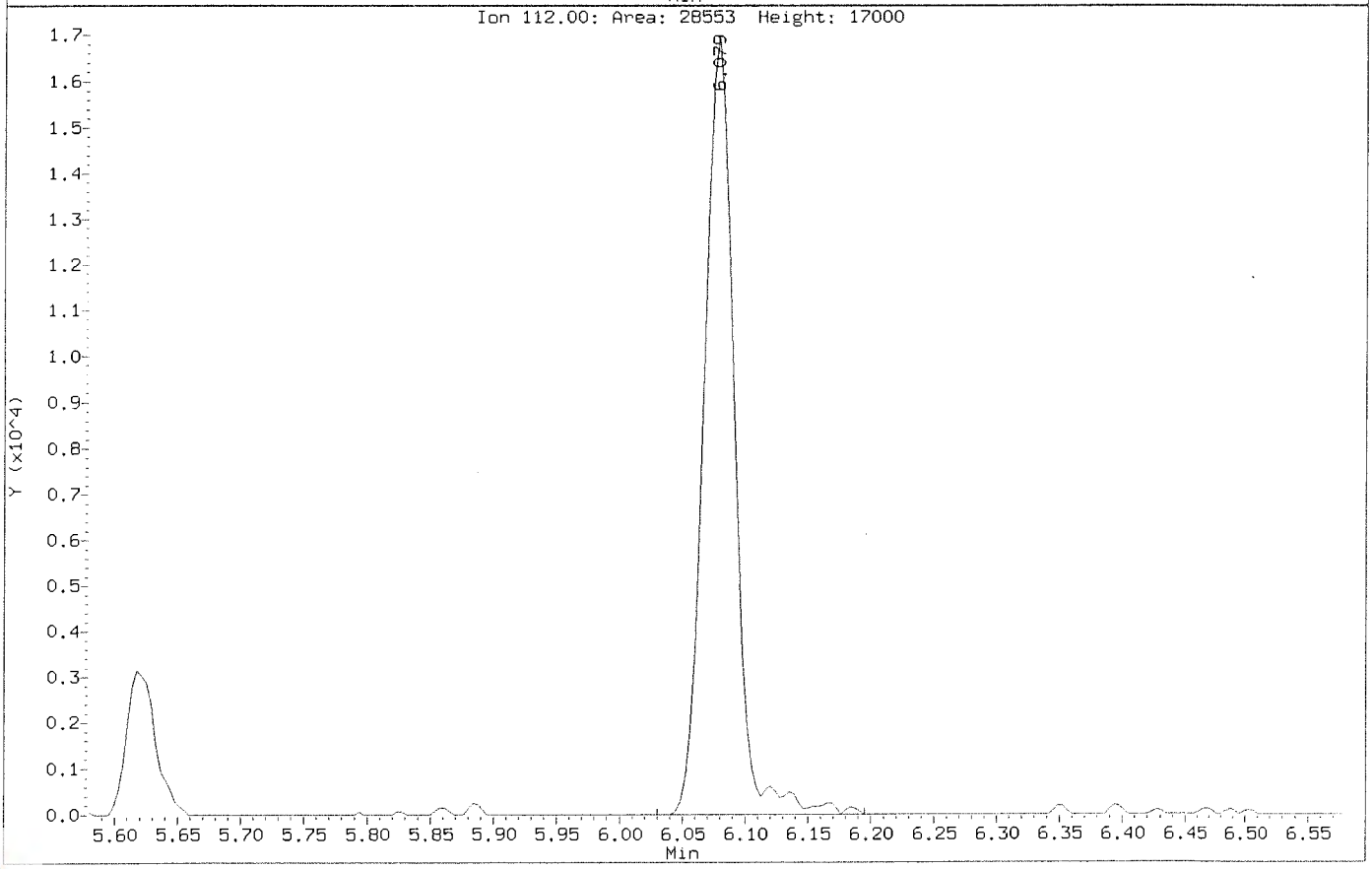




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Instrument: VOA9.i
Client Sample ID: VSTD150

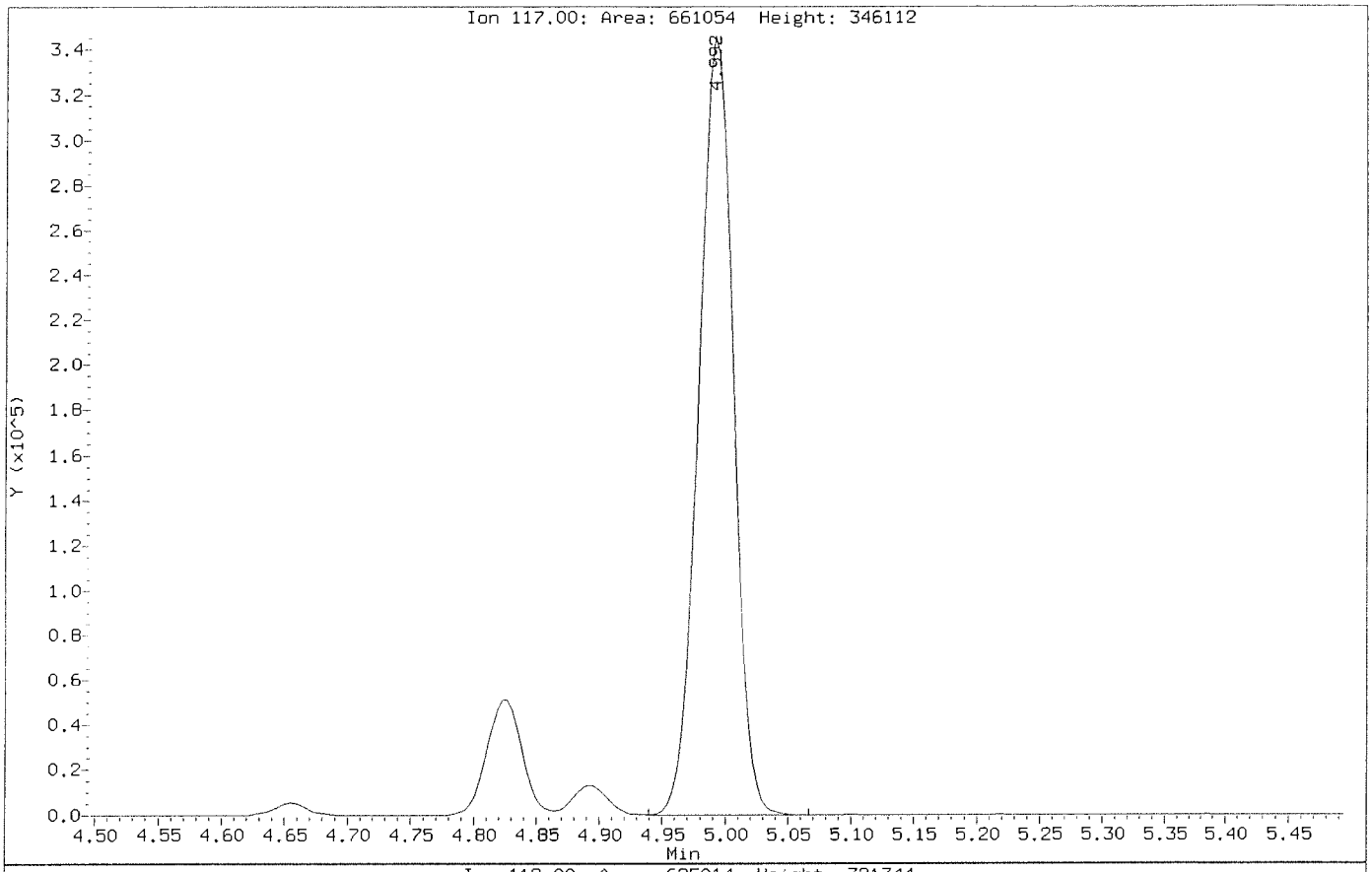
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

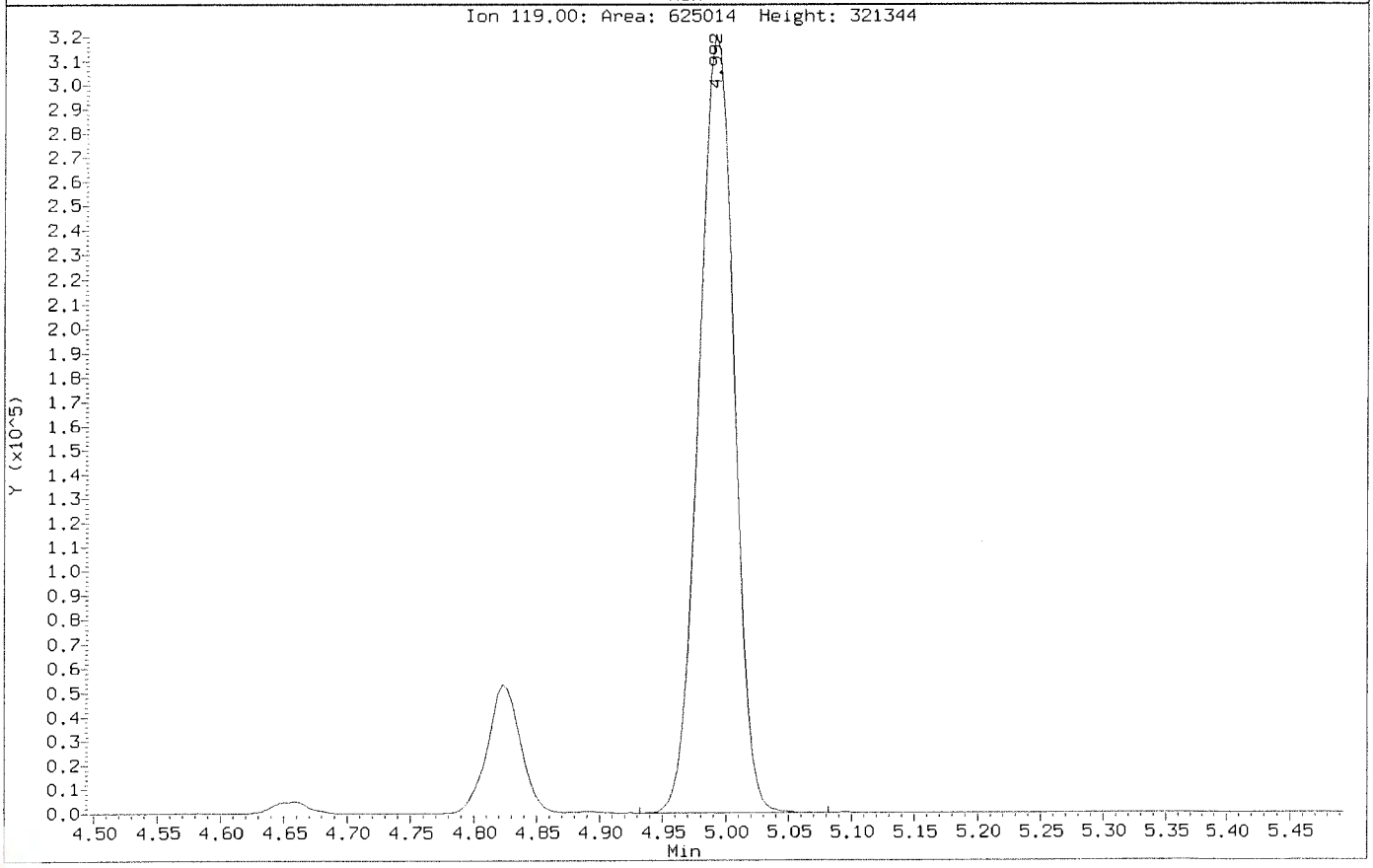




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Instrument: VOA9.i
Client Sample ID: VSTD150

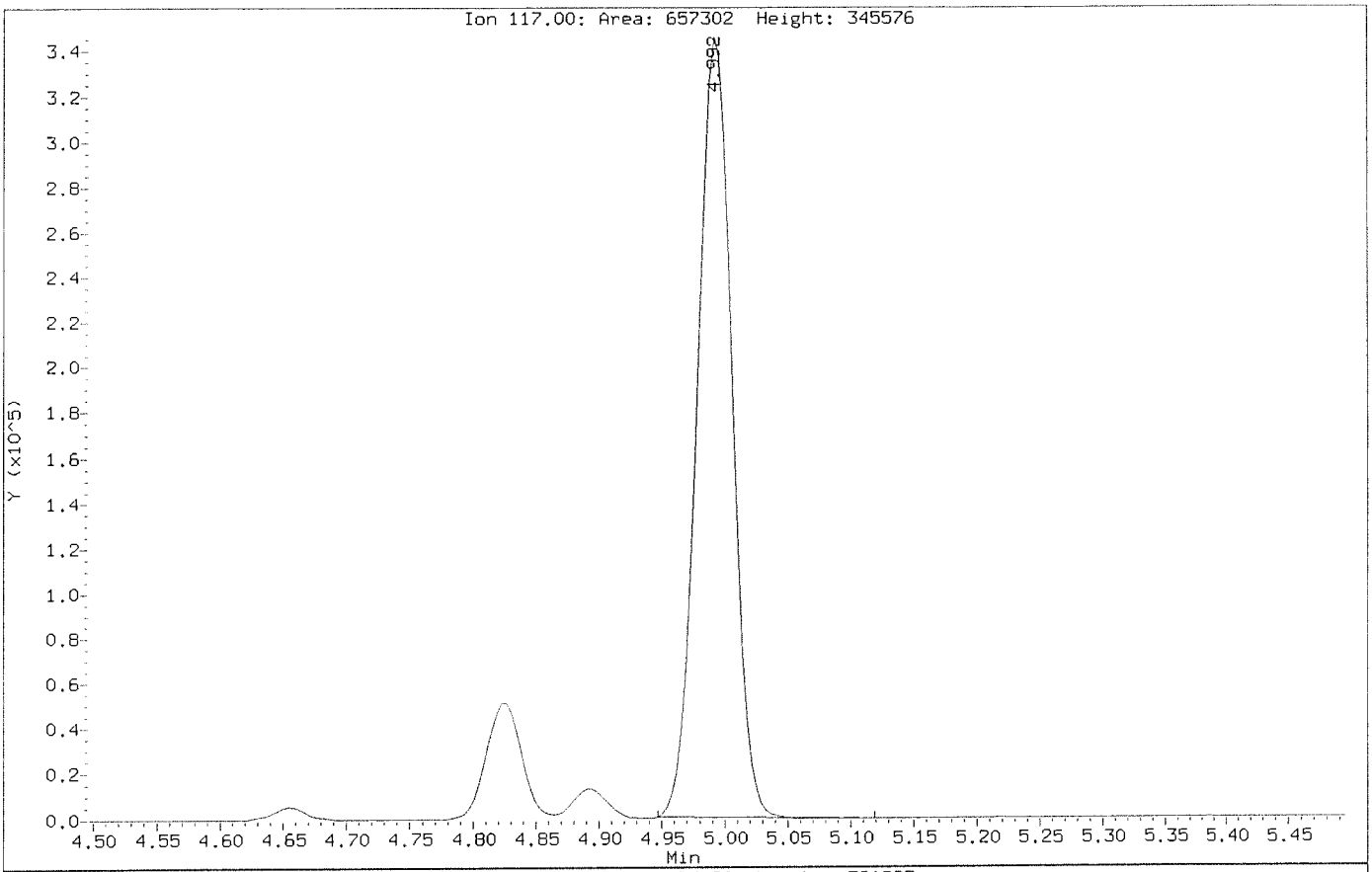
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

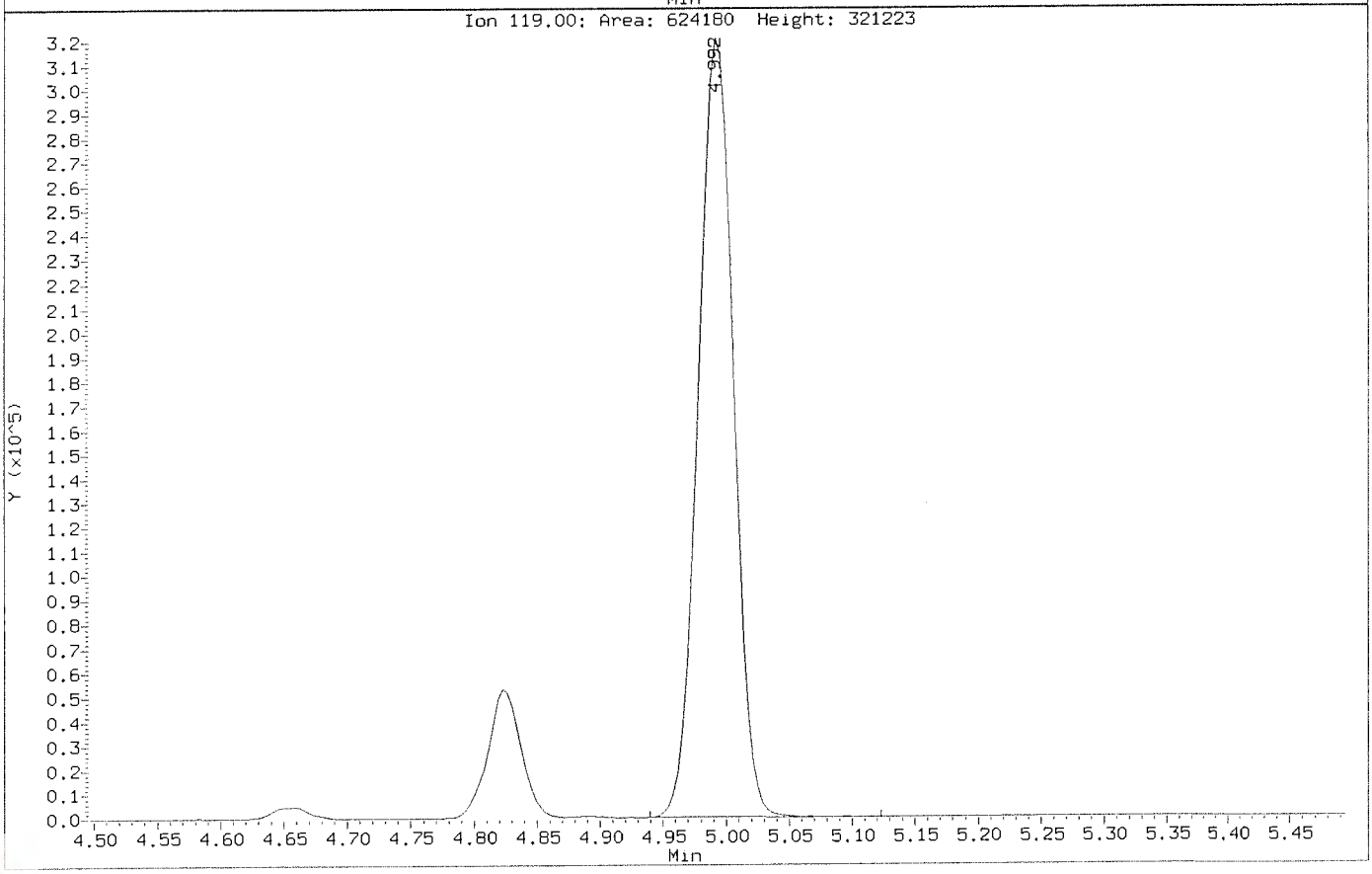




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Injection Date: 12-NOV-2019 14:53
Instrument: VOA9.i
Client Sample ID: VSTD150

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111211.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111211.D
Lab Smp Id: VSTD200 Client Smp ID: VSTD200
Inj Date : 12-NOV-2019 15:17
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD200;VSTD200;1;10;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 15:17 Cal File: U112111.D
Als bottle: 12 Calibration Sample, Level: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

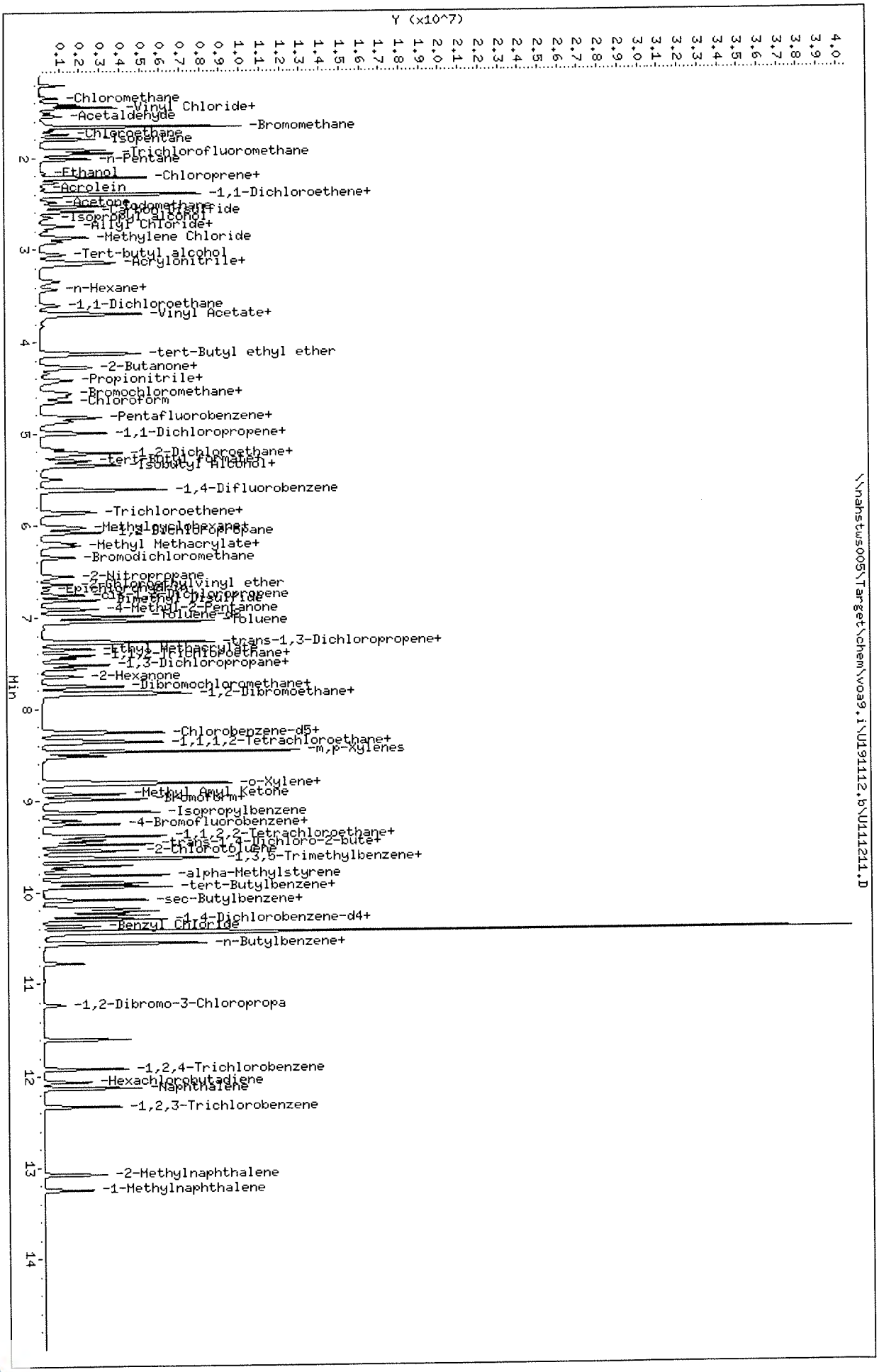
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.894	4.894	(1.000)	334619	50.0000	
*	36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	677271	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	558479	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	309917	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	653758	200.000	198.29
$	69 4-Bromofluorobenzene	95	9.253	9.253	(1.122)	874895	200.000	200.73(A)
$	30 Dibromofluoromethane	113	4.826	4.826	(0.986)	711540	200.000	196.44
$	48 Toluene-d8	98	6.989	6.989	(0.847)	2782744	200.000	200.31(A)
	60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	826765	200.000	201.45(A)
	31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	1092276	200.000	219.43(A)
	68 1,1,2,2-Tetrachloroethane	83	9.388	9.388	(0.918)	1145484	200.000	208.35(A)
	138 Freon TF	101	2.397	2.397	(0.490)	1421216	200.000	190.38
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.899)	574439	200.000	197.97
	22 1,1-Dichloroethane	63	3.600	3.600	(0.736)	913824	200.000	192.43
	11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	1473218	200.000	188.49
	32 1,1-Dichloropropene	75	5.002	5.002	(0.889)	814337	200.000	179.29
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	1090083	200.000	223.61(A)
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	1135197	200.000	215.58(A)
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	1165422	200.000	211.21(A)
	79 1,2,4-Trimethylbenzene	105	9.939	9.939	(0.971)	3024621	200.000	210.42(A)
	89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	223916	200.000	202.38(A)
	57 1,2-Dibromoethane	107	7.848	7.848	(0.951)	967680	200.000	230.25(A)
	88 1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	1999573	200.000	214.18(A)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111211.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.933)	823258	200.000	163.29
42	1,2-Dichloropropane	63	6.078	6.078	(1.081)	597030	200.000	197.22(M)
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.941)	2994446	200.000	221.74(A)
83	1,3-Dichlorobenzene	146	10.179	10.179	(0.995)	1824355	200.000	198.95
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	1146723	200.000	197.61
84	1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	1926041	200.000	193.95
26	2,2-Dichloropropane	77	4.271	4.271	(0.873)	848917	200.000	221.21(A)
24	2-Butanone	43	4.339	4.339	(0.887)	478432	400.000	397.56(A)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	2076951	200.000	206.86(A)
52	2-Hexanone	43	7.649	7.649	(0.927)	961525	400.000	394.19(A)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	2700197	200.000	213.27(A)
82	p-Isopropyltoluene	119	10.209	10.209	(0.998)	3019027	200.000	208.98(A)
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	1358044	400.000	416.82(A)
10	Acetone	43	2.483	2.483	(0.507)	787633	400.000	395.27(A)
37	Benzene	78	5.216	5.216	(0.927)	2659337	200.000	181.66
74	Bromobenzene	156	9.381	9.381	(0.917)	1119880	200.000	199.82
29	Bromochloromethane	128	4.553	4.553	(0.930)	376553	200.000	190.62
39	Bromodichloromethane	83	6.344	6.344	(1.128)	879452	200.000	194.78
66	Bromoform	173	8.984	8.984	(1.089)	787561	200.000	198.10
6	Bromomethane	94	1.659	1.659	(0.339)	3452678	200.000	129.59
19	Carbon Disulfide	76	2.584	2.584	(0.528)	3238986	400.000	436.41(A)
34	Carbon Tetrachloride	117	4.995	4.995	(0.888)	966070	200.000	205.21(AM)
59	Chlorobenzene	112	8.271	8.271	(1.003)	2284557	200.000	202.00(A)
7	Chloroethane	64	1.741	1.741	(0.356)	907418	200.000	198.26
28	Chloroform	83	4.654	4.654	(0.951)	1141910	200.000	201.86(A)
3	Chloromethane	50	1.340	1.340	(0.274)	595821	200.000	203.37(A)
27	cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	755344	200.000	198.17
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	1037887	200.000	210.51(A)
55	Dibromochloromethane	129	7.758	7.758	(0.940)	900839	200.000	202.16(A)
44	Dibromomethane	93	6.187	6.187	(1.100)	487374	200.000	177.58
2	Dichlorodifluoromethane	85	1.205	1.205	(0.246)	683277	200.000	200.78(A)
61	Ethylbenzene	106	8.369	8.369	(1.015)	1180757	200.000	209.42(A)
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	370021	200.000	198.16
67	Isopropylbenzene	105	9.126	9.126	(1.106)	3444634	200.000	215.44(A)
62	m,p-Xylenes	106	8.470	8.470	(1.027)	3239304	400.000	469.48(A)
17	Methylene Chloride	84	2.869	2.869	(0.586)	642406	200.000	203.16(A)
87	n-Butylbenzene	91	10.554	10.554	(1.032)	2614564	200.000	216.12(A)
73	n-Propylbenzene	91	9.475	9.475	(0.926)	3727632	200.000	205.76(A)
92	Naphthalene	128	12.129	12.129	(1.185)	3392769	200.000	231.40(A)
63	o-Xylene	106	8.807	8.807	(1.068)	1586689	200.000	226.95(A)
81	sec-Butylbenzene	105	10.086	10.086	(0.986)	3165742	200.000	208.57(A)
64	Styrene	104	8.822	8.822	(1.070)	2832806	200.000	233.01(A)
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	2418087	200.000	210.81(A)
56	Tetrachloroethene	166	7.522	7.522	(0.912)	849071	200.000	200.56(A)
50	Toluene	91	7.045	7.045	(0.854)	3661108	200.000	217.25(A)
20	trans-1,2-Dichloroethene	96	3.139	3.139	(0.642)	682070	200.000	203.84(A)
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	1110034	200.000	196.76
38	Trichloroethene	130	5.861	5.861	(1.042)	778879	200.000	173.69
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	2609513	200.000	181.74
5	Vinyl Chloride	62	1.419	1.419	(0.290)	1236500	200.000	166.16

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

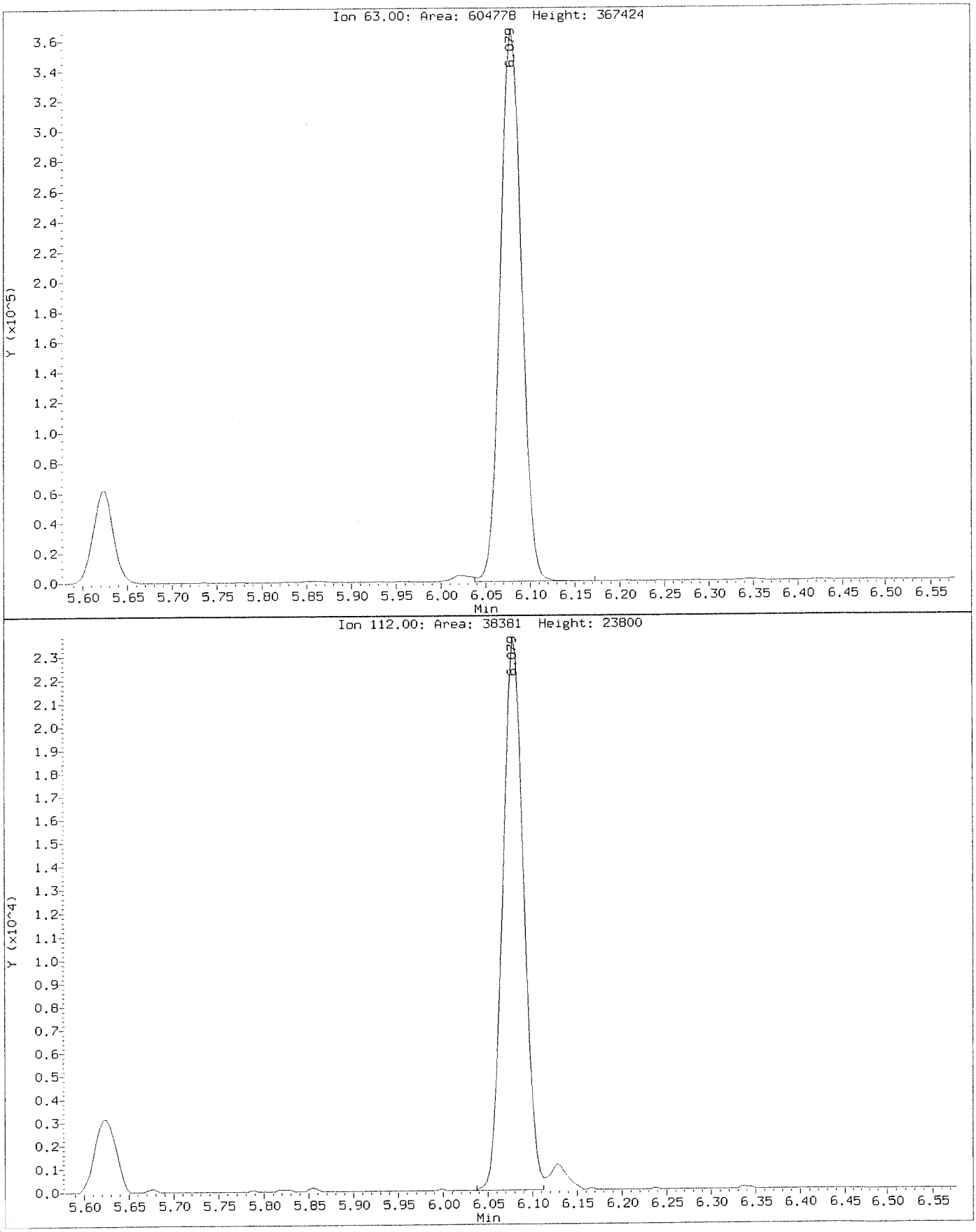


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Date : 12-NOV-2019 15:17
Client ID: VSTD200
Sample Info: VSTD200;VSTD200;1;10;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

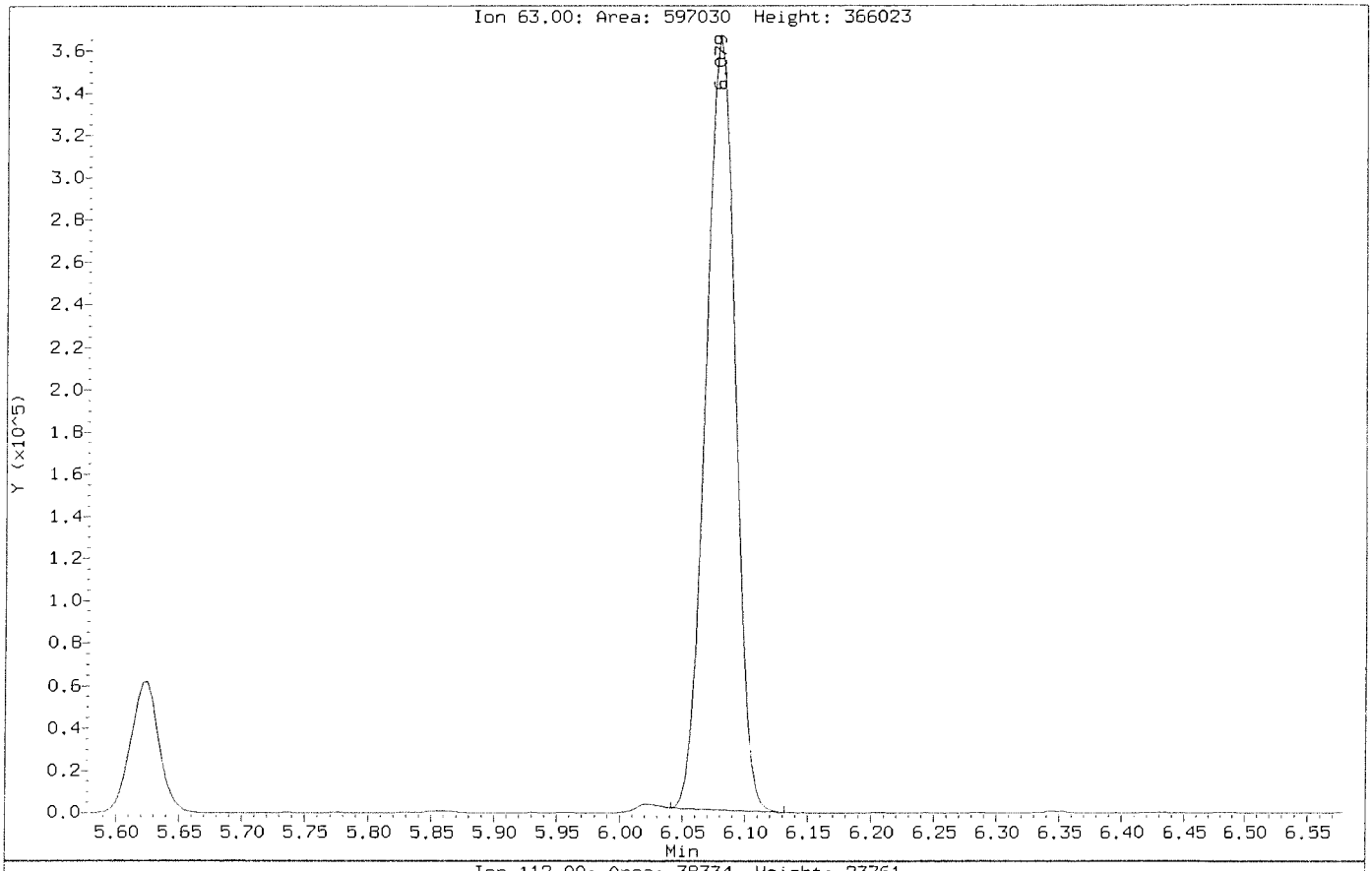
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Client Sample ID: VSTD200

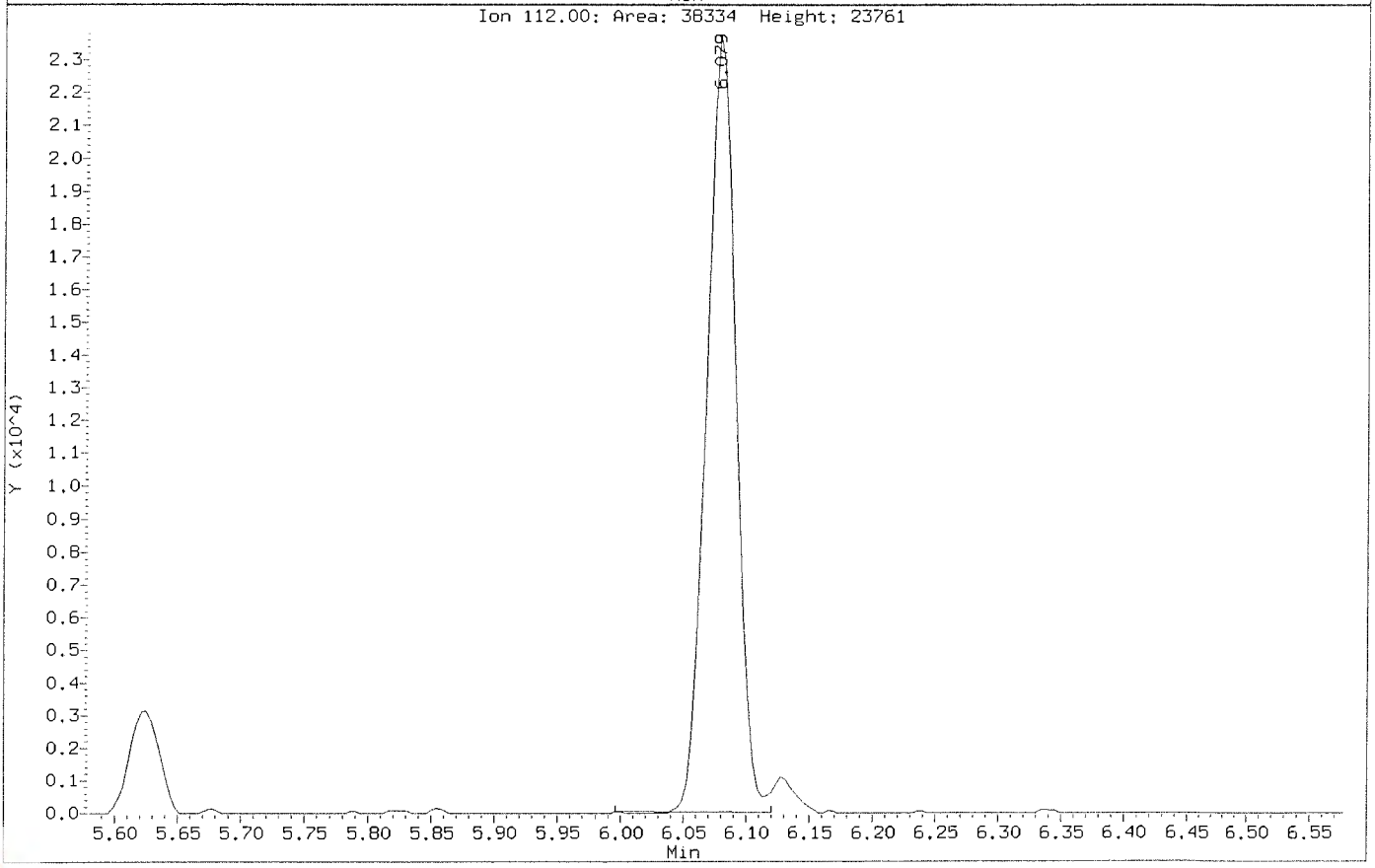
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5



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Instrument: VOA9.i
Client Sample ID: VSTD200

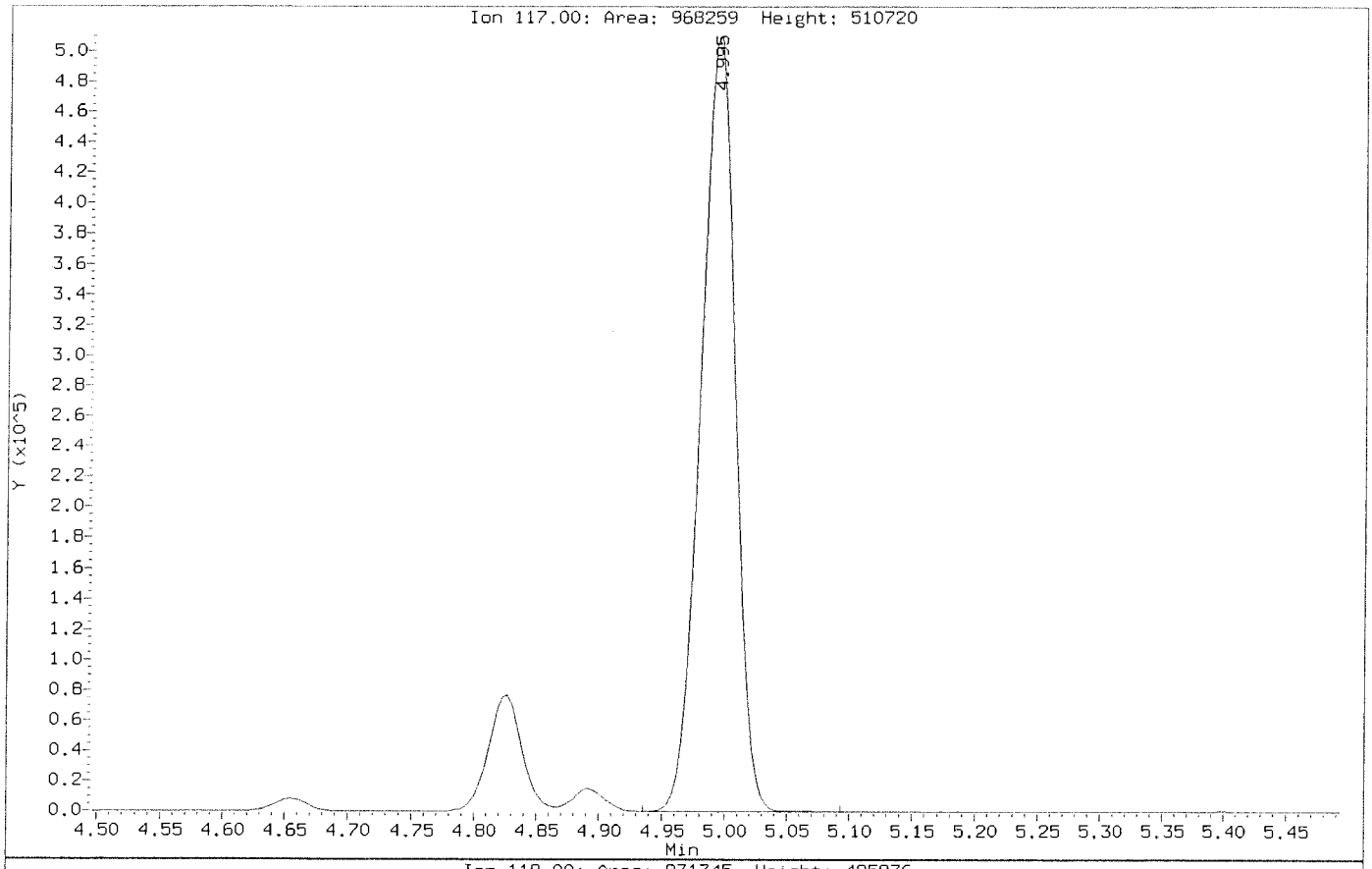
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

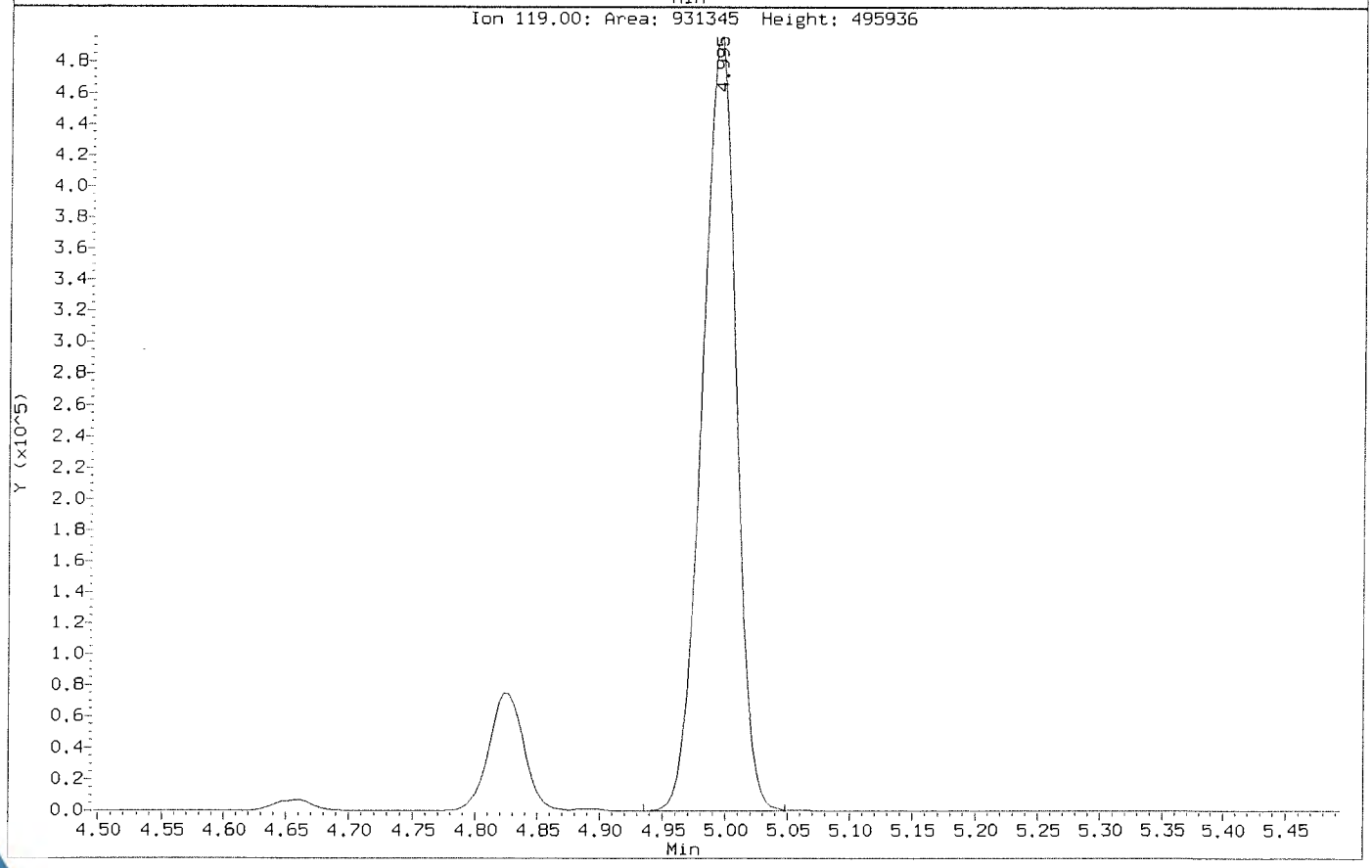




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Injection Date: 12-NOV-2019 15:17
Instrument: VOA9.i
Client Sample ID: VSTD200

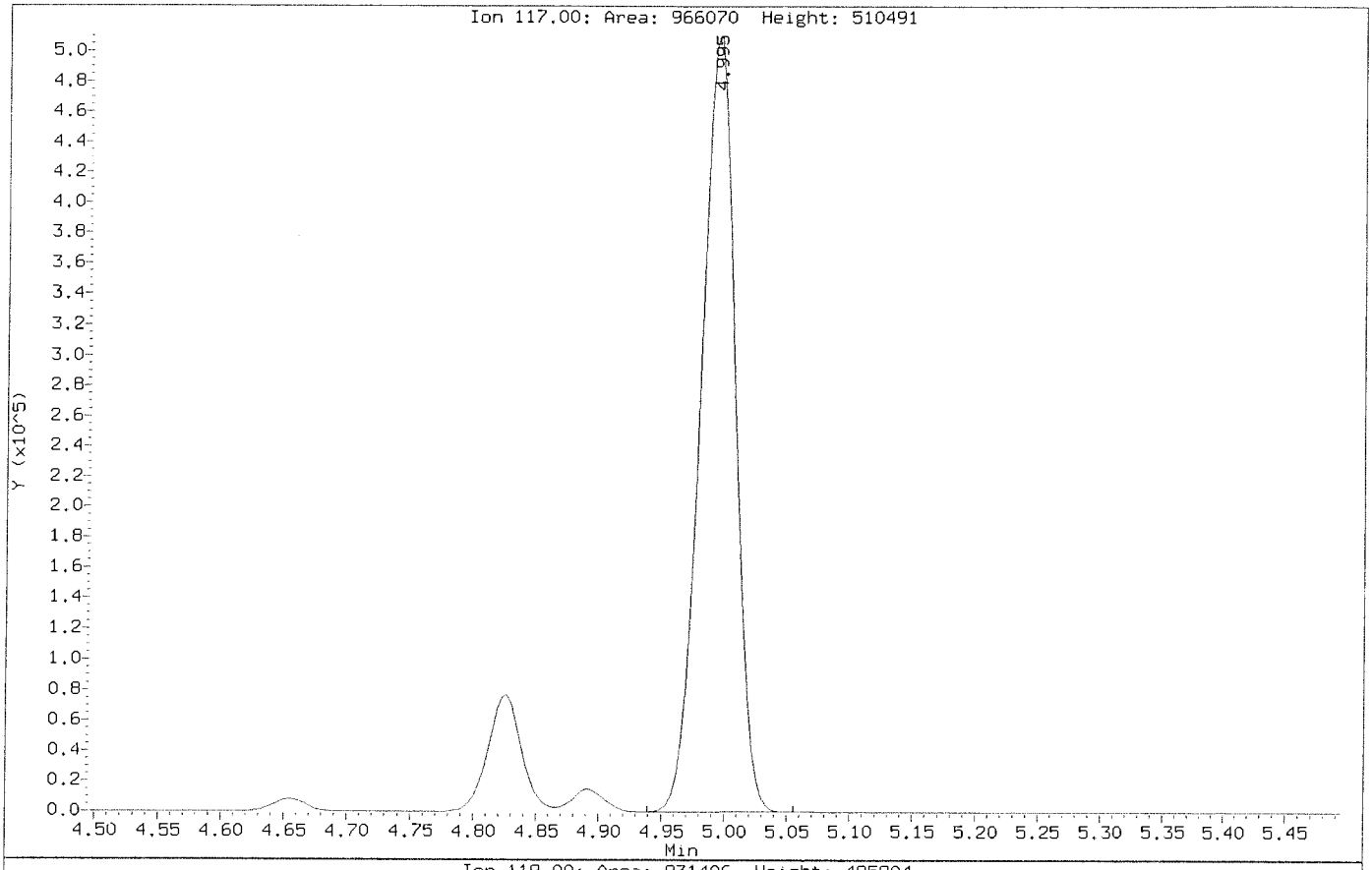
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

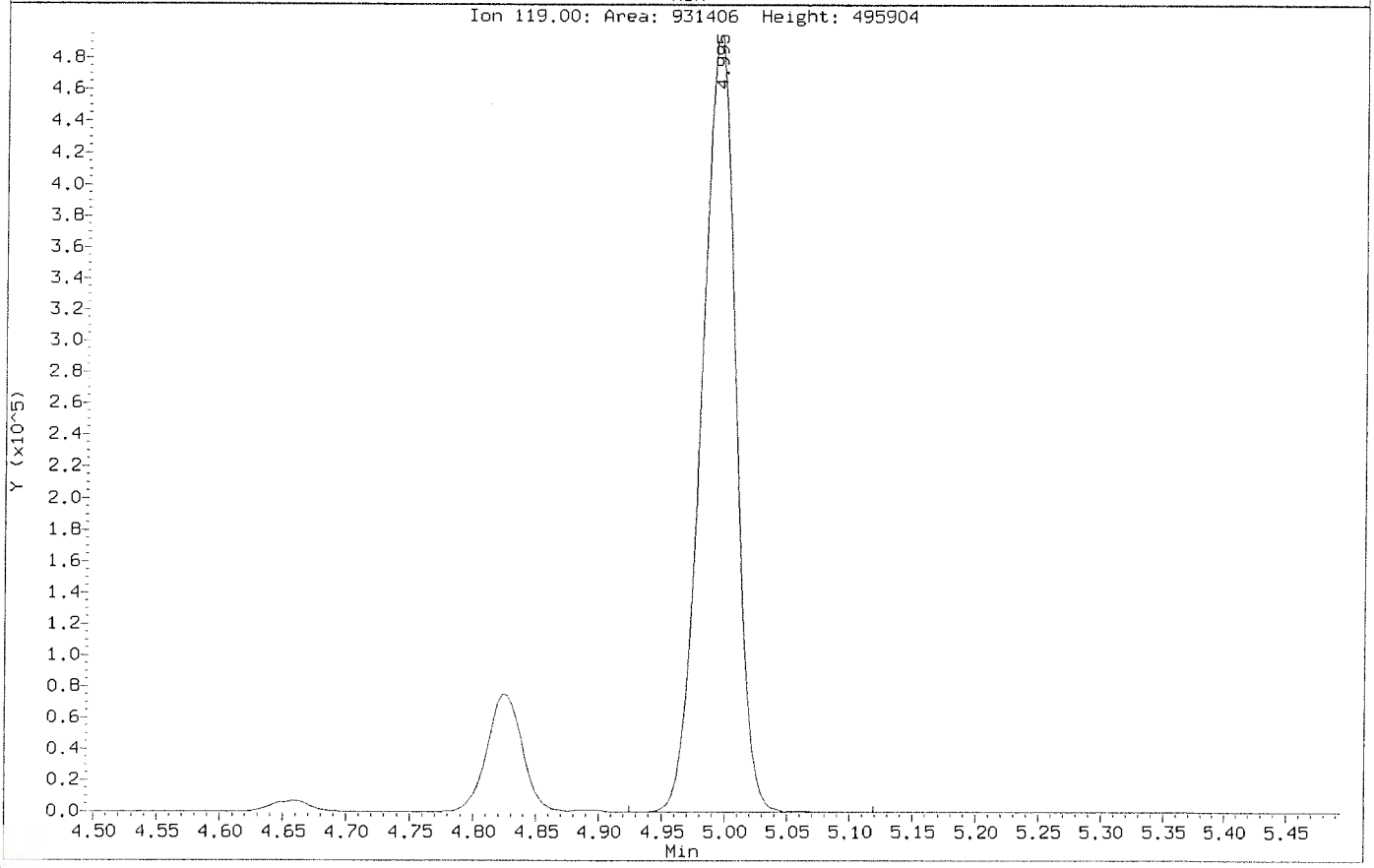




Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111211.D
Injection Date: 12-NOV-2019 15:17
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111214.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111214.D
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 12-NOV-2019 16:30
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;ICV
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 15:17 Cal File: U111211.D
Als bottle: 15 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

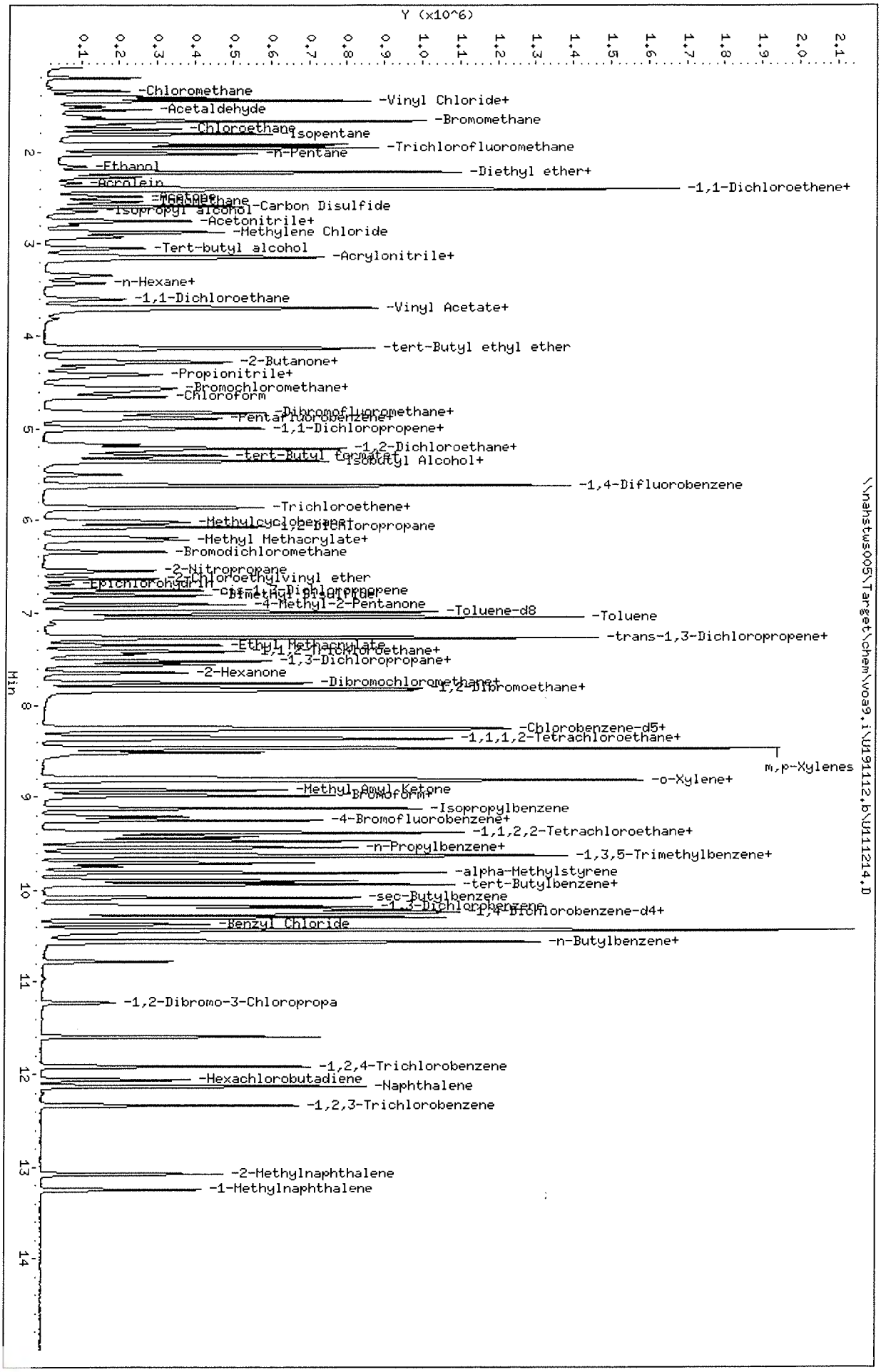
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	290824	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	490400	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	450077	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	244843	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	146385	50.3813	50.38
$ 69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	170506	49.0405	49.04
$ 30 Dibromofluoromethane	113	4.827	4.826	(0.986)	151033	52.5772	52.57
$ 48 Toluene-d8	98	6.986	6.989	(0.847)	554888	49.6631	49.66
60 1,1,1,2-Tetrachloroethane	131	8.347	8.346	(1.012)	155102	48.2276	48.22
31 1,1,1-Trichloroethane	97	4.827	4.826	(0.986)	197795	45.7210	45.72
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	212602	48.9496	48.94
138 Freon TF	101	2.405	2.397	(0.491)	284710	43.8838	43.88
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	115690	49.4737	49.47
22 1,1-Dichloroethane	63	3.604	3.600	(0.737)	193837	46.9663	46.96
11 1,1-Dichloroethene	96	2.401	2.397	(0.491)	308625	45.4337	45.43
32 1,1-Dichloropropene	75	5.003	5.002	(0.890)	154351	46.9338	46.93
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	194624	50.5349	50.53
71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	210975	50.7145	50.71
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	201793	46.2922	46.29
79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	534628	47.0802	47.08
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	38646	45.4616	45.46
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	164565	48.5886	48.58
88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	350052	47.4622	47.46

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111214.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.934)	168338	46.1141	46.11
42	1,2-Dichloropropane	63	6.079	6.078	(1.081)	120576	53.8632	53.86
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	488895	45.8264	45.82
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	326152	45.0210	45.02
54	1,3-Dichloropropane	76	7.559	7.563	(0.917)	237672	50.8238	50.82
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	356016	45.3806	45.38
26	2,2-Dichloropropane	77	4.275	4.271	(0.874)	168568	50.5417	50.54
24	2-Butanone	43	4.339	4.339	(0.887)	112154	105.967	105.96
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	378540	47.7239	47.72
52	2-Hexanone	43	7.649	7.649	(0.928)	182787	92.9860	92.98
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	469559	46.9445	46.94
82	p-Isopropyltoluene	119	10.206	10.209	(0.997)	498390	43.6683	43.66
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	263585	100.388	100.38
10	Acetone	43	2.484	2.483	(0.508)	206539	111.326	111.32
37	Benzene	78	5.216	5.216	(0.928)	514641	48.5525	48.55
74	Bromobenzene	156	9.381	9.381	(0.917)	203368	45.9332	45.93
29	Bromochloromethane	128	4.553	4.553	(0.930)	82651	48.1422	48.14
39	Bromodichloromethane	83	6.345	6.344	(1.129)	172114	52.6454	52.64
66	Bromoform	173	8.980	8.984	(1.089)	118321	46.5540	46.55
6	Bromomethane	94	1.666	1.659	(0.341)	406858	49.9489	49.94
19	Carbon Disulfide	76	2.589	2.584	(0.529)	622559	96.5137	96.51
34	Carbon Tetrachloride	117	4.995	4.995	(0.889)	168384	49.3987	49.39
59	Chlorobenzene	112	8.272	8.271	(1.003)	413410	45.3591	45.35
7	Chloroethane	64	1.753	1.741	(0.358)	206943	50.7337	50.73
28	Chloroform	83	4.658	4.654	(0.952)	234981	47.7952	47.79
3	Chloromethane	50	1.344	1.340	(0.275)	133807	51.6485	51.64
27	cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	149534	45.1401	45.14
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	204739	57.3505	57.35
55	Dibromochloromethane	129	7.754	7.758	(0.940)	156192	45.4931	45.49
44	Dibromomethane	93	6.187	6.187	(1.101)	97781	49.2058	49.20
2	Dichlorodifluoromethane	85	1.209	1.205	(0.247)	131693	44.5261	44.52
61	Ethylbenzene	106	8.369	8.369	(1.015)	210450	46.3156	46.31
91	Hexachlorobutadiene	225	12.058	12.061	(1.178)	59234	40.1544	40.15
67	Isopropylbenzene	105	9.123	9.126	(1.106)	596256	46.2752	46.27
62	m,p-Xylenes	106	8.470	8.470	(1.027)	529787	95.2776	95.27
17	Methylene Chloride	84	2.873	2.869	(0.587)	131549	48.5585	48.55
87	n-Butylbenzene	91	10.551	10.554	(1.031)	422612	44.2190	44.21
73	n-Propylbenzene	91	9.471	9.475	(0.926)	653748	45.6774	45.67
92	Naphthalene	128	12.129	12.129	(1.185)	615028	53.0972	53.09
63	o-Xylene	106	8.808	8.807	(1.068)	262747	46.6334	46.63
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	523468	43.6552	43.65
64	Styrene	104	8.823	8.822	(1.070)	483840	49.3852	49.38
78	tert-Butylbenzene	119	9.899	9.898	(0.967)	410663	45.3182	45.31
56	Tetrachloroethene	166	7.522	7.522	(0.912)	148804	43.6153	43.61
50	Toluene	91	7.046	7.045	(0.855)	623236	45.8921	45.89
20	trans-1,2-Dichloroethene	96	3.143	3.139	(0.642)	127491	45.3123	45.31
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	203227	50.3058	50.30
38	Trichloroethene	130	5.861	5.861	(1.043)	156076	48.0691	48.06
8	Trichlorofluoromethane	101	1.955	1.951	(0.400)	560418	44.9084	44.90
5	Vinyl Chloride	62	1.423	1.419	(0.291)	285870	44.2005	44.20



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111214.D
Date : 12-NOV-2019 16:30
Client ID: ICV
Sample Info: VSTD050;VSTD050;2;;ICV
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

MSVOA09 -Logbook

Batch: 38379
Date: 11-13-2019
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	11-13-2019 10:52 am	1.00	0.00 mL	0.00 mL	U111301a.D	Liquid	Y	NA
	Auto find/purged									
2	BFB	TUNE	11-13-2019 11:16 am	1.00	0.00 mL	0.00 mL	U111302.D	Liquid	Y	NA
	Auto find/purged									
3	VSTD050	CCV	11-13-2019 11:40 am	1.00	5.00 mL	0.00 mL	U111303.D	Liquid	Y	NA
	10 uL cal/50 mL DI									
4	CCB	SAMP	11-13-2019 12:04 pm	1.00	5.00 mL	0.00 mL	U111304.D	Liquid	Y	NA
5	VLCSW-191113	LCS	11-13-2019 12:28 pm	1.00	5.00 mL	0.00 mL	U111305.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
6	BLANK	SAMP	11-13-2019 12:52 pm	1.00	5.00 mL	0.00 mL	U111306.D	Liquid	Y	NA
7	VBLKW-191113	MBLK	11-13-2019 01:17 pm	1.00	5.00 mL	0.00 mL	U111307.D	Liquid	Y	NA
8	HS19110613-02	SAMP	11-13-2019 01:41 pm	1.00	5.00 mL	0.00 mL	U111308.D	Liquid	Y	NA
9	HS19110613-01	SAMP	11-13-2019 02:05 pm	1.00	5.00 mL	0.00 mL	U111309.D	Liquid	Y	NA
10	HS19110623-01	SAMP	11-13-2019 02:30 pm	1.00	5.00 mL	0.00 mL	U111310.D	Liquid	Y	NA
11	HS19110623-02	SAMP	11-13-2019 02:54 pm	1.00	5.00 mL	0.00 mL	U111311.D	Liquid	Y	NA
12	HS19110486-05	SAMP	11-13-2019 03:18 pm	1.00	5.00 mL	0.00 mL	U111312.D	Liquid	Y	NA
13	HS19110613-01MS	MS	11-13-2019 03:43 pm	1.00	5.00 mL	0.00 mL	U111313.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
14	HS19110613-01MSD	MSD	11-13-2019 04:07 pm	1.00	5.00 mL	0.00 mL	U111314.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
15	HS19110486-05	SAMP	11-13-2019 04:31 pm	5.00	5.00 mL	0.00 mL	U111315.D	Liquid	Y	NA
16	HS19110486-08	SAMP	11-13-2019 04:55 pm	1.00	5.00 mL	0.00 mL	U111316.D	Liquid	Y	NA
17	HS19110486-01	SAMP	11-13-2019 05:20 pm	1.00	5.00 mL	0.00 mL	U111317.D	Liquid	Y	NA
18	HS19110486-02	SAMP	11-13-2019 05:44 pm	1.00	5.00 mL	0.00 mL	U111318.D	Liquid	Y	NA
19	HS19110486-03	SAMP	11-13-2019 06:08 pm	1.00	5.00 mL	0.00 mL	U111319.D	Liquid	Y	NA
20	HS19110486-04	SAMP	11-13-2019 06:33 pm	1.00	5.00 mL	0.00 mL	U111320.D	Liquid	Y	NA
21	HS19110486-06	SAMP	11-13-2019 06:57 pm	1.00	5.00 mL	0.00 mL	U111321.D	Liquid	Y	NA
22	HS19110486-07	SAMP	11-13-2019 07:21 pm	1.00	5.00 mL	0.00 mL	U111322.D	Liquid	Y	NA
23	CCV-END	CCV	11-13-2019 07:45 pm	1.00	5.00 mL	0.00 mL	U111323.D	Liquid	Y	NA
24	HS19110349-01	SAMP	11-13-2019 08:10 pm	25.00	5.00 mL	0.00 mL	U111324.D	Liquid	Y	NA
25	HS19110349-02	SAMP	11-13-2019 08:34 pm	5.00	5.00 mL	0.00 mL	U111325.D	Liquid	Y	NA
26	HS19110590-03	SAMP	11-13-2019 08:58 pm	1.00	5.00 mL	0.00 mL	U111326.D	Liquid	Y	NA
27	HS19110590-01	SAMP	11-13-2019 09:22 pm	1.00	5.00 mL	0.00 mL	U111327.D	Liquid	Y	NA
28	HS19110590-02	SAMP	11-13-2019 09:47 pm	1.00	5.00 mL	0.00 mL	U111328.D	Liquid	Y	NA
29	HS19110422-01	SAMP	11-13-2019 10:11 pm	100.0(	5.00 mL	0.00 mL	U111329.D	Liquid	Y	NA
30	HS19110422-01	SAMP	11-13-2019 10:35 pm	1000.0	5.00 mL	0.00 mL	U111330.D	Liquid	Y	NA
31	BFB	TUNE	11-13-2019 11:00 pm	1.00	0.00 mL	0.00 mL	V111301.D	Liquid	Y	NA
	Auto find/purged									
32	VSTD050	CCV	11-13-2019 11:24 pm	1.00	5.00 mL	0.00 mL	V111302.D	Liquid	Y	NA
	10 uL cal/50 mL DI									
33	BLANK	SAMP	11-13-2019 11:48 pm	1.00	5.00 mL	0.00 mL	V111303.D	Liquid	Y	NA
34	VLCSW-191113	LCS	11-14-2019 12:12 am	1.00	5.00 mL	0.00 mL	V111304.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
35	BLANK	SAMP	11-14-2019 12:37 am	1.00	5.00 mL	0.00 mL	V111305.D	Liquid	Y	NA
36	VBLKW-191113	MBLK	11-14-2019 01:01 am	1.00	5.00 mL	0.00 mL	V111306.D	Liquid	Y	NA

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
37	HS19110470-01	SAMP	11-14-2019 01:25 am	1.00	5.00 mL	0.00 mL	V111307.D	Liquid	Y	NA
38	HS19110470-01MS	MS	11-14-2019 01:49 am	1.00	5.00 mL	0.00 mL	V111308.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
39	HS19110470-01MSD	MSD	11-14-2019 02:14 am	1.00	5.00 mL	0.00 mL	V111309.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
40	HS19110437-01	SAMP	11-14-2019 02:38 am	200.0(	5.00 mL	0.00 mL	V111310.D	Liquid	Y	NA
41	MBLK-147409	MBLK	11-14-2019 03:02 am	20.00	5.00 mL	0.00 mL	V111311.D	Liquid	Y	NA
42	HS19110365-01	SAMP	11-14-2019 03:27 am	20.00	5.00 mL	0.00 mL	V111312.D	Liquid	Y	NA
43	HS19110545-01	SAMP	11-14-2019 03:51 am	100.0(	5.00 mL	0.00 mL	V111313.D	Liquid	Y	NA
44	HS19110574-01	SAMP	11-14-2019 04:15 am	100.0(	5.00 mL	0.00 mL	V111314.D	Liquid	Y	NA
45	HS19110440-01	SAMP	11-14-2019 04:40 am	20.00	5.00 mL	0.00 mL	V111315.D	Liquid	Y	NA
46	HS19110435-01	SAMP	11-14-2019 05:04 am	20.00	5.00 mL	0.00 mL	V111316.D	Liquid	Y	NA
47	HS19110435-02	SAMP	11-14-2019 05:28 am	20.00	5.00 mL	0.00 mL	V111317.D	Liquid	Y	NA
48	HS19110601-37	SAMP	11-14-2019 05:53 am	1.00	5.00 mL	0.00 mL	V111318.D	Liquid	Y	NA
49	HS19110601-38	SAMP	11-14-2019 06:17 am	1.00	5.00 mL	0.00 mL	V111319.D	Liquid	Y	NA
50	HS19110565-07	SAMP	11-14-2019 06:41 am	1.00	5.00 mL	0.00 mL	V111320.D	Liquid	Y	NA
51	HS19110565-08	SAMP	11-14-2019 07:06 am	1.00	5.00 mL	0.00 mL	V111321.D	Liquid	Y	NA
52	HS19110649-06	SAMP	11-14-2019 07:30 am	1.00	5.00 mL	0.00 mL	V111322.D	Liquid	Y	NA
53	HS19110649-08	SAMP	11-14-2019 07:54 am	1.00	5.00 mL	0.00 mL	V111323.D	Liquid	Y	NA
54	HS19110565-01	SAMP	11-14-2019 08:18 am	10.00	5.00 mL	0.00 mL	V111324.D	Liquid	Y	NA
55	HS19110565-01	SAMP	11-14-2019 08:43 am	100.0(	5.00 mL	0.00 mL	V111325.D	Liquid	Y	NA
56	HS19110565-02	SAMP	11-14-2019 09:07 am	10.00	5.00 mL	0.00 mL	V111326.D	Liquid	Y	NA
57	HS19110565-02	SAMP	11-14-2019 09:31 am	100.0(	5.00 mL	0.00 mL	V111327.D	Liquid	Y	NA
58	HS19110565-09	SAMP	11-14-2019 09:56 am	10.00	5.00 mL	0.00 mL	V111328.D	Liquid	Y	NA
59	HS19110565-09	SAMP	11-14-2019 10:20 am	200.0(	5.00 mL	0.00 mL	V111329.D	Liquid	Y	NA
60	BLANK	SAMP	11-14-2019 10:44 am	1.00	5.00 mL	0.00 mL	V111330.D	Liquid	Y	NA

Chemical	Value
SURR SPK ID	31106-03-03
IS ID	31106-03-04
ICV STD ID	30603-91-01
LCS/MS ID	30603-91-01
CAL STD ID	31106-03-01/02
BFB ID	31106-04-03
pH Paper	634-64-11

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

	CLIENT SAMPLE NO.	SMC1 #	SMC2 #	SMC3 (TOL) #	OTHER (DCE) #	TOT OUT
01	VLCSW-191113	96	104	102	108	0
02	VBLKW-191113	95	82	105	95	0
03	HS19110486-05	97	89	107	93	0
04	HS19110486-05	93	84	103	92	0
05	HS19110486-08	92	85	107	92	0
06	HS19110486-01	98	91	108	95	0
07	HS19110486-02	95	89	105	96	0
08	HS19110486-03	94	85	103	94	0
09	HS19110486-04	96	89	103	95	0
10	HS19110486-06	100	84	110	97	0
11	HS19110486-07	100	88	105	96	0
12						
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		QC LIMITS
SMC1	= 4-Bromofluorobenzene	(70-130)
SMC2	= Dibromofluoromethane	(70-130)
SMC3 (TOL)	= Toluene-d8	(0-130)
OTHER(DCE)	= 1,2-Dichloroethane-d4	(0-130)

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-191113

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Lab File ID: U111307 Lab Sample ID: VBLKW-191113

Date Analyzed: 11/13/19 Time Analyzed: 1317

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA9

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VLCSW-191113	VLCSW-191113	U111305	1228
02	HS19110486-0	HS19110486-05	U111312	1518
03	HS19110613-0	HS19110613-01M	U111313	1543
04	HS19110613-0	HS19110613-01M	U111314	1607
05	HS19110486-0	HS19110486-05	U111315	1631
06	HS19110486-0	HS19110486-08	U111316	1655
07	HS19110486-0	HS19110486-01	U111317	1720
08	HS19110486-0	HS19110486-02	U111318	1744
09	HS19110486-0	HS19110486-03	U111319	1808
10	HS19110486-0	HS19110486-04	U111320	1833
11	HS19110486-0	HS19110486-06	U111321	1857
12	HS19110486-0	HS19110486-07	U111322	1921
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COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Lab File ID: U111302 BFB Injection Date: 11/13/19

Instrument ID: VOA9 BFB Injection Time: 1116

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	18.2
75	30.0 - 60.0% of mass 95	52.2
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	0.0 (0.0)1
174	Greater than 50.0% of mass 95	114.9
175	5.0 - 9.0% of mass 174	9.3 (8.1)1
176	95.0 - 101.0% of mass 174	109.2 (95.0)1
177	5.0 - 9.0% of mass 176	6.9 (6.3)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	U111303	11/13/19	1140
02	VLCSW-191113	VLCSW-191113	U111305	11/13/19	1228
03	VBLKW-191113	VBLKW-191113	U111307	11/13/19	1317
04	HS19110486-0	HS19110486-05	U111312	11/13/19	1518
05	HS19110613-0	HS19110613-01M	U111313	11/13/19	1543
06	HS19110613-0	HS19110613-01M	U111314	11/13/19	1607
07	HS19110486-0	HS19110486-05	U111315	11/13/19	1631
08	HS19110486-0	HS19110486-08	U111316	11/13/19	1655
09	HS19110486-0	HS19110486-01	U111317	11/13/19	1720
10	HS19110486-0	HS19110486-02	U111318	11/13/19	1744
11	HS19110486-0	HS19110486-03	U111319	11/13/19	1808
12	HS19110486-0	HS19110486-04	U111320	11/13/19	1833
13	HS19110486-0	HS19110486-06	U111321	11/13/19	1857
14	HS19110486-0	HS19110486-07	U111322	11/13/19	1921
15	CCV-END	CCV-END	U111323	11/13/19	1945
16					
17					
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22					

FORM V VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Instrument ID: VOA9 Calibration Date: 11/13/19 Time: 1140

Lab File ID: U111303 Init. Calib. Date(s): 11/12/19 11/12/19

Init. Calib. Times: 1116 1517

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
cis-1,3-Dichloropropene	0.3640000	0.4189153	0.4189153	0.2	-15.09	20.00	AVRG
trans-1,3-Dichloropropene	50.261143	50.000000	0.4140372	0.1	-0.52	20.00	LINR
1,3-Dichlorobenzene	1.4790000	1.3660438	1.3660438	0.6	7.64	20.00	AVRG
2,2-Dichloropropane	0.5730000	0.5923084	0.5923084	0.1	-3.37	20.00	AVRG
1,1-Dichloropropene	0.3350000	0.3374170	0.3374170	0.1	-0.72	20.00	AVRG
Dibromomethane	0.2030000	0.2084354	0.2084354	0.1	-2.68	20.00	AVRG
1,2-Dibromoethane	0.3760000	0.3678108	0.3678108	0.1	2.18	20.00	AVRG
trans-1,2-Dichloroethene	47.156870	50.000000	0.4569944	0.1	5.69	20.00	LINR
1,1,1,2-Tetrachloroethane	46.954387	50.000000	0.3351747	0.1	6.09	20.00	LINR
1,1,1-Trichloroethane	0.7440000	0.7218229	0.7218229	0.1	2.98	20.00	AVRG
1,1,2,2-Tetrachloroethane	0.8870000	0.8843350	0.8843350	0.3	0.30	20.00	AVRG
Toluene	1.5080000	1.4670787	1.4670787	0.4	2.71	20.00	AVRG
1,1,2-Trichloroethane	0.2600000	0.2588517	0.2588517	0.1	0.44	20.00	AVRG
1,1-Dichloroethane	0.7090000	0.6839079	0.6839079	0.2	3.54	20.00	AVRG
1,1-Dichloroethene	1.1680000	1.1390885	1.1390885	0.1	2.48	20.00	AVRG
Trichlorofluoromethane	2.1450000	1.9929562	1.9929562	0.1	7.09	20.00	AVRG
1,2,3-Trichlorobenzene	0.7860000	0.8054318	0.8054318	0.1	-2.47	20.00	AVRG
Tetrachloroethene	0.3790000	0.3605215	0.3605215	0.2	4.88	20.00	AVRG
1,2,4-Trichlorobenzene	0.8900000	0.8380018	0.8380018	0.2	5.84	20.00	AVRG
1,2,4-Trimethylbenzene	2.3190000	2.2622636	2.2622636	0.1	2.45	20.00	AVRG
tert-Butylbenzene	1.8500000	1.8130666	1.8130666	0.1	2.00	20.00	AVRG
Trichloroethene	0.3310000	0.3162727	0.3162727	0.2	4.45	20.00	AVRG
1,2-Dichlorobenzene	1.5060000	1.4463548	1.4463548	0.4	3.96	20.00	AVRG
1,2-Dichloroethane	0.3720000	0.3658450	0.3658450	0.1	1.65	20.00	AVRG
1,2-Dichloropropane	56.193270	50.000000	0.2562041	0.1	-12.39	20.00	LINR
1,3,5-Trimethylbenzene	2.1790000	2.1292444	2.1292444	0.1	2.28	20.00	AVRG
1,3-Dichloropropane	0.5190000	0.5412014	0.5412014	0.1	-4.28	20.00	AVRG
1,4-Dichlorobenzene	1.6020000	1.4645249	1.4645249	0.4	8.58	20.00	AVRG
2-Butanone	99.249152	100.00000	0.1807932	0.1	0.75	20.00	LINR
2-Chlorotoluene	1.6200000	1.6497548	1.6497548	0.1	-1.84	20.00	AVRG
2-Hexanone	0.2180000	0.2096664	0.2096664	0.1	3.82	20.00	AVRG
4-Chlorotoluene	2.0420000	1.9775753	1.9775753	0.1	3.15	20.00	AVRG
Styrene	1.0880000	1.1020730	1.1020730	0.3	-1.29	20.00	AVRG
4-Methyl-2-Pentanone	0.2920000	0.2890945	0.2890945	0.1	1.00	20.00	AVRG
Acetone	103.75934	100.00000	0.3331926	0.1	-3.76	20.00	LINR
Benzene	1.0810000	1.1054071	1.1054071	0.5	-2.26	20.00	AVRG
Bromobenzene	0.9040000	0.8047190	0.8047190	0.1	10.98	20.00	AVRG
Bromochloromethane	0.2950000	0.2887955	0.2887955	0.1	2.10	20.00	AVRG
Bromodichloromethane	0.3330000	0.3560732	0.3560732	0.2	-6.93	20.00	AVRG
Bromoform	44.321294	50.000000	0.2491924	0.1	11.36	20.00	2RDR
Bromomethane	48.991019	50.000000	1.3696521	0.1	2.02	20.00	2RDR
Carbon Disulfide	1.1090000	1.1606667	1.1606667	0.1	-4.66	20.00	AVRG

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911048

Instrument ID: VOA9 Calibration Date: 11/13/19 Time: 1140

Lab File ID: U111303 Init. Calib. Date(s): 11/12/19 11/12/19

Init. Calib. Times: 1116 1517

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
Carbon Tetrachloride	0.3480000	0.3682595	0.3682595	0.1	-5.82	20.00	AVRG
Chlorobenzene	1.0130000	0.9444313	0.9444313	0.5	6.77	20.00	AVRG
Chloroethane	56.225654	50.000000	0.7860353	0.1	-12.45	20.00	LINR
Chloroform	0.8450000	0.8104737	0.8104737	0.2	4.08	20.00	AVRG
Chloromethane	51.981022	50.000000	0.4629899	0.1	-3.96	20.00	LINR
cis-1,2-Dichloroethene	0.5690000	0.5245024	0.5245024	0.1	7.82	20.00	AVRG
Dibromochloromethane	44.839672	50.000000	0.3417536	0.1	10.32	20.00	LINR
Dichlorodifluoromethane	0.5080000	0.5066856	0.5066856	0.1	0.26	20.00	AVRG
Ethylbenzene	0.5050000	0.4914667	0.4914667	0.1	2.68	20.00	AVRG
Hexachlorobutadiene	0.3010000	0.2780757	0.2780757	0.1	7.62	20.00	AVRG
Isopropylbenzene	1.4310000	1.4308950	1.4308950	0.1	0.01	20.00	AVRG
m,p-Xylenes	0.6180000	0.6242434	0.6242434	0.1	-1.01	20.00	AVRG
Methylene Chloride	48.720807	50.000000	0.4538722	0.1	2.56	20.00	LINR
n-Butylbenzene	1.9520000	1.9603332	1.9603332	0.5	-0.43	20.00	AVRG
n-Propylbenzene	2.9230000	2.9878059	2.9878059	0.1	-2.22	20.00	AVRG
Naphthalene	2.3660000	2.4553435	2.4553435	0.2	-3.78	20.00	AVRG
o-Xylene	0.6260000	0.6024319	0.6024319	0.3	3.76	20.00	AVRG
sec-Butylbenzene	2.4490000	2.3747635	2.3747635	0.1	3.03	20.00	AVRG
Vinyl Chloride	1.1120000	1.1042768	1.1042768	0.1	0.69	20.00	AVRG
1,2,3-Trichloropropane	0.8490000	0.8495728	0.8495728	0.1	-0.07	20.00	AVRG
p-Isopropyltoluene	2.3300000	2.2786629	2.2786629	0.1	2.20	20.00	AVRG
1,2-Dibromo-3-Chloropropane	43.775400	50.000000	0.1517722	0.05	12.45	20.00	LINR
Freon TF	1.1150000	1.0779305	1.0779305	0.1	3.32	20.00	AVRG
4-Bromofluorobenzene	48.776119	50.000000	0.3767670	0.1	2.45	20.00	LINR
Dibromofluoromethane	51.825655	50.000000	0.5118138	0.1	-3.65	20.00	2RDR
Toluene-d8	49.981358	50.000000	1.2407943	0.1	0.04	20.00	LINR
1,2-Dichloroethane-d4	50.324652	50.000000	0.5027904	0.1	-0.65	20.00	LINR

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Instrument ID: VOA9 Calibration Date: 11/13/19 Time: 1945

Lab File ID: U111323 Init. Calib. Date(s): 11/12/19 11/12/19

Init. Calib. Times: 1116 1517

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
cis-1,3-Dichloropropene	0.3640000	0.4183929	0.4183929	0.2	-14.94	50.00	AVRG
trans-1,3-Dichloropropene	48.317810	50.000000	0.3977885	0.1	3.36	50.00	LINR
1,3-Dichlorobenzene	1.4790000	1.3464098	1.3464098	0.6	8.96	50.00	AVRG
2,2-Dichloropropane	0.5730000	0.5155478	0.5155478	0.1	10.03	50.00	AVRG
1,1-Dichloropropene	0.3350000	0.3408243	0.3408243	0.1	-1.74	50.00	AVRG
Dibromomethane	0.2030000	0.2127251	0.2127251	0.1	-4.79	50.00	AVRG
1,2-Dibromoethane	0.3760000	0.3662164	0.3662164	0.1	2.60	50.00	AVRG
trans-1,2-Dichloroethene	48.337201	50.000000	0.4689067	0.1	3.32	50.00	LINR
1,1,1,2-Tetrachloroethane	47.300329	50.000000	0.3377389	0.1	5.40	50.00	LINR
1,1,1-Trichloroethane	0.7440000	0.7240674	0.7240674	0.1	2.68	50.00	AVRG
1,1,2,2-Tetrachloroethane	0.8870000	0.9129955	0.9129955	0.3	-2.93	50.00	AVRG
Toluene	1.5080000	1.4906171	1.4906171	0.4	1.15	50.00	AVRG
1,1,2-Trichloroethane	0.2600000	0.2702491	0.2702491	0.1	-3.94	50.00	AVRG
1,1-Dichloroethane	0.7090000	0.7476993	0.7476993	0.2	-5.46	50.00	AVRG
1,1-Dichloroethene	1.1680000	1.2372133	1.2372133	0.1	-5.92	50.00	AVRG
Trichlorofluoromethane	2.1450000	2.2054950	2.2054950	0.1	-2.82	50.00	AVRG
1,2,3-Trichlorobenzene	0.7860000	0.7493169	0.7493169	0.1	4.67	50.00	AVRG
Tetrachloroethene	0.3790000	0.3399486	0.3399486	0.2	10.30	50.00	AVRG
1,2,4-Trichlorobenzene	0.8900000	0.8146673	0.8146673	0.2	8.46	50.00	AVRG
1,2,4-Trimethylbenzene	2.3190000	2.2831870	2.2831870	0.1	1.54	50.00	AVRG
tert-Butylbenzene	1.8500000	1.7776209	1.7776209	0.1	3.91	50.00	AVRG
Trichloroethene	0.3310000	0.3194429	0.3194429	0.2	3.49	50.00	AVRG
1,2-Dichlorobenzene	1.5060000	1.4489125	1.4489125	0.4	3.79	50.00	AVRG
1,2-Dichloroethane	0.3720000	0.3724299	0.3724299	0.1	-0.12	50.00	AVRG
1,2-Dichloropropane	59.261213	50.000000	0.2698069	0.1	-18.52	50.00	LINR
1,3,5-Trimethylbenzene	2.1790000	2.0457786	2.0457786	0.1	6.11	50.00	AVRG
1,3-Dichloropropane	0.5190000	0.5718429	0.5718429	0.1	-10.18	50.00	AVRG
1,4-Dichlorobenzene	1.6020000	1.4272383	1.4272383	0.4	10.91	50.00	AVRG
2-Butanone	108.57056	100.00000	0.1974820	0.1	-8.57	50.00	LINR
2-Chlorotoluene	1.6200000	1.6052000	1.6052000	0.1	0.91	50.00	AVRG
2-Hexanone	0.2180000	0.2186692	0.2186692	0.1	-0.31	50.00	AVRG
4-Chlorotoluene	2.0420000	2.0009277	2.0009277	0.1	2.01	50.00	AVRG
Styrene	1.0880000	1.1230472	1.1230472	0.3	-3.22	50.00	AVRG
4-Methyl-2-Pentanone	0.2920000	0.3110430	0.3110430	0.1	-6.52	50.00	AVRG
Acetone	115.53468	100.00000	0.3672734	0.1	-15.53	50.00	LINR
Benzene	1.0810000	1.1612947	1.1612947	0.5	-7.43	50.00	AVRG
Bromobenzene	0.9040000	0.8015337	0.8015337	0.1	11.33	50.00	AVRG
Bromochloromethane	0.2950000	0.3116496	0.3116496	0.1	-5.64	50.00	AVRG
Bromodichloromethane	0.3330000	0.3685549	0.3685549	0.2	-10.68	50.00	AVRG
Bromoform	43.636049	50.000000	0.2450006	0.1	12.73	50.00	2RDR
Bromomethane	54.616584	50.000000	1.5439746	0.1	-9.23	50.00	2RDR
Carbon Disulfide	1.1090000	1.1820721	1.1820721	0.1	-6.59	50.00	AVRG

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911048

Instrument ID: VOA9 Calibration Date: 11/13/19 Time: 1945

Lab File ID: U111323 Init. Calib. Date(s): 11/12/19 11/12/19

Init. Calib. Times: 1116 1517

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
Carbon Tetrachloride	0.3480000	0.3412154	0.3412154	0.1	1.95	50.00	AVRG
Chlorobenzene	1.0130000	0.9656557	0.9656557	0.5	4.67	50.00	AVRG
Chloroethane	63.369711	50.000000	0.8828945	0.1	-26.74	50.00	LINR
Chloroform	0.8450000	0.9064375	0.9064375	0.2	-7.27	50.00	AVRG
Chloromethane	60.573566	50.000000	0.5377697	0.1	-21.15	50.00	LINR
cis-1,2-Dichloroethene	0.5690000	0.5552323	0.5552323	0.1	2.42	50.00	AVRG
Dibromochloromethane	45.138605	50.000000	0.3441692	0.1	9.72	50.00	LINR
Dichlorodifluoromethane	0.5080000	0.4953096	0.4953096	0.1	2.50	50.00	AVRG
Ethylbenzene	0.5050000	0.4888521	0.4888521	0.1	3.20	50.00	AVRG
Hexachlorobutadiene	0.3010000	0.2365412	0.2365412	0.1	21.41	50.00	AVRG
Isopropylbenzene	1.4310000	1.3922467	1.3922467	0.1	2.71	50.00	AVRG
m,p-Xylenes	0.6180000	0.6212932	0.6212932	0.1	-0.53	50.00	AVRG
Methylene Chloride	52.703706	50.000000	0.4916757	0.1	-5.41	50.00	LINR
n-Butylbenzene	1.9520000	1.8406169	1.8406169	0.5	5.71	50.00	AVRG
n-Propylbenzene	2.9230000	2.8185595	2.8185595	0.1	3.57	50.00	AVRG
Naphthalene	2.3660000	2.5006806	2.5006806	0.2	-5.69	50.00	AVRG
o-Xylene	0.6260000	0.6203762	0.6203762	0.3	0.90	50.00	AVRG
sec-Butylbenzene	2.4490000	2.3043923	2.3043923	0.1	5.90	50.00	AVRG
Vinyl Chloride	1.1120000	1.1928673	1.1928673	0.1	-7.27	50.00	AVRG
1,2,3-Trichloropropane	0.8490000	0.8540228	0.8540228	0.1	-0.59	50.00	AVRG
p-Isopropyltoluene	2.3300000	2.1941809	2.1941809	0.1	5.83	50.00	AVRG
1,2-Dibromo-3-Chloropropane	45.231965	50.000000	0.1570135	0.05	9.54	50.00	LINR
Freon TF	1.1150000	1.1134448	1.1134448	0.1	0.14	50.00	AVRG
4-Bromofluorobenzene	51.169105	50.000000	0.3955033	0.1	-2.34	50.00	LINR
Dibromofluoromethane	53.389784	50.000000	0.5274594	0.1	-6.78	50.00	2RDR
Toluene-d8	51.416204	50.000000	1.2765081	0.1	-2.83	50.00	LINR
1,2-Dichloroethane-d4	54.518690	50.000000	0.5439168	0.1	-9.04	50.00	LINR

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Lab File ID (Standard): U111303 Date Analyzed: 11/13/19

Instrument ID: VOA9 Time Analyzed: 1140

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(DCB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DFB) AREA #	RT #
	12 HOUR STD	223058	10.23	406758	8.25	448537	5.63
	UPPER LIMIT	446116	10.73	813516	8.75	897074	6.13
	LOWER LIMIT	111529	9.73	203379	7.75	224269	5.13
	CLIENT SAMPLE NO.						
01	VLCSW-191113	196499	10.23	371938	8.25	411391	5.63
02	VBLKW-191113	141552	10.23	294756	8.25	334989	5.62
03	HS19110486-05	133550	10.23	272179	8.25	307425	5.62
04	HS19110613-01	161169	10.23	304074	8.25	330083	5.62
05	HS19110613-01	165437	10.23	310603	8.25	331883	5.63
06	HS19110486-05	139088	10.23	283225	8.25	316025	5.62
07	HS19110486-08	134100	10.23	272636	8.25	304780	5.62
08	HS19110486-01	131667	10.23	274700	8.25	315317	5.63
09	HS19110486-02	137133	10.23	279202	8.25	313145	5.62
10	HS19110486-03	137649	10.23	281629	8.25	324227	5.62
11	HS19110486-04	138230	10.23	277678	8.25	318449	5.62
12	HS19110486-06	123638	10.23	260059	8.25	307389	5.62
13	HS19110486-07	137546	10.23	273142	8.25	311135	5.63
14							
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IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (CBZ) = Chlorobenzene-d5
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 VIII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110486

Lab File ID (Standard): U111303 Date Analyzed: 11/13/19

Instrument ID: VOA9 Time Analyzed: 1140

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	265198	4.89				
	UPPER LIMIT	530396	5.39				
	LOWER LIMIT	132599	4.39				
01	VLCSW-191113	241722	4.89				
02	VBLKW-191113	219215	4.89				
03	HS19110486-05	201034	4.89				
04	HS19110613-01	217868	4.89				
05	HS19110613-01	222266	4.89				
06	HS19110486-05	216358	4.89				
07	HS19110486-08	204491	4.89				
08	HS19110486-01	201245	4.89				
09	HS19110486-02	201832	4.89				
10	HS19110486-03	204340	4.89				
11	HS19110486-04	205652	4.89				
12	HS19110486-06	199303	4.89				
13	HS19110486-07	199359	4.89				
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.

FORM VIII VOA

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111302.D

Page 1

Date : 13-NOV-2019 11:16

Client ID: BFB

Instrument: VOA9.i

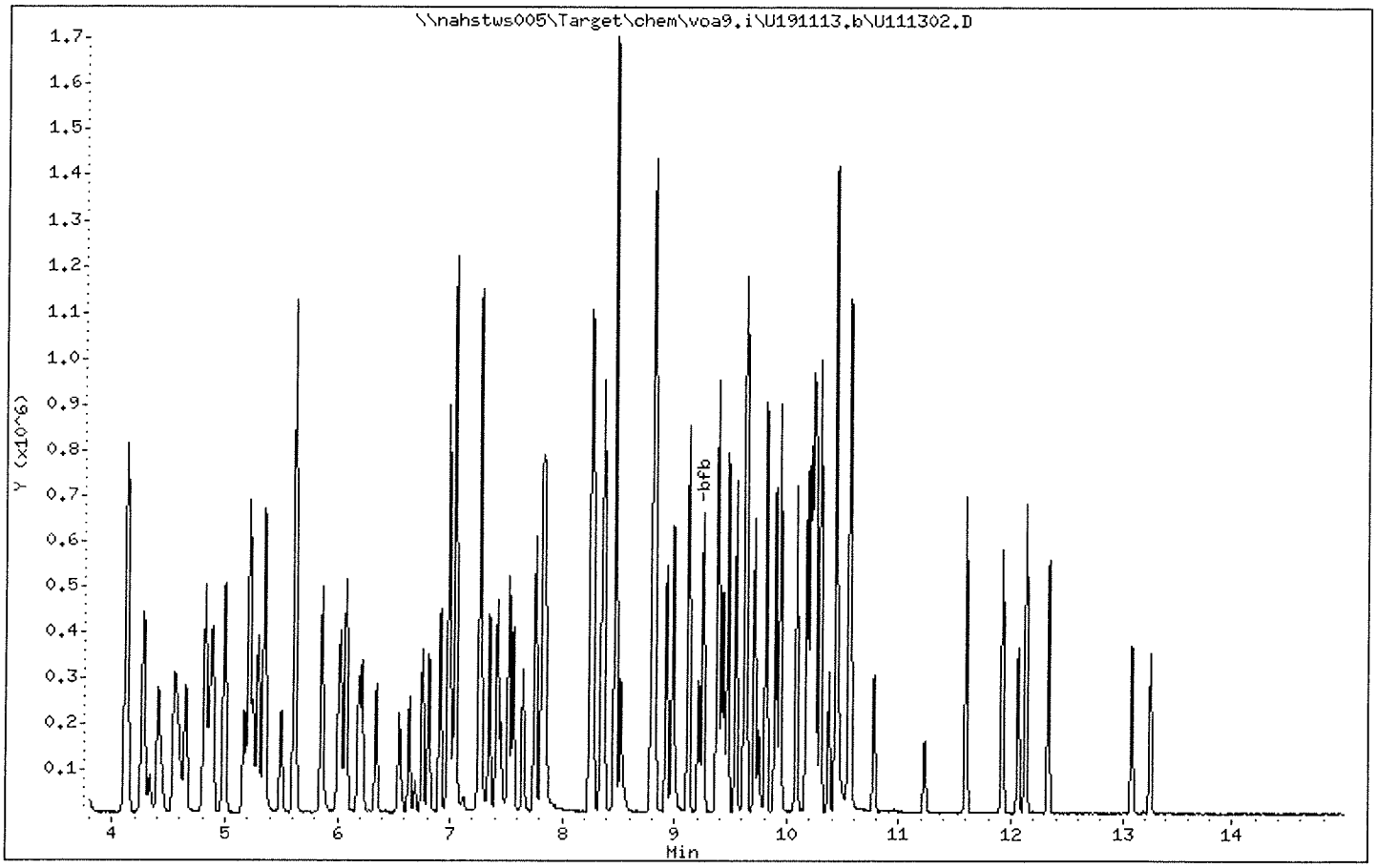
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111302.D Page 2

Date : 13-NOV-2019 11:16

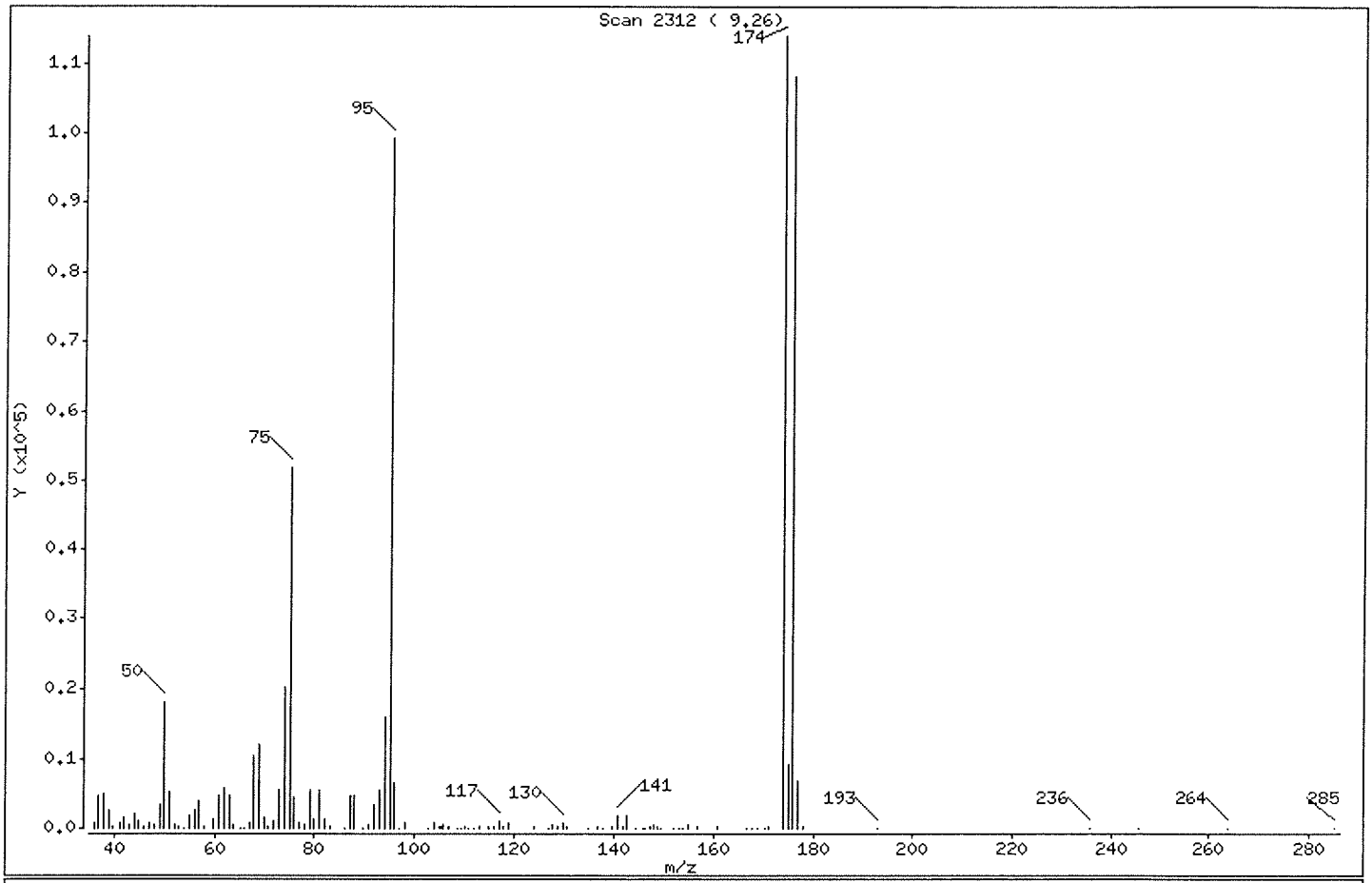
Client ID: BFB Instrument: VOA9.i

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	18.19
75	30.00 - 60.00% of mass 95	52.25
96	5.00 - 9.00% of mass 95	6.62
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	114.89
175	5.00 - 9.00% of mass 174	9.28 (8.07)
176	95.00 - 101.00% of mass 174	109.16 (95.01)
177	5.00 - 9.00% of mass 176	6.93 (6.35)

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111302.D Page 3

Date : 13-NOV-2019 11:16

Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

Data File: U111302.D
Spectrum: Scan 2312 (9.26)
Location of Maximum: 173.90
Number of points: 117

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	804	67.00	682	103.80	709	145.80	115
37.00	4748	68.00	10483	104.90	354	146.30	112
38.00	4973	69.00	12029	105.50	301	147.30	137
39.10	2531	70.00	1553	105.90	467	147.90	496
39.80	382	70.80	136	106.90	191	148.70	144
41.20	697	72.00	946	108.70	64	149.70	116
42.00	1497	73.10	5374	109.50	82	151.90	59
43.00	482	74.00	20128	110.10	194	153.00	81
44.00	2073	75.00	51808	110.80	92	153.80	121
44.90	1168	76.00	4330	111.80	110	154.90	513
46.00	284	76.90	740	112.90	224	156.90	219
47.00	674	78.00	618	114.90	138	160.90	294
48.10	649	79.00	5594	115.80	360	166.50	85
49.10	3278	79.90	1212	116.90	997	167.80	84
50.00	18040	80.90	5503	117.70	383	168.90	72
51.00	5173	81.90	1357	119.00	738	170.30	62
52.10	452	83.00	296	124.10	192	170.90	388
53.00	171	86.10	67	126.80	118	173.90	113920
54.10	81	87.00	4614	127.80	475	175.00	9199
54.90	1849	88.00	4596	128.80	300	175.90	108240
56.00	2538	89.70	58	129.70	680	176.90	6872
57.00	3891	90.90	554	130.70	339	177.80	272
58.00	251	92.00	3502	134.90	111	192.90	68
59.90	1373	93.00	5532	136.70	207	235.70	88
61.00	4711	94.00	15852	137.80	81	245.40	54
62.00	5665	95.00	99160	139.50	179	263.90	117
63.00	4820	96.00	6568	140.90	1920	285.30	84
63.90	436	97.10	89	141.80	352		
65.10	95	98.20	740	142.70	1728		
66.10	73	102.80	76	144.60	56		

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111303.D Page 1
Report Date: 05-Dec-2019 16:34

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111303.D
Lab Smp Id: CCV Client Smp ID: CCV
Inj Date : 13-NOV-2019 11:40
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:31 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 3 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

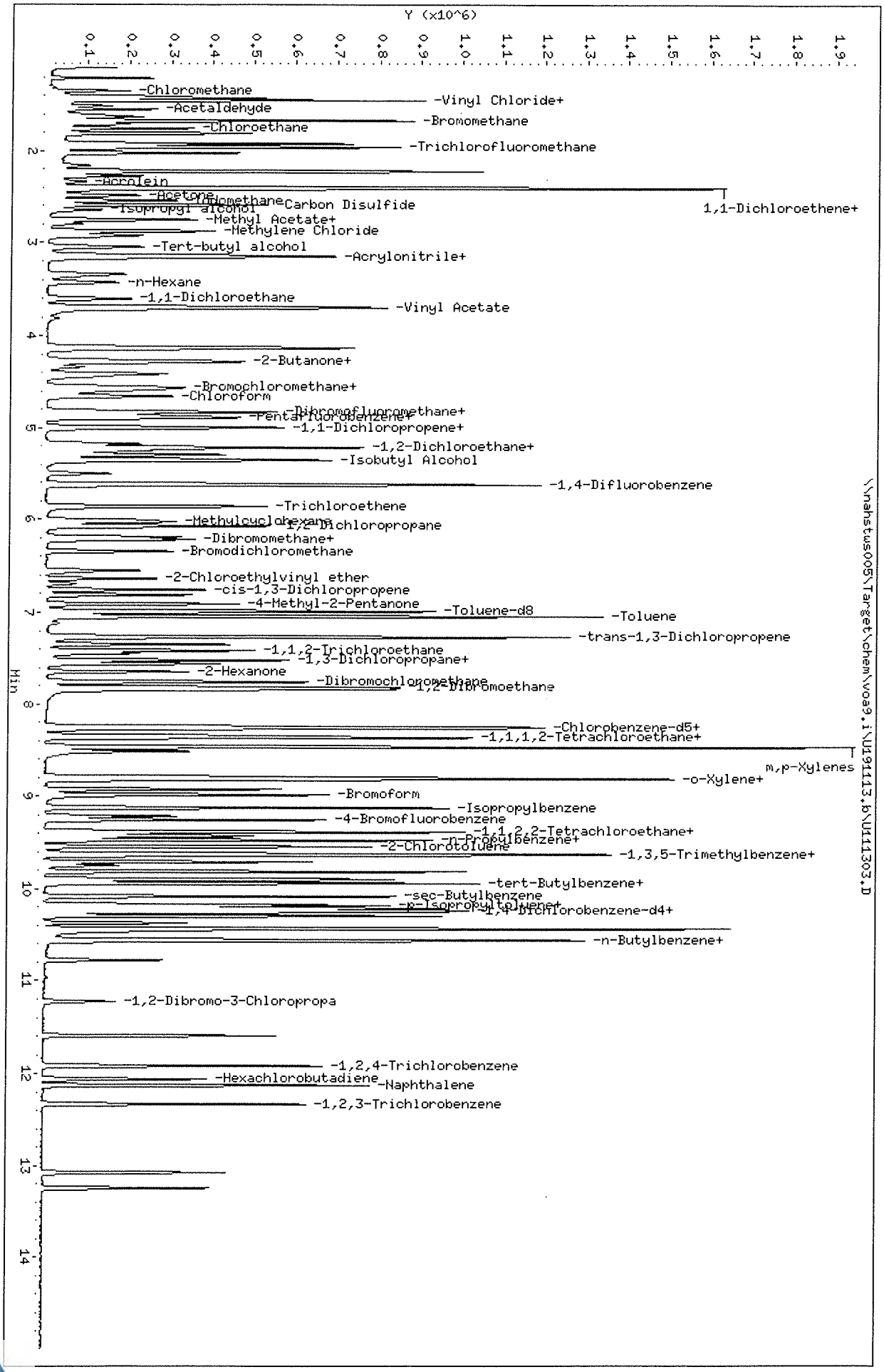
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.890	(1.000)	265198	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.621	(1.000)	448537	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.245	(1.000)	406758	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	223058	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.167	(1.057)	133339	50.0000	50.32
$ 69 4-Bromofluorobenzene	95	9.253	9.254	(1.122)	153253	50.0000	48.77
$ 30 Dibromofluoromethane	113	4.830	4.823	(0.987)	135732	50.0000	51.82
$ 48 Toluene-d8	98	6.985	6.986	(0.847)	504703	50.0000	49.98
60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	136335	50.0000	46.95
31 1,1,1-Trichloroethane	97	4.826	4.823	(0.986)	191426	50.0000	48.52
68 1,1,2,2-Tetrachloroethane	83	9.388	9.389	(0.918)	197258	50.0000	49.85
138 Freon TF	101	2.408	2.393	(0.492)	285865	50.0000	48.31
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.899)	105290	50.0000	49.82
22 1,1-Dichloroethane	63	3.604	3.593	(0.737)	181371	50.0000	48.19
11 1,1-Dichloroethene	96	2.405	2.390	(0.491)	302084	50.0000	48.76
32 1,1-Dichloropropene	75	5.002	4.999	(0.889)	151344	50.0000	50.31
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	179658	50.0000	51.20
71 1,2,3-Trichloropropane	75	9.422	9.422	(0.921)	189504	50.0000	50.00
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	186923	50.0000	47.06
79 1,2,4-Trimethylbenzene	105	9.939	9.940	(0.971)	504616	50.0000	48.77
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	33854	50.0000	43.77
57 1,2-Dibromoethane	107	7.848	7.848	(0.951)	149610	50.0000	48.87
88 1,2-Dichlorobenzene	146	10.565	10.566	(1.033)	322621	50.0000	48.01

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111303.D Page 2
Report Date: 05-Dec-2019 16:34

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.254	5.246	(0.934)	164095	50.0000	49.14
42	1,2-Dichloropropane	63	6.078	6.075	(1.081)	114917	50.0000	56.19
75	1,3,5-Trimethylbenzene	105	9.621	9.621	(0.940)	474945	50.0000	48.86
83	1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	304707	50.0000	46.16
54	1,3-Dichloropropane	76	7.559	7.559	(0.916)	220138	50.0000	52.08
84	1,4-Dichlorobenzene	146	10.251	10.251	(1.002)	326674	50.0000	45.70
26	2,2-Dichloropropane	77	4.275	4.268	(0.874)	157079	50.0000	51.64
24	2-Butanone	43	4.339	4.332	(0.887)	95892	100.000	99.24
76	2-Chlorotoluene	91	9.542	9.542	(0.933)	367991	50.0000	50.92
52	2-Hexanone	43	7.649	7.645	(0.927)	170567	100.000	96.01
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	441114	50.0000	48.40
82	p-Isopropyltoluene	119	10.206	10.206	(0.997)	508274	50.0000	48.88
45	4-Methyl-2-Pentanone	43	6.910	6.911	(0.838)	235183	100.000	99.10
10	Acetone	43	2.483	2.472	(0.507)	176724	100.000	103.75
37	Benzene	78	5.216	5.212	(0.927)	495816	50.0000	51.14
74	Bromobenzene	156	9.381	9.377	(0.917)	179499	50.0000	44.50
29	Bromochloromethane	128	4.556	4.549	(0.931)	76588	50.0000	48.92
39	Bromodichloromethane	83	6.344	6.345	(1.128)	159712	50.0000	53.41
66	Bromoform	173	8.980	8.980	(1.089)	101361	50.0000	44.32
6	Bromomethane	94	1.670	1.659	(0.341)	363229	50.0000	48.99
19	Carbon Disulfide	76	2.592	2.581	(0.530)	615613	100.000	104.65
34	Carbon Tetrachloride	117	4.995	4.988	(0.888)	165178	50.0000	52.98
59	Chlorobenzene	112	8.271	8.271	(1.003)	384155	50.0000	46.63
7	Chloroethane	64	1.756	1.741	(0.359)	208455	50.0000	56.22
28	Chloroform	83	4.657	4.650	(0.952)	214936	50.0000	47.94
3	Chloromethane	50	1.347	1.333	(0.275)	122784	50.0000	51.98
27	cis-1,2-Dichloroethene	96	4.286	4.279	(0.876)	139097	50.0000	46.04
46	cis-1,3-Dichloropropene	75	6.757	6.753	(1.201)	187899	50.0000	57.54
55	Dibromochloromethane	129	7.754	7.754	(0.940)	139011	50.0000	44.83
44	Dibromomethane	93	6.191	6.183	(1.101)	93491	50.0000	51.43
2	Dichlorodifluoromethane	85	1.209	1.198	(0.247)	134372	50.0000	49.82
61	Ethylbenzene	106	8.369	8.365	(1.015)	199908	50.0000	48.68
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	62027	50.0000	46.15
67	Isopropylbenzene	105	9.122	9.122	(1.106)	582028	50.0000	49.98
62	m,p-Xylenes	106	8.470	8.470	(1.027)	507832	100.000	101.05
17	Methylene Chloride	84	2.873	2.862	(0.587)	120366	50.0000	48.72
87	n-Butylbenzene	91	10.554	10.551	(1.032)	437268	50.0000	50.22
73	n-Propylbenzene	91	9.471	9.471	(0.926)	666454	50.0000	51.11
92	Naphthalene	128	12.129	12.129	(1.185)	547684	50.0000	51.90
63	o-Xylene	106	8.807	8.807	(1.068)	245044	50.0000	48.12
81	sec-Butylbenzene	105	10.082	10.082	(0.985)	529710	50.0000	48.49
64	Styrene	104	8.822	8.819	(1.070)	448277	50.0000	50.62
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	404419	50.0000	48.98
56	Tetrachloroethene	166	7.521	7.522	(0.912)	146645	50.0000	47.56
50	Toluene	91	7.045	7.042	(0.854)	596746	50.0000	48.62
20	trans-1,2-Dichloroethene	96	3.143	3.132	(0.642)	121194	50.0000	47.15
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	185711	50.0000	50.26
38	Trichloroethene	130	5.861	5.857	(1.042)	141860	50.0000	47.76
8	Trichlorofluoromethane	101	1.958	1.944	(0.400)	528528	50.0000	46.44
5	Vinyl Chloride	62	1.426	1.411	(0.291)	292852	50.0000	49.65



Data File: \\nahstus005\Target\chem\voa9,i\U191113,b\U111303,D
Date : 13-NOV-2019 11:40
Client ID: CCV
Sample Info: VSTD050;VSTD050;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111305.D Page 1
Report Date: 05-Dec-2019 16:34

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111305.D
Lab Smp Id: VLCSW-191113 Client Smp ID: VLCSW-191113
Inj Date : 13-NOV-2019 12:28
Operator : PC Inst ID: VOA9.i
Smp Info : VLCSW-191113;VLCSW-191113;3;;LCS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:31 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 5 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

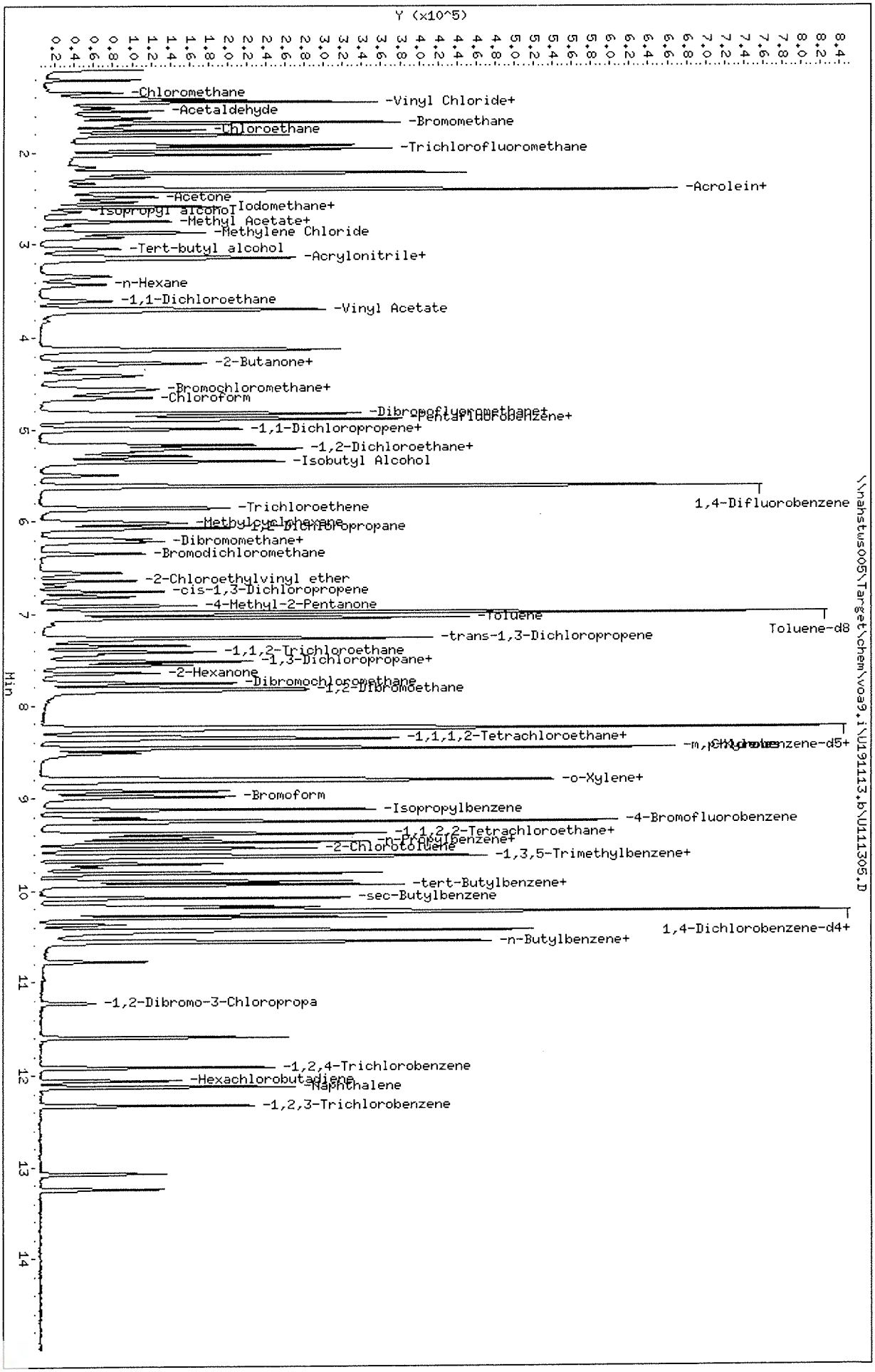
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
*	1 Pentafluorobenzene	168	4.894	4.890	(1.000)	241722	50.0000	
*	36 1,4-Difluorobenzene	114	5.625	5.621	(1.000)	411391	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	371938	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	196499	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.175	5.167	(1.057)	130481	54.0986	54.09
$	69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	137764	47.9623	47.96
$	30 Dibromofluoromethane	113	4.827	4.823	(0.986)	124711	52.2372	52.23
$	48 Toluene-d8	98	6.986	6.986	(0.847)	472800	51.2021	51.20
	60 1,1,1,2-Tetrachloroethane	131	8.347	8.346	(1.012)	44921	18.0294	18.02
	31 1,1,1-Trichloroethane	97	4.827	4.823	(0.986)	69271	19.2648	19.26
	68 1,1,2,2-Tetrachloroethane	83	9.389	9.389	(0.918)	70355	20.1838	20.18
	138 Freon TF	101	2.405	2.393	(0.491)	117328	21.7579	21.75
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	38735	20.0447	20.04
	22 1,1-Dichloroethane	63	3.608	3.593	(0.737)	70240	20.4761	20.47
	11 1,1-Dichloroethene	96	2.401	2.390	(0.491)	118474	20.9838	20.98
	32 1,1-Dichloropropene	75	5.003	4.999	(0.889)	59386	21.5256	21.52
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	60312	19.5131	19.51
	71 1,2,3-Trichloropropane	75	9.422	9.422	(0.921)	68290	20.4543	20.45
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	66127	18.9020	18.90
	79 1,2,4-Trimethylbenzene	105	9.940	9.940	(0.971)	184399	20.2336	20.23
	89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	10877	16.9807	16.98
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	52910	18.9039	18.90
	88 1,2-Dichlorobenzene	146	10.566	10.566	(1.033)	112281	18.9692	18.96

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111305.D Page 2
Report Date: 05-Dec-2019 16:34

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.246	(0.933)	60496	19.7549	19.75
42	1,2-Dichloropropane	63	6.079	6.075	(1.081)	43004	21.9858	21.98
75	1,3,5-Trimethylbenzene	105	9.621	9.621	(0.940)	171892	20.0763	20.07
83	1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	106002	18.2321	18.23
54	1,3-Dichloropropane	76	7.559	7.559	(0.917)	82780	21.4206	21.42
84	1,4-Dichlorobenzene	146	10.251	10.251	(1.002)	114769	18.2286	18.22
26	2,2-Dichloropropane	77	4.276	4.268	(0.874)	54500	19.6601	19.66
24	2-Butanone	43	4.339	4.332	(0.887)	38940	43.2574	43.25
76	2-Chlorotoluene	91	9.542	9.542	(0.933)	135934	21.3540	21.35
52	2-Hexanone	43	7.649	7.645	(0.928)	61815	38.0525	38.05
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	154772	19.2803	19.28
82	p-Isopropyltoluene	119	10.206	10.206	(0.997)	183331	20.0152	20.01
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.838)	87418	40.2881	40.28
10	Acetone	43	2.484	2.472	(0.508)	86085	50.1613	50.16
37	Benzene	78	5.216	5.212	(0.927)	185765	20.8913	20.89
74	Bromobenzene	156	9.377	9.377	(0.916)	67452	18.9831	18.98
29	Bromochloromethane	128	4.553	4.549	(0.930)	28968	20.3007	20.30
39	Bromodichloromethane	83	6.345	6.345	(1.128)	57058	20.8045	20.80
66	Bromoform	173	8.980	8.980	(1.089)	31703	16.8222	16.82
6	Bromomethane	94	1.674	1.659	(0.342)	149921	22.9706	22.97
19	Carbon Disulfide	76	2.592	2.581	(0.530)	219684	40.9752	40.97
34	Carbon Tetrachloride	117	4.995	4.988	(0.888)	57820	20.2203	20.22
59	Chlorobenzene	112	8.272	8.271	(1.003)	145929	19.3750	19.37
7	Chloroethane	64	1.756	1.741	(0.359)	83325	23.6751	23.67
28	Chloroform	83	4.658	4.650	(0.952)	83831	20.5149	20.51
3	Chloromethane	50	1.348	1.333	(0.275)	54293	24.5900	24.58
27	cis-1,2-Dichloroethene	96	4.283	4.279	(0.875)	53768	19.5281	19.52
46	cis-1,3-Dichloropropene	75	6.757	6.753	(1.201)	63406	21.1720	21.17
55	Dibromochloromethane	129	7.754	7.754	(0.940)	46230	17.9287	17.92
44	Dibromomethane	93	6.187	6.183	(1.100)	33640	20.1796	20.17
2	Dichlorodifluoromethane	85	1.209	1.198	(0.247)	51361	20.8929	20.89
61	Ethylbenzene	106	8.369	8.365	(1.015)	74550	19.8537	19.85
91	Hexachlorobutadiene	225	12.062	12.061	(1.179)	21374	18.0541	18.05
67	Isopropylbenzene	105	9.123	9.122	(1.106)	208054	19.5392	19.53
62	m,p-Xylenes	106	8.470	8.470	(1.027)	184236	40.0941	40.09
17	Methylene Chloride	84	2.873	2.862	(0.587)	46946	21.3638	21.36
87	n-Butylbenzene	91	10.555	10.551	(1.032)	157667	20.5559	20.55
73	n-Propylbenzene	91	9.471	9.471	(0.926)	238276	20.7443	20.74
92	Naphthalene	128	12.129	12.129	(1.185)	194896	20.9656	20.96
63	o-Xylene	106	8.808	8.807	(1.068)	85642	18.3934	18.39
81	sec-Butylbenzene	105	10.082	10.082	(0.985)	199898	20.7721	20.77
64	Styrene	104	8.823	8.819	(1.070)	162048	20.0150	20.01
78	tert-Butylbenzene	119	9.899	9.898	(0.967)	145392	19.9919	19.99
56	Tetrachloroethene	166	7.522	7.522	(0.912)	54540	19.3444	19.34
50	Toluene	91	7.046	7.042	(0.855)	216908	19.3276	19.32
20	trans-1,2-Dichloroethene	96	3.143	3.132	(0.642)	44387	20.0703	20.07
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	58527	17.7575	17.75
38	Trichloroethene	130	5.861	5.857	(1.042)	53168	19.5198	19.51
8	Trichlorofluoromethane	101	1.959	1.944	(0.400)	220793	21.2870	21.28
5	Vinyl Chloride	62	1.423	1.411	(0.291)	117463	21.8511	21.85



Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111305.D
Date : 13-NOV-2019 12:28
Client ID: VLCSW-191113
Sample Info: VLCSW-191113;VLCSW-191113;3;;LCS
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

\\nahstws005\Target\chem\voa9.i\U191113.b\U111305.D

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111307.D Page 1
Report Date: 05-Dec-2019 16:34

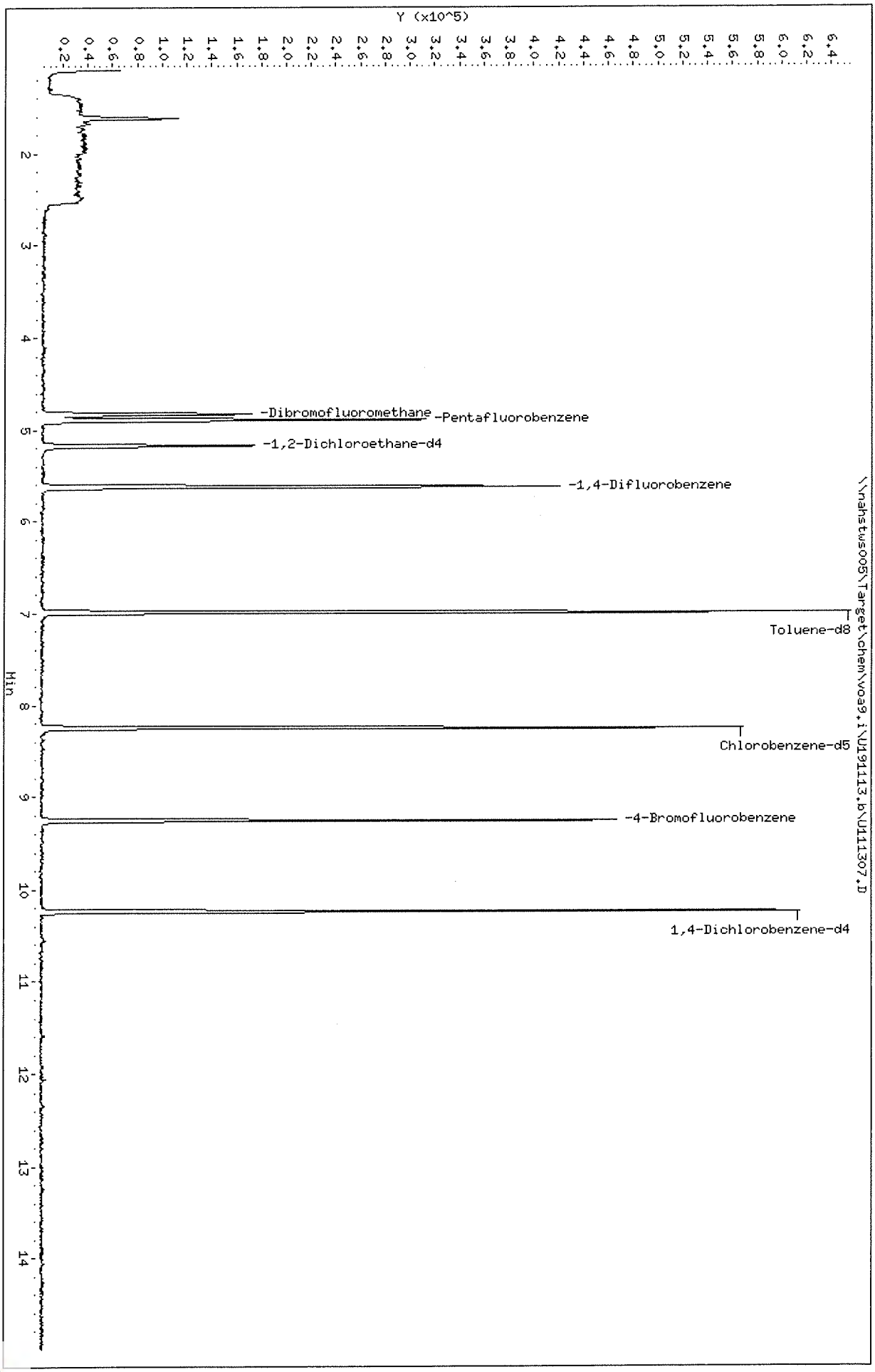
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111307.D
Lab Smp Id: VBLKW-191113 Client Smp ID: VBLKW-191113
Inj Date : 13-NOV-2019 13:17
Operator : PC Inst ID: VOA9.i
Smp Info : VBLKW-191113;VBLKW-191113;3;;BLANK
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:31 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
* 1 Pentafluorobenzene	168	4.890	4.890	(1.000)	219215	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.621	(1.000)	334989	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	294756	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	141552	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.167	(1.057)	103871	47.3715	47.37
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	107800	47.3660	47.36
$ 30 Dibromofluoromethane	113	4.826	4.823	(0.987)	88883	41.1088	41.10
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	383493	52.4023	52.40



Data File: \\nahstws005\Target\chem\voa9,i\U191113,b\U111307.D
Date : 13-NOV-2019 13:17
Client ID: VBLKW-191113
Sample Info: VBLKW-191113;VBLKW-191113;3;;BLANK
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111312.D Page 1
Report Date: 05-Dec-2019 16:36

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111312.D
Lab Smp Id: HS19110486-05 Client Smp ID: HS19110486-05
Inj Date : 13-NOV-2019 15:18
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110486-05;HS19110486-05;;;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:34 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 12
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

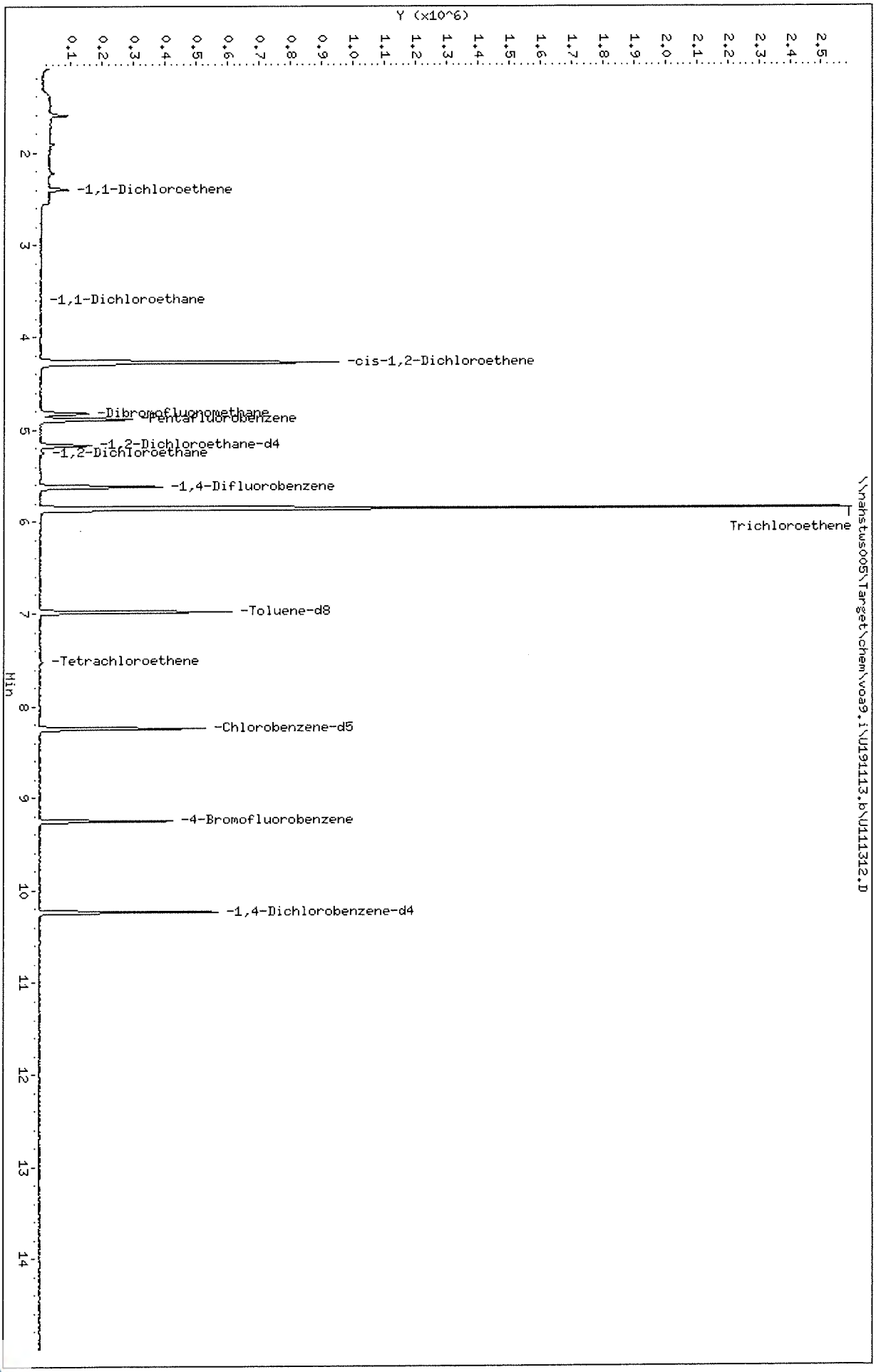
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.886	4.890	(1.000)	201034	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.621	(1.000)	307425	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	272179	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	133550	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.167	5.167	(1.058)	93595	46.5287	46.52
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	101821	48.4349	48.43
$ 30 Dibromofluoromethane	113	4.823	4.823	(0.987)	88122	44.4381	44.43
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	362425	53.6283	53.62
22 1,1-Dichloroethane	63	3.601	3.593	(0.737)	1182	0.41431	0.41(a)
11 1,1-Dichloroethene	96	2.390	2.390	(0.489)	22339	4.75742	4.75(a)
33 1,2-Dichloroethane	62	5.246	5.246	(0.934)	6080	2.65685	2.65(a)
27 cis-1,2-Dichloroethene	96	4.279	4.279	(0.876)	457781	199.913	199.91
56 Tetrachloroethene	166	7.518	7.522	(0.912)	2483	1.20347	1.20(a)
38 Trichloroethene	130	5.857	5.857	(1.043)	764781	375.732	375.73(A)

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\voa9.i\UJ191113.b\UJ111312.D
Date : 13-NOV-2019 15:18
Client ID: HS19110486-05
Sample Info: HS19110486-05;HS19110486-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111312.D Page 3

Date : 13-NOV-2019 15:18

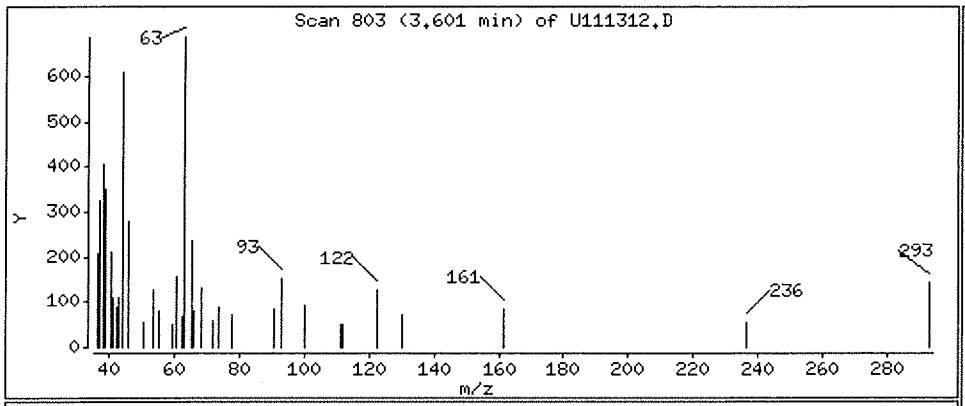
Client ID: HS19110486-05 Instrument: VOA9.i

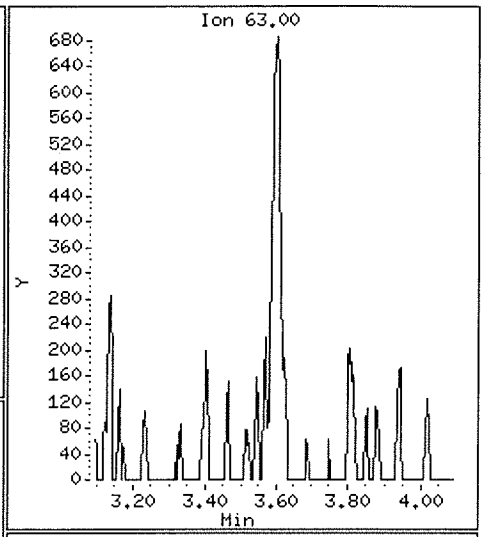
Sample Info: HS19110486-05;HS19110486-05;;;

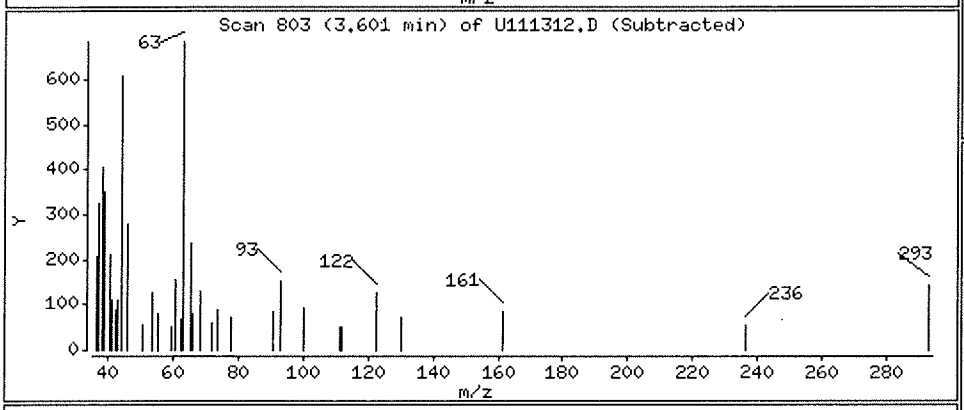
Purge Volume: 5.0 Operator: PC

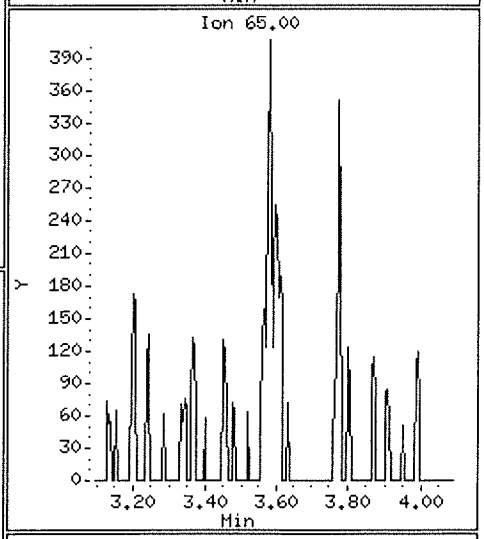
Column phase: DB624 Column diameter: 0.18

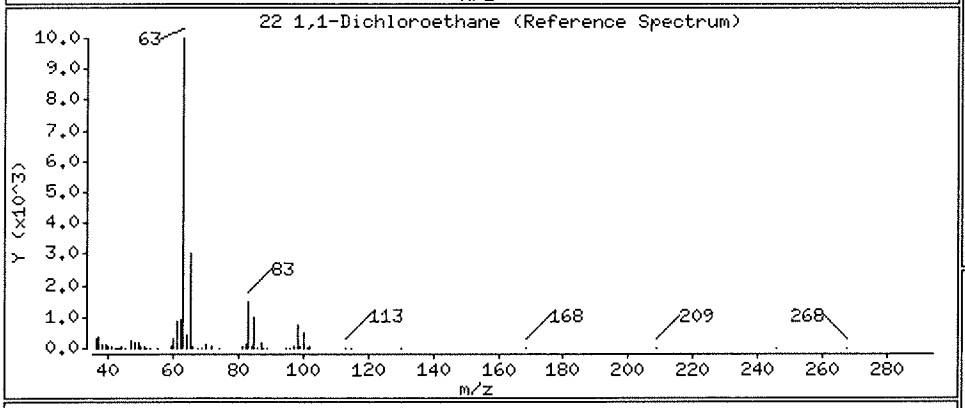
22 1,1-Dichloroethane Concentration: 0.41 ug/l

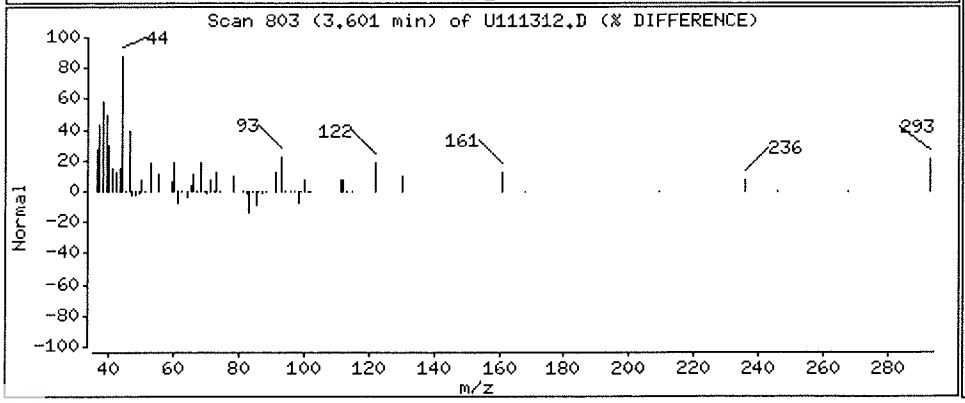


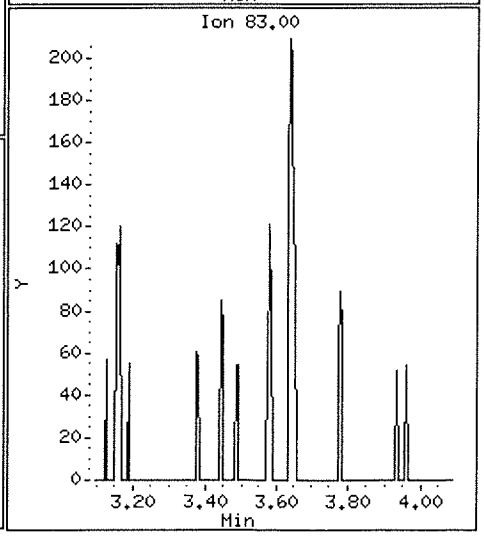












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111312.D

Date : 13-NOV-2019 15:18

Client ID: HS19110486-05

Instrument: VOA9.i

Sample Info: HS19110486-05;HS19110486-05;;;

Purge Volume: 5.0

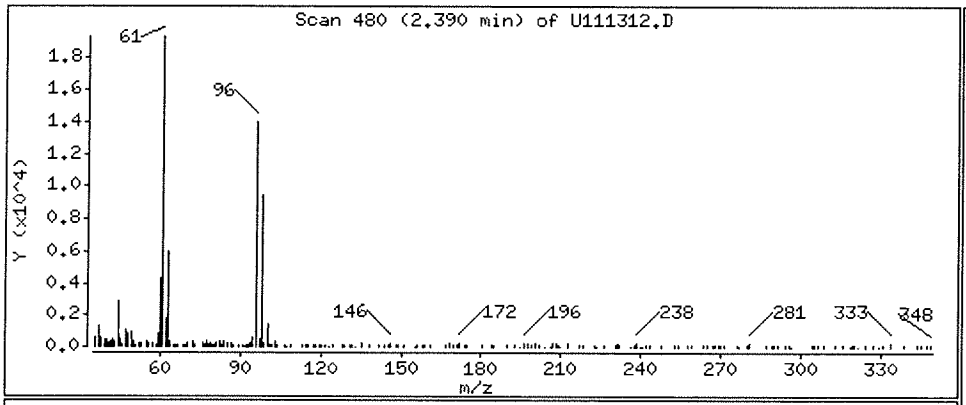
Operator: PC

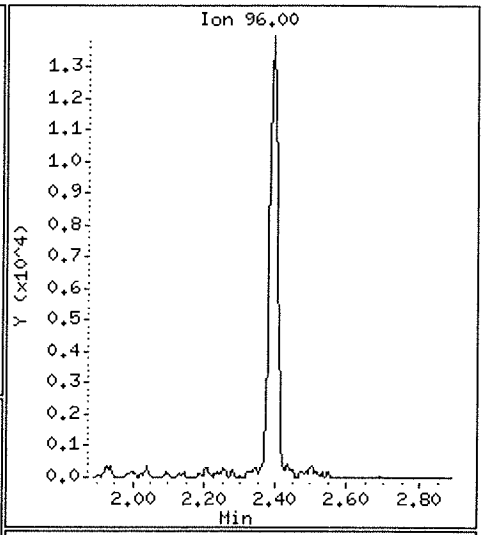
Column phase: DB624

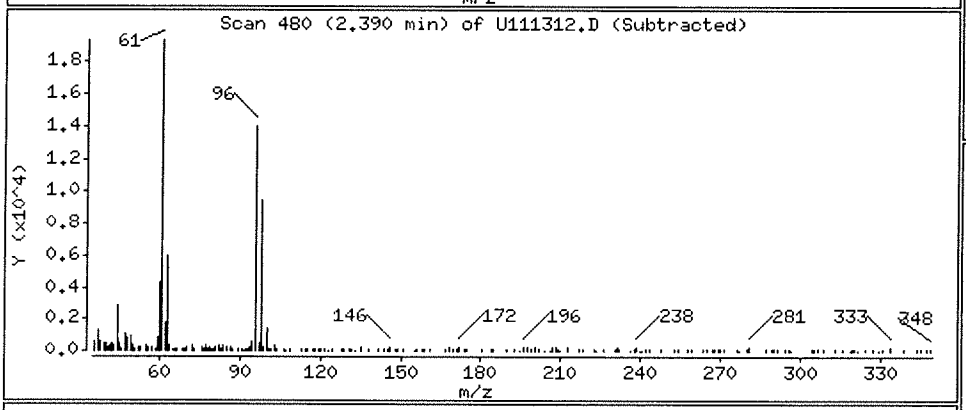
Column diameter: 0.18

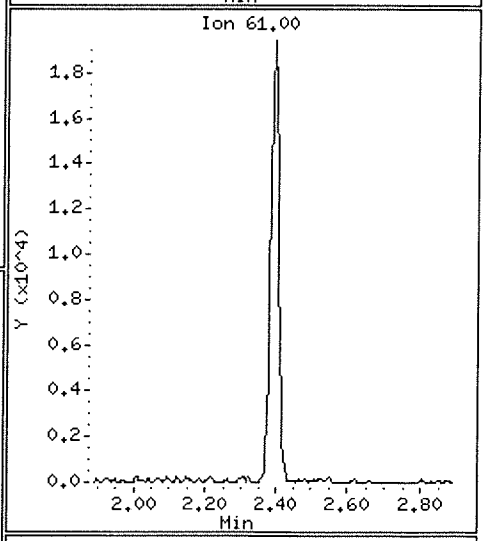
11 1,1-Dichloroethene

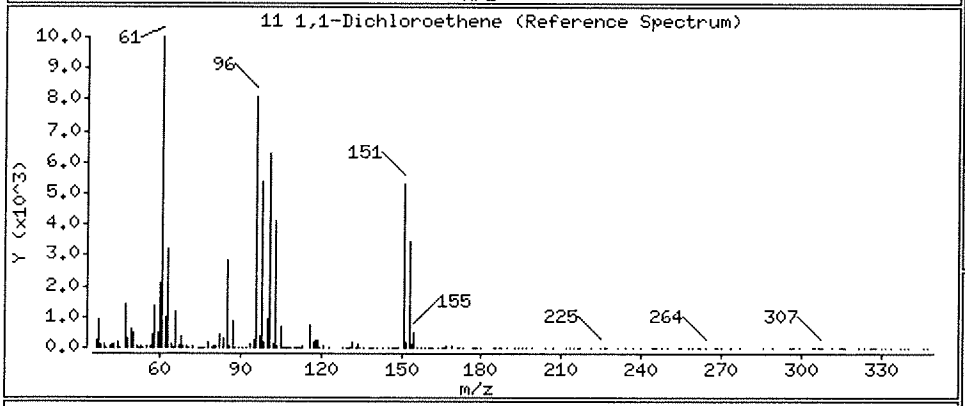
Concentration: 4.75 ug/l

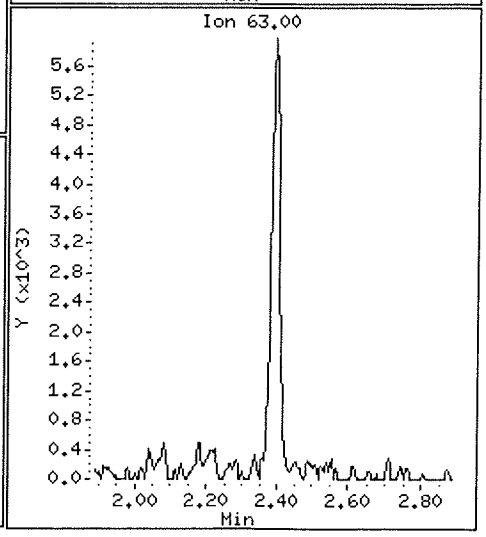


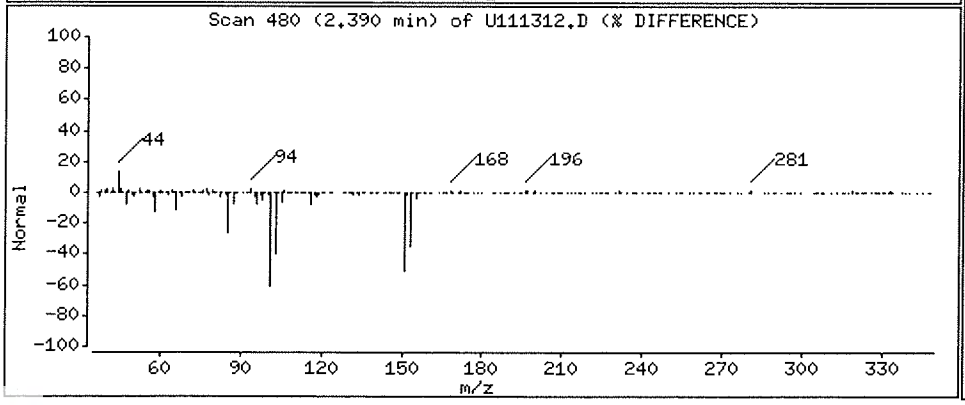












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111312.D Page 5

Date : 13-NOV-2019 15:18

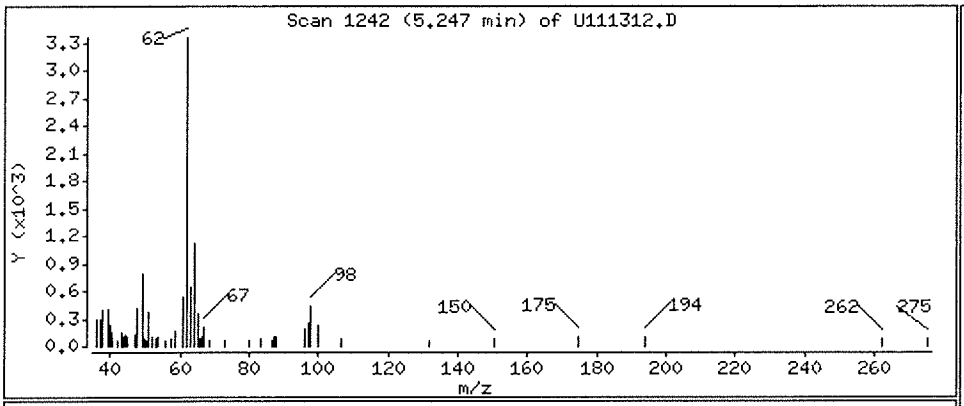
Client ID: HS19110486-05 Instrument: VOA9.i

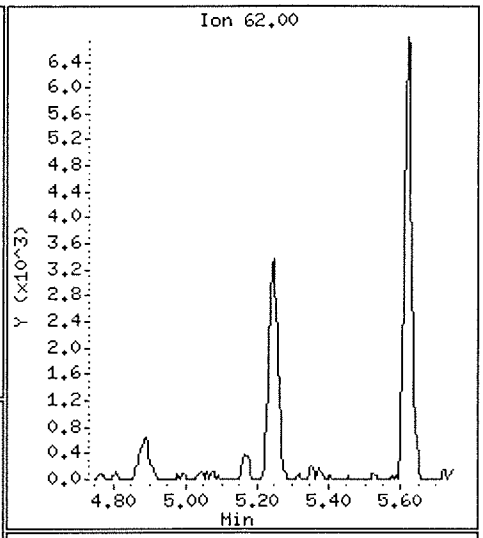
Sample Info: HS19110486-05;HS19110486-05;;;

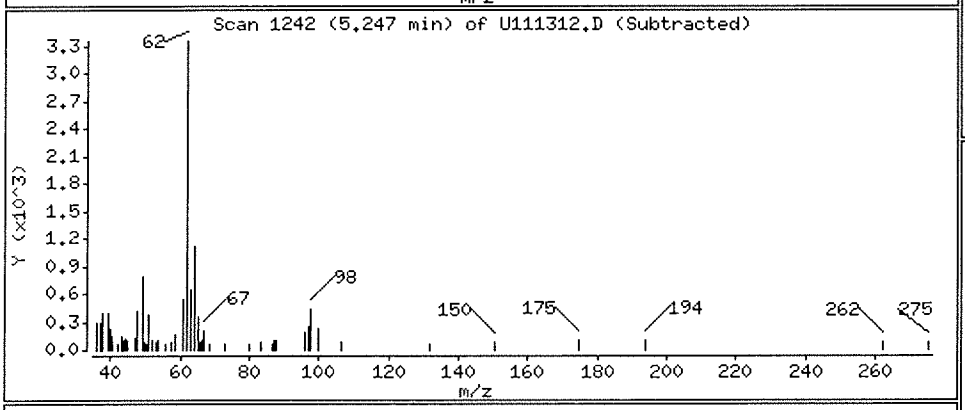
Purge Volume: 5.0 Operator: PC

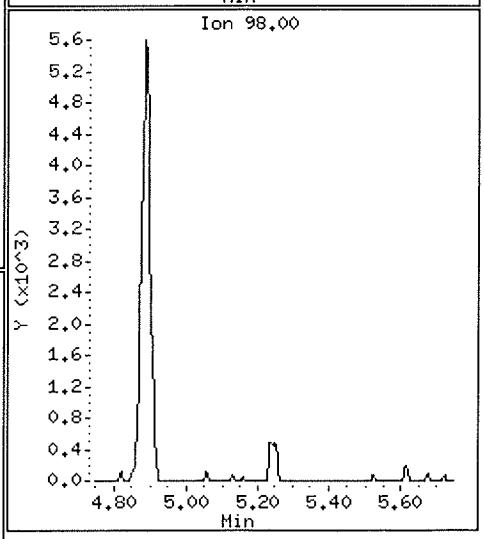
Column phase: DB624 Column diameter: 0.18

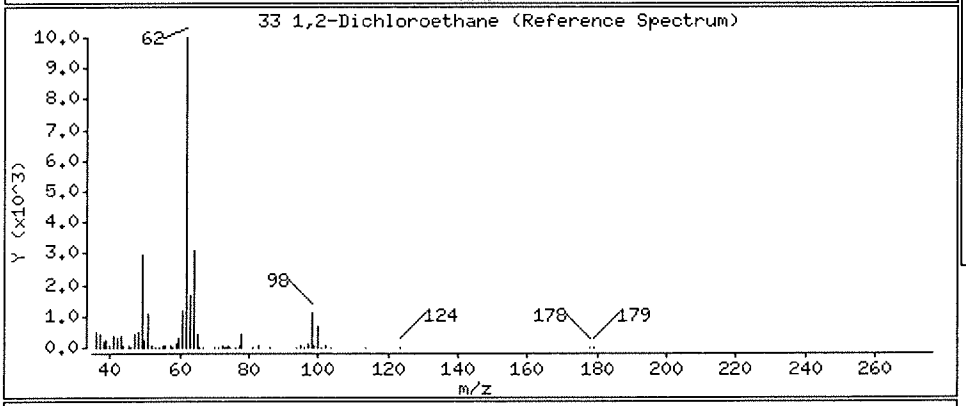
33 1,2-Dichloroethane Concentration: 2.65 ug/l

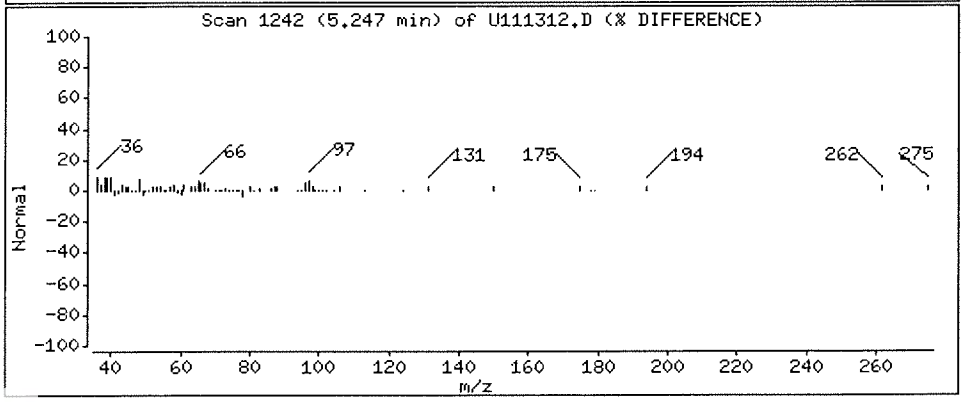












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111312.D Page 6

Date : 13-NOV-2019 15:18

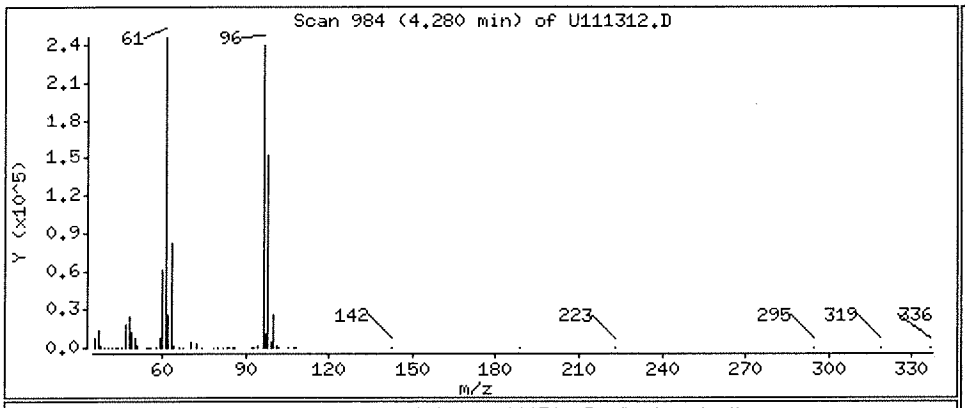
Client ID: HS19110486-05 Instrument: VOA9.i

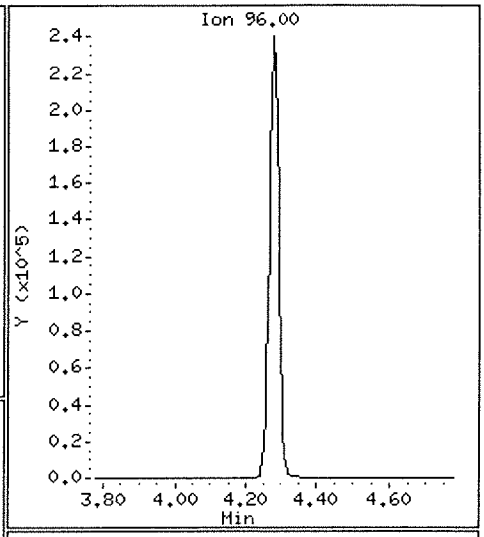
Sample Info: HS19110486-05;HS19110486-05;;;

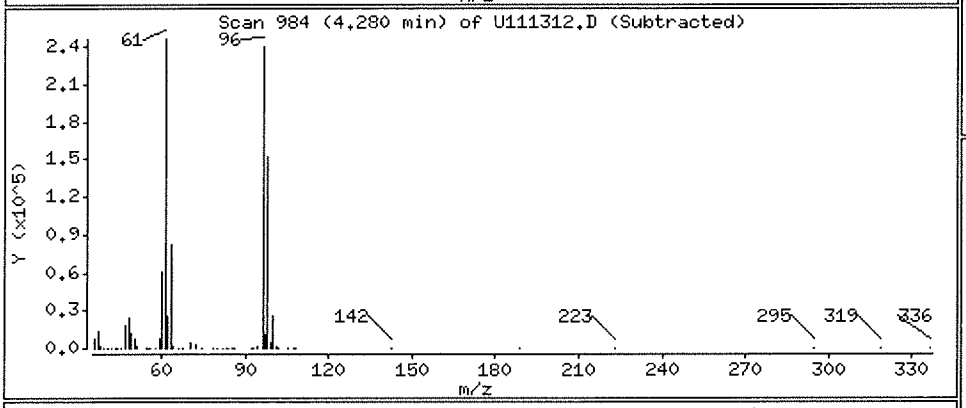
Purge Volume: 5.0 Operator: PC

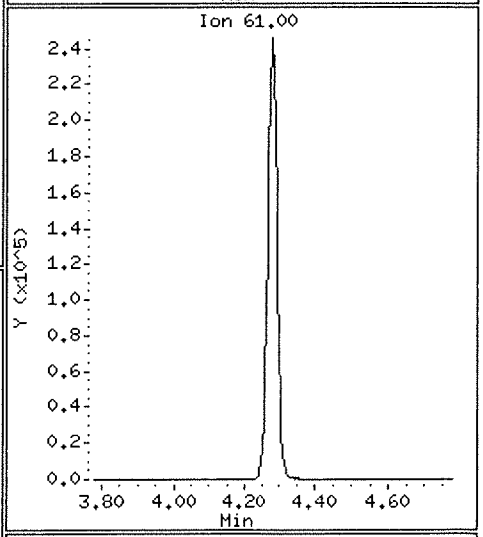
Column phase: DB624 Column diameter: 0.18

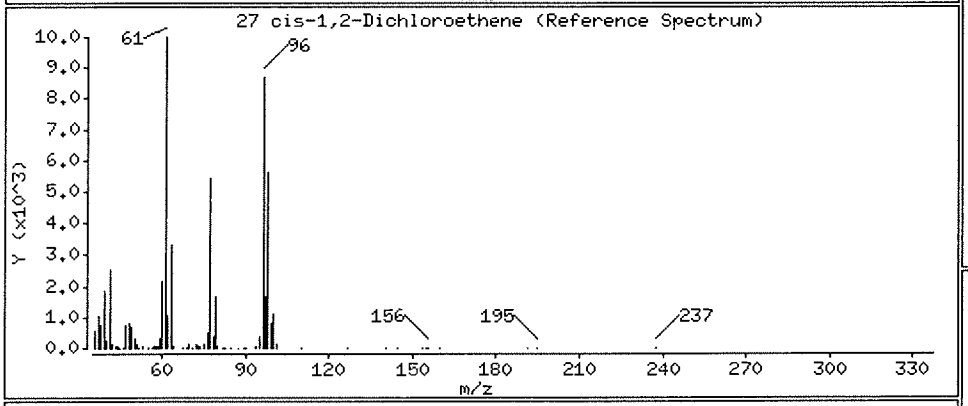
27 cis-1,2-Dichloroethene Concentration: 199.91 ug/l

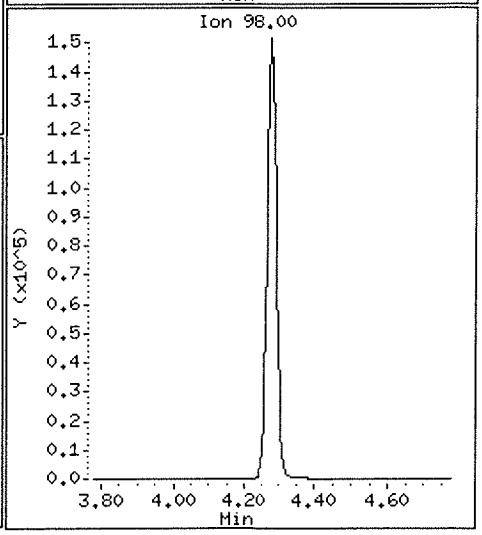


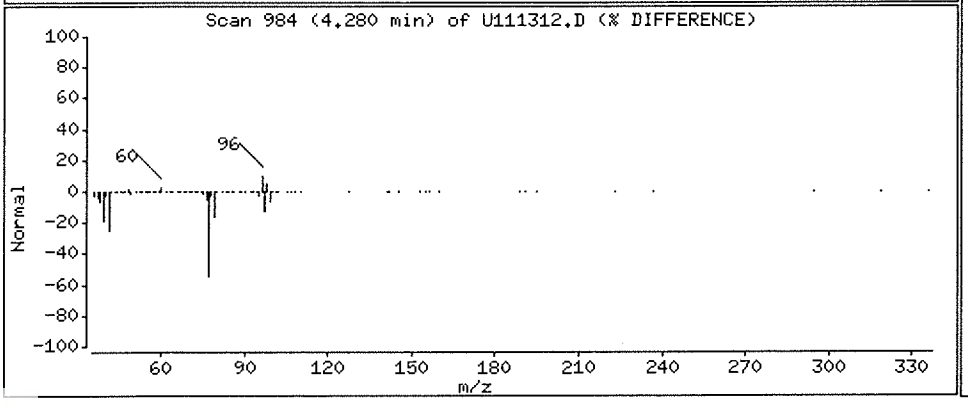












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111312.D

Date : 13-NOV-2019 15:18

Client ID: HS19110486-05

Instrument: VOA9.i

Sample Info: HS19110486-05;HS19110486-05;;;

Purge Volume: 5.0

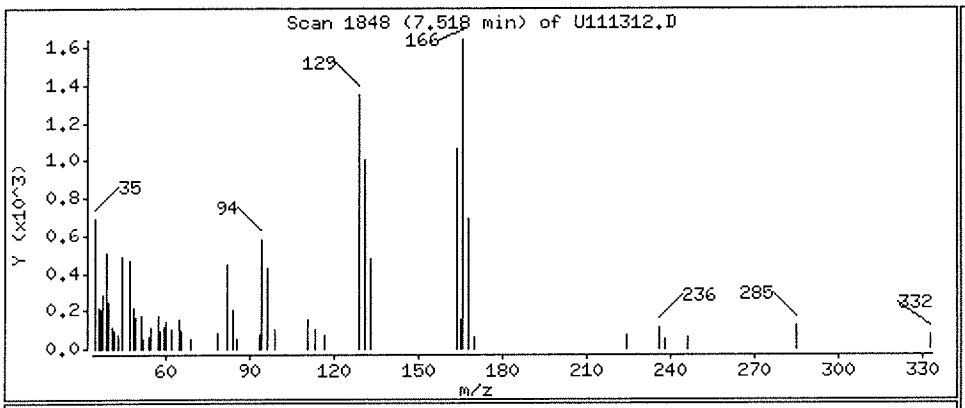
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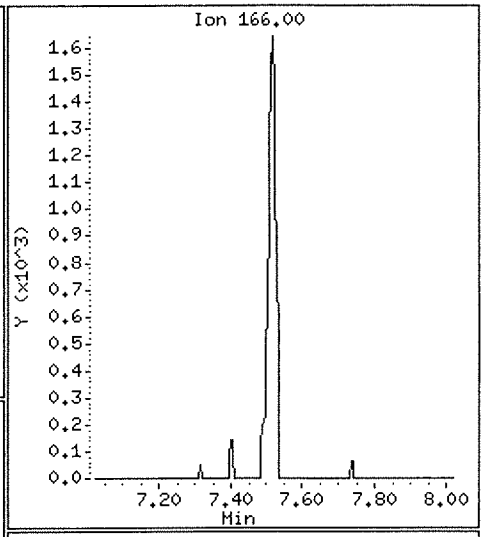
Column phase: DB624

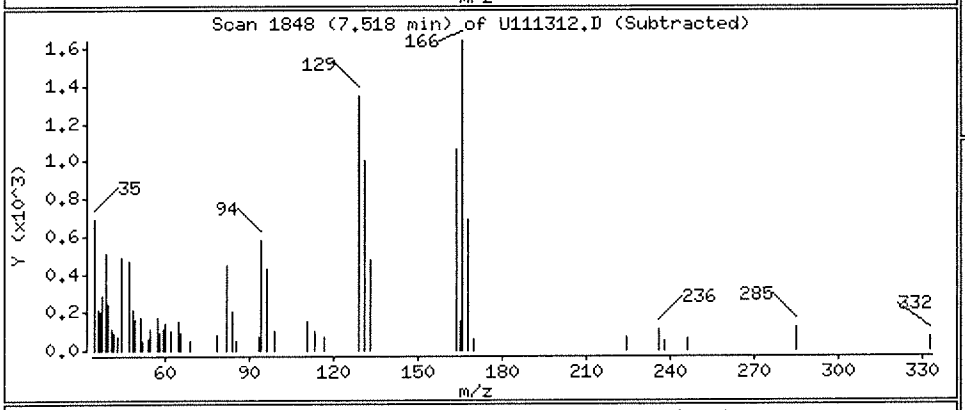
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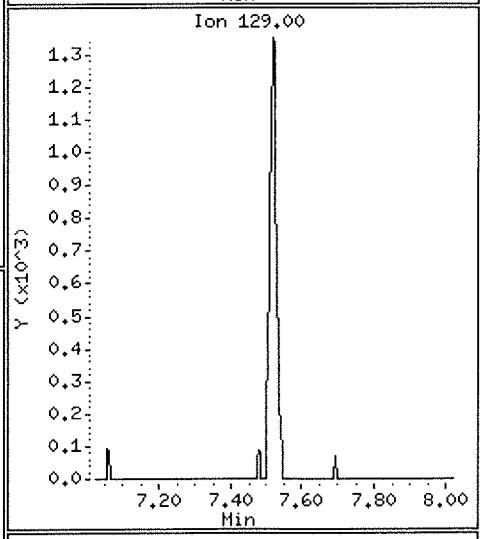
56 Tetrachloroethene

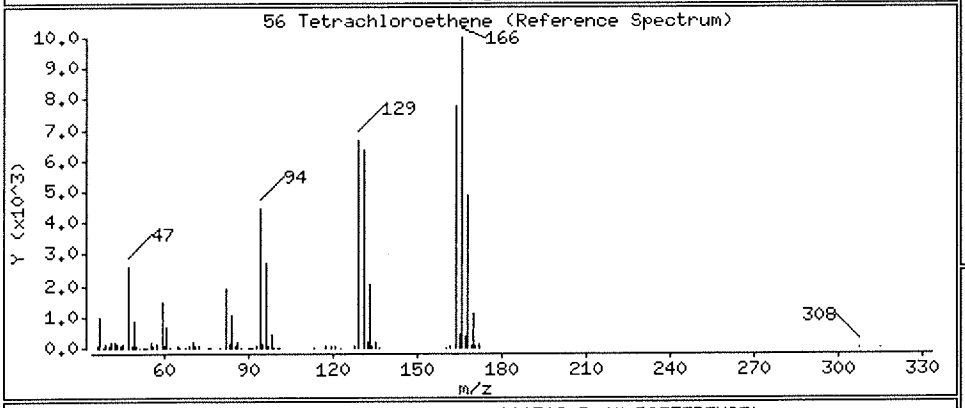
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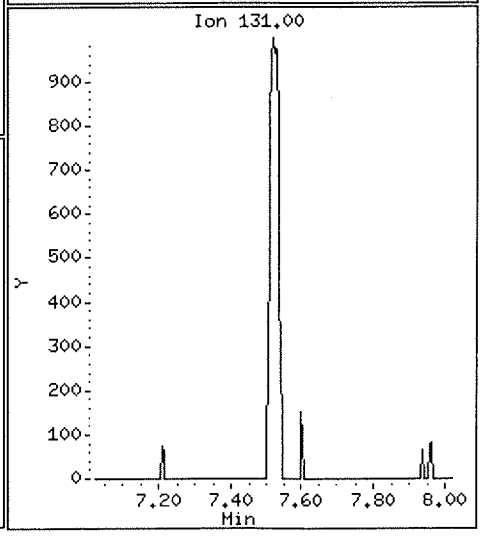


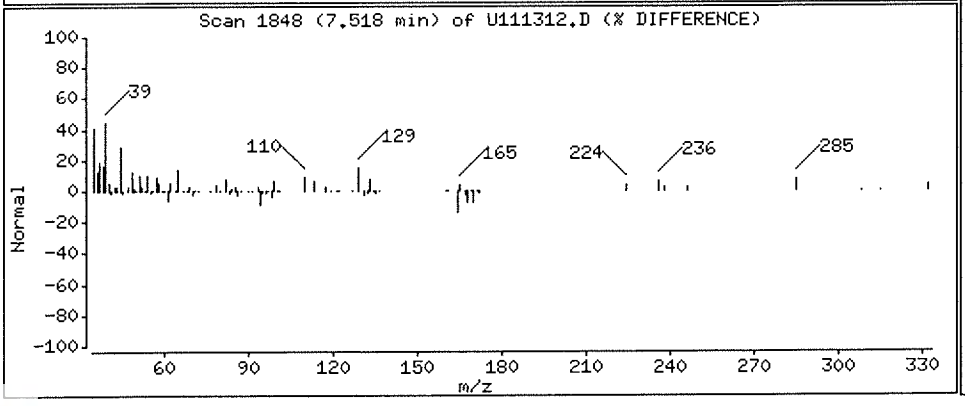












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111312.D Page 8

Date : 13-NOV-2019 15:18

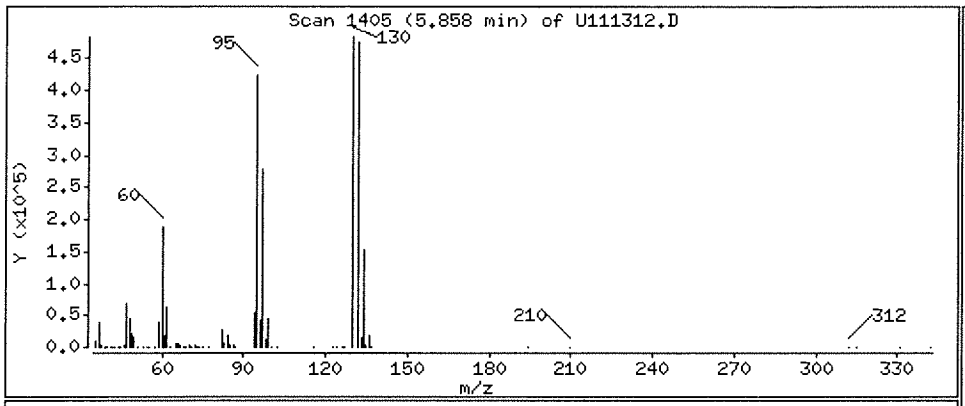
Client ID: HS19110486-05 Instrument: VOA9.i

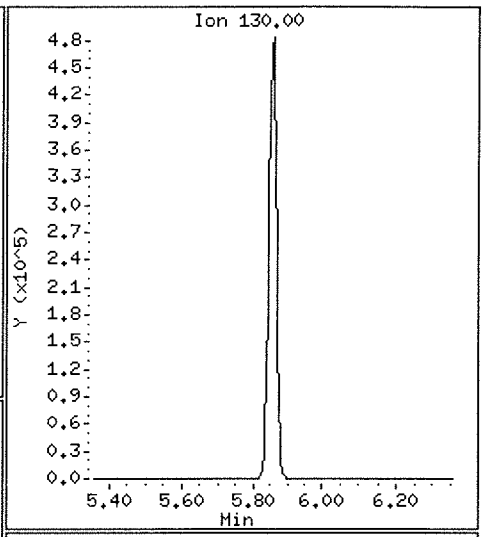
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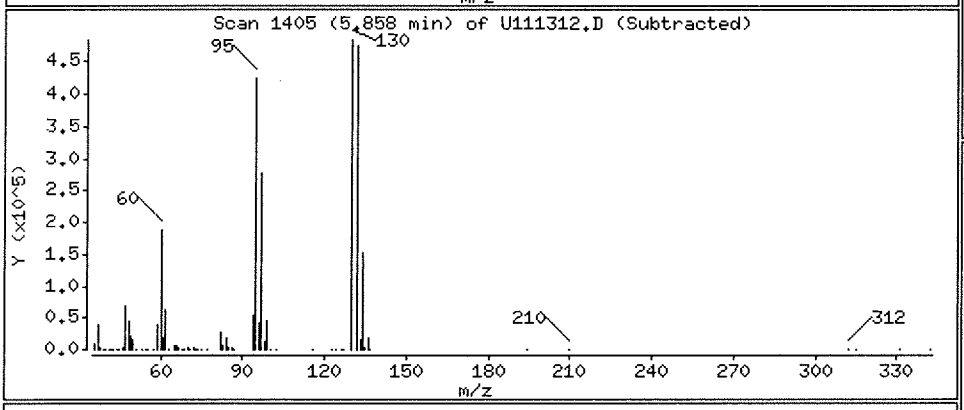
Purge Volume: 5.0 Operator: PC

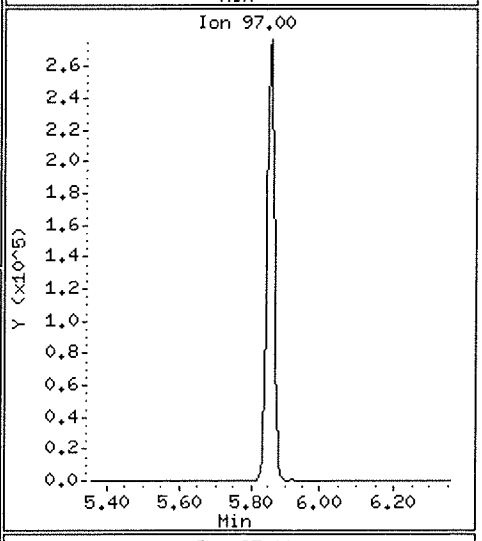
Column phase: DB624 Column diameter: 0.18

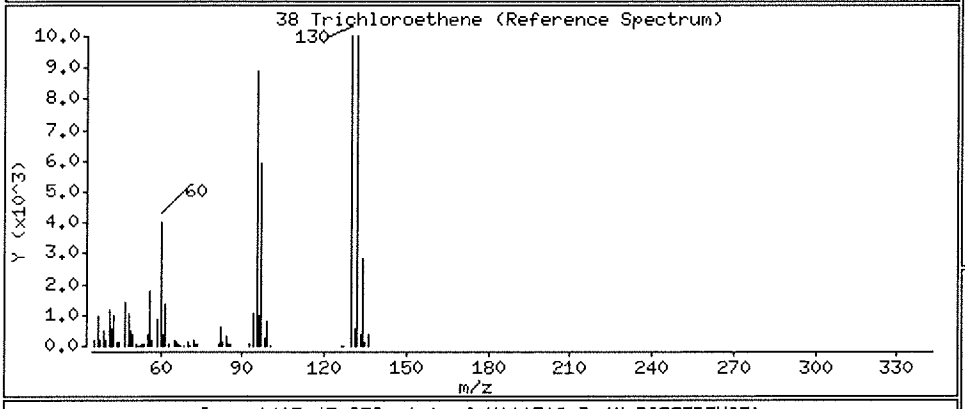
38 Trichloroethene Concentration: 375.73 ug/l

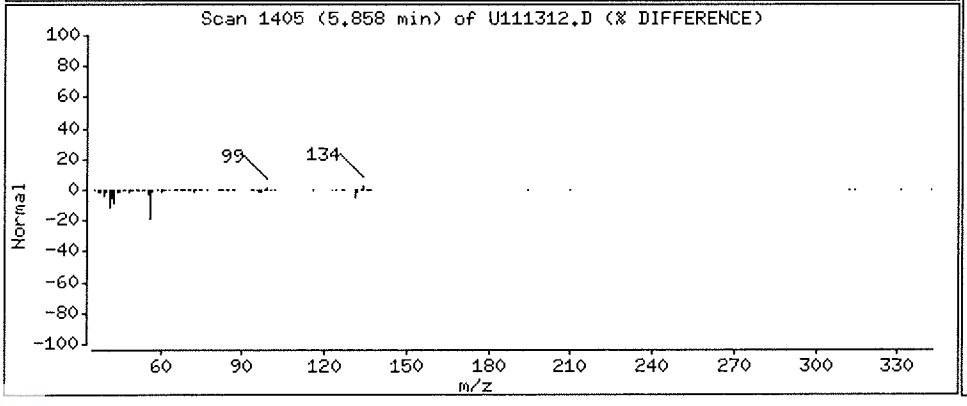


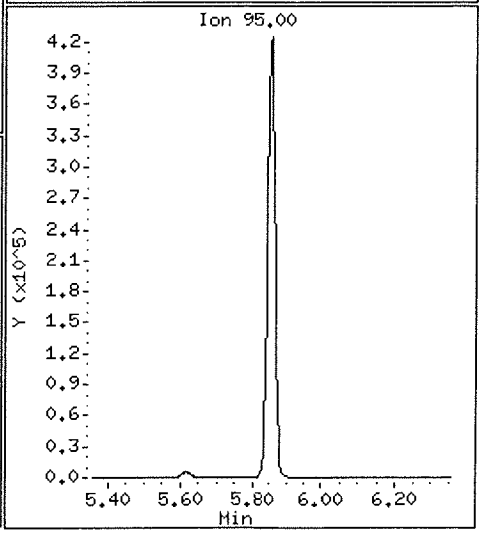












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111313.D Page 1
Report Date: 05-Dec-2019 16:34

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111313.D
Lab Smp Id: HS19110613-01MS Client Smp ID: HS19110613-01MS
Inj Date : 13-NOV-2019 15:43
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110613-01MS;HS19110613-01MS;3;;MS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:31 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 13 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

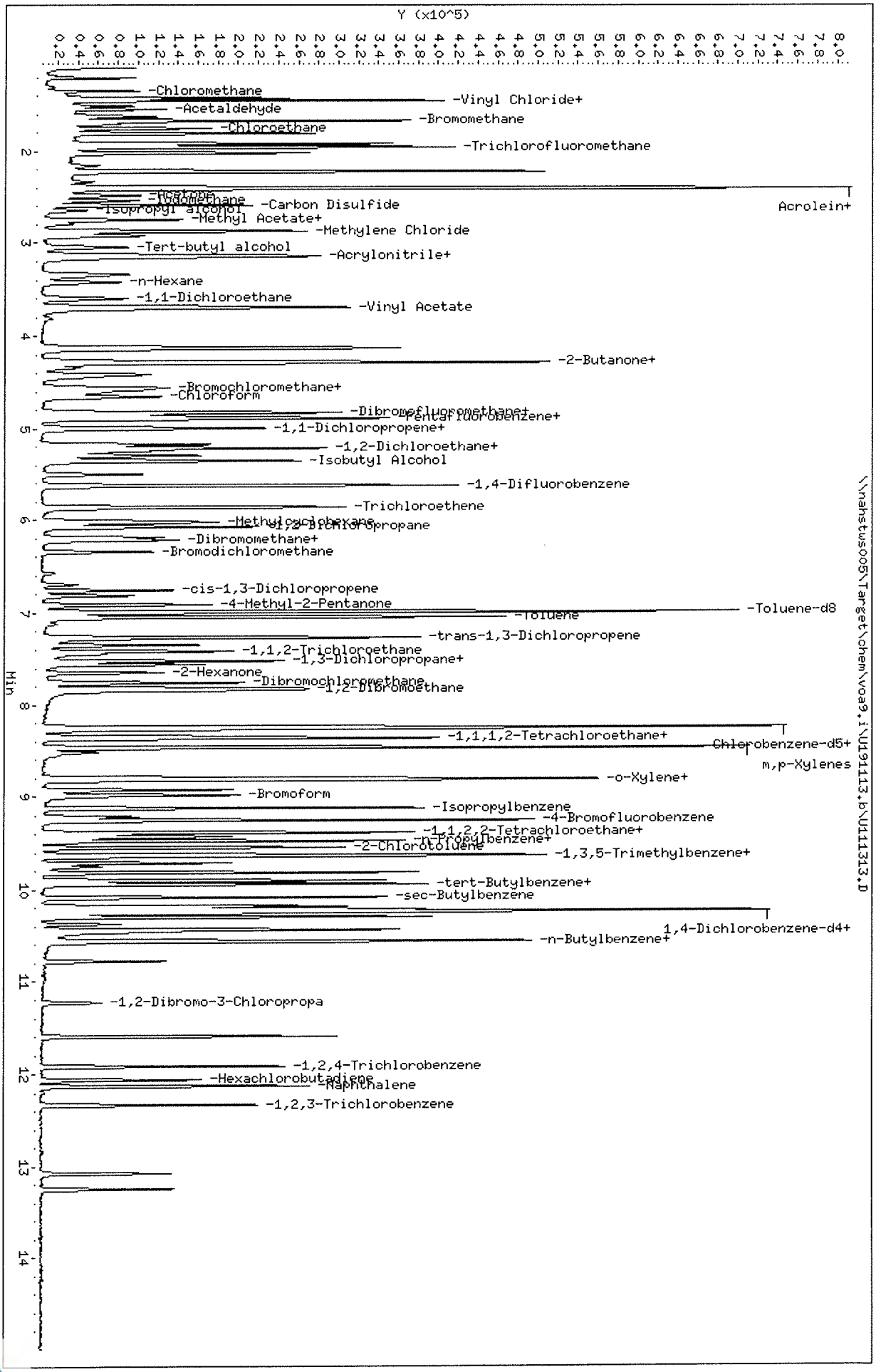
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.890	4.890	(1.000)	217868	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.621	(1.000)	330083	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	304074	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	161169	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.167	(1.057)	97217	44.5556	44.55
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	115961	49.3625	49.36
$ 30 Dibromofluoromethane	113	4.827	4.823	(0.987)	95699	44.5298	44.52
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	392771	52.0264	52.02
60 1,1,1,2-Tetrachloroethane	131	8.347	8.346	(1.012)	46648	22.4322	22.43
31 1,1,1-Trichloroethane	97	4.827	4.823	(0.987)	77710	23.9780	23.97
68 1,1,2,2-Tetrachloroethane	83	9.385	9.389	(0.917)	71775	25.1050	25.10
138 Freon TF	101	2.401	2.393	(0.491)	137464	28.2831	28.28
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	39929	25.2740	25.27
22 1,1-Dichloroethane	63	3.601	3.593	(0.736)	75688	24.4801	24.48
11 1,1-Dichloroethene	96	2.401	2.390	(0.491)	136448	26.8133	26.81
32 1,1-Dichloropropene	75	4.999	4.999	(0.889)	65288	29.4942	29.49
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	60215	23.7523	23.75
71 1,2,3-Trichloropropane	75	9.422	9.422	(0.921)	67192	24.5372	24.53
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	66575	23.2017	23.20
79 1,2,4-Trimethylbenzene	105	9.940	9.940	(0.971)	191476	25.6158	25.61
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	10917	20.4218	20.42
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	52922	23.1281	23.12
88 1,2-Dichlorobenzene	146	10.566	10.566	(1.033)	114370	23.5577	23.55

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111313.D Page 2
Report Date: 05-Dec-2019 16:34

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.246	(0.934)	64966	26.4402	26.44
42	1,2-Dichloropropane	63	6.079	6.075	(1.081)	43274	27.9777	27.97
75	1,3,5-Trimethylbenzene	105	9.621	9.621	(0.940)	183697	26.1582	26.15
83	1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	115402	24.2000	24.19
54	1,3-Dichloropropane	76	7.559	7.559	(0.917)	85227	26.9758	26.97
84	1,4-Dichlorobenzene	146	10.251	10.251	(1.002)	118433	22.9340	22.93
26	2,2-Dichloropropane	77	4.272	4.268	(0.874)	55799	22.3325	22.33
24	2-Butanone	43	4.339	4.332	(0.887)	36045	44.4723	44.47
76	2-Chlorotoluene	91	9.542	9.542	(0.933)	143137	27.4146	27.41
52	2-Hexanone	43	7.649	7.645	(0.928)	60147	45.2891	45.28
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	162515	24.6828	24.68
82	p-Isopropyltoluene	119	10.206	10.206	(0.997)	194522	25.8924	25.89
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.838)	85987	48.4730	48.47
10	Acetone	43	2.484	2.472	(0.508)	71453	45.2951	45.29
37	Benzene	78	5.216	5.212	(0.928)	199945	28.0249	28.02
74	Bromobenzene	156	9.377	9.377	(0.916)	66935	22.9670	22.96
29	Bromochloromethane	128	4.553	4.549	(0.931)	29239	22.7341	22.73
39	Bromodichloromethane	83	6.345	6.345	(1.129)	56096	25.4920	25.49
66	Bromoform	173	8.980	8.980	(1.089)	32052	20.2826	20.28
6	Bromomethane	94	1.666	1.659	(0.341)	162211	27.4930	27.49
19	Carbon Disulfide	76	2.589	2.581	(0.529)	242907	50.2672	50.26
34	Carbon Tetrachloride	117	4.995	4.988	(0.889)	62815	27.3782	27.37
59	Chlorobenzene	112	8.272	8.271	(1.003)	149732	24.3167	24.31
7	Chloroethane	64	1.753	1.741	(0.358)	92050	29.4126	29.41
28	Chloroform	83	4.654	4.650	(0.952)	86518	23.4906	23.49
3	Chloromethane	50	1.344	1.333	(0.275)	57447	29.0792	29.07
27	cis-1,2-Dichloroethene	96	4.283	4.279	(0.876)	213242	85.9275	85.92
46	cis-1,3-Dichloropropene	75	6.753	6.753	(1.201)	64089	26.6715	26.67
55	Dibromochloromethane	129	7.754	7.754	(0.940)	47637	21.9343	21.93
44	Dibromomethane	93	6.187	6.183	(1.101)	35045	26.2008	26.20
2	Dichlorodifluoromethane	85	1.205	1.198	(0.247)	47916	21.6257	21.62
61	Ethylbenzene	106	8.369	8.365	(1.015)	78130	25.4509	25.45
91	Hexachlorobutadiene	225	12.062	12.061	(1.179)	24415	25.1435	25.14
67	Isopropylbenzene	105	9.123	9.122	(1.106)	227701	26.1570	26.15
62	m,p-Xylenes	106	8.470	8.470	(1.027)	191846	51.0681	51.06
17	Methylene Chloride	84	2.870	2.862	(0.587)	79666	39.4271	39.42
87	n-Butylbenzene	91	10.555	10.551	(1.032)	171943	27.3312	27.33
73	n-Propylbenzene	91	9.471	9.471	(0.926)	256042	27.1774	27.17
92	Naphthalene	128	12.129	12.129	(1.185)	190123	24.9355	24.93
63	o-Xylene	106	8.808	8.807	(1.068)	96795	25.4284	25.42
81	sec-Butylbenzene	105	10.082	10.082	(0.985)	211977	26.8559	26.85
64	Styrene	104	8.823	8.819	(1.070)	168057	25.3898	25.38
78	tert-Butylbenzene	119	9.899	9.898	(0.967)	160489	26.9054	26.90
56	Tetrachloroethene	166	7.522	7.522	(0.912)	57492	24.9425	24.94
50	Toluene	91	7.046	7.042	(0.855)	228252	24.8775	24.87
20	trans-1,2-Dichloroethene	96	3.143	3.132	(0.643)	45653	22.6382	22.63
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	57641	21.6277	21.62
38	Trichloroethene	130	5.861	5.857	(1.043)	80736	36.9424	36.94
8	Trichlorofluoromethane	101	1.955	1.944	(0.400)	245266	26.2355	26.23
5	Vinyl Chloride	62	1.419	1.411	(0.290)	135342	27.9337	27.93



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Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111314.D Page 1
Report Date: 05-Dec-2019 16:34

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111314.D
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Inj Date : 13-NOV-2019 16:07
Operator : PC Inst ID: VOA9.i
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Misc Info : 180315V9;WATER;0;1;
Comment   :
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Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

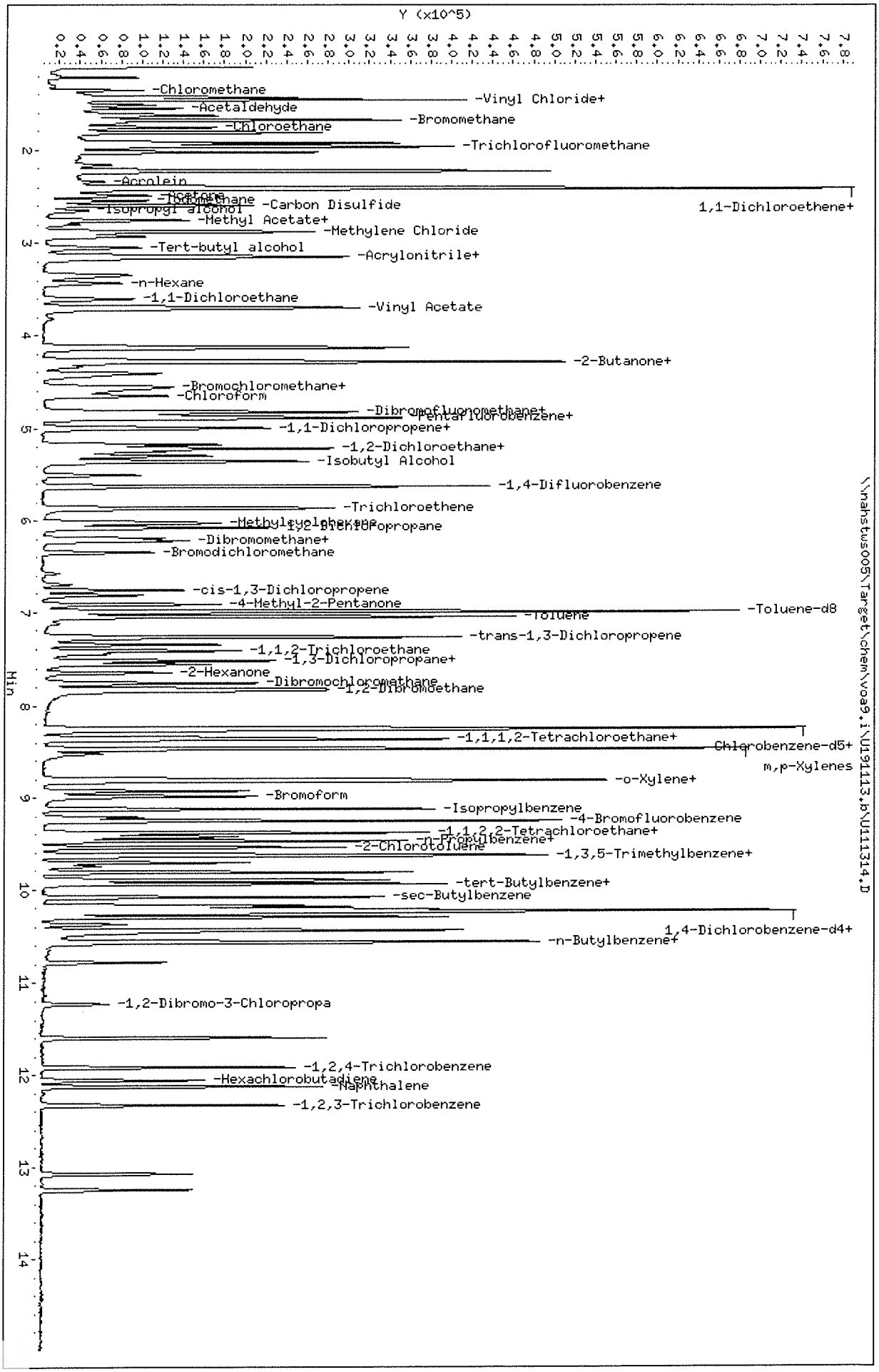
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.890	(1.000)	222266	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.621	(1.000)	331883	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	310603	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	165437	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.167	(1.057)	98171	44.0929	44.09
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	116828	48.6951	48.69
$ 30 Dibromofluoromethane	113	4.830	4.823	(0.987)	101180	46.1413	46.14
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	391379	50.7555	50.75
60 1,1,1,2-Tetrachloroethane	131	8.347	8.346	(1.012)	47251	22.2590	22.25
31 1,1,1-Trichloroethane	97	4.827	4.823	(0.986)	73112	22.1129	22.11
68 1,1,2,2-Tetrachloroethane	83	9.389	9.389	(0.918)	72287	24.6318	24.63
138 Freon TF	101	2.405	2.393	(0.491)	130382	26.2952	26.29
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	41019	25.4182	25.41
22 1,1-Dichloroethane	63	3.604	3.593	(0.737)	75161	23.8286	23.82
11 1,1-Dichloroethene	96	2.405	2.390	(0.491)	127882	24.6328	24.63
32 1,1-Dichloropropene	75	5.003	4.999	(0.889)	60735	27.2886	27.28
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	67360	25.8852	25.88
71 1,2,3-Trichloropropane	75	9.422	9.422	(0.921)	70202	24.9750	24.97
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	65578	22.2646	22.26
79 1,2,4-Trimethylbenzene	105	9.940	9.940	(0.971)	188144	24.5207	24.52
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	11168	20.3578	20.35
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	54928	23.5002	23.50
88 1,2-Dichlorobenzene	146	10.566	10.566	(1.033)	119792	24.0380	24.03

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111314.D Page 2
Report Date: 05-Dec-2019 16:34

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33	1,2-Dichloroethane	62	5.254	5.246	(0.934)	67342	27.2586	27.25
42	1,2-Dichloropropane	63	6.079	6.075	(1.081)	46577	30.0619	30.06
75	1,3,5-Trimethylbenzene	105	9.621	9.621	(0.940)	171900	23.8469	23.84
83	1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	112328	22.9476	22.94
54	1,3-Dichloropropane	76	7.559	7.559	(0.917)	83069	25.7401	25.74
84	1,4-Dichlorobenzene	146	10.251	10.251	(1.002)	114748	21.6471	21.64
26	2,2-Dichloropropane	77	4.279	4.268	(0.874)	56437	22.1409	22.14
24	2-Butanone	43	4.339	4.332	(0.887)	38753	46.9605	46.96
76	2-Chlorotoluene	91	9.542	9.542	(0.933)	133653	24.9378	24.93
52	2-Hexanone	43	7.649	7.645	(0.928)	63834	47.0550	47.05
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	165205	24.4440	24.44
82	p-Isopropyltoluene	119	10.206	10.206	(0.997)	190751	24.7354	24.73
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.838)	90336	49.8542	49.85
10	Acetone	43	2.484	2.472	(0.508)	69210	42.4307	42.43
37	Benzene	78	5.216	5.212	(0.927)	190620	26.5730	26.57
74	Bromobenzene	156	9.381	9.377	(0.917)	64920	21.7009	21.70
29	Bromochloromethane	128	4.557	4.549	(0.931)	30249	23.0540	23.05
39	Bromodichloromethane	83	6.345	6.345	(1.128)	56192	25.3971	25.39
66	Bromoform	173	8.980	8.980	(1.089)	32801	20.3161	20.31
6	Bromomethane	94	1.674	1.659	(0.342)	152896	25.4427	25.44
19	Carbon Disulfide	76	2.592	2.581	(0.530)	241280	48.9426	48.94
34	Carbon Tetrachloride	117	4.995	4.988	(0.888)	59148	25.6401	25.64
59	Chlorobenzene	112	8.272	8.271	(1.003)	143678	22.8431	22.84
7	Chloroethane	64	1.756	1.741	(0.359)	86764	27.0419	27.04
28	Chloroform	83	4.658	4.650	(0.952)	86807	23.1027	23.10
3	Chloromethane	50	1.348	1.333	(0.275)	55190	27.3129	27.31
27	cis-1,2-Dichloroethene	96	4.287	4.279	(0.876)	211588	83.5739	83.57
46	cis-1,3-Dichloropropene	75	6.757	6.753	(1.201)	67095	27.7710	27.77
55	Dibromochloromethane	129	7.754	7.754	(0.940)	46111	20.9187	20.91
44	Dibromomethane	93	6.187	6.183	(1.100)	36729	27.3109	27.31
2	Dichlorodifluoromethane	85	1.209	1.198	(0.247)	46887	20.7425	20.74
61	Ethylbenzene	106	8.369	8.365	(1.015)	75914	24.2092	24.20
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	23159	23.2347	23.23
67	Isopropylbenzene	105	9.122	9.122	(1.106)	221592	24.9201	24.92
62	m,p-Xylenes	106	8.470	8.470	(1.027)	186488	48.5984	48.59
17	Methylene Chloride	84	2.873	2.862	(0.587)	81752	39.6536	39.65
87	n-Butylbenzene	91	10.551	10.551	(1.031)	164660	25.4983	25.49
73	n-Propylbenzene	91	9.471	9.471	(0.926)	248092	25.6542	25.65
92	Naphthalene	128	12.129	12.129	(1.185)	194702	24.8773	24.87
63	o-Xylene	106	8.808	8.807	(1.068)	94341	24.2628	24.26
81	sec-Butylbenzene	105	10.082	10.082	(0.985)	209987	25.9175	25.91
64	Styrene	104	8.823	8.819	(1.070)	160726	23.7718	23.77
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	157881	25.7853	25.78
56	Tetrachloroethene	166	7.522	7.522	(0.912)	55792	23.6962	23.69
50	Toluene	91	7.046	7.042	(0.855)	220021	23.4763	23.47
20	trans-1,2-Dichloroethene	96	3.143	3.132	(0.642)	47710	23.1443	23.14
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	58035	21.6564	21.65
38	Trichloroethene	130	5.861	5.857	(1.042)	79231	36.0571	36.05
8	Trichlorofluoromethane	101	1.959	1.944	(0.400)	236255	24.7716	24.77
5	Vinyl Chloride	62	1.423	1.411	(0.291)	131580	26.6199	26.61



Data File: \\nahstws005\Target\chem\voa9,i\U191113,b\U111314,D
Date : 13-NOV-2019 16:07
Client ID: HS19110613-01MSD
Sample Info: HS19110613-01MSD;HS19110613-01MSD;3;;MSD
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111315.D Page 1
Report Date: 05-Dec-2019 16:36

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111315.D
Lab Smp Id: HS19110486-05 Client Smp ID: HS19110486-05
Inj Date : 13-NOV-2019 16:31
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110486-05;HS19110486-05;;;
Misc Info : 180315V9;WATER;0;5;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:34 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 14
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

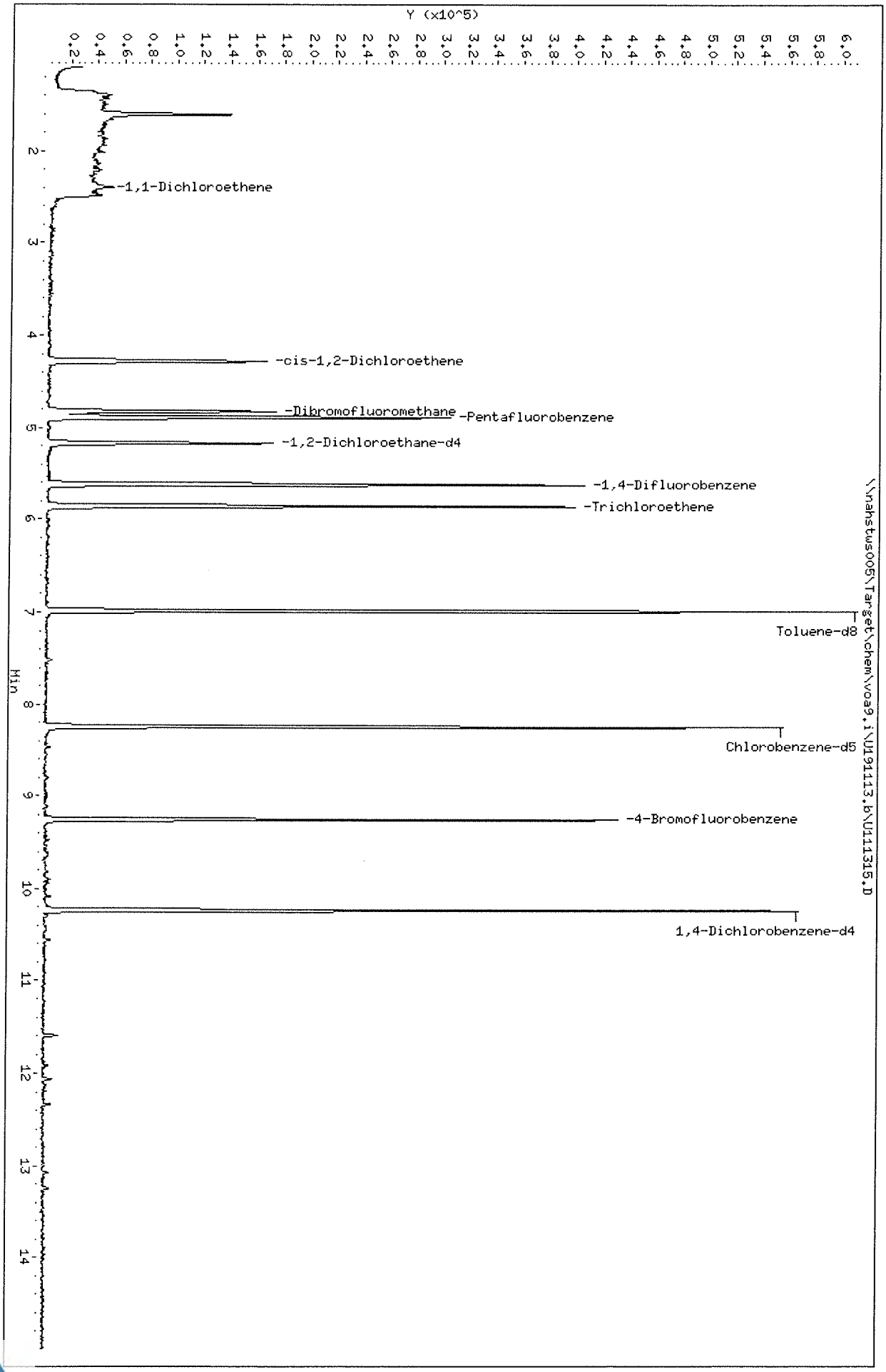
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.890	(1.000)	216358	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.621	(1.000)	316025	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	283225	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	139088	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.167	(1.057)	99312	45.8607	45.86
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	101305	46.3388	46.33
$ 30 Dibromofluoromethane	113	4.823	4.823	(0.986)	89919	42.1372	42.13
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	361390	51.3951	51.39
11 1,1-Dichloroethene	96	2.401	2.390	(0.491)	4939	0.97733	4.88(a)
27 cis-1,2-Dichloroethene	96	4.279	4.279	(0.875)	82206	33.3567	166.78
38 Trichloroethene	130	5.857	5.857	(1.042)	120011	57.3562	286.78

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9,i\U191113,b\U111315.D
Date : 13-NOV-2019 16:31
Client ID: HS19110486-05
Sample Info: HS19110486-05;HS19110486-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111315.D

Date : 13-NOV-2019 16:31

Client ID: HS19110486-05

Instrument: VOA9.i

Sample Info: HS19110486-05;HS19110486-05;;;

Purge Volume: 5.0

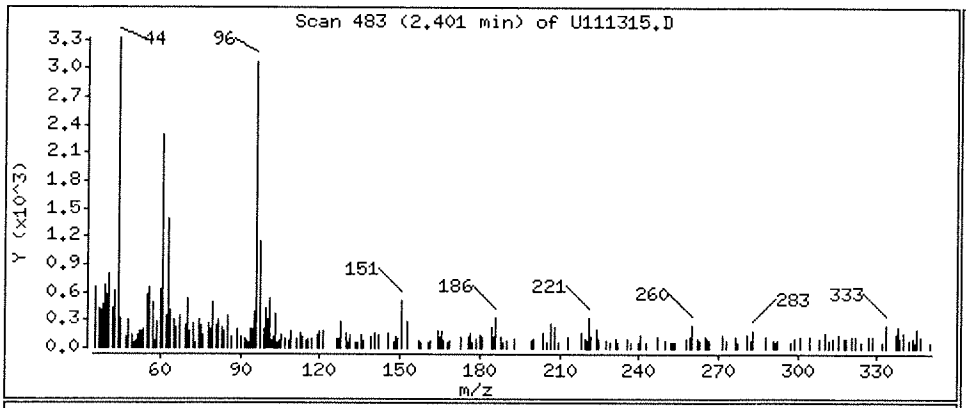
Operator: PC

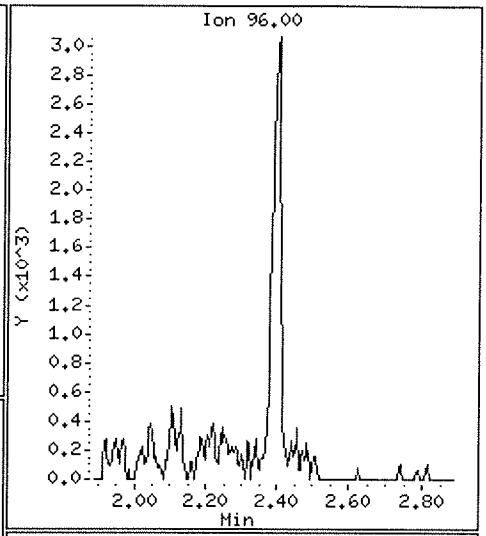
Column phase: DB624

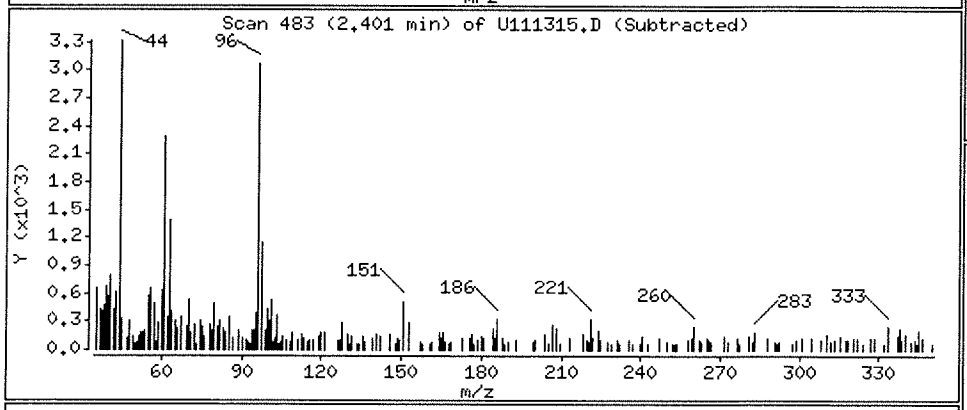
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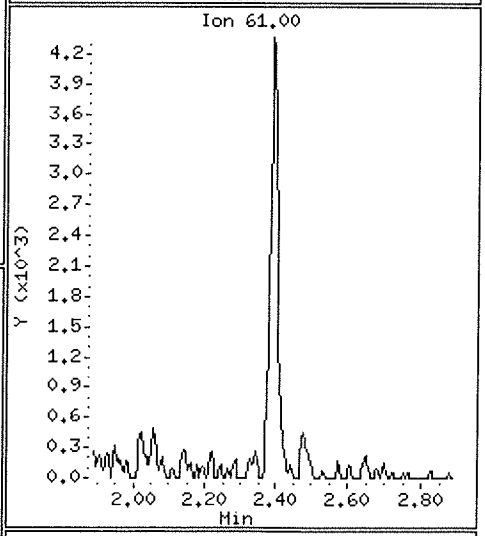
11 1,1-Dichloroethene

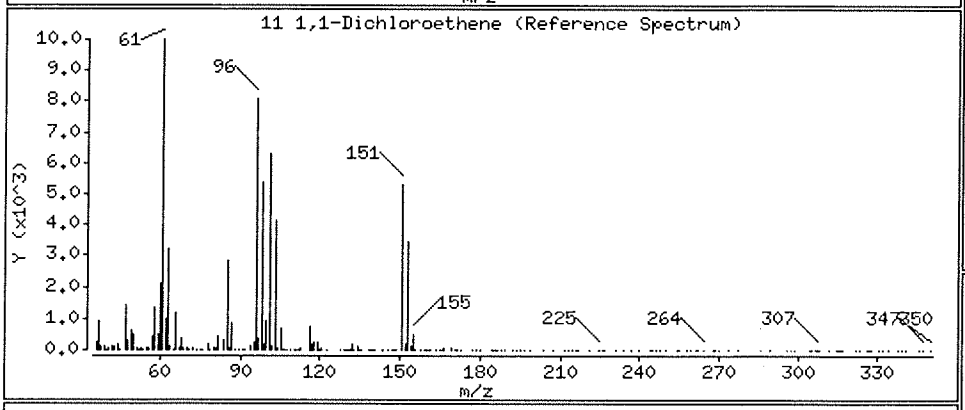
Concentration: 4.88 ug/l

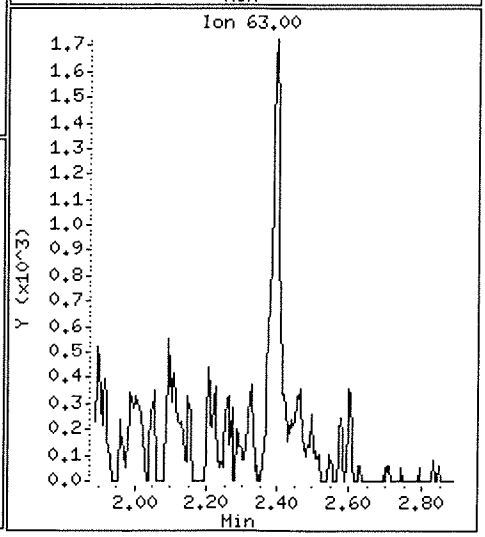


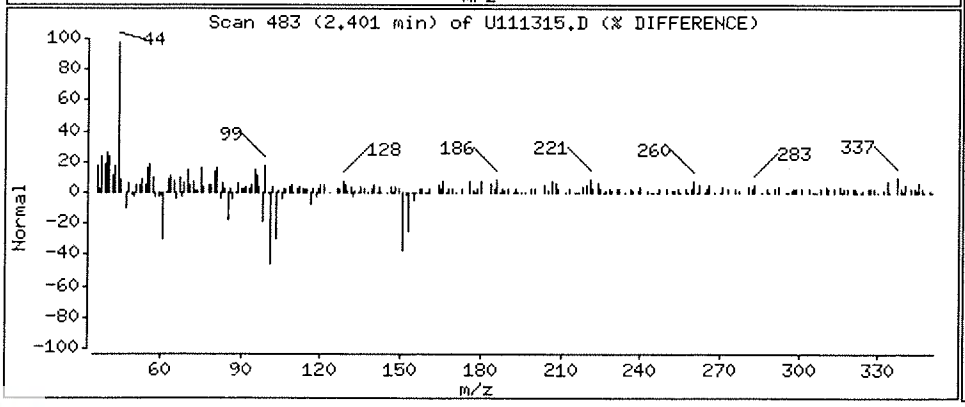












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111315.D

Date : 13-NOV-2019 16:31

Client ID: HS19110486-05

Instrument: VOA9.i

Sample Info: HS19110486-05;HS19110486-05;;;

Purge Volume: 5.0

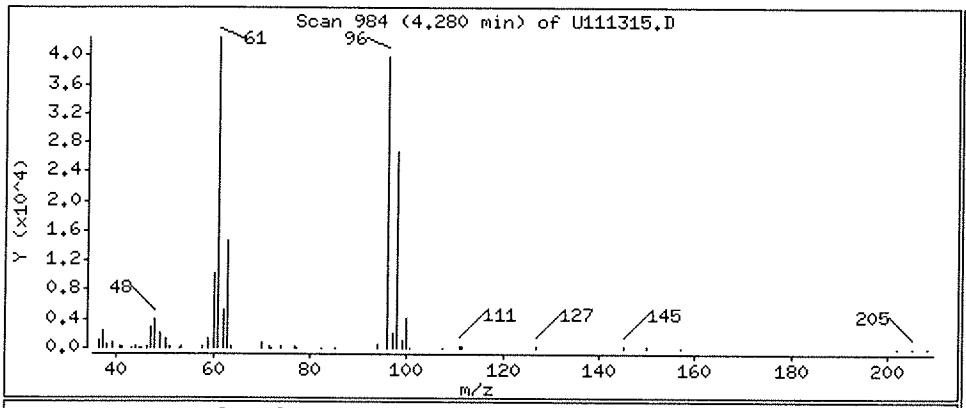
Operator: PC

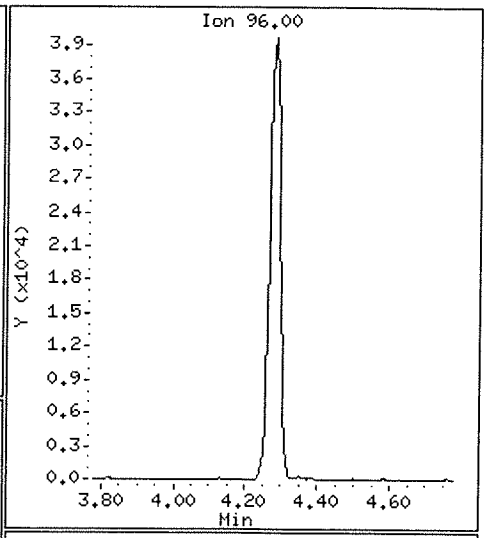
Column phase: DB624

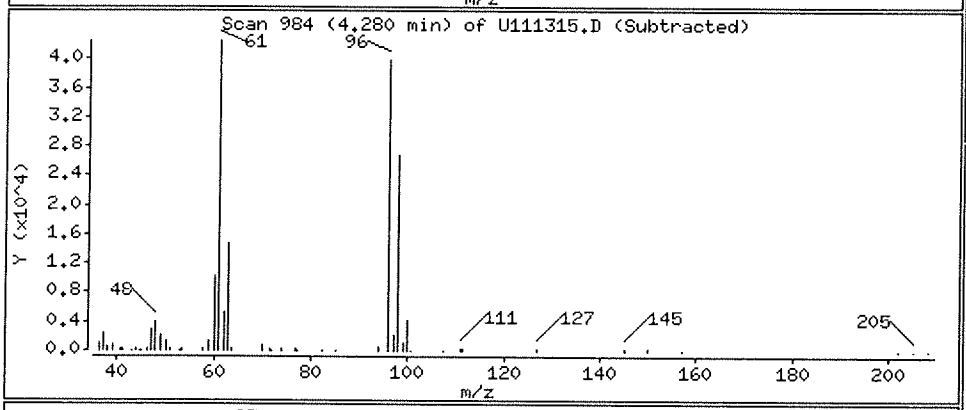
Column diameter: 0.18

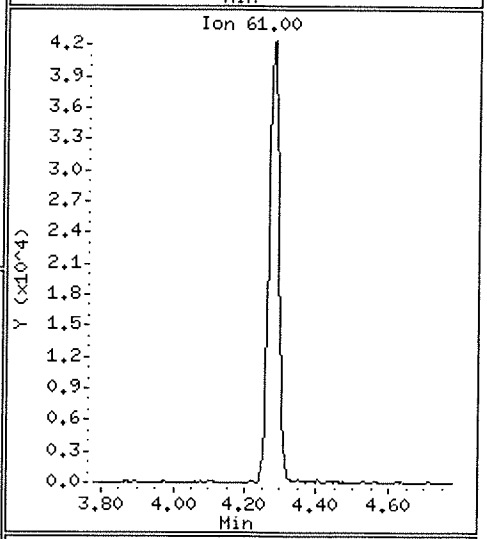
27 cis-1,2-Dichloroethene

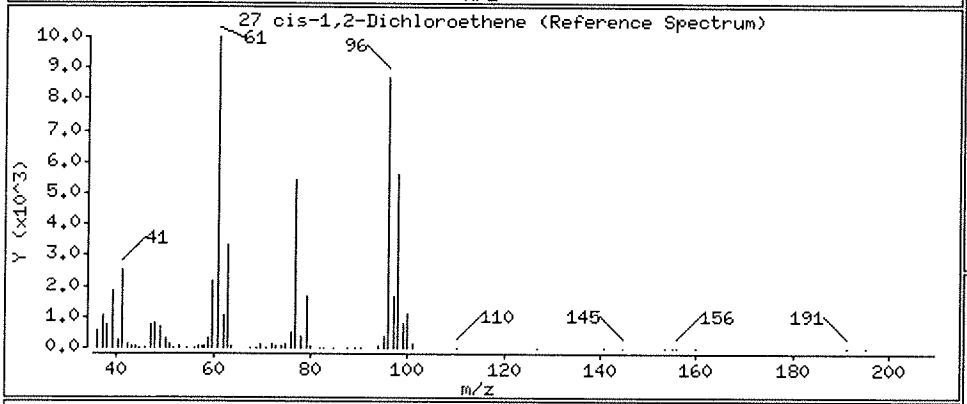
Concentration: 166.78 ug/l

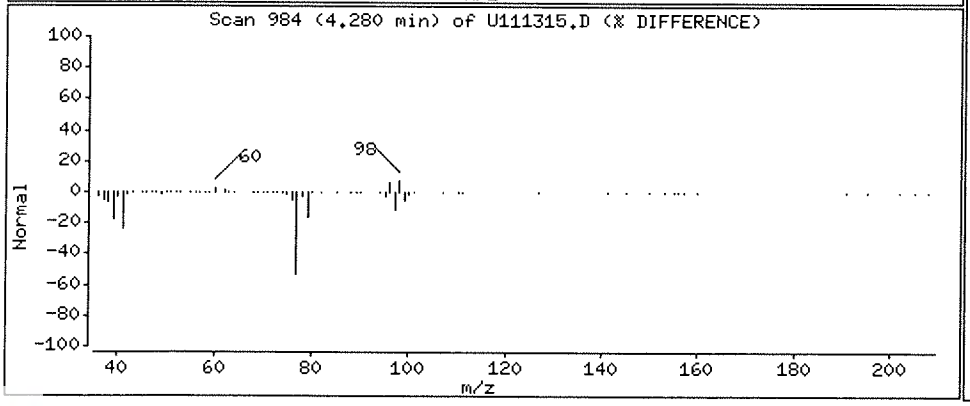


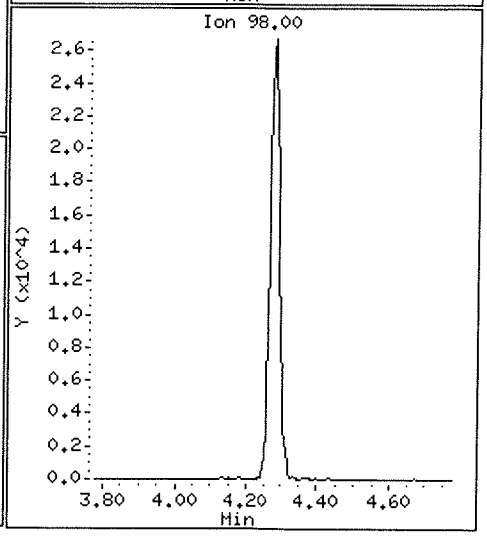












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111315.D Page 5

Date : 13-NOV-2019 16:31

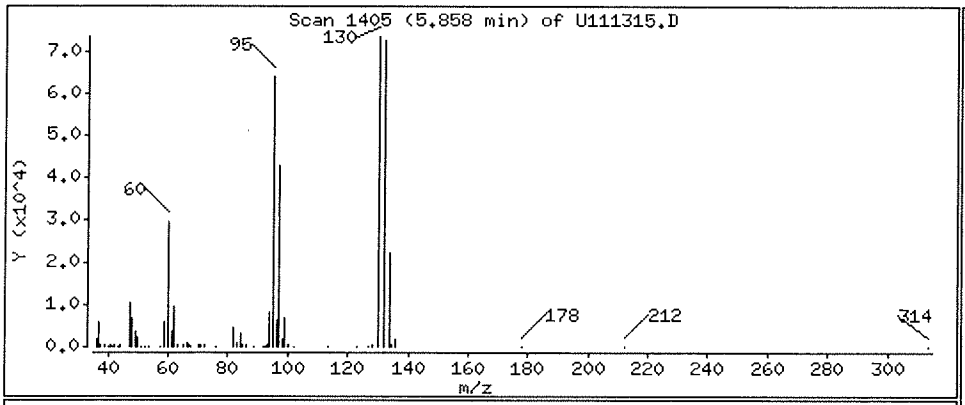
Client ID: HS19110486-05 Instrument: VOA9.i

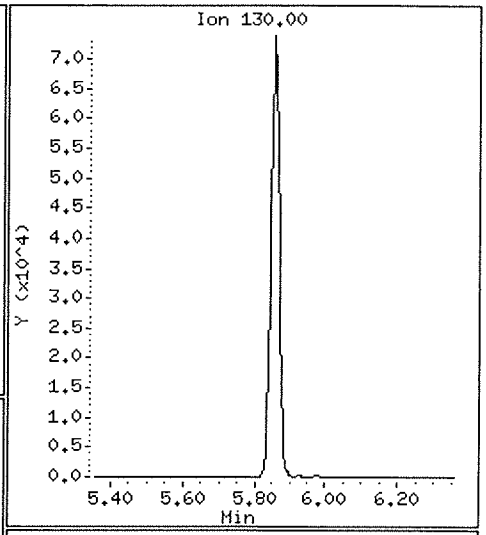
Sample Info: HS19110486-05;HS19110486-05;;;

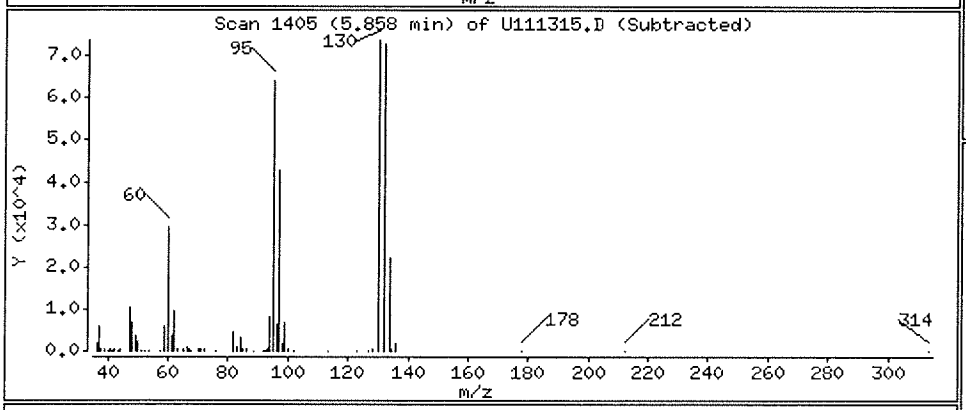
Purge Volume: 5.0 Operator: PC

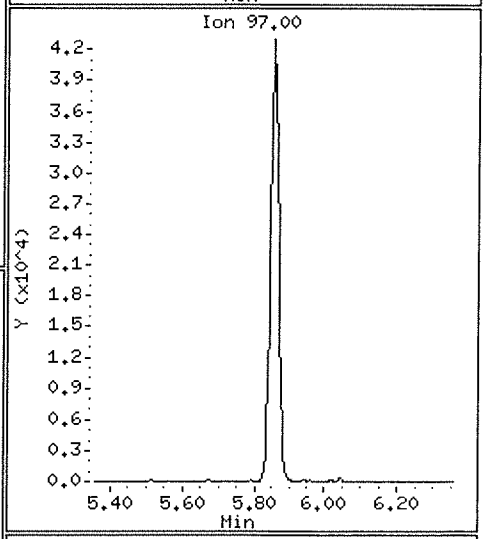
Column phase: DB624 Column diameter: 0.18

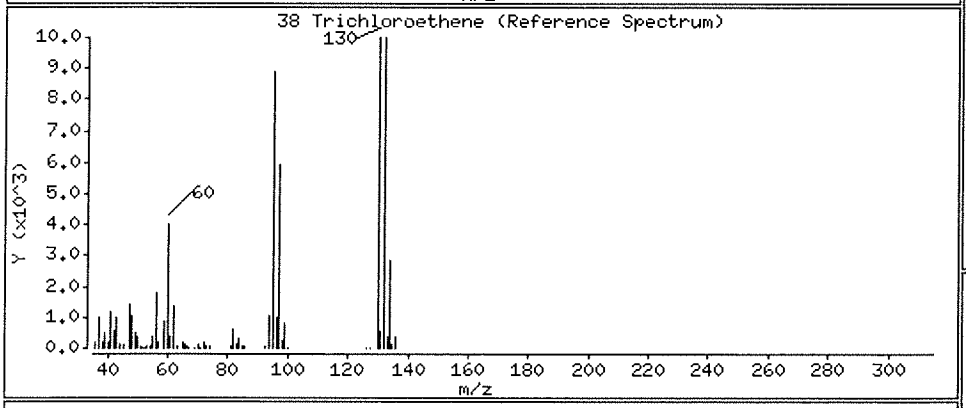
38 Trichloroethene Concentration: 286.78 ug/l

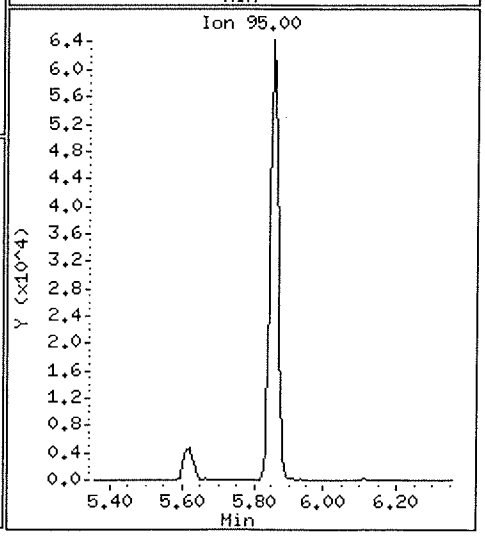


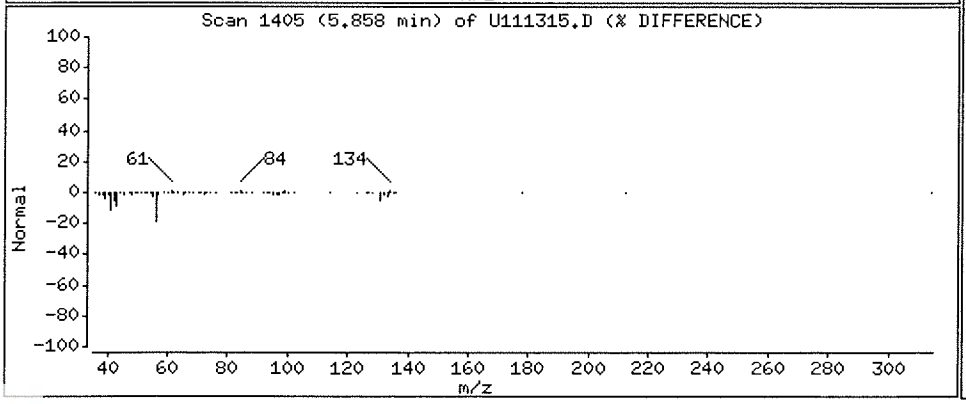












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111316.D Page 1
Report Date: 05-Dec-2019 16:36

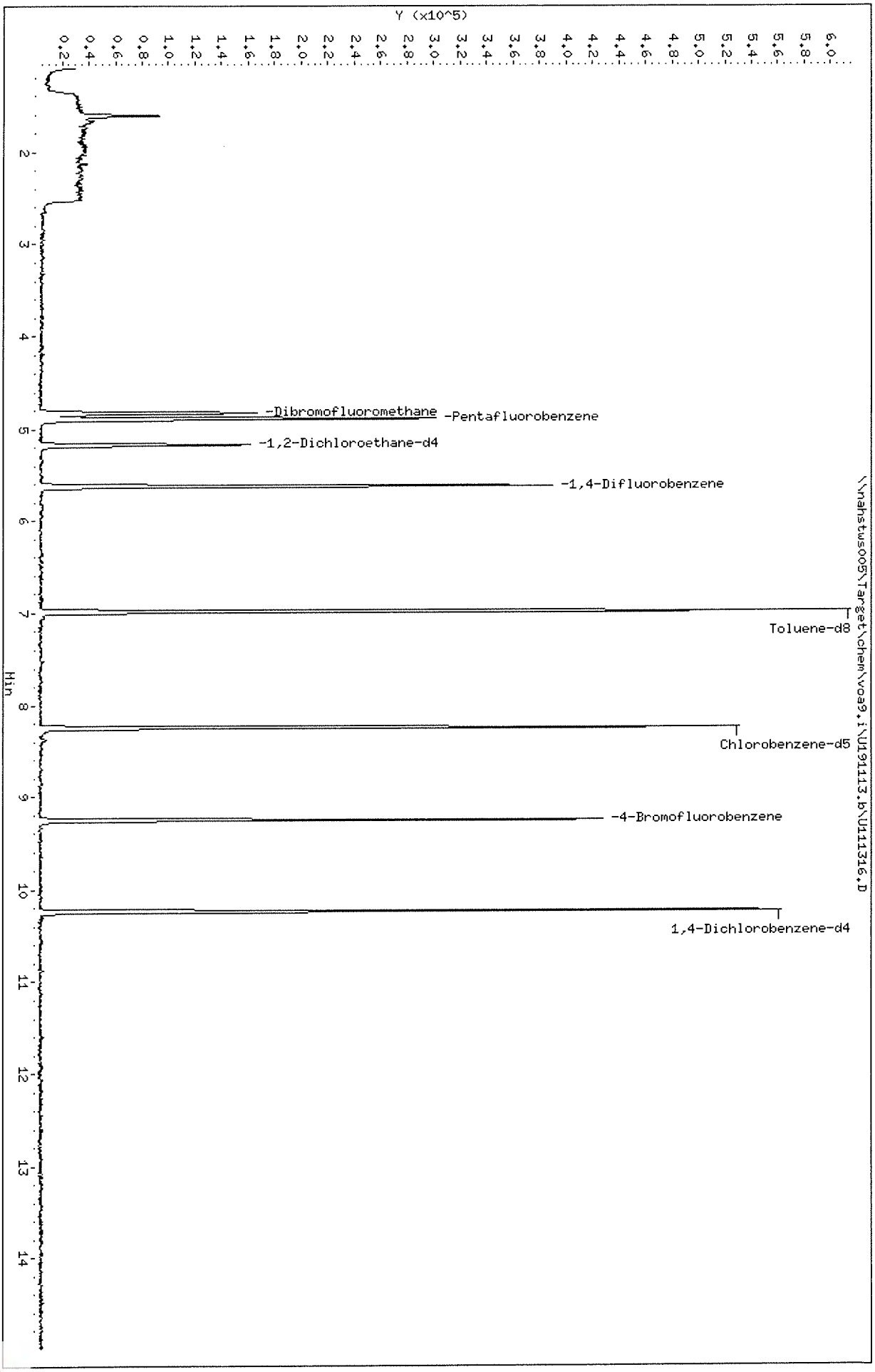
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111316.D
Lab Smp Id: HS19110486-08 Client Smp ID: HS19110486-08
Inj Date : 13-NOV-2019 16:55
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110486-08;HS19110486-08;;;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:34 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 15
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
* 1 Pentafluorobenzene	168	4.890	4.890	(1.000)	204491	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.621	(1.000)	304780	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	272636	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	134100	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.167	(1.057)	94725	46.2896	46.28
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	97010	46.1011	46.10
$ 30 Dibromofluoromethane	113	4.827	4.823	(0.987)	85835	42.5572	42.55
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	361512	53.4041	53.40



Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111316.D
Date : 13-NOV-2019 16:55
Client ID: HS19110486-08
Sample Info: HS19110486-08;HS19110486-08;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111317.D Page 1
Report Date: 05-Dec-2019 16:36

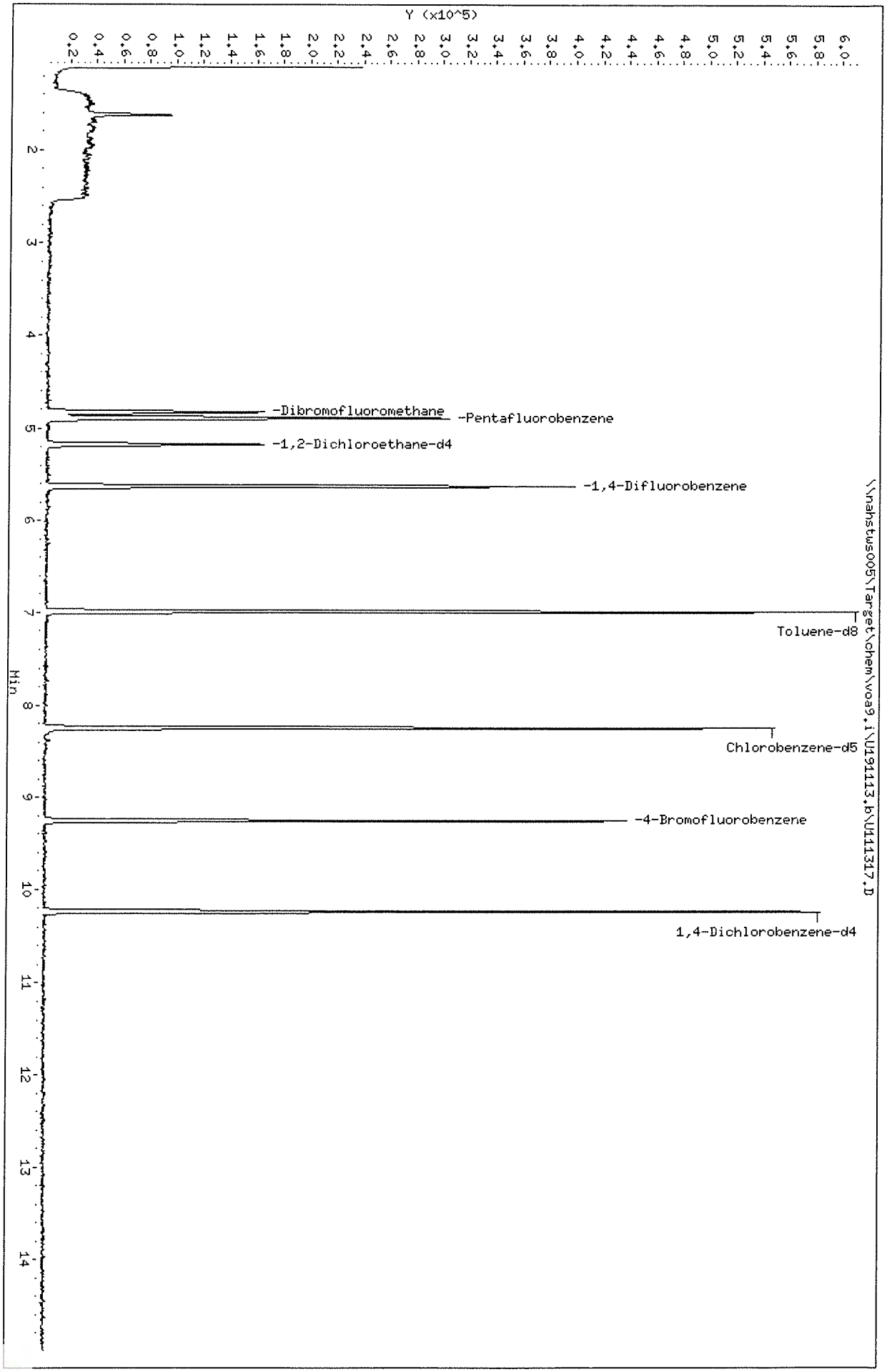
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111317.D
Lab Smp Id: HS19110486-01 Client Smp ID: HS19110486-01
Inj Date : 13-NOV-2019 17:20
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110486-01;HS19110486-01;;;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:34 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 16
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
* 1 Pentafluorobenzene	168	4.894	4.890	(1.000)	201245	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.621	(1.000)	315317	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	274700	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	131667	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.167	(1.057)	95656	47.5234	47.52
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	104553	49.2667	49.26
$ 30 Dibromofluoromethane	113	4.830	4.823	(0.987)	90118	45.3931	45.39
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	368175	53.9783	53.97



Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111317.D
Date : 13-NOV-2019 17:20
Client ID: HS19110486-01
Sample Info: HS19110486-01;HS19110486-01;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

\\nahstws005\Target\chem\voa9.i\U191113.b\U111317.D

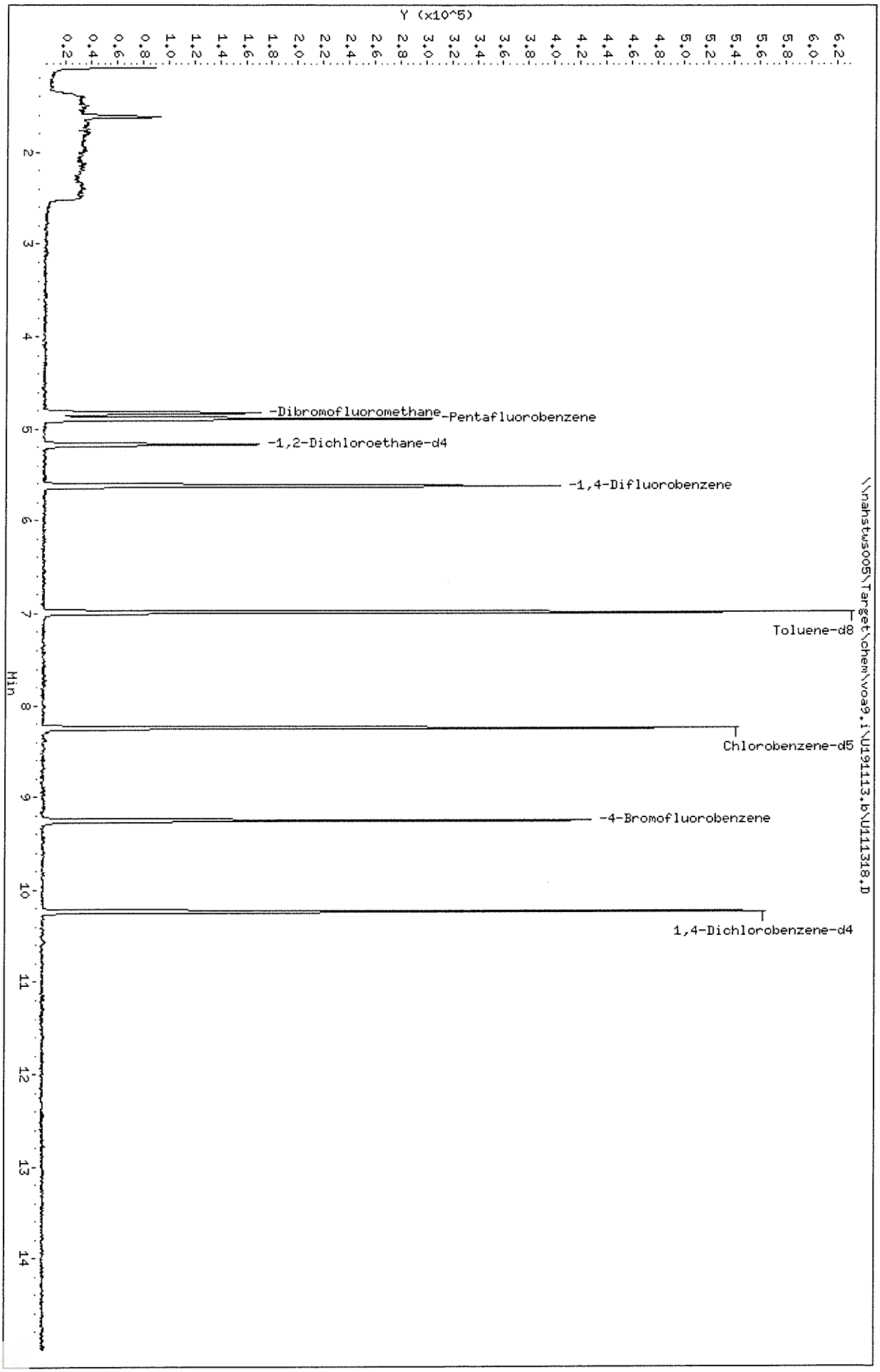
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111318.D
Lab Smp Id: HS19110486-02 Client Smp ID: HS19110486-02
Inj Date : 13-NOV-2019 17:44
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110486-02;HS19110486-02;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:34 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 17
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
* 1 Pentafluorobenzene	168	4.894	4.890	(1.000)	201832	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.621	(1.000)	313145	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	279202	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	137133	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.167	(1.057)	96617	47.8679	47.86
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	102369	47.4838	47.48
$ 30 Dibromofluoromethane	113	4.826	4.823	(0.986)	88701	44.5528	44.55
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	362892	52.3499	52.34



Data File: \\nahstws005\Target\chem\voa9,i\U191113,b\U111318,D
Date : 13-NOV-2019 17:44
Client ID: HS19110486-02
Sample Info: HS19110486-02;HS19110486-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111319.D Page 1
Report Date: 05-Dec-2019 16:36

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111319.D
Lab Smp Id: HS19110486-03 Client Smp ID: HS19110486-03
Inj Date : 13-NOV-2019 18:08
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110486-03;HS19110486-03;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:34 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 18
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

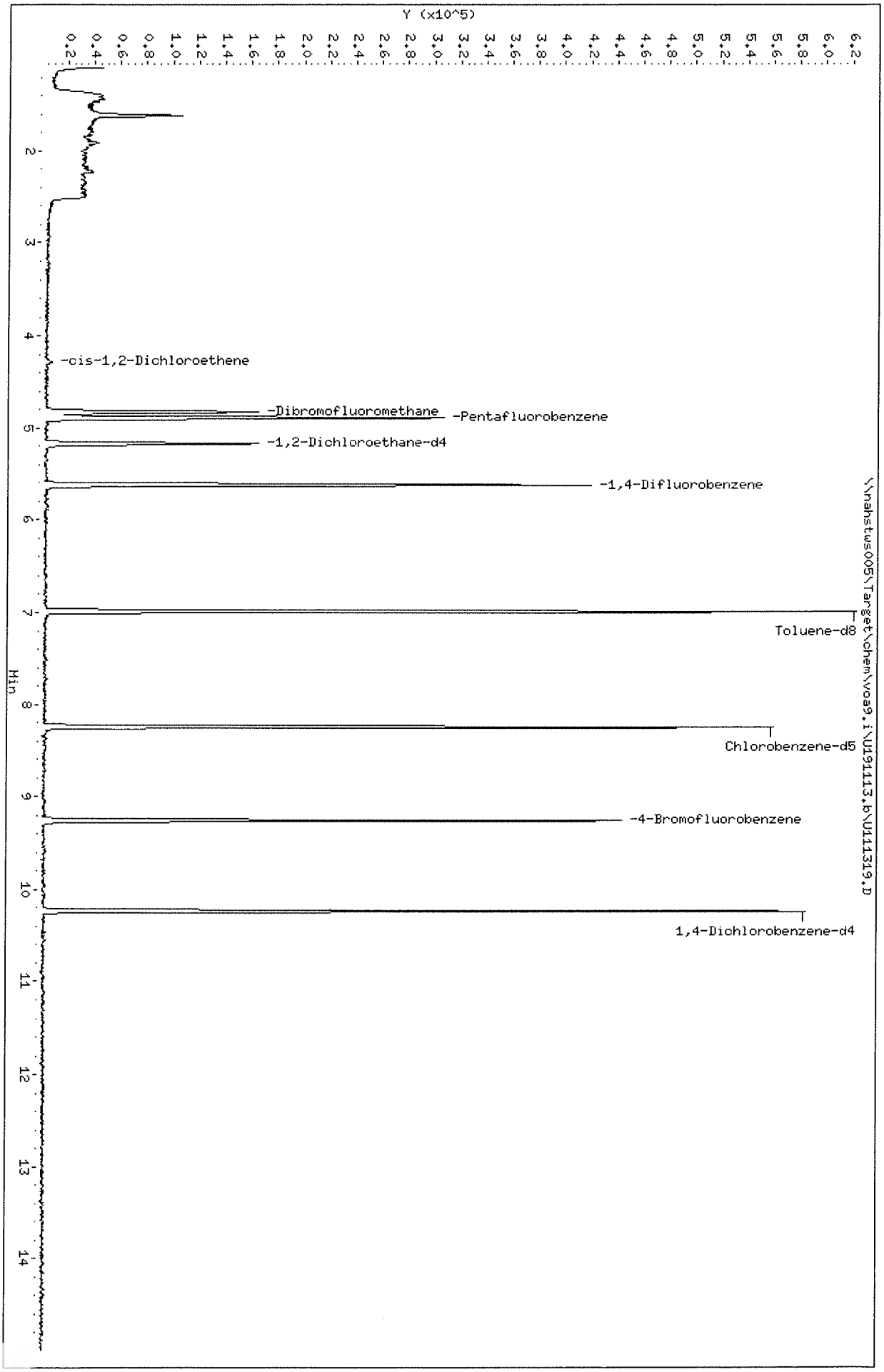
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.890	4.890	(1.000)	204340	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.621	(1.000)	324227	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	281629	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	137649	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.167	(1.057)	96523	47.2219	47.22
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	102279	47.0394	47.03
$ 30 Dibromofluoromethane	113	4.826	4.823	(0.987)	86007	42.6739	42.67
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	359631	51.4346	51.43
27 cis-1,2-Dichloroethene	96	4.283	4.279	(0.876)	2137	0.91813	0.91(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111319.D
Date : 13-NOV-2019 18:08
Client ID: HS19110486-03
Sample Info: HS19110486-03;HS19110486-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111319.D

Date : 13-NOV-2019 18:08

Client ID: HS19110486-03

Instrument: VOA9.i

Sample Info: HS19110486-03;HS19110486-03;;;

Purge Volume: 5.0

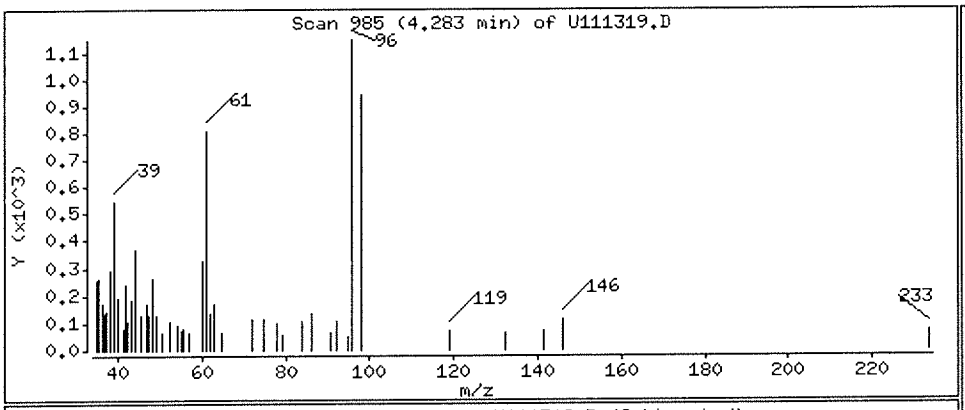
Operator: PC

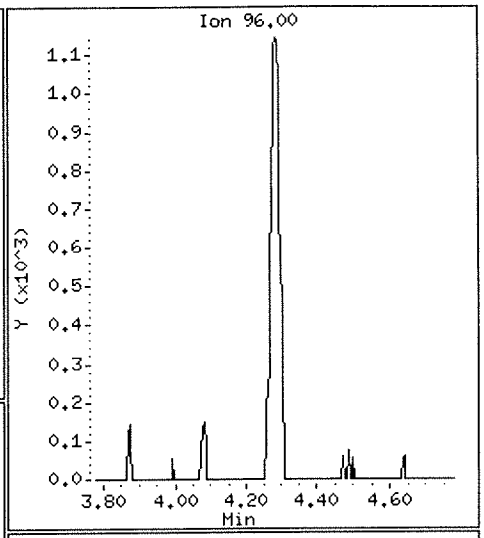
Column phase: DB624

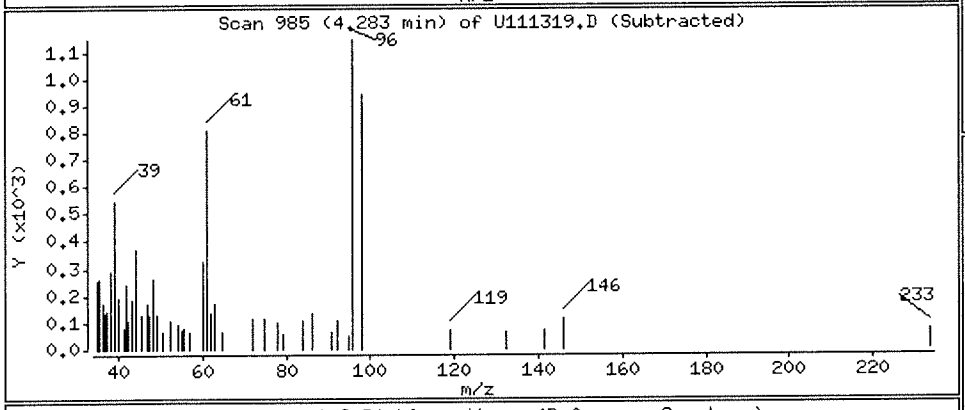
Column diameter: 0.18

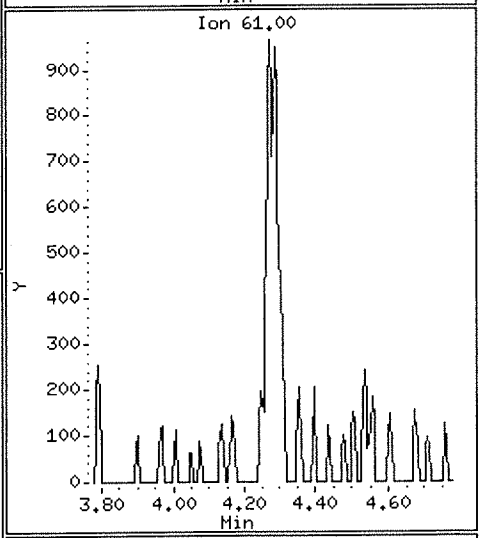
27 cis-1,2-Dichloroethene

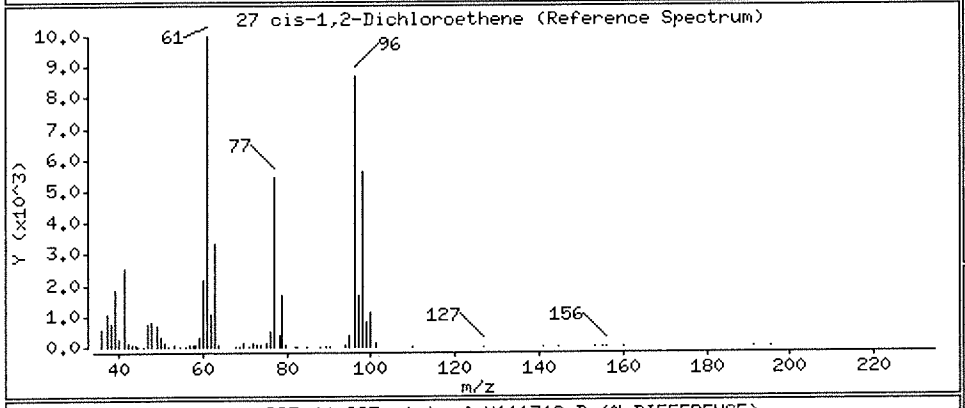
Concentration: 0.91 ug/l

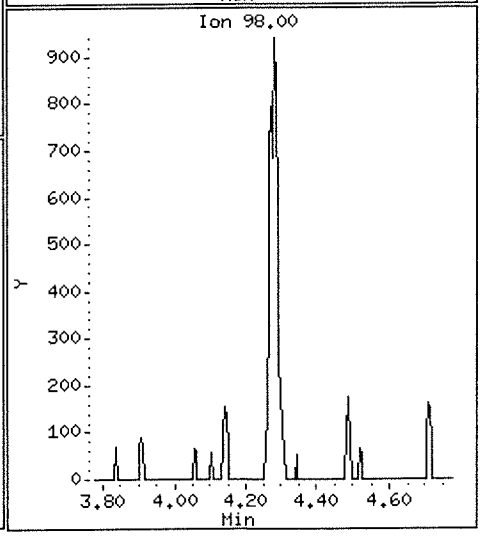


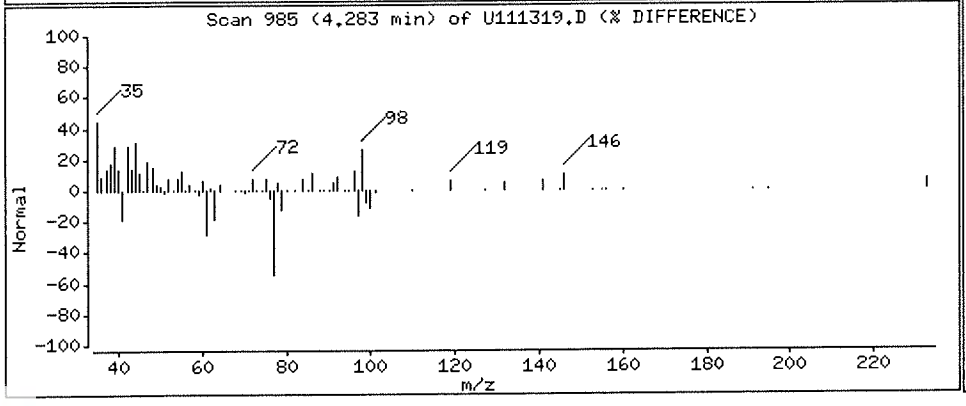












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111320.D Page 1
Report Date: 05-Dec-2019 16:36

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111320.D
Lab Smp Id: HS19110486-04 Client Smp ID: HS19110486-04
Inj Date : 13-NOV-2019 18:33
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110486-04;HS19110486-04;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:34 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 19
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

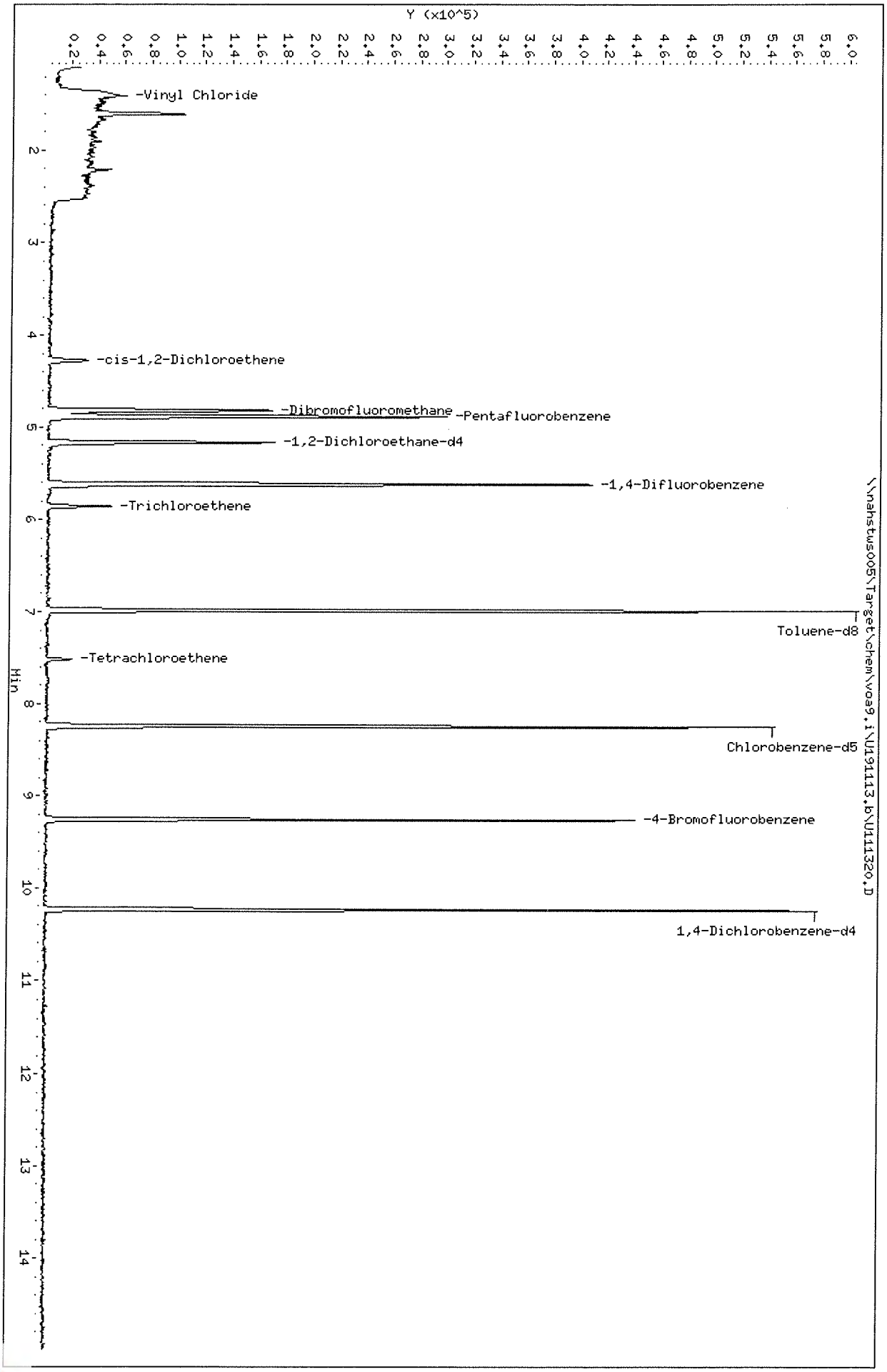
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.890	4.890	(1.000)	205652	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.621	(1.000)	318449	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	277678	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	138230	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.167	5.167	(1.057)	97992	47.6430	47.64
$ 69 4-Bromofluorobenzene	95	9.253	9.254	(1.122)	102430	47.7689	47.76
$ 30 Dibromofluoromethane	113	4.822	4.823	(0.986)	90333	44.5298	44.52
$ 48 Toluene-d8	98	6.985	6.986	(0.847)	355117	51.5115	51.51
27 cis-1,2-Dichloroethene	96	4.275	4.279	(0.874)	12951	5.52870	5.52
56 Tetrachloroethene	166	7.521	7.522	(0.912)	4405	2.09274	2.09(a)
38 Trichloroethene	130	5.857	5.857	(1.042)	15243	7.22955	7.22
5 Vinyl Chloride	62	1.411	1.411	(0.289)	7789	1.70309	1.70(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111320.D
Date : 13-NOV-2019 18:33
Client ID: HS19110486-04
Sample Info: HS19110486-04;HS19110486-04;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111320.D

Date : 13-NOV-2019 18:33

Client ID: HS19110486-04

Instrument: VOA9.i

Sample Info: HS19110486-04;HS19110486-04;;;

Purge Volume: 5.0

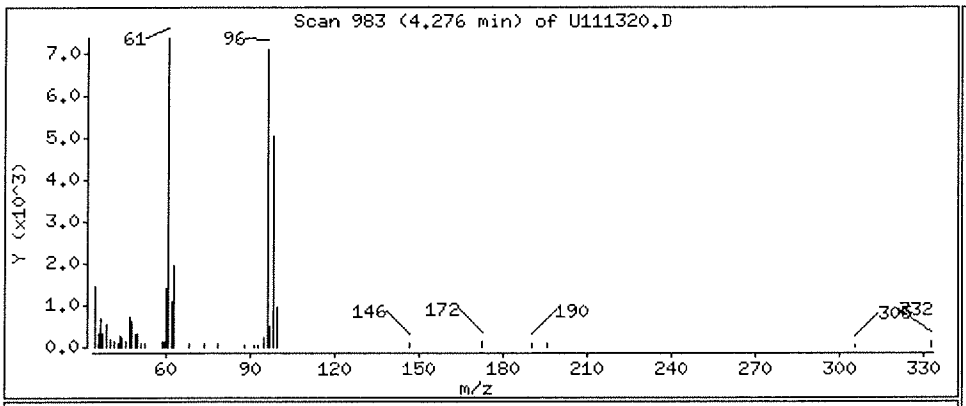
Operator: PC

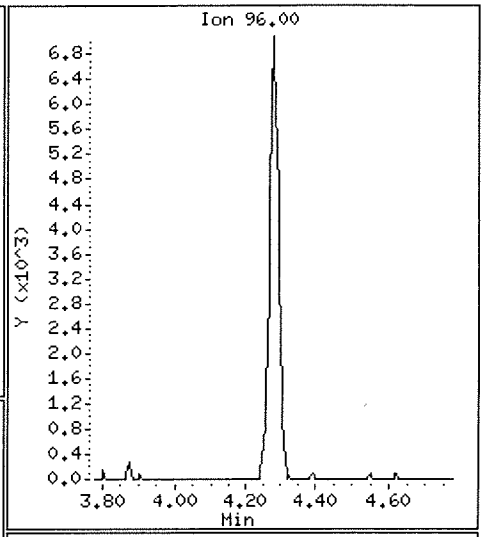
Column phase: DB624

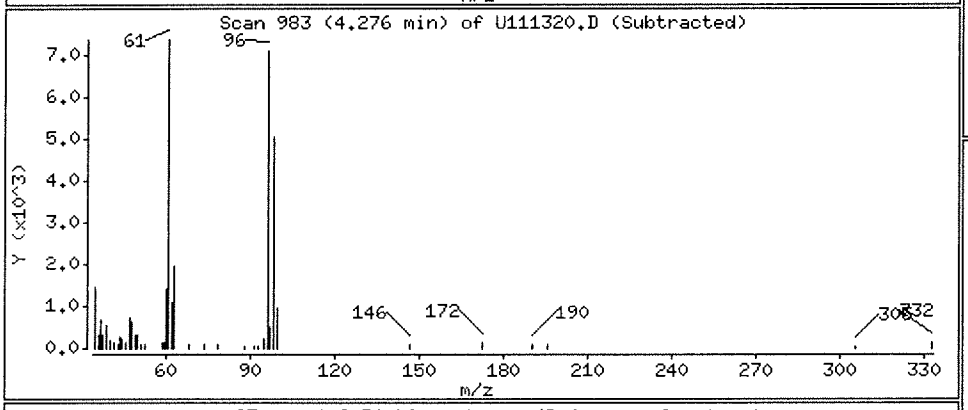
Column diameter: 0.18

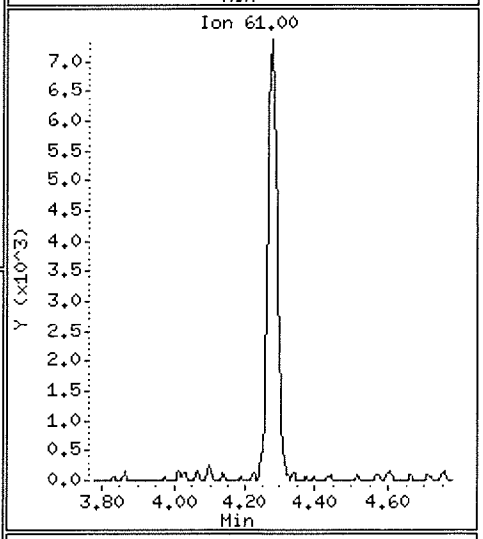
27 cis-1,2-Dichloroethene

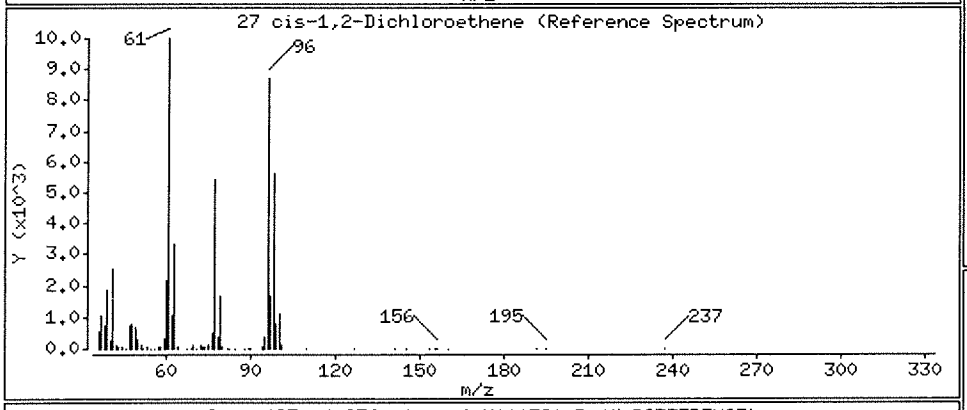
Concentration: 5.52 ug/l

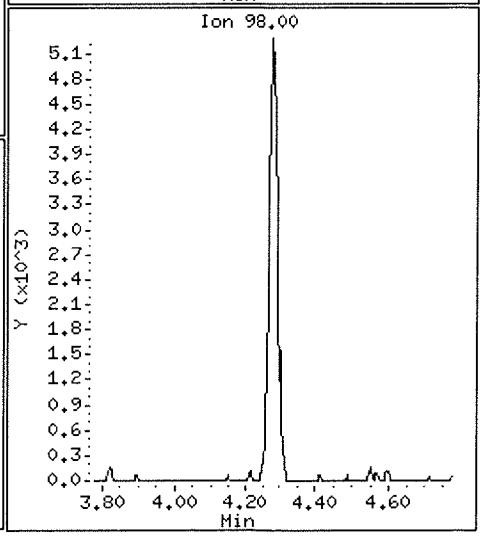


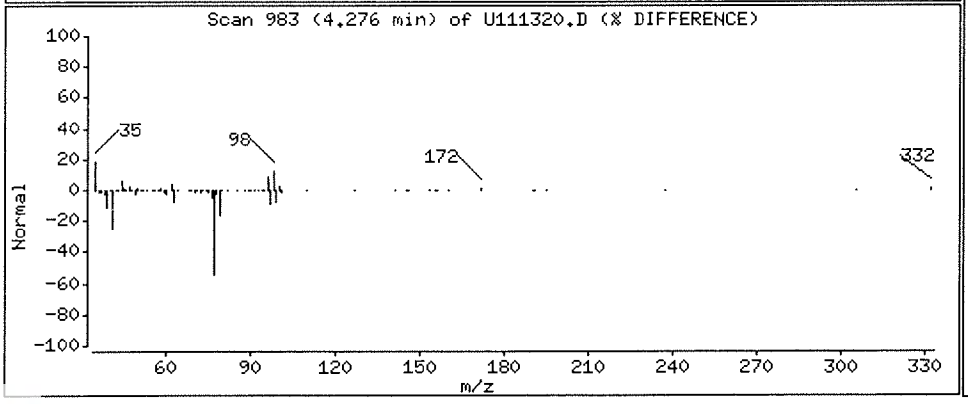












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111320.D Page 4

Date : 13-NOV-2019 18:33

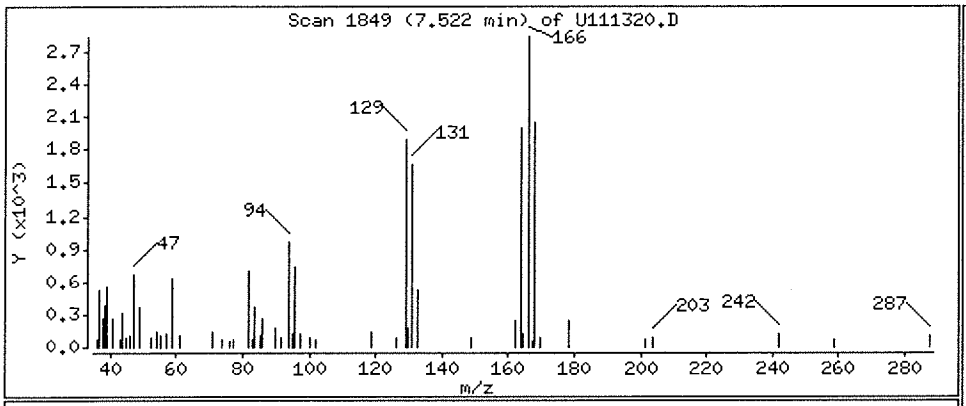
Client ID: HS19110486-04 Instrument: VOA9.i

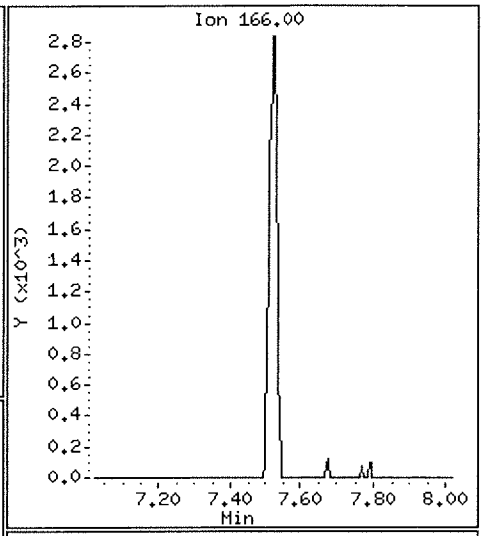
Sample Info: HS19110486-04;HS19110486-04;;;

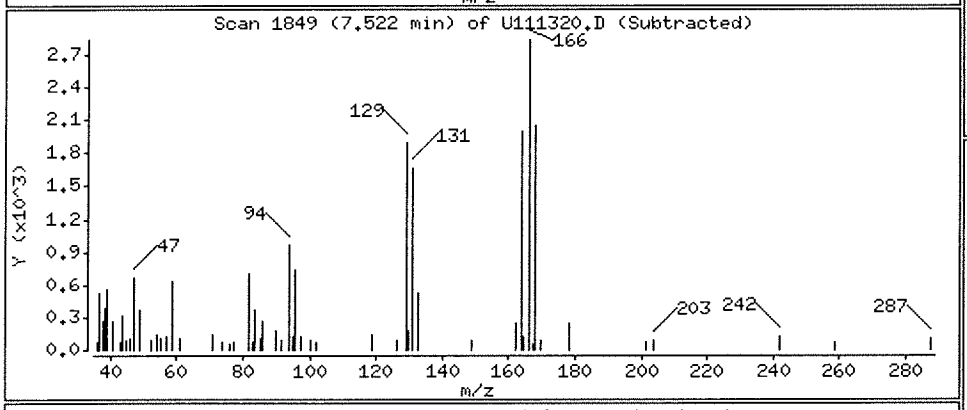
Purge Volume: 5.0 Operator: PC

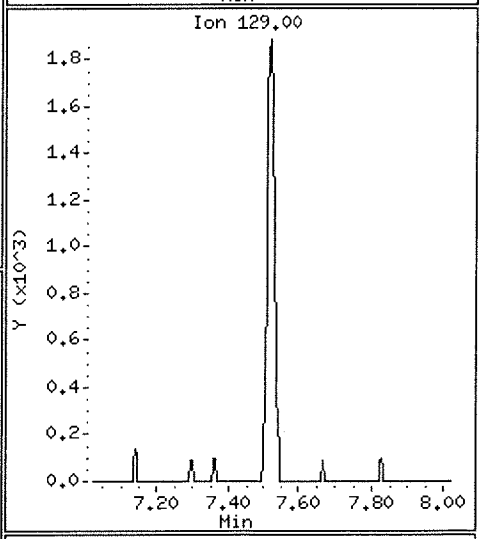
Column phase: DB624 Column diameter: 0.18

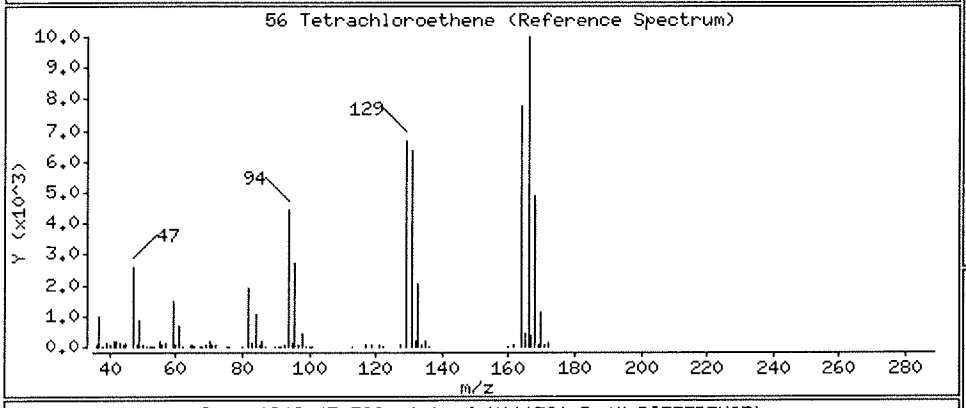
56 Tetrachloroethene Concentration: 2.09 ug/l

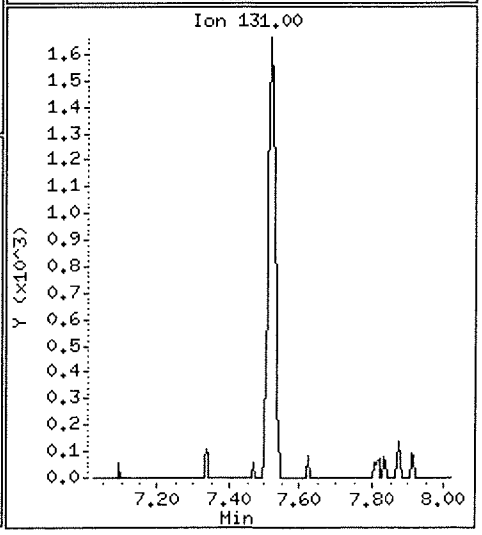


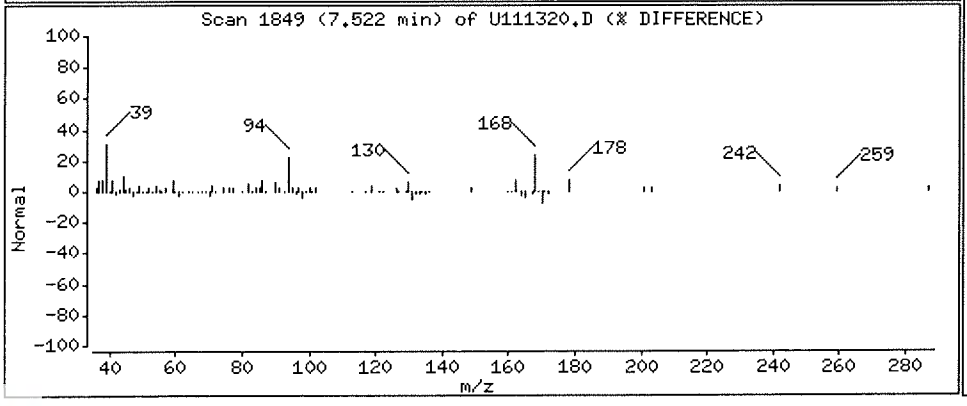












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111320.D

Date : 13-NOV-2019 18:33

Client ID: HS19110486-04

Instrument: VOA9.i

Sample Info: HS19110486-04;HS19110486-04;;;

Purge Volume: 5.0

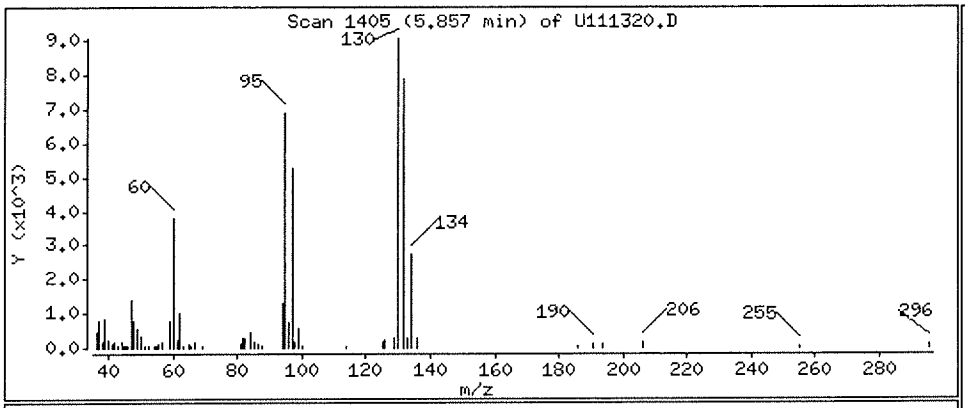
Operator: PC

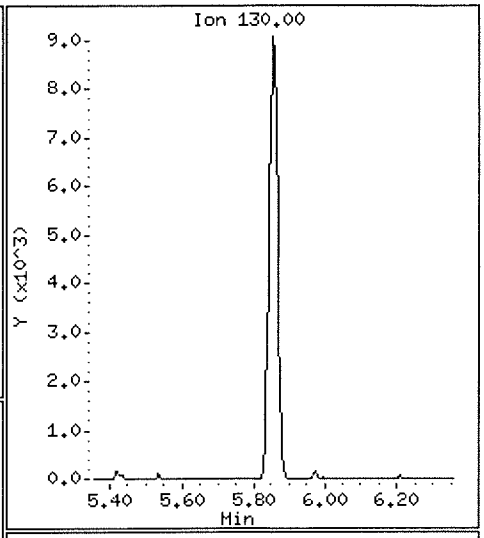
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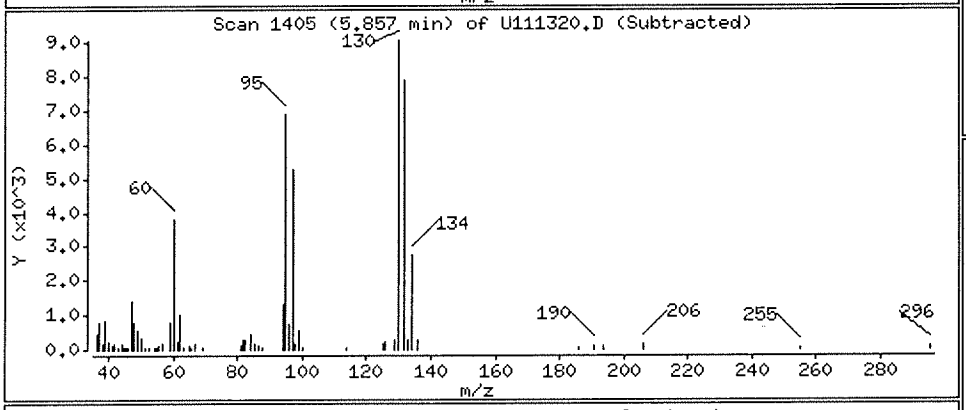
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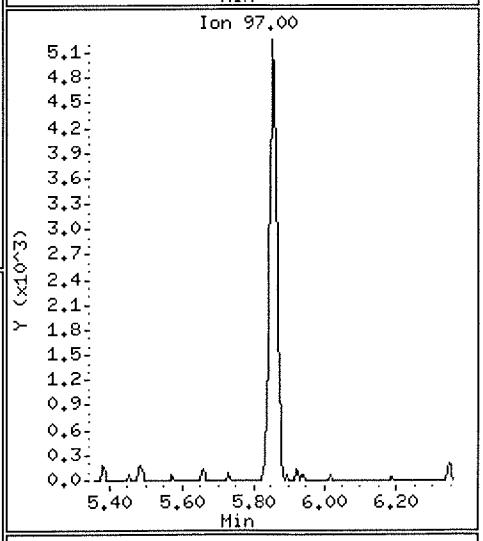
38 Trichloroethene

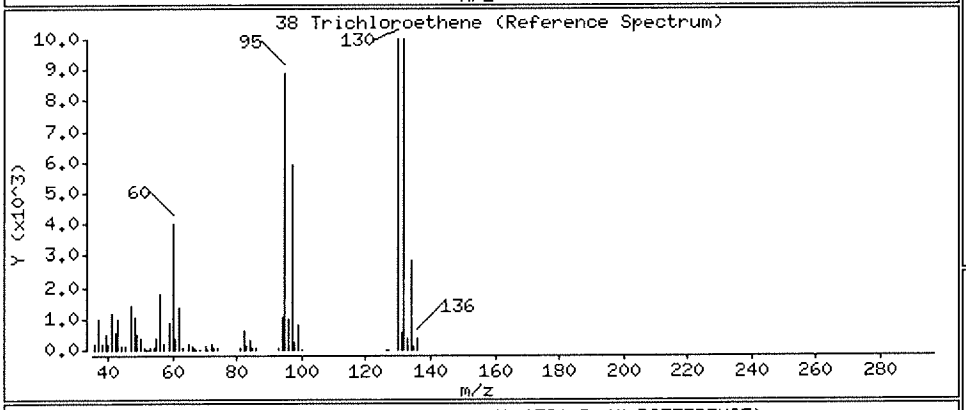
Concentration: 7.22 ug/l

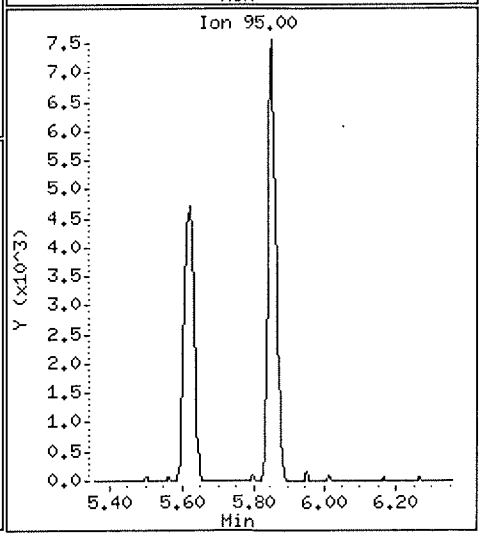


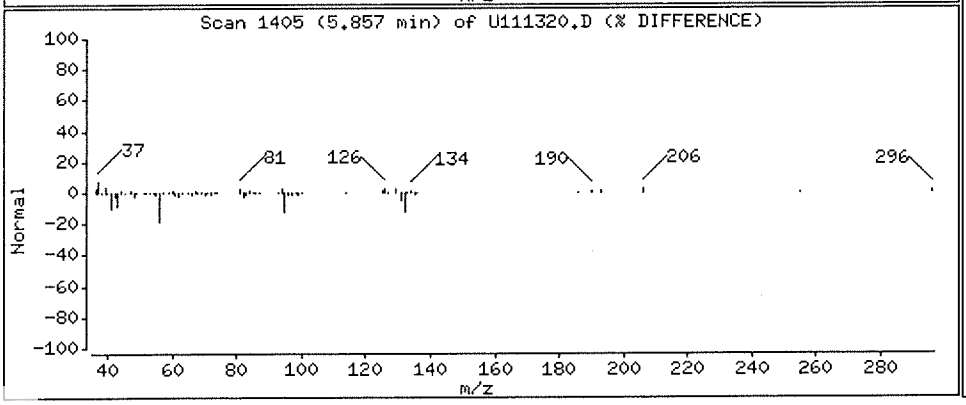












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111320.D Page 6

Date : 13-NOV-2019 18:33

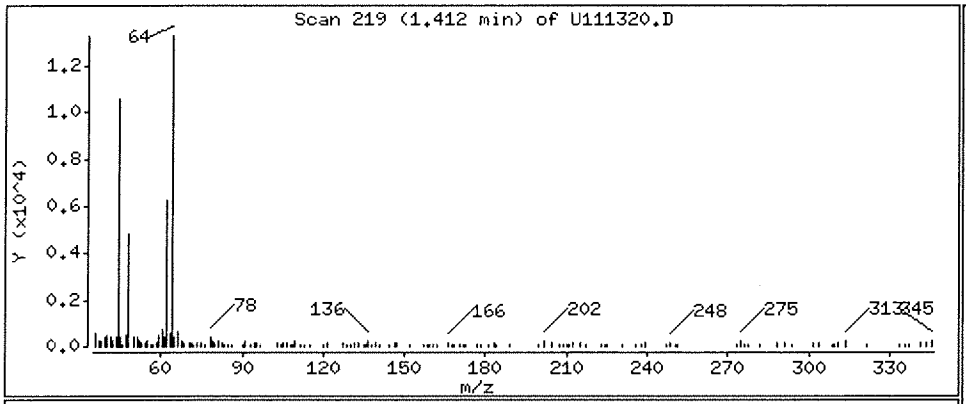
Client ID: HS19110486-04 Instrument: VOA9.i

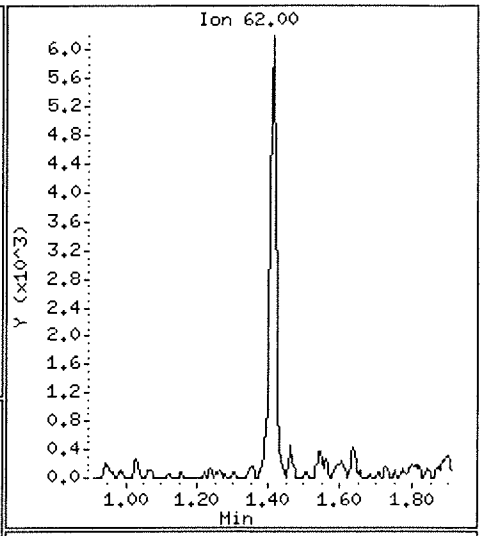
Sample Info: HS19110486-04;HS19110486-04;;;

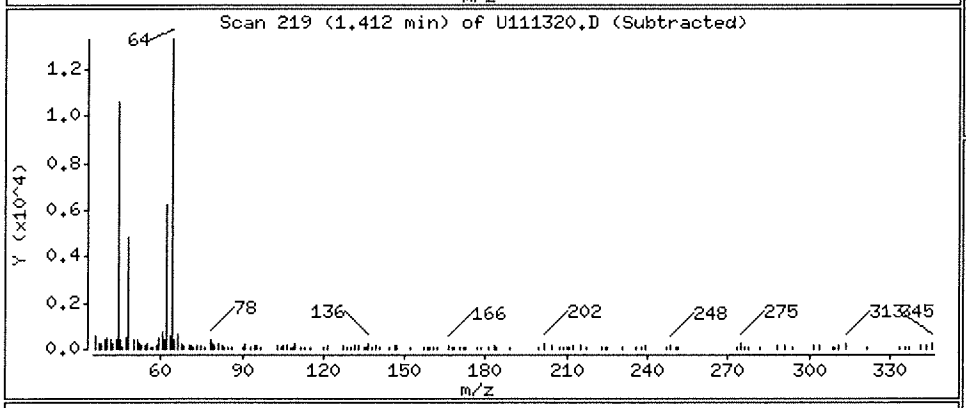
Purge Volume: 5.0 Operator: PC

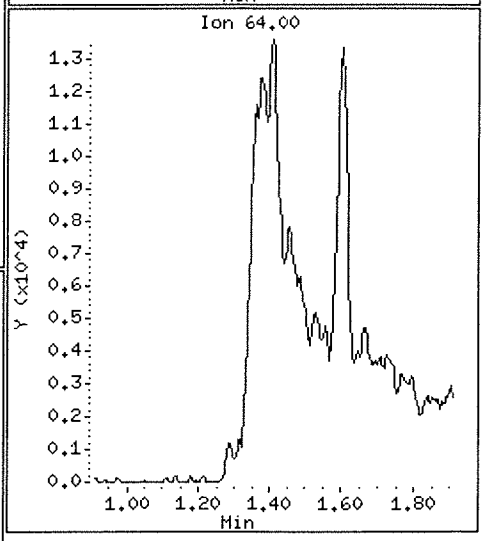
Column phase: DB624 Column diameter: 0.18

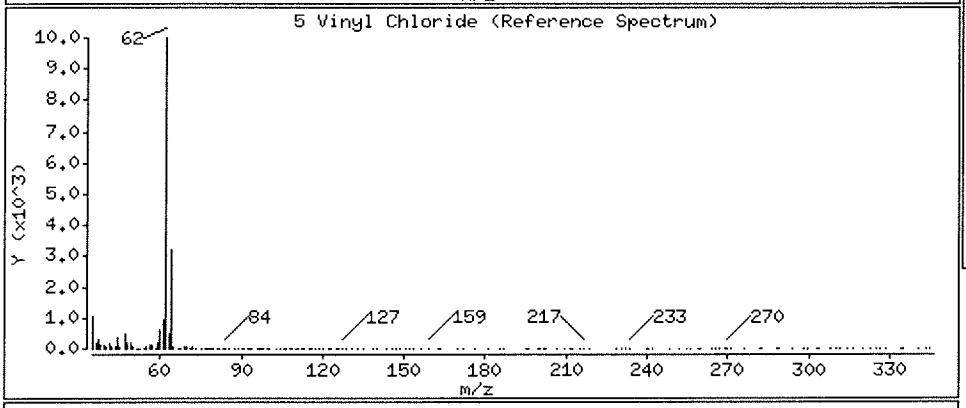
5 Vinyl Chloride Concentration: 1.70 ug/l

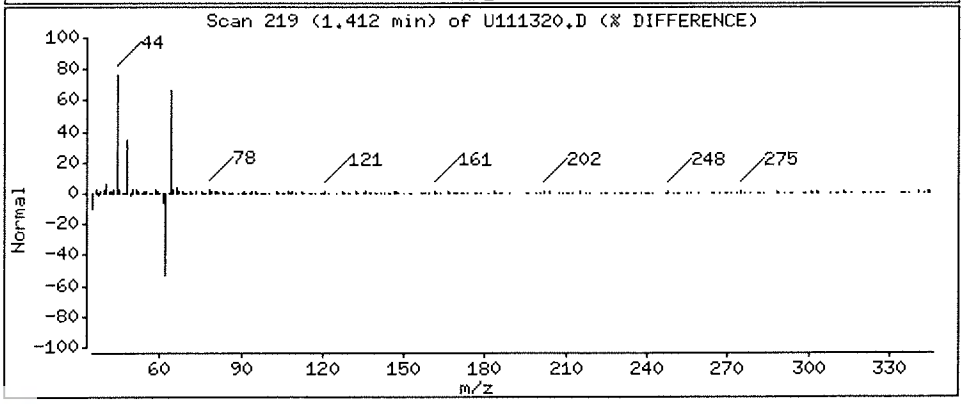












Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111321.D Page 1
Report Date: 05-Dec-2019 16:36

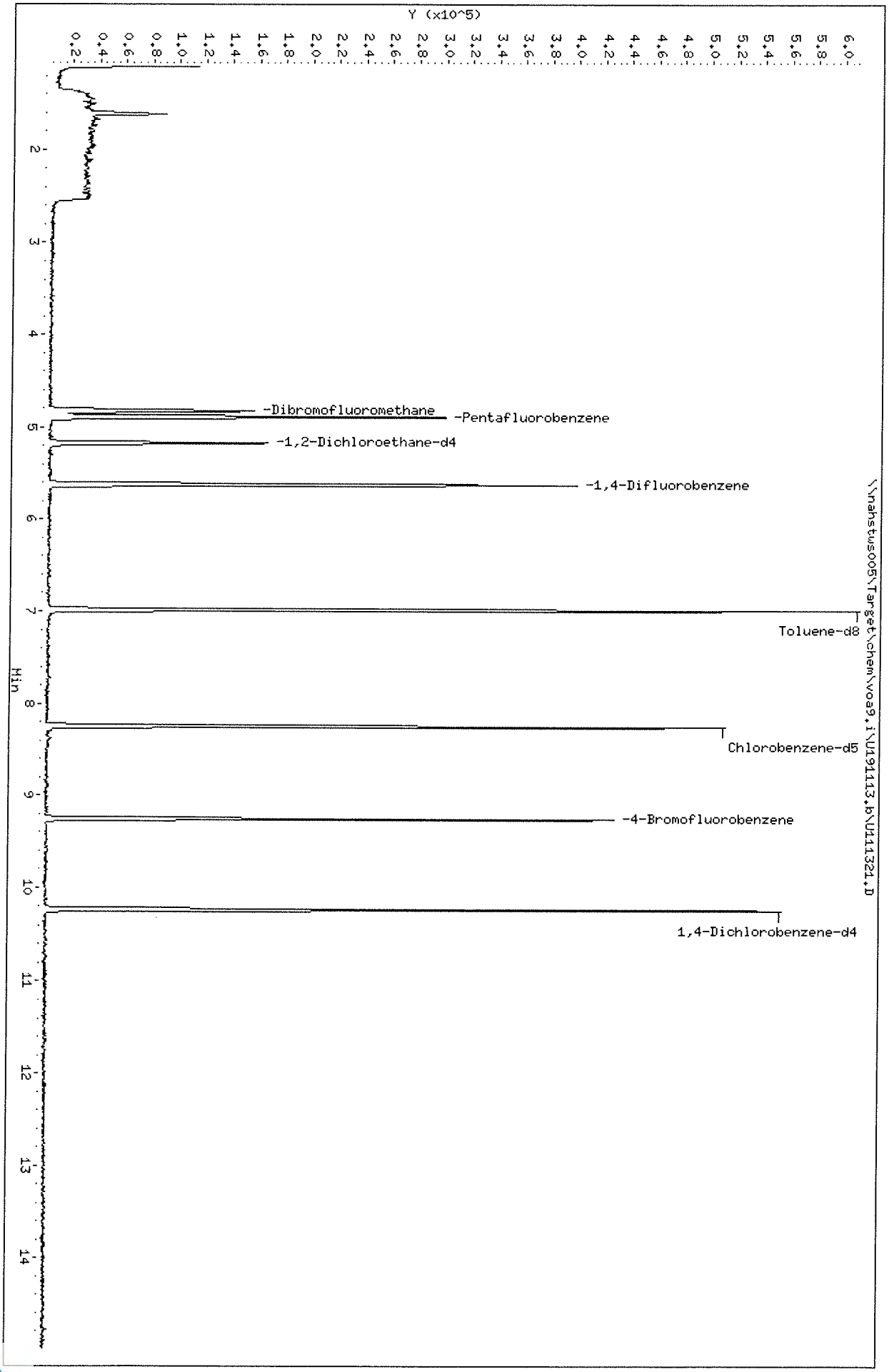
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111321.D
Lab Smp Id: HS19110486-06 Client Smp ID: HS19110486-06
Inj Date : 13-NOV-2019 18:57
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110486-06;HS19110486-06;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:34 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 20
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
* 1 Pentafluorobenzene	168	4.894	4.890	(1.000)	199303	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.621	(1.000)	307389	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	260059	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	123638	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.167	(1.057)	96456	48.4050	48.40
$ 69 4-Bromofluorobenzene	95	9.253	9.254	(1.122)	100155	49.8435	49.84
$ 30 Dibromofluoromethane	113	4.826	4.823	(0.986)	82958	42.2018	42.20
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	356317	55.1779	55.17



Data File: \\nahstws005\Target\chem\voa9,i\U191113,b\U111321.D
Date : 13-NOV-2019 18:57
Client ID: HS19110486-06
Sample Info: HS19110486-06;HS19110486-06;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111322.D
Lab Smp Id: HS19110486-07 Client Smp ID: HS19110486-07
Inj Date : 13-NOV-2019 19:21
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110486-07;HS19110486-07;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:34 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 21
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

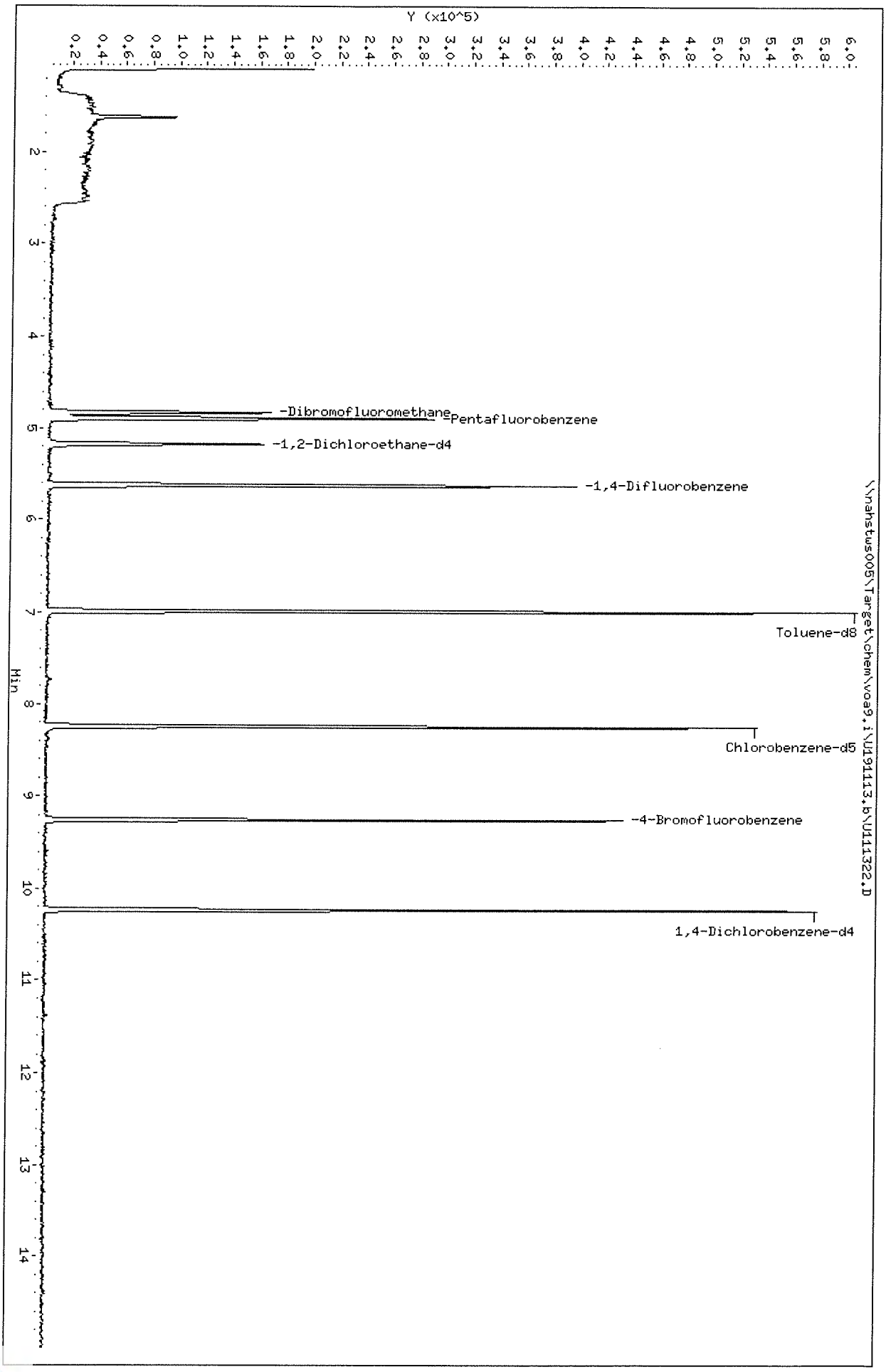
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.890	(1.000)	199359	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.621	(1.000)	311135	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.245	(1.000)	273142	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	137546	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.167	(1.057)	96115	48.2167	48.21
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	105013	49.7591	49.75
$ 30 Dibromofluoromethane	113	4.830	4.823	(0.987)	86578	44.0276	44.02
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	356251	52.5316	52.53

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111322.D
Date : 13-NOV-2019 19:21
Client ID: HS19110486-07
Sample Info: HS19110486-07;HS19110486-07;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111323.D Page 1
Report Date: 05-Dec-2019 16:34

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191113.b\U111323.D
Lab Smp Id: CCV-END Client Smp ID: CCV-END
Inj Date : 13-NOV-2019 19:45
Operator : PC Inst ID: VOA9.i
Smp Info : CCV-END;CCV-END;2;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191113.b\8260C.m
Meth Date : 05-Dec-2019 16:31 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 22 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

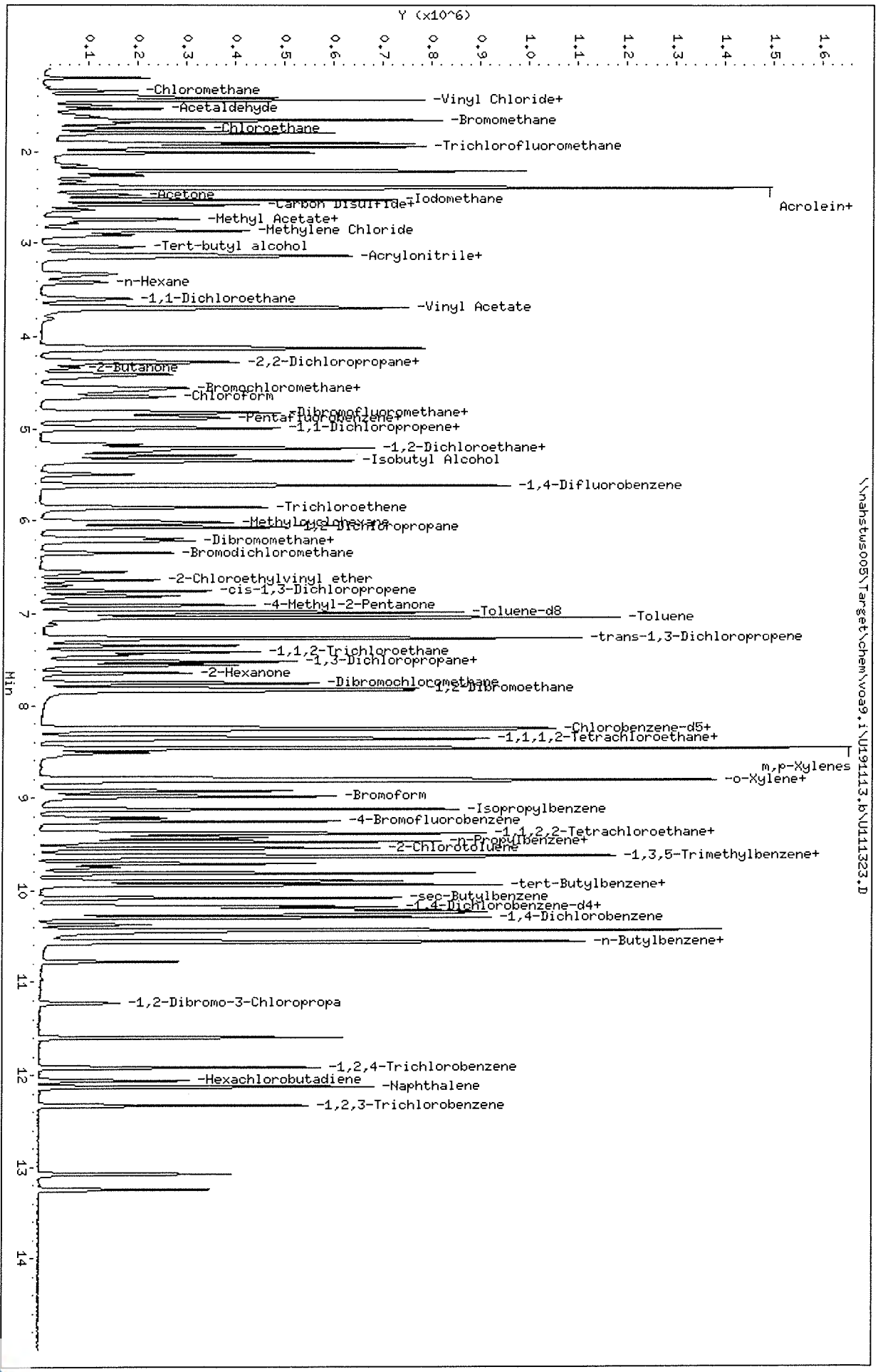
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
*	1 Pentafluorobenzene	168	4.890	4.890	(1.000)	224823	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.621	(1.000)	391228	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.245	(1.000)	362040	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	198346	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.167	5.167	(1.057)	122285	50.0000	54.51
$	69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	143188	50.0000	51.16
$	30 Dibromofluoromethane	113	4.823	4.823	(0.986)	118585	50.0000	53.38
$	48 Toluene-d8	98	6.986	6.986	(0.847)	462147	50.0000	51.41
	60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	122275	50.0000	47.30
	31 1,1,1-Trichloroethane	97	4.823	4.823	(0.986)	162787	50.0000	48.67
	68 1,1,2,2-Tetrachloroethane	83	9.389	9.389	(0.918)	181089	50.0000	51.46
	138 Freon TF	101	2.393	2.393	(0.490)	250328	50.0000	49.91
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	97841	50.0000	52.01
	22 1,1-Dichloroethane	63	3.593	3.593	(0.735)	168100	50.0000	52.68
	11 1,1-Dichloroethene	96	2.390	2.390	(0.489)	278154	50.0000	52.96
	32 1,1-Dichloropropene	75	4.999	4.999	(0.889)	133340	50.0000	50.82
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	148624	50.0000	47.63
	71 1,2,3-Trichloropropane	75	9.422	9.422	(0.921)	169392	50.0000	50.26
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	161586	50.0000	45.75
	79 1,2,4-Trimethylbenzene	105	9.940	9.940	(0.971)	452861	50.0000	49.22
	89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	31143	50.0000	45.23
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	132585	50.0000	48.66
	88 1,2-Dichlorobenzene	146	10.566	10.566	(1.033)	287386	50.0000	48.10

Data File: \\nahstws005\Target\chem\voa9.i\U191113.b\U111323.D Page 2
Report Date: 05-Dec-2019 16:34

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.246	(0.933)	145705	50.0000	50.03
42	1,2-Dichloropropane	63	6.075	6.075	(1.081)	105556	50.0000	59.26
75	1,3,5-Trimethylbenzene	105	9.621	9.621	(0.940)	405772	50.0000	46.95
83	1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	267055	50.0000	45.50
54	1,3-Dichloropropane	76	7.559	7.559	(0.917)	207030	50.0000	55.03
84	1,4-Dichlorobenzene	146	10.251	10.251	(1.002)	283087	50.0000	44.54
26	2,2-Dichloropropane	77	4.268	4.268	(0.873)	115907	50.0000	44.95
24	2-Butanone	43	4.332	4.332	(0.886)	88797	100.000	108.57
76	2-Chlorotoluene	91	9.542	9.542	(0.933)	318385	50.0000	49.54
52	2-Hexanone	43	7.645	7.645	(0.927)	158334	100.000	100.13
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	396876	50.0000	48.97
82	p-Isopropyltoluene	119	10.206	10.206	(0.997)	435207	50.0000	47.07
45	4-Methyl-2-Pentanone	43	6.911	6.911	(0.838)	225220	100.000	106.63
10	Acetone	43	2.472	2.472	(0.506)	165143	100.000	115.53
37	Benzene	78	5.212	5.212	(0.927)	454331	50.0000	53.72
74	Bromobenzene	156	9.377	9.377	(0.916)	158981	50.0000	44.32
29	Bromochloromethane	128	4.549	4.549	(0.930)	70066	50.0000	52.79
39	Bromodichloromethane	83	6.345	6.345	(1.129)	144189	50.0000	55.28
66	Bromoform	173	8.980	8.980	(1.089)	88700	50.0000	43.63
6	Bromomethane	94	1.659	1.659	(0.339)	347121	50.0000	54.61
19	Carbon Disulfide	76	2.581	2.581	(0.528)	531514	100.000	106.58
34	Carbon Tetrachloride	117	4.988	4.988	(0.887)	133493	50.0000	49.09
59	Chlorobenzene	112	8.271	8.271	(1.003)	349606	50.0000	47.68
7	Chloroethane	64	1.741	1.741	(0.356)	198495	50.0000	63.36
28	Chloroform	83	4.650	4.650	(0.951)	203788	50.0000	53.61
3	Chloromethane	50	1.333	1.333	(0.273)	120903	50.0000	60.57
27	cis-1,2-Dichloroethene	96	4.279	4.279	(0.875)	124829	50.0000	48.74
46	cis-1,3-Dichloropropene	75	6.753	6.753	(1.201)	163687	50.0000	57.47
55	Dibromochloromethane	129	7.754	7.754	(0.940)	124603	50.0000	45.13
44	Dibromomethane	93	6.183	6.183	(1.100)	83224	50.0000	52.49
2	Dichlorodifluoromethane	85	1.198	1.198	(0.245)	111357	50.0000	48.70
61	Ethylbenzene	106	8.365	8.365	(1.015)	176984	50.0000	48.42
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	46917	50.0000	39.26
67	Isopropylbenzene	105	9.122	9.122	(1.106)	504049	50.0000	48.63
62	m,p-Xylenes	106	8.470	8.470	(1.027)	449866	100.000	100.57
17	Methylene Chloride	84	2.862	2.862	(0.585)	110540	50.0000	52.70
87	n-Butylbenzene	91	10.551	10.551	(1.031)	365079	50.0000	47.15
73	n-Propylbenzene	91	9.471	9.471	(0.926)	559050	50.0000	48.21
92	Naphthalene	128	12.129	12.129	(1.185)	496000	50.0000	52.85
63	o-Xylene	106	8.807	8.807	(1.068)	224601	50.0000	49.55
81	sec-Butylbenzene	105	10.082	10.082	(0.985)	457067	50.0000	47.05
64	Styrene	104	8.819	8.819	(1.070)	406588	50.0000	51.59
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	352584	50.0000	48.03
56	Tetrachloroethene	166	7.522	7.522	(0.912)	123075	50.0000	44.84
50	Toluene	91	7.042	7.042	(0.854)	539663	50.0000	49.40
20	trans-1,2-Dichloroethene	96	3.132	3.132	(0.641)	105421	50.0000	48.33
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	155626	50.0000	48.31
38	Trichloroethene	130	5.857	5.857	(1.042)	124975	50.0000	48.24
8	Trichlorofluoromethane	101	1.944	1.944	(0.398)	495846	50.0000	51.39
5	Vinyl Chloride	62	1.411	1.411	(0.289)	268184	50.0000	53.63



Data File: \\nahstws005\Target\chem\voa9,i\U191113,b\U111323.D
Date : 13-NOV-2019 19:45
Client ID: CCV-END
Sample Info: CCV-END;CCV-END;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

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

WorkOrder: HS19110644

LHAAP-50 501032

Aptim Environmental & Infrastucture, Inc.

Susan Huang
2500 City West Blvd., Suite 1700
Houston TX 77042

06-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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HS19110644 ALS Simi Valley Sub Data P1906981 Tier IV
HS19110644 ALS Salt Lake City Combined Report 1932284
HS19110644 8260 Raw Data
HS19110644 Wet Chem Raw Data

HS19110644 LHAAP50 501032 Final

ALS WO# HS19110644

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: **HS19110644**

Laboratory Results for: **LHAAP-50 501032**

Dear Susan,

ALS Environmental received 11 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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Work Order: HS19110644

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110644-01	50WW29-191111	Groundwater		11-Nov-2019 09:20	13-Nov-2019 09:39	☐
HS19110644-02	50WW10-191111	Groundwater		11-Nov-2019 10:15	13-Nov-2019 09:39	☐
HS19110644-03	50WW09-191111	Groundwater		11-Nov-2019 11:05	13-Nov-2019 09:39	☐
HS19110644-04	50WW09-191111-FD	Groundwater		11-Nov-2019 11:05	13-Nov-2019 09:39	☐
HS19110644-05	50WW22-191112	Groundwater		12-Nov-2019 08:30	13-Nov-2019 09:39	☐
HS19110644-06	50WW08-191112	Groundwater		12-Nov-2019 09:30	13-Nov-2019 09:39	☐
HS19110644-07	50WW06-191112	Groundwater		12-Nov-2019 10:30	13-Nov-2019 09:39	☐
HS19110644-08	50WW11-191112	Groundwater		12-Nov-2019 11:30	13-Nov-2019 09:39	☐
HS19110644-09	50WW12-191112	Groundwater		12-Nov-2019 12:30	13-Nov-2019 09:39	☐
HS19110644-10	50WW12-191112-FD	Groundwater		12-Nov-2019 12:30	13-Nov-2019 09:39	☐
HS19110644-11	Trip Blank	Water	CG 101419 -06	11-Nov-2019 00:00	13-Nov-2019 09:39	☐

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-50 501032
Work Order: HS19110644

Work Order Comments

- 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 Environmental in Kelso, WA. Final Report attached.

GCMS Volatiles by Method SW8260

Batch ID: R350624

Sample ID: 50WW29-191111 (HS19110644-01MS)

- MS/MSD failed QC limits for several compounds.

Sample ID: VLCSW-191115

- 1,2_Dichloropropane exceeded QC limits for LCS. CCV is OK. Samples are ND for this compound.

Sample ID: VSTD050

- Acetone exceeded %D limits for CCV. Samples are ND for this compound.

WetChemistry by Method SW9056

Batch ID: R350457

Sample ID: HS19110621-01MS

- MS and MSD are for an unrelated sample (Chloride,Sulfate)

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW29-191111
Collection Date: 11-Nov-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:56
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 13:56
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 13:56
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:56
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 13:56
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 13:56
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 13:56
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW29-191111
Collection Date: 11-Nov-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 13:56
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 13:56
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 13:56
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:56
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:56
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 13:56*
Surr: 4-Bromofluorobenzene	*96.6*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 13:56*
Surr: Dibromofluoromethane	*87.2*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 13:56*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 13:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW10-191111
Collection Date: 11-Nov-2019 10:15

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:23
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 18:23
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 18:23
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:23
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 18:23
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 18:23
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 18:23
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW10-191111
Collection Date: 11-Nov-2019 10:15

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 18:23
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 18:23
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 18:23
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:23
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:23
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 18:23*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 18:23*
Surr: Dibromofluoromethane	*89.5*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 18:23*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 18:23*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW09-191111
Collection Date: 11-Nov-2019 11:05

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:48
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 18:48
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 18:48
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:48
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 18:48
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 18:48
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 18:48
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW09-191111
Collection Date: 11-Nov-2019 11:05

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
cis-1,2-Dichloroethene	**4.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 18:48
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 18:48
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 18:48
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 18:48
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 18:48
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Trichloroethene	**30**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 18:48
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 18:48
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 18:48*
Surr: 4-Bromofluorobenzene	*90.0*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 18:48*
Surr: Dibromofluoromethane	*88.0*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 18:48*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 18:48*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW09-191111-FD
Collection Date: 11-Nov-2019 11:05

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:12
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 19:12
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 19:12
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:12
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 19:12
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 19:12
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 19:12
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW09-191111-FD
Collection Date: 11-Nov-2019 11:05

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
cis-1,2-Dichloroethene	**4.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 19:12
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 19:12
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 19:12
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 19:12
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:12
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Trichloroethene	**30**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 19:12
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:12
Surr: 1,2-Dichloroethane-d4	*98.6*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 19:12*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 19:12*
Surr: Dibromofluoromethane	*90.9*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 19:12*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 19:12*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP-50 501032 WorkOrder:HS19110644
Sample ID: 50WW22-191112 Lab ID:HS19110644-05
Collection Date: 12-Nov-2019 08:30 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,1,2-Trichlor-1,2,2-trifluoroethane	**1.0**		**0.50**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 19:36
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:36
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 19:36
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 19:36
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:36
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 19:36
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 19:36
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 19:36
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW22-191112
Collection Date: 12-Nov-2019 08:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 19:36
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 19:36
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 19:36
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 19:36
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 19:36
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 19:36*
Surr: 4-Bromofluorobenzene	*97.2*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 19:36*
Surr: Dibromofluoromethane	*86.8*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 19:36*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 19:36*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**773**		**4.00**	**10.0**	**10.0**	**mg/L**	20	13-Nov-2019 19:01
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	13-Nov-2019 18:44
Sulfate	**587**		**4.00**	**10.0**	**10.0**	**mg/L**	20	13-Nov-2019 19:01
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW22-191112
Collection Date: 12-Nov-2019 08:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Nov-2019 17:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	25-Nov-2019 09:52

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW08-191112
Collection Date: 12-Nov-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,1,2-Trichlor-1,2,2-trifluoroethane	**1.6**		**0.50**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 15:09
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,1-Dichloroethane	**1.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 15:09
1,1-Dichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 15:09
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,2-Dichloroethane	**2.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 15:09
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 15:09
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 15:09
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 15:09
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 15:09
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 15:09
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 15:09
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 15:09
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW08-191112
Collection Date: 12-Nov-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
cis-1,2-Dichloroethene	**39**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 15:09
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 15:09
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 15:09
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 15:09
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 15:09
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Tetrachloroethene	**1.3**		**0.30**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 15:09
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Trichloroethene	**420**		**2.0**	**5.0**	**10**	**UG/L**	10	15-Nov-2019 17:10
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 15:09
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*10*	*15-Nov-2019 17:10*
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 15:09*
Surr: 4-Bromofluorobenzene	*92.4*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 15:09*
Surr: 4-Bromofluorobenzene	*98.5*			**0**	*85-114*	*%REC*	*10*	*15-Nov-2019 17:10*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*10*	*15-Nov-2019 17:10*
Surr: Dibromofluoromethane	*91.2*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 15:09*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*10*	*15-Nov-2019 17:10*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 15:09*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**361**		**2.00**	**5.00**	**5.00**	**mg/L**	10	13-Nov-2019 19:34
Nitrogen, Nitrate (As N)	**0.118**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	13-Nov-2019 19:17
Sulfate	**304**		**2.00**	**5.00**	**5.00**	**mg/L**	10	13-Nov-2019 19:34

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW08-191112
Collection Date: 12-Nov-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Nov-2019 17:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	25-Nov-2019 09:52

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW06-191112
Collection Date: 12-Nov-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 20:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 20:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 20:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 20:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 20:01
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 20:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 20:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW06-191112
Collection Date: 12-Nov-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
cis-1,2-Dichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 20:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 20:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 20:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 20:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 20:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Trichloroethene	**41**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 20:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 20:01
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 20:01*
Surr: 4-Bromofluorobenzene	*94.7*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 20:01*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 20:01*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 20:01*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**84.1**		**0.200**	**0.500**	**0.500**	**mg/L**	1	13-Nov-2019 20:40
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	13-Nov-2019 20:40
Sulfate	**20.8**		**0.200**	**0.500**	**0.500**	**mg/L**	1	13-Nov-2019 20:40
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Nov-2019 17:07

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW06-191112
Collection Date: 12-Nov-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	25-Nov-2019 09:52

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW11-191112
Collection Date: 12-Nov-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,1,2-Trichlor-1,2,2-trifluoroethane	5.0	U	5.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,1-Dichloroethene	**26**		**2.0**	**5.0**	**10**	**UG/L**	10	15-Nov-2019 15:33
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,2-Dichloroethane	**28**		**2.0**	**5.0**	**10**	**UG/L**	10	15-Nov-2019 15:33
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Nov-2019 15:33
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
2-Butanone	10	U	5.0	10	20	UG/L	10	15-Nov-2019 15:33
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
2-Hexanone	10	U	10	10	20	UG/L	10	15-Nov-2019 15:33
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	15-Nov-2019 15:33
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	15-Nov-2019 15:33
Acetone	20	U	4.0	20	20	UG/L	10	15-Nov-2019 15:33
Benzene	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Carbon disulfide	10	U	6.0	10	20	UG/L	10	15-Nov-2019 15:33
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW11-191112
Collection Date: 12-Nov-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
cis-1,2-Dichloroethene	**58**		**2.0**	**5.0**	**10**	**UG/L**	10	15-Nov-2019 15:33
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	15-Nov-2019 15:33
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
m,p-Xylene	10	U	5.0	10	20	UG/L	10	15-Nov-2019 15:33
Methylene chloride	10	U	4.0	10	20	UG/L	10	15-Nov-2019 15:33
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Nov-2019 15:33
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Styrene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Toluene	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Trichloroethene	**3,300**		**20**	**50**	**100**	**UG/L**	100	15-Nov-2019 16:46
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	15-Nov-2019 15:33
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*10*	*15-Nov-2019 15:33*
Surr: 1,2-Dichloroethane-d4	*99.6*			**0**	*81-118*	*%REC*	*100*	*15-Nov-2019 16:46*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*10*	*15-Nov-2019 15:33*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*100*	*15-Nov-2019 16:46*
Surr: Dibromofluoromethane	*92.2*			**0**	*80-119*	*%REC*	*10*	*15-Nov-2019 15:33*
Surr: Dibromofluoromethane	*88.8*			**0**	*80-119*	*%REC*	*100*	*15-Nov-2019 16:46*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*10*	*15-Nov-2019 15:33*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*100*	*15-Nov-2019 16:46*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**294**		**2.00**	**5.00**	**5.00**	**mg/L**	10	13-Nov-2019 21:47
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	13-Nov-2019 21:30
Sulfate	**351**		**2.00**	**5.00**	**5.00**	**mg/L**	10	13-Nov-2019 21:47

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW11-191112
Collection Date: 12-Nov-2019 11:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Nov-2019 17:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	25-Nov-2019 09:52

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW12-191112
Collection Date: 12-Nov-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,1-Dichloroethene	**4.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 14:20
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,2-Dichloroethane	**2.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 14:20
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:20
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 14:20
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 14:20
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:20
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 14:20
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 14:20
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 14:20
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW12-191112
Collection Date: 12-Nov-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 14:20
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 14:20
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 14:20
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:20
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Trichloroethene	**280**		**1.0**	**2.5**	**5.0**	**UG/L**	5	15-Nov-2019 17:35
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:20
Surr: 1,2-Dichloroethane-d4	*98.3*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 14:20*
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*5*	*15-Nov-2019 17:35*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*5*	*15-Nov-2019 17:35*
Surr: 4-Bromofluorobenzene	*90.2*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 14:20*
Surr: Dibromofluoromethane	*86.6*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 14:20*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*5*	*15-Nov-2019 17:35*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*5*	*15-Nov-2019 17:35*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 14:20*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**1,070**		**4.00**	**10.0**	**10.0**	**mg/L**	20	13-Nov-2019 22:20
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	13-Nov-2019 22:03
Sulfate	**531**		**4.00**	**10.0**	**10.0**	**mg/L**	20	13-Nov-2019 22:20

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW12-191112
Collection Date: 12-Nov-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Nov-2019 17:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	25-Nov-2019 09:52

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW12-191112-FD
Collection Date: 12-Nov-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,1-Dichloroethane	**1.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 14:45
1,1-Dichloroethene	**4.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 14:45
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,2-Dichloroethane	**2.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 14:45
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:45
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 14:45
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 14:45
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:45
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 14:45
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 14:45
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 14:45
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW12-191112-FD
Collection Date: 12-Nov-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
cis-1,2-Dichloroethene	**0.76**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Nov-2019 14:45
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 14:45
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 14:45
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 14:45
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 14:45
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Trichloroethene	**260**		**1.0**	**2.5**	**5.0**	**UG/L**	5	15-Nov-2019 17:59
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 14:45
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 14:45*
Surr: 1,2-Dichloroethane-d4	*100.0*			**0**	*81-118*	*%REC*	*5*	*15-Nov-2019 17:59*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*5*	*15-Nov-2019 17:59*
Surr: 4-Bromofluorobenzene	*96.0*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 14:45*
Surr: Dibromofluoromethane	*89.3*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 14:45*
Surr: Dibromofluoromethane	*84.0*			**0**	*80-119*	*%REC*	*5*	*15-Nov-2019 17:59*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*5*	*15-Nov-2019 17:59*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 14:45*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**1,060**		**4.00**	**10.0**	**10.0**	**mg/L**	20	13-Nov-2019 22:53
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	13-Nov-2019 22:37
Sulfate	**533**		**4.00**	**10.0**	**10.0**	**mg/L**	20	13-Nov-2019 22:53

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW12-191112-FD
Collection Date: 12-Nov-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	26-Nov-2019 17:07
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	25-Nov-2019 09:52

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP-50 501032 WorkOrder:HS19110644
Sample ID: Trip Blank Lab ID:HS19110644-11
Collection Date: 11-Nov-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
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:32
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 13:32
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Nov-2019 13:32
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:32
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Nov-2019 13:32
Acetone	2.0	U	0.40	2.0	2.0	UG/L	1	15-Nov-2019 13:32
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Nov-2019 13:32
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: Trip Blank
Collection Date: 11-Nov-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19110644
Lab ID:HS19110644-11
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Nov-2019 13:32
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Nov-2019 13:32
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Nov-2019 13:32
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Nov-2019 13:32
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Nov-2019 13:32
Surr: 1,2-Dichloroethane-d4	*96.4*			**0**	*81-118*	*%REC*	*1*	*15-Nov-2019 13:32*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*1*	*15-Nov-2019 13:32*
Surr: Dibromofluoromethane	*89.0*			**0**	*80-119*	*%REC*	*1*	*15-Nov-2019 13:32*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*15-Nov-2019 13:32*

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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R350457 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19110644-05	50WW22-191112	12 Nov 2019 08:30			13 Nov 2019 19:01	20
HS19110644-05	50WW22-191112	12 Nov 2019 08:30			13 Nov 2019 18:44	1
HS19110644-06	50WW08-191112	12 Nov 2019 09:30			13 Nov 2019 19:34	10
HS19110644-06	50WW08-191112	12 Nov 2019 09:30			13 Nov 2019 19:17	1
HS19110644-07	50WW06-191112	12 Nov 2019 10:30			13 Nov 2019 20:40	1
HS19110644-08	50WW11-191112	12 Nov 2019 11:30			13 Nov 2019 21:47	10
HS19110644-08	50WW11-191112	12 Nov 2019 11:30			13 Nov 2019 21:30	1
HS19110644-09	50WW12-191112	12 Nov 2019 12:30			13 Nov 2019 22:20	20
HS19110644-09	50WW12-191112	12 Nov 2019 12:30			13 Nov 2019 22:03	1
HS19110644-10	50WW12-191112-FD	12 Nov 2019 12:30			13 Nov 2019 22:53	20
HS19110644-10	50WW12-191112-FD	12 Nov 2019 12:30			13 Nov 2019 22:37	1
Batch ID: R350624 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19110644-11	Trip Blank	11 Nov 2019 00:00			15 Nov 2019 13:32	1
Batch ID: R350624 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19110644-01	50WW29-191111	11 Nov 2019 09:20			15 Nov 2019 13:56	1
HS19110644-02	50WW10-191111	11 Nov 2019 10:15			15 Nov 2019 18:23	1
HS19110644-03	50WW09-191111	11 Nov 2019 11:05			15 Nov 2019 18:48	1
HS19110644-04	50WW09-191111-FD	11 Nov 2019 11:05			15 Nov 2019 19:12	1
HS19110644-05	50WW22-191112	12 Nov 2019 08:30			15 Nov 2019 19:36	1
HS19110644-06	50WW08-191112	12 Nov 2019 09:30			15 Nov 2019 17:10	10
HS19110644-06	50WW08-191112	12 Nov 2019 09:30			15 Nov 2019 15:09	1
HS19110644-07	50WW06-191112	12 Nov 2019 10:30			15 Nov 2019 20:01	1
HS19110644-08	50WW11-191112	12 Nov 2019 11:30			15 Nov 2019 16:46	100
HS19110644-08	50WW11-191112	12 Nov 2019 11:30			15 Nov 2019 15:33	10
HS19110644-09	50WW12-191112	12 Nov 2019 12:30			15 Nov 2019 17:35	5
HS19110644-09	50WW12-191112	12 Nov 2019 12:30			15 Nov 2019 14:20	1
HS19110644-10	50WW12-191112-FD	12 Nov 2019 12:30			15 Nov 2019 17:59	5
HS19110644-10	50WW12-191112-FD	12 Nov 2019 12:30			15 Nov 2019 14:45	1
Batch ID: R351196 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS19110644-05	50WW22-191112	12 Nov 2019 08:30			25 Nov 2019 09:52	1
HS19110644-06	50WW08-191112	12 Nov 2019 09:30			25 Nov 2019 09:52	1
HS19110644-07	50WW06-191112	12 Nov 2019 10:30			25 Nov 2019 09:52	1
HS19110644-08	50WW11-191112	12 Nov 2019 11:30			25 Nov 2019 09:52	1
HS19110644-09	50WW12-191112	12 Nov 2019 12:30			25 Nov 2019 09:52	1
HS19110644-10	50WW12-191112-FD	12 Nov 2019 12:30			25 Nov 2019 09:52	1

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R351372 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS19110644-05	50WW22-191112	12 Nov 2019 08:30			26 Nov 2019 17:07	1
HS19110644-06	50WW08-191112	12 Nov 2019 09:30			26 Nov 2019 17:07	1
HS19110644-07	50WW06-191112	12 Nov 2019 10:30			26 Nov 2019 17:07	1
HS19110644-08	50WW11-191112	12 Nov 2019 11:30			26 Nov 2019 17:07	1
HS19110644-09	50WW12-191112	12 Nov 2019 12:30			26 Nov 2019 17:07	1
HS19110644-10	50WW12-191112-FD	12 Nov 2019 12:30			26 Nov 2019 17:07	1
Batch ID: R351504 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19110644-01	50WW29-191111	11 Nov 2019 09:20			27 Nov 2019 17:54	1
HS19110644-02	50WW10-191111	11 Nov 2019 10:15			27 Nov 2019 17:54	1
HS19110644-03	50WW09-191111	11 Nov 2019 11:05			27 Nov 2019 17:54	1
HS19110644-04	50WW09-191111-FD	11 Nov 2019 11:05			27 Nov 2019 17:54	1
HS19110644-05	50WW22-191112	12 Nov 2019 08:30			27 Nov 2019 17:54	1
HS19110644-06	50WW08-191112	12 Nov 2019 09:30			27 Nov 2019 17:54	1
HS19110644-07	50WW06-191112	12 Nov 2019 10:30			27 Nov 2019 17:54	1
HS19110644-08	50WW11-191112	12 Nov 2019 11:30			27 Nov 2019 17:54	1
HS19110644-09	50WW12-191112	12 Nov 2019 12:30			27 Nov 2019 17:54	1
HS19110644-10	50WW12-191112-FD	12 Nov 2019 12:30			27 Nov 2019 17:54	1

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-191115** Units: **UG/L** Analysis Date: **15-Nov-2019 13:07**
Client ID: Run ID: **VOA9_350624** SeqNo: **5346675** 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	0.50	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

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-191115** Units: **UG/L** Analysis Date: **15-Nov-2019 13:07**
Client ID: Run ID: **VOA9_350624** SeqNo: **5346675** 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	*49*	*1.0*	*50*	*0*	*98.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.09*	*1.0*	*50*	*0*	*94.2*	*85 - 114*				
Surr: Dibromofluoromethane	*44.5*	*1.0*	*50*	*0*	*89.0*	*80 - 119*				

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-191115** Units: **UG/L** Analysis Date: **15-Nov-2019 13:07**
Client ID: Run ID: **VOA9_350624** SeqNo: **5346675** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*52.12*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-191115** Units: **UG/L** Analysis Date: **15-Nov-2019 12:19**
Client ID: Run ID: **VOA9_350624** SeqNo: **5346674** 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	18.38	1.0	20	0	91.9	78 - 124				
1,1,1-Trichloroethane	18.42	1.0	20	0	92.1	74 - 131				
1,1,2,2-Tetrachloroethane	21.73	1.0	20	0	109	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	19.98	1.0	20	0	99.9	70 - 136				
1,1,2-Trichloroethane	21.08	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	23.15	1.0	20	0	116	77 - 125				
1,1-Dichloroethene	22.18	1.0	20	0	111	71 - 131				
1,1-Dichloropropene	20.1	1.0	20	0	101	78 - 125				
1,2,3-Trichlorobenzene	18.57	1.0	20	0	92.8	69 - 129				
1,2,3-Trichloropropane	20.03	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	16.44	1.0	20	0	82.2	69 - 130				
1,2,4-Trimethylbenzene	19.09	1.0	20	0	95.4	76 - 124				
1,2-Dibromo-3-chloropropane	15.93	1.0	20	0	79.6	62 - 128				
1,2-Dibromoethane	19.15	1.0	20	0	95.8	77 - 121				
1,2-Dichlorobenzene	19.25	1.0	20	0	96.3	80 - 119				
1,2-Dichloroethane	19.49	1.0	20	0	97.5	73 - 128				
1,2-Dichloropropane	24.44	1.0	20	0	122	78 - 122				S
1,3,5-Trimethylbenzene	18.93	1.0	20	0	94.7	75 - 124				
1,3-Dichlorobenzene	17.36	1.0	20	0	86.8	80 - 119				
1,3-Dichloropropane	22.24	1.0	20	0	111	80 - 119				
1,4-Dichlorobenzene	17.42	1.0	20	0	87.1	79 - 118				
2,2-Dichloropropane	18.33	1.0	20	0	91.7	60 - 139				
2-Butanone	45.48	2.0	40	0	114	56 - 143				
2-Chlorotoluene	20.93	1.0	20	0	105	79 - 122				
2-Hexanone	42.68	2.0	40	0	107	57 - 139				
4-Chlorotoluene	19.29	1.0	20	0	96.4	78 - 122				
4-Isopropyltoluene	17.88	1.0	20	0	89.4	77 - 127				
4-Methyl-2-pentanone	44.57	2.0	40	0	111	67 - 130				
Acetone	50.37	2.0	40	0	126	39 - 160				
Benzene	21.94	1.0	20	0	110	79 - 120				
Bromobenzene	18.07	1.0	20	0	90.4	80 - 120				
Bromochloromethane	20.73	1.0	20	0	104	78 - 123				
Bromodichloromethane	21.16	1.0	20	0	106	79 - 125				
Bromoform	15.87	1.0	20	0	79.3	66 - 130				

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-191115** Units: **UG/L** Analysis Date: **15-Nov-2019 12:19**
Client ID: Run ID: **VOA9_350624** SeqNo: **5346674** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	25.62	1.0	20	0	128	53 - 141				
Carbon disulfide	45.84	2.0	40	0	115	64 - 133				
Carbon tetrachloride	17.73	1.0	20	0	88.6	72 - 136				
Chlorobenzene	19.39	1.0	20	0	96.9	82 - 118				
Chloroethane	26.49	1.0	20	0	132	60 - 138				
Chloroform	21.33	1.0	20	0	107	79 - 124				
Chloromethane	26.49	1.0	20	0	132	50 - 139				
cis-1,2-Dichloroethene	20.98	1.0	20	0	105	78 - 123				
cis-1,3-Dichloropropene	22.73	1.0	20	0	114	75 - 124				
Dibromochloromethane	16.93	1.0	20	0	84.7	74 - 126				
Dibromomethane	22.64	1.0	20	0	113	79 - 123				
Dichlorodifluoromethane	20.36	1.0	20	0	102	32 - 152				
Ethylbenzene	17.83	1.0	20	0	89.2	79 - 121				
Hexachlorobutadiene	17.34	1.0	20	0	86.7	66 - 134				
Isopropylbenzene	18.14	1.0	20	0	90.7	72 - 131				
m,p-Xylene	38.39	2.0	40	0	96.0	80 - 121				
Methylene chloride	23.01	2.0	20	0	115	74 - 124				
Naphthalene	20.07	1.0	20	0	100	61 - 128				
n-Butylbenzene	18.35	1.0	20	0	91.7	75 - 128				
n-Propylbenzene	19.54	1.0	20	0	97.7	76 - 126				
o-Xylene	18.84	1.0	20	0	94.2	78 - 122				
sec-Butylbenzene	18.59	1.0	20	0	93.0	77 - 126				
Styrene	19.45	1.0	20	0	97.3	78 - 123				
tert-Butylbenzene	18.39	1.0	20	0	91.9	78 - 124				
Tetrachloroethene	17.17	1.0	20	0	85.8	74 - 129				
Toluene	19.42	1.0	20	0	97.1	80 - 121				
trans-1,2-Dichloroethene	20.68	1.0	20	0	103	75 - 124				
trans-1,3-Dichloropropene	17.97	1.0	20	0	89.9	73 - 127				
Trichloroethene	18.71	1.0	20	0	93.6	79 - 123				
Trichlorofluoromethane	21.47	1.0	20	0	107	65 - 141				
Vinyl chloride	24.2	1.0	20	0	121	58 - 137				
Surr: 1,2-Dichloroethane-d4	*57.79*	*1.0*	*50*	*0*	*116*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.4*	*1.0*	*50*	*0*	*94.8*	*85 - 114*				
Surr: Dibromofluoromethane	*53.56*	*1.0*	*50*	*0*	*107*	*80 - 119*				

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-191115** Units: **UG/L** Analysis Date: **15-Nov-2019 12:19**
Client ID: Run ID: **VOA9_350624** SeqNo: **5346674** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*50.48*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19110644-01MS** Units: **UG/L** Analysis Date: **15-Nov-2019 15:58**
Client ID: **50WW29-191111** Run ID: **VOA9_350624** SeqNo: **5346682** 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	22.07	1.0	20	0	110	78 - 124				
1,1,1-Trichloroethane	24.4	1.0	20	0	122	74 - 131				
1,1,2,2-Tetrachloroethane	24.09	1.0	20	0	120	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	28.04	1.0	20	0	140	70 - 136				S
1,1,2-Trichloroethane	27.89	1.0	20	0	139	80 - 119				S
1,1-Dichloroethane	26.81	1.0	20	0	134	77 - 125				S
1,1-Dichloroethene	28.31	1.0	20	0	142	71 - 131				S
1,1-Dichloropropene	28.52	1.0	20	0	143	78 - 125				S
1,2,3-Trichlorobenzene	21.55	1.0	20	0	108	69 - 129				
1,2,3-Trichloropropane	23.36	1.0	20	0	117	73 - 122				
1,2,4-Trichlorobenzene	20.9	1.0	20	0	105	69 - 130				
1,2,4-Trimethylbenzene	23.87	1.0	20	0	119	76 - 124				
1,2-Dibromo-3-chloropropane	20.82	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	23.75	1.0	20	0	119	77 - 121				
1,2-Dichlorobenzene	23	1.0	20	0	115	80 - 119				
1,2-Dichloroethane	27.38	1.0	20	0	137	73 - 128				S
1,2-Dichloropropane	30.12	1.0	20	0	151	78 - 122				S
1,3,5-Trimethylbenzene	24.87	1.0	20	0	124	75 - 124				S
1,3-Dichlorobenzene	22.18	1.0	20	0	111	80 - 119				
1,3-Dichloropropane	27.21	1.0	20	0	136	80 - 119				S
1,4-Dichlorobenzene	21.15	1.0	20	0	106	79 - 118				
2,2-Dichloropropane	18.1	1.0	20	0	90.5	60 - 139				
2-Butanone	49.58	2.0	40	0	124	56 - 143				
2-Chlorotoluene	25.31	1.0	20	0	127	79 - 122				S
2-Hexanone	49.24	2.0	40	0	123	57 - 139				
4-Chlorotoluene	23.92	1.0	20	0	120	78 - 122				
4-Isopropyltoluene	23.77	1.0	20	0	119	77 - 127				
4-Methyl-2-pentanone	51.87	2.0	40	0	130	67 - 130				
Acetone	53.41	2.0	40	0	134	39 - 160				
Benzene	27.96	1.0	20	0	140	79 - 120				S
Bromobenzene	20.86	1.0	20	0	104	80 - 120				
Bromochloromethane	22.36	1.0	20	0	112	78 - 123				
Bromodichloromethane	26.35	1.0	20	0	132	79 - 125				S
Bromoform	18.33	1.0	20	0	91.6	66 - 130				

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19110644-01MS** Units: **UG/L** Analysis Date: **15-Nov-2019 15:58**
Client ID: **50WW29-191111** Run ID: **VOA9_350624** SeqNo: **5346682** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	30.26	1.0	20	0	151	53 - 141				S
Carbon disulfide	51.42	2.0	40	0	129	64 - 133				
Carbon tetrachloride	25.03	1.0	20	0	125	72 - 136				
Chlorobenzene	24.59	1.0	20	0	123	82 - 118				S
Chloroethane	33.6	1.0	20	0	168	60 - 138				S
Chloroform	25.42	1.0	20	0	127	79 - 124				S
Chloromethane	29.51	1.0	20	0	148	50 - 139				S
cis-1,2-Dichloroethene	24.5	1.0	20	0	123	78 - 123				
cis-1,3-Dichloropropene	25.95	1.0	20	0	130	75 - 124				S
Dibromochloromethane	20.93	1.0	20	0	105	74 - 126				
Dibromomethane	26.4	1.0	20	0	132	79 - 123				S
Dichlorodifluoromethane	23.29	1.0	20	0	116	32 - 152				
Ethylbenzene	25.77	1.0	20	0	129	79 - 121				S
Hexachlorobutadiene	19.15	1.0	20	0	95.7	66 - 134				
Isopropylbenzene	25.76	1.0	20	0	129	72 - 131				
m,p-Xylene	49.79	2.0	40	0	124	80 - 121				S
Methylene chloride	25.83	2.0	20	0	129	74 - 124				S
Naphthalene	24.07	1.0	20	0	120	61 - 128				
n-Butylbenzene	24.53	1.0	20	0	123	75 - 128				
n-Propylbenzene	25.65	1.0	20	0	128	76 - 126				S
o-Xylene	24.31	1.0	20	0	122	78 - 122				
sec-Butylbenzene	25.34	1.0	20	0	127	77 - 126				S
Styrene	24.01	1.0	20	0	120	78 - 123				
tert-Butylbenzene	24.69	1.0	20	0	123	78 - 124				
Tetrachloroethene	24.11	1.0	20	0	121	74 - 129				
Toluene	25.26	1.0	20	0	126	80 - 121				S
trans-1,2-Dichloroethene	23.67	1.0	20	0	118	75 - 124				
trans-1,3-Dichloropropene	20.28	1.0	20	0	101	73 - 127				
Trichloroethene	26.8	1.0	20	0	134	79 - 123				S
Trichlorofluoromethane	27.21	1.0	20	0	136	65 - 141				
Vinyl chloride	28.22	1.0	20	0	141	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*49.65*	*1.0*	*50*	*0*	*99.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.69*	*1.0*	*50*	*0*	*99.4*	*85 - 114*				
Surr: Dibromofluoromethane	*48.26*	*1.0*	*50*	*0*	*96.5*	*80 - 119*				

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19110644-01MS** Units: **UG/L** Analysis Date: **15-Nov-2019 15:58**
Client ID: **50WW29-191111** Run ID: **VOA9_350624** SeqNo: **5346682** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*51.91*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19110644-01MSD** Units: **UG/L** Analysis Date: **15-Nov-2019 16:22**
Client ID: **50WW29-191111** Run ID: **VOA9_350624** SeqNo: **5346683** 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	21.57	1.0	20	0	108	78 - 124	22.07	2.3	20	
1,1,1-Trichloroethane	22.02	1.0	20	0	110	74 - 131	24.4	10.2	20	
1,1,2,2-Tetrachloroethane	25.8	1.0	20	0	129	71 - 121	24.09	6.86	20	S
1,1,2-Trichlor-1,2,2-trifluoroethane	26.91	1.0	20	0	135	70 - 136	28.04	4.1	20	
1,1,2-Trichloroethane	26.94	1.0	20	0	135	80 - 119	27.89	3.44	20	S
1,1-Dichloroethane	24.76	1.0	20	0	124	77 - 125	26.81	7.98	20	
1,1-Dichloroethene	27.22	1.0	20	0	136	71 - 131	28.31	3.93	20	S
1,1-Dichloropropene	28.8	1.0	20	0	144	78 - 125	28.52	0.971	20	S
1,2,3-Trichlorobenzene	23.04	1.0	20	0	115	69 - 129	21.55	6.66	20	
1,2,3-Trichloropropane	23.5	1.0	20	0	118	73 - 122	23.36	0.614	20	
1,2,4-Trichlorobenzene	21.13	1.0	20	0	106	69 - 130	20.9	1.08	20	
1,2,4-Trimethylbenzene	23.9	1.0	20	0	120	76 - 124	23.87	0.127	20	
1,2-Dibromo-3-chloropropane	21.36	1.0	20	0	107	62 - 128	20.82	2.55	20	
1,2-Dibromoethane	22.34	1.0	20	0	112	77 - 121	23.75	6.15	20	
1,2-Dichlorobenzene	22.62	1.0	20	0	113	80 - 119	23	1.64	20	
1,2-Dichloroethane	27.67	1.0	20	0	138	73 - 128	27.38	1.07	20	S
1,2-Dichloropropane	30.28	1.0	20	0	151	78 - 122	30.12	0.517	20	S
1,3,5-Trimethylbenzene	24.18	1.0	20	0	121	75 - 124	24.87	2.82	20	
1,3-Dichlorobenzene	22.63	1.0	20	0	113	80 - 119	22.18	2.05	20	
1,3-Dichloropropane	27.68	1.0	20	0	138	80 - 119	27.21	1.71	20	S
1,4-Dichlorobenzene	21.72	1.0	20	0	109	79 - 118	21.15	2.64	20	
2,2-Dichloropropane	16.92	1.0	20	0	84.6	60 - 139	18.1	6.74	20	
2-Butanone	47.99	2.0	40	0	120	56 - 143	49.58	3.26	20	
2-Chlorotoluene	26.03	1.0	20	0	130	79 - 122	25.31	2.8	20	S
2-Hexanone	51.84	2.0	40	0	130	57 - 139	49.24	5.16	20	
4-Chlorotoluene	24.01	1.0	20	0	120	78 - 122	23.92	0.38	20	
4-Isopropyltoluene	23.96	1.0	20	0	120	77 - 127	23.77	0.774	20	
4-Methyl-2-pentanone	55.93	2.0	40	0	140	67 - 130	51.87	7.54	20	S
Acetone	55.55	2.0	40	0	139	39 - 160	53.41	3.93	20	
Benzene	28.33	1.0	20	0	142	79 - 120	27.96	1.31	20	S
Bromobenzene	21.8	1.0	20	0	109	80 - 120	20.86	4.43	20	
Bromochloromethane	22.8	1.0	20	0	114	78 - 123	22.36	1.94	20	
Bromodichloromethane	26.66	1.0	20	0	133	79 - 125	26.35	1.18	20	S
Bromoform	19.33	1.0	20	0	96.7	66 - 130	18.33	5.33	20	

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19110644-01MSD** Units: **UG/L** Analysis Date: **15-Nov-2019 16:22**
Client ID: **50WW29-191111** Run ID: **VOA9_350624** SeqNo: **5346683** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	29.37	1.0	20	0	147	53 - 141	30.26	2.98	20	S
Carbon disulfide	51.04	2.0	40	0	128	64 - 133	51.42	0.738	20	
Carbon tetrachloride	25.45	1.0	20	0	127	72 - 136	25.03	1.68	20	
Chlorobenzene	23.53	1.0	20	0	118	82 - 118	24.59	4.39	20	
Chloroethane	32.01	1.0	20	0	160	60 - 138	33.6	4.85	20	S
Chloroform	25.03	1.0	20	0	125	79 - 124	25.42	1.57	20	S
Chloromethane	30.07	1.0	20	0	150	50 - 139	29.51	1.88	20	S
cis-1,2-Dichloroethene	21.53	1.0	20	0	108	78 - 123	24.5	12.9	20	
cis-1,3-Dichloropropene	25.66	1.0	20	0	128	75 - 124	25.95	1.12	20	S
Dibromochloromethane	21.8	1.0	20	0	109	74 - 126	20.93	4.08	20	
Dibromomethane	27.07	1.0	20	0	135	79 - 123	26.4	2.52	20	S
Dichlorodifluoromethane	20.9	1.0	20	0	105	32 - 152	23.29	10.8	20	
Ethylbenzene	24.65	1.0	20	0	123	79 - 121	25.77	4.47	20	S
Hexachlorobutadiene	22.17	1.0	20	0	111	66 - 134	19.15	14.6	20	
Isopropylbenzene	25.67	1.0	20	0	128	72 - 131	25.76	0.342	20	
m,p-Xylene	50.3	2.0	40	0	126	80 - 121	49.79	1.01	20	S
Methylene chloride	24.37	2.0	20	0	122	74 - 124	25.83	5.8	20	
Naphthalene	24.51	1.0	20	0	123	61 - 128	24.07	1.8	20	
n-Butylbenzene	25.91	1.0	20	0	130	75 - 128	24.53	5.48	20	S
n-Propylbenzene	25.54	1.0	20	0	128	76 - 126	25.65	0.405	20	S
o-Xylene	23.88	1.0	20	0	119	78 - 122	24.31	1.77	20	
sec-Butylbenzene	25.67	1.0	20	0	128	77 - 126	25.34	1.29	20	S
Styrene	24.26	1.0	20	0	121	78 - 123	24.01	1.07	20	
tert-Butylbenzene	25.59	1.0	20	0	128	78 - 124	24.69	3.56	20	S
Tetrachloroethene	23.86	1.0	20	0	119	74 - 129	24.11	1.01	20	
Toluene	25.06	1.0	20	0	125	80 - 121	25.26	0.813	20	S
trans-1,2-Dichloroethene	22.99	1.0	20	0	115	75 - 124	23.67	2.93	20	
trans-1,3-Dichloropropene	21.05	1.0	20	0	105	73 - 127	20.28	3.75	20	
Trichloroethene	26.03	1.0	20	0	130	79 - 123	26.8	2.92	20	S
Trichlorofluoromethane	26.97	1.0	20	0	135	65 - 141	27.21	0.899	20	
Vinyl chloride	28.16	1.0	20	0	141	58 - 137	28.22	0.239	20	S
Surr: 1,2-Dichloroethane-d4	*48.35*	*1.0*	*50*	*0*	*96.7*	*81 - 118*	*49.65*	*2.64*	*20*	
Surr: 4-Bromofluorobenzene	*49.79*	*1.0*	*50*	*0*	*99.6*	*85 - 114*	*49.69*	*0.203*	*20*	
Surr: Dibromofluoromethane	*46.3*	*1.0*	*50*	*0*	*92.6*	*80 - 119*	*48.26*	*4.13*	*20*	

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350624 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19110644-01MSD** Units: **UG/L** Analysis Date: **15-Nov-2019 16:22**
Client ID: **50WW29-191111** Run ID: **VOA9_350624** SeqNo: **5346683** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*51.64*	*1.0*	*50*	*0*	*103*	*89 - 112*	*51.91*	*0.529*	*20*	

The following samples were analyzed in this batch:

HS19110644-01	HS19110644-02	HS19110644-03	HS19110644-04
HS19110644-05	HS19110644-06	HS19110644-07	HS19110644-08
HS19110644-09	HS19110644-10	HS19110644-11	

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

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
Chloride	0.500	0.500								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Sulfate	0.500	0.500								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
Chloride	19.9	0.500	20	0	99.5	80 - 120				
Nitrogen, Nitrate (As N)	4.021	0.100	4	0	101	80 - 120				
Sulfate	19.6	0.500	20	0	98.0	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
Chloride	19.76	0.500	20	0	98.8	80 - 120	19.9	0.736	20	
Nitrogen, Nitrate (As N)	3.991	0.100	4	0	99.8	80 - 120	4.021	0.741	20	
Sulfate	19.39	0.500	20	0	96.9	80 - 120	19.6	1.07	20	

MS Sample ID: **HS19110644-07MS** Units: **mg/L** Analysis Date: **13-Nov-2019 20:57**
Client ID: **50WW06-191112** 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
Chloride	92.15	0.500	10	84.1	80.5	80 - 120				O
Nitrogen, Nitrate (As N)	1.929	0.100	2	0	96.4	80 - 120				
Sulfate	29.85	0.500	10	20.76	90.9	80 - 120				

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110644

QC BATCH REPORT

Batch ID: R350457 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

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
Chloride	311.1	1.00	20	297	70.3	80 - 120				SEO
Nitrogen, Nitrate (As N)	24.53	0.200	4	21	88.0	80 - 120				O
Sulfate	322.5	1.00	20	310.5	60.1	80 - 120				SEO

MSD Sample ID: **HS19110644-07MSD** Units: **mg/L** Analysis Date: **13-Nov-2019 21:14**
Client ID: **50WW06-191112** 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
Chloride	92.17	0.500	10	84.1	80.7	80 - 120	92.15	0.0174	20	O
Nitrogen, Nitrate (As N)	1.934	0.100	2	0	96.7	80 - 120	1.929	0.243	20	
Sulfate	29.88	0.500	10	20.76	91.2	80 - 120	29.85	0.1	20	

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
Chloride	310.4	1.00	20	297	66.5	80 - 120	311.1	0.243	20	SEO
Nitrogen, Nitrate (As N)	24.44	0.200	4	21	85.9	80 - 120	24.53	0.359	20	O
Sulfate	322.3	1.00	20	310.5	59.2	80 - 120	322.5	0.0539	20	SEO

The following samples were analyzed in this batch: HS19110644-05 HS19110644-06 HS19110644-07 HS19110644-08 HS19110644-09 HS19110644-10

ALS Houston, US Date: 27-Nov-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: **HS19110644**

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

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Work Order: HS19110644

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19110644-01	50WW29-191111	Login	11/13/2019 3:24:15 PM	JRM	Sub
HS19110644-01	50WW29-191111	Login	11/13/2019 3:24:15 PM	JRM	Disposed
HS19110644-02	50WW10-191111	Login	11/13/2019 3:24:15 PM	JRM	Sub
HS19110644-02	50WW10-191111	Login	11/13/2019 3:24:15 PM	JRM	Disposed
HS19110644-03	50WW09-191111	Login	11/13/2019 3:24:15 PM	JRM	Sub
HS19110644-03	50WW09-191111	Login	11/13/2019 3:24:15 PM	JRM	Disposed
HS19110644-05	50WW22-191112	Login	11/13/2019 3:24:15 PM	JRM	Sub
HS19110644-05	50WW22-191112	Login	11/13/2019 3:24:15 PM	JRM	Disposed
HS19110644-05	50WW22-191112	Login	11/13/2019 3:24:15 PM	JRM	Disposed
HS19110644-05	50WW22-191112	Login	11/13/2019 3:24:15 PM	JRM	Sub
HS19110644-05	50WW22-191112	Login	11/13/2019 3:24:15 PM	JRM	Sub
HS19110644-05	50WW22-191112	Login	11/13/2019 3:24:15 PM	JRM	Sub

ALS Houston, US Date: 27-Nov-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19110644
Date/Time Received: **13-Nov-2019 09:39**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 13-Nov-2019 Date
Reviewed by: *RJ Modashia* eSignature 14-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: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):	1.0°C / 0.5°C UC/C	IR11	
Cooler(s)/Kit(s):	43786		
Date/Time sample(s) sent to storage:	11/13/2019 15:45		
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

Page 1 of

COC ID: 50NOV2019-1911_-ALS | TURNAROUND TIME: | RUSH:

PROJECT/CLIENT INFO

Facility Name	Longhorn AAP
Project Number	501032
	LHAAP-50
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	281.575.3279 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

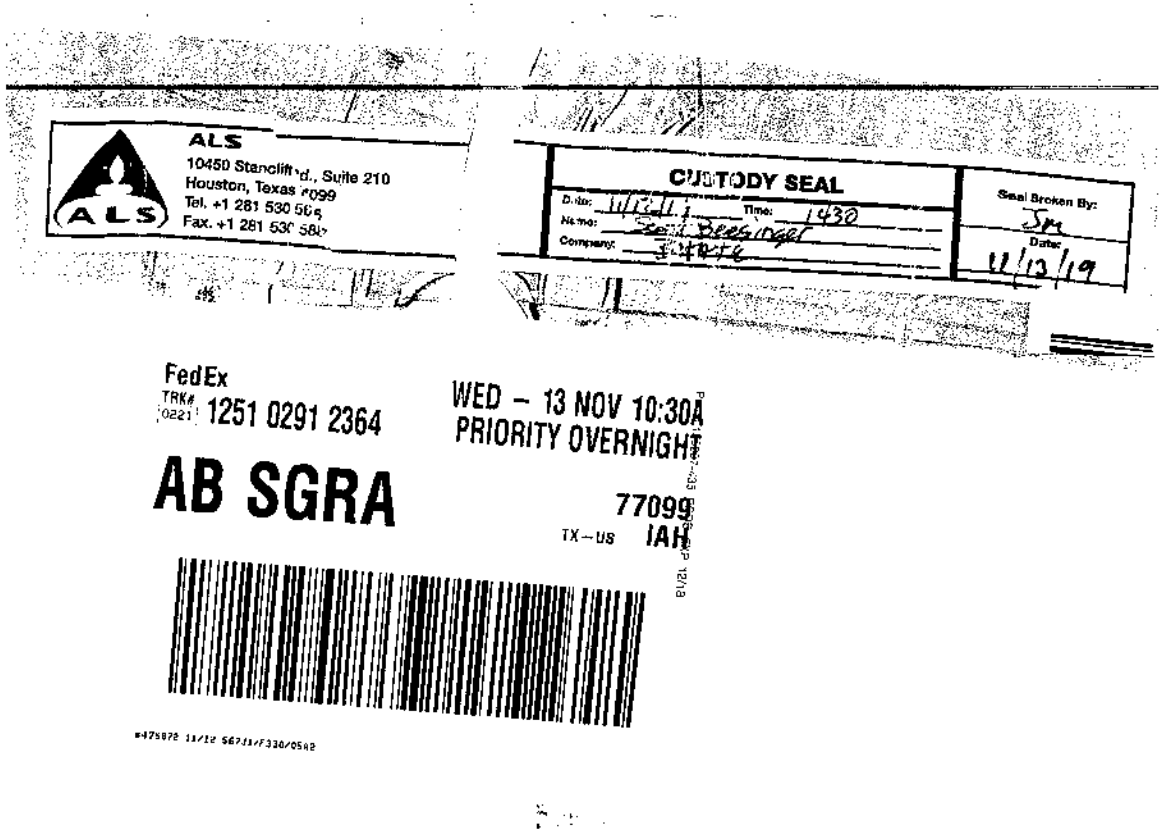
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	Sample Container and Preservatives: 3-40 ml VOA/HCL — Vocs by 8260B	3-40 ml VOA/HCL — MEE by RSK175	3-40 ml VOA/Cool to 6 deg C — CO2 by RSK175	2-40ml Amber/H2SO4 — TOC by Sm5310C	1-250ml/Cool to 6 deg C — Anions (chloride/sulfate/nitrate) by 9056	1-125ml/Cool to 6 deg C — Perchlorate by 6850
SDWW29-191111	LHAAP 50				WG	11/11/19	0920	4		X					X
SDWW10-191111	LHAAP 50				WG	11/11/19	1015	4		X					X
SDWW09-191111	LHAAP 50				WG	11/11/19	1105	4		X					X
SDWW09-191111-FD	LHAAP 50				WG	11/11/19	1105	4		X					X
SDWW22-191112	LHAAP50				WG	11/12/19	0830	13		X	X	X	X	X	X
SDWW08-191112	LHAAP 50				WG	11/12/19	0930	13		X	X	X	X	X	X
SDWW06-191112	LHAAP 50				WG	11/12/19	1030	13		X	X	X	X	X	X
SDWW11-191112	LHAAP 50				WG	11/12/19	1130	13		X	X	X	X	X	X
SDWW12-191112	LHAAP50				WG	11/12/19	1230	13		X	X	X	X	X	X
SDWW12-191112-FD	LHAAP50				WG	11/12/19	1230	13		X	X	X	X	X	X
TRIP Blank	LHAAP 50				W	11/12/19		2		X					

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Cooler 43736 1021	Sam Bassey/BHATE	11/12/19 1430		11/13/19 09:30
Temp 1.0 3F-0-5				

HS19110644

Aptim Environmental & Infrastructure, Inc.

LHAAP-50 501032


ALS
10450 Stanclift Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 11/12/19
Time: 1430
Name: Scott Beesinger
Company: ALS-HOU
Seal Broken By:
Date: 11/13/19
FedEx
TRK# 0221 1251 0291 2364
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:** K1910759

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

RE: HS19110644

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 **K1910759.**

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

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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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

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

ALS Environmental

Client: ALS Environmental - US
Project: HS19110644
Sample Matrix: Ground Water

Service Request: K1910759
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:

Six 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

KH910755

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12625**

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:	HS19110644
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19110644-05**	**50WW22-191112**	**Groundwater**	**12 Nov 2019 08:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			27 Nov 2019
2.	**HS19110644-06**	**50WW08-191112**	**Groundwater**	**12 Nov 2019 09:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			27 Nov 2019
3.	**HS19110644-07**	**50WW06-191112**	**Groundwater**	**12 Nov 2019 10:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			27 Nov 2019
4.	**HS19110644-08**	**50WW11-191112**	**Groundwater**	**12 Nov 2019 11:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			27 Nov 2019
5.	**HS19110644-09**	**50WW12-191112**	**Groundwater**	**12 Nov 2019 12:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			27 Nov 2019
6.	**HS19110644-10**	**50WW12-191112-FD**	**Groundwater**	**12 Nov 2019 12:30**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			27 Nov 2019

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

QC Level: DOD IV (DoD Data Package)

KL9107S9

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **12625**

Relinquished By: _____ Date/Time: 11/13/19 1800

Received By: Monrow ALS Houston Date/Time: 11-14-19 0940

Cooler ID(s): _____ Temperature(s): _____

PC KCL

Cooler Receipt and Preservation Form

Client MS-Houston Service Request K19 10759

Received: 11-14-19 Opened: 11-14-19 By: DM Unloaded: 11-14-19 By: DM

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? 1F4/B
   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
   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:**	K1910759
Project:	HS19110644	**Date Collected:**	11/12/19
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
50WW22-191112	K1910759-001	**1.01**	0.50	0.20	0.07	1	11/21/19 01:36	
50WW08-191112	K1910759-002	**0.83**	0.50	0.20	0.07	1	11/21/19 02:41	
50WW06-191112	K1910759-003	**1.63**	0.50	0.20	0.07	1	11/21/19 03:13	
50WW11-191112	K1910759-004	**1.49**	0.50	0.20	0.07	1	11/21/19 04:18	
50WW12-191112	K1910759-005	**1.11**	0.50	0.20	0.07	1	11/21/19 04:51	
50WW12-191112-FD	K1910759-006	**1.19**	0.50	0.20	0.07	1	11/21/19 05:23	
Method Blank	K1910759-MB	ND U	0.50	0.20	0.07	1	11/20/19 23:26	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1910759
Project	HS19110644	**Date Collected:**	11/12/19
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
50WW22-191112	K1910759-001DUP	0.50	0.20	0.07	1.01	1.06	1.03	4	10	11/21/19
50WW08-191112	K1910759-002DUP	0.50	0.20	0.07	0.83	0.83	0.835	<1	10	11/21/19
50WW06-191112	K1910759-003DUP	0.50	0.20	0.07	1.63	1.59	1.61	3	10	11/21/19
50WW11-191112	K1910759-004DUP	0.50	0.20	0.07	1.49	1.53	1.51	3	10	11/21/19
50WW12-191112	K1910759-005DUP	0.50	0.20	0.07	1.11	1.05	1.08	6	10	11/21/19
50WW12-191112-FD	K1910759-006DUP	0.50	0.20	0.07	1.19	1.15	1.17	4	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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1910759
Project:	HS19110644	**Date Collected:**	11/12/19
Sample Matrix:	Ground Water	**Date Received:**	11/14/19
		Date Analyzed:	11/21/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	50WW22-191112	**Units:**	mg/L
Lab Code:	K1910759-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1910759-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.01	26.0	25.0	100	83-117

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1910759
Project:	HS19110644	**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	K1910759-LCS	24.5	25.0	98	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1910759
Project: HS19110644

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	660506	KQ1917163-01	11/20/19 16:58	25.0	23.6	94	90-110
CCV2	660506	KQ1917163-02	11/20/19 22:52	25.0	23.8	95	90-110
CCV3	660506	KQ1917163-03	11/21/19 03:45	25.0	23.6	94	90-110
CCV4	660506	KQ1917163-04	11/21/19 08:36	25.0	23.5	94	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1910759
Project: HS19110644

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	660506	KQ1917163-05	11/20/19 17:15	0.50	0.20	0.07	ND	U
CCB2	660506	KQ1917163-06	11/20/19 23:09	0.50	0.20	0.07	ND	U
CCB3	660506	KQ1917163-07	11/21/19 04:02	0.50	0.20	0.07	ND	U
CCB4	660506	KQ1917163-08	11/21/19 08:52	0.50	0.20	0.07	ND	U

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1910759
Project:	HS19110644	**Date Collected:**	11/12/19
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
50WW22-191112	K1910759-001	**1.01**	0.50	0.20	0.07	1	11/21/19 01:36	
50WW08-191112	K1910759-002	**0.83**	0.50	0.20	0.07	1	11/21/19 02:41	
50WW06-191112	K1910759-003	**1.63**	0.50	0.20	0.07	1	11/21/19 03:13	
50WW11-191112	K1910759-004	**1.49**	0.50	0.20	0.07	1	11/21/19 04:18	
50WW12-191112	K1910759-005	**1.11**	0.50	0.20	0.07	1	11/21/19 04:51	
50WW12-191112-FD	K1910759-006	**1.19**	0.50	0.20	0.07	1	11/21/19 05:23	
Method Blank	K1910759-MB	ND U	0.50	0.20	0.07	1	11/20/19 23:26	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1910759
Project	HS19110644	**Date Collected:**	11/12/19
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:	MRL	LOQ	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
50WW22-191112	K1910759-001DUP	0.50	0.20	0.07	1.01	1.06	1.03	4	10	11/21/19
50WW08-191112	K1910759-002DUP	0.50	0.20	0.07	0.83	0.83	0.835	<1	10	11/21/19
50WW06-191112	K1910759-003DUP	0.50	0.20	0.07	1.63	1.59	1.61	3	10	11/21/19
50WW11-191112	K1910759-004DUP	0.50	0.20	0.07	1.49	1.53	1.51	3	10	11/21/19
50WW12-191112	K1910759-005DUP	0.50	0.20	0.07	1.11	1.05	1.08	6	10	11/21/19
50WW12-191112-FD	K1910759-006DUP	0.50	0.20	0.07	1.19	1.15	1.17	4	10	11/21/19

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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:**	K1910759
Project:	HS19110644	**Date Collected:**	11/12/19
Sample Matrix:	Ground Water	**Date Received:**	11/14/19
		Date Analyzed:	11/21/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	50WW22-191112	**Units:**	mg/L
Lab Code:	K1910759-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1910759-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.01	26.0	25.0	100	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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1910759
Project:	HS19110644	**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	K1910759-LCS	24.5	25.0	98	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1910759
Project: HS19110644

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	660506	KQ1917163-01	11/20/19 16:58	25.0	23.6	94	90-110
CCV2	660506	KQ1917163-02	11/20/19 22:52	25.0	23.8	95	90-110
CCV3	660506	KQ1917163-03	11/21/19 03:45	25.0	23.6	94	90-110
CCV4	660506	KQ1917163-04	11/21/19 08:36	25.0	23.5	94	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1910759
Project: HS19110644

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	660506	KQ1917163-05	11/20/19 17:15	0.50	0.20	0.07	ND	U
CCB2	660506	KQ1917163-06	11/20/19 23:09	0.50	0.20	0.07	ND	U
CCB3	660506	KQ1917163-07	11/21/19 04:02	0.50	0.20	0.07	ND	U
CCB4	660506	KQ1917163-08	11/21/19 08:52	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
www.alsglobal.com

General Chemistry

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Work Request # Original ( ) K9/0407, 425, 566, 461, 254, 378, 381, 401, 407, 415, 566, 617, 157, 432, 464, 759, 765, 857, 858

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

Date Analyzed: 11/19/19

Analyst: RCP

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.

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

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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

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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.

11/21/19

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.

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 - 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 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: 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
◈	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: 1:10
Blank Contribution: (TC) 10.3749 (IC) (v1321)
Method: Extended Reaction 021711 (v4)
Calibration: 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: 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
◈	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 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
◆	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 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
◆	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 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
◆	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 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)	23.9275 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: 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
◆	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: 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
◆	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: 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)	23.7272 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 - 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 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 - 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 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: 1:10
Blank Contribution: (TC) 10.3749 (IC) (v1321)
Method: Extended Reaction 021711 (v4)
Calibration: 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 - 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 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	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
◈	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	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
◈	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	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)	23.5990 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 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 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: 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
◆	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: 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)	23.8483 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 - 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 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

ALS Environmental

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:	BP	Date Analyzed:	11/19/19
Reviewed By:	[signature]	Date Reviewed:	11/21/19

LABORATORY REPORT

November 26, 2019

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

RE: HS19110644

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on November 14, 2019. For your reference, these analyses have been assigned our service request number P1906981.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 1:49 pm, Nov 26, 2019

Hayden Akers
Project Manager

Client: ALS Laboratory Group Service Request No: P1906981
Project: HS19110644

CASE NARRATIVE

The sample(s) were received intact under chain of custody on November 14, 2019 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample(s) at the time of sample receipt.

Methane, Ethene and Ethane Analysis

The samples were analyzed for methane, ethene, and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

Carbon Dioxide Analysis

The samples were also analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Manual integrations were performed on the following sample(s) and analyte(s). Refer to the raw data for additional information.

Sample Identification(s)	Analyte(s)
P1906981-001	Methane
P1906981-003	Carbon dioxide
P1906981-005	Carbon dioxide
P1906981-006	Carbon dioxide

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS19110644

Service Request: P1906981

Date Received: 11/14/2019
Time Received: 09:15

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
50WW22-191112	P1906981-001	Water	11/12/2019	08:30	X	X
50WW08-191112	P1906981-002	Water	11/12/2019	09:30	X	X
50WW06-191112	P1906981-003	Water	11/12/2019	10:30	X	X
50WW11-191112	P1906981-004	Water	11/12/2019	11:30	X	X
50WW12-191112	P1906981-005	Water	11/12/2019	12:30	X	X
50WW12-191112-FD	P1906981-006	Water	11/12/2019	12:30	X	X

PP106981

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:** **12624**

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

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:	HS19110644
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19110644-05**	**50WW22-191112**	**Groundwater**	**12 Nov 2019 08:30**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			27 Nov 2019
2.	**HS19110644-06**	**50WW08-191112**	**Groundwater**	**12 Nov 2019 09:30**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			27 Nov 2019
3.	**HS19110644-07**	**50WW06-191112**	**Groundwater**	**12 Nov 2019 10:30**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			27 Nov 2019
4.	**HS19110644-08**	**50WW11-191112**	**Groundwater**	**12 Nov 2019 11:30**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			27 Nov 2019
5.	**HS19110644-09**	**50WW12-191112**	**Groundwater**	**12 Nov 2019 12:30**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			27 Nov 2019
6.	**HS19110644-10**	**50WW12-191112-FD**	**Groundwater**	**12 Nov 2019 12:30**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			27 Nov 2019

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

QC Level: DOD IV (DoD Data Package)

RIGHT SOLUTIONS | RIGHT PARTNER

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **12624**

Relinquished By: J [illegible]

Date/Time: 11/13/19 18:00

Received By: [signature]

Date/Time: 11-14-19 0911

Cooler ID(s):

Temperature(s): 1°C wet

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1906981

Project: HS19110644

Sample(s) received on: 11/14/19 Date opened: 11/14/19 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: ° C Blank Temperature: 1° C Thermometer ID T-111 Wet Ic			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1906981-001.01	40mL VOA NP		6		A	LD/WH 11/19/2019
P1906981-001.02	40mL VOA NP					
P1906981-001.03	40mL VOA NP					
P1906981-001.04	40ml VOA HCL		1		A	LD/WH 11/18/2019
P1906981-001.05	40ml VOA HCL					
P1906981-001.06	40ml VOA HCL					
P1906981-002.01	40mL VOA NP		6		A	LD/WH 11/19/2019
P1906981-002.02	40mL VOA NP					
P1906981-002.03	40mL VOA NP					
P1906981-002.04	40ml VOA HCL		1		A	LD/WH 11/18/2019
P1906981-002.05	40ml VOA HCL					
P1906981-002.06	40ml VOA HCL					
P1906981-003.01	40mL VOA NP		6		A	LD/WH 11/19/2019
P1906981-003.02	40mL VOA NP					
P1906981-003.03	40mL VOA NP					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1906981

Project: HS19110644

Sample(s) received on: 11/14/19 Date opened: 11/14/19 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1906981-003.04	40ml VOA HCL		1		A	LD/WH 11/18/2019
P1906981-003.05	40ml VOA HCL					
P1906981-003.06	40ml VOA HCL					
P1906981-004.01	40mL VOA NP		6		A	LD/WH 11/19/2019
P1906981-004.02	40mL VOA NP					
P1906981-004.03	40mL VOA NP					
P1906981-004.04	40ml VOA HCL		1		A	LD/WH 11/18/2019
P1906981-004.05	40ml VOA HCL					
P1906981-004.06	40ml VOA HCL					
P1906981-005.01	40mL VOA NP		6		A	LD/WH 11/19/2019
P1906981-005.02	40mL VOA NP					
P1906981-005.03	40mL VOA NP					
P1906981-005.04	40ml VOA HCL		1		A	LD/WH 11/18/2019
P1906981-005.05	40ml VOA HCL					
P1906981-005.06	40ml VOA HCL					
P1906981-006.01	40mL VOA NP		6		A	LD/WH 11/19/2019
P1906981-006.02	40mL VOA NP					
P1906981-006.03	40mL VOA NP					
P1906981-006.04	40ml VOA HCL		1		A	LD/WH 11/18/2019
P1906981-006.05	40ml VOA HCL					
P1906981-006.06	40ml VOA HCL					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS19110644** ALS Project ID: P1906981

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date(s) Collected: 11/12/19
Date Received: 11/14/19
Date Analyzed: 11/19/19

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
50WW22-191112	P1906981-001	0.10	**79,000**	1,000	860	370	
50WW08-191112	P1906981-002	0.10	**69,000**	1,000	860	370	
50WW06-191112	P1906981-003	0.10	**120,000**	1,000	860	370	
50WW11-191112	P1906981-004	0.10	**270,000**	1,000	860	370	
50WW12-191112	P1906981-005	0.10	**250,000**	1,000	860	370	
50WW12-191112-FD	P1906981-006	0.10	**300,000**	1,000	860	370	
Method Control Sample	P191119-MB	0.10	860	1,000	860	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P1906981
Client Project ID: **HS19110644** ALS Sample ID: P191119-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Li Donghao/Wade Henton Date Analyzed: 11/19/19
Matrix: Water Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result$_1$ LCS ug/L	Result$_1$ DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	21,100	21,100	**92**	**92**	80-122	0	12	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW22-191112**
Client Project ID: **HS19110644**

ALS Project ID: P1906981
ALS Sample ID: P1906981-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/12/19
Date Received: 11/14/19
Date Analyzed: 11/18/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**0.55**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW08-191112**
Client Project ID: **HS19110644**

ALS Project ID: P1906981
ALS Sample ID: P1906981-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/12/19
Date Received: 11/14/19
Date Analyzed: 11/18/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**3.0**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW06-191112**
Client Project ID: **HS19110644**

ALS Project ID: P1906981
ALS Sample ID: P1906981-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/12/19
Date Received: 11/14/19
Date Analyzed: 11/18/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.1**	1.3	1.0	0.51	**J**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW11-191112**
Client Project ID: **HS19110644**

ALS Project ID: P1906981
ALS Sample ID: P1906981-004

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/12/19
Date Received: 11/14/19
Date Analyzed: 11/18/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**6.8**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW12-191112**
Client Project ID: **HS19110644**

ALS Project ID: P1906981
ALS Sample ID: P1906981-005

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/12/19
Date Received: 11/14/19
Date Analyzed: 11/18/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.5**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW12-191112-FD**
Client Project ID: **HS19110644**

ALS Project ID: P1906981
ALS Sample ID: P1906981-006

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/12/19
Date Received: 11/14/19
Date Analyzed: 11/18/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.6**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample** ALS Project ID: P1906981
Client Project ID: **HS19110644** ALS Sample ID: P191118-MB

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/FID Date Received: NA
Analyst: Li Donghao/Wade Henton Date Analyzed: 11/18/19
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS19110644**

ALS Project ID: P1906981
ALS Sample ID: P191118-LCS
P191118-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 11/18/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.27	2.24	**90**	**89**	73-125	1	26	
74-85-1	Ethene	4.40	4.29	4.24	**98**	**96**	72-133	2	11	
74-84-0	Ethane	4.72	4.38	4.35	**93**	**92**	74-131	1	10	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191907.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 12:54:42
Operator : WH/LD
Sample : P1906981-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 13:23:01 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

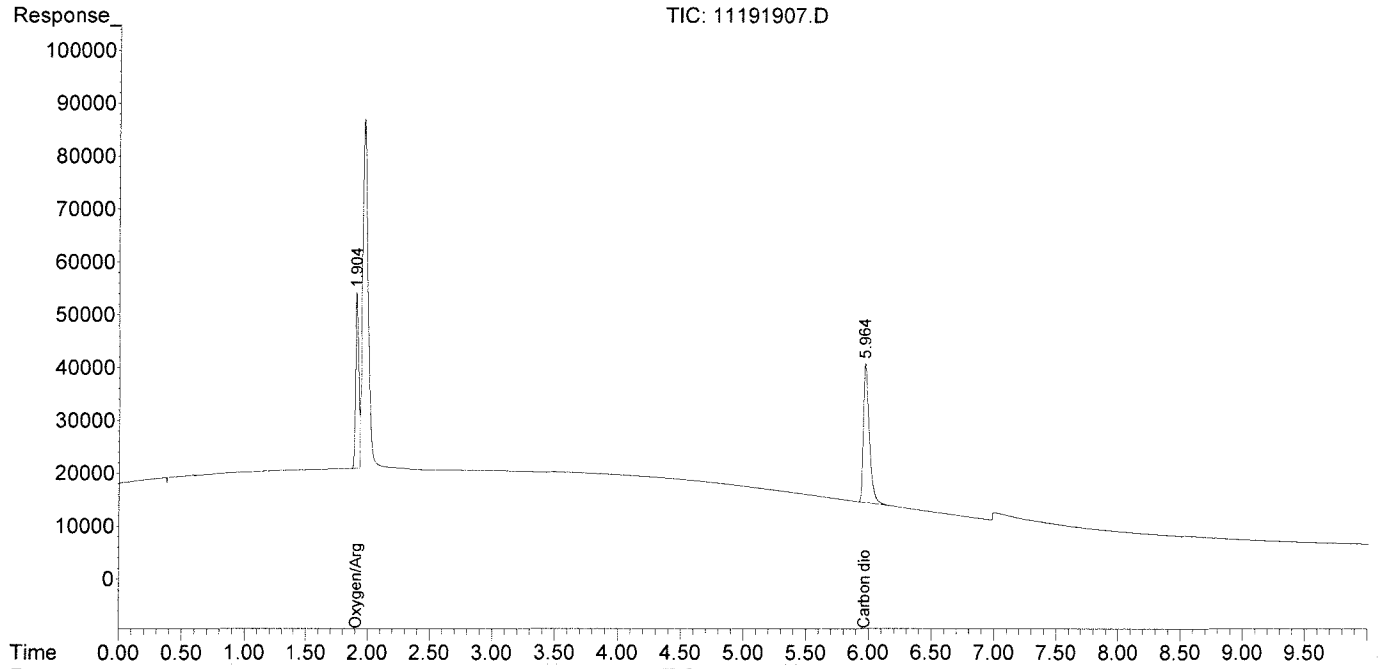
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.905f	565206	0.119	ppm
2)	Carbon monoxide	1.905	565206	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.965	853972	3638.117	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

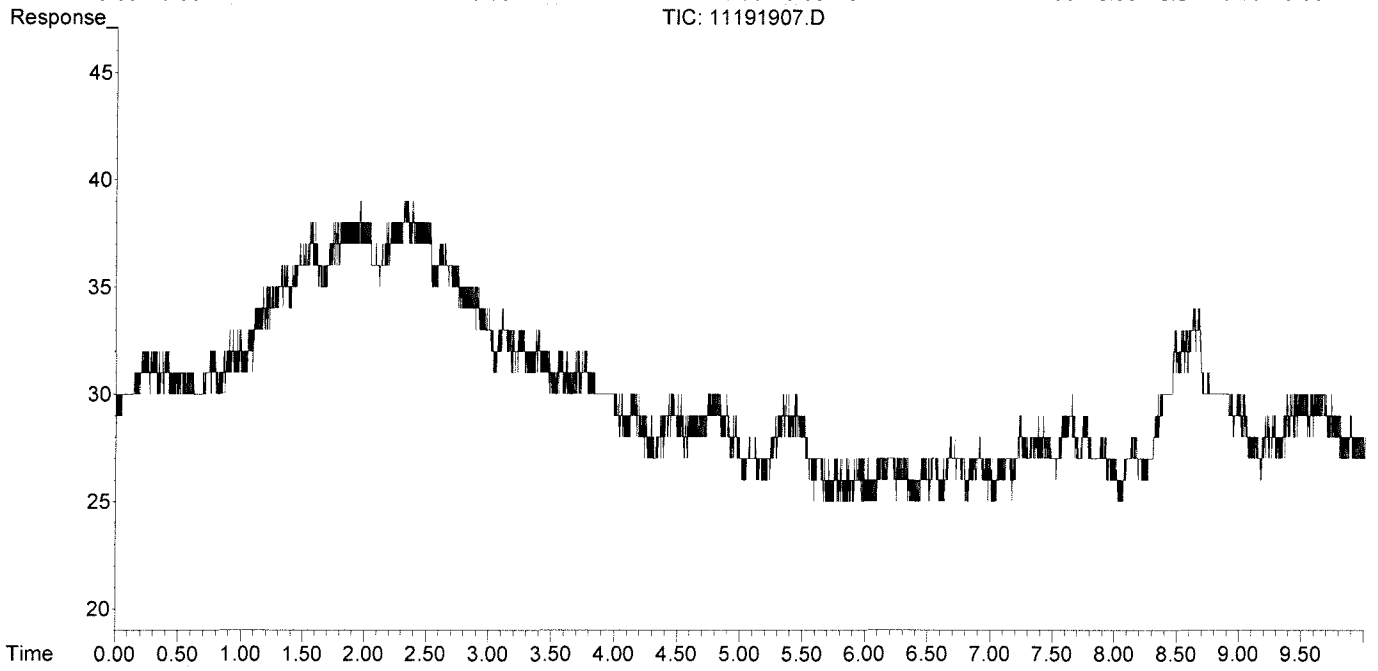
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191907.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 12:54:42
Operator : WH/LD
Sample : P1906981-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 13:23:01 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 13:43:34
Operator : WH/LD
Sample : P1906981-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 13:23:15 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

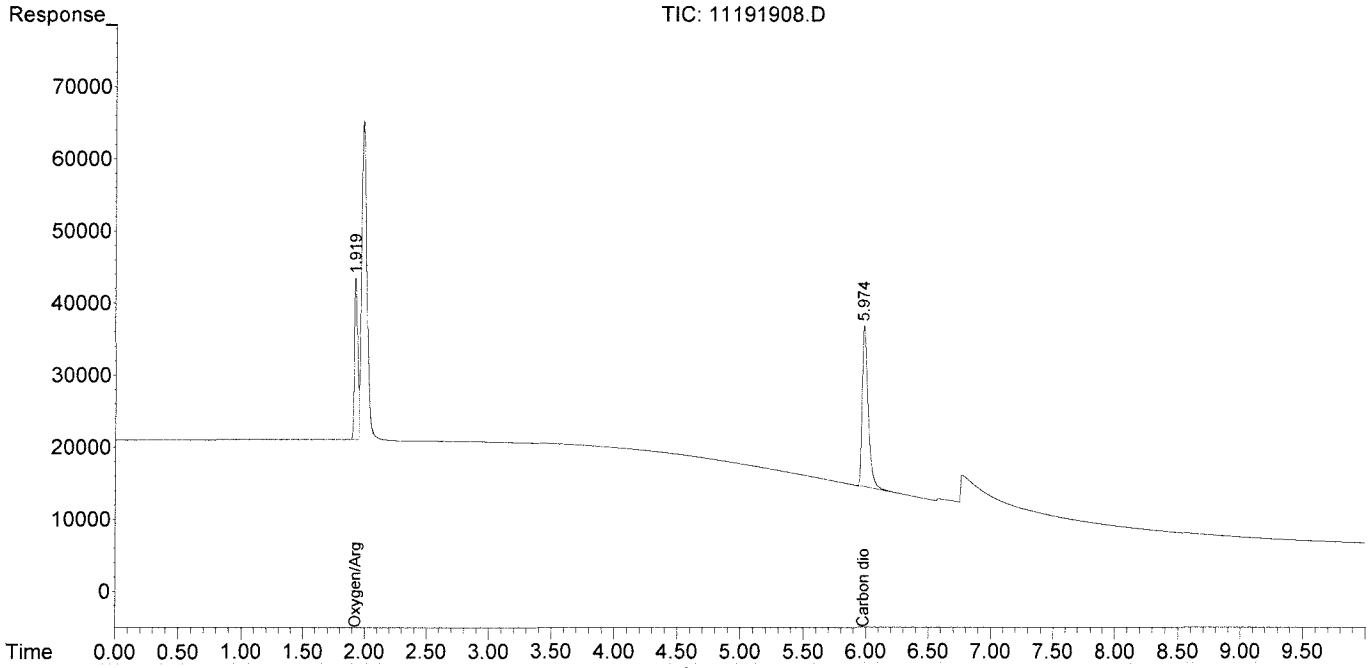
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.920f	399837	0.084	ppm
2)	Carbon monoxide	1.920f	399837	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.975	741977	3160.990	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

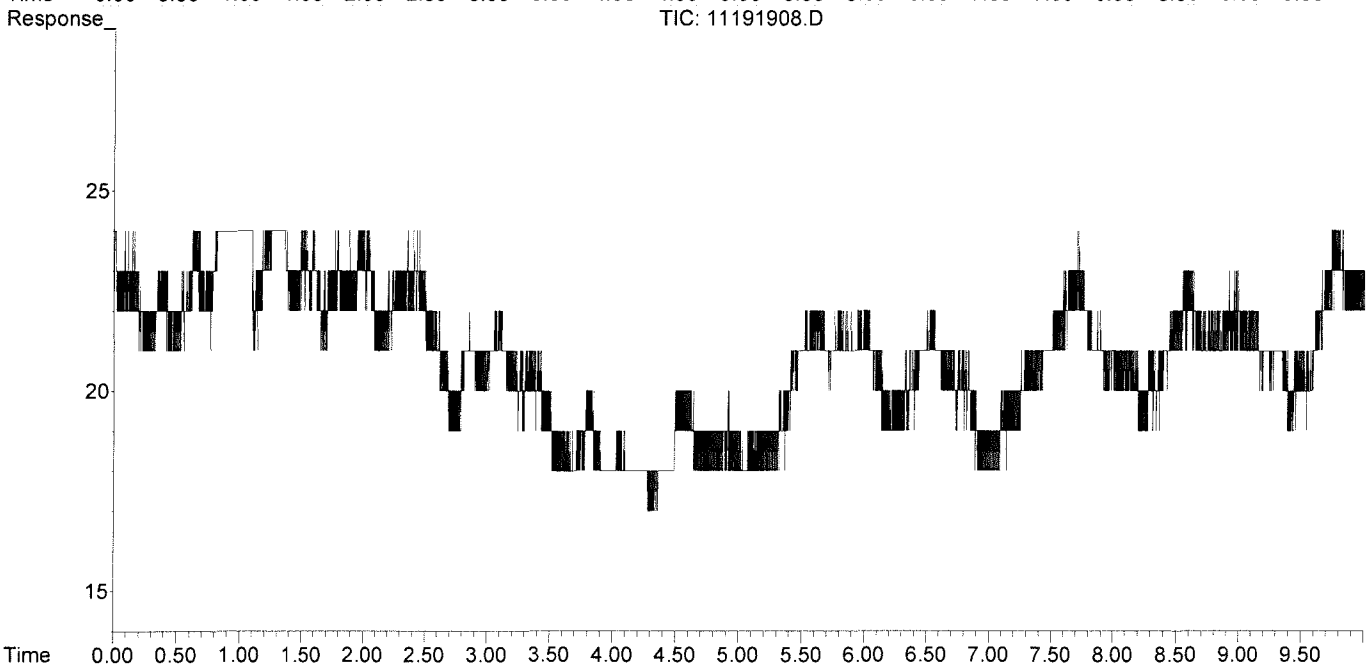
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 13:43:34
Operator : WH/LD
Sample : P1906981-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 13:23:15 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:15:19
Operator : WH/LD
Sample : P1906981-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 13:31:07 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

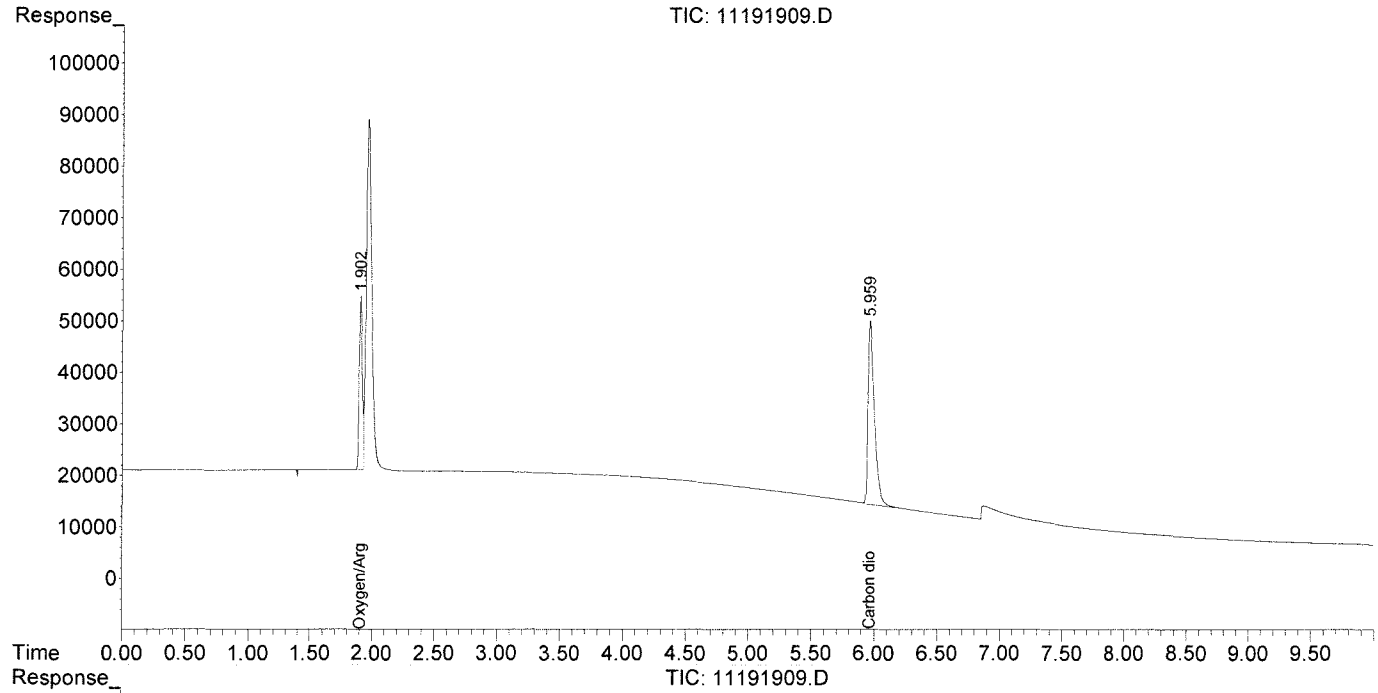
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.903	575266	0.121	ppm	
2)	Carbon monoxide	1.903	575266	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.959	1248003	5316.778	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

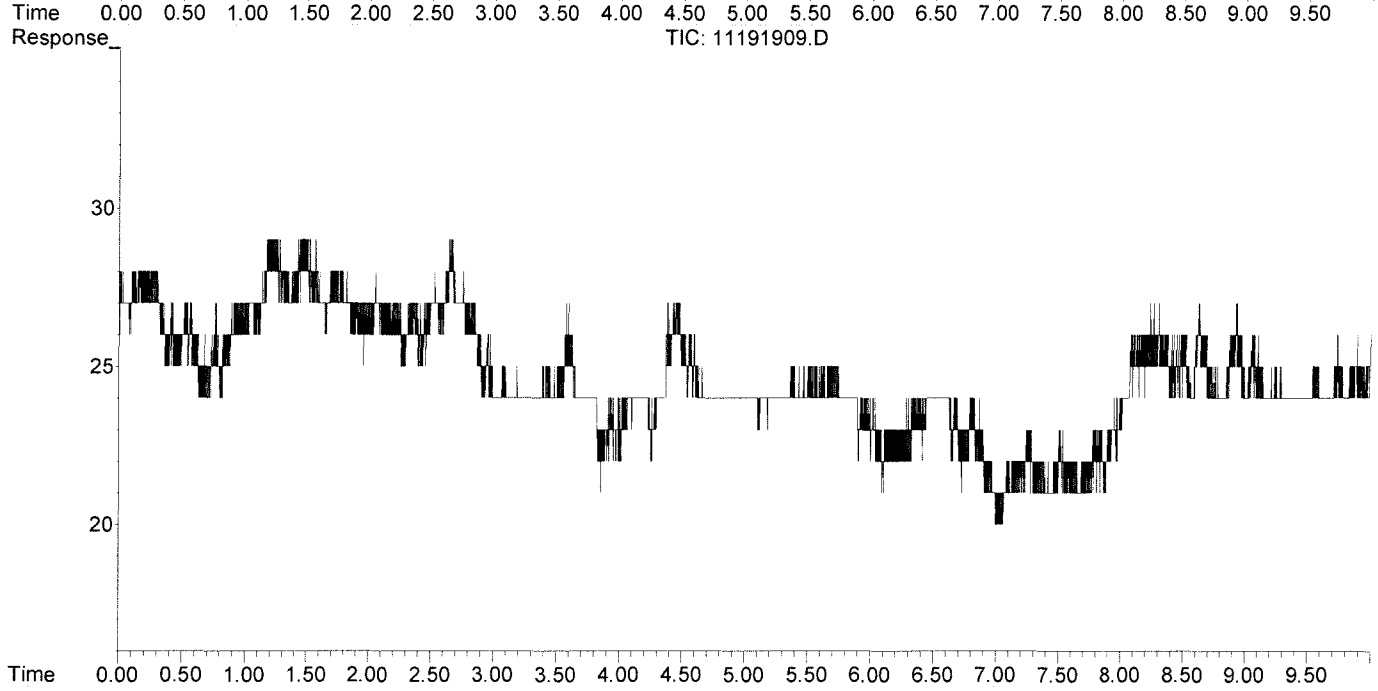
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:15:19
Operator : WH/LD
Sample : P1906981-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 13:31:07 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

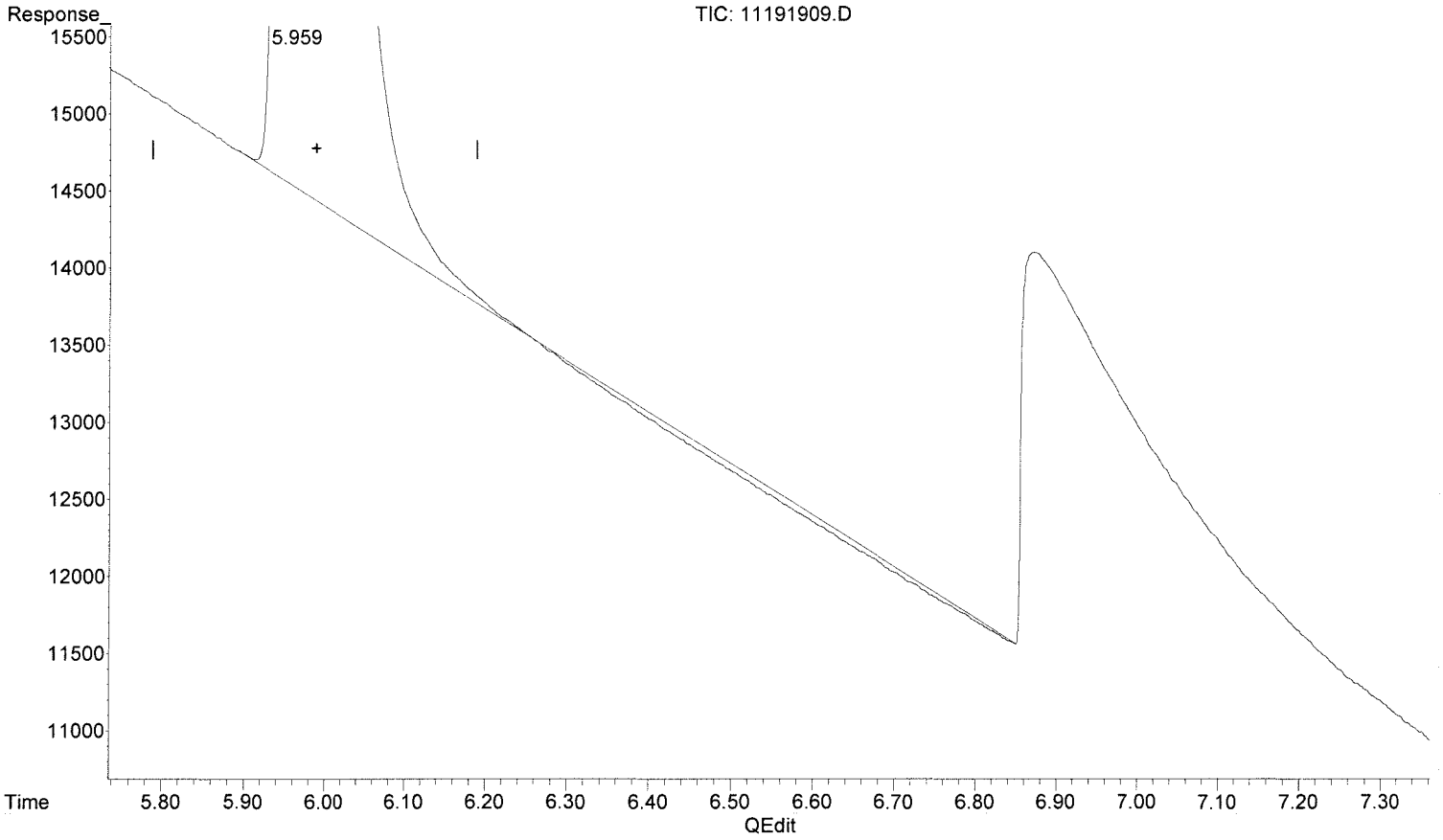




Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:15:19
Operator : WH/LD
Sample : P1906981-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 13:31:07 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.960min 5277.217 ppm

response 1238717

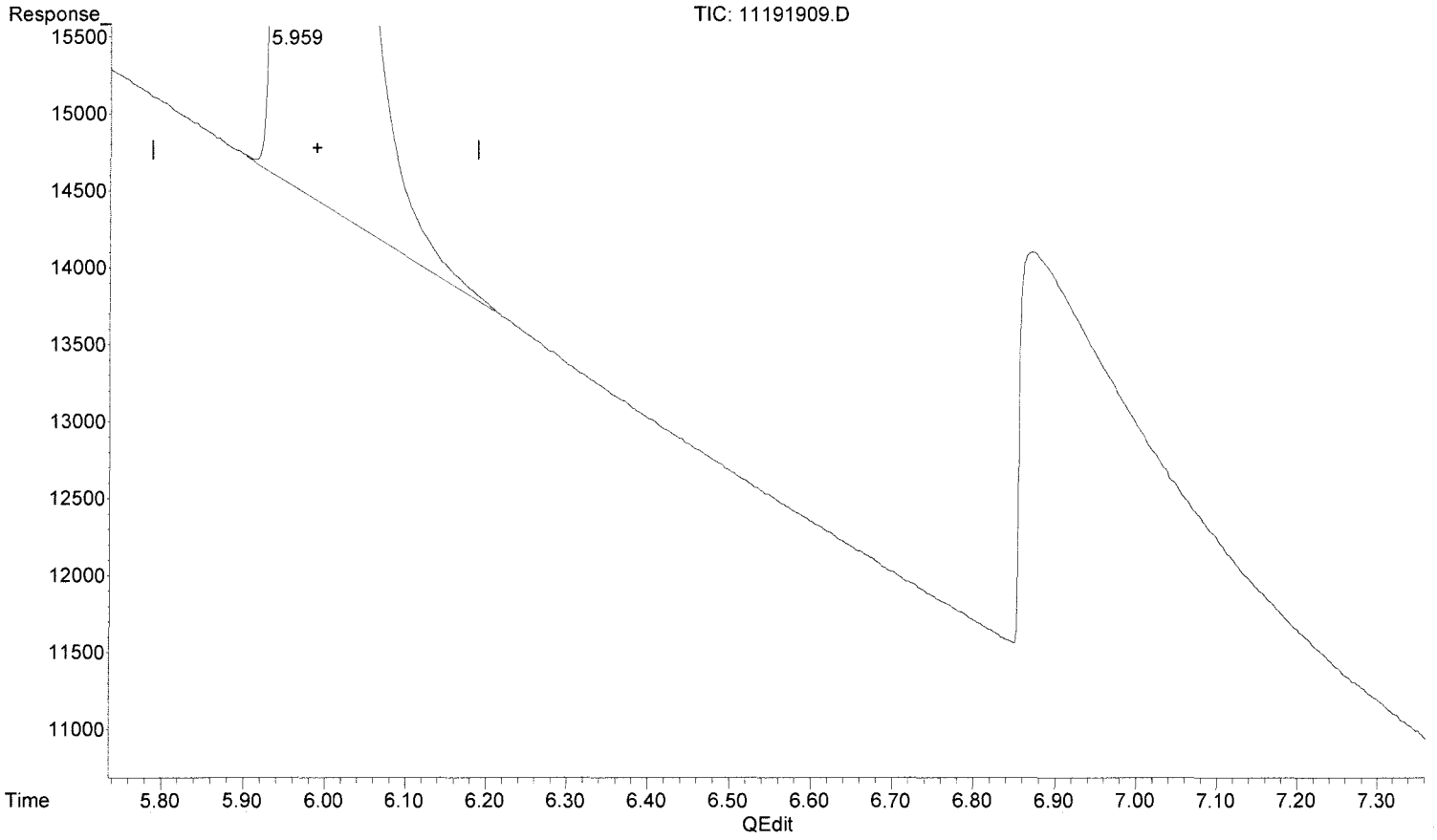
(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:15:19
Operator : WH/LD
Sample : P1906981-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 13:31:07 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

CD
11/19
BLC

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.959min 5316.778 ppm m

response 1248003

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:29:15
Operator : WH/LD
Sample : P1906981-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:18:42 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

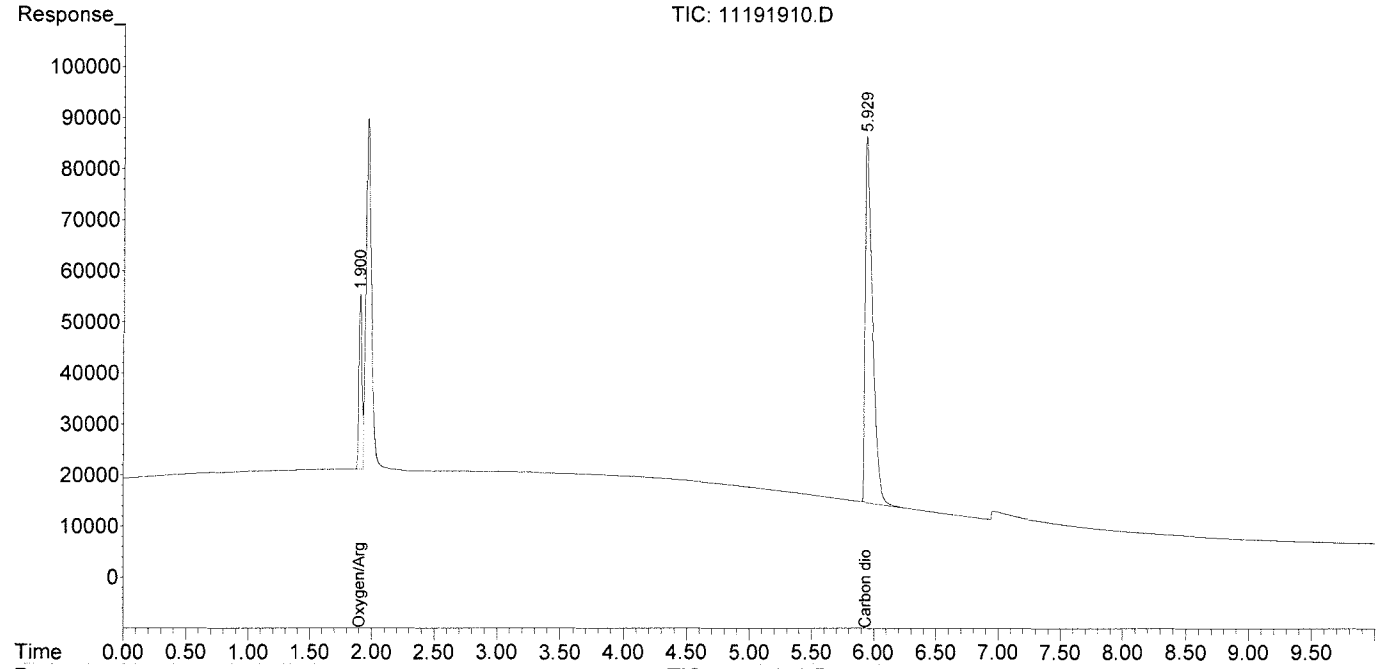
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.901	578218	0.121	ppm
2)	Carbon monoxide	1.901	578218	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.930	2942979	12537.765	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

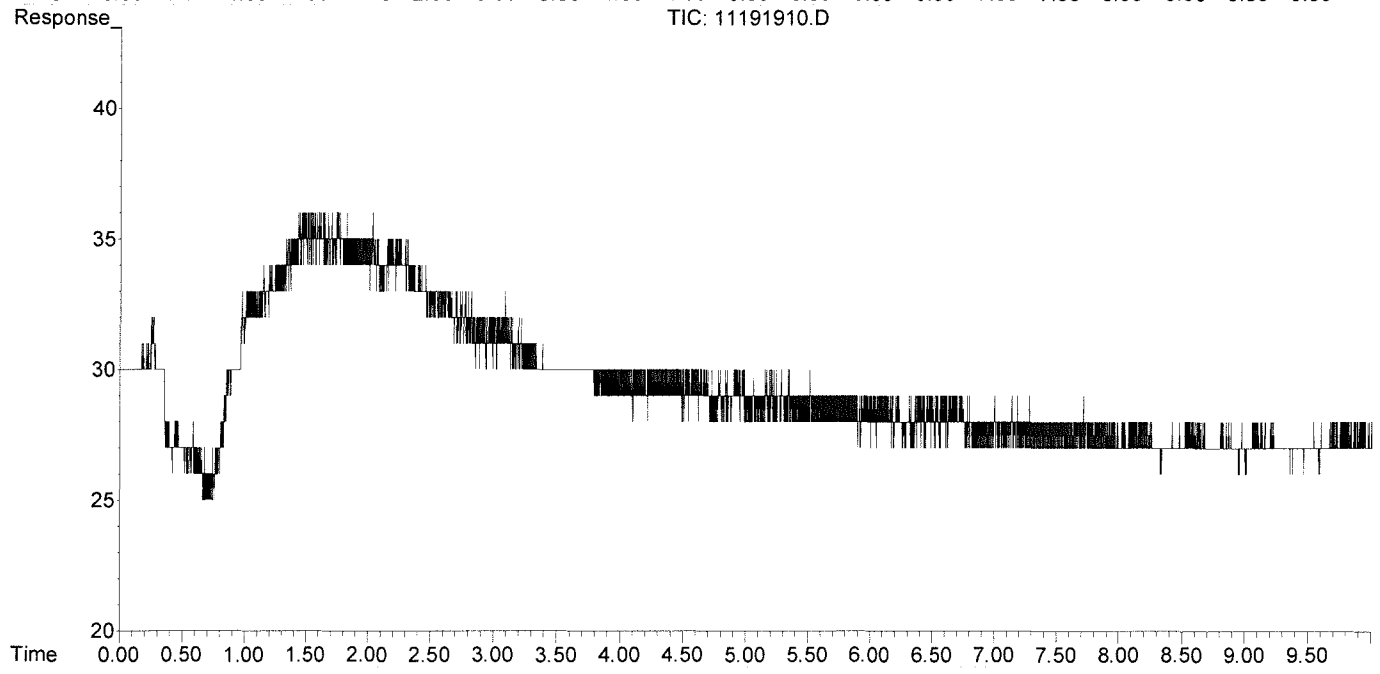
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:29:15
Operator : WH/LD
Sample : P1906981-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:18:42 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:42:11
Operator : WH/LD
Sample : P1906981-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:18:55 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

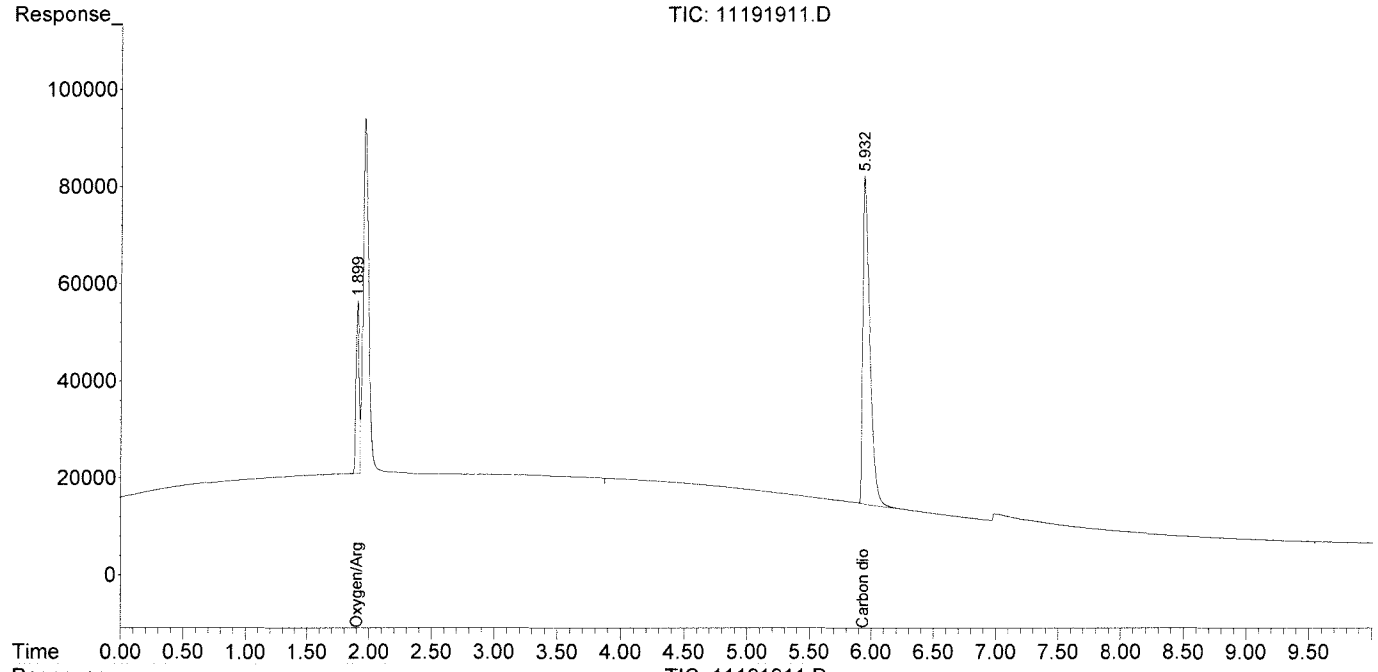
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.900	597951	0.126	ppm	
2)	Carbon monoxide	1.900	597951	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.932	2669272	11371.711	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

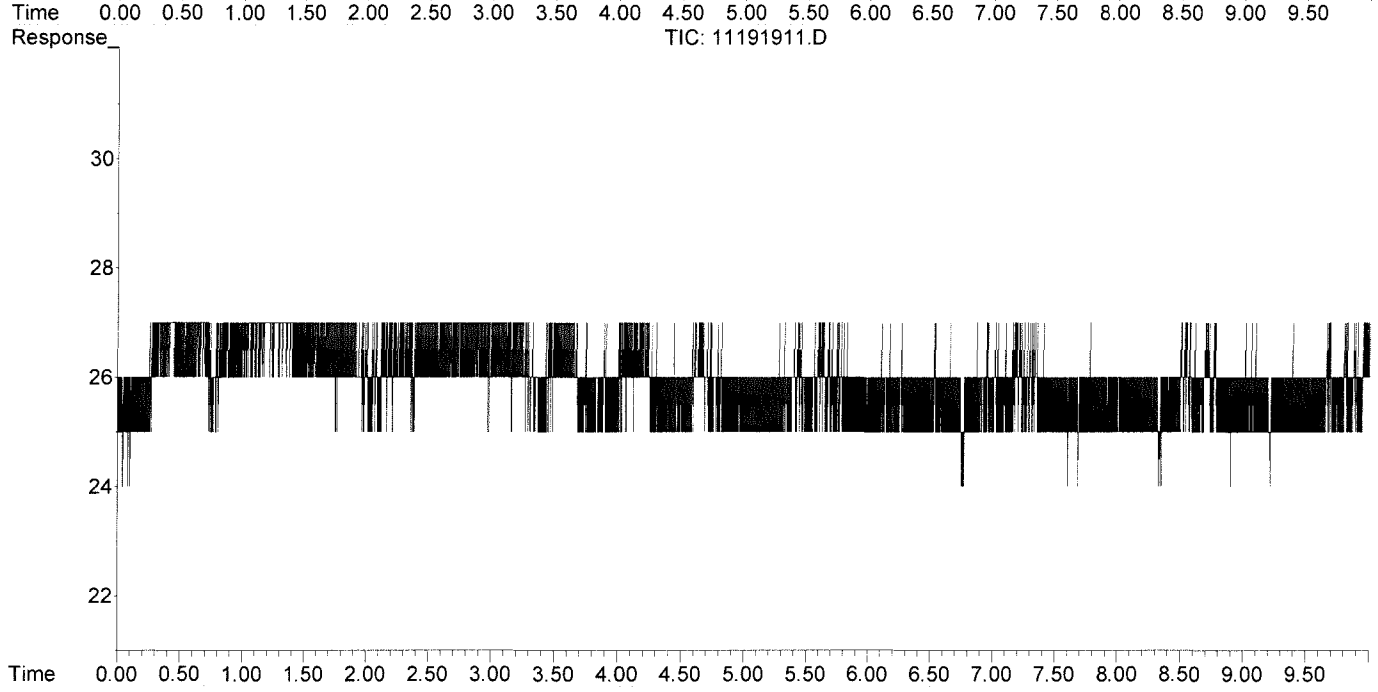
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:42:11
Operator : WH/LD
Sample : P1906981-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:18:55 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

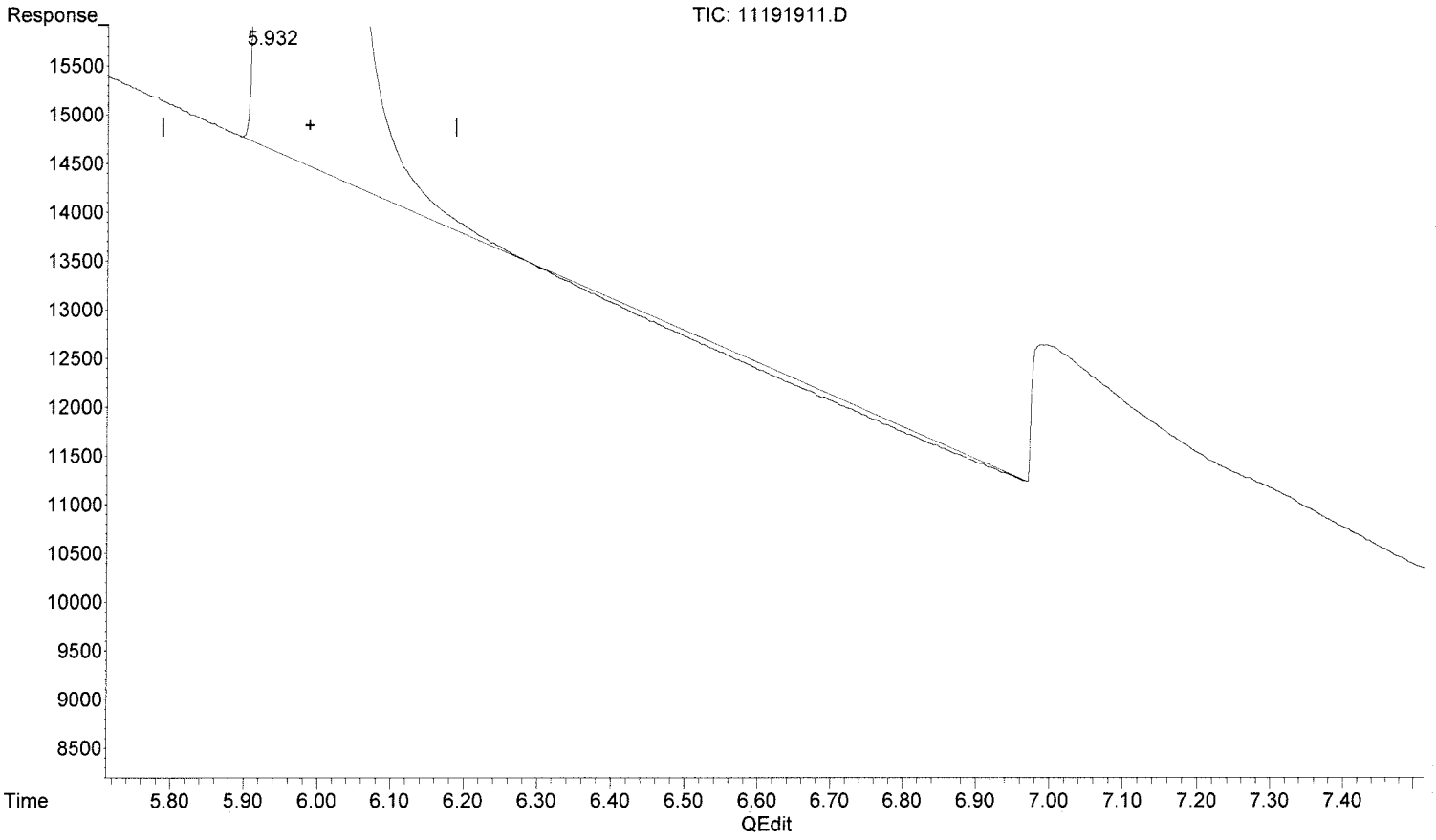




Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:42:11
Operator : WH/LD
Sample : P1906981-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:18:55 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.934min 11301.373 ppm

response 2652762

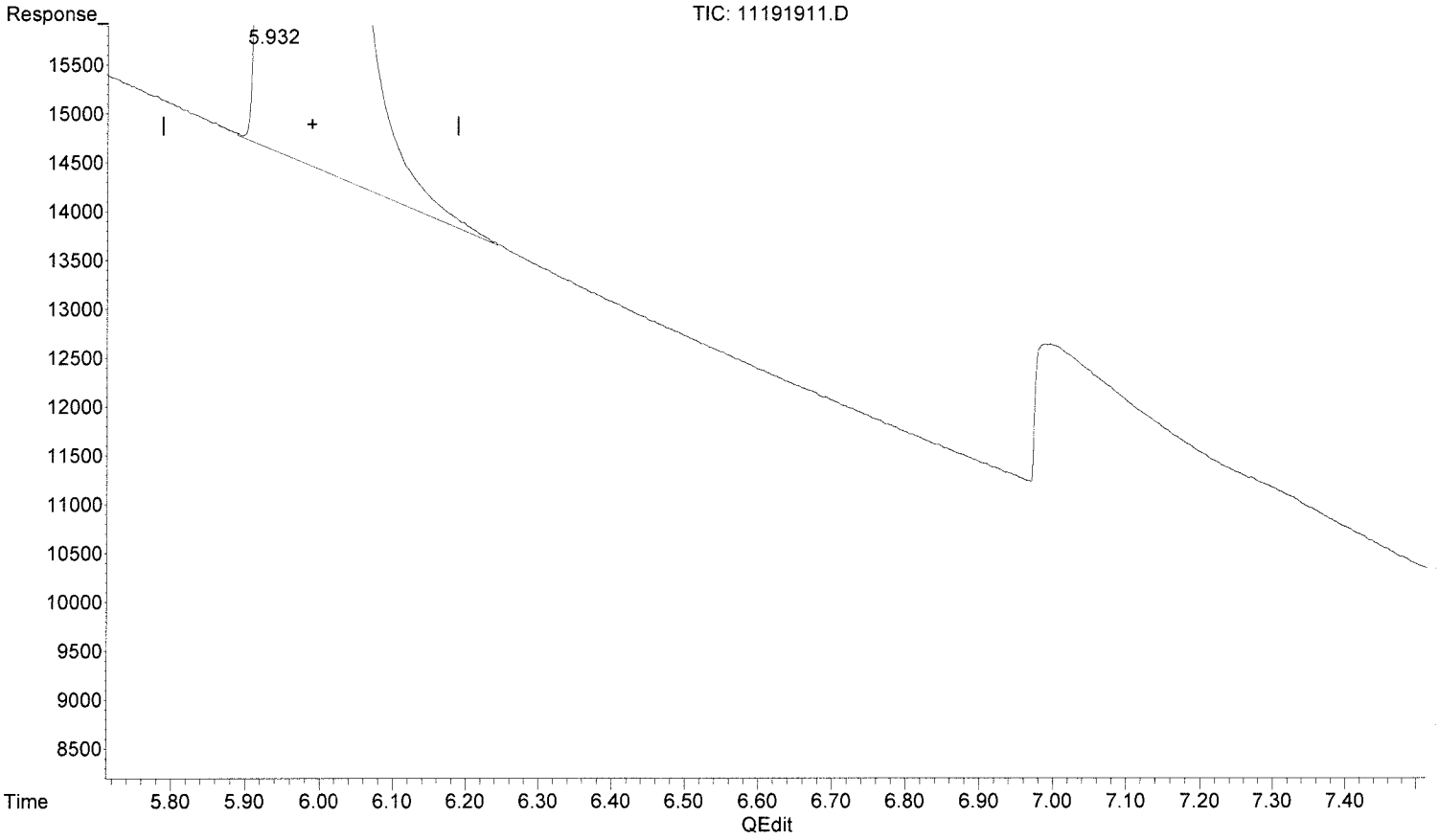
(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:42:11
Operator : WH/LD
Sample : P1906981-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:18:55 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

LP
11/19
BLL

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.932min 11371.711 ppm m

response 2669272

lw 11/20/19

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:55:10
Operator : WH/LD
Sample : P1906981-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:19:12 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

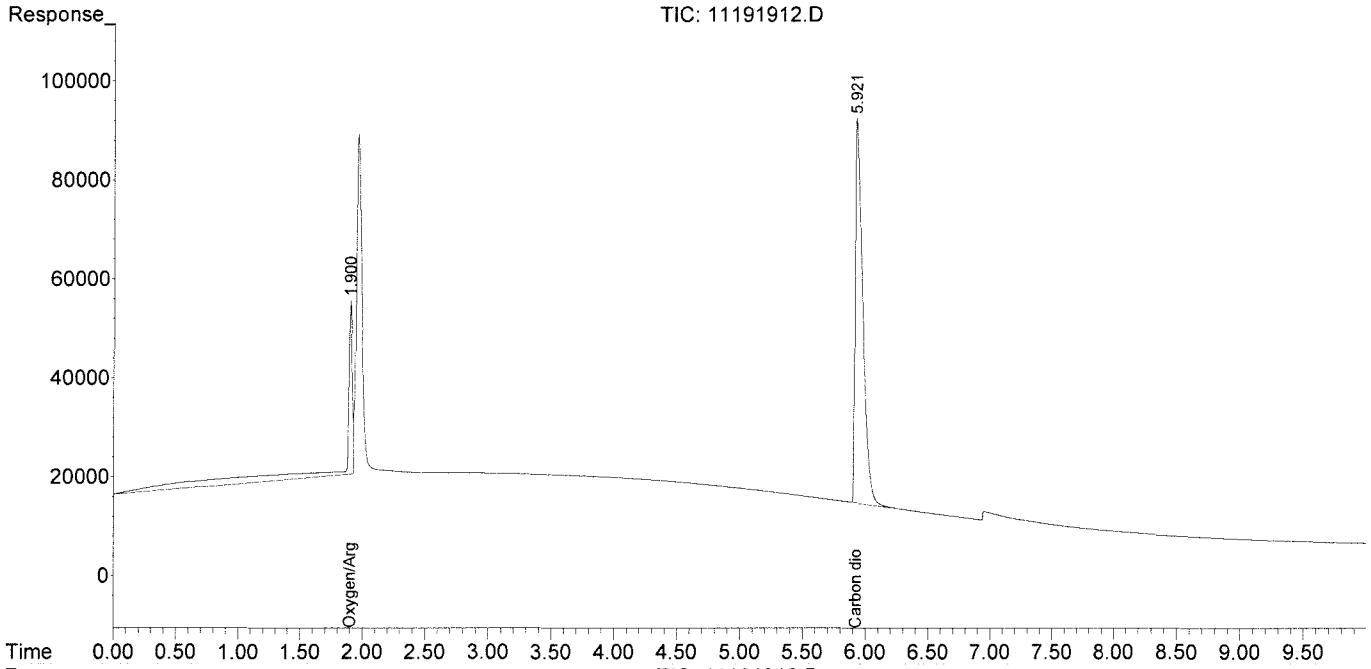
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.901	1701904	0.358	ppm	
2)	Carbon monoxide	1.901	1701904	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.921	3225515	13741.433	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

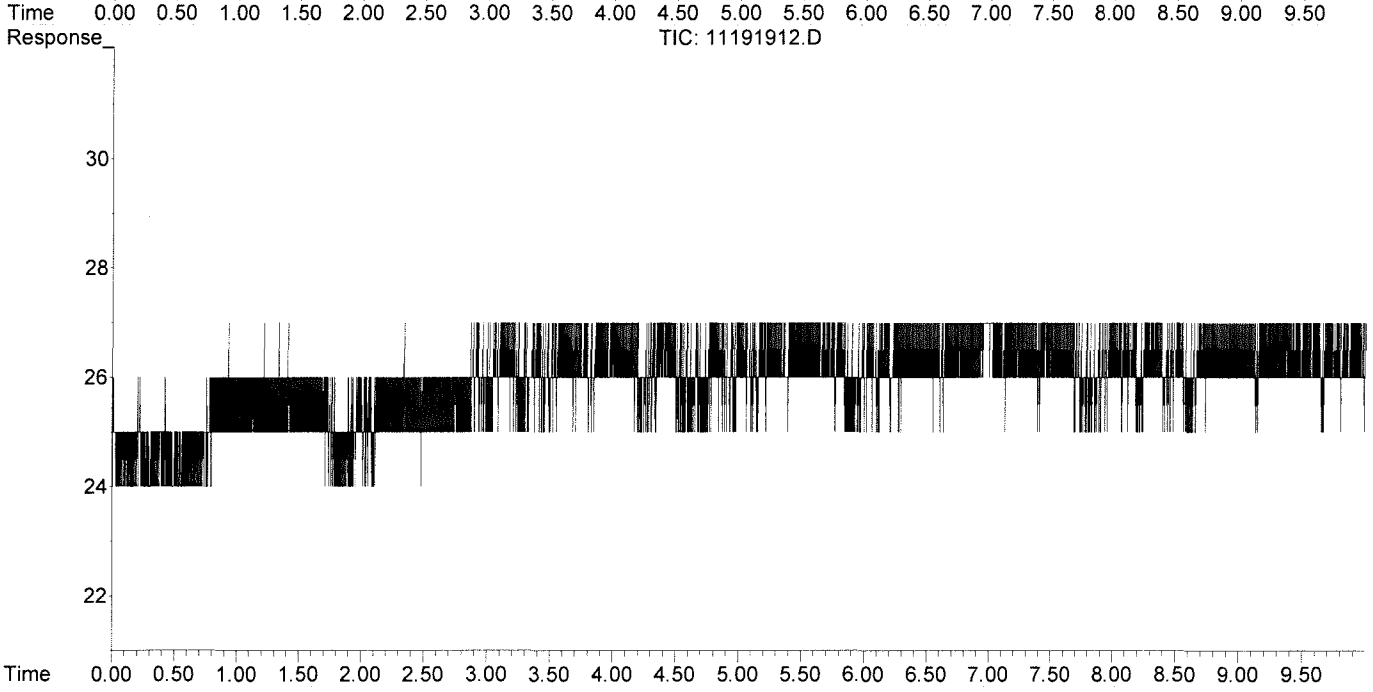
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:55:10
Operator : WH/LD
Sample : P1906981-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:19:12 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

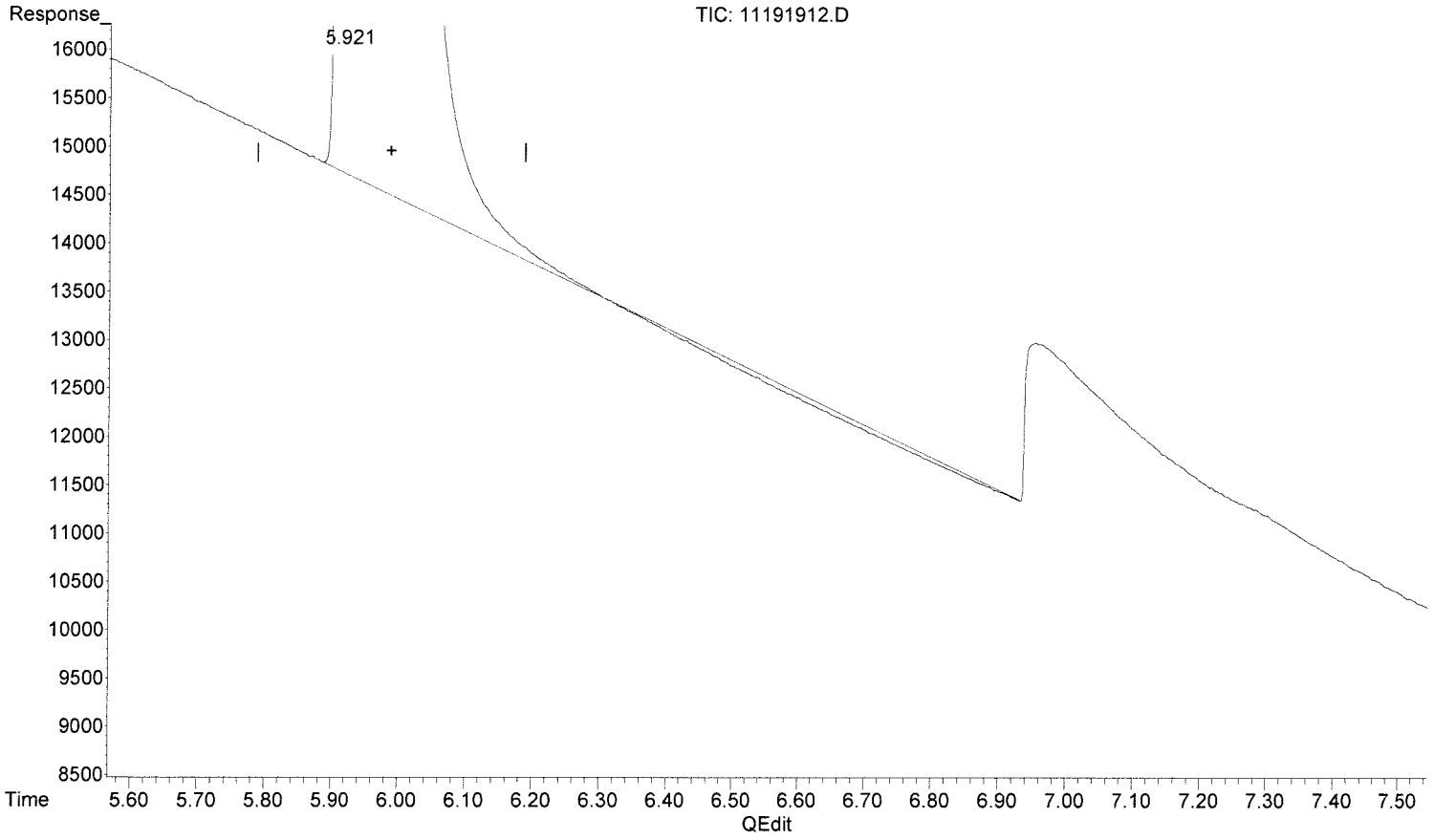




Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:55:10
Operator : WH/LD
Sample : P1906981-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:19:12 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.922min 13688.986 ppm

response 3213205

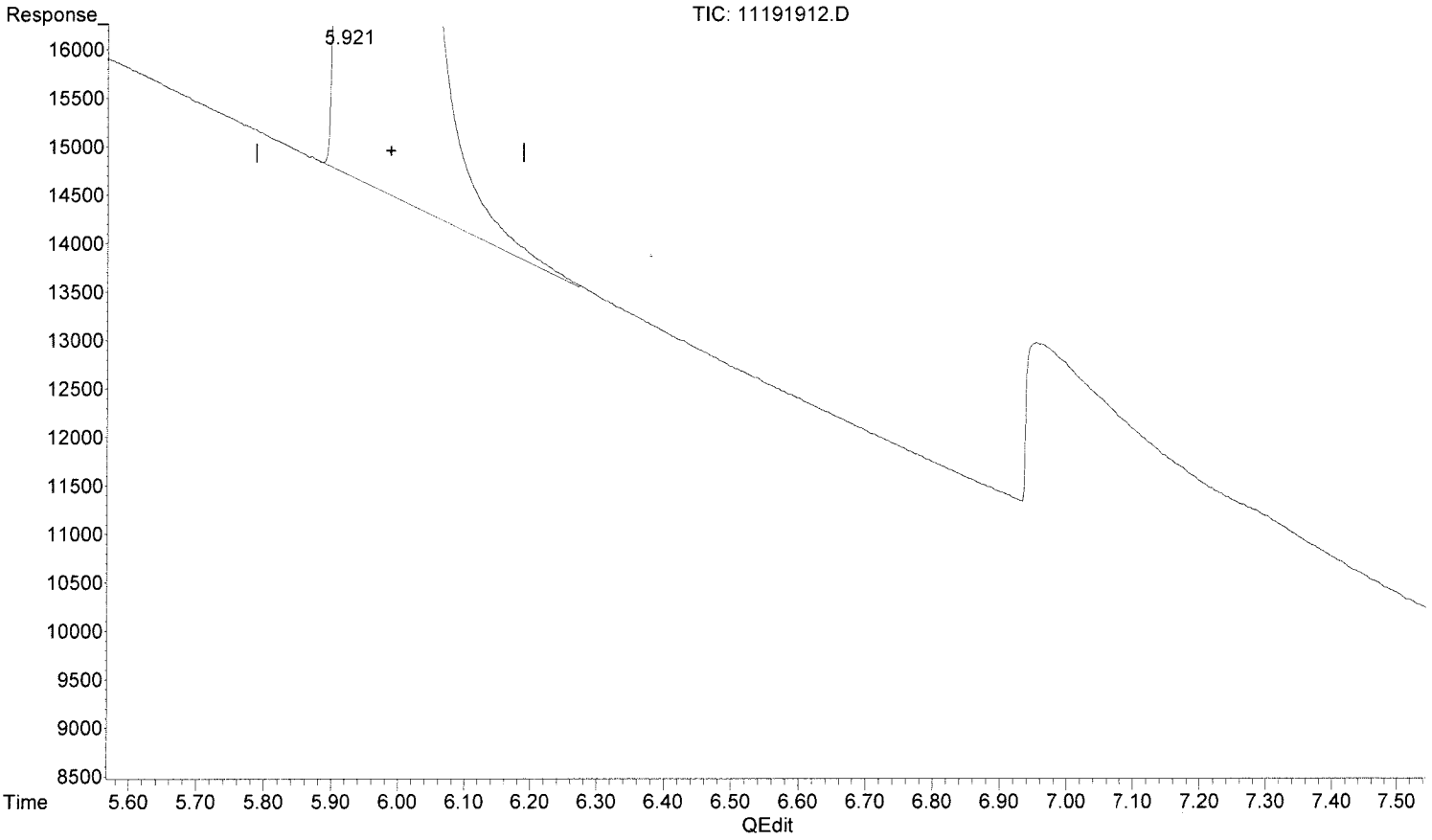
(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 14:55:10
Operator : WH/LD
Sample : P1906981-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:19:12 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

LD
BLC
11/19

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.921min 13741.433 ppm m

response 3225515

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191904.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 12:14:52
Operator : WH/LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 11:25:26 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

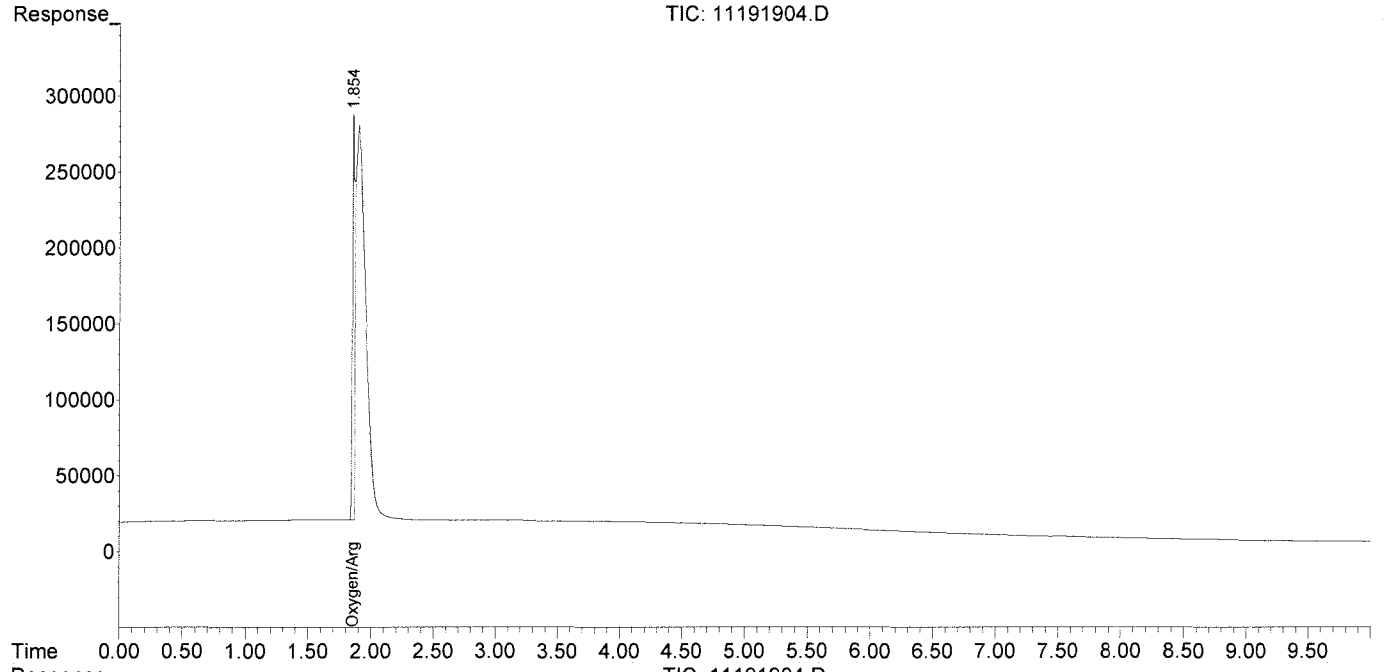
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.855	3182198	0.669	ppm
2)	Carbon monoxide	1.855	3182198	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

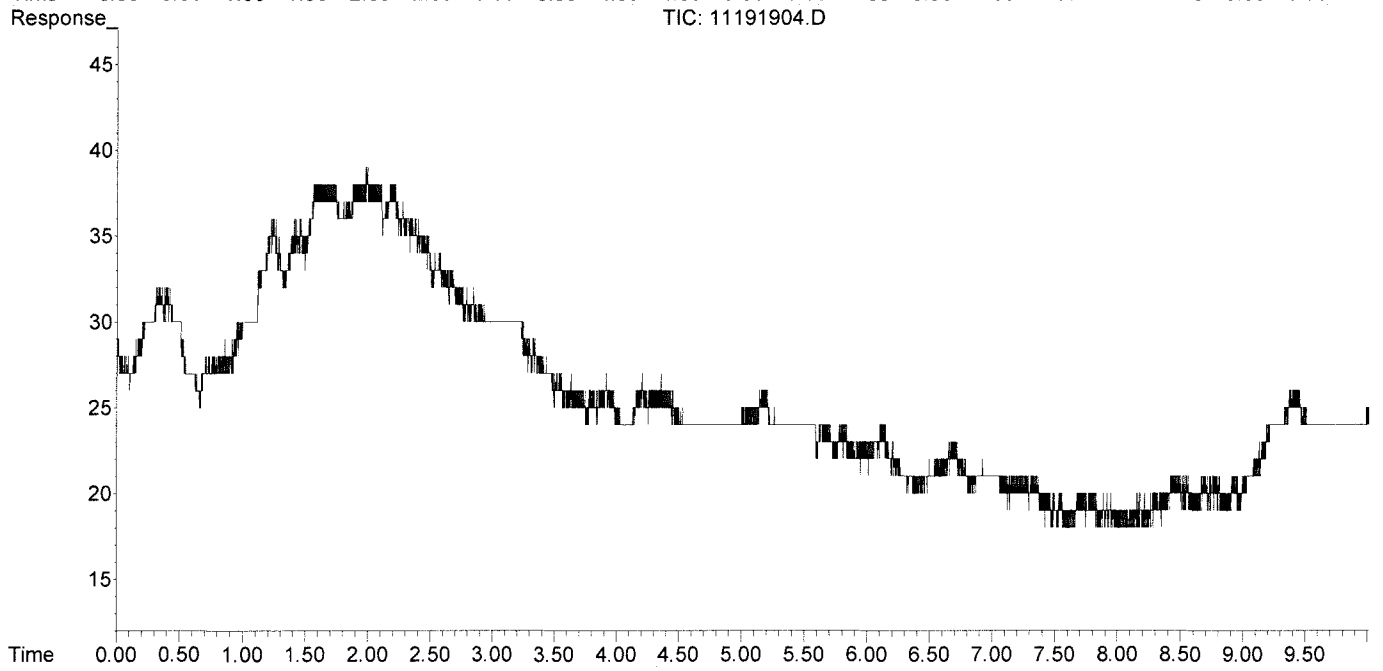
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191904.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 12:14:52
Operator : WH/LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 11:25:26 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:30:06
Operator : WH/LD
Sample : LCS S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:43:39 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

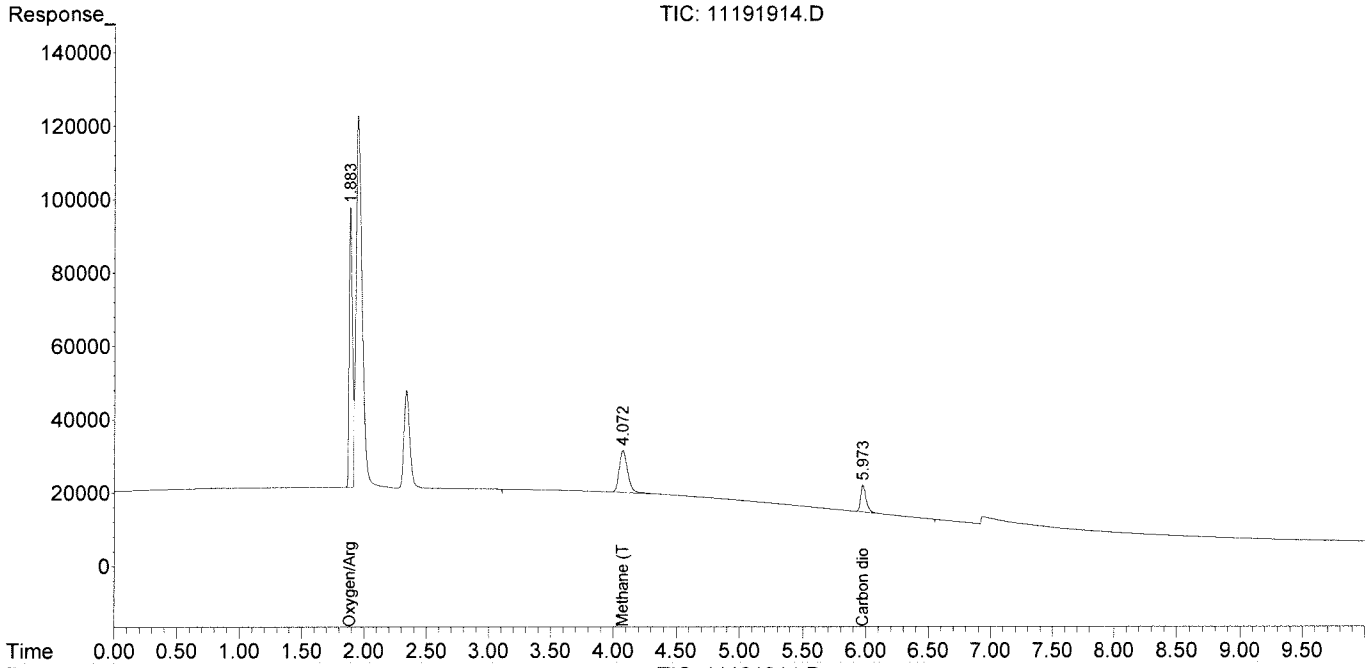
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.883	1353672	0.284	ppm	
2)	Carbon monoxide	1.883	1353672	N.D.	ppm	
3)	Methane (TCD)	4.073f	530835	56129.320	ppm	
4)	Carbon dioxide	5.973	227313	968.407	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

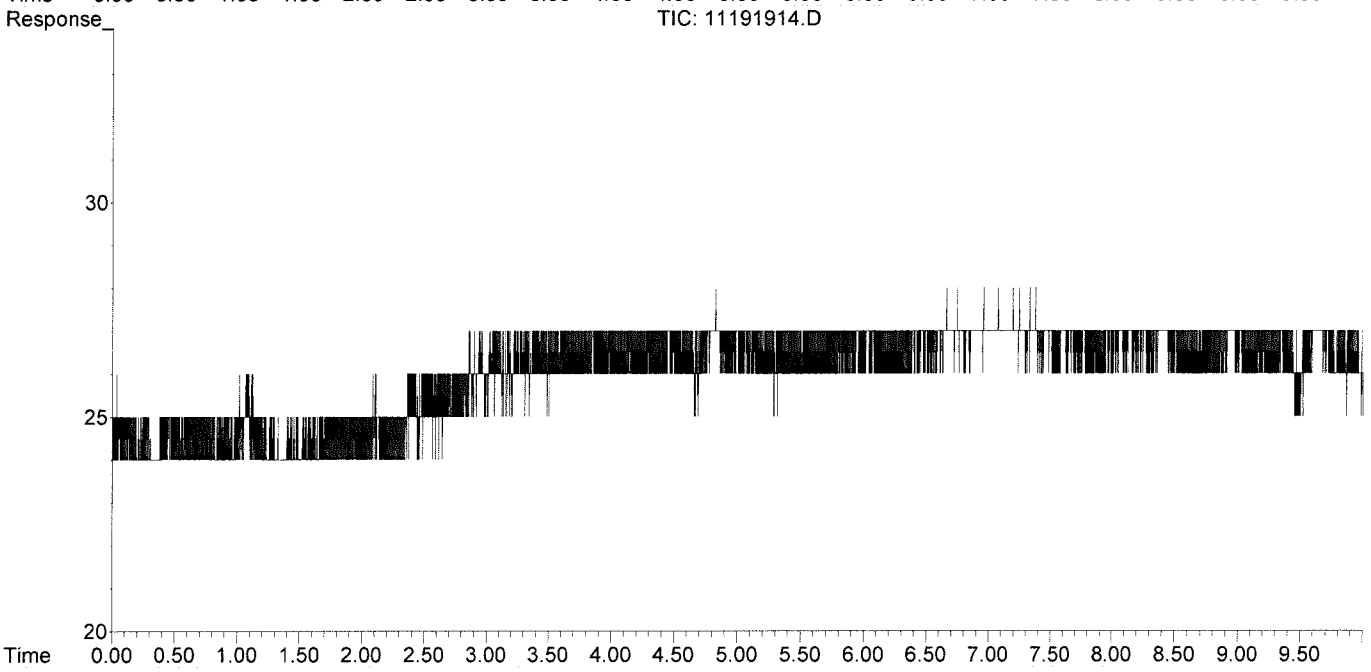
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:30:06
Operator : WH/LD
Sample : LCS S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:43:39 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

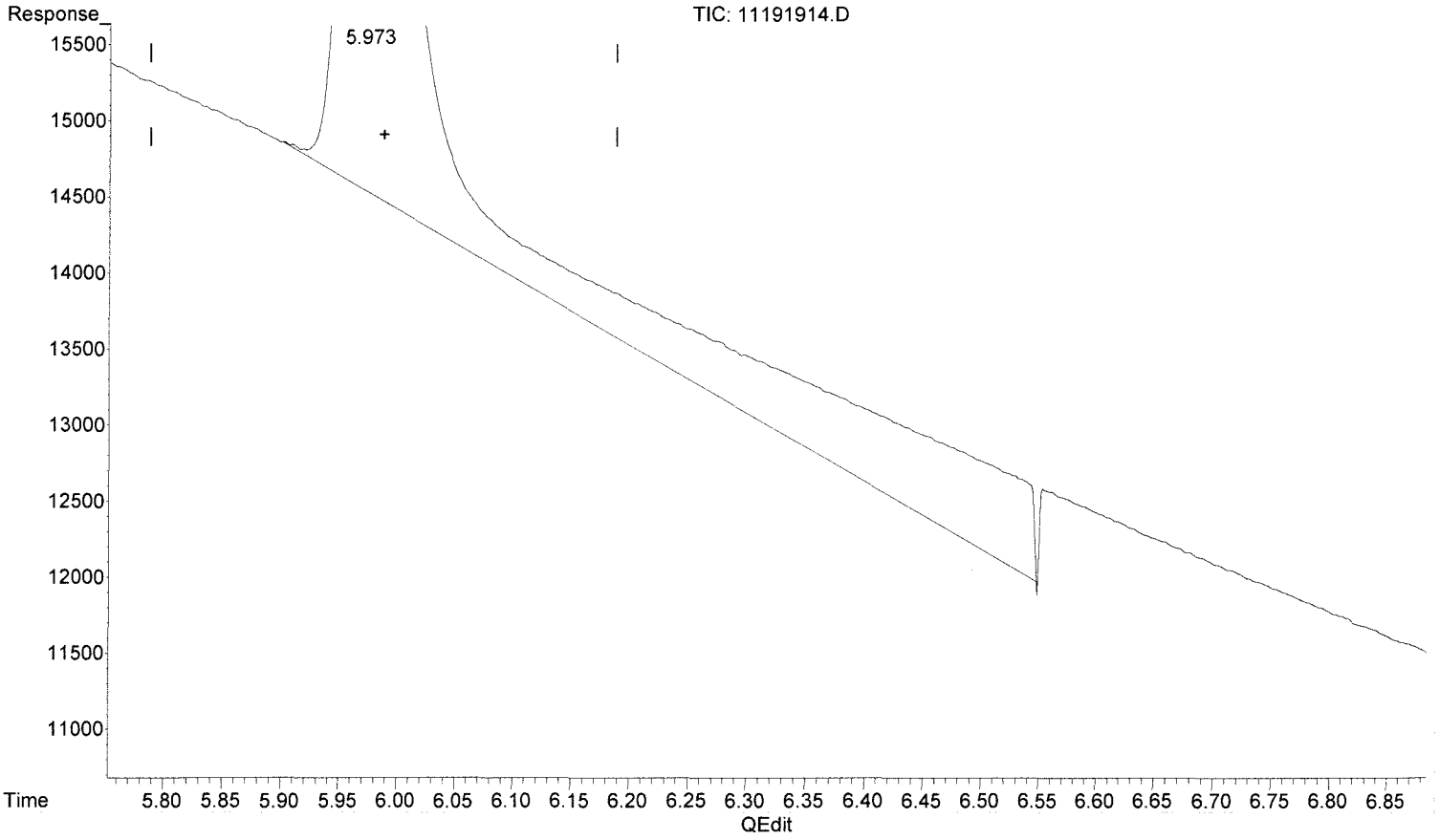




Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:30:06
Operator : WH/LD
Sample : LCS S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:43:39 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.974min 1495.113 ppm

response 350947

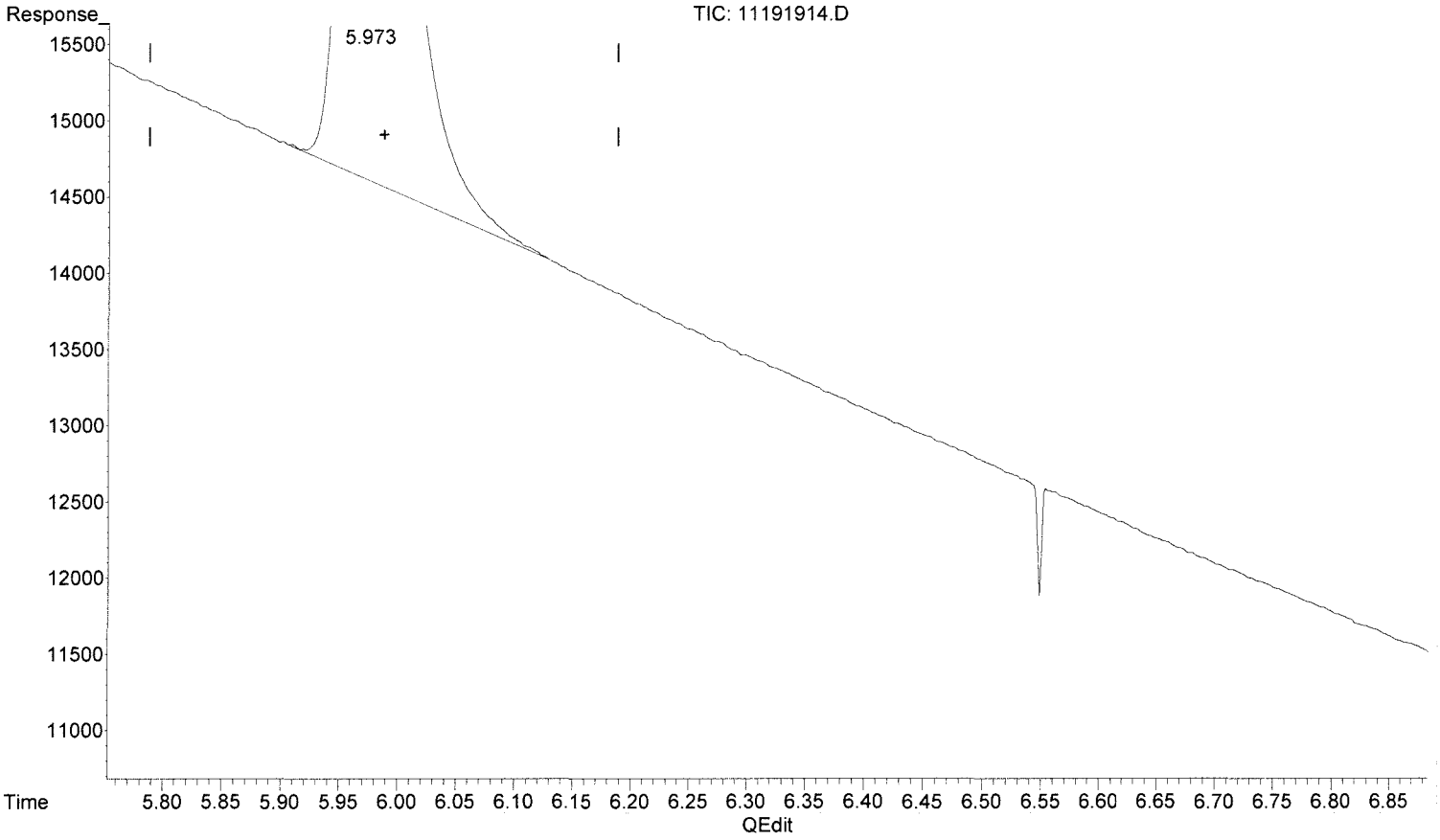
(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:30:06
Operator : WH/LD
Sample : LCS S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

LD
BLL
11/19

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:43:39 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.973min 968.407 ppm m

response 227313

11/20/19

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191915.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:43:01
Operator : WH/LD
Sample : LCSD S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:56:34 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

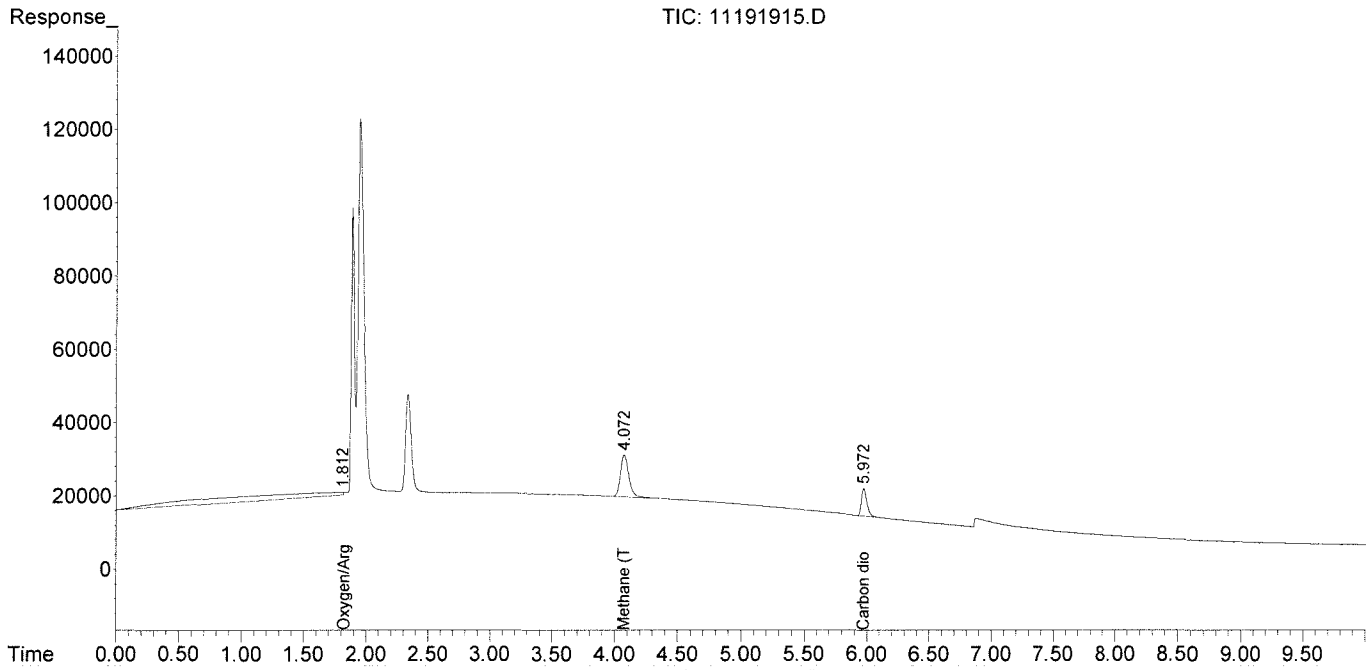
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.812	1190812	0.250	ppm	
2)	Carbon monoxide	1.812	1190812	N.D.	ppm	
3)	Methane (TCD)	4.073f	523663	55370.957	ppm	
4)	Carbon dioxide	5.972	226846	966.415	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

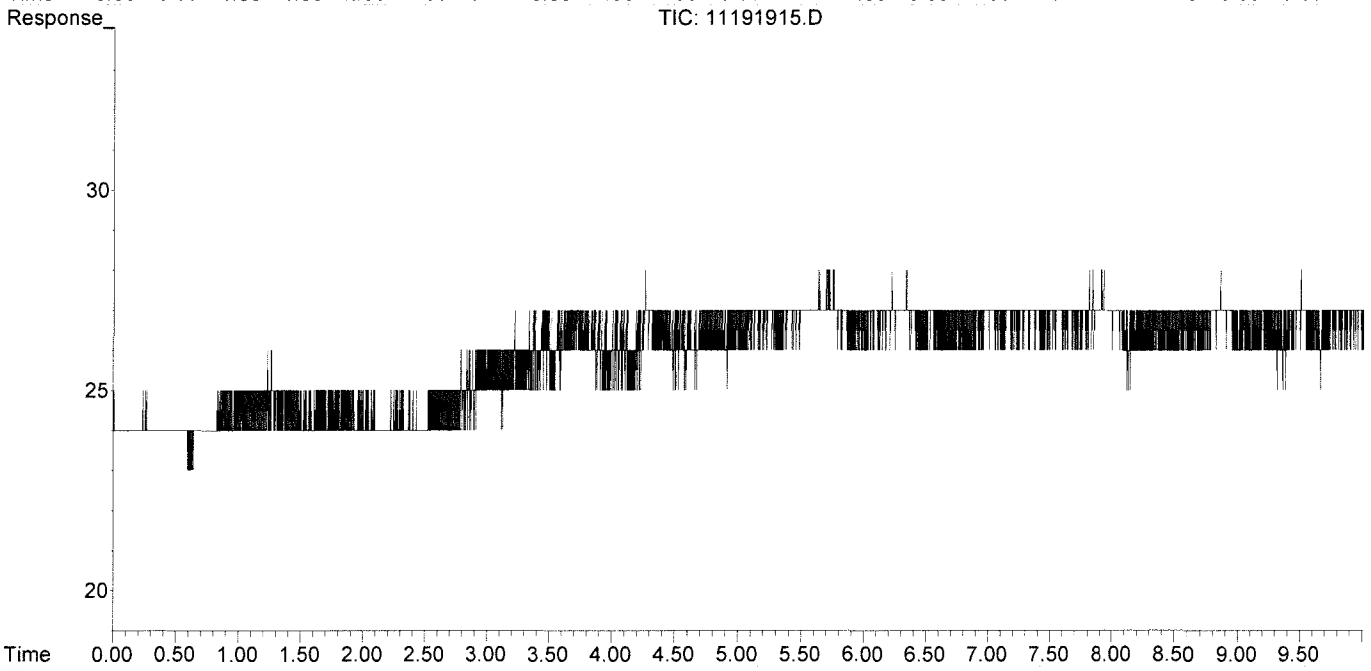
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191915.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:43:01
Operator : WH/LD
Sample : LCSD S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:56:34 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

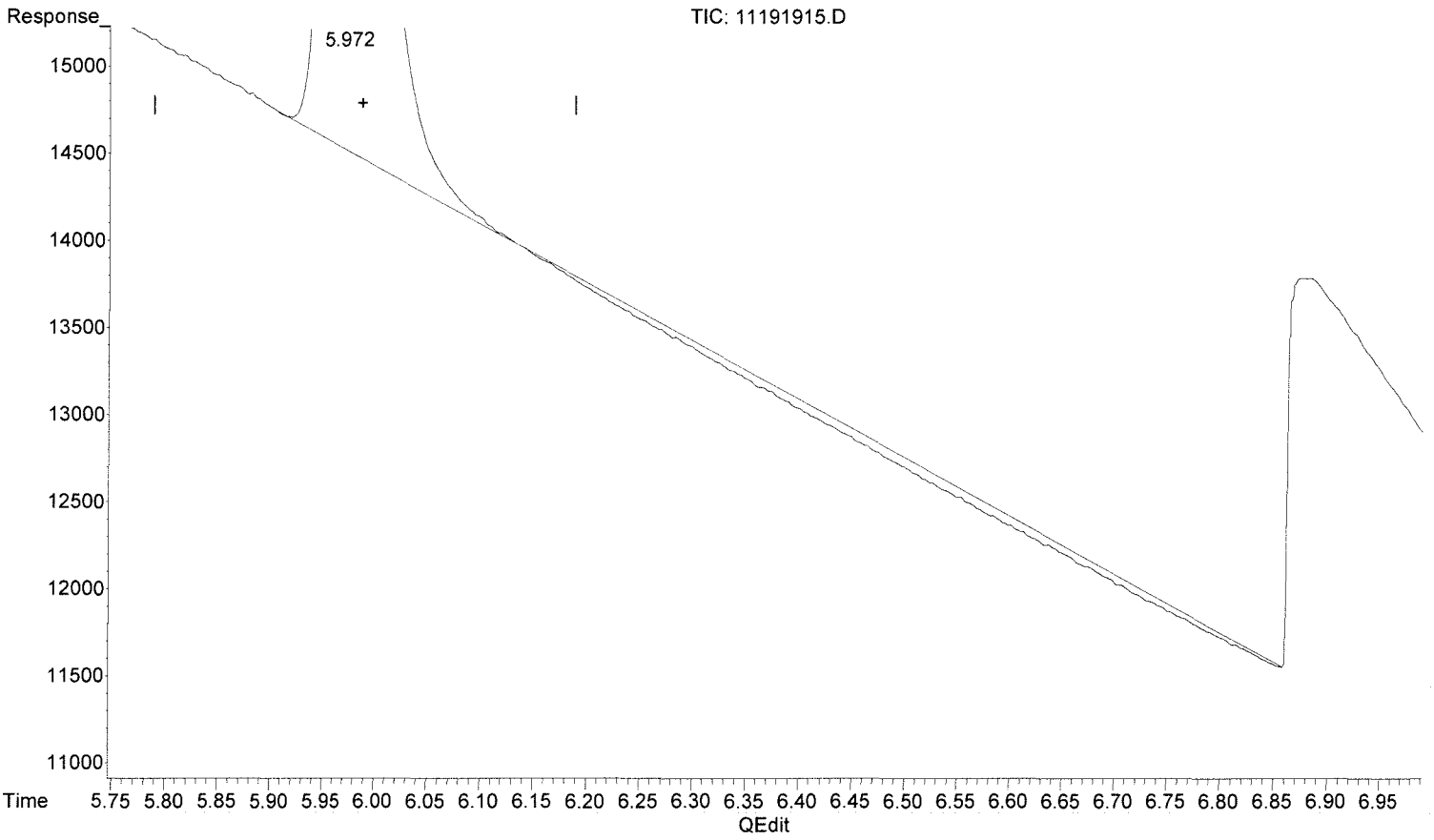




Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191915.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:43:01
Operator : WH/LD
Sample : LCSD S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:56:34 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.973min 898.264 ppm

response 210849

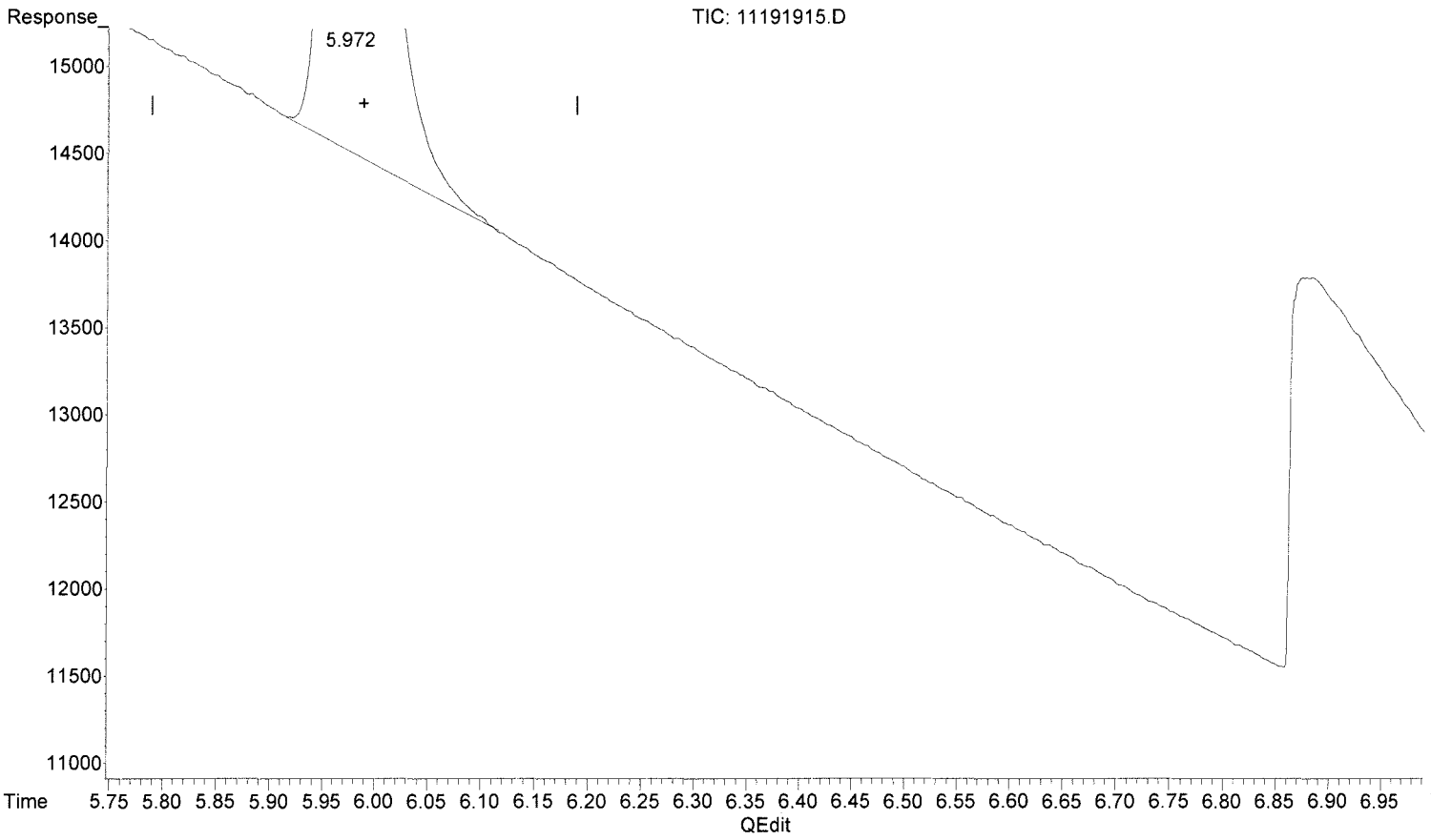
(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191915.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:43:01
Operator : WH/LD
Sample : LCSD S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

LD
11/19
BLC

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 14:56:34 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.972min 966.415 ppm m

response 226846

11/20/19

(+) = Expected Retention Time
RS082817_CO2.M Tue Nov 19 14:56:53 2019 166 of 364 Page: 1

Response Factor Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	4.760						4.760	E6	0.00
2)	Carbon monoxide	2.775		1.066	0.043	0.033	0.027	0.657	E6	170.12
3)	Methane (TCD)							9.457		0.00
4)	Carbon dioxide	2.717	2.193	2.338	2.272	2.265	2.298	2.347	E2	7.99

Signal #2 Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)	1.253	1.160	1.005	0.927	0.848	0.848	0.945	E4	15.85
7)	Ethylene	1.677	1.605	1.900	1.749	1.597	1.579	1.684	E4	7.30
8)	Ethane	1.769	1.631	1.866	1.767	1.639	1.667	1.723	E4	5.40
9)	Propylene	2.402	2.309	2.767	2.551	2.331	2.333	2.449	E4	7.32
10)	Propane	2.906	2.737	2.817	2.639	2.410	2.420	2.655	E4	7.75
11)	Isobutylene							0.000		-1.00
12)	Isobutane							0.000		-1.00
13)	n-Butane							0.000		-1.00

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS082817_CO2.M Wed Aug 30 13:24:19 2017

dit Compounds -- Compound #4 -- Carbon dioxide

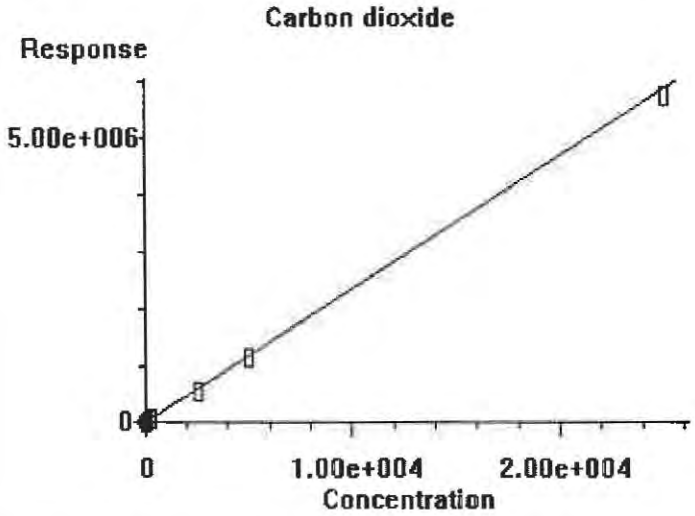
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	25.000000	6793.665186
2	100.000000	21932.418000
3	250.000000	58460.642510
4	2500.000000	568043.388750
5	5000.000000	1132363.215937
6	25000.000000	5744294.891563
7	25000.000000	
8	25000.000000	
9	2000.000000	
10	30000.000000	

Lvl ID	Concentration	Response



0.000e+000	Quadratic term
2.347e+002	Linear term
0.000e+000	Constant term
7.987%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Calibration Status Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291715.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291716.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291717.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291719.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291720.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291721.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241711.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Aug 29 14:21 2017	Aug 29 14:20 2017	29-Aug-2017, 14:07
2	2	Aug 29 14:52 2017	Aug 29 14:51 2017	29-Aug-2017, 14:22
3	3	Aug 29 15:04 2017	Aug 29 15:04 2017	29-Aug-2017, 14:53
4	4	Aug 29 15:36 2017	Aug 29 15:36 2017	29-Aug-2017, 15:23
5	5	Aug 29 15:57 2017	Aug 29 15:57 2017	29-Aug-2017, 15:44
6	6	Aug 29 16:13 2017	Aug 29 16:13 2017	29-Aug-2017, 16:00
7	7	Aug 25 09:05 2017	Aug 24 16:00 2017	24-Aug-2017, 15:44
8	8	Aug 25 09:06 2017	Aug 24 16:13 2017	24-Aug-2017, 16:02
9	9	Aug 25 09:06 2017	Aug 24 16:31 2017	24-Aug-2017, 16:16
10	10	Aug 25 09:07 2017	Aug 24 16:42 2017	24-Aug-2017, 16:33

RS082817_CO2.M Wed Aug 30 13:24:30 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

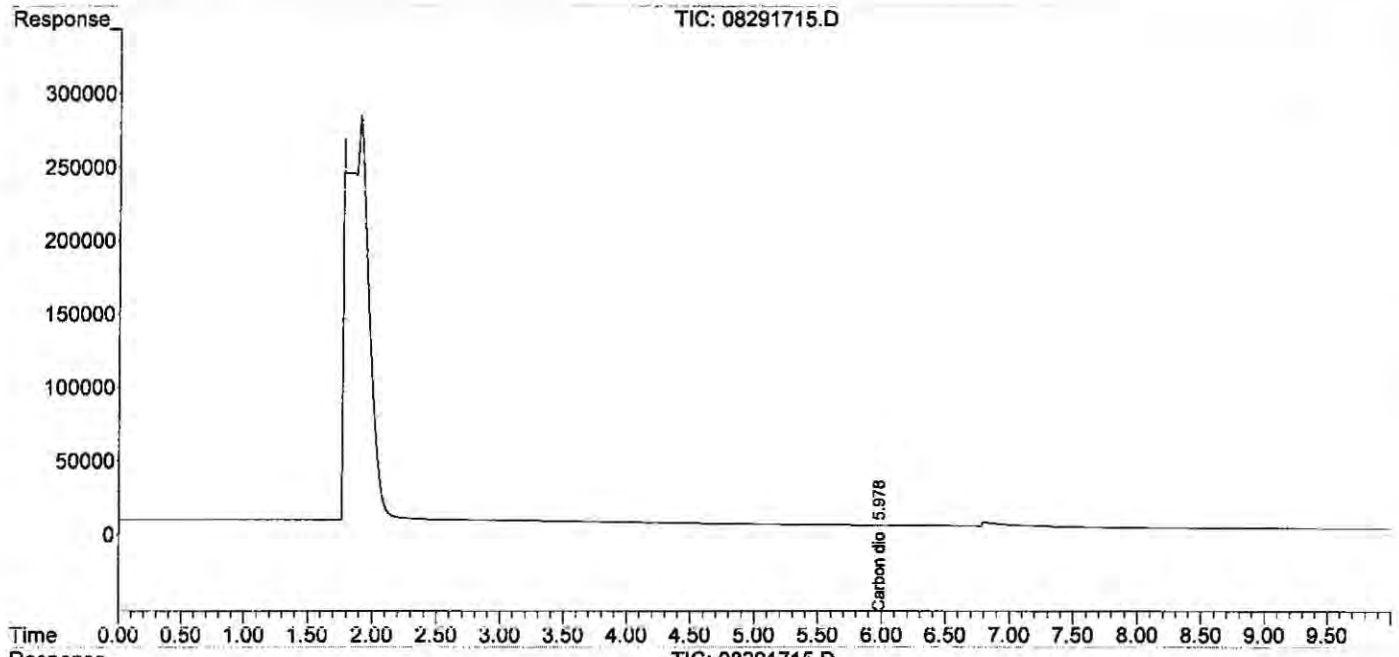
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.776	277465	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	6794	27.870	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

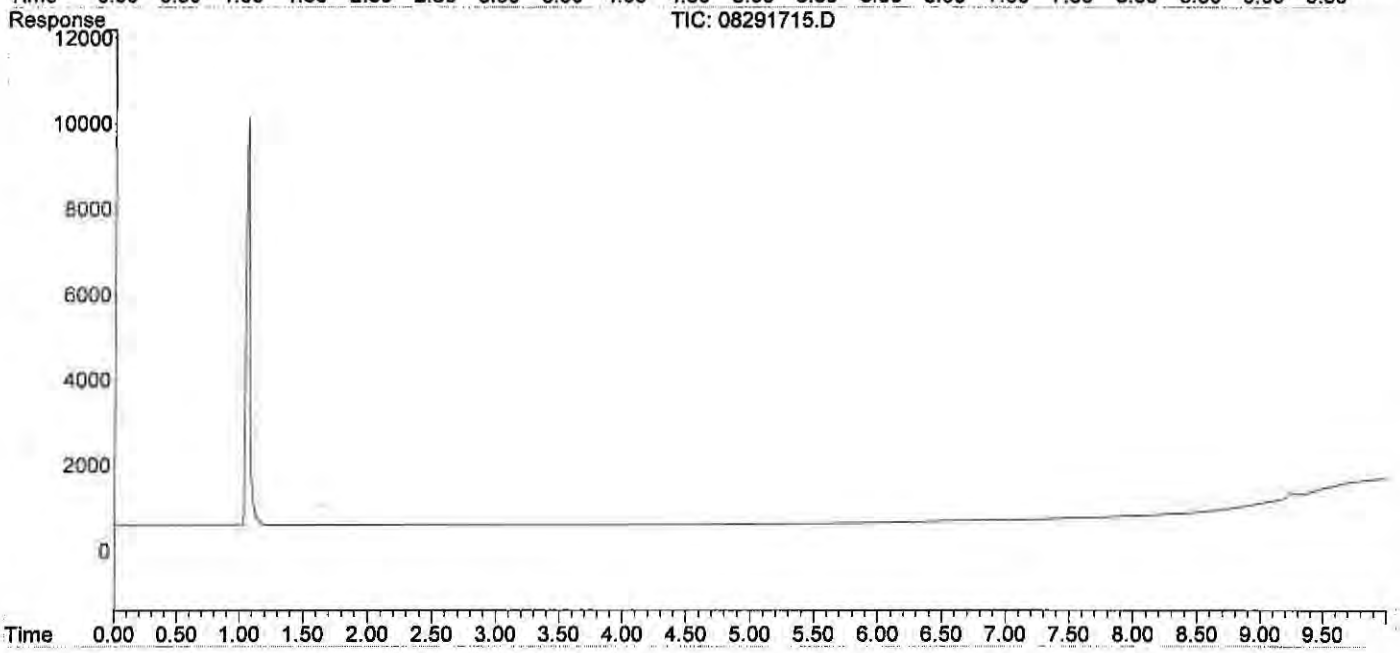
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



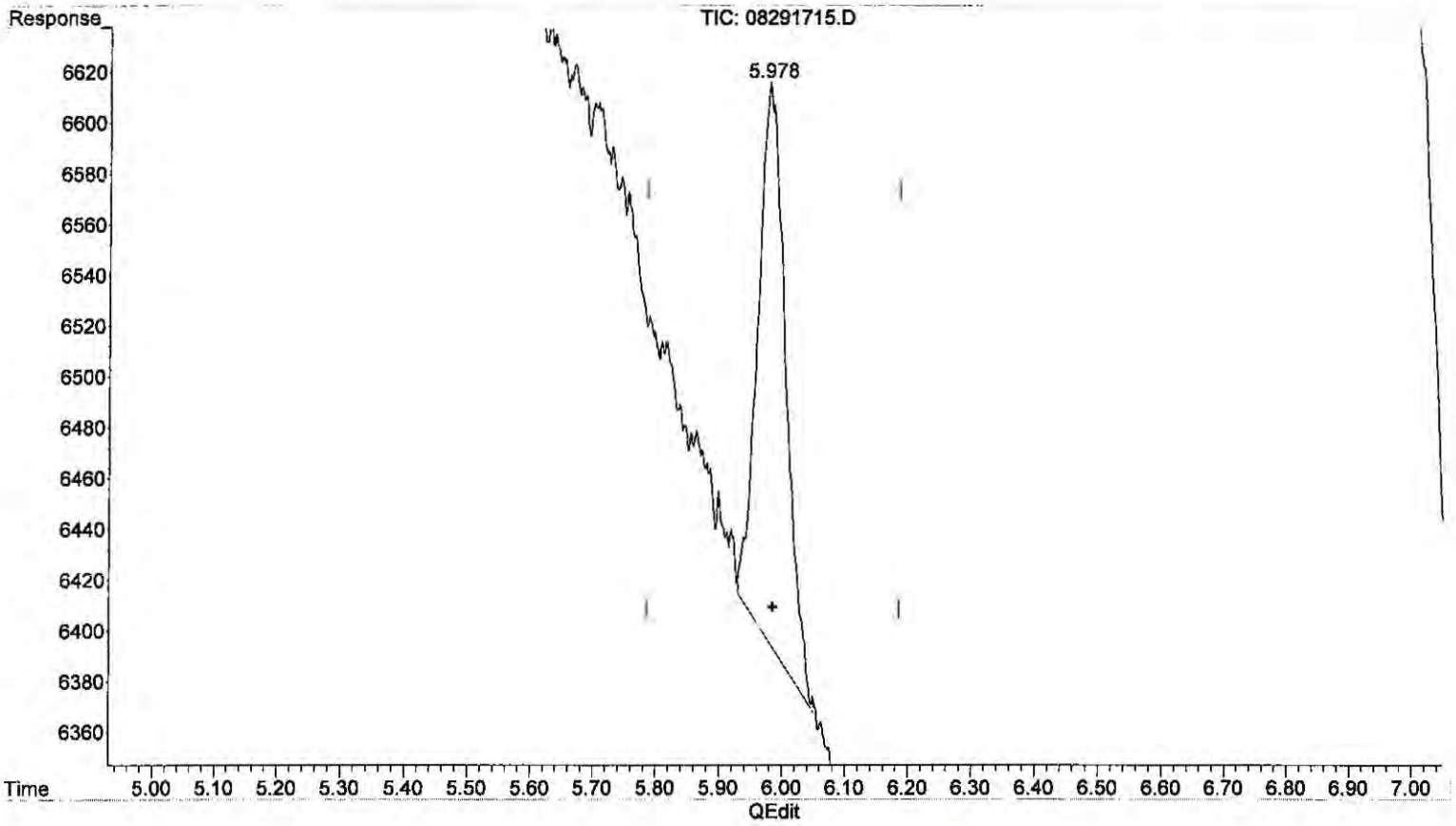


01009727

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.978min 27.870 ppm m

response 6794

8/30/17 BW M. prcvw

8/31/17

(+) = Expected Retention Time

RS082817_CO2.M Wed Aug 30 13:17:47 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.790	-598962	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	21932	87.858	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

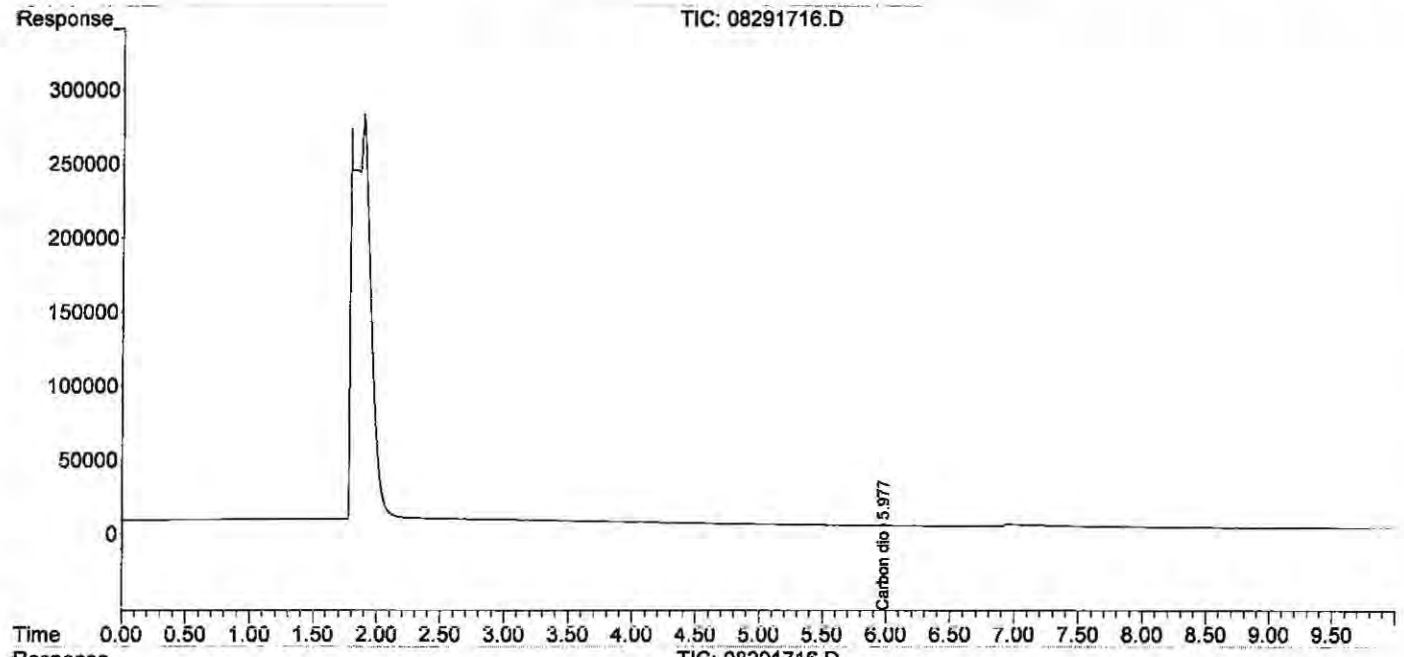
(f)=RT Delta > 1/2 Window (m)=manual int.

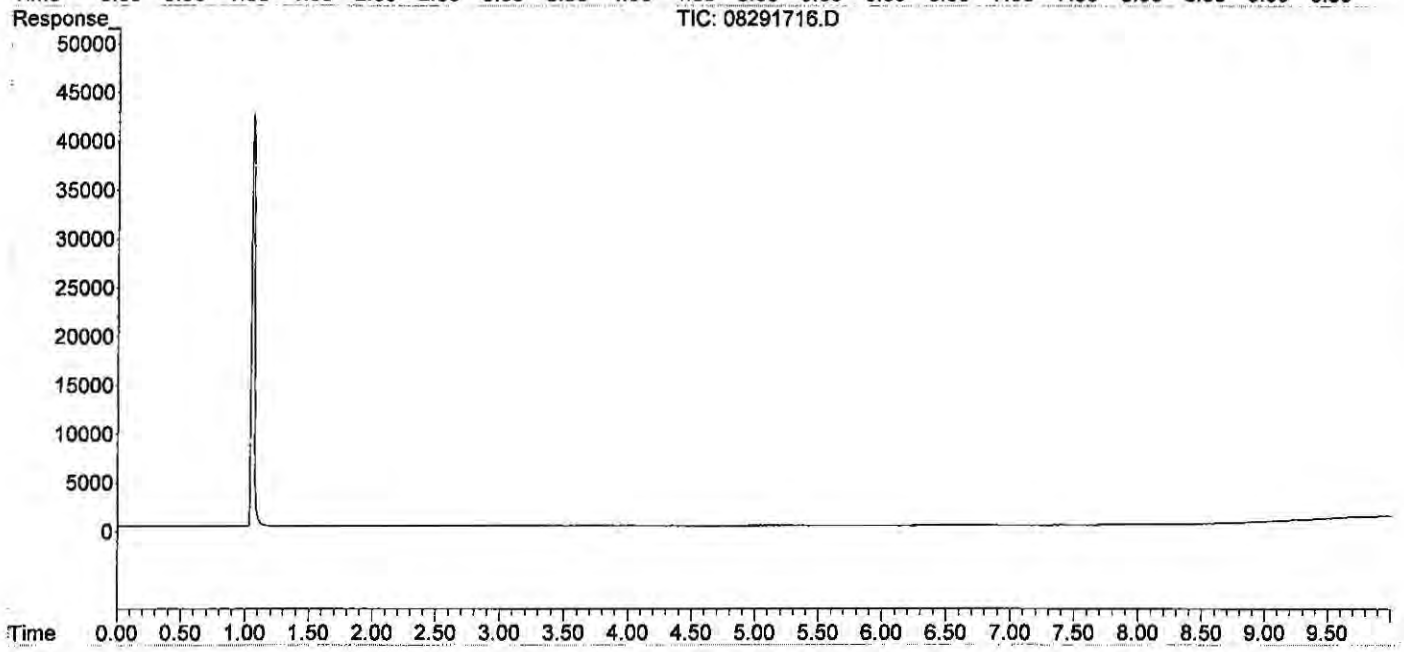
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

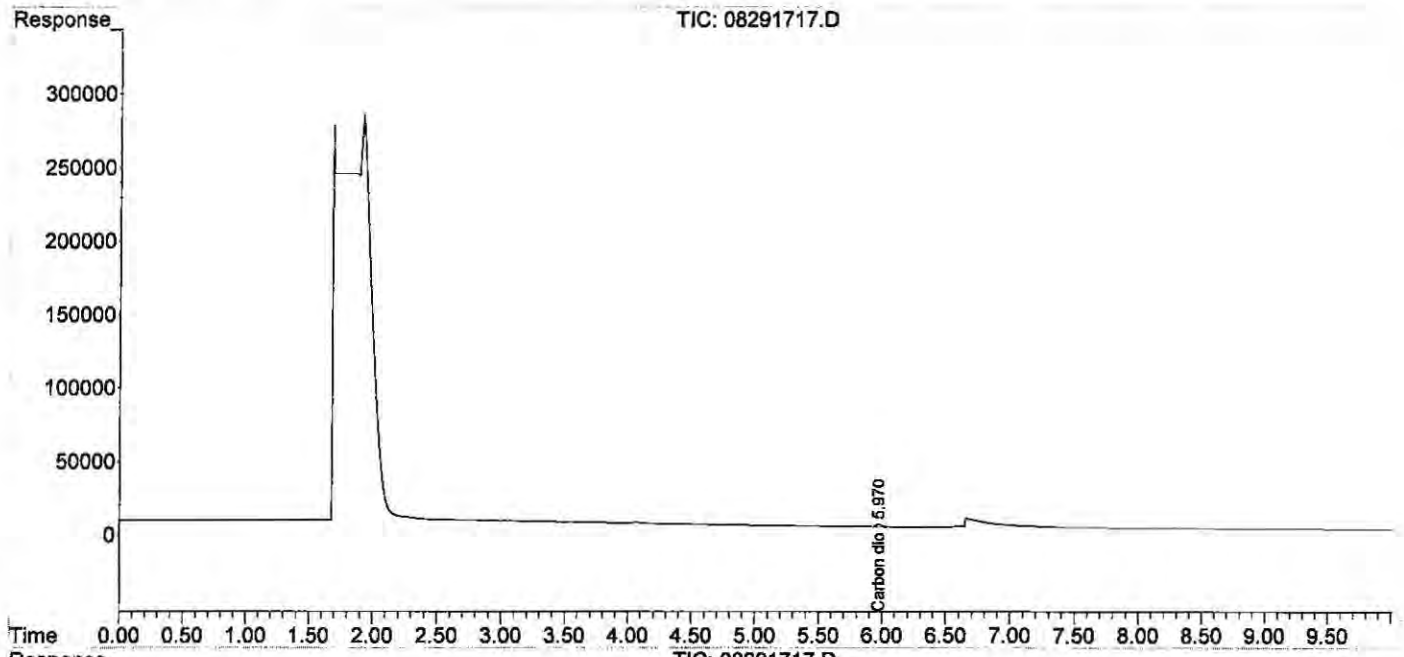
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.920f	-30716454	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.970	58461	240.204	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

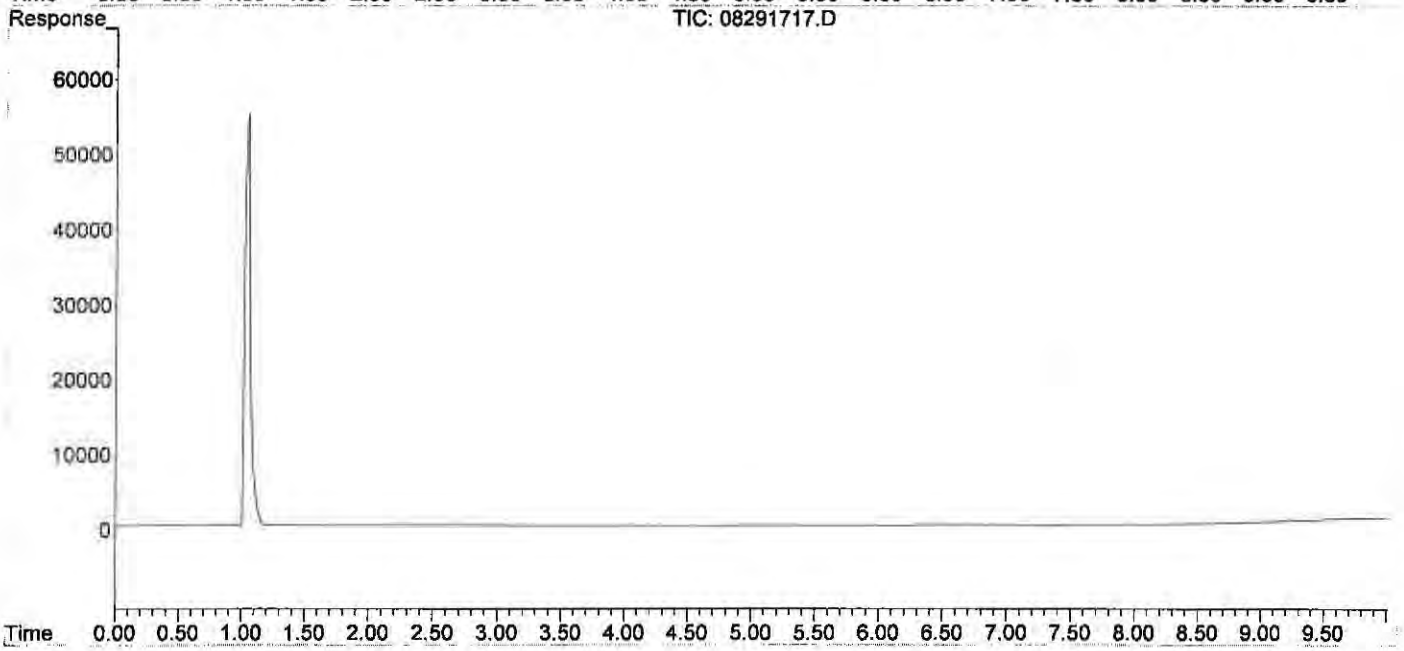
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

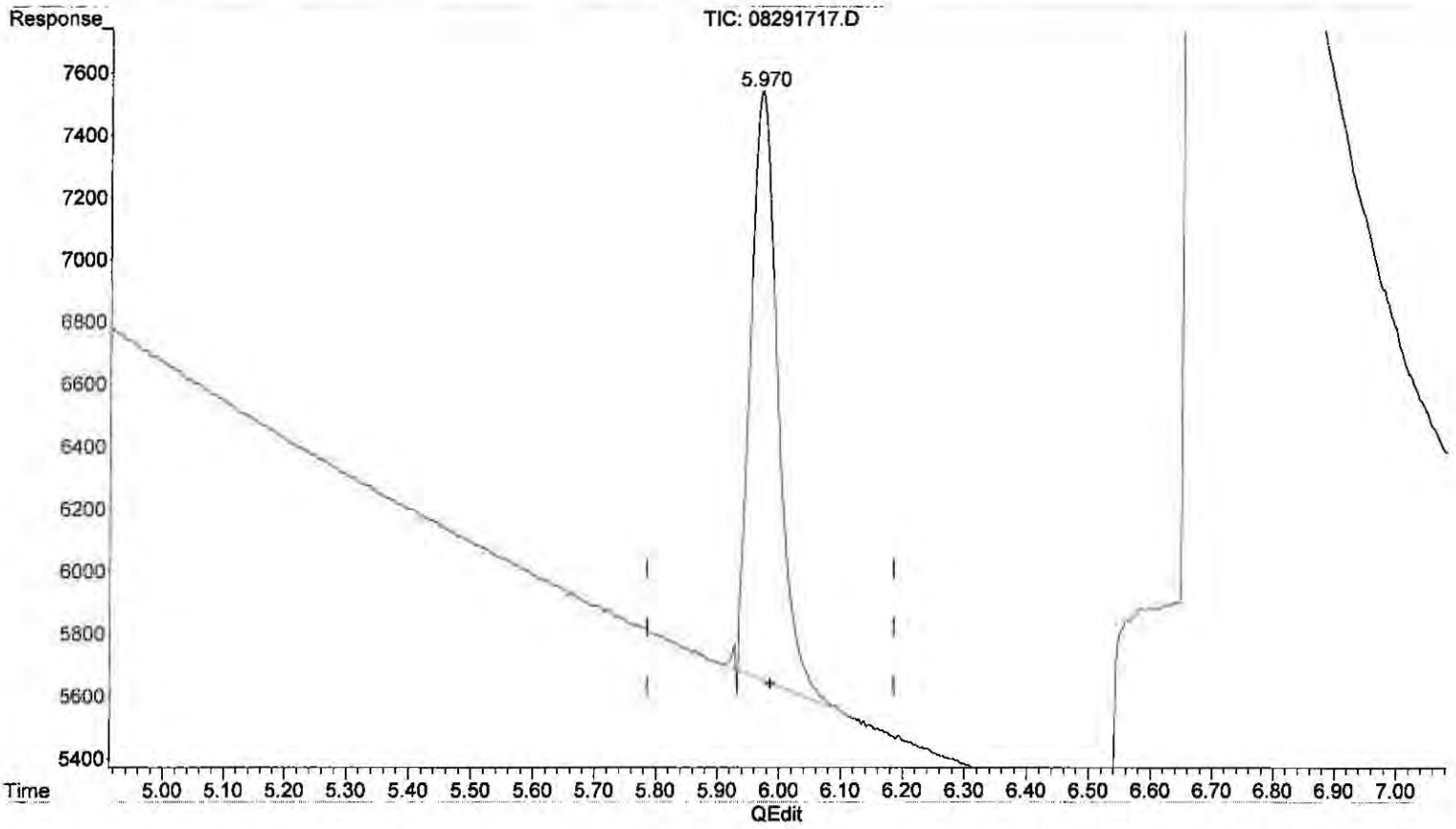




Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
5.970min 240.204 ppm m
response 58461

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

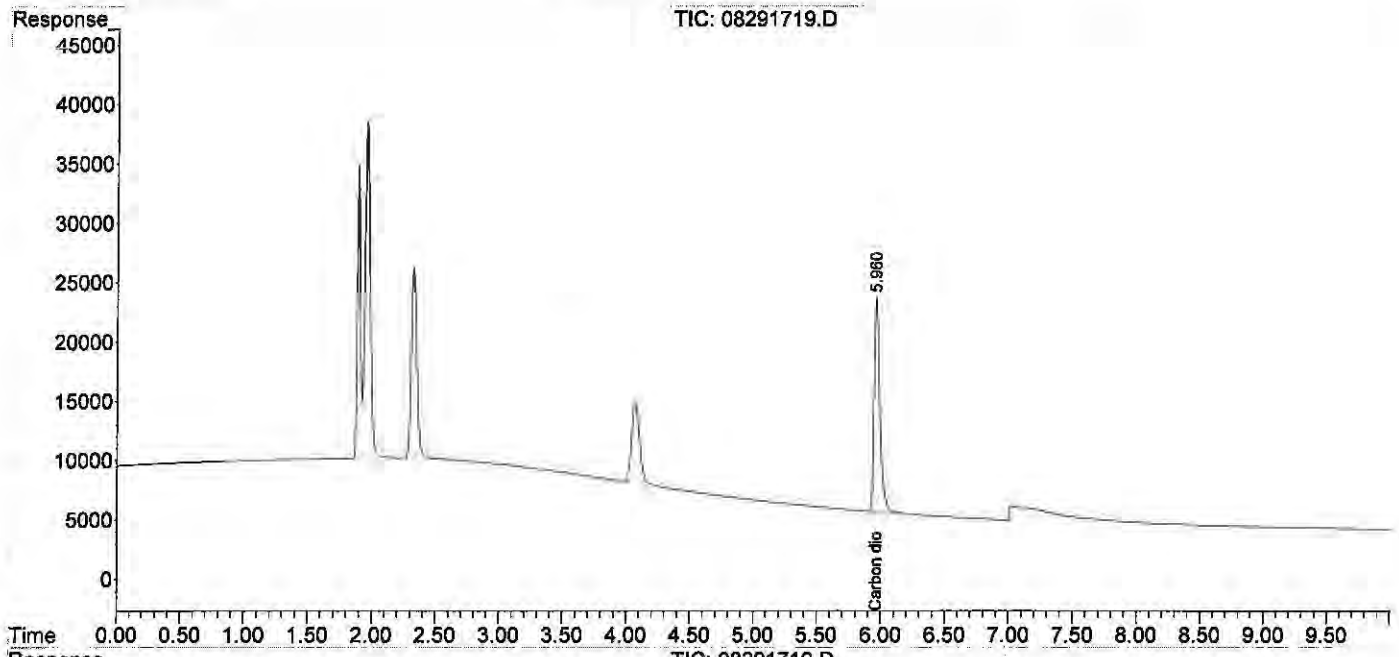
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.891	425113	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.962	568043	2369.673	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

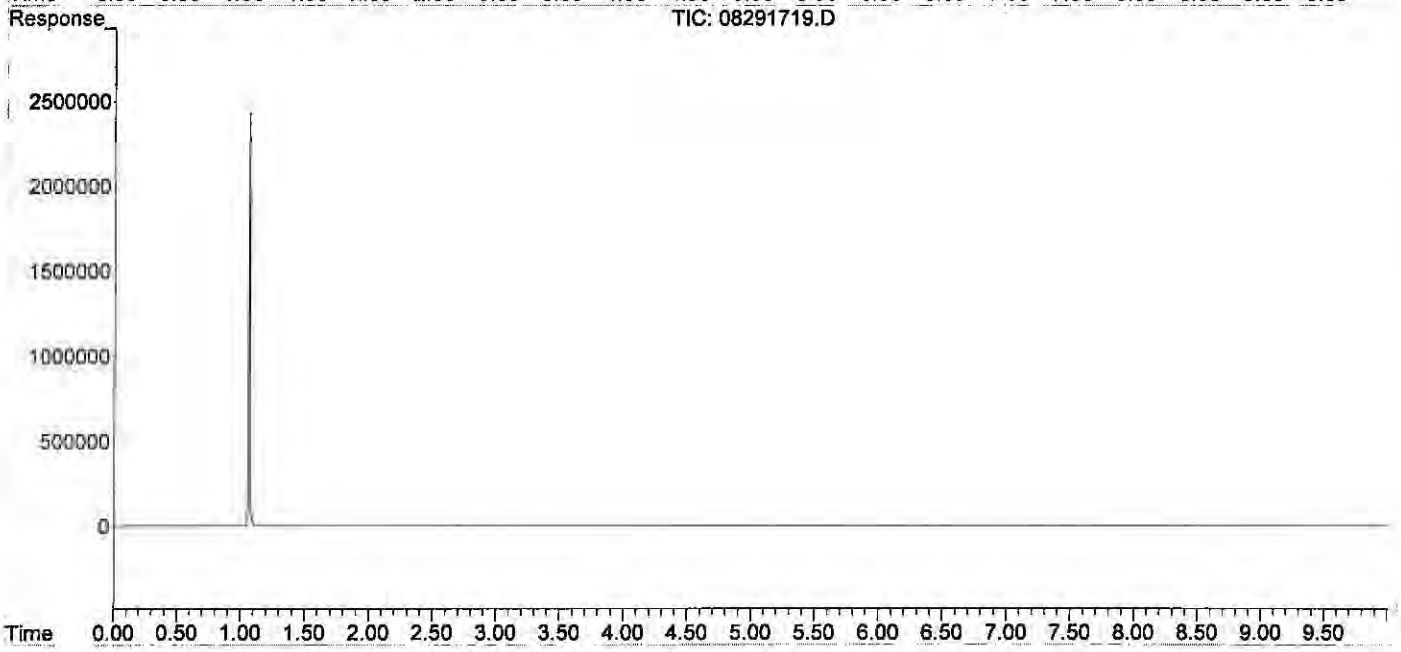
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

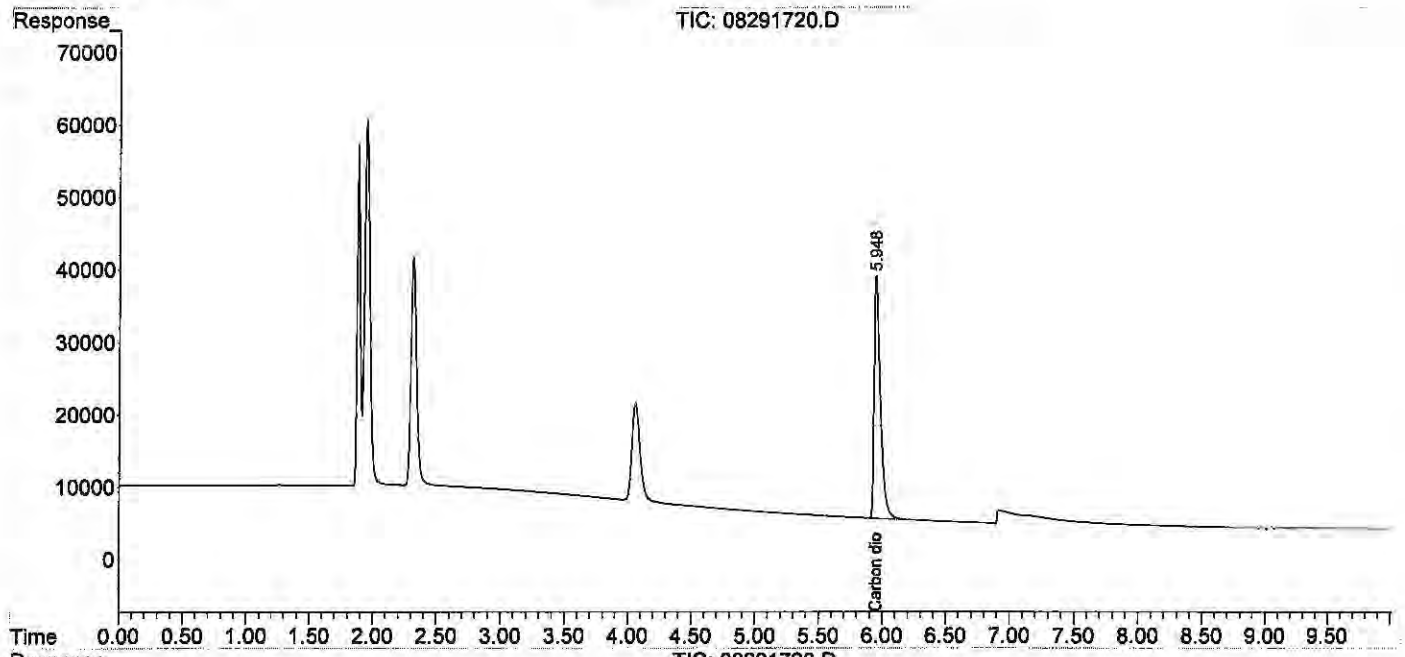
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.880	819221	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.948	1132363	4753.126	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

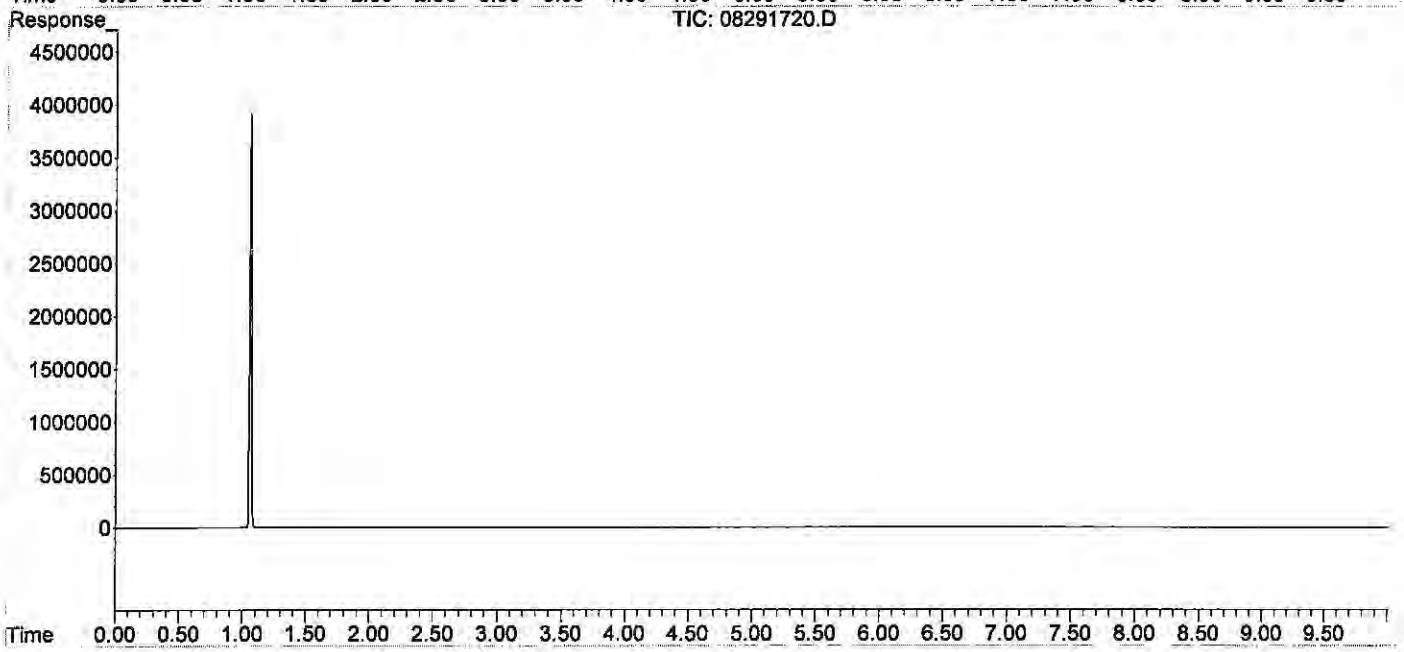
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

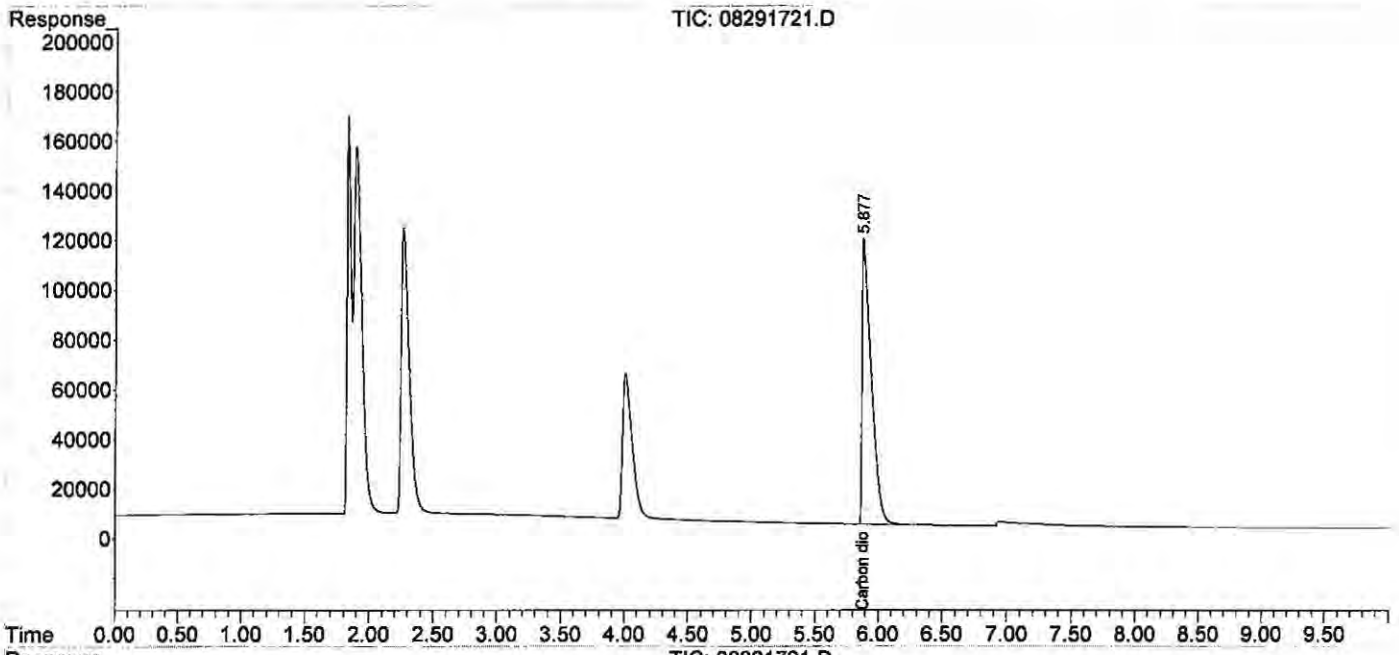
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.827	3325463	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.879f	5744295	24443.288	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

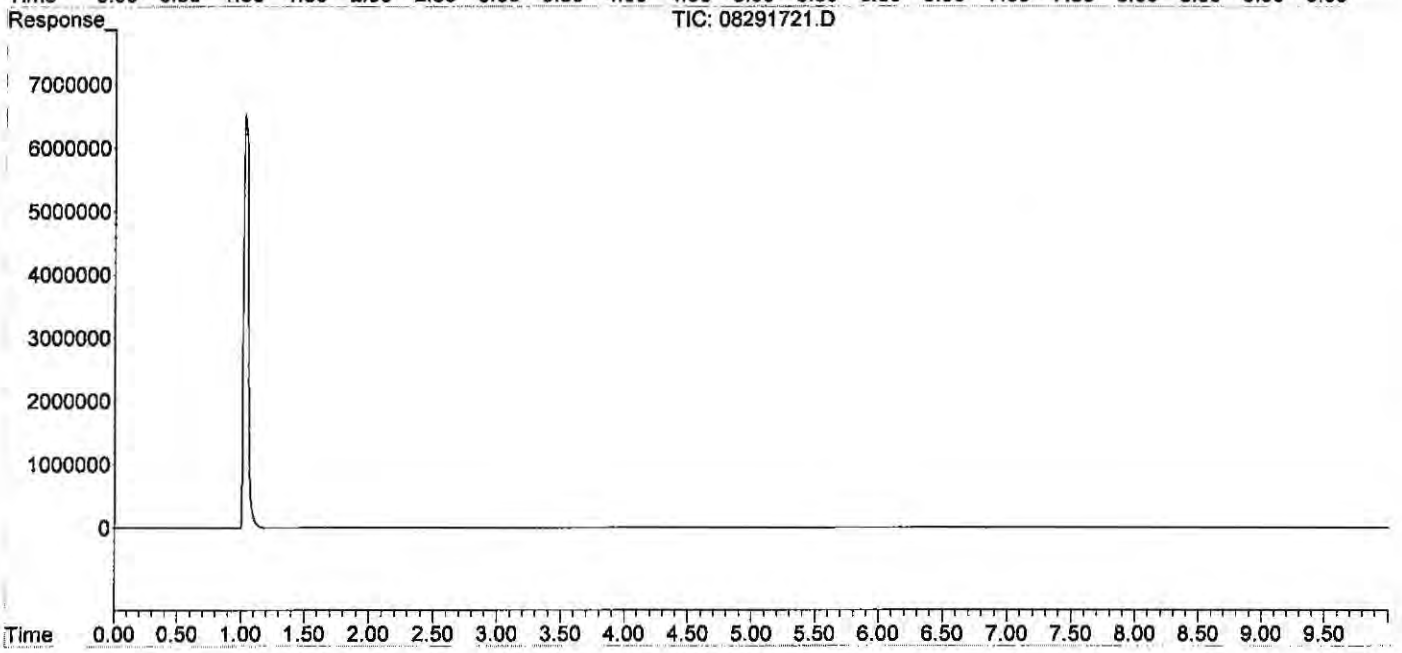
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.886	536422	0.113	ppm
2)	Carbon monoxide	1.886	536422	N.D.	ppm
3)	Methane (TCD)	4.059f	626500	66244.710	ppm
4)	Carbon dioxide	5.947	1163775	4957.948	ppm
6)	Methane (FID)	1.062	37290742	3947.023	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

Actual %D
5000 99.16

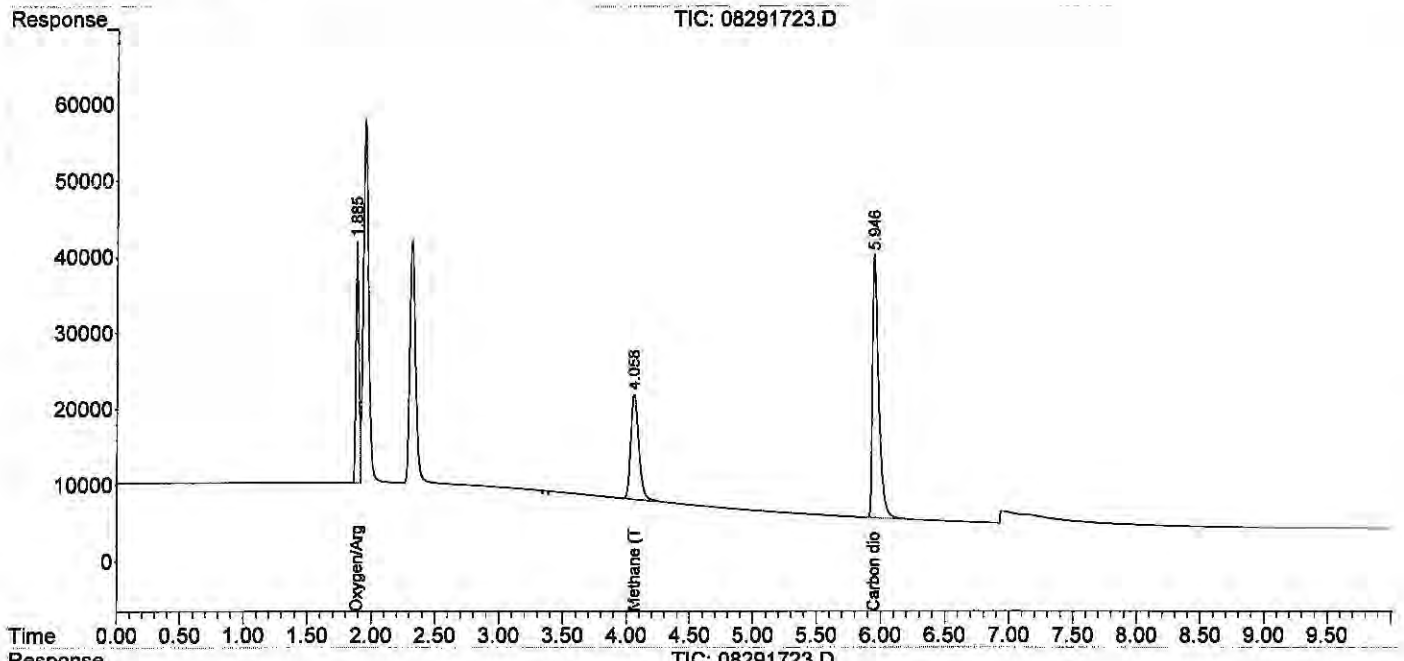
(f)=RT Delta > 1/2 Window (m)=manual int.

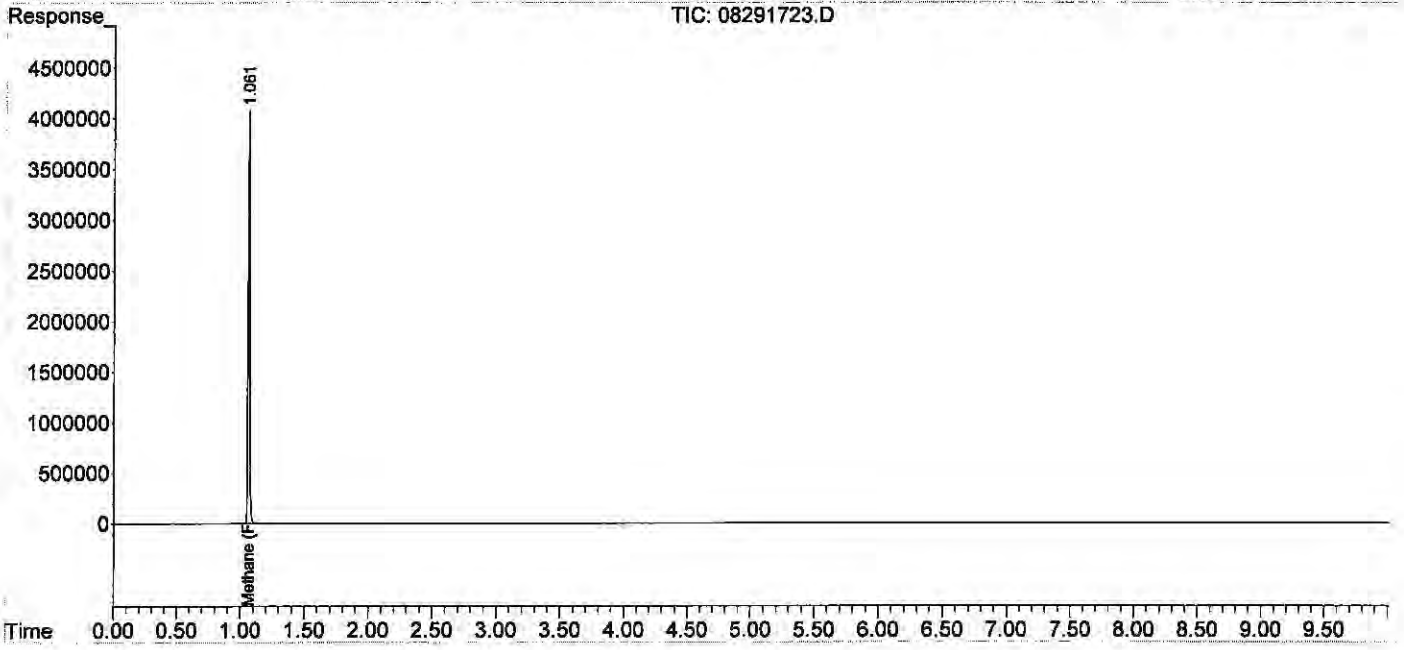
W 9/4/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group
Service Request: P1906981
Sample Vol. (ml) : 32.00 ml
Analyst : WH/LD
Date Analysis : 11/19/19
Head Space Vol.(ml) : 8.00 ml
Instrument : GC#10
Detector : FID#10, TCD#10
Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Carbon Dioxide
STD S32-10291901	0.100	5006.629
ACTUAL		5000.00
%Difference		0.1%
MCS 0.1ml	0.100	0.000
RB 0.1ml	0.100	0.000
LCS S32-08141901	0.100	968.407
LCSD S32-08141901	0.100	966.415
P1906981-001 0.1ml	0.100	3638.117
P1906981-002 0.1ml	0.100	3160.990
P1906981-003 0.1ml	0.100	5316.778
P1906981-004 0.1ml	0.100	12537.77
P1906981-005 0.1ml	0.100	11371.71
P1906981-006 0.1ml	0.100	13741.43

FINAL HEAD SPACE RESULT (ppm)

	Carbon Dioxide
WWt.	44.10
HENRY'S CONSTANT	1.42E+03
RL	100.00
MCS 0.1ml	0.000
LCS S32-08141901	9684.070
LCSD S32-08141901	9664.150
P1906981-001 0.1ml	36381.170
P1906981-002 0.1ml	31609.900
P1906981-003 0.1ml	53167.780
P1906981-004 0.1ml	125377.65
P1906981-005 0.1ml	113717.11
P1906981-006 0.1ml	137414.33

LD
11/19

STD S32-10291901	0.000	0.000	0.000	0.000	0.000	4992.314	14:55:10	0.00	0.00	0.00	0.00	0.00
ACTUAL	101.50	100.90	101.40	102.20	101.30	5000.00						
%Difference	100.0%	100.0%	100.0%	100.0%	100.0%	0.2%						

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191902.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 11:47:44
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 10:57:47 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

LD
11/19

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

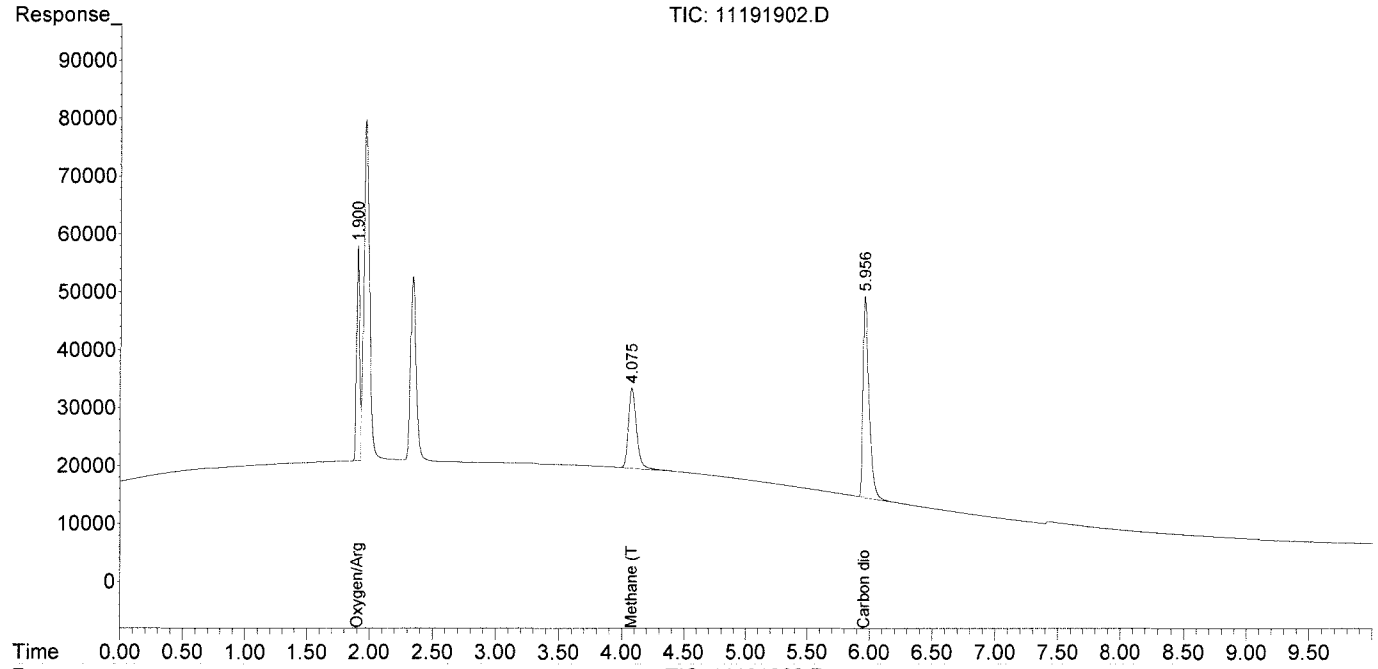
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.901	633578	0.133	ppm	
2)	Carbon monoxide	1.901	633578	N.D.	ppm	
3)	Methane (TCD)	4.076f	642456	67931.889	ppm	
4)	Carbon dioxide	5.956	1175202	5006.629	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

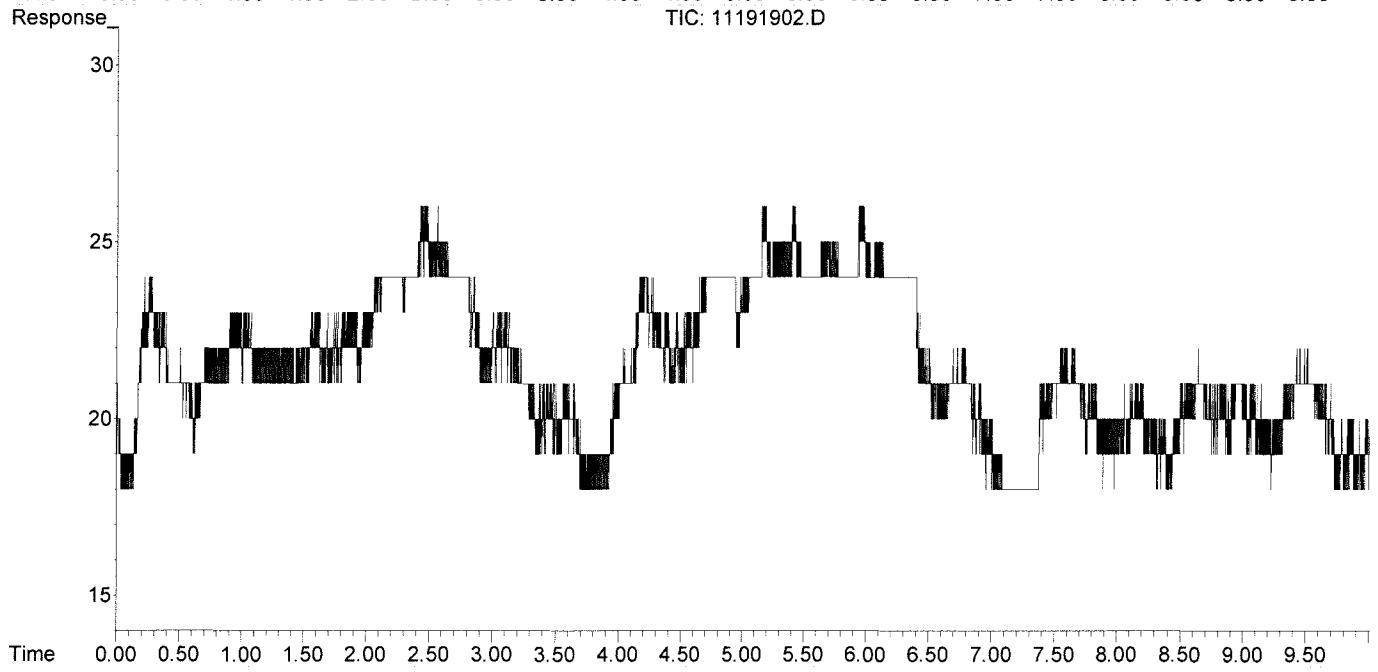
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191902.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 11:47:44
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 10:57:47 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

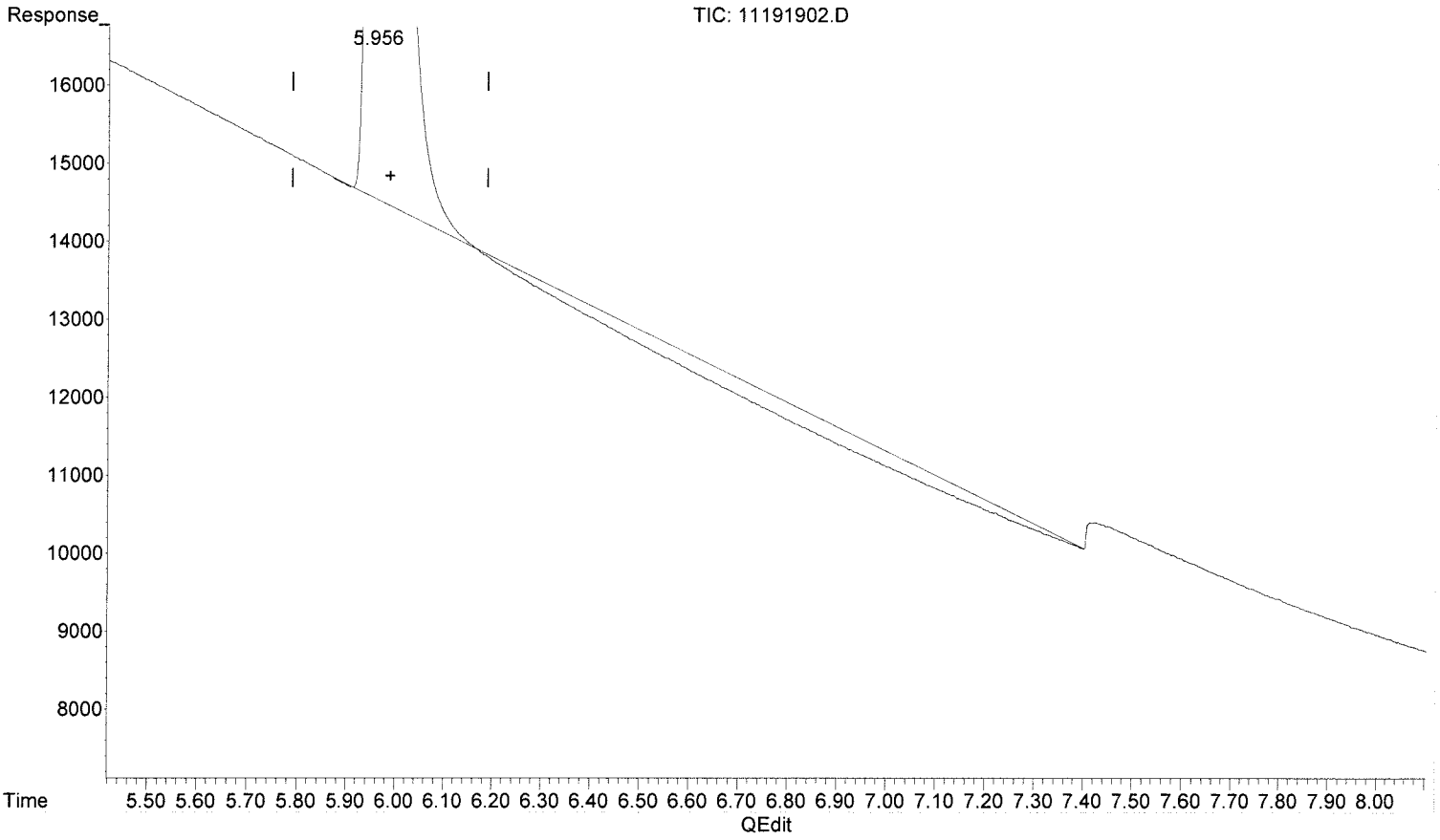




Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191902.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 11:47:44
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 10:57:47 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.957min 4519.618 ppm

response 1060886

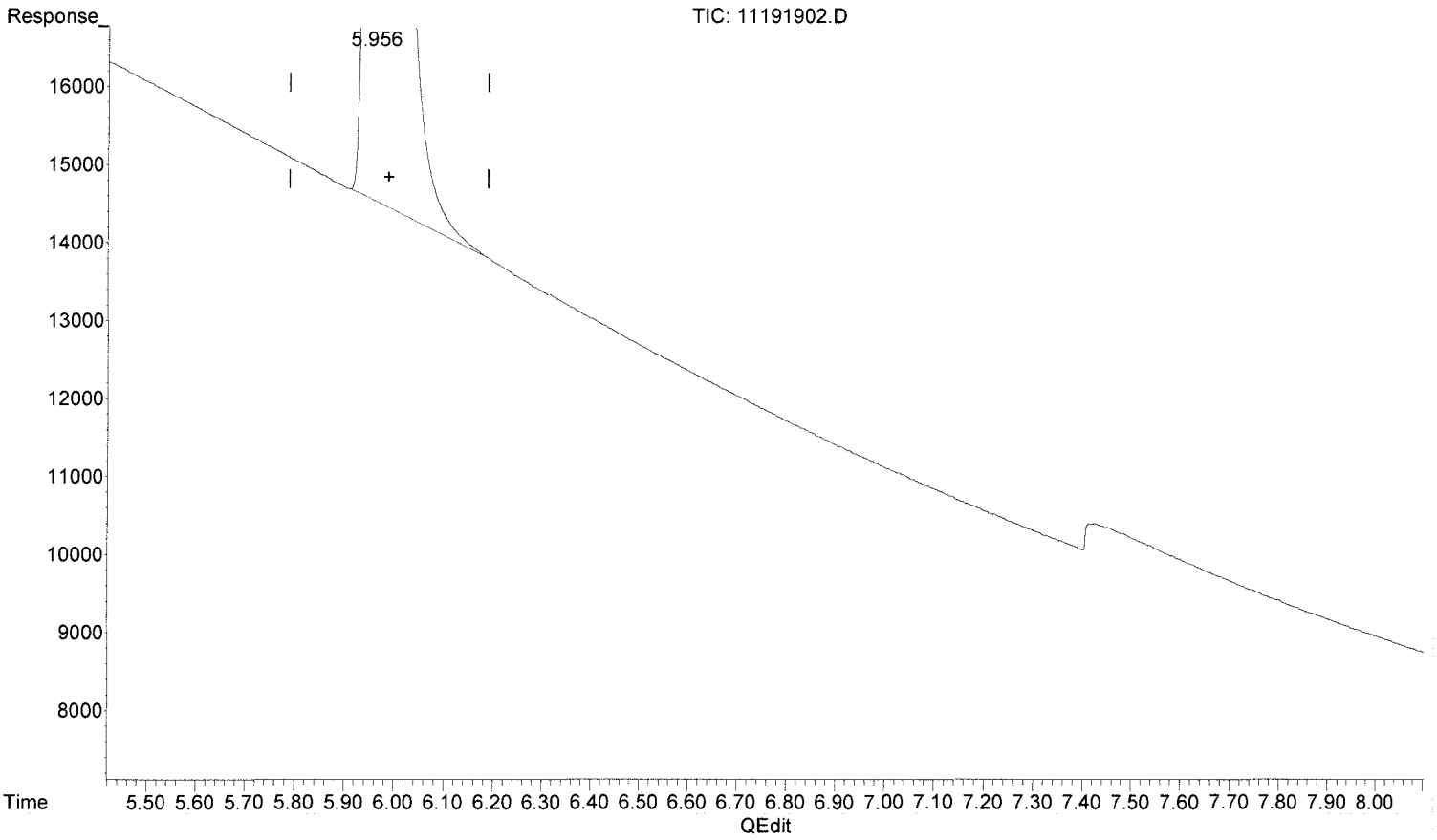
(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191902.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 11:47:44
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 10:57:47 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

LD
BLC
11/19

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.956min 5006.629 ppm m

response 1175202

11/20/19

(+) = Expected Retention Time
RS082817_CO2.M Tue Nov 19 10:58:24 2019

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191916.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:56:00
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 15:04:00 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

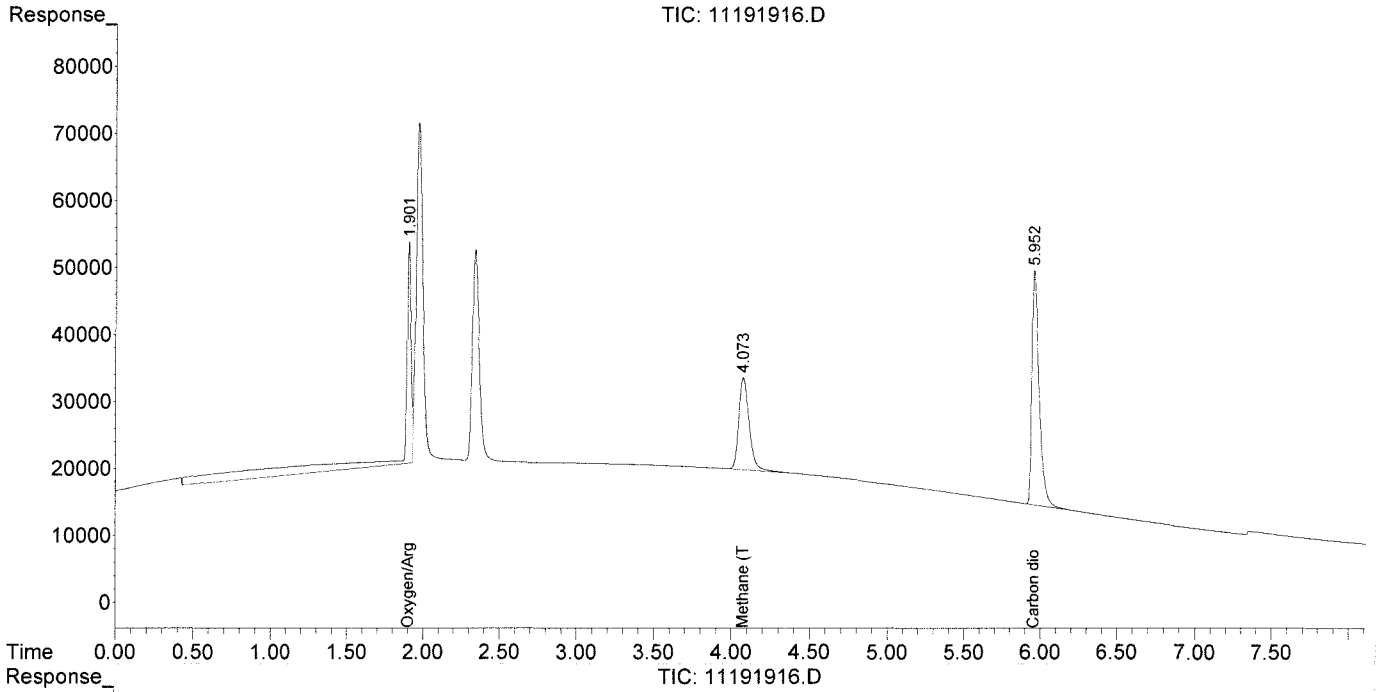
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.902	1497758	0.315	ppm	
2)	Carbon monoxide	1.902	1497758	N.D.	ppm	
3)	Methane (TCD)	4.073f	632021	66828.577	ppm	
4)	Carbon dioxide	5.952	1171842	4992.314	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

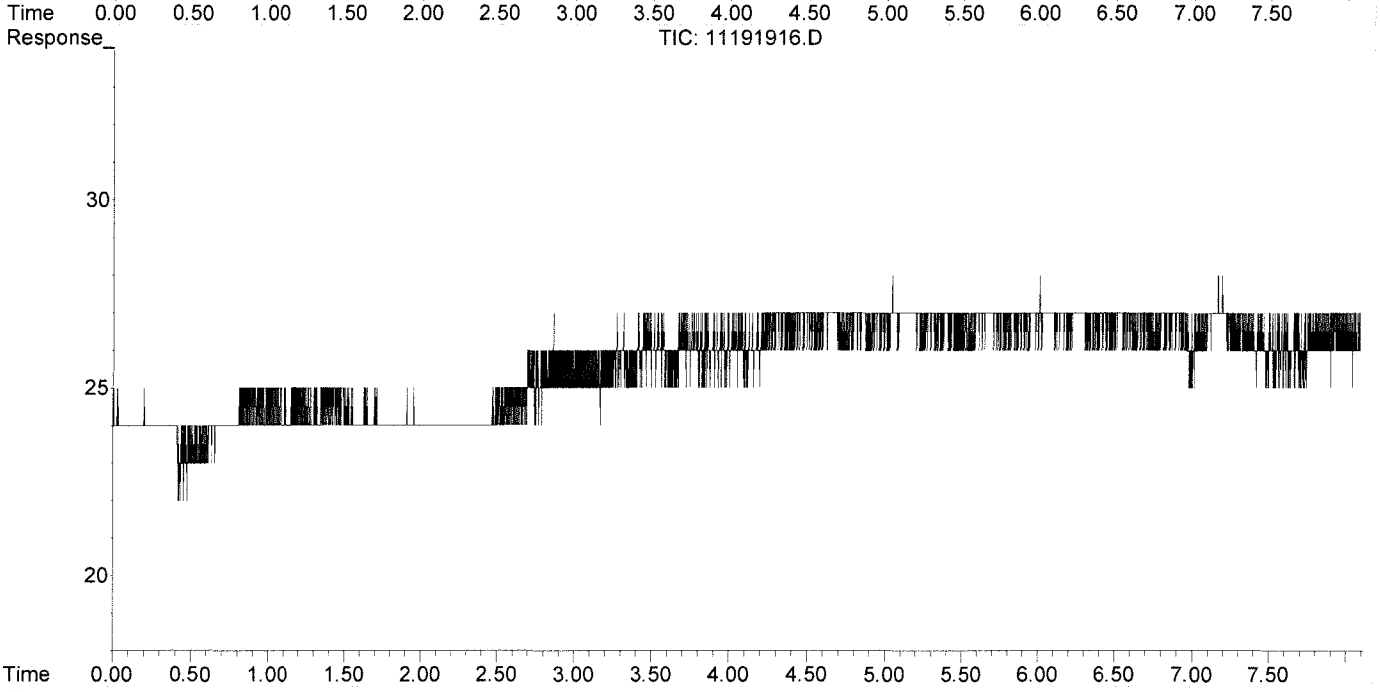
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191916.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:56:00
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 15:04:00 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

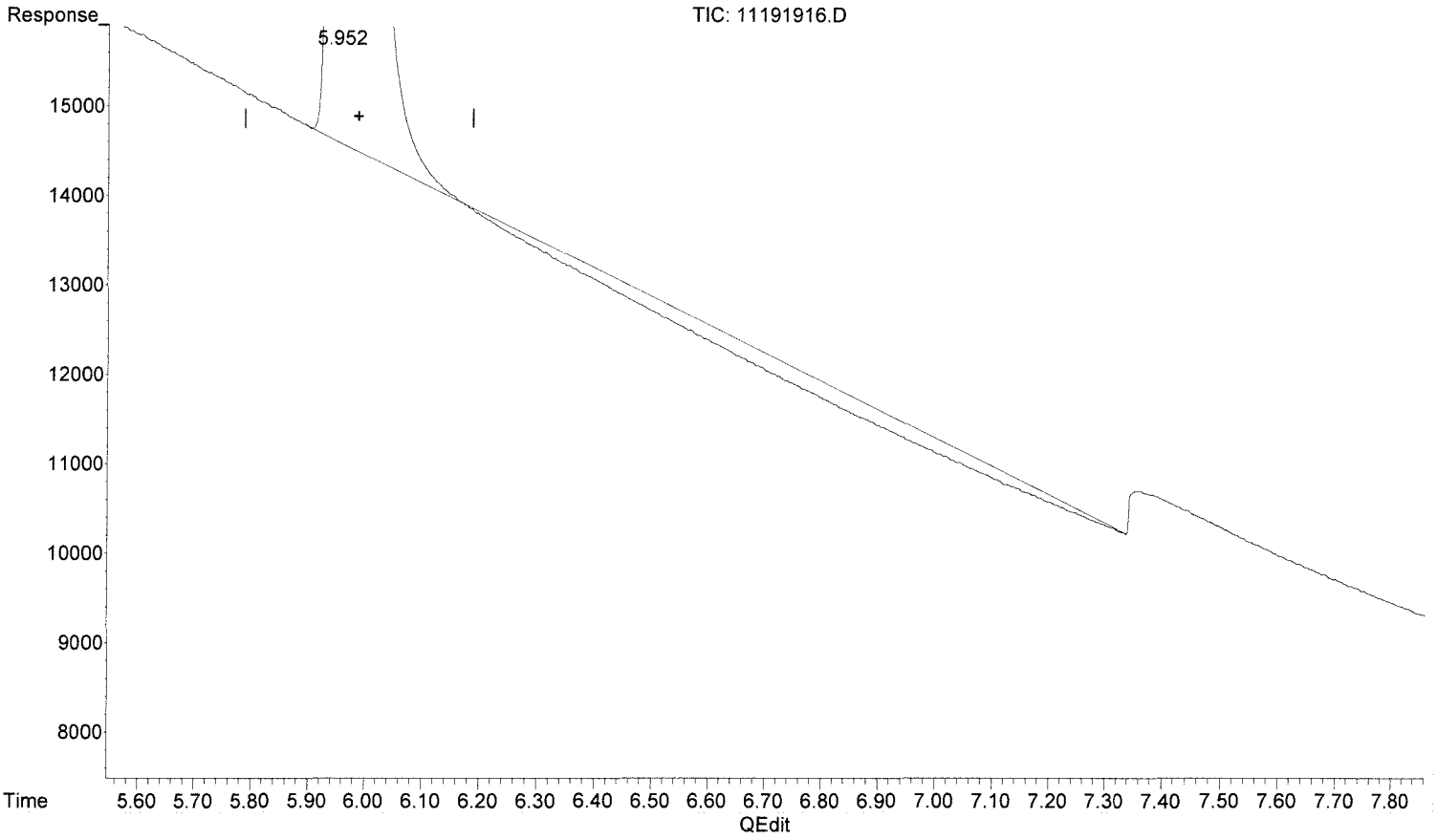




Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191916.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:56:00
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 15:04:00 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.953min 4592.713 ppm

response 1078044

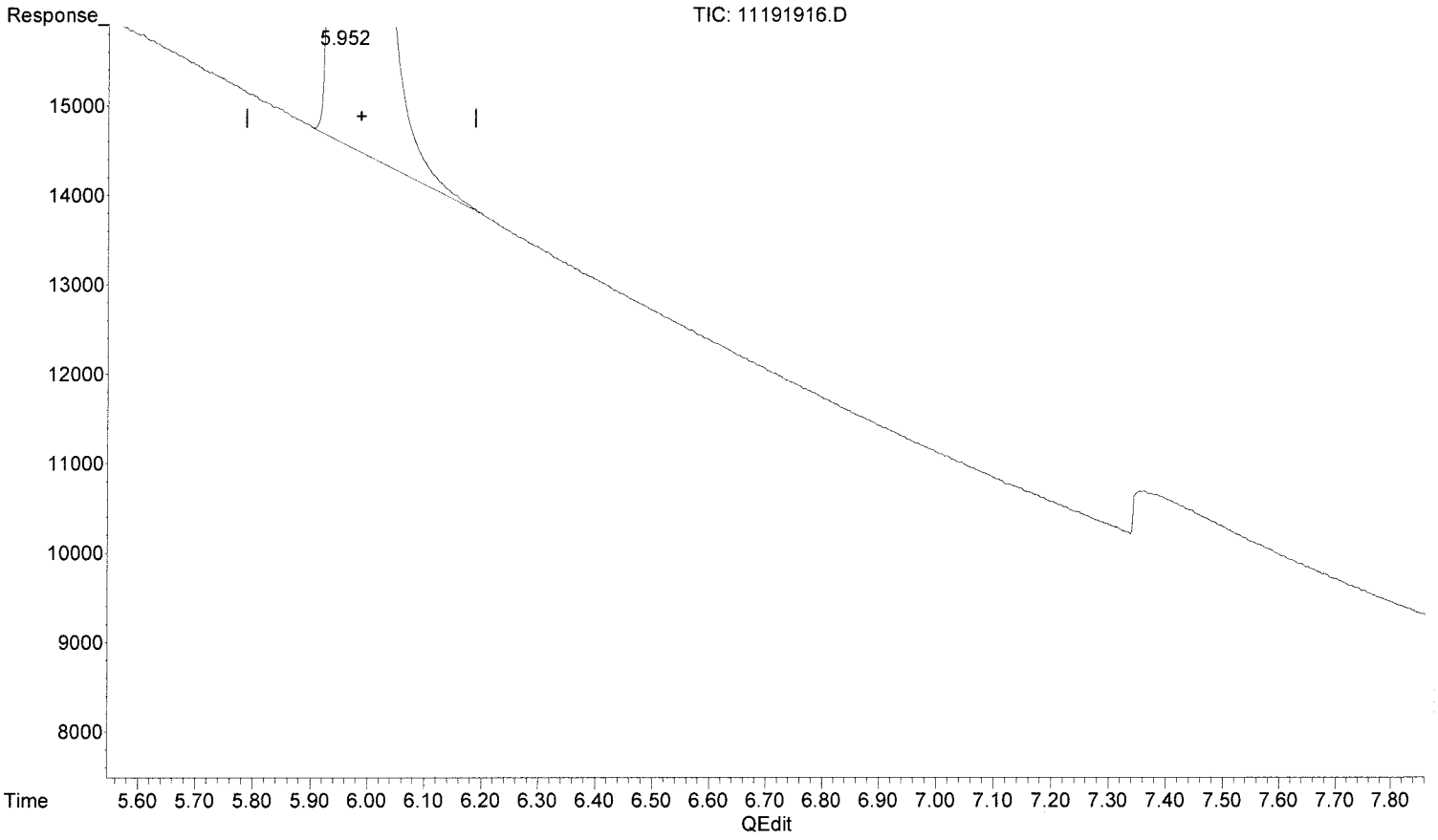
(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\19\
Data File : 11191916.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 19-Nov-2019, 15:56:00
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 19 15:04:00 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

CD
BLC
11/19

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :



(4) Carbon dioxide

5.952min 4992.314 ppm m

response 1171842

11/20/19

(+) = Expected Retention Time

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_08\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	29-Aug-17, 07:58:00	08291701.D	std s30-06161601		MC	RSKBOTH.M	Pass
2	29-Aug-17, 08:11:02	08291702.D	mb 0.5ml		MC	RSKBOTH.M	Pass
3	29-Aug-17, 08:24:13	08291703.D	4089-001 0.5ml		MC	RSKBOTH.M	
4	29-Aug-17, 08:39:29	08291704.D	4089-002 0.5ml		MC	RSKBOTH.M	
5	29-Aug-17, 08:53:38	08291705.D	4089-003 0.5ml		MC	RSKBOTH.M	
6	29-Aug-17, 09:33:52	08291706.D	4089-004 0.5ml		MC	RSKBOTH.M	
7	29-Aug-17, 09:50:51	08291707.D	4089-005 0.5ml		MC	RSKBOTH.M	
8	29-Aug-17, 10:07:54	08291708.D	4089-006 0.5ml		MC	RSKBOTH.M	
9	29-Aug-17, 10:42:34	08291709.D	4089-007 0.5ml		MC	RSKBOTH.M	
10	29-Aug-17, 11:06:01	08291710.D	4089-008 0.5ml		MC	RSKBOTH.M	
11	29-Aug-17, 11:23:53	08291711.D	4089-009 0.5ml		MC	RSKBOTH.M	
12	29-Aug-17, 11:37:17	08291712.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
13	29-Aug-17, 11:50:31	08291713.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
14	29-Aug-17, 12:29:45	08291714.D	std s30-06161601		MC	RSKBOTH.M	Pass
15	29-Aug-17, 14:07:01	08291715.D	25ppm s32-08291701 0.25ml		MC	RSKBOTH.M	Curve
16	29-Aug-17, 14:22:12	08291716.D	100ppm s32-08291702 0.2ml		MC	RSKBOTH.M	Curve
17	29-Aug-17, 14:53:00	08291717.D	250ppm s32-08291702 0.5ml		MC	RSKBOTH.M	Curve
18	29-Aug-17, 15:07:43	08291718.D	mls inject		MC	RSKBOTH.M	
19	29-Aug-17, 15:23:21	08291719.D	2500ppm s32-08231701 50ul		MC	RSKBOTH.M	Curve
20	29-Aug-17, 15:44:54	08291720.D	5000ppm s32-08231701 0.1ml		MC	RSKBOTH.M	Curve
21	29-Aug-17, 16:00:09	08291721.D	25000ppm s32-08231701 0.5ml		MC	RSKBOTH.M	Curve
22	29-Aug-17, 16:15:43	08291722.D	mb 0.1ml		MC	RSKBOTH.M	Pass
23	29-Aug-17, 16:35:37	08291723.D	lcv s30-07071701		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_TCD\2019_11\19\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	19-Nov-19, 11:34:26	11191901.D	prime		WH/LD	RSKBOTH.M	
2	19-Nov-19, 11:47:44	11191902.D	STD S32-10291901		WH/LD	RSKBOTH.M	PASS
3	19-Nov-19, 12:00:53	11191903.D	RB 0.1ml		WH/LD	RSKBOTH.M	PASS
4	19-Nov-19, 12:14:52	11191904.D	MCS 0.1ml		WH/LD	RSKBOTH.M	PASS
5	19-Nov-19, 12:28:01	11191905.D	xxxxxLCS S32-08141901		WH/LD	RSKBOTH.M	FAIL
6	19-Nov-19, 12:41:11	11191906.D	xxxxxLCS S32-08141901		WH/LD	RSKBOTH.M	FAIL
7	19-Nov-19, 12:54:42	11191907.D	P1906981-001 0.1ml		WH/LD	RSKBOTH.M	
8	19-Nov-19, 13:43:34	11191908.D	P1906981-002 0.1ml		WH/LD	RSKBOTH.M	
9	19-Nov-19, 14:15:19	11191909.D	P1906981-003 0.1ml		WH/LD	RSKBOTH.M	
10	19-Nov-19, 14:29:15	11191910.D	P1906981-004 0.1ml		WH/LD	RSKBOTH.M	
11	19-Nov-19, 14:42:11	11191911.D	P1906981-005 0.1ml		WH/LD	RSKBOTH.M	
12	19-Nov-19, 14:55:10	11191912.D	P1906981-006 0.1ml		WH/LD	RSKBOTH.M	
13	19-Nov-19, 15:15:48	11191913.D	XXXLCS S32-08141901		WH/LD	RSKBOTH.M	FAIL
14	19-Nov-19, 15:30:06	11191914.D	LCS S32-08141901		WH/LD	RSKBOTH.M	PASS
15	19-Nov-19, 15:43:01	11191915.D	LCSD S32-08141901		WH/LD	RSKBOTH.M	PASS
16	19-Nov-19, 15:56:00	11191916.D	STD S32-10291901		WH/LD	RSKBOTH.M	PASS

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 14:48:34
Operator : WH/LD
Sample : p1906981-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:04:28 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

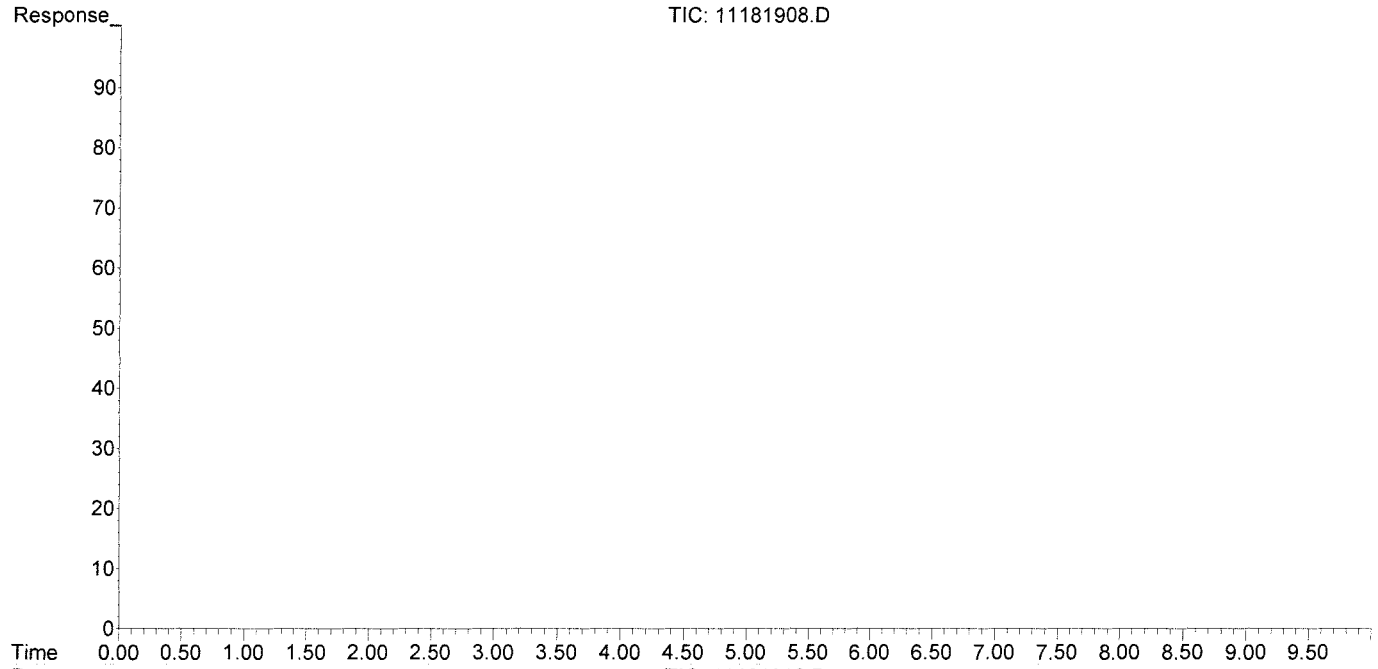
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.144	2609	0.288	ppm	m
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

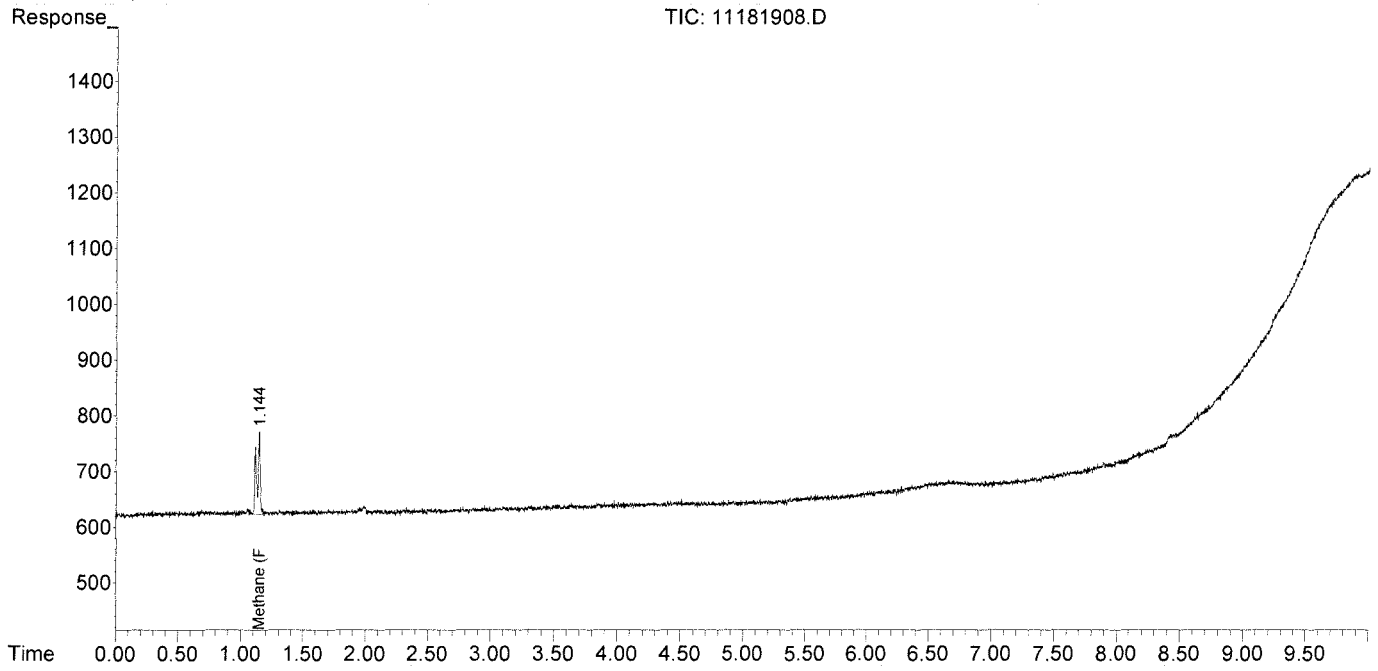
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 14:48:34
Operator : WH/LD
Sample : p1906981-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:04:28 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

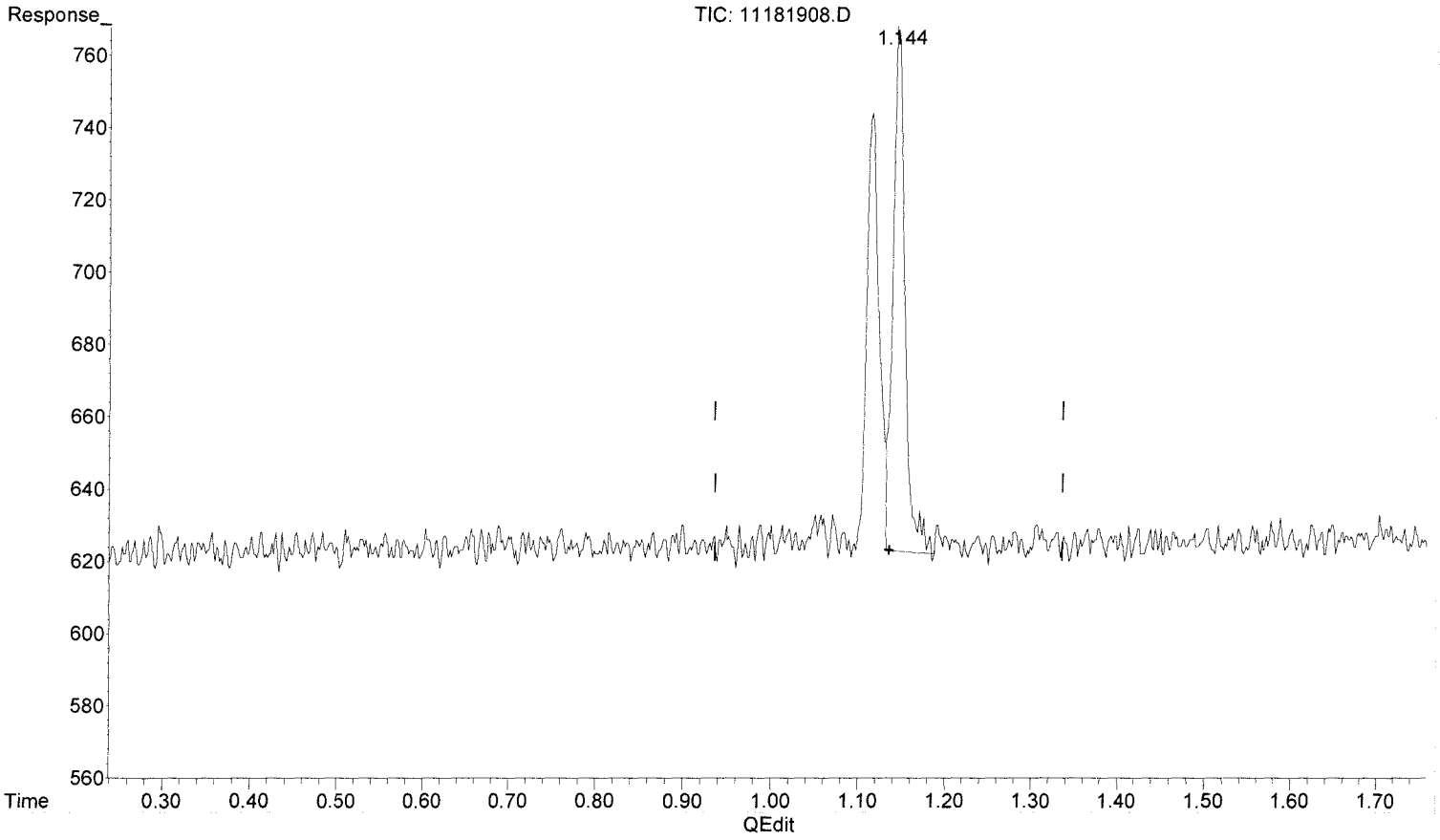




Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 14:48:34
Operator : WH/LD
Sample : p1906981-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:04:28 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.145min 0.157 ppm

response 1420

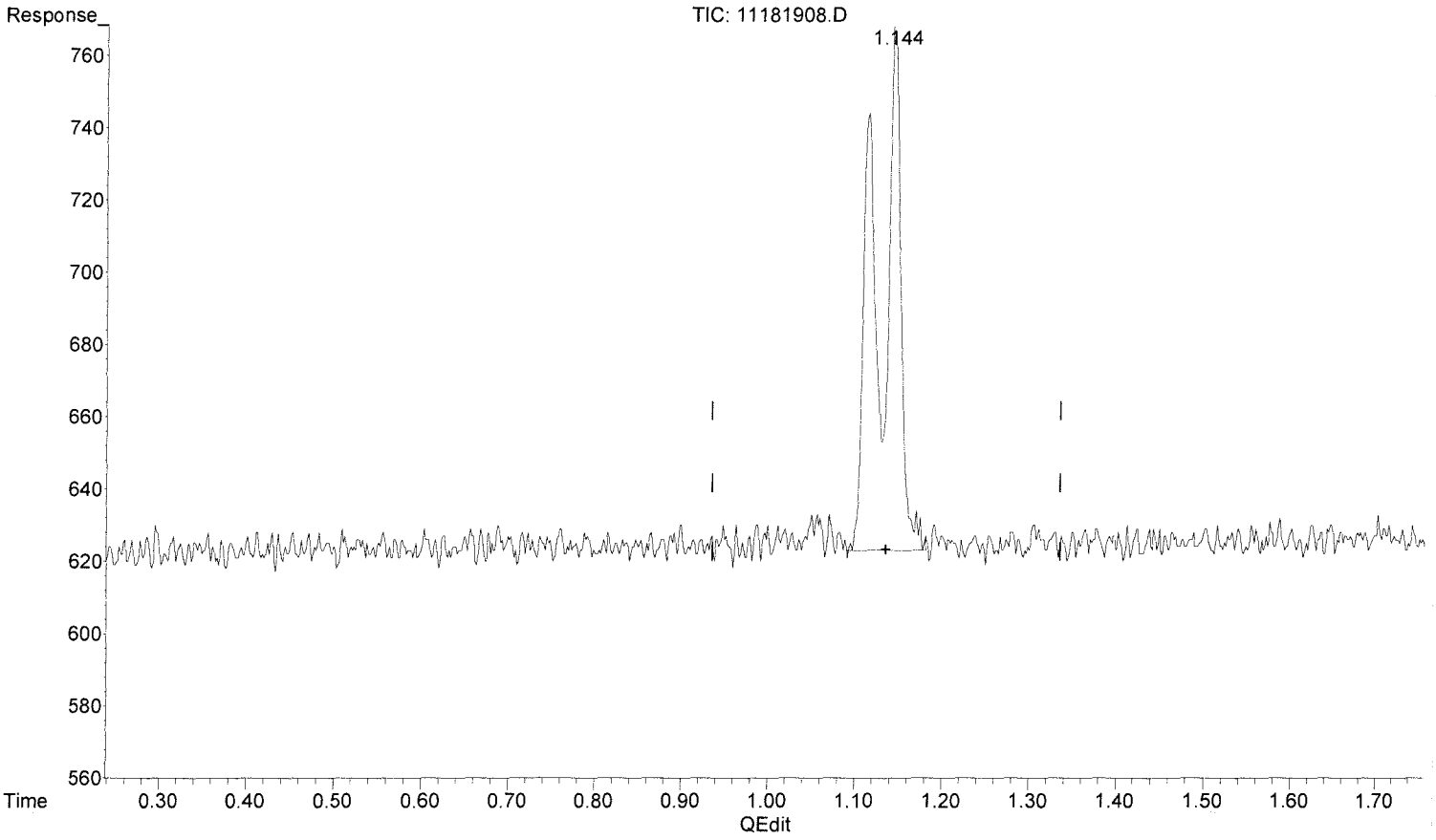
(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 14:48:34
Operator : WH/LD
Sample : p1906981-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

LD
SP
11/18

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:04:28 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.144min 0.288 ppm m

response 2609

11/19/19

(+) = Expected Retention Time

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:01:59
Operator : WH/LD
Sample : p1906981-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:43:21 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

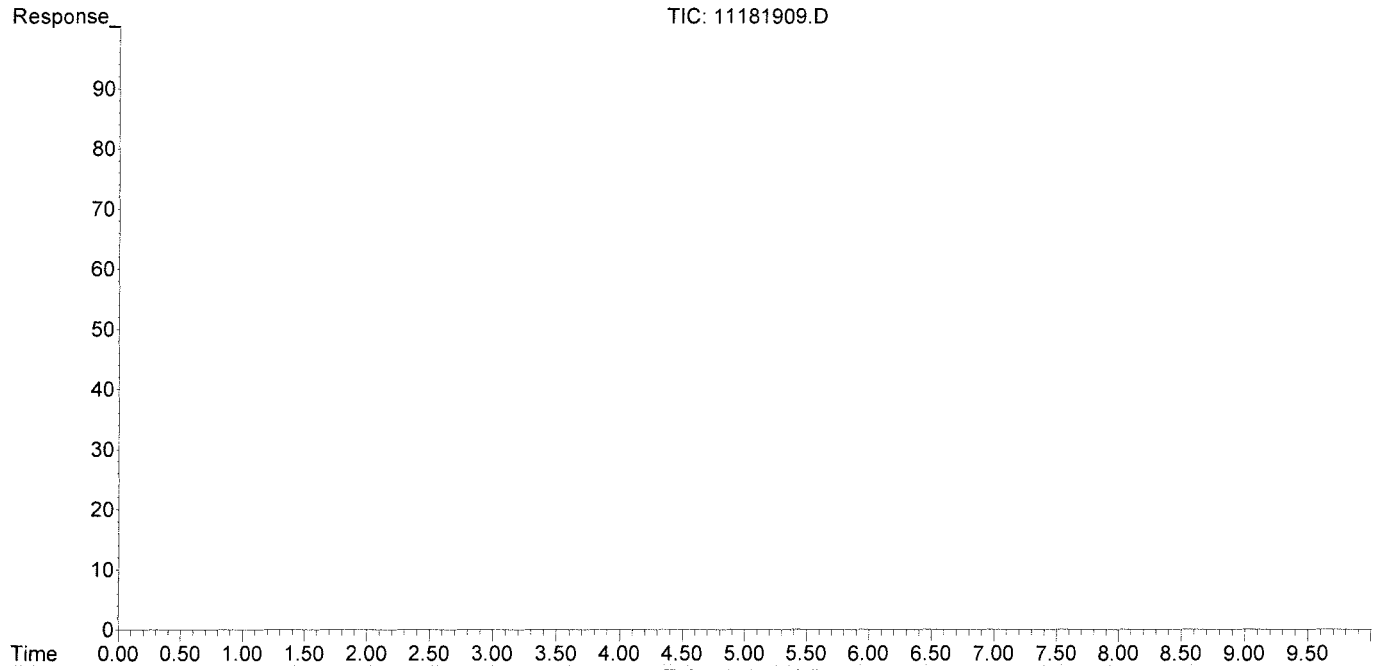
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.116	14418	1.590	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

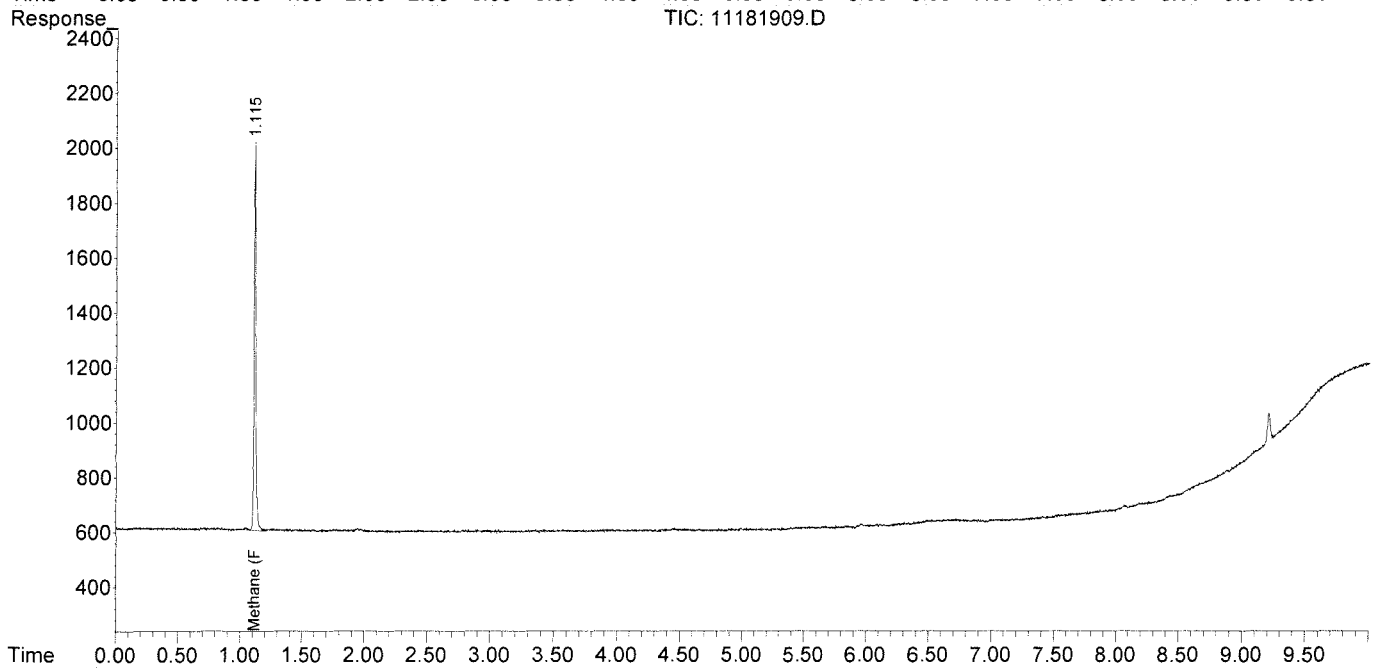
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:01:59
Operator : WH/LD
Sample : p1906981-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:43:21 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:15:50
Operator : WH/LD
Sample : p1906981-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:43:41 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

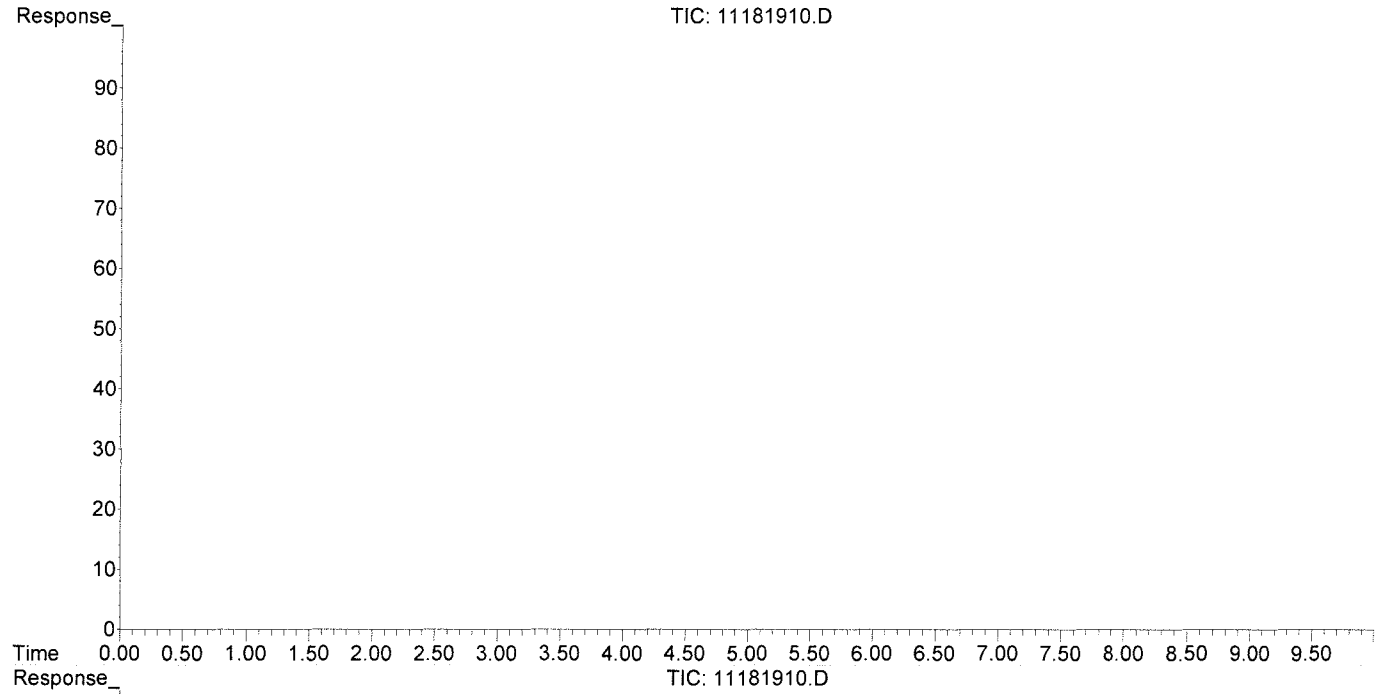
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.119	5075	0.560	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

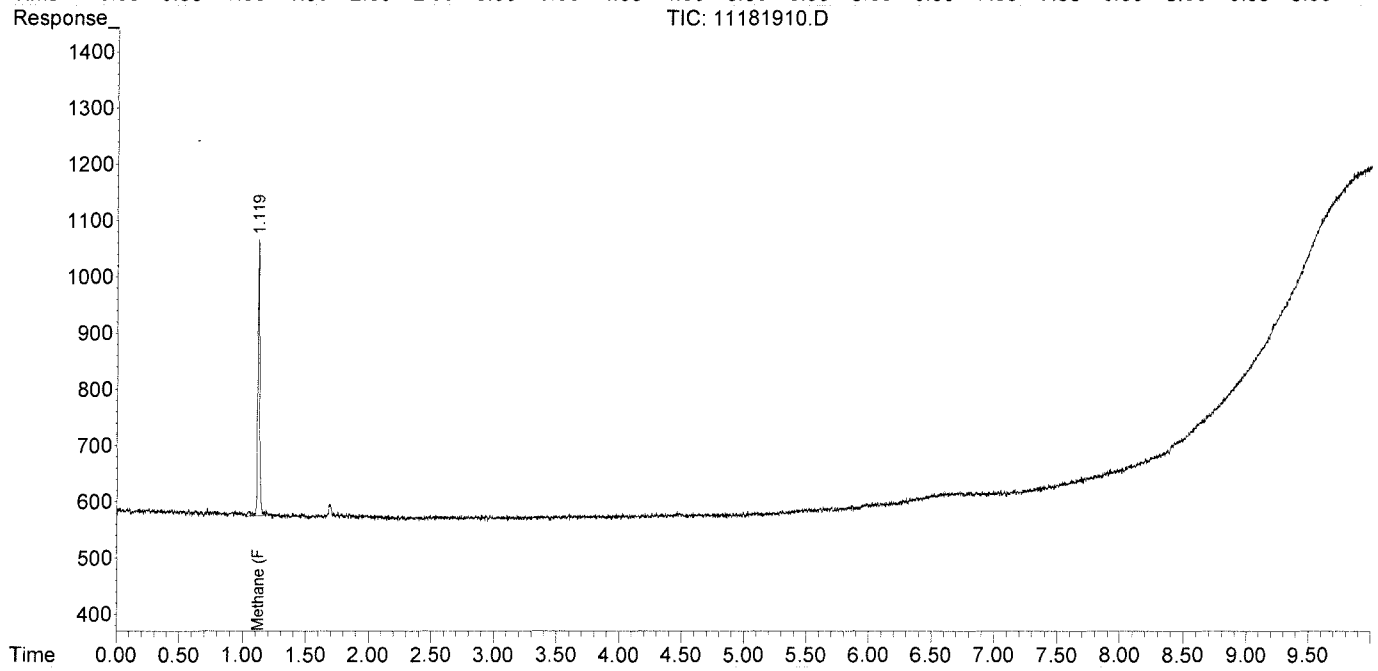
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:15:50
Operator : WH/LD
Sample : p1906981-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:43:41 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:28:41
Operator : WH/LD
Sample : p1906981-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:44:11 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

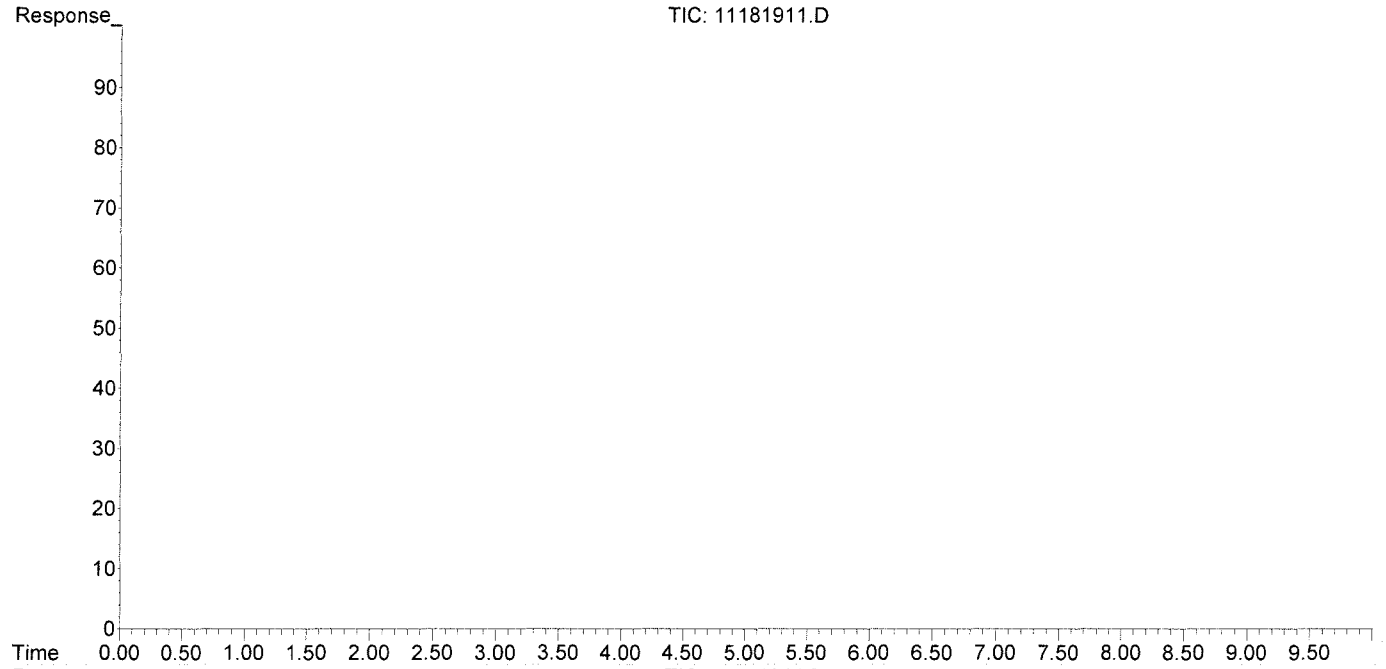
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.111	32616	3.596	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

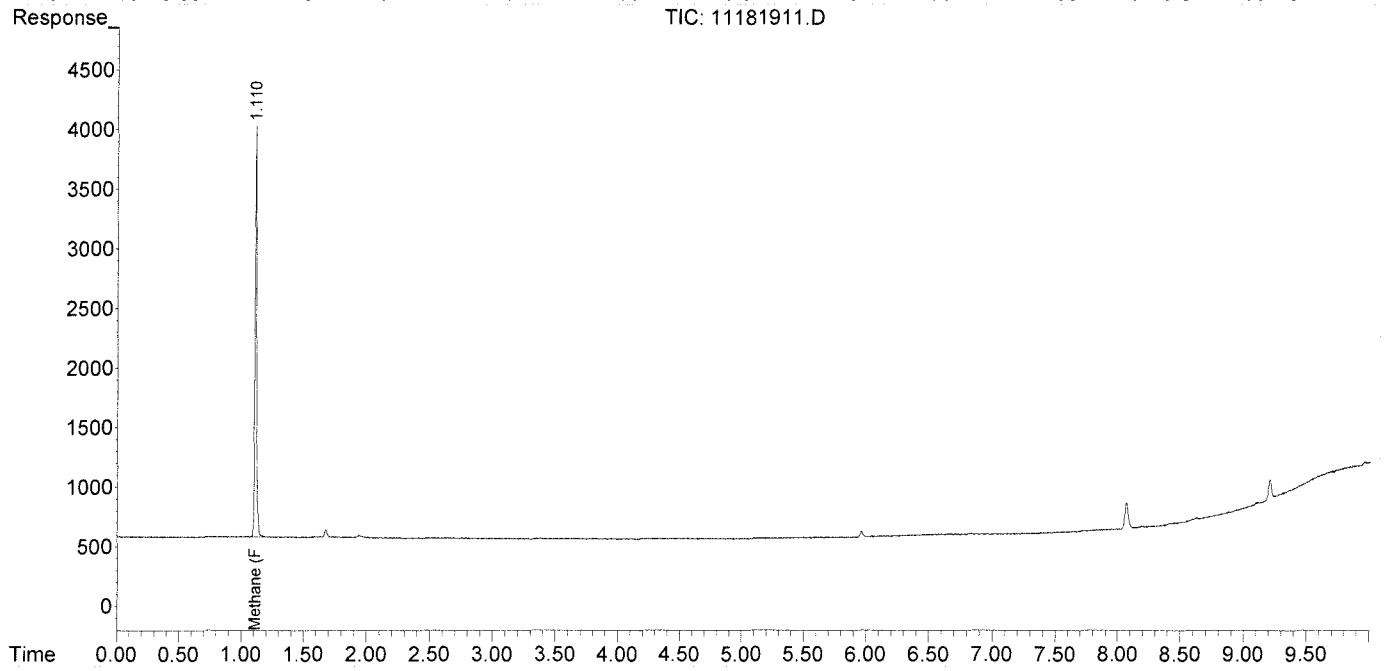
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:28:41
Operator : WH/LD
Sample : p1906981-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:44:11 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:42:36
Operator : WH/LD
Sample : p1906981-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:57:02 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

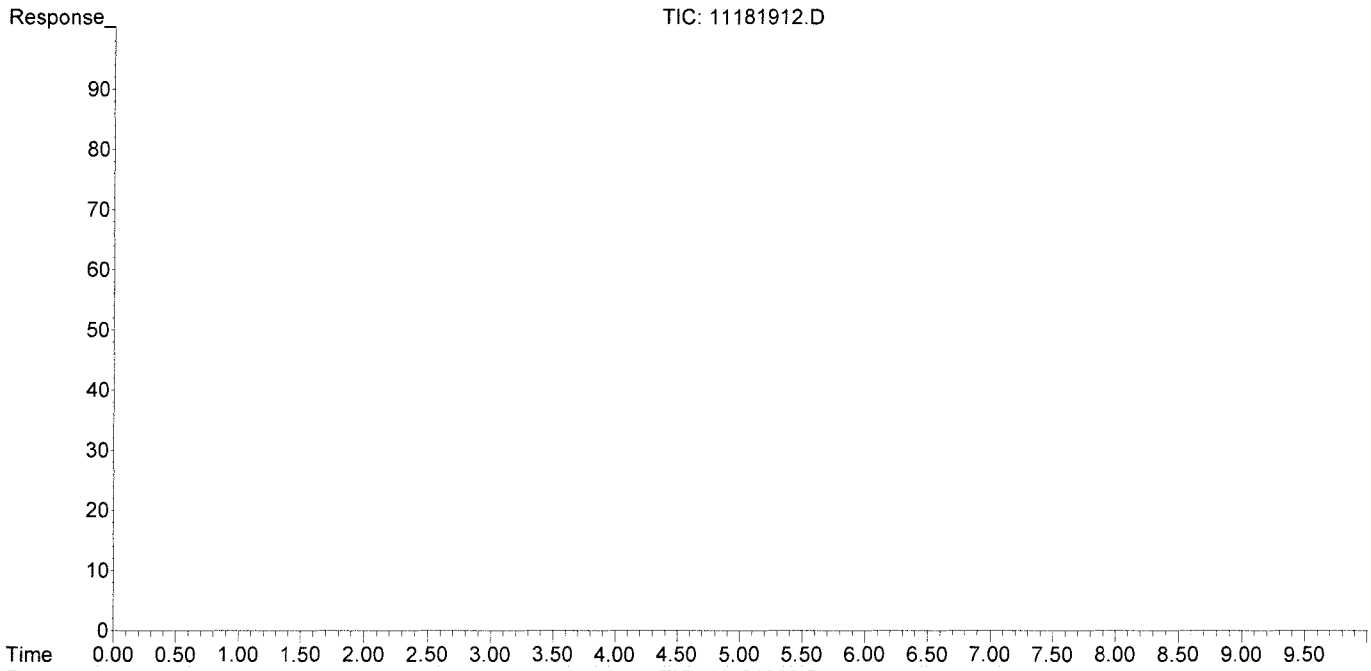
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.121	7128	0.786	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

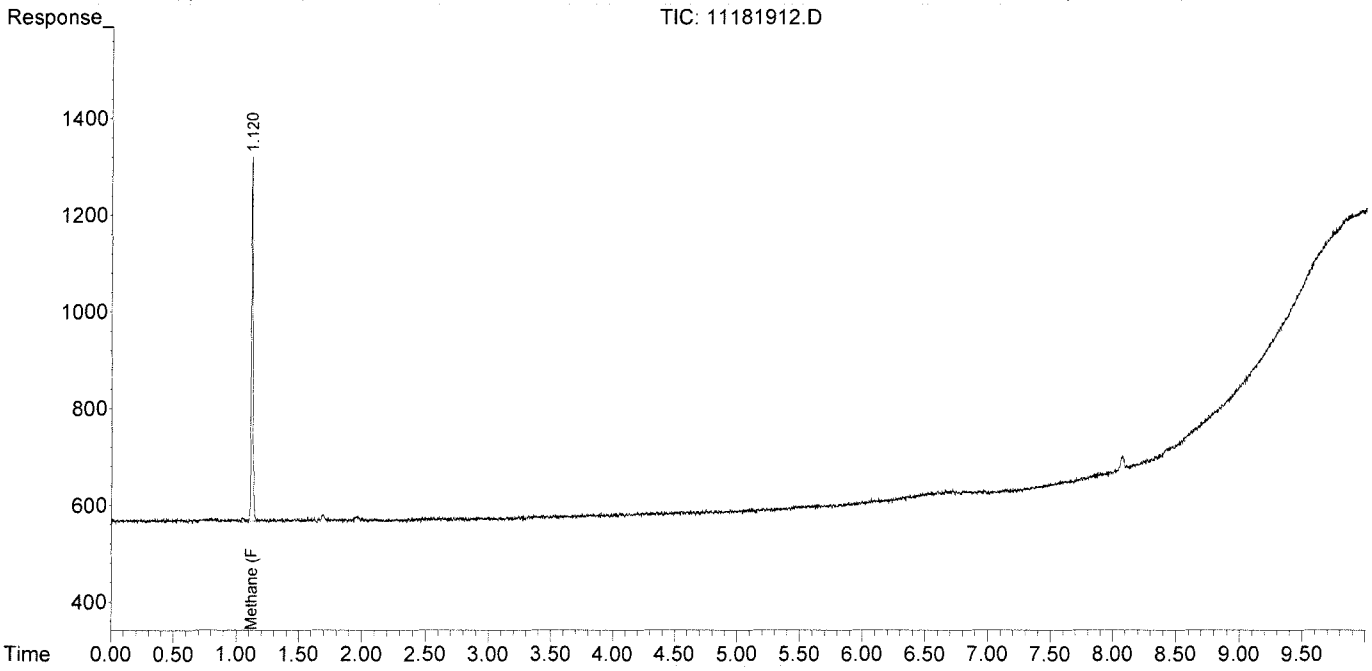
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:42:36
Operator : WH/LD
Sample : p1906981-005 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 14:57:02 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181913.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:55:33
Operator : WH/LD
Sample : p1906981-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 15:05:44 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

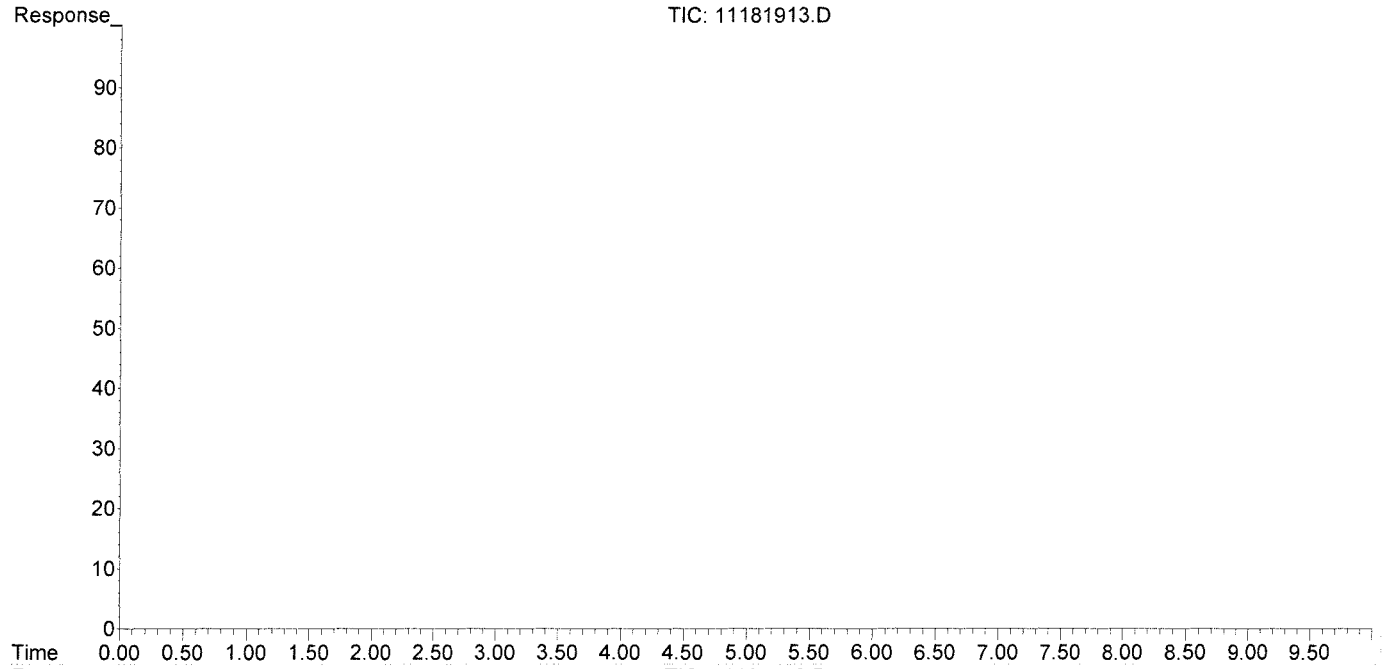
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	7753	0.855	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

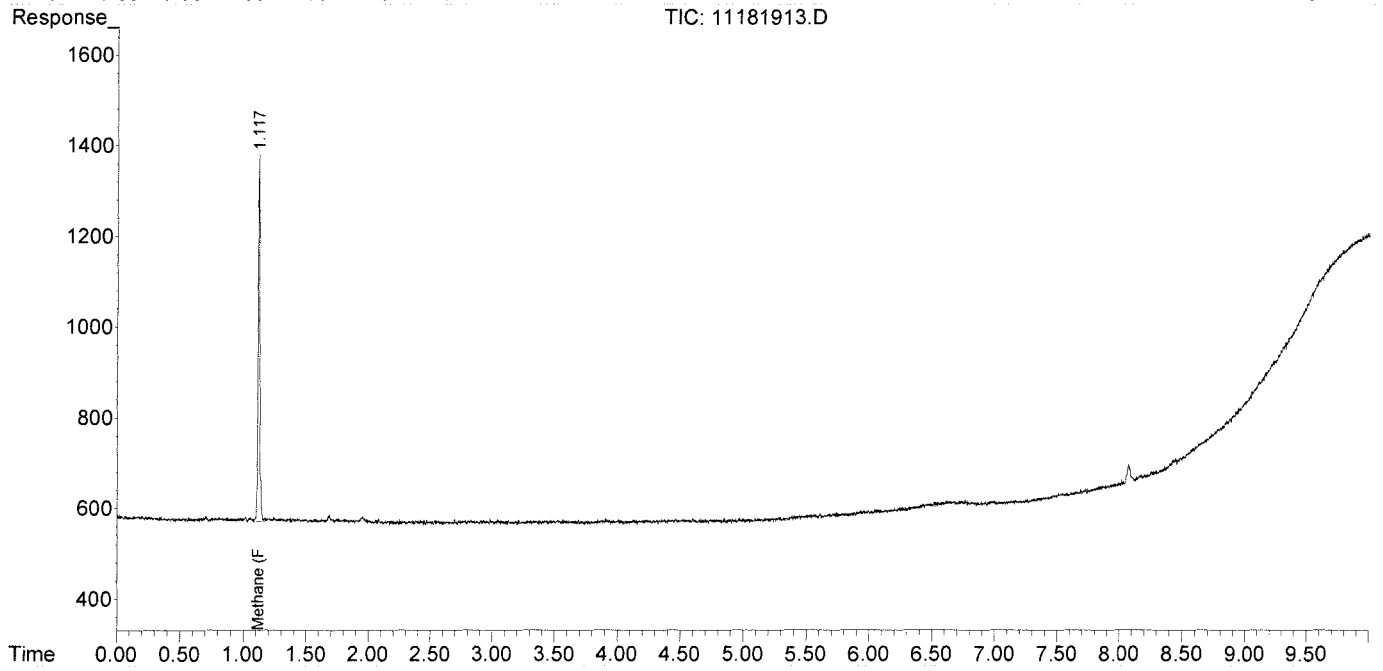
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181913.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 15:55:33
Operator : WH/LD
Sample : p1906981-006 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 15:05:44 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 13:36:03
Operator : WH/LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 12:50:33 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

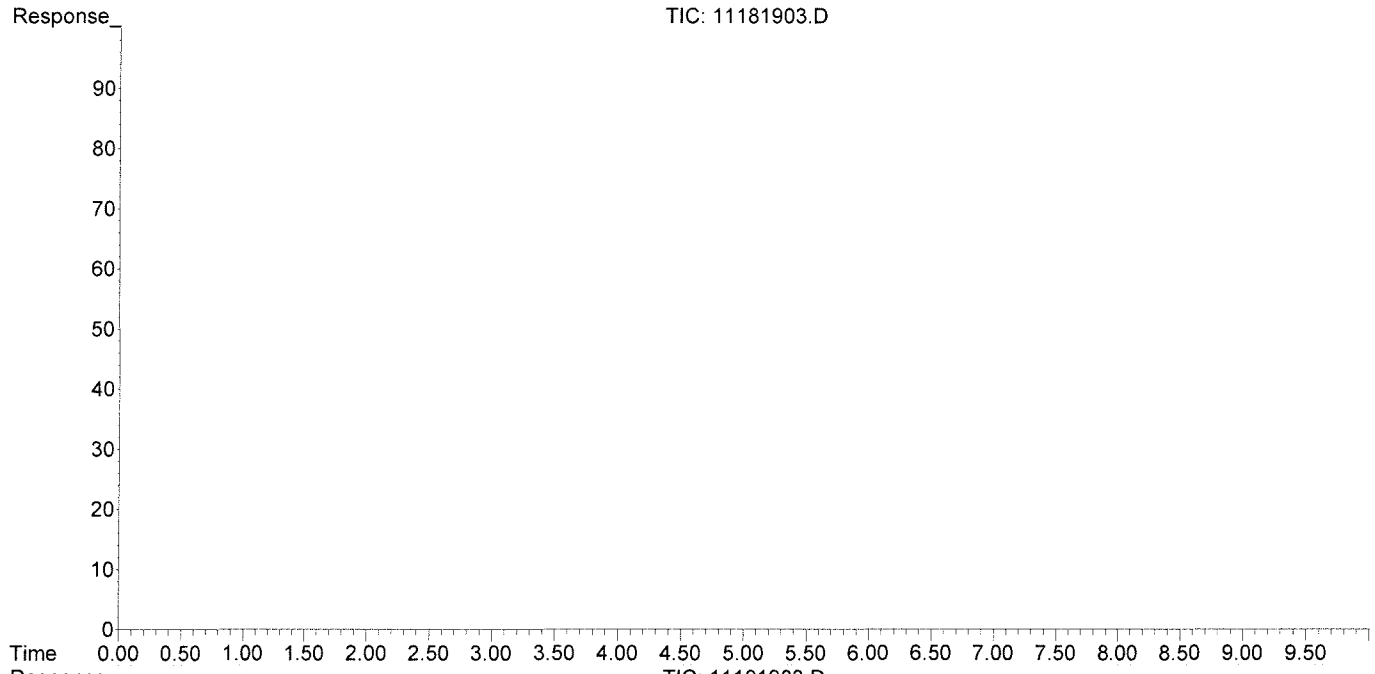
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.117	1685	0.186	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

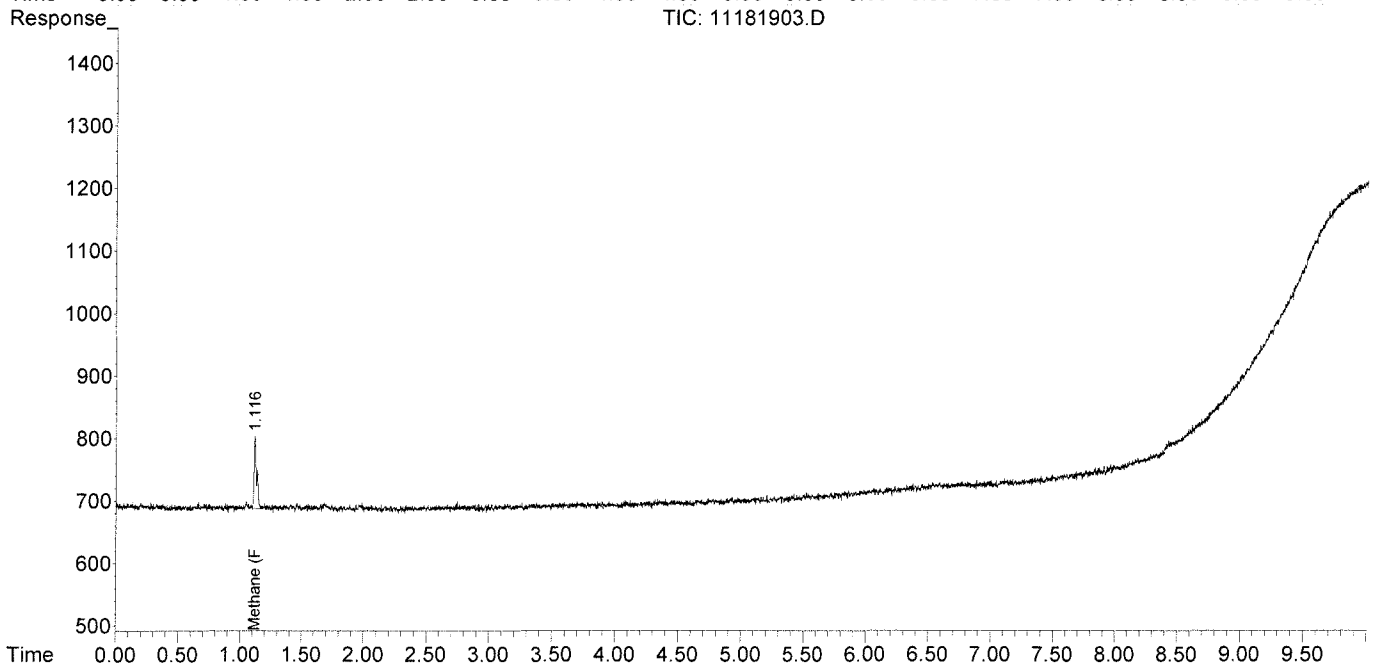
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 13:36:03
Operator : WH/LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 12:50:33 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181904.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 13:52:11
Operator : WH/LD
Sample : LCS FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 13:05:19 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

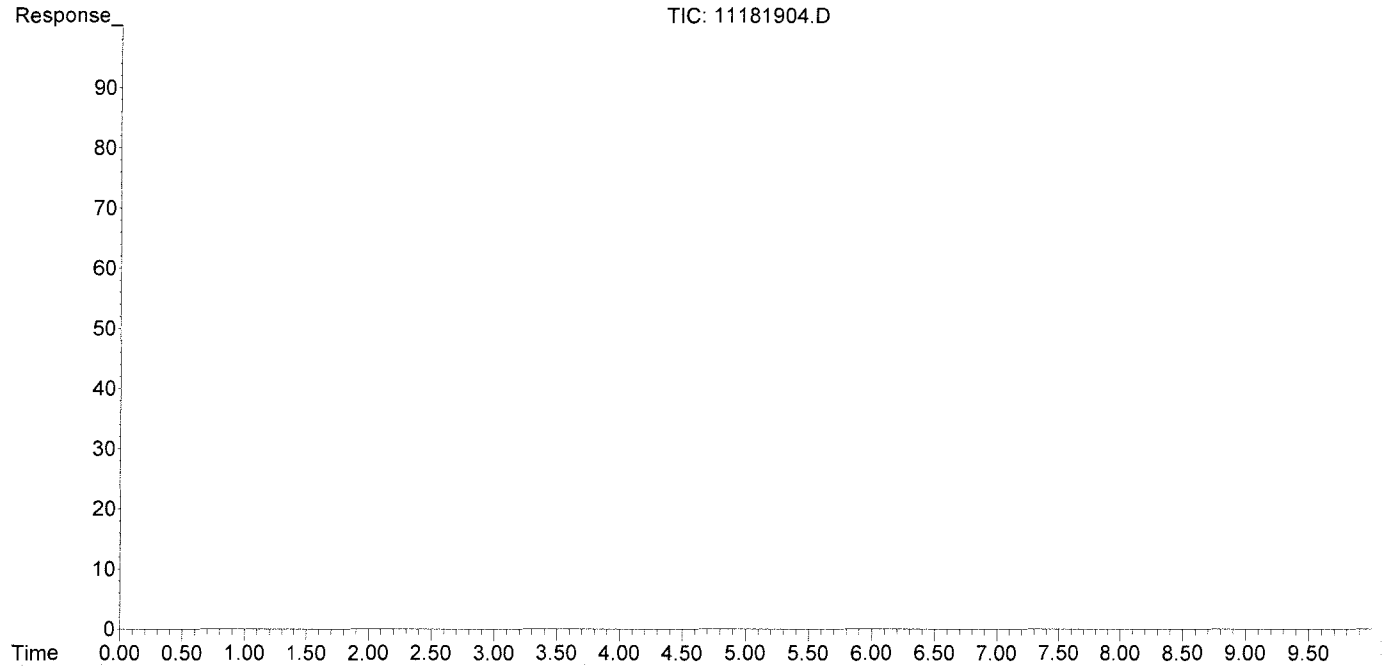
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.104	12525	1.381	ppm
7)	Ethylene	1.678	16145	0.965	ppm
8)	Ethane	1.945	19741	1.165	ppm
9)	Propylene	4.330	21516	0.918	ppm
10)	Propane	4.453	29676	1.193	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.656	38343	1.441	ppm
13)	n-Butane	6.656	38343	1.441	ppm

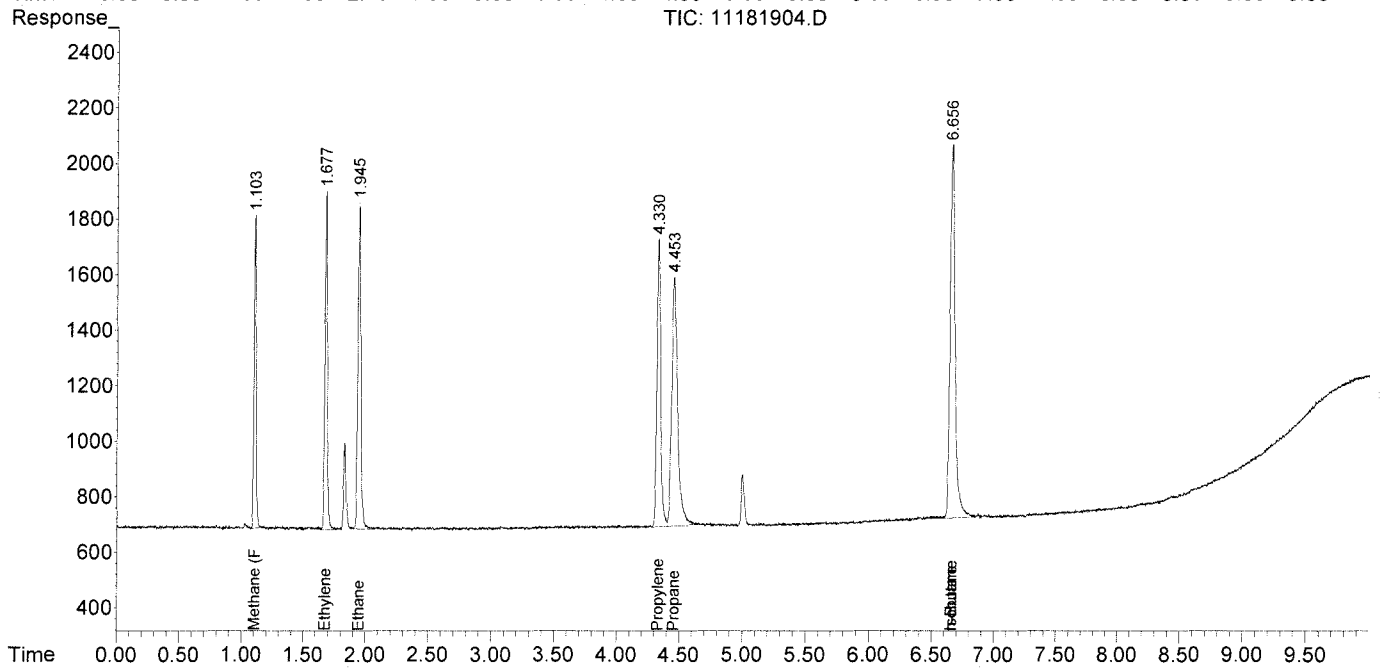
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181904.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 13:52:11
Operator : WH/LD
Sample : LCS FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 13:05:19 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 14:05:22
Operator : WH/LD
Sample : LCSD FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 13:15:54 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

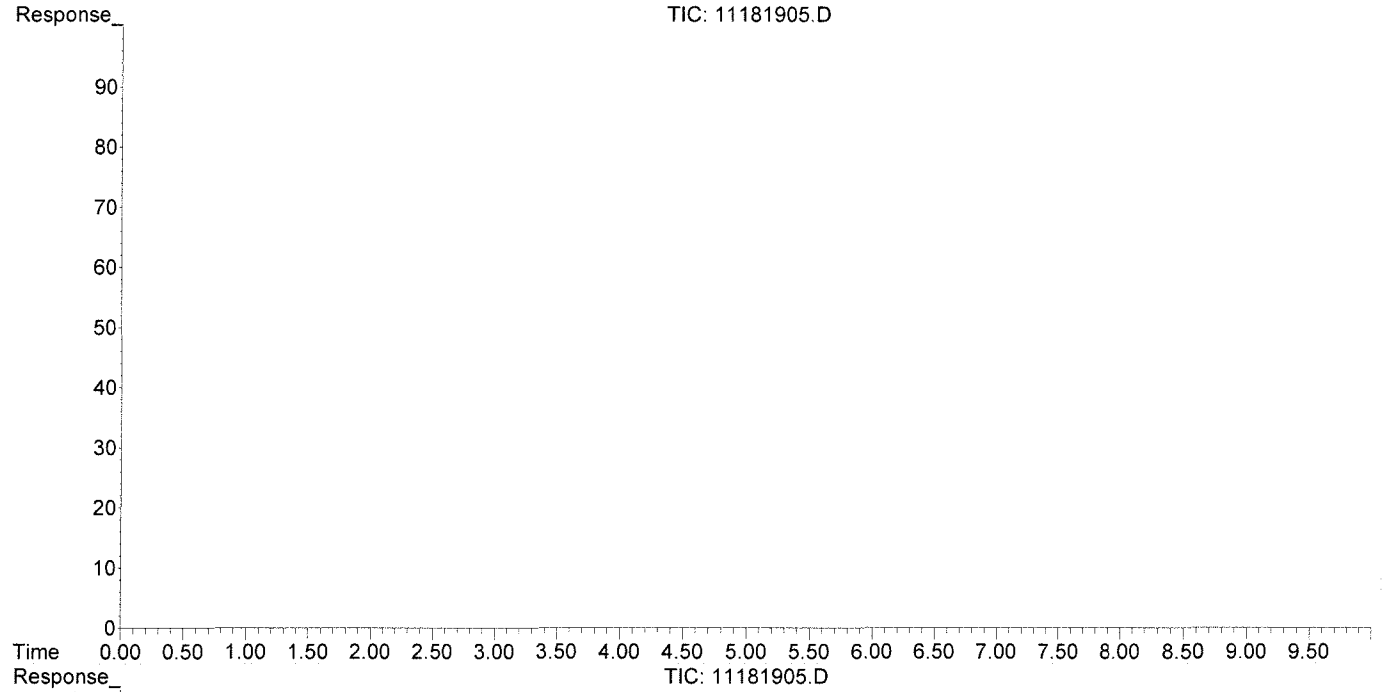
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.120	12378	1.365	ppm
7)	Ethylene	1.693	15989	0.955	ppm
8)	Ethane	1.960	19608	1.157	ppm
9)	Propylene	4.337	21486	0.917	ppm
10)	Propane	4.459	29068	1.168	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.659	36967	1.389	ppm
13)	n-Butane	6.659	36967	1.389	ppm

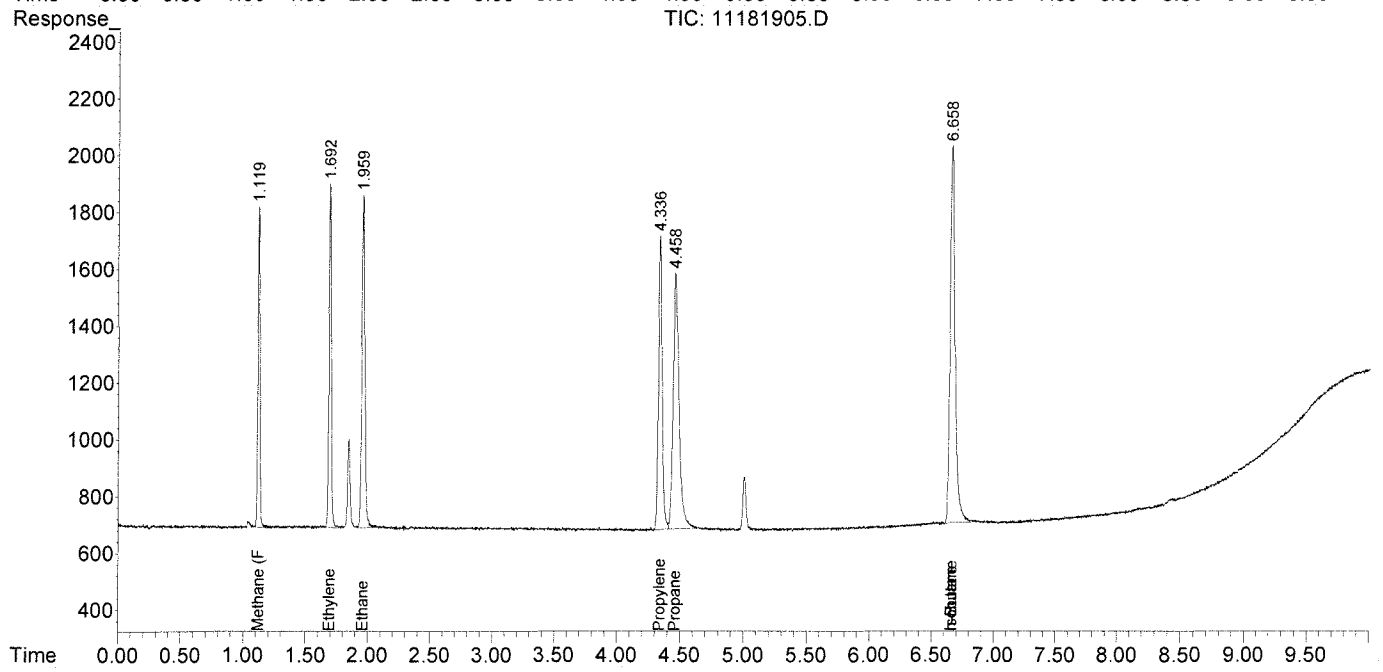
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 14:05:22
Operator : WH/LD
Sample : LCSD FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 13:15:54 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Response Factor Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	3.739		1.014			0.001	0.793	E6	189.17
2)	Carbon monoxide	3.739		1.014			0.001	0.594	E6	221.92
3)	Methane (TCD)						2.161	0.951	E2	106.37
4)	Carbon dioxide	2.365	2.569	2.558	2.361	2.459	2.314	2.438	E2	4.44

Signal #2 Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)		1.180	0.975	0.908	0.870	0.868	0.907	E4	11.66
7)	Ethylene	1.736	1.638	1.780	1.720	1.628	1.670	1.673	E4	3.90
8)	Ethane	1.781	1.676	1.784	1.730	1.692	1.675	1.695	E4	3.83
9)	Propylene	2.505	2.296	2.592	2.480	2.346	2.252	2.343	E4	6.56
10)	Propane	2.439	2.283	2.645	2.555	2.433	2.522	2.488	E4	4.20
11)	Isobutylene							0.652	E1	138.46
12)	Isobutane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17
13)	n-Butane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS091217_R.M Wed Sep 13 15:11:48 2017

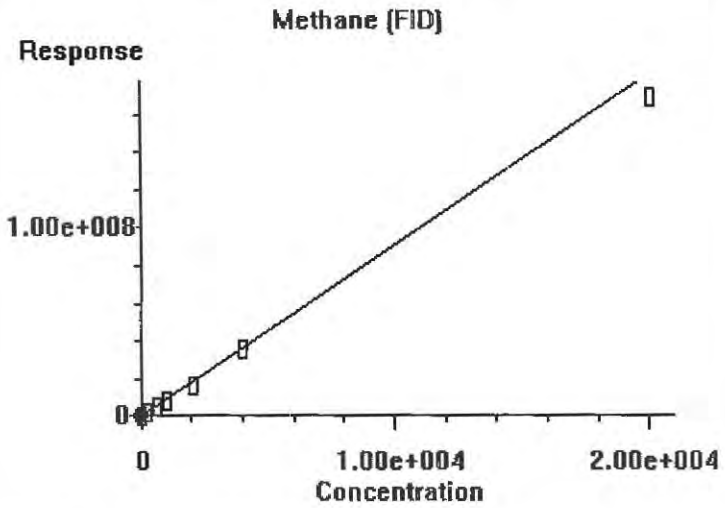
Edit Compounds -- Compound #6 -- Methane (FID)

Search by: Ret Time | Name | Index | Find Compound

Compound Database
External Standard Compoun
- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	
2	0.302000	3564.400000
3	1.510000	14725.268625
4	4.530000	41128.575000
5	10.570000	91966.784531
6	200.000000	1735997.497500
7	600.000000	5189848.900000
8	1000.000000	8598533.570000
9	2000.000000	16098209.390000
10	4000.000000	35776839.311362
11	20000.000000	169009160.49199



0.000e+000	Quadratic term
9.071e+003	Linear term
0.000e+000	Constant term
11.657%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #7 -- Ethylene

Search by: Ret Time | Name | Index | Find Compound

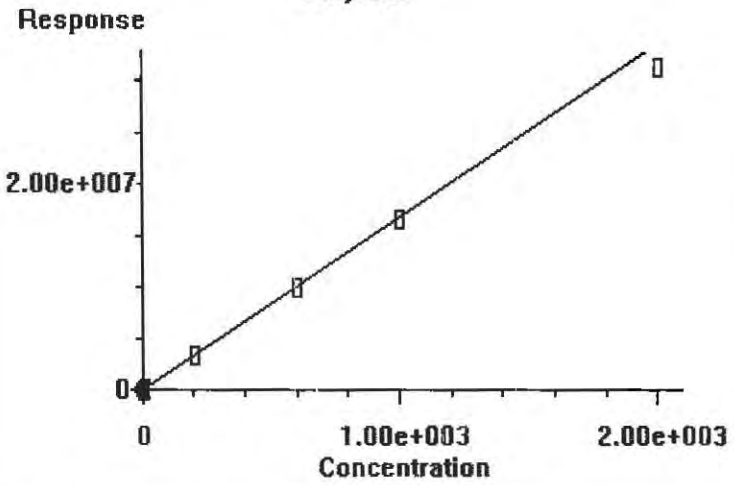
- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2621.970000
2	0.302000	4946.731301
3	1.510000	26884.746847
4	4.530000	77902.721497
5	10.570000	172085.529560
6	200.000000	3339702.313219
7	600.000000	10007758.776971
8	1000.000000	16608503.805988
9	2000.000000	31192443.898600
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	

Ethylene



0.000e+000	Quadratic term
1.673e+004	Linear term
0.000e+000	Constant term
3.897%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #8 -- Ethane

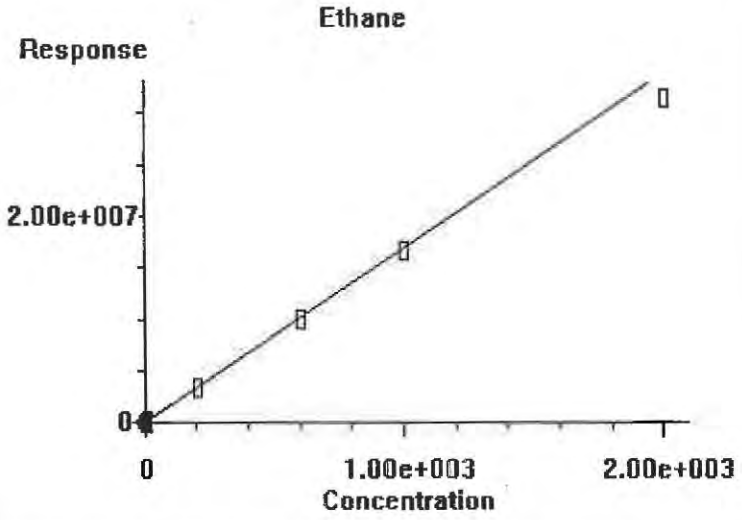
Search by: Ret Time | Name | Index — Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

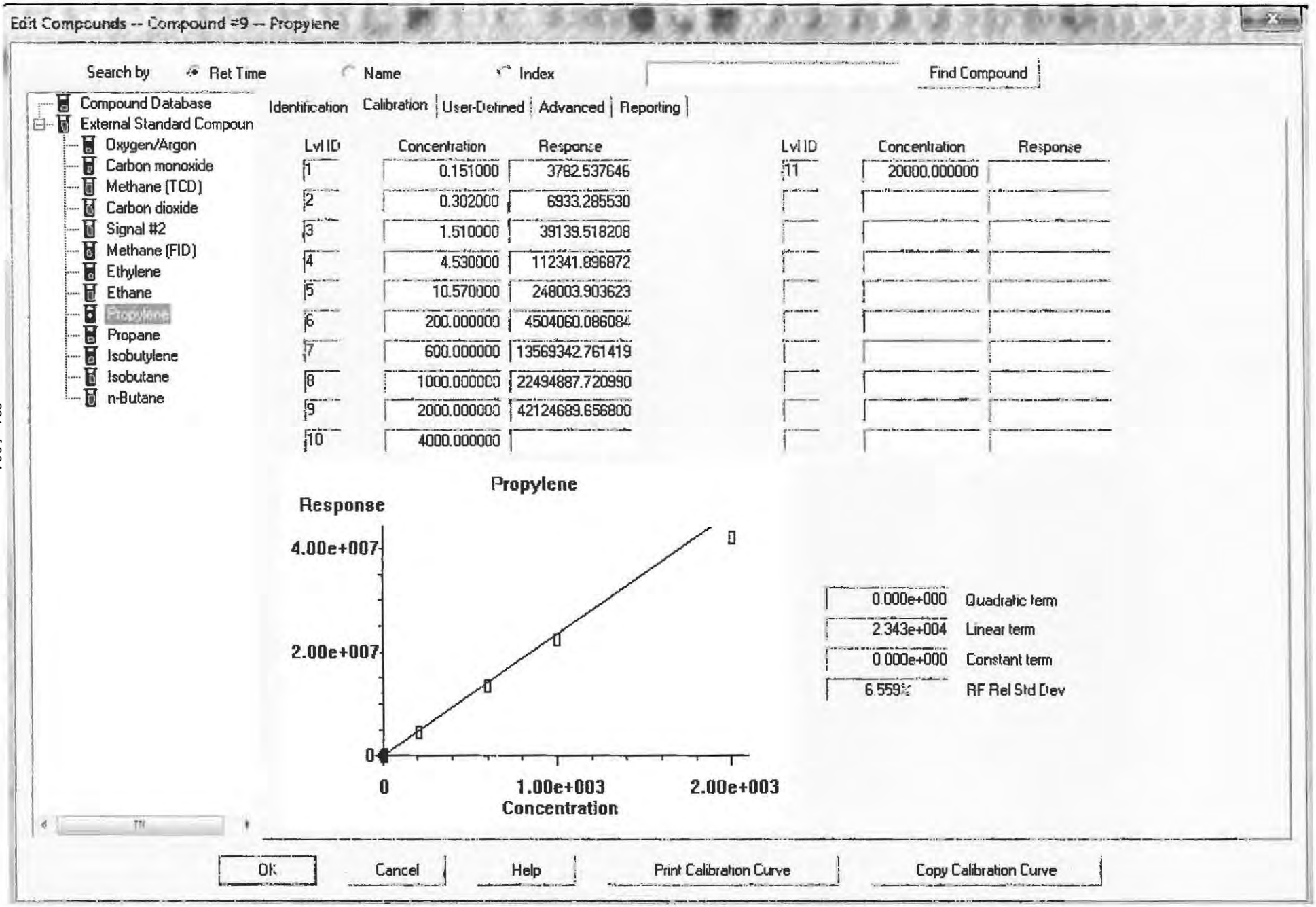
Lvl ID	Concentration	Response
1	0.151000	2689.928008
2	0.302000	5060.331943
3	1.510000	26943.667500
4	4.530000	78353.525045
5	10.570000	178840.731148
6	200.000000	3350442.319129
7	600.000000	10048964.218029
8	1000.000000	16703164.879012
9	2000.000000	31424217.938900
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.695e+004	Linear term
0.000e+000	Constant term
3.831%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve


Edit Compounds -- Compound #9 -- Propylene
Search by: Ret Time Name Index
Find Compound
Compound Database
External Standard Compoun
Oxygen/Argon
Carbon monoxide
Methane (TCD)
Carbon dioxide
Signal #2
Methane (FID)
Ethylene
Ethane
Propylene
Propane
Isobutylene
Isobutane
n-Butane
Identification Calibration User-Defined Advanced Reporting
Lvl ID Concentration Response
1 0.151000 3782.537646
2 0.302000 6933.285530
3 1.510000 39139.518208
4 4.530000 112341.896872
5 10.570000 248003.903623
6 200.000000 4504060.086084
7 600.000000 13569342.761419
8 1000.000000 22494887.720990
9 2000.000000 42124689.656800
10 4000.000000
11 20000.000000
Propylene
Response
4.00e+007
2.00e+007
0
0
1.00e+003
2.00e+003
Concentration
0.000e+000 Quadratic term
2.343e+004 Linear term
0.000e+000 Constant term
6.559% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

Edit Compounds -- Compound #10 -- Propane

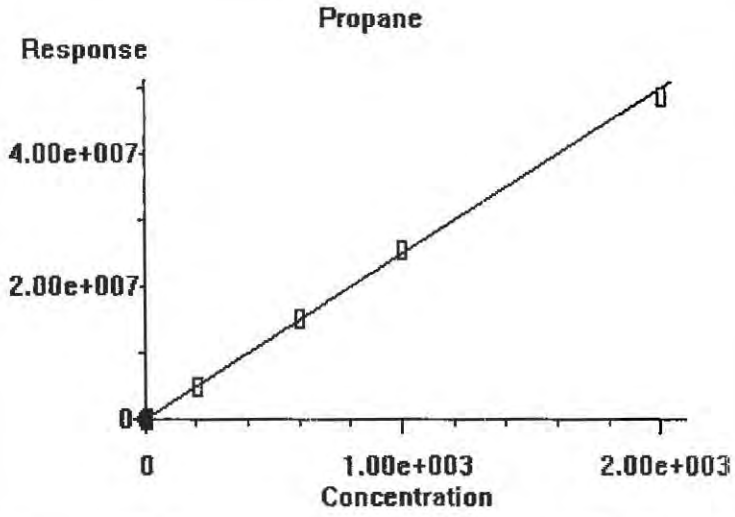
Search by: Ret Time | Name | Index — Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3682.897354
2	0.302000	6894.237803
3	1.510000	39934.166792
4	4.530000	115723.428128
5	10.570000	257124.432806
6	200.000000	5043035.663316
7	600.000000	15251325.797404
8	1000.000000	25459410.657938
9	2000.000000	48583085.287451
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.488e+004	Linear term
0.000e+000	Constant term
4.200%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Calibration Status Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121702.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121703.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121704.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121705.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121706.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121707.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121711.D
11	11	20000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121712.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Sep 13 11:04 2017	Sep 12 15:03 2017	12-Sep-2017, 10:52
2	2	Sep 13 11:05 2017	Sep 13 11:05 2017	12-Sep-2017, 11:05
3	3	Sep 13 11:06 2017	Sep 13 11:05 2017	12-Sep-2017, 11:45
4	4	Sep 13 11:09 2017	Sep 13 11:06 2017	12-Sep-2017, 12:09
5	5	Sep 13 11:09 2017	Sep 13 11:09 2017	12-Sep-2017, 12:30
6	6	Sep 13 11:10 2017	Sep 13 11:10 2017	12-Sep-2017, 12:47
7	7	Sep 13 11:11 2017	Sep 13 11:10 2017	12-Sep-2017, 13:00
8	8	Sep 13 11:12 2017	Sep 13 11:11 2017	12-Sep-2017, 13:47
9	9	Sep 13 11:12 2017	Sep 13 11:12 2017	12-Sep-2017, 14:07
10	10	Sep 13 11:14 2017	Sep 13 11:13 2017	12-Sep-2017, 14:48
11	11	Sep 13 11:14 2017	Sep 13 11:14 2017	12-Sep-2017, 15:21

RS091217_R.M Wed Sep 13 15:11:22 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.767	373920	0.128	ppm	
2)	Carbon monoxide	1.767	373920	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	1.595	2622	0.156	ppm	
8)	Ethane	1.848	2690	0.156	ppm	
9)	Propylene	4.222	3783	0.154	ppm	
10)	Propane	4.348	3683	0.139	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.582f	6058	NoCal	ppm	
13)	n-Butane	6.582f	6058	NoCal	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

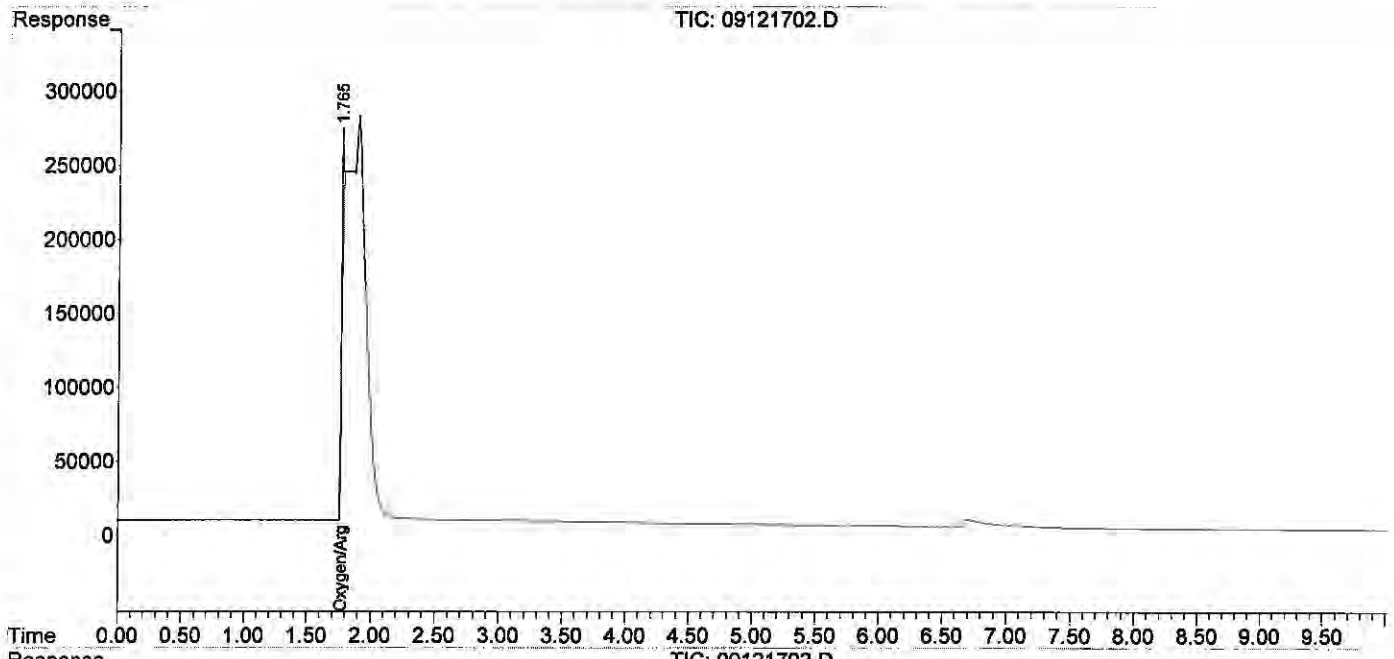
9/13/17

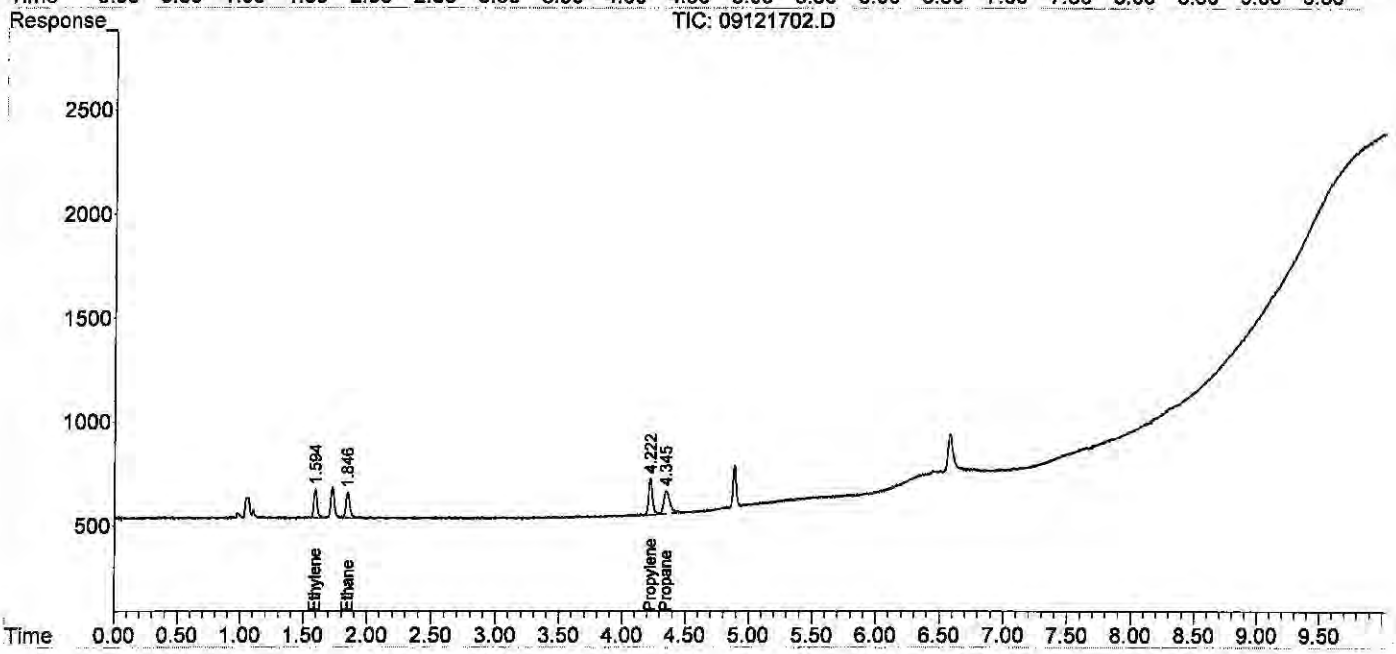
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





RS091217_R.M Wed Sep 13 14:58:18 2017 Page: 2

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

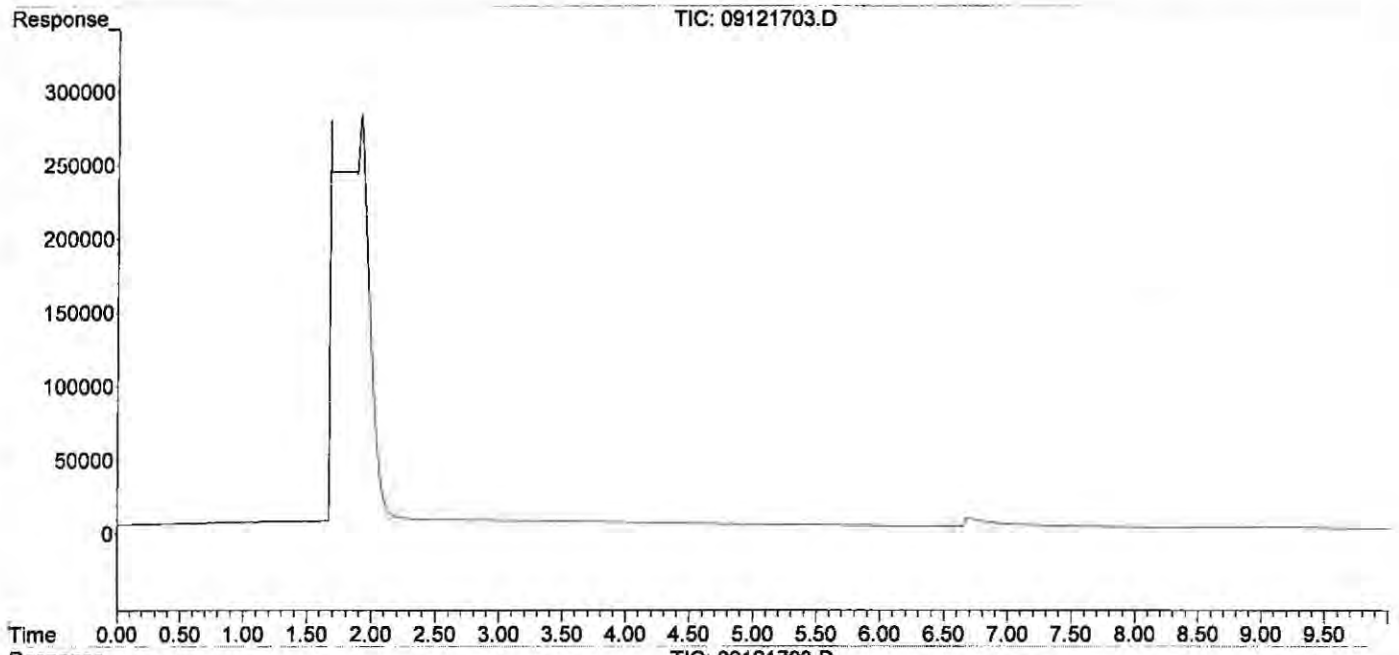
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.913f	-25181981	N.D.	ppm	
2)	Carbon monoxide	1.913f	-25181981	1.089	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.049	3564	0.391	ppm	m
7)	Ethylene	1.577	4947	0.292	ppm	
8)	Ethane	1.828	5060	0.293	ppm	
9)	Propylene	4.207	6933	0.281	ppm	
10)	Propane	4.337	6894	0.268	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	9587	0.158	ppm	
13)	n-Butane	6.579f	9587	0.158	ppm	

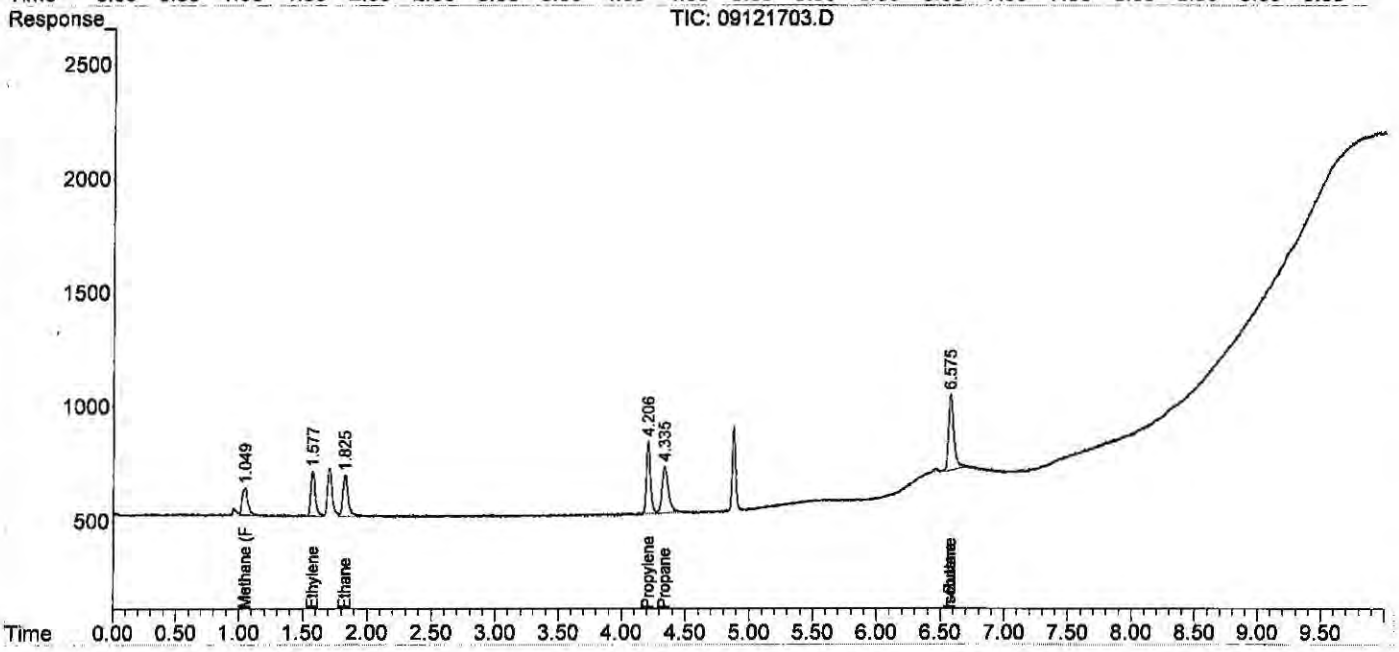
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

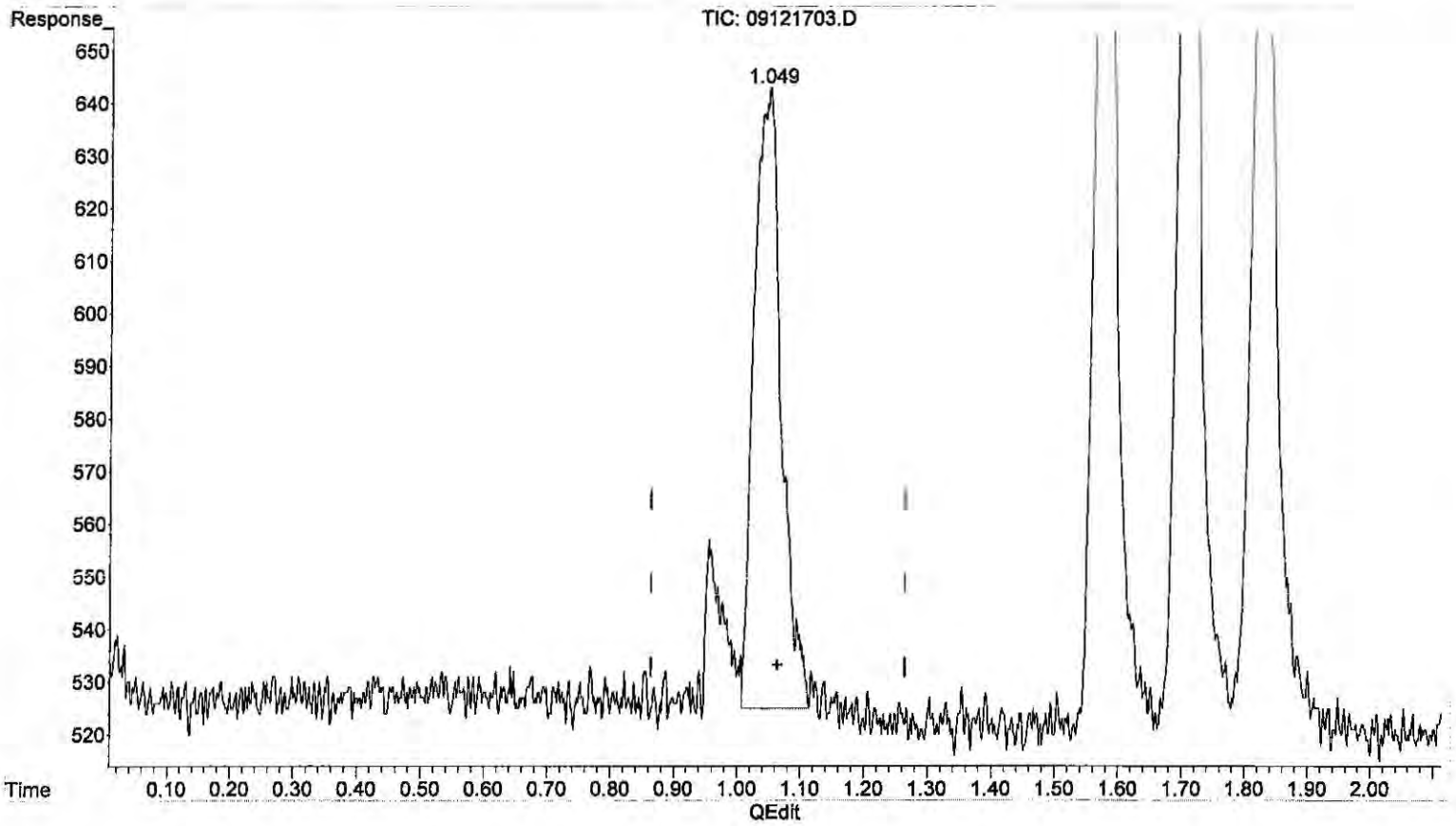




Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)
1.049min 0.391 ppm m
response 3564

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

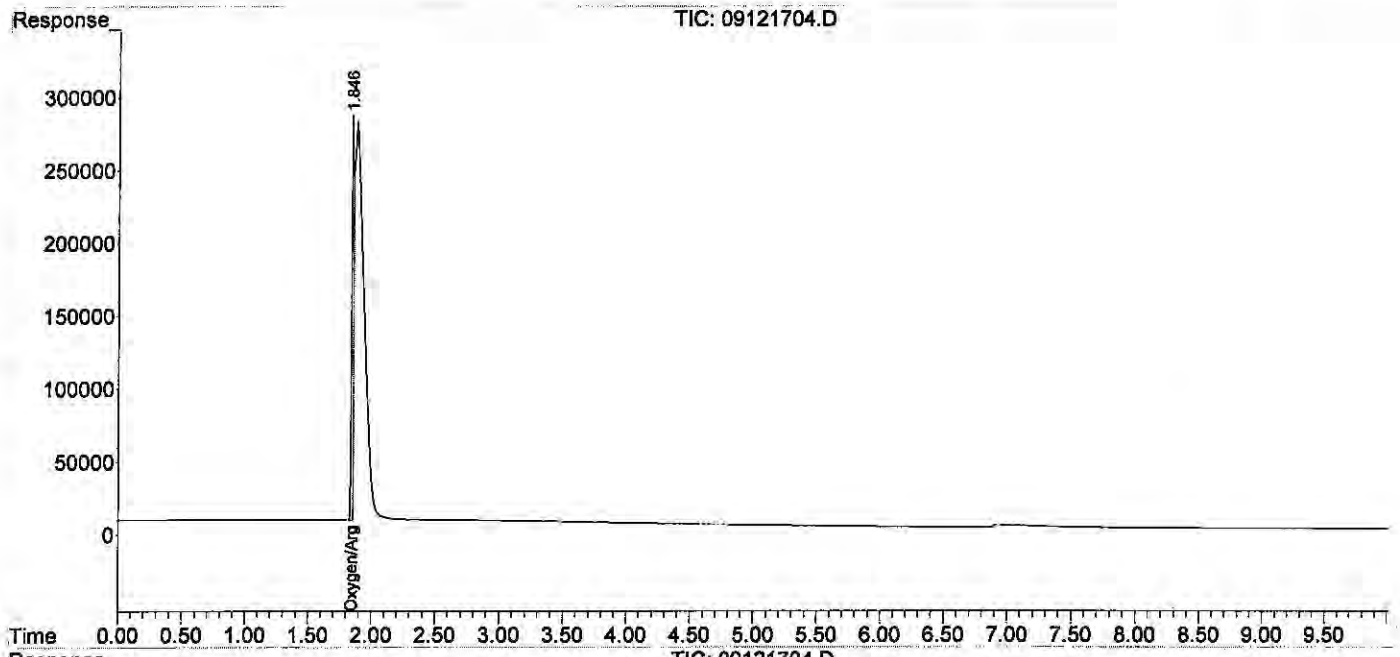
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.847	2536230	1.056	ppm
2)	Carbon monoxide	1.847	2536230	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.064	14725	1.613	ppm
7)	Ethylene	1.598	26885	1.582	ppm
8)	Ethane	1.851	26944	1.555	ppm
9)	Propylene	4.220	39140	1.589	ppm
10)	Propane	4.349	39934	1.596	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	55348	1.020	ppm
13)	n-Butane	6.578f	55348	1.020	ppm

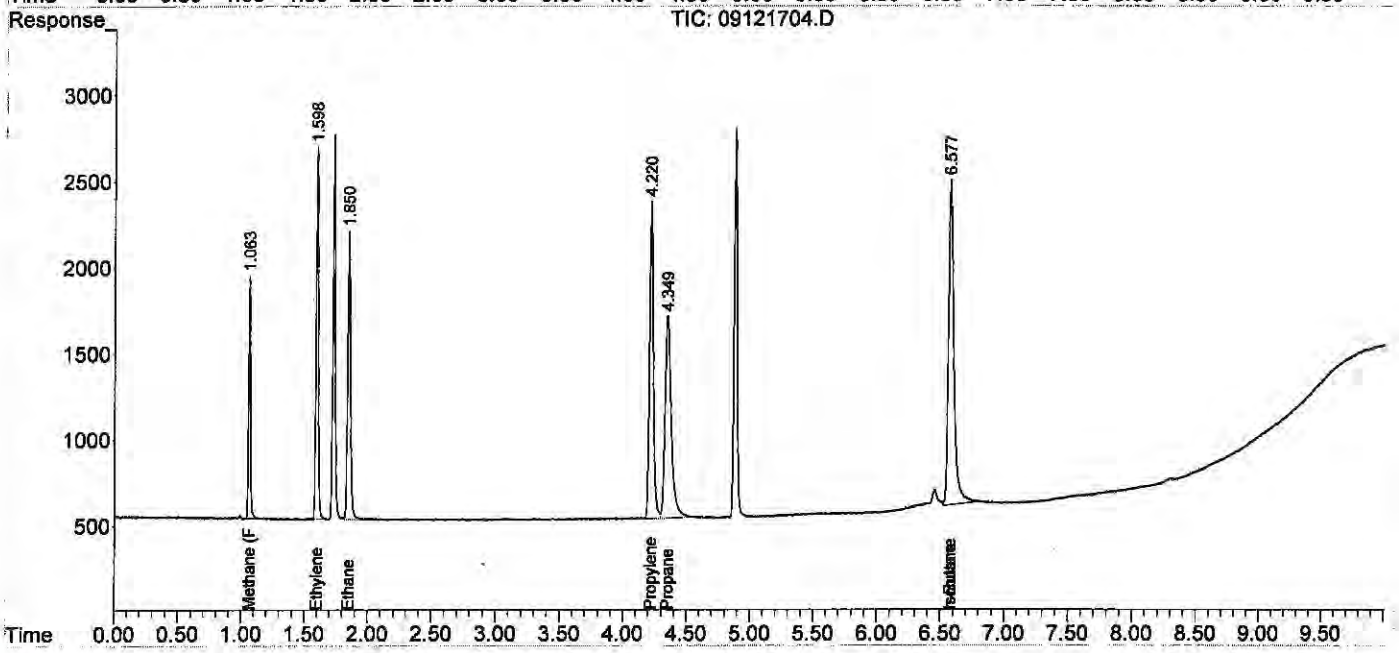
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

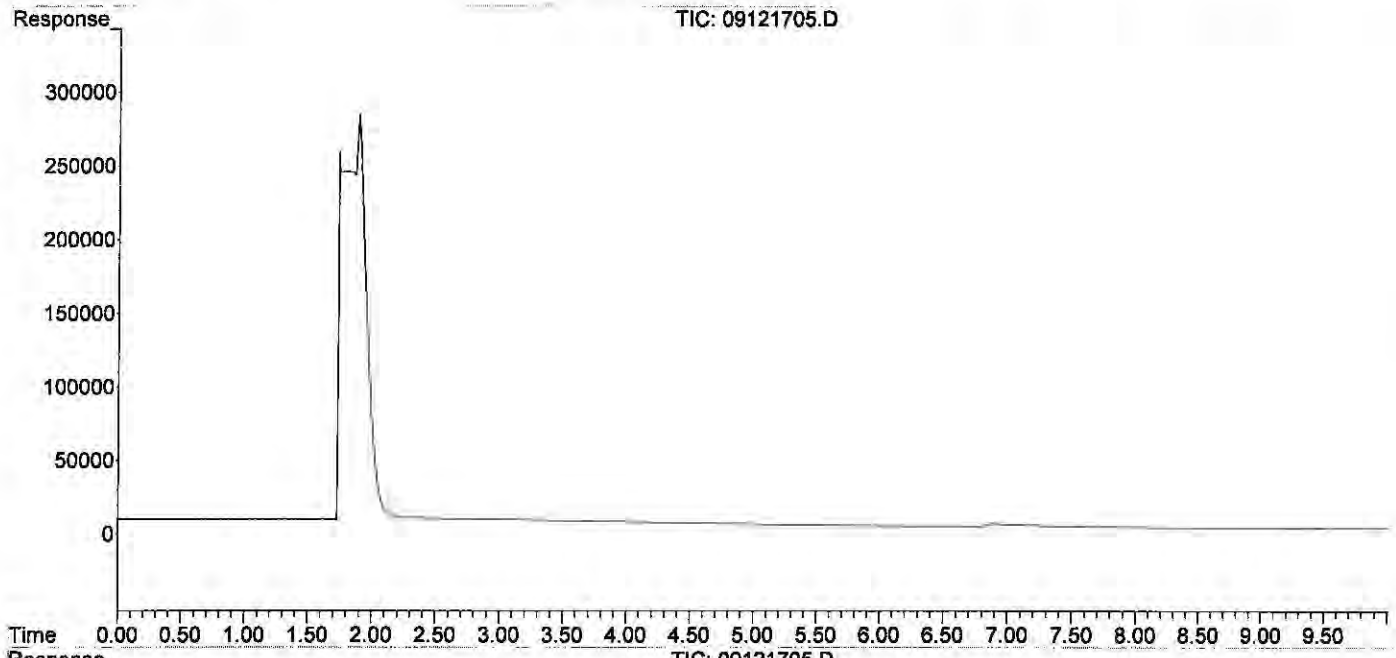
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.738	-331216	N.D.	ppm
2)	Carbon monoxide	1.738	-331216	0.019	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.052	41129	4.522	ppm
7)	Ethylene	1.586	77903	4.637	ppm
8)	Ethane	1.838	78354	4.558	ppm
9)	Propylene	4.218	112342	4.614	ppm
10)	Propane	4.347	115723	4.680	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.580f	155256	3.565	ppm
13)	n-Butane	6.580f	155256	3.565	ppm

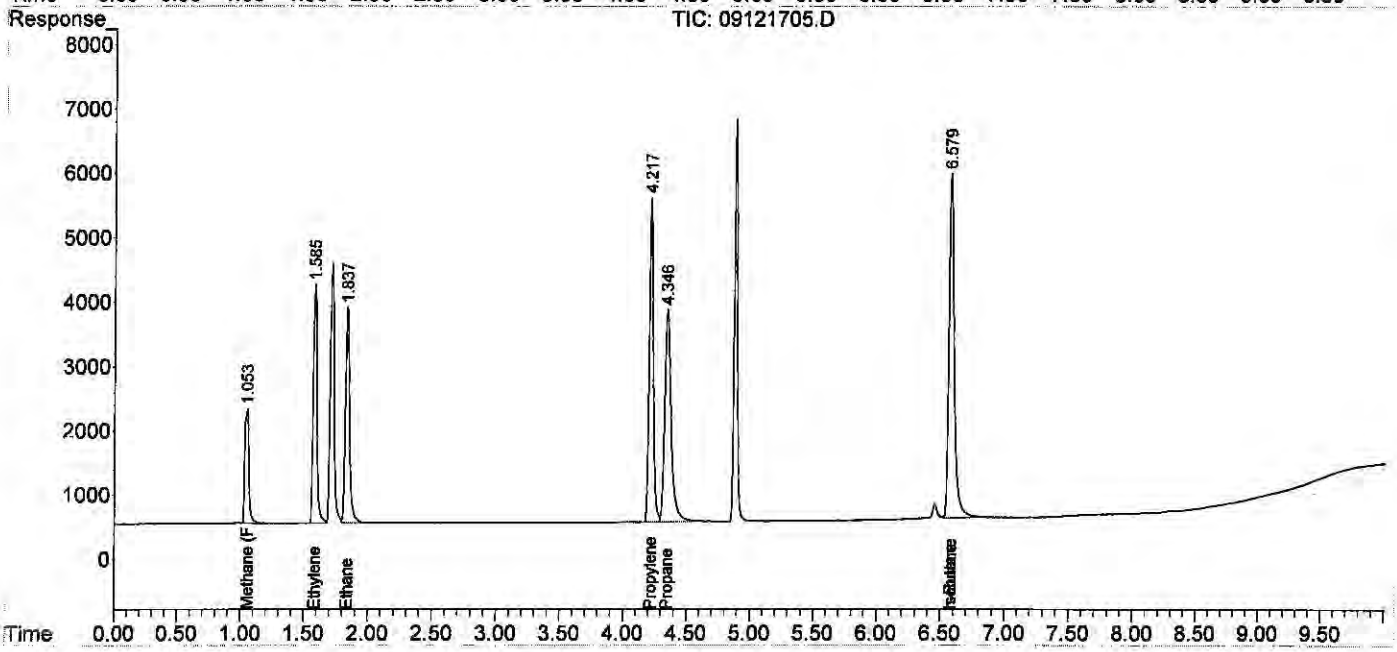
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.929f	-31871242	N.D.	ppm
2)	Carbon monoxide	1.929f	-31871242	1.818	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.025	91967	10.135	ppm
7)	Ethylene	1.568	172086	10.273	ppm
8)	Ethane	1.822	178841	10.441	ppm
9)	Propylene	4.214	248004	10.236	ppm
10)	Propane	4.344	257124	10.458	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	338181	9.254	ppm
13)	n-Butane	6.578f	338181	9.254	ppm

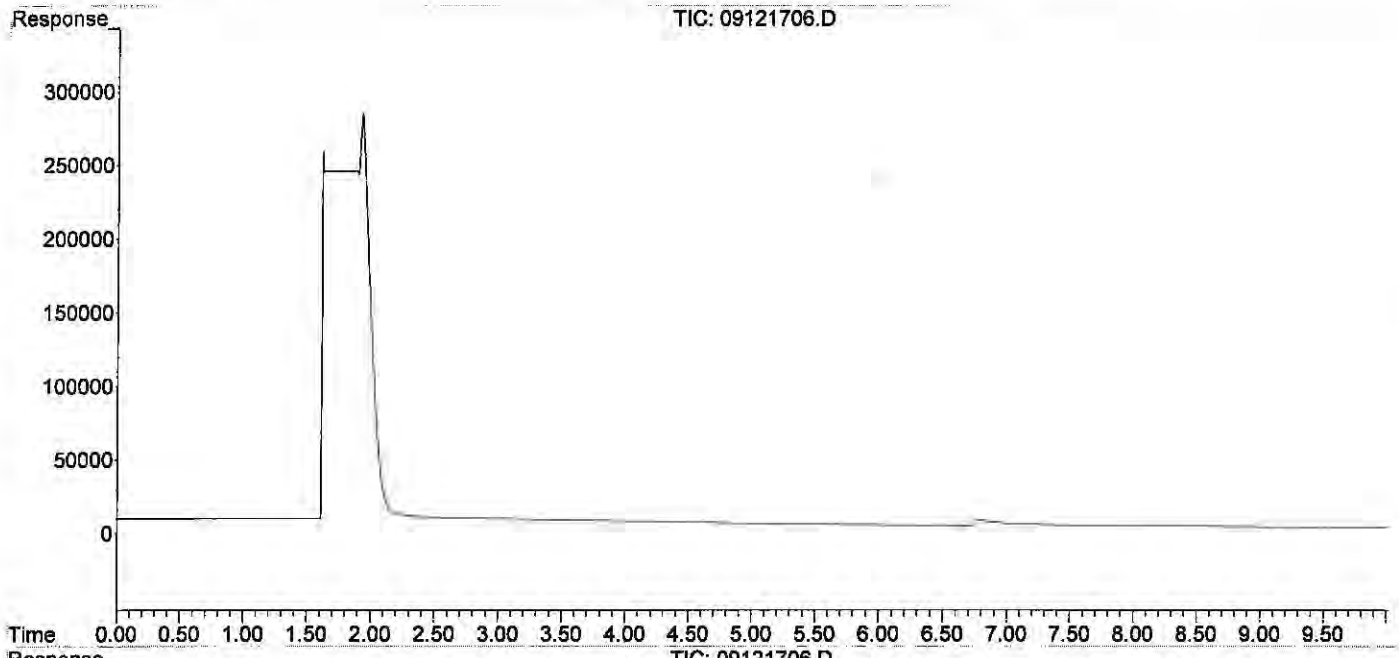
(f)=RT Delta > 1/2 Window (m)=manual int.

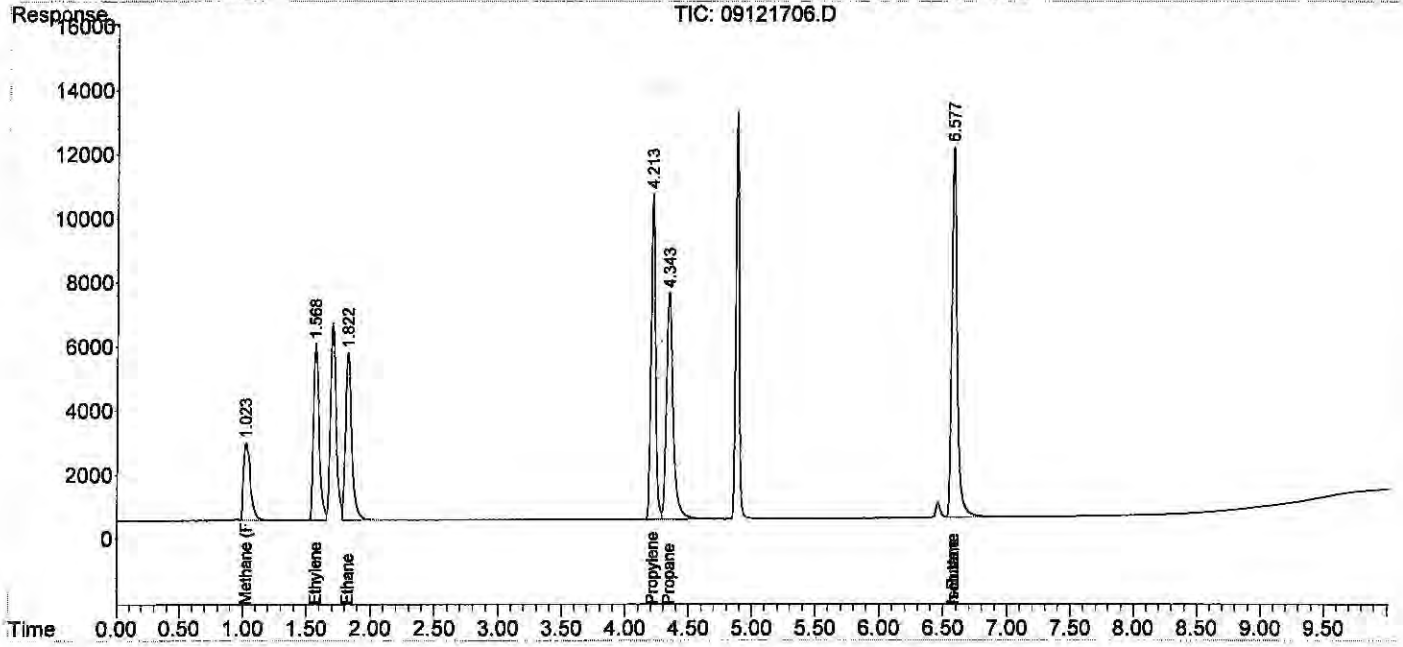
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

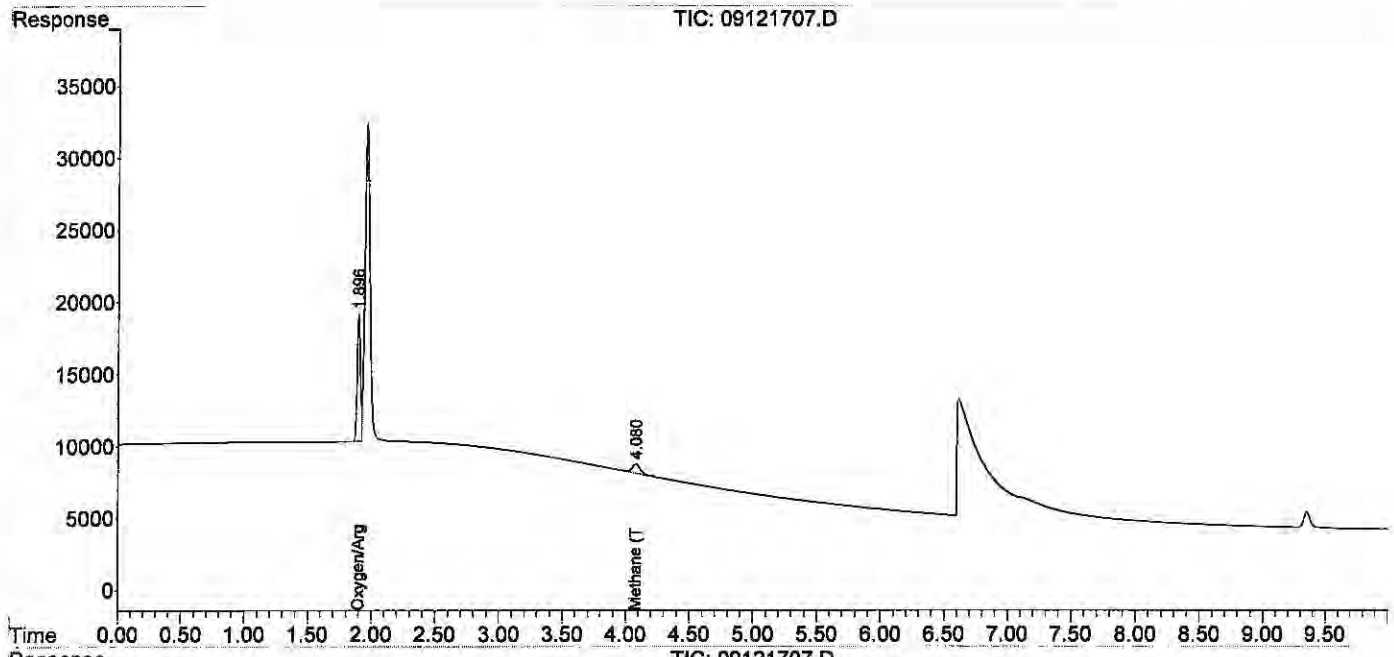
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.897	155286	0.065	ppm
2)	Carbon monoxide	1.897	155286	N.D.	ppm
3)	Methane (TCD)	4.079f	27015	2856.472	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.063	1735997	190.792	ppm
7)	Ethylene	1.597	3339702	198.758	ppm
8)	Ethane	1.849	3350442	194.597	ppm
9)	Propylene	4.201	4504060	185.706	ppm
10)	Propane	4.333	5043036	204.809	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

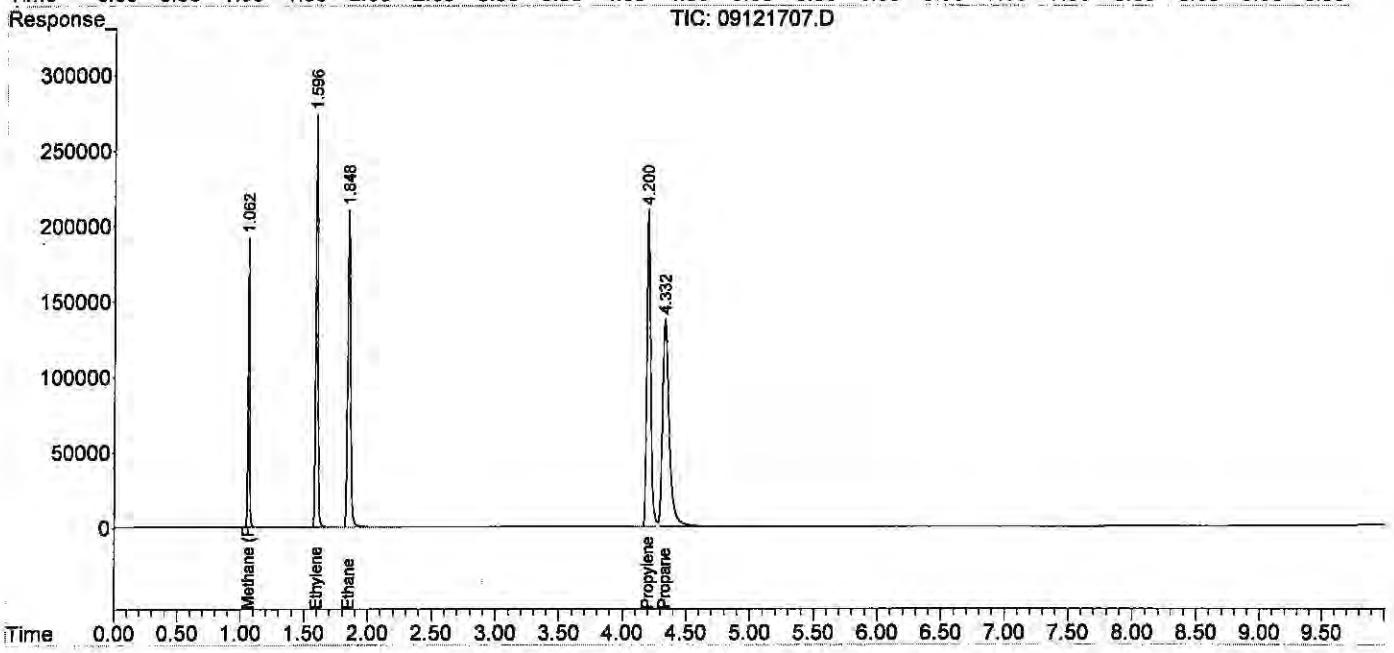
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.884	196022	0.124	ppm
2)	Carbon monoxide	1.884	196022	N.D.	ppm
3)	Methane (TCD)	4.070f	88282	782.730	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.044	5189849	539.759	ppm
7)	Ethylene	1.573	10007759	590.286	ppm
8)	Ethane	1.822	10048964	583.213	ppm
9)	Propylene	4.160	13569343	562.612	ppm
10)	Propane	4.300	15251326	615.171	ppm
11)	Isobutylene	6.143	9815	NoCal	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

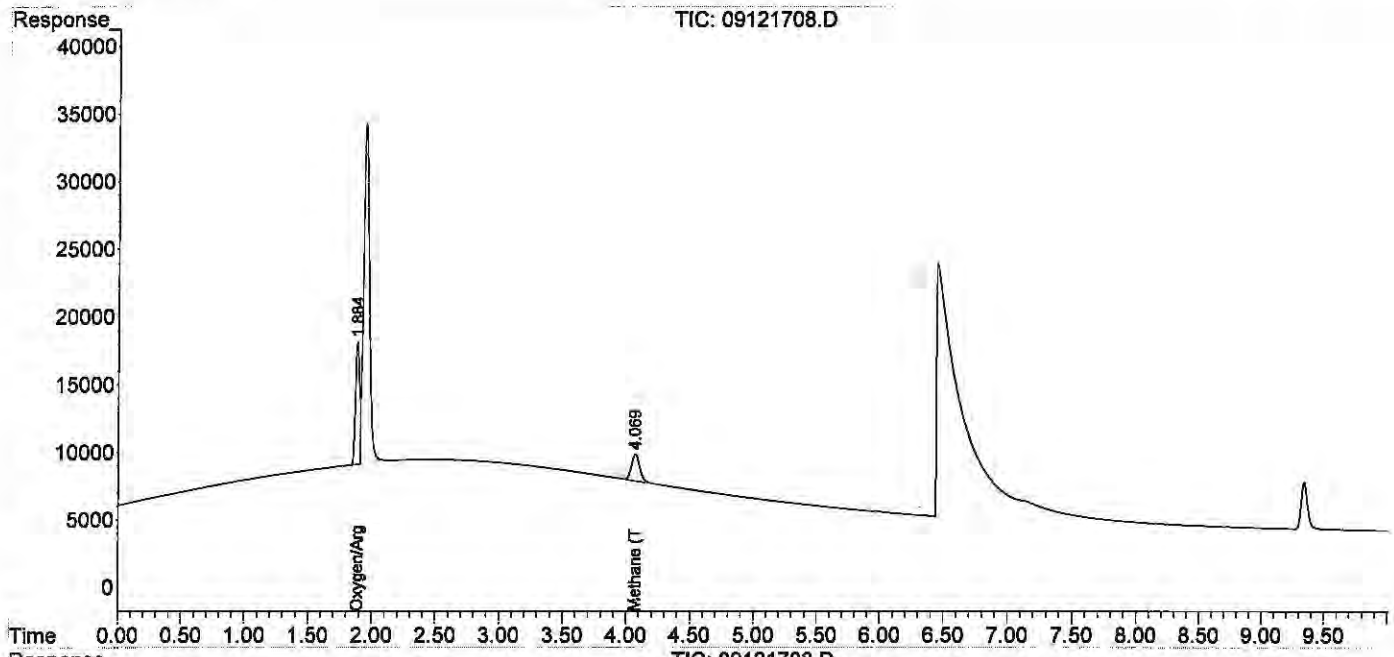
(f)=RT Delta > 1/2 Window (m)=manual int.

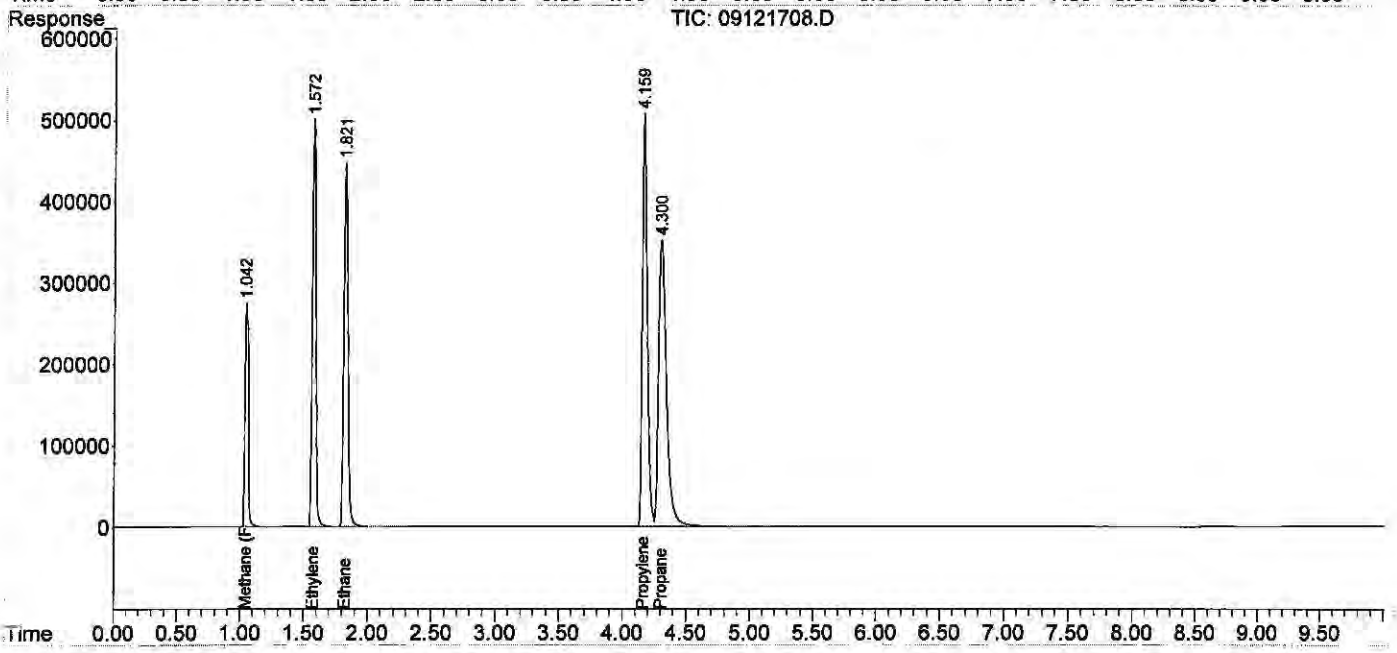
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

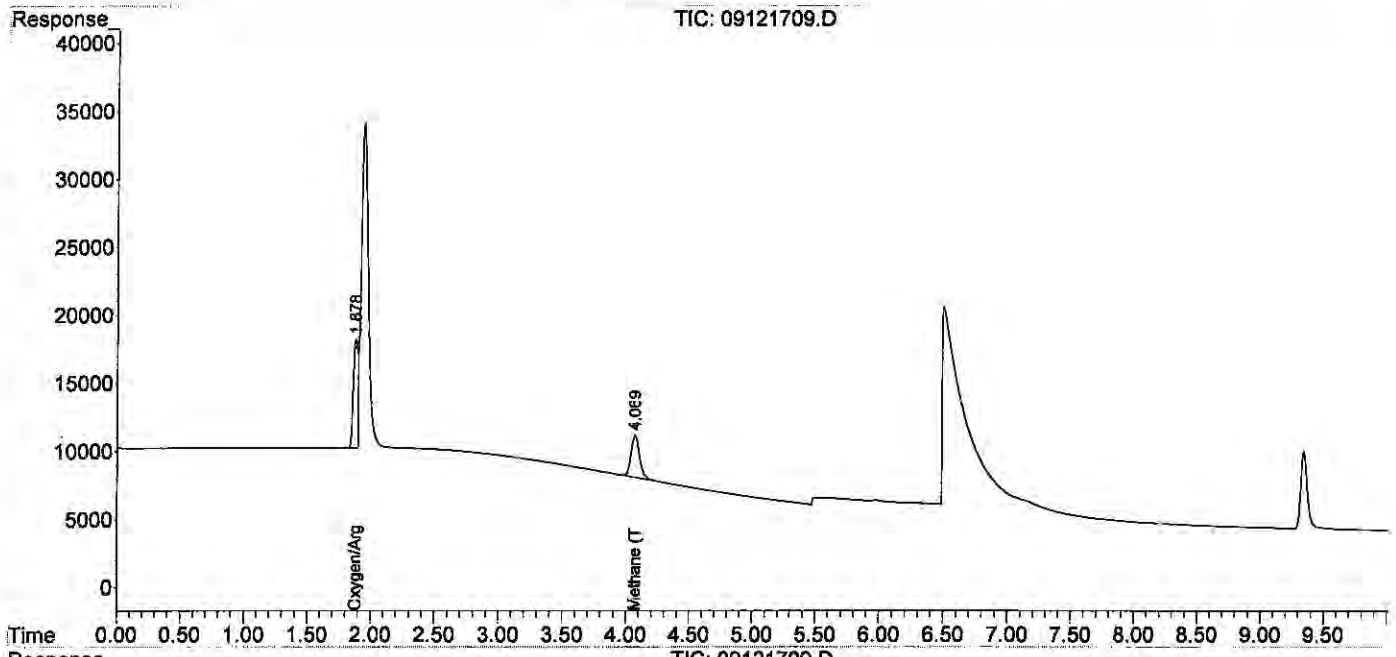
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.879	192611	0.162	ppm
2)	Carbon monoxide	1.879	192611	N.D.	ppm
3)	Methane (TCD)	4.070f	145492	1244.729	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.039	8598534	945.644	ppm
7)	Ethylene	1.576	16608504	981.887	ppm
8)	Ethane	1.827	16709165	973.644	ppm
9)	Propylene	4.161	22494888	941.060	ppm
10)	Propane	4.298	25459411	1023.223	ppm
11)	Isobutylene	6.138	16970	8645.243	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

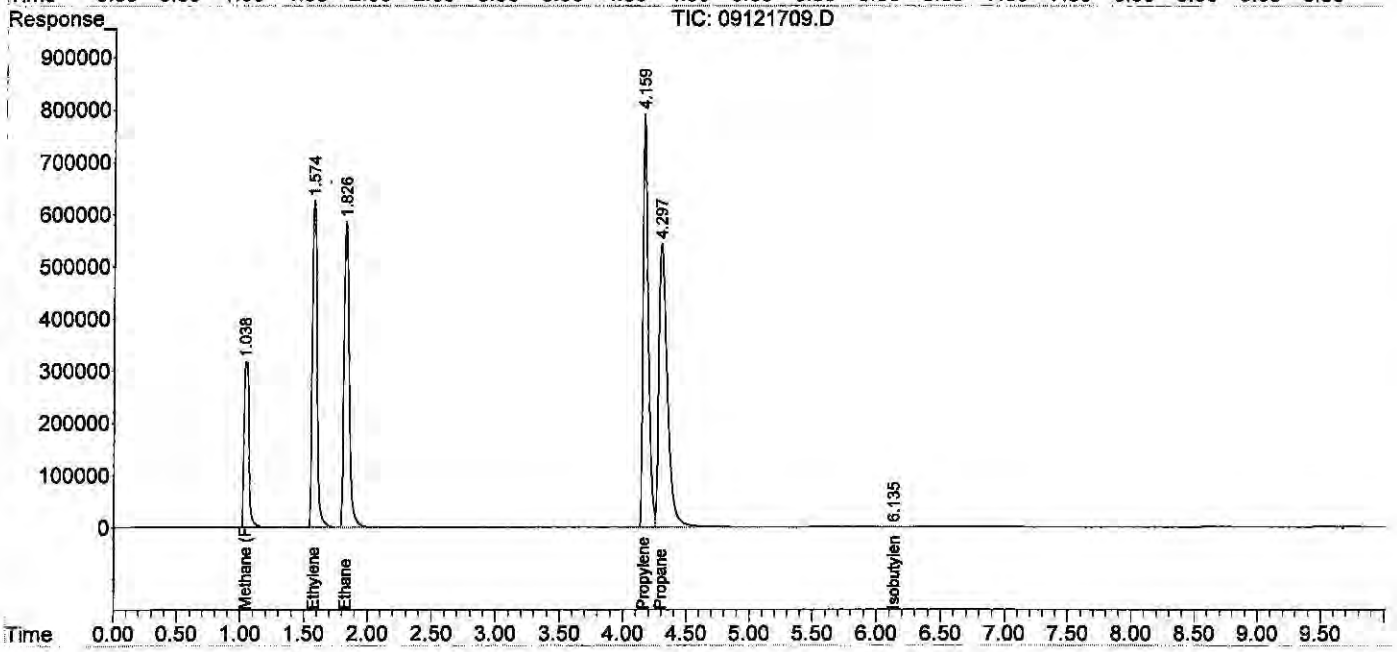
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

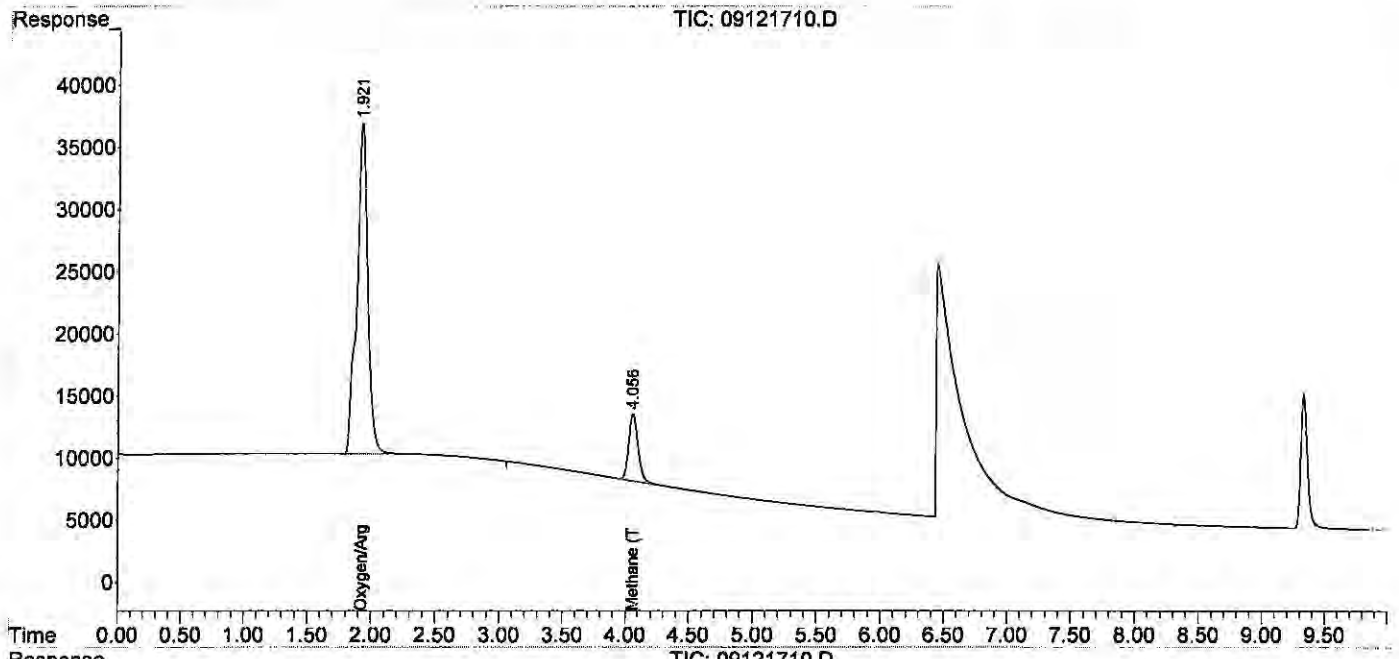
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.922f	1578147	1.659	ppm	
2)	Carbon monoxide	1.922f	1578147	N.D.	ppm	
3)	Methane (TCD)	4.057f	281651	3526.607	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.016	16098209	1763.622	ppm	
7)	Ethylene	1.552	31192444	1848.268	ppm	
8)	Ethane	1.801	31424218	1837.143	ppm	
9)	Propylene	4.129	42124690	1775.341	ppm	m
10)	Propane	4.269	48583085	1946.921	ppm	
11)	Isobutylene	6.136	33832	25613.603	ppm	
12)	Isobutane	6.576f	3845	0.120	ppm	
13)	n-Butane	6.576f	3845	0.120	ppm	

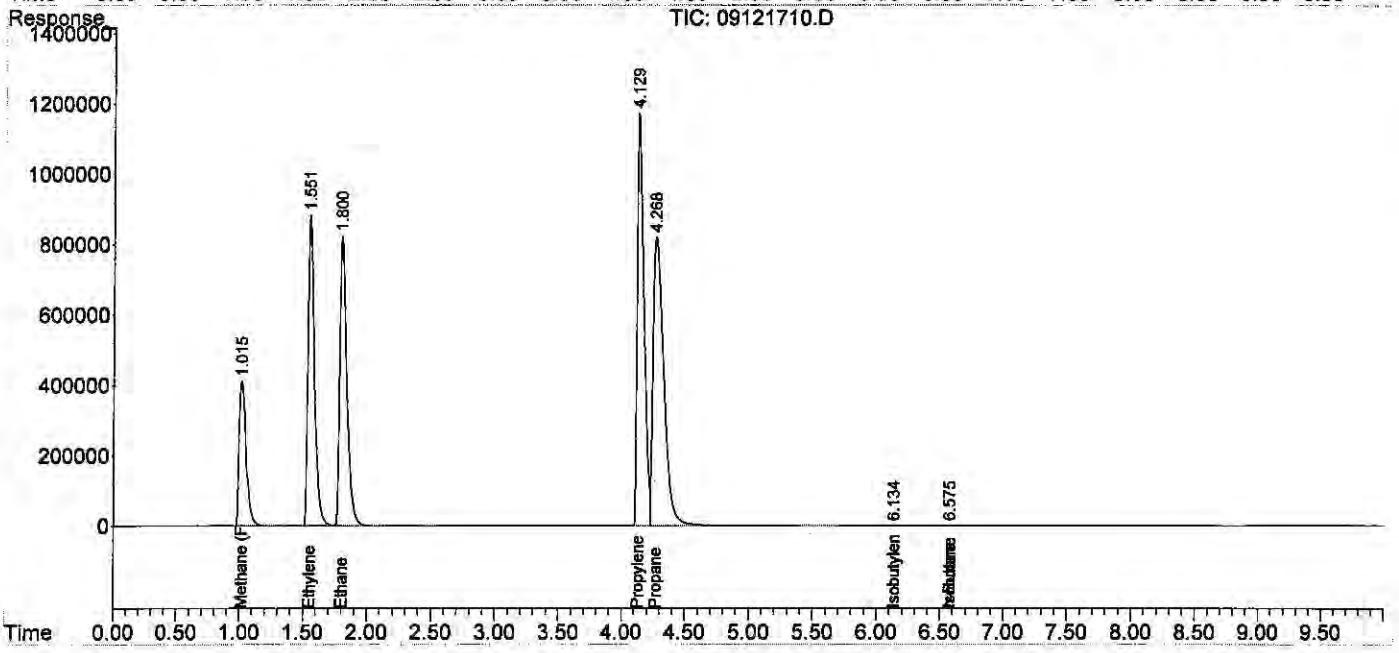
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



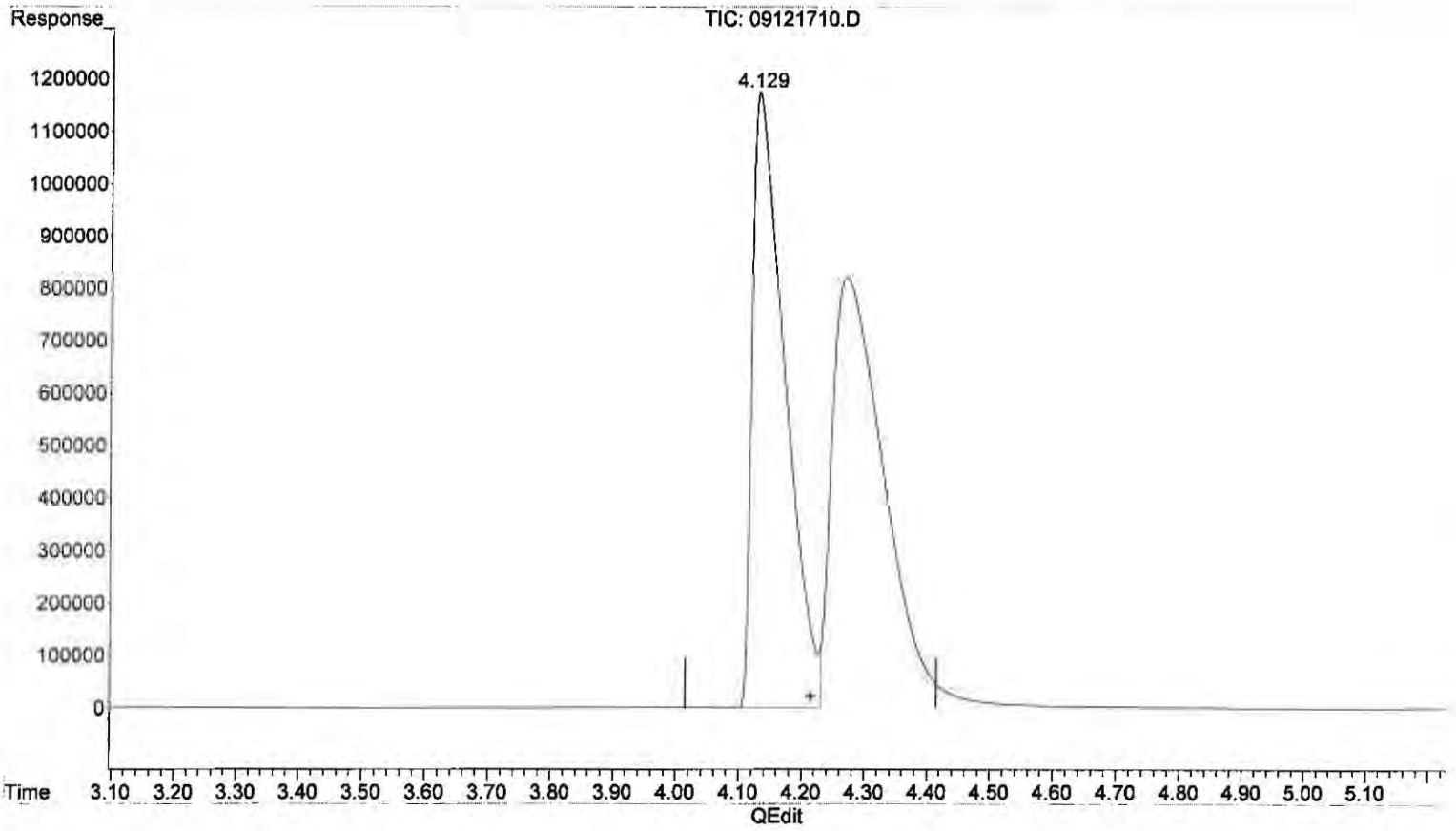


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :



(9) Propylene

4.129min 1775.341 ppm m

response 42124690

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

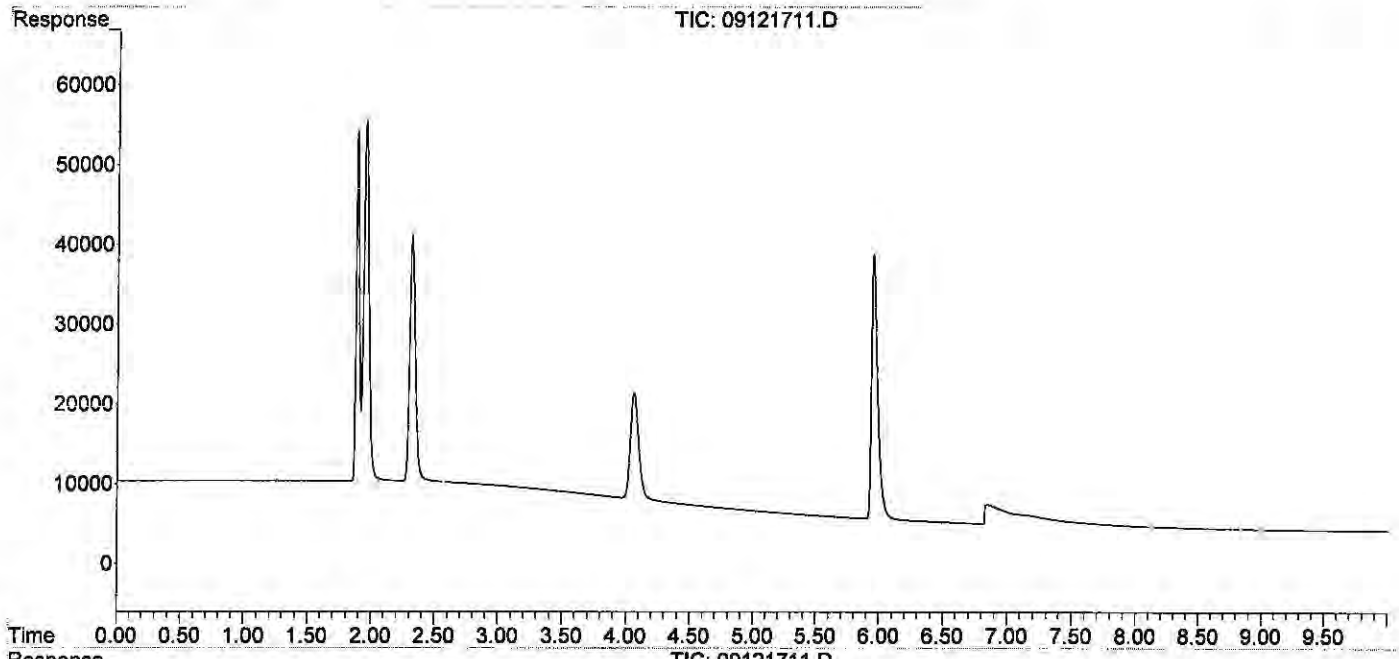
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.059	35776839	3925.122	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

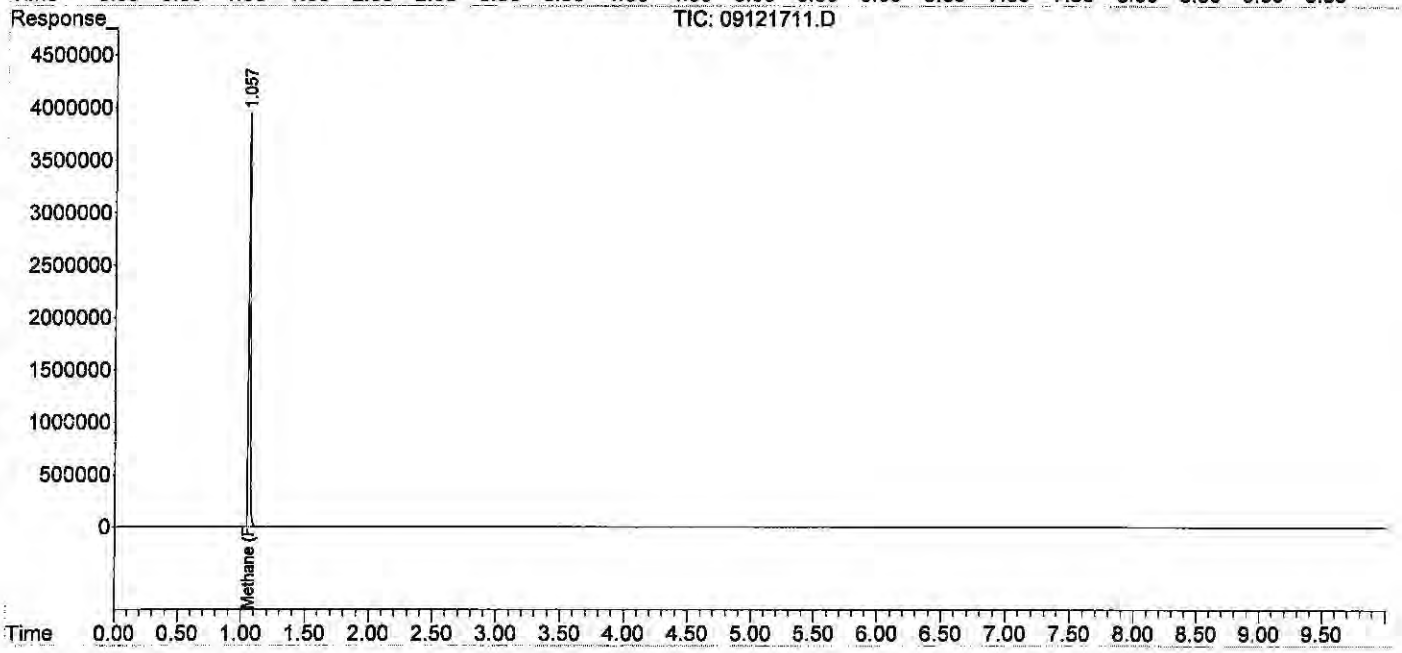
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

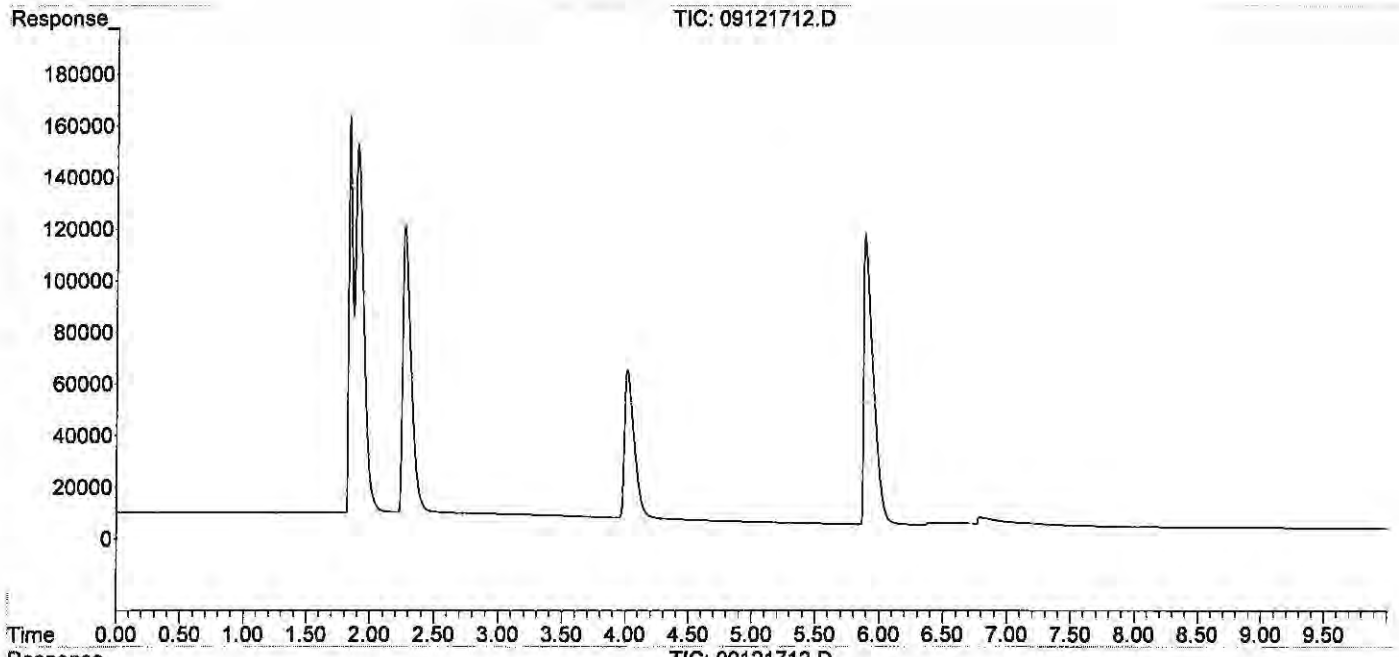
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.836	3190788	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.034	169009160	18492.064	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

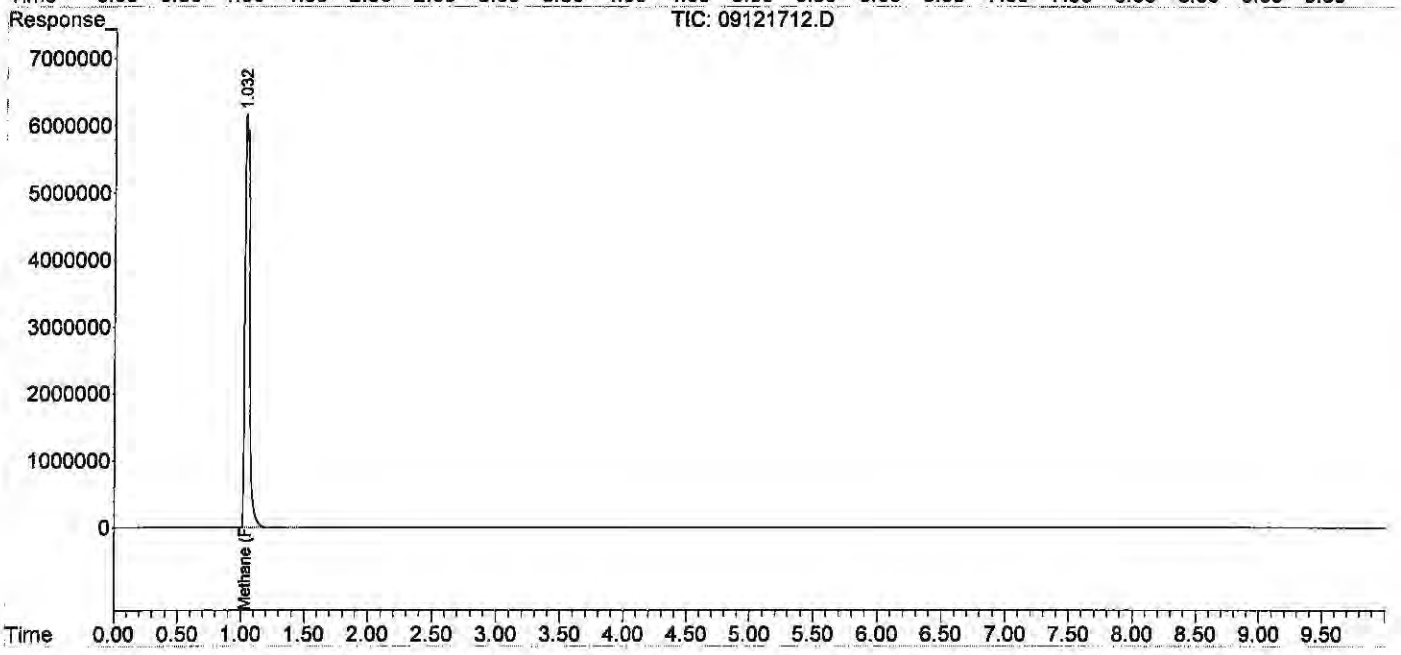
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.843	2922459	3.687	ppm	
2)	Carbon monoxide	1.843	2922459	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	actual %D
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.063	13748	1.516	ppm	1.50 101.1
7)	Ethylene	1.598	24153	1.443	ppm	1.50 96.2
8)	Ethane	1.850	24488	1.445	ppm	1.50 96.3
9)	Propylene	4.221	36004	1.537	ppm	1.50 102.5
10)	Propane	4.350	37738	1.517	ppm	1.51 100.5
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	48019	1.804	ppm	9/14/2
13)	n-Butane	6.579f	48019	1.804	ppm	

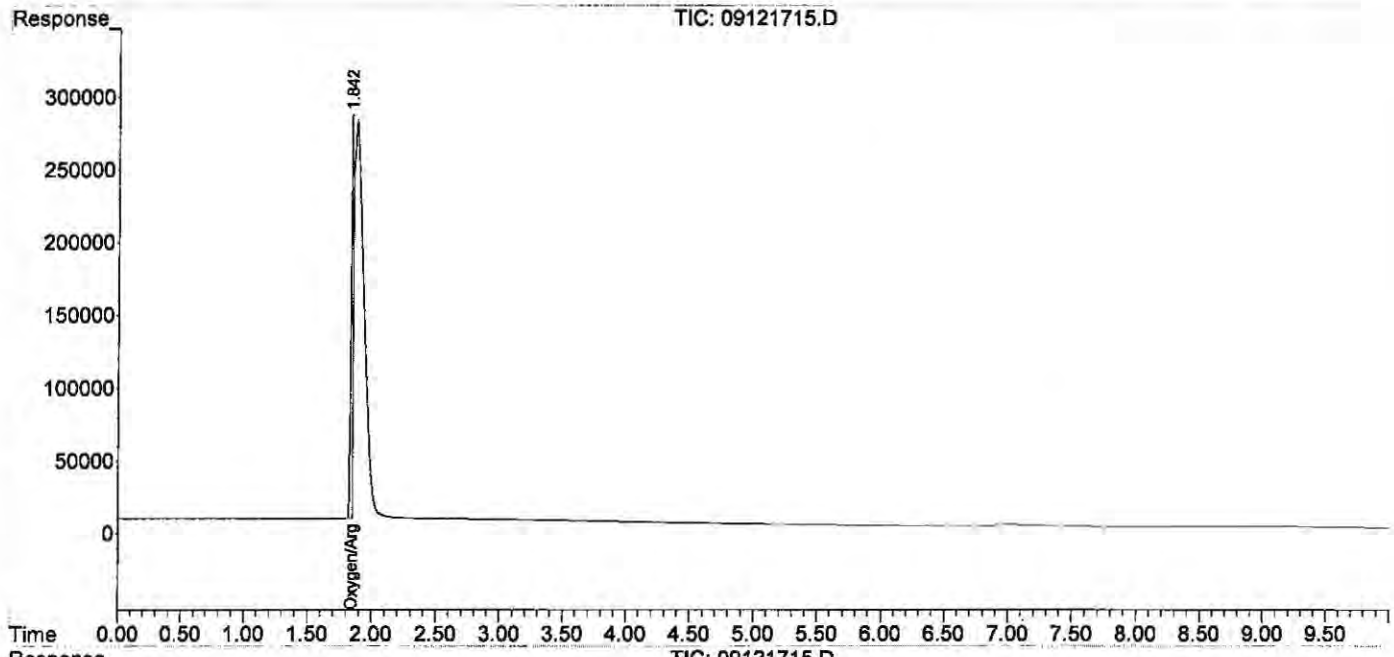
(f)=RT Delta > 1/2 Window (m)=manual int.

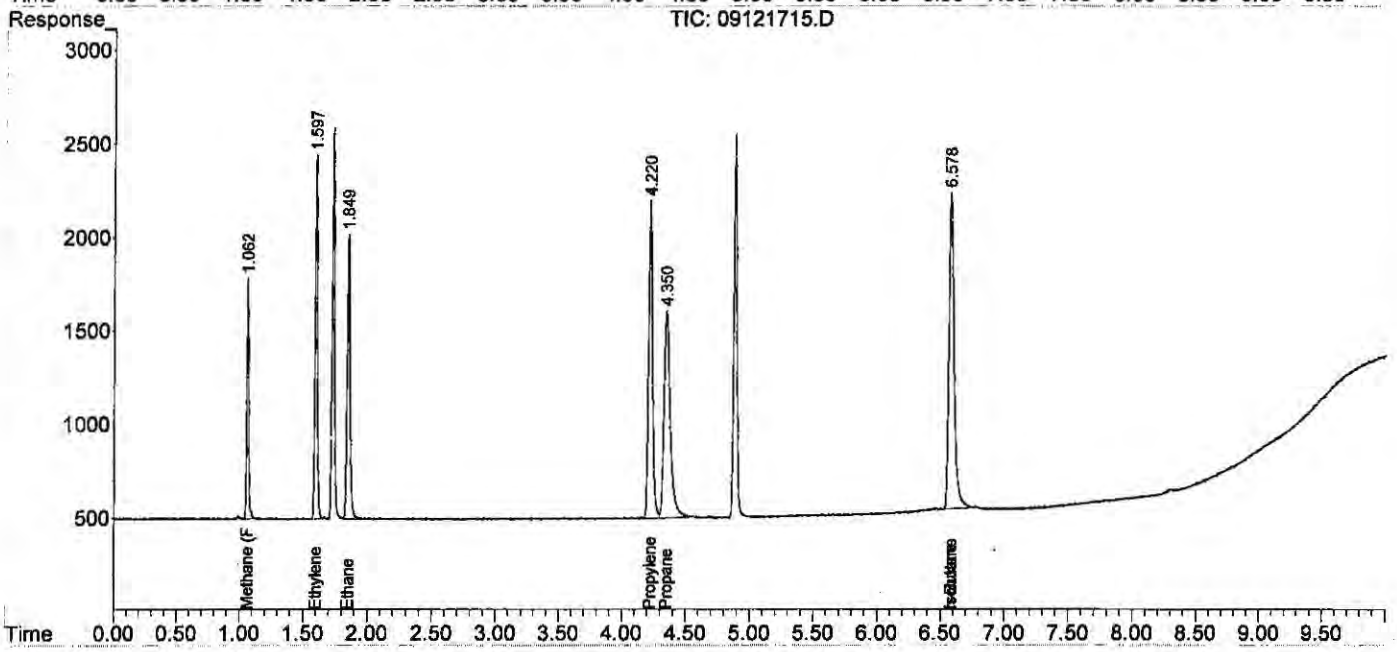
9/14/2017

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group
Service Request: P1906981
Sample Vol. (ml) : 32.00 ml
Analyst : WH/LD
Date Analysis : 11/18/19
Head Space Vol.(ml) : 8.00 ml
Instrument : GC#10
Detector : FID#10, TCD#10
Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Methane	Ethylene	Ethane
STD S32-05221901	0.100	89.511	94.682	93.891
ACTUAL		101.50	100.90	101.40
%Difference		11.8%	6.2%	7.4%
MCS 0.1ml	0.100	0.186	0.000	0.000
RB 0.1ml	0.100	0.000	0.000	0.000
LCS FID 0.1ml	0.100	1.381	0.965	1.165
LCSD FID 0.1ml	0.100	1.365	0.955	1.157
p1906981-001 0.1ml	0.100	0.288	0.000	0.000
p1906981-002 0.1ml	0.100	1.590	0.000	0.000
p1906981-003 0.1ml	0.100	0.560	0.000	0.000
p1906981-004 0.1ml	0.100	3.596	0.000	0.000
p1906981-005 0.1ml	0.100	0.786	0.000	0.000
p1906981-006 0.1ml	0.100	0.855	0.000	0.000

FINAL HEAD SPACE RESULT (ppm)

	Methane	Ethylene	Ethane
WWt.	16.04	28.05	30.07
HENRY'S CONSTANT	3.76E+04	1.02E+04	2.63E+04
RL	1.30	1.00	0.60
MCS 0.1ml	1.860	0.000	0.000
LCS FID 0.1ml	13.810	9.650	11.650
LCSD FID 0.1ml	13.650	9.550	11.570
p1906981-001 0.1ml	2.880	0.000	0.000
p1906981-002 0.1ml	15.900	0.000	0.000
p1906981-003 0.1ml	5.600	0.000	0.000
p1906981-004 0.1ml	35.960	0.000	0.000
p1906981-005 0.1ml	7.860	0.000	0.000
p1906981-006 0.1ml	8.550	0.000	0.000

LD
11/19

STD S32-05221901		91.347	96.683	95.996	15:55:33	0.86	0.00	0.00	0.00	0.00
ACTUAL		101.50	100.90	101.40						
%Difference		10.0%	4.2%	5.3%						

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 13:04:17
Operator : WH/LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 12:18:23 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

LD
11/19

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

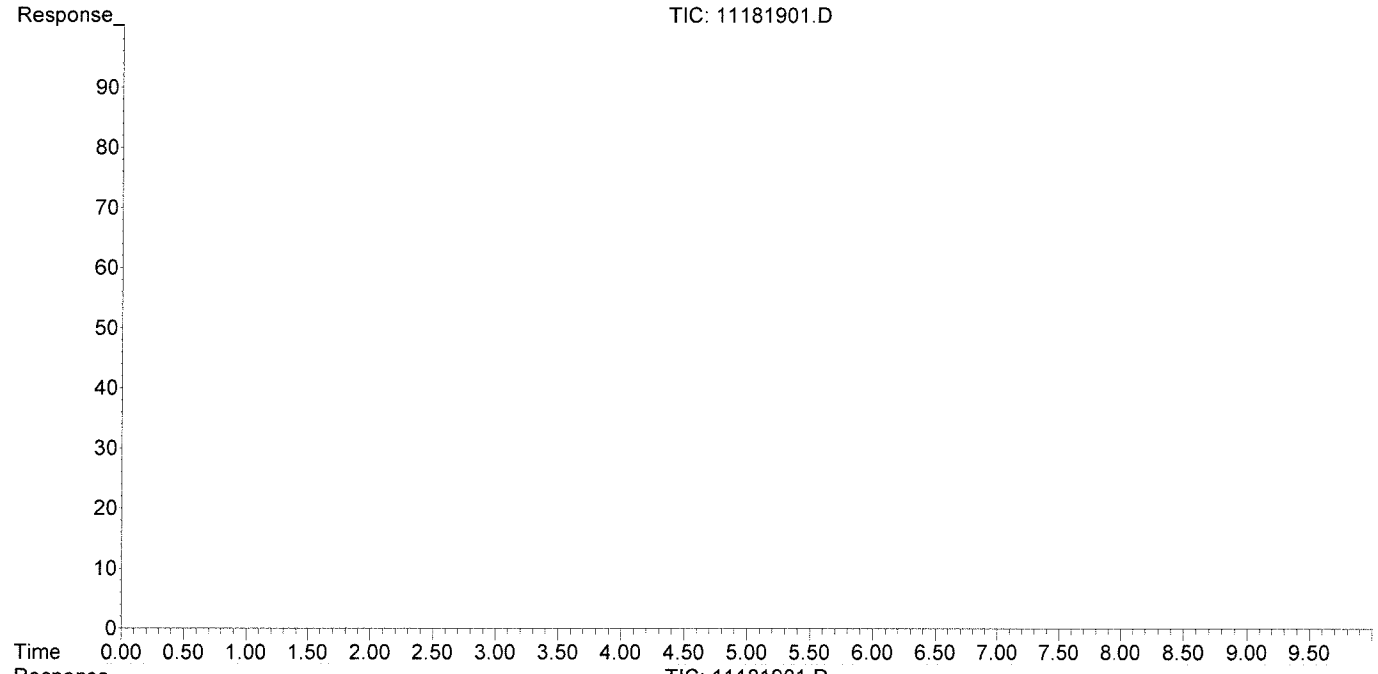
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.109	811925	89.511	ppm
7)	Ethylene	1.682	1584438	94.682	ppm
8)	Ethane	1.948	1591472	93.891	ppm
9)	Propylene	4.324	2313117	98.718	ppm
10)	Propane	4.447	2376077	95.501	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

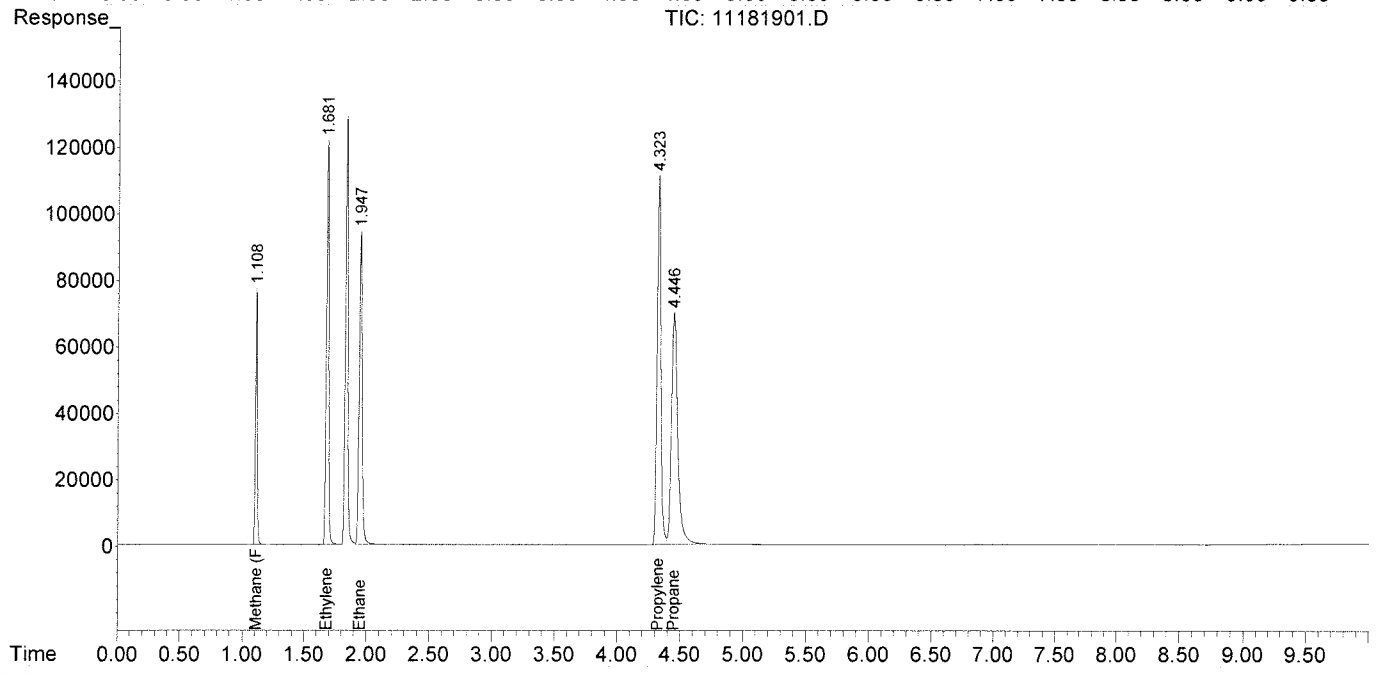
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 13:04:17
Operator : WH/LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 12:18:23 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 16:08:30
Operator : WH/LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 15:17:30 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

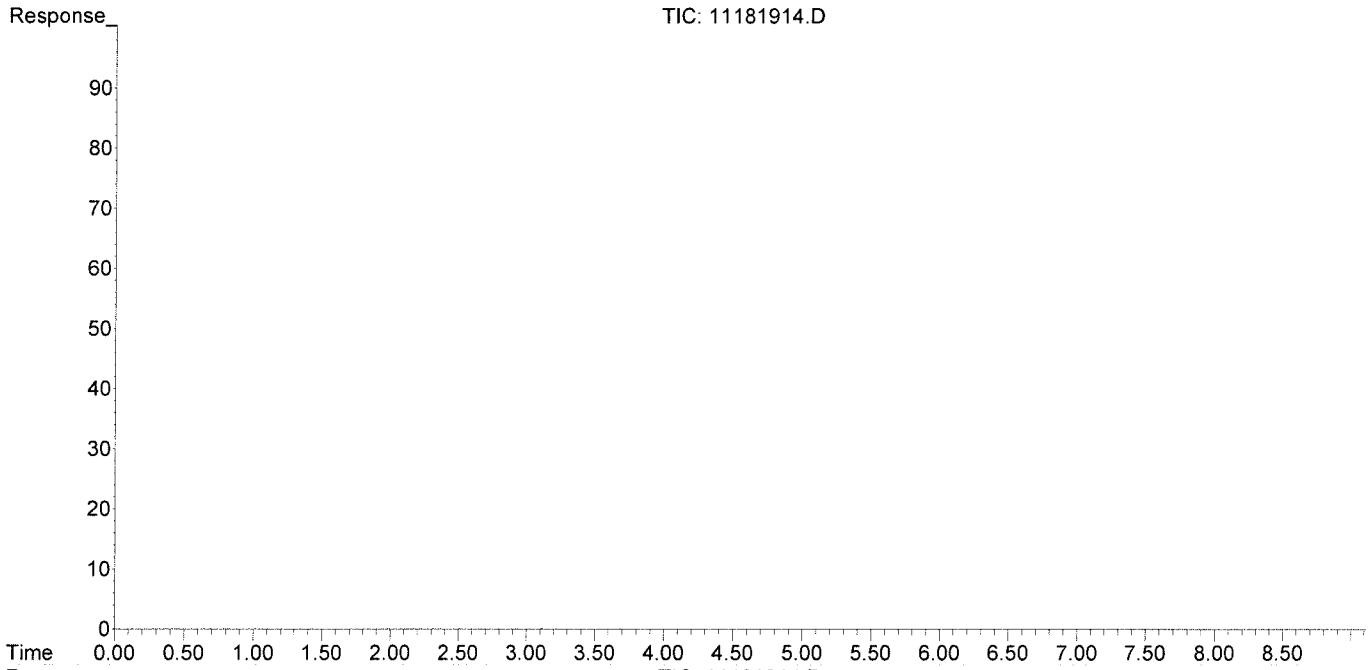
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	828575	91.347	ppm
7)	Ethylene	1.686	1617930	96.683	ppm
8)	Ethane	1.951	1627156	95.996	ppm
9)	Propylene	4.331	2359771	100.709	ppm
10)	Propane	4.454	2427573	97.570	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

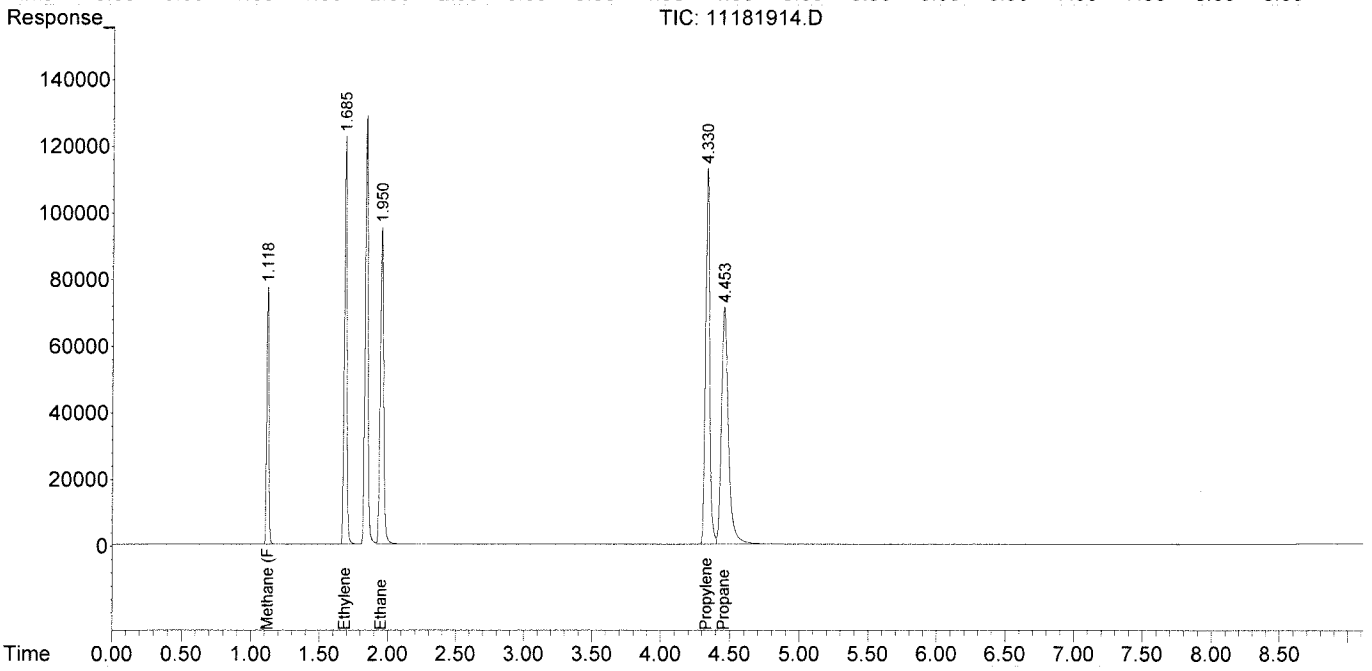
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\18\
Data File : 11181914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 18-Nov-2019, 16:08:30
Operator : WH/LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 18 15:17:30 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_09\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Sep-17, 08:38:08	09121701.D	test		MC	RSKBOTH.M	
2	12-Sep-17, 10:52:40	09121702.D	0.151ppm 0.250ml s32-09121702		MC	RSKBOTH.M	Curve
3	12-Sep-17, 11:05:49	09121703.D	0.302ppm 0.5ml s32-09121702		MC	RSKBOTH.M	Curve
4	12-Sep-17, 11:45:34	09121704.D	1.51ppm 0.1ml s32-09051701		MC	RSKBOTH.M	Curve
5	12-Sep-17, 12:09:33	09121705.D	4.53ppm 0.3ml s32-09051701		MC	RSKBOTH.M	Curve
6	12-Sep-17, 12:30:23	09121706.D	10.57ppm 0.7ml s32-09051701		MC	RSKBOTH.M	Curve
7	12-Sep-17, 12:47:18	09121707.D	200ppm 0.1ml s32-09121701		MC	RSKBOTH.M	Curve
8	12-Sep-17, 13:00:22	09121708.D	600ppm 0.3ml s32-09121701		MC	RSKBOTH.M	Curve
9	12-Sep-17, 13:47:48	09121709.D	1000ppm 0.5ml s32-09121701		MC	RSKBOTH.M	Curve
10	12-Sep-17, 14:07:58	09121710.D	2000ppm 1ml s32-09121701		MC	RSKBOTH.M	Curve
11	12-Sep-17, 14:48:48	09121711.D	4000ppm 0.1ml s32-08231701		MC	RSKBOTH.M	Curve
12	12-Sep-17, 15:21:51	09121712.D	20000ppm 0.5ml s32-08231701		MC	RSKBOTH.M	Curve
13	12-Sep-17, 15:38:59	09121713.D	mb 0.5ml		MC	RSKBOTH.M	Pass
14	12-Sep-17, 15:55:35	09121714.D	mb 0.1ml		MC	RSKBOTH.M	Pass
15	12-Sep-17, 16:15:26	09121715.D	icv s30-05241604		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2019_11\18\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	18-Nov-19, 13:04:17	11181901.D	STD S32-05221901		WH/LD	RSKBOTH.M	pass
2	18-Nov-19, 13:23:09	11181902.D	RB 0.1ml		WH/LD	RSKBOTH.M	pass
3	18-Nov-19, 13:36:03	11181903.D	MCS 0.1ml		WH/LD	RSKBOTH.M	pass
4	18-Nov-19, 13:52:11	11181904.D	LCS FID 0.1ml		WH/LD	RSKBOTH.M	pass
5	18-Nov-19, 14:05:22	11181905.D	LCSD FID 0.1ml		WH/LD	RSKBOTH.M	pass
6	18-Nov-19, 14:18:19	11181906.D	p1907035-001 0.1ml		WH/LD	RSKBOTH.M	
7	18-Nov-19, 14:31:17	11181907.D	p1907035-002 0.1ml		WH/LD	RSKBOTH.M	
8	18-Nov-19, 14:48:34	11181908.D	p1906981-001 0.1ml		WH/LD	RSKBOTH.M	
9	18-Nov-19, 15:01:59	11181909.D	p1906981-002 0.1ml		WH/LD	RSKBOTH.M	
10	18-Nov-19, 15:15:50	11181910.D	p1906981-003 0.1ml		WH/LD	RSKBOTH.M	
11	18-Nov-19, 15:28:41	11181911.D	p1906981-004 0.1ml		WH/LD	RSKBOTH.M	
12	18-Nov-19, 15:42:36	11181912.D	p1906981-005 0.1ml		WH/LD	RSKBOTH.M	
13	18-Nov-19, 15:55:33	11181913.D	p1906981-006 0.1ml		WH/LD	RSKBOTH.M	
14	18-Nov-19, 16:08:30	11181914.D	STD S32-05221901		WH/LD	RSKBOTH.M	pass

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1932283; 1932284; 1932352

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2320 (252432)

General Set Information: There were seventeen 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 1932284006 was analyzed and reported from a 1:10 dilution. Field sample 1932284007 was analyzed and reported from a 1:100 dilution. Field samples 1932284008/09/10 and 1932352003 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 685442) was less than 1/2 the CRDL. The recovery for the LCS (685439) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1932352005/06 (Client ID: 50WW23-191113). 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 – 685440) is reported from the analysis of the Laboratory Control Sample (LCS – 685439) 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 datafile 22NOV19D07.

Thomas Bosch November 25, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: November 26, 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: **34-1932284**
Project ID: HS19110644
Purchase Order: HS19110644
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
50WW29-191111	1932284001	11/11/19	11/14/19	HS19110644-01
50WW10-191111	1932284002	11/11/19	11/14/19	HS19110644-01
50WW09-191111	1932284003	11/11/19	11/14/19	HS19110644-01
50WW09-191111-FD	1932284004	11/11/19	11/14/19	HS19110644-01
50WW22-191112	1932284005	11/12/19	11/14/19	HS19110644-01
50WW08-191112	1932284006	11/12/19	11/14/19	HS19110644-01
50WW06-191112	1932284007	11/12/19	11/14/19	HS19110644-01
50WW11-191112	1932284008	11/12/19	11/14/19	HS19110644-01
50WW12-191112	1932284009	11/12/19	11/14/19	HS19110644-01
50WW12-191112-FD	1932284010	11/12/19	11/14/19	HS19110644-01

ANALYTICAL REPORT

Workorder: 34-1932284
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **50WW29-191111** | Sampling Site: HS19110644-01 | Collected: 11/11/2019
Lab ID: 1932284001 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 09:26 | **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

Sample ID: **50WW10-191111** | Sampling Site: HS19110644-01 | Collected: 11/11/2019
Lab ID: 1932284002 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 09:55 | **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: **50WW09-191111** | Sampling Site: HS19110644-01 | Collected: 11/11/2019
Lab ID: 1932284003 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 10:08 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**6.6**	1.0	2.0	4.0	1	

Sample ID: **50WW09-191111-FD** | Sampling Site: HS19110644-01 | Collected: 11/11/2019
Lab ID: 1932284004 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 10:22 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**7.4**	1.0	2.0	4.0	1	

ANALYTICAL REPORT

Workorder: 34-1932284
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **50WW22-191112** | Sampling Site: HS19110644-01 | Collected: 11/12/2019
Lab ID: 1932284005 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 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: **50WW08-191112** | Sampling Site: HS19110644-01 | Collected: 11/12/2019
Lab ID: 1932284006 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 10:50 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**83**	10	20	40	10	

Sample ID: **50WW06-191112** | Sampling Site: HS19110644-01 | Collected: 11/12/2019
Lab ID: 1932284007 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 13:39 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4300**	100	200	400	100	

Sample ID: **50WW11-191112** | Sampling Site: HS19110644-01 | Collected: 11/12/2019
Lab ID: 1932284008 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 11:18 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**8000**	1000	2000	4000	1000	

ANALYTICAL REPORT

Workorder: 34-1932284
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **50WW12-191112** | Sampling Site: HS19110644-01 | Collected: 11/12/2019
Lab ID: 1932284009 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 11:32 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**47000**	1000	2000	4000	1000	

Sample ID: **50WW12-191112-FD** | Sampling Site: HS19110644-01 | Collected: 11/12/2019
Lab ID: 1932284010 | Media: 125 mL Nalgene | Received: 11/14/2019
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/2320 (HBN: 252432) | **%Solids:** NA
Analyzed: 11/22/2019 11:59 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**43000**	1000	2000	4000	1000	

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 252432)**

Field sample 1932284006 was analyzed and reported from a 1:10 dilution. Field sample 1932284007 was analyzed and reported from a 1:100 dilution. Field samples 1932284008/09/10 and 1932352003 were analyzed and reported from 1:1,000 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 11/25/2019 12:25	/S/ Stephen Brose 11/26/2019 07:45

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: 34-1932284
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: 1932284

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2320 (HBN: 252432)
		Prepared By:	NA	**Analyzed By:**	Thom as Bosch

Blank

LMB: 685442
Analyzed: 11/22/2019 08:51
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 685439
Analyzed: 11/22/2019 08:23
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	2.92	3.00	97.3	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1932352004	**MS:**	1932352005					**MSD:**	1932352006					
Analyzed:	11/22/2019 12:55	**Analyzed:**	11/22/2019 13:09					**Analyzed:**	11/22/2019 13:23					
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	3.29	3	110	78.8	123.8	3.05	102	7.54	0.0	20.0

Comments

Field sample 1932284006 was analyzed and reported from a 1:10 dilution. Field sample 1932284007 was analyzed and reported from a 1:100 dilution. Field samples 1932284008/09/10 and 1932352003 were analyzed and reported from 1:1,000 dilutions. The reporting limits have 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
11/25/2019 12:27	11/26/2019 07:45

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

1932284

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

1932284

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: **Texas** **COC ID:** **12623**

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:	HS19110644
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19110644-01**	**50WW29-191111**	**Groundwater**	**11 Nov 2019 09:20**
	SUB_Perch-6850			27 Nov 2019
2.	**HS19110644-02**	**50WW10-191111**	**Groundwater**	**11 Nov 2019 10:15**
	SUB_Perch-6850			27 Nov 2019
3.	**HS19110644-03**	**50WW09-191111**	**Groundwater**	**11 Nov 2019 11:05**
	SUB_Perch-6850			27 Nov 2019
4.	**HS19110644-04**	**50WW09-191111-FD**	**Groundwater**	**11 Nov 2019 11:05**
	SUB_Perch-6850			27 Nov 2019
5.	**HS19110644-05**	**50WW22-191112**	**Groundwater**	**12 Nov 2019 08:30**
	SUB_Perch-6850			27 Nov 2019
6.	**HS19110644-06**	**50WW08-191112**	**Groundwater**	**12 Nov 2019 09:30**
	SUB_Perch-6850			27 Nov 2019
7.	**HS19110644-07**	**50WW06-191112**	**Groundwater**	**12 Nov 2019 10:30**
	SUB_Perch-6850			27 Nov 2019
8.	**HS19110644-08**	**50WW11-191112**	**Groundwater**	**12 Nov 2019 11:30**
	SUB_Perch-6850			27 Nov 2019
9.	**HS19110644-09**	**50WW12-191112**	**Groundwater**	**12 Nov 2019 12:30**

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12623**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
		SUB_Perch-6850		27 Nov 2019
10.	**HS19110644-10**	**50WW12-191112-FD**	**Groundwater**	**12 Nov 2019 12:30**
	SUB_Perch-6850			27 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: _____ Date/Time: 11/13/19 1800

Received By: Jay Lynn Date/Time: 11/14/19 09:08

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19110644-01	***Split:***	**Workorder ID:** 1932284	**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)	Count	Requested Analysis: EPA 6850, DoD QSM
1	11/11/2019 09:20	50WW29-191111	1932284001		Water	A	1	A
2	11/11/2019 10:15	50WW10-191111	1932284002		Water	A	1	A
3	11/11/2019 11:05	50WW09-191111	1932284003		Water	A	1	A
4	11/11/2019 11:05	50WW09-191111-FD	1932284004		Water	A	1	A
5	11/12/2019 08:30	50WW22-191112	1932284005		Water	A	1	A
6	11/12/2019 09:30	50WW08-191112	1932284006		Water	A	1	A
7	11/12/2019 10:30	50WW06-191112	1932284007		Water	A	1	A
8	11/12/2019 11:30	50WW11-191112	1932284008		Water	A	1	A
9	11/12/2019 12:30	50WW12-191112	1932284009		Water	A	1	A
10	11/12/2019 12:30	50WW12-191112-FD	1932284010		Water	A	1	A

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	11/14/2019 09:08	ALS Sample Receiving	Sample Login
Tami VanTassell R.331	11/14/19 14:55	BB	Storage
	11.2019/14:00	T.Booth	clay 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: _____

Date/Time of Receipt: 11/14/19 09:08

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	Great	2 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: JayLynn Signature JayLynn Johnson Printed Name 11/14/19 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:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 13NOV19
ACTWGT: 18.95 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19110615/644/646 - RJ

FedEx Express

TRK# 0201 1251 0291 7712

THU - 14 NOV 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

551C1/F330/104C

Batch Worklist

Batch: ELMS/ 2320 Created: 11/22/2019 07:40 Instrument:

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

HBN: 252432

Workorder: 1932283 [ENV_LVL4]
Workorder: 1932284 [ENV_LVL4]
Workorder: 1932352 [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	685438	CCV for HBN 252432 [ELMS/2320]				CCV	3		E685041C3Q	5311		11/27/2019	
2	685439	LCS for HBN 252432 [ELMS/2320]				LCS	3		E6850Q413Q	5311		11/27/2019	
3	685440	RLVS for HBN 252432 [ELMS/2320				RLVS	3		E685041C3Q	5311		11/27/2019	
4	685441	ICS for HBN 252432 [ELMS/2320]				ICS	3		E6850..D3Q	5311		11/27/2019	
5	685442	LMB for HBN 252432 [ELMS/2320]				LMB	3		E6850Q413Q	5311		11/27/2019	
6	1932283001	LH18/24-SP650_111219_AIX				SAMPLE	3	1932283001-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
7	1932284001	50WW29-191111				SAMPLE	3	1932284001-A	E6850Q41.3	5480	12/9/2019	11/27/2019	
8	1932284002	50WW10-191111				SAMPLE	3	1932284002-A	E6850Q41.3	5480	12/9/2019	11/27/2019	
9	1932284003	50WW09-191111				SAMPLE	3	1932284003-A	E6850Q41.3	5480	12/9/2019	11/27/2019	
10	1932284004	50WW09-191111-FD				SAMPLE	3	1932284004-A	E6850Q41.3	5480	12/9/2019	11/27/2019	
11	1932284005	50WW22-191112				SAMPLE	3	1932284005-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
12	1932284006	50WW08-191112				SAMPLE	3	1932284006-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
13	1932284007	50WW06-191112				SAMPLE	3	1932284007-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
14	1932284008	50WW11-191112				SAMPLE	3	1932284008-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
15	1932284009	50WW12-191112				SAMPLE	3	1932284009-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
16	685443	CCV for HBN 252432 [ELMS/2320]				CCV	3		E685041C3Q	5311		11/27/2019	
17	1932284010	50WW12-191112-FD				SAMPLE	3	1932284010-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
18	1932352001	50WW16-191113				SAMPLE	3	1932352001-A	E6850Q41.3	5480	12/11/2019	12/2/2019	
19	1932352002	50WW14-191113				SAMPLE	3	1932352002-A	E6850Q41.3	5480	12/11/2019	12/2/2019	
20	1932352003	50WW13-191113				SAMPLE	3	1932352003-A	E6850Q41.3	5480	12/11/2019	12/2/2019	
21	1932352004	50WW23-191113				SAMPLE	3	1932352004-A	E6850Q41.3	5480	12/11/2019	12/2/2019	
22	1932352005	50WW23-191113 MS				MS	3	1932352005-A	E6850Q413Q	5480		11/27/2019	
23	1932352006	50WW23-191113 MSD				MSD	3	1932352006-A	E6850Q413Q	5480		11/27/2019	
24	685444	CCV for HBN 252432 [ELMS/2320]				CCV	3		E685041C3Q	5311		11/27/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 1932283 (001); 1932284 (001-10); 1932352 (001-06)
ELMS Batch/HBN ID: 2320 (252432)
Prep Date: 11/20/2019 Analysis Date: 11/22/2019 Analyst: Tom Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\NOV\22NOV19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom 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: 35µL
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 685439; Target = 3.0µg/L. ASTM type II water was used for LMB 685442.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1932352005/06 (Client ID's: 50WW23-191113. 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 1932284006 was analyzed and reported from a 1:10 dilution. Field sample 1932284007 was analyzed and reported from a 1:100 dilution. Field samples 1932284008/09/10 and 1932352003 were analyzed and reported from 1:1,000 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\2019\NOV\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\252432-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 685440) is reported from the analysis of the Laboratory Control Sample (LCS – 685439) 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 datafile 22NOV19D07.

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 2320 HBN: 252432 **Sample Set IDs if Applicable:** 1932283/1932284/1932352	**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	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/20/2019 03:09PM	**Expires:** 07/25/2020
MFG Lot: TNB: 09/20/2019		**Usable:** Yes
Pipette ID: Not Provided		**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	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** Yes
Part ID: IC-PER-10X-1		**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	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/23/2019 03:09PM	**Expires:** 07/25/2020
MFG Lot: TNB: 09/20/2019		**Usable:** Yes
Pipette ID: Not Provided		**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	**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	**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

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

AccuStandard

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ISO 9001 ISO 17025 ISO GUIDE 34 ULTRA

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 GUIDE 34 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

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*: ** For isotopically labeled compounds, MW listed is for the fully enriched product.*	130.44
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.

$NaCl^{18}O_4$

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

01009844

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
*	685438 CCV@25	Vial 71	1	Control	1	1.18387e6	7.449	24.67940
*	685439 QC@3.0	Vial 72	1	Control	2	1.54064e5	7.386	2.91840
*	685441 ICS@3.0	Vial 73	1	Control	3	8.60264e4	7.254	2.21034
*	685442 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1932283001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1932284001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1932284002	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1932284003	Vial 78	1	Sample	8	3.39907e5	7.111	6.60218
*	1932284004	Vial 79	1	Sample	9	3.51318e5	7.127	7.40859
*	1932284005	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1932284006 10X	Vial 81	1	Sample	11	3.45930e5	7.327	83.07076
*	1932284008 1K	Vial 83	1	Sample	13	3.33136e5	7.511	7986.47256
*	1932284009 1K	Vial 84	1	Sample	14	2.24426e6	7.566	4.73695e4
*	685443 CCV@25	Vial 71	1	Control	15	1.08713e6	7.452	23.36377
*	1932284010 1K	Vial 85	1	Sample	16	2.57913e6	7.503	4.25987e4
*	1932352001	Vial 86	1	Sample	17	8.45132e4	7.334	1.64039
*	1932352002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1932352003 1K	Vial 88	1	Sample	19	2.46586e5	7.620	4887.02652
*	1932352004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1932352005 MS	Vial 90	1	Sample	21	1.31208e5	7.056	3.28992
*	1932352006 MSD	Vial 91	1	Sample	22	1.21739e5	6.973	3.05088
*	1932284007 100	Vial 92	1	Sample	23	2.00097e6	7.508	4344.98594
*	685444 CCV@25	Vial 71	1	Control	24	1.01321e6	7.528	23.41845

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	685438 CCV@25	Vial 71	1	Control	1	1.64125e5	7.468	5.00000
*	685439 QC@3.0	Vial 72	1	Control	2	1.94166e5	7.409	5.00000
*	685441 ICS@3.0	Vial 73	1	Control	3	1.42348e5	7.286	5.00000
*	685442 LMB	Vial 74	1	Control	4	1.76890e5	7.423	5.00000
*	1932283001	Vial 75	1	Sample	5	1.50033e5	7.238	5.00000
*	1932284001	Vial 76	1	Sample	6	1.75095e5	7.088	5.00000
*	1932284002	Vial 77	1	Sample	7	1.69527e5	7.355	5.00000
*	1932284003	Vial 78	1	Sample	8	1.89098e5	7.138	5.00000
*	1932284004	Vial 79	1	Sample	9	1.73764e5	7.145	5.00000
*	1932284005	Vial 80	1	Sample	10	1.68474e5	7.001	5.00000
*	1932284006 10X	Vial 81	1	Sample	11	1.52150e5	7.348	50.00000
*	1932284008 1K	Vial 83	1	Sample	13	1.52567e5	7.535	5000.00000
*	1932284009 1K	Vial 84	1	Sample	14	1.48043e5	7.591	5000.00000
*	685443 CCV@25	Vial 71	1	Control	15	1.60069e5	7.476	5.00000
*	1932284010 1K	Vial 85	1	Sample	16	1.92723e5	7.534	5000.00000
*	1932352001	Vial 86	1	Sample	17	1.86562e5	7.360	5.00000
*	1932352002	Vial 87	1	Sample	18	1.64477e5	7.141	5.00000
*	1932352003 1K	Vial 88	1	Sample	19	1.85984e5	7.653	5000.00000
*	1932352004	Vial 89	1	Sample	20	1.67521e5	7.041	5.00000
*	1932352005 MS	Vial 90	1	Sample	21	1.46896e5	7.077	5.00000
*	1932352006 MSD	Vial 91	1	Sample	22	1.46852e5	6.990	5.00000
*	1932284007 100	Vial 92	1	Sample	23	1.46105e5	7.536	500.00000
*	685444 CCV@25	Vial 71	1	Control	24	1.48803e5	7.553	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	685438 CCV@25	Vial 71	1	Control	1	3.62557e5	7.464	24.77392
*	685439 QC@3.0	Vial 72	1	Control	2	4.98007e4	7.424	3.00461

Batch Report: C:\HPCHEM\1\DATA\22NOV19D\22NOV19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	685441 ICS@3.0	Vial 73	1	Control	3	3.55197e4	7.263	2.91970
*	685442 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1932283001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1932284001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1932284002	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1932284003	Vial 78	1	Sample	8	1.13127e5	7.120	7.10077
*	1932284004	Vial 79	1	Sample	9	1.17024e5	7.135	7.98367
*	1932284005	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1932284006 10X	Vial 81	1	Sample	11	1.11676e5	7.348	86.89341
*	1932284008 1K	Vial 83	1	Sample	13	1.02889e5	7.529	7994.43215
*	1932284009 1K	Vial 84	1	Sample	14	6.95779e5	7.584	4.83298e4
*	685443 CCV@25	Vial 71	1	Control	15	3.40343e5	7.472	23.92121
*	1932284010 1K	Vial 85	1	Sample	16	7.87731e5	7.521	4.28684e4
*	1932352001	Vial 86	1	Sample	17	2.73332e4	7.346	1.65533
*	1932352002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1932352003 1K	Vial 88	1	Sample	19	7.88807e4	7.651	5031.65245
*	1932352004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1932352005 MS	Vial 90	1	Sample	21	4.82831e4	7.074	3.88198
*	1932352006 MSD	Vial 91	1	Sample	22	4.25685e4	6.990	3.41115
*	1932284007 100	Vial 92	1	Sample	23	6.21132e5	7.526	4434.86232
*	685444 CCV@25	Vial 71	1	Control	24	3.26599e5	7.551	24.62821

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\NOV\22NOV19D.S

Sequence Table:

Method and Injection Info Part:

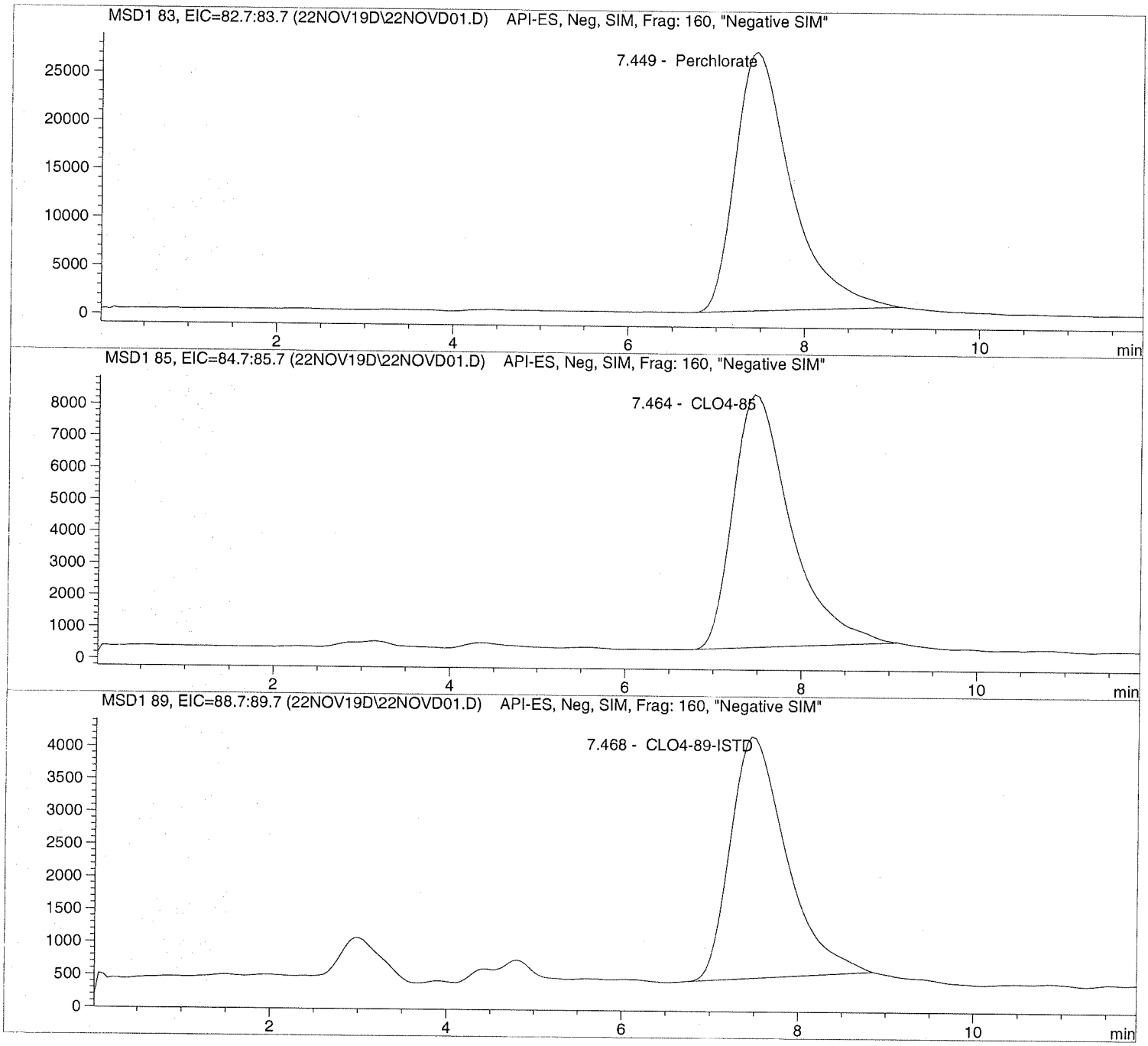
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	685438	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	685439	QC@3.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	685441	ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	685442	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1932283001		CLO4-AQN	1	Sample		
6	Vial 76	1932284001		CLO4-AQN	1	Sample		
7	Vial 77	1932284002		CLO4-AQN	1	Sample		
8	Vial 78	1932284003		CLO4-AQN	1	Sample		
9	Vial 79	1932284004		CLO4-AQN	1	Sample		
10	Vial 80	1932284005		CLO4-AQN	1	Sample		
11	Vial 81	1932284006	10X	CLO4-AQN	1	Sample		
12	Vial 82	1932284007	1K	CLO4-AQN	1	Sample		
13	Vial 83	1932284008	1K	CLO4-AQN	1	Sample		
14	Vial 84	1932284009	1K	CLO4-AQN	1	Sample		
15	Vial 71	685443	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1932284010	1K	CLO4-AQN	1	Sample		
17	Vial 86	1932352001		CLO4-AQN	1	Sample		
18	Vial 87	1932352002		CLO4-AQN	1	Sample		
19	Vial 88	1932352003	1K	CLO4-AQN	1	Sample		
20	Vial 89	1932352004		CLO4-AQN	1	Sample		
21	Vial 90	1932352005	MS	CLO4-AQN	1	Sample		
22	Vial 91	1932352006	MSD	CLO4-AQN	1	Sample		
23	Vial 92	1932284007	100	CLO4-AQN	1	Sample		
24	Vial 71	685444	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD01.D Sample Name: 685438 CCV@25

Injection Date:	11/22/2019 08:07:39	Seq Line:	1
Sample Name:	685438 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\22NOV19D\22NOVD01.D Sample Name: 685438 CCV@25

Injection Date:	11/22/2019 08:07:39	Seq Line:	1
Sample Name:	685438 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
7.449	PBA	1183865.7	24.6794	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.464	PBA	362557.4	24.7739	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.468	PBA	164125.4	5.0000	CLO4-89-ISTD

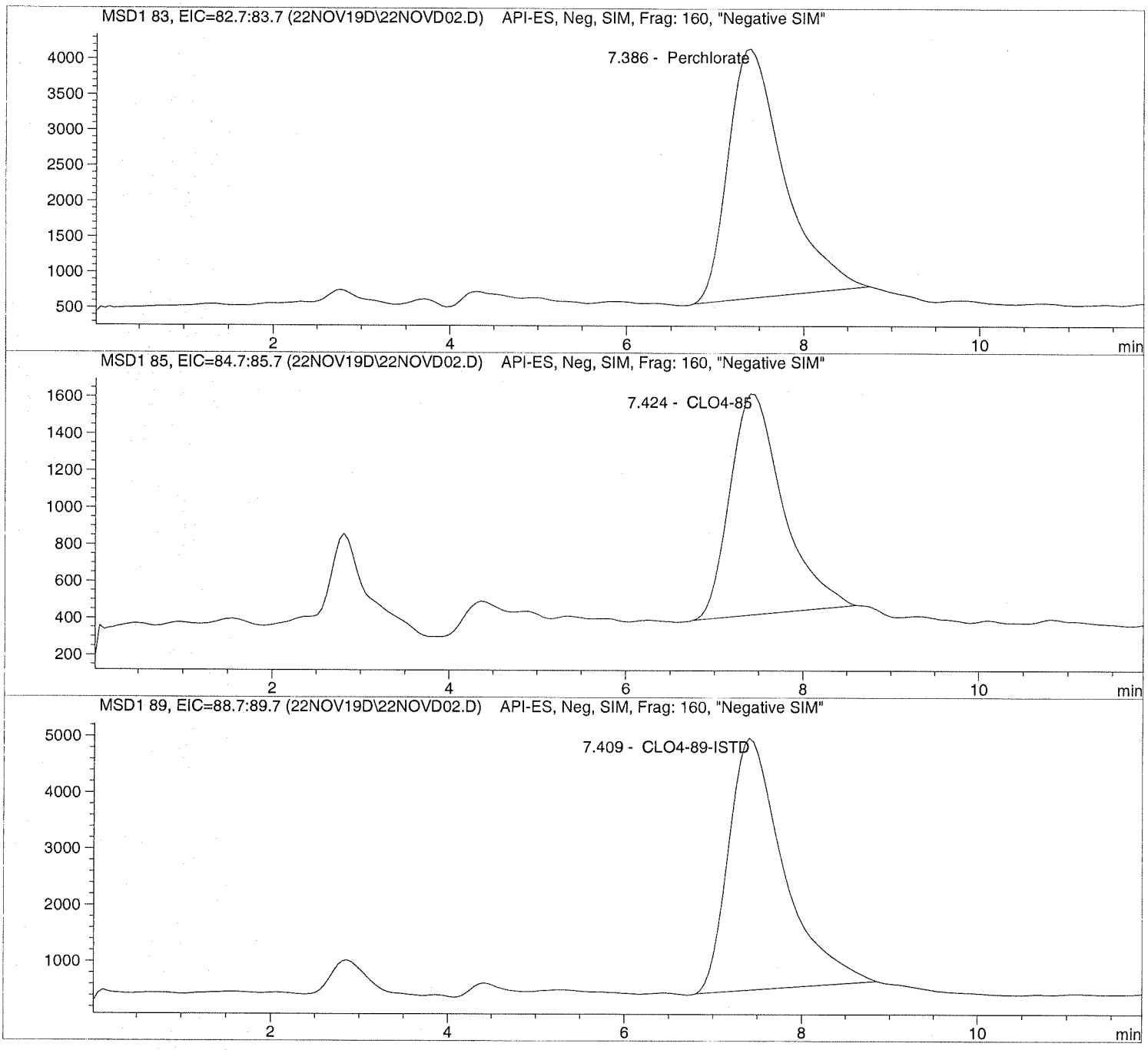
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD02.D Sample Name: 685439 QC@3.0

Injection Date:	11/22/2019 08:23:13	Seq Line:	2
Sample Name:	685439 QC@3.0	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\22NOV19D\22NOVD02.D Sample Name: 685439 QC@3.0

Injection Date:	11/22/2019 08:23:13	Seq Line:	2
Sample Name:	685439 QC@3.0	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: 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
7.386	PBA	154063.9	2.9184	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.424	PBA	49800.7	3.0046	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.409	PBA	194166.2	5.0000	CLO4-89-ISTD

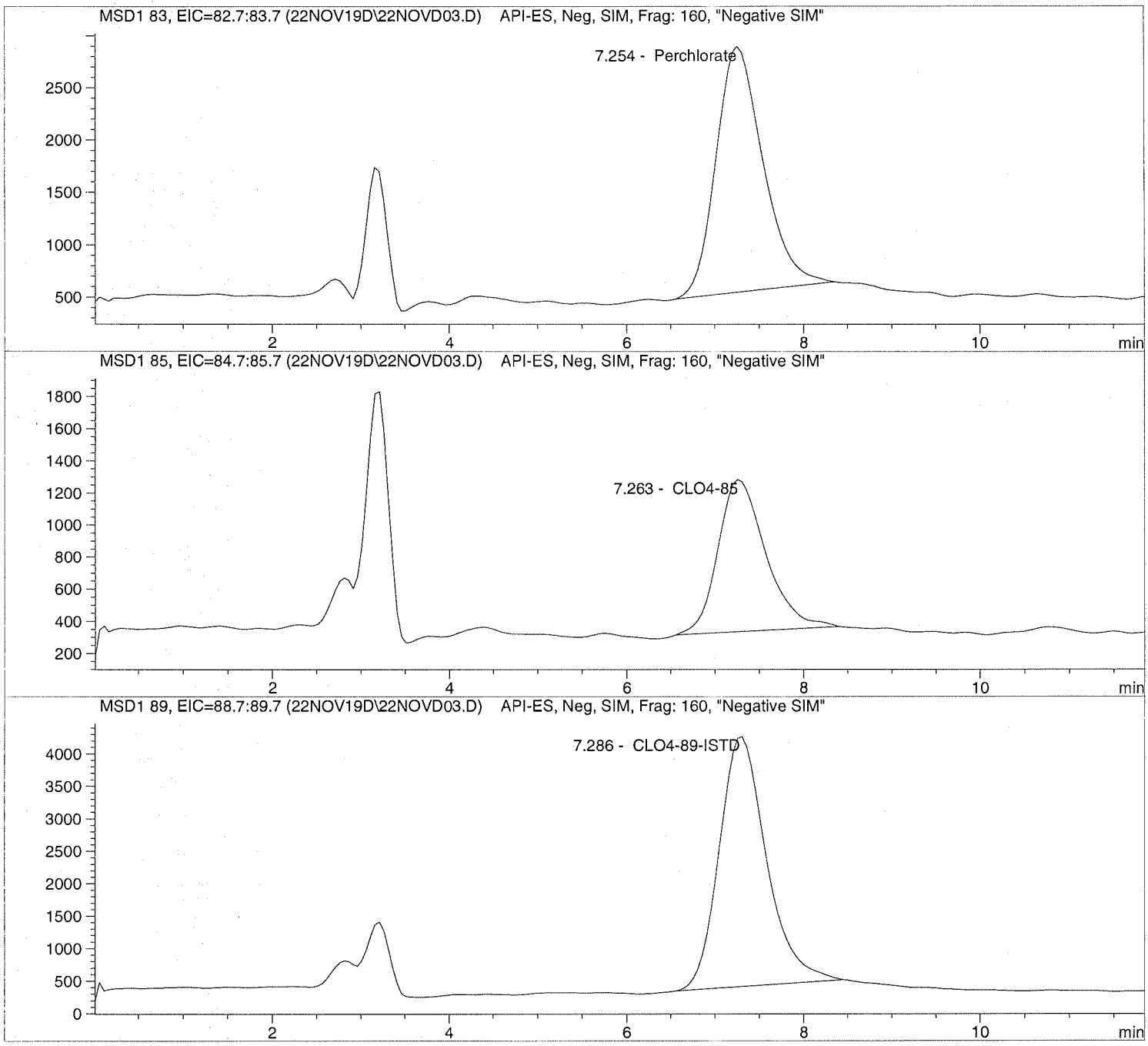
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD03.D Sample Name: 685441 ICS@3.0

Injection Date:	11/22/2019 08:37:06	Seq Line:	3
Sample Name:	685441 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\22NOV19D\22NOVD03.D Sample Name: 685441 ICS@3.0

Injection Date:	11/22/2019 08:37:06	Seq Line:	3
Sample Name:	685441 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
7.254	PBA	86026.4	2.2103	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.263	BBA	35519.7	2.9197	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.286	PBA	142348.3	5.0000	CLO4-89-ISTD

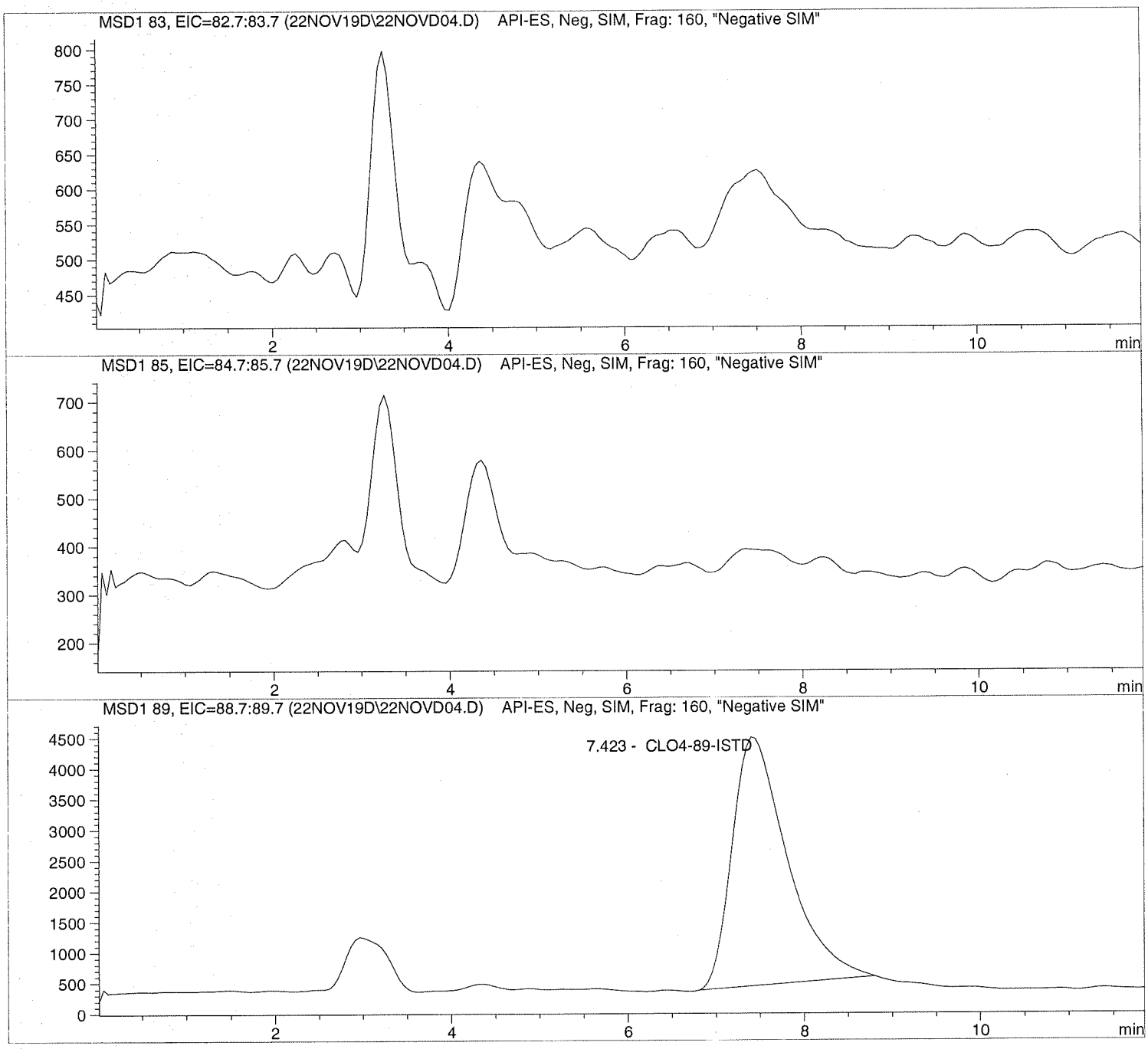
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD04.D Sample Name: 685442 LMB

Injection Date:	11/22/2019 08:51:01	Seq Line:	4
Sample Name:	685442 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\22NOV19D\22NOVD04.D Sample Name: 685442 LMB

Injection Date:	11/22/2019 08:51:01	Seq Line:	4
Sample Name:	685442 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:	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
7.423	PBA	176890.3	5.0000	CLO4-89-ISTD

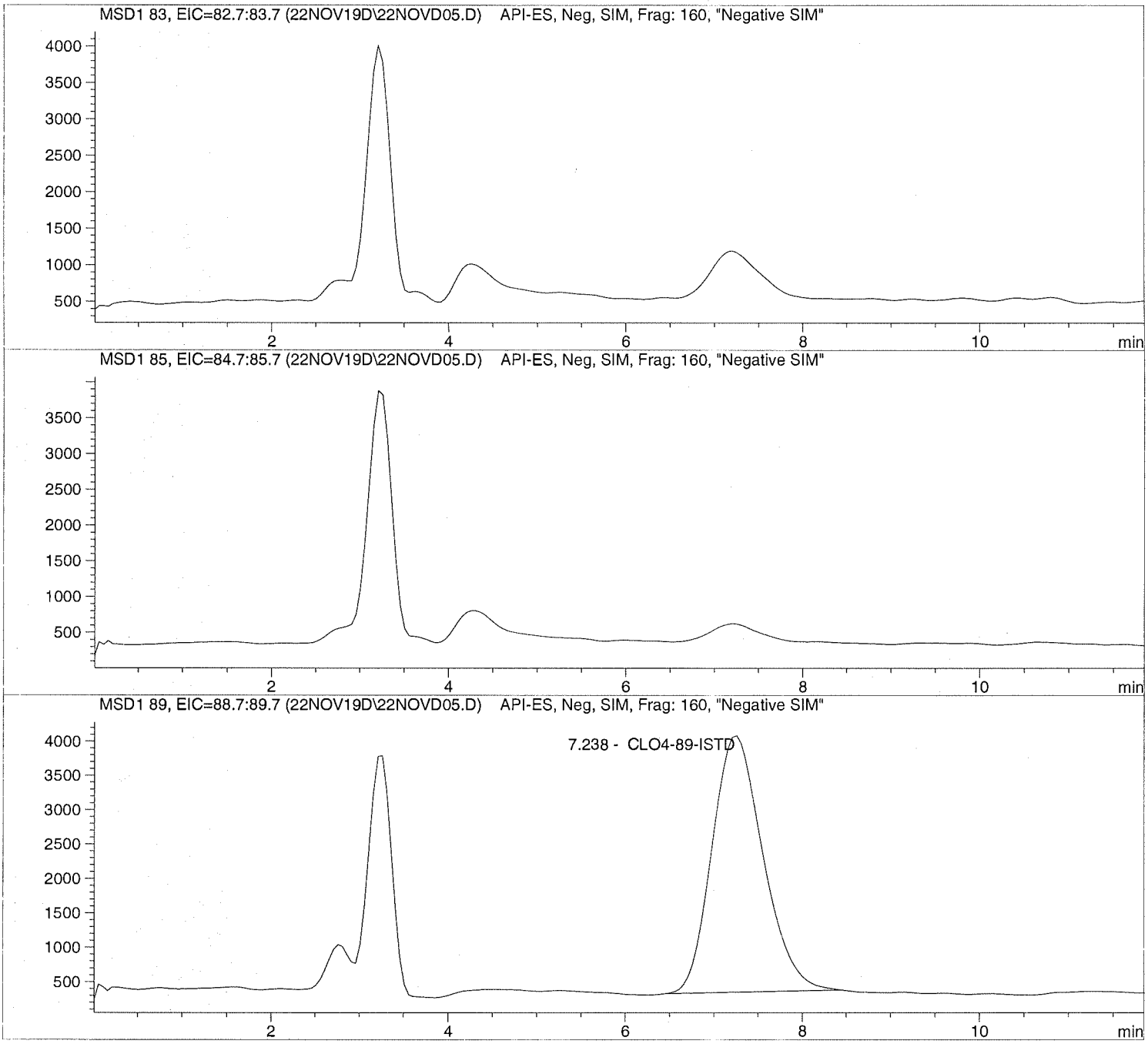
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD05.D Sample Name: 1932283001

Injection Date:	11/22/2019 09:12:41	Seq Line:	5
Sample Name:	1932283001	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\22NOV19D\22NOVD05.D Sample Name: 1932283001

Injection Date:	11/22/2019 09:12:41	Seq Line:	5
Sample Name:	1932283001	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:	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
7.238	PBA	150033.3	5.0000	CLO4-89-ISTD

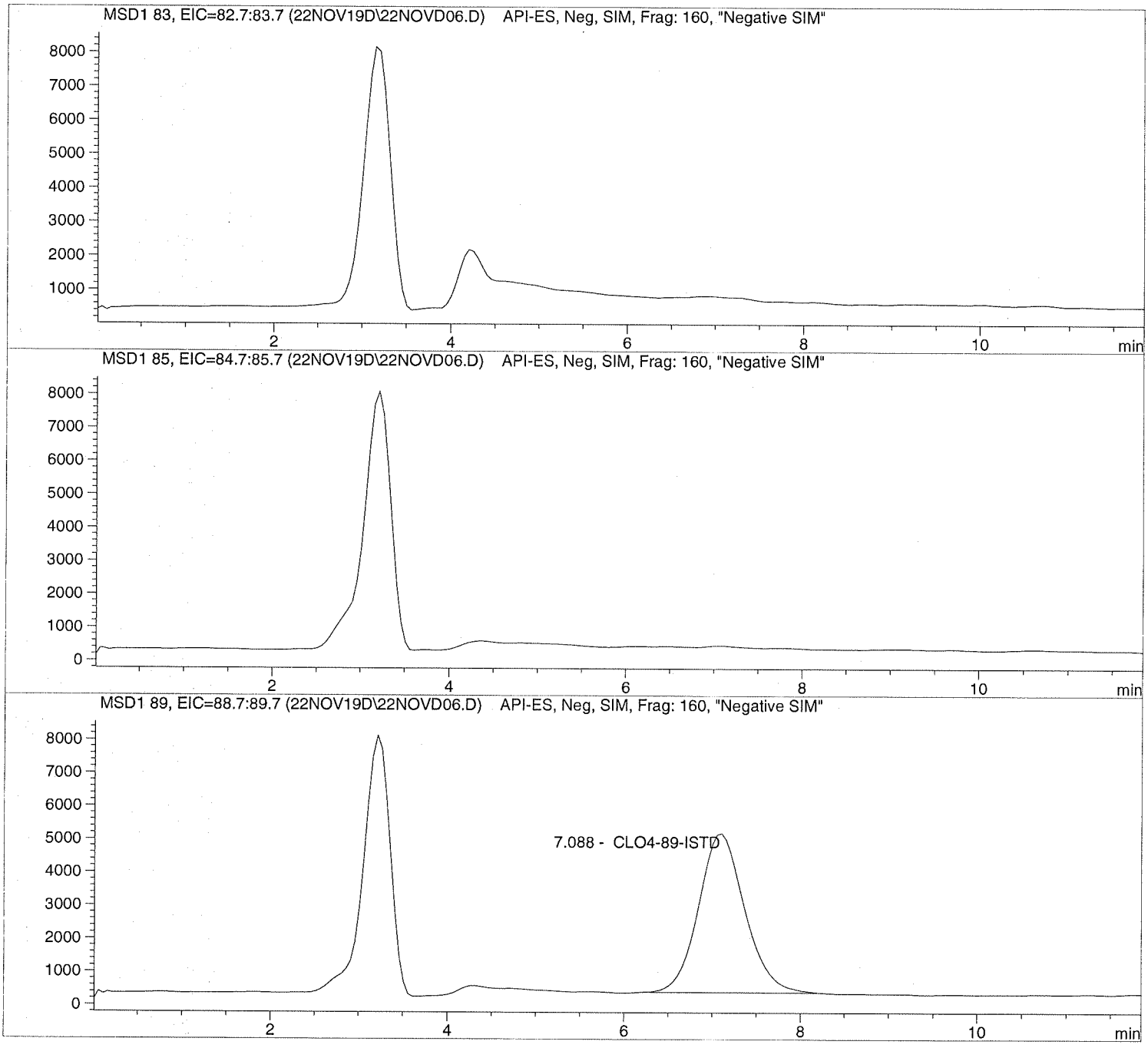
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD06.D Sample Name: 1932284001

Injection Date:	11/22/2019 09:26:34	Seq Line:	6
Sample Name:	1932284001	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\22NOV19D\22NOVD06.D Sample Name: 1932284001

Injection Date:	11/22/2019 09:26:34	Seq Line:	6
Sample Name:	1932284001	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:	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
7.088	BBA	175095.0	5.0000	CLO4-89-ISTD

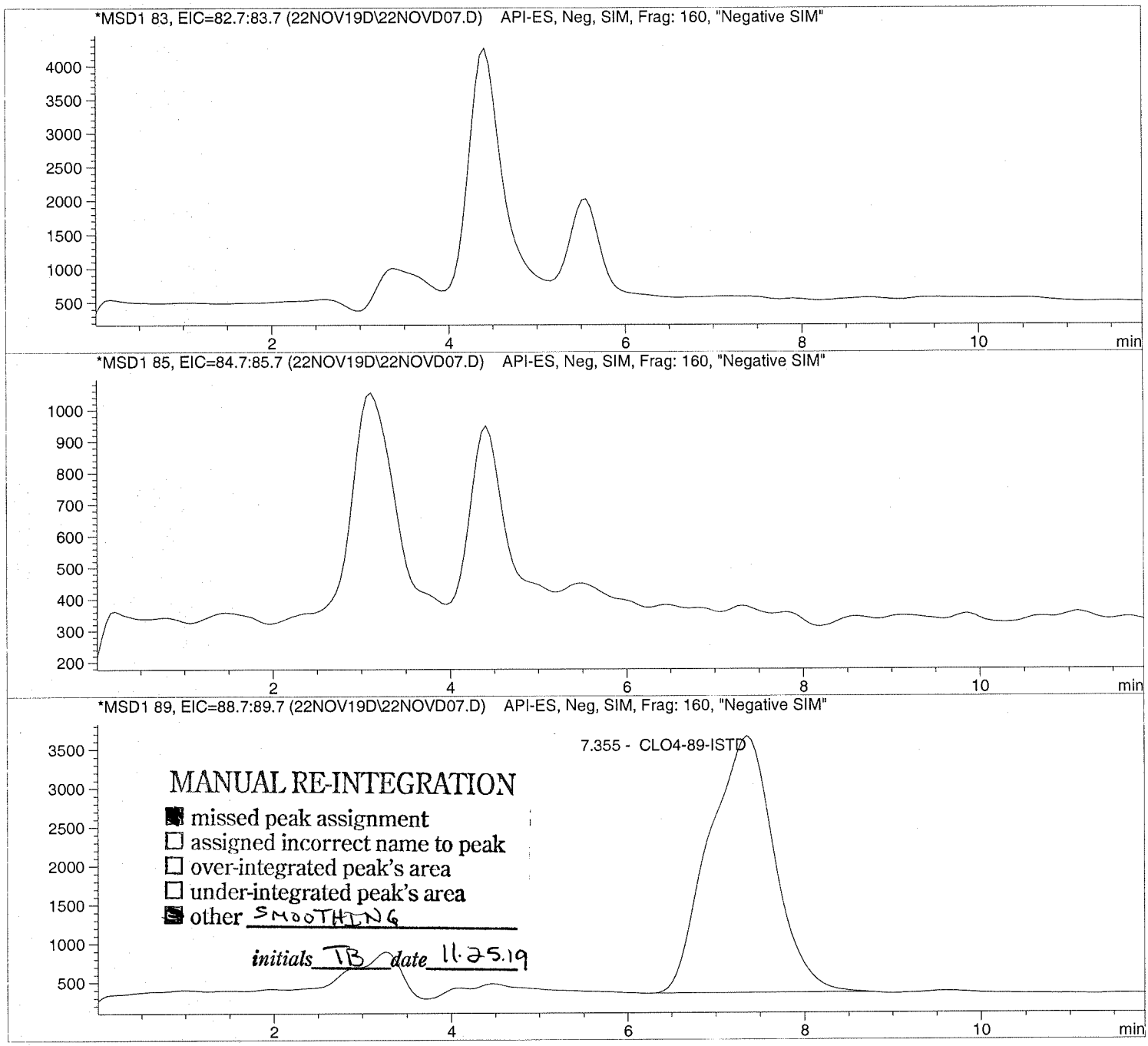
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD07.D Sample Name: 1932284002

Injection Date:	11/22/2019 09:55:02	Seq Line:	7
Sample Name:	1932284002	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\22NOV19D\22NOVD07.D Sample Name: 1932284002

Injection Date:	11/22/2019 09:55:02	Seq Line:	7
Sample Name:	1932284002	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:	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
7.355	PBA	169526.6	5.0000	CLO4-89-ISTD

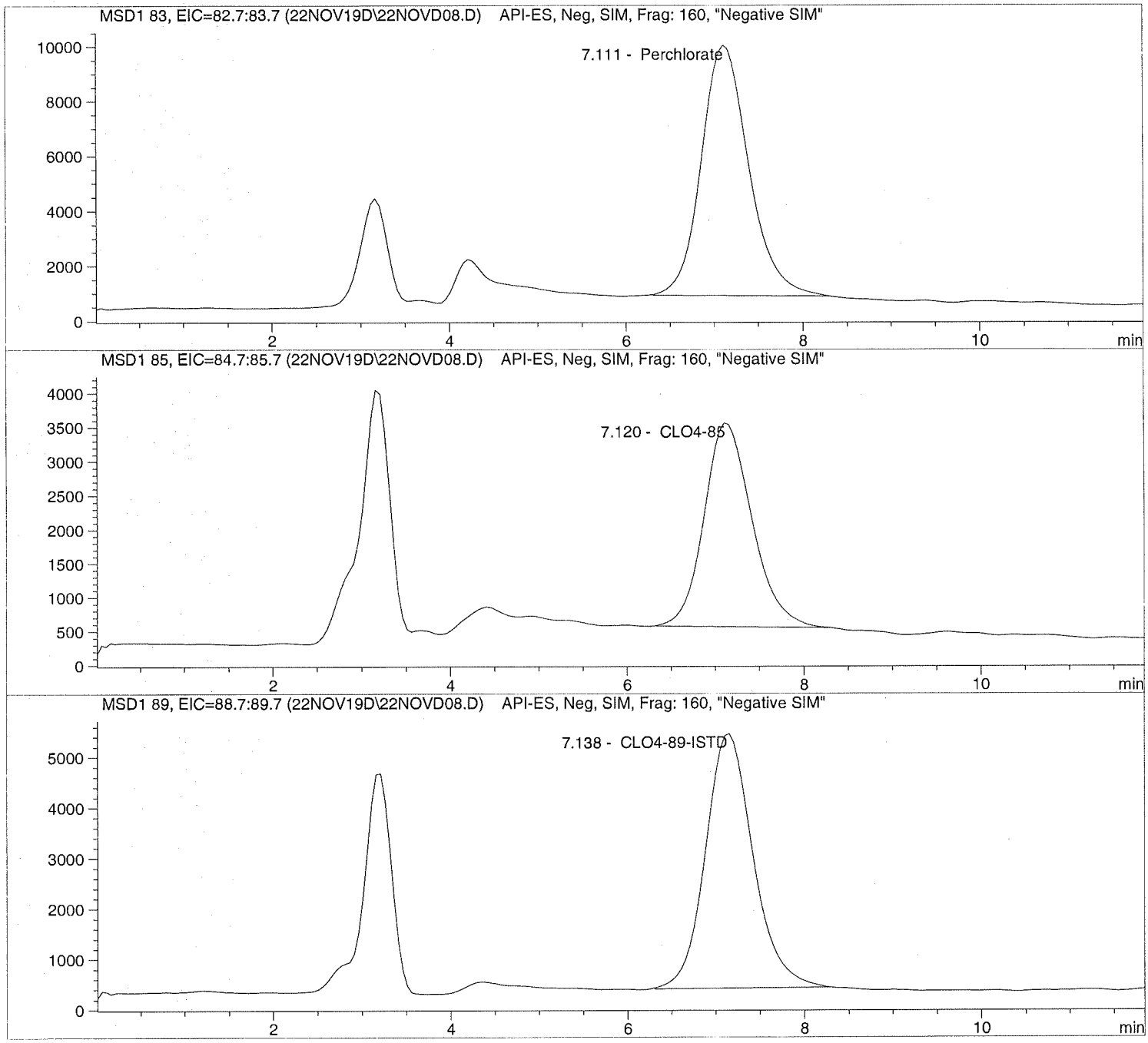
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD08.D Sample Name: 1932284003

Injection Date:	11/22/2019 10:08:56	Seq Line:	8
Sample Name:	1932284003	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\22NOV19D\22NOVD08.D Sample Name: 1932284003

Injection Date:	11/22/2019 10:08:56	Seq Line:	8
Sample Name:	1932284003	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:	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
7.111	BBA	339906.7	6.6022	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.120	PBA	113127.0	7.1008	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.138	PBA	189097.7	5.0000	CLO4-89-ISTD

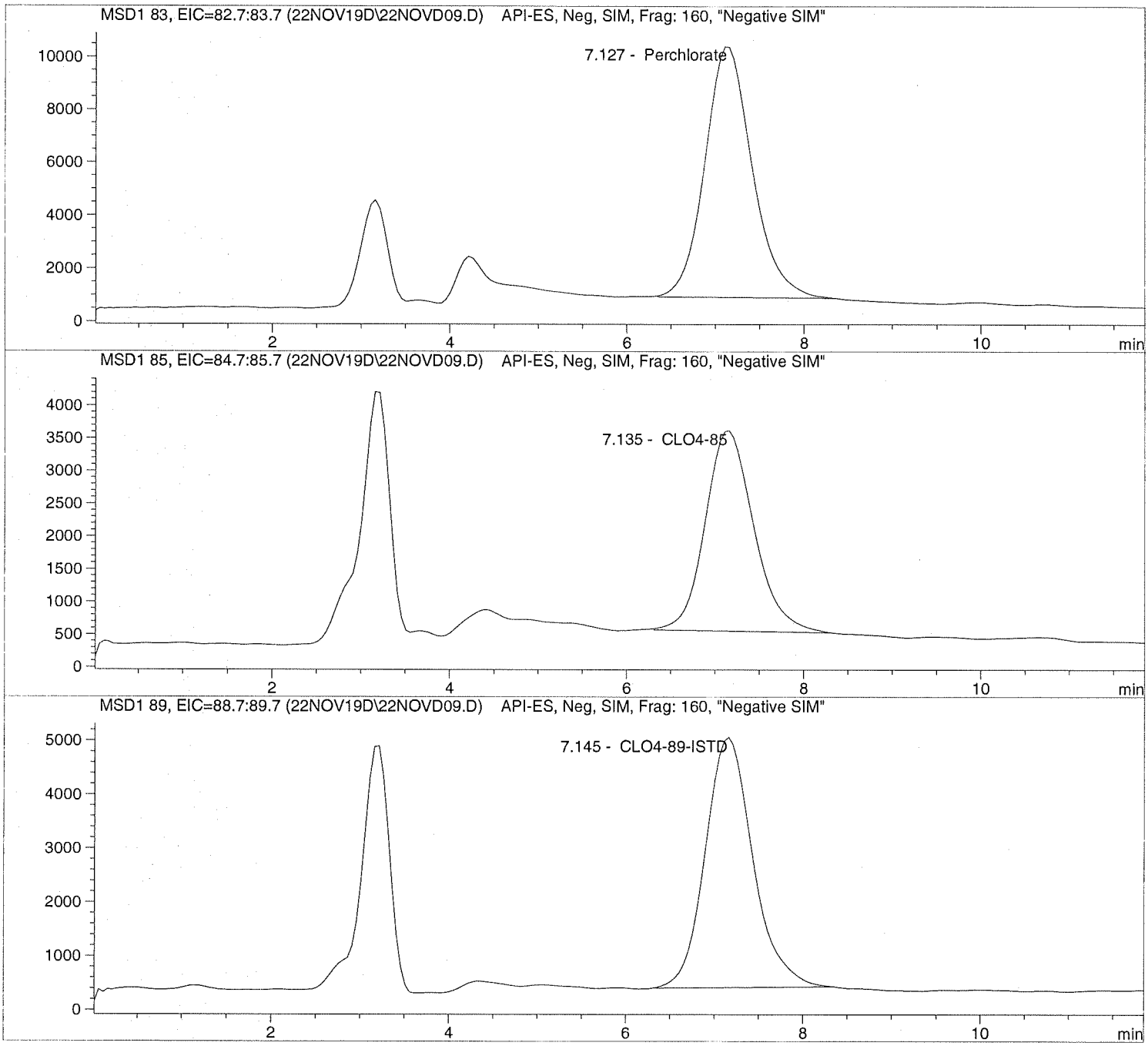
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD09.D Sample Name: 1932284004

Injection Date:	11/22/2019 10:22:49	Seq Line:	9
Sample Name:	1932284004	Location:	Vial 79
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\22NOV19D\22NOVD09.D Sample Name: 1932284004

Injection Date:	11/22/2019 10:22:49	Seq Line:	9
Sample Name:	1932284004	Location:	Vial 79
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:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.127	BBA	351317.6	7.4086	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.135	BBA	117024.3	7.9837	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.145	PBA	173763.9	5.0000	CLO4-89-ISTD

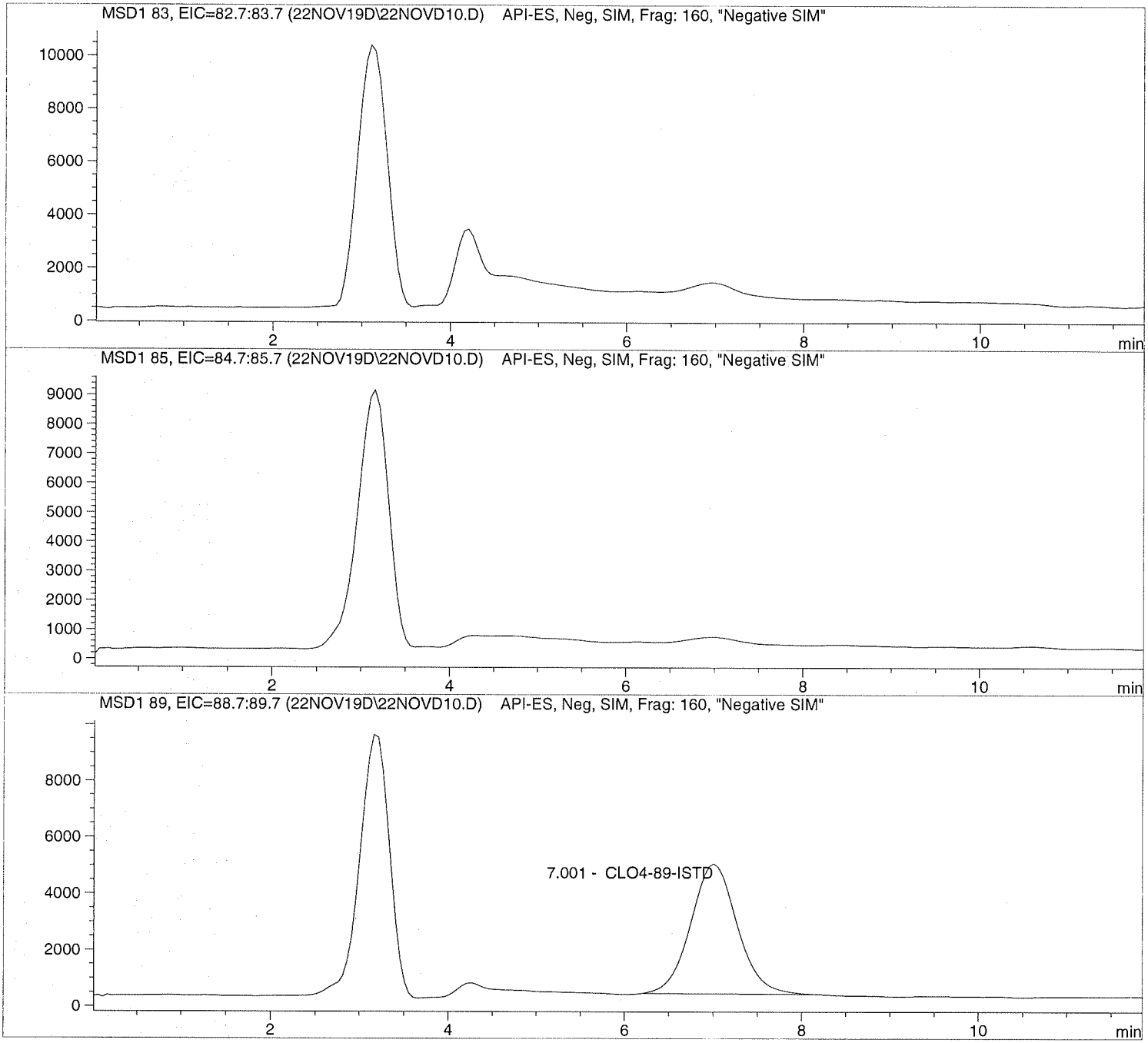
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD10.D Sample Name: 1932284005

Injection Date:	11/22/2019 10:36:43	Seq Line:	10
Sample Name:	1932284005	Location:	Vial 80
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\22NOV19D\22NOVD10.D Sample Name: 1932284005

Injection Date:	11/22/2019 10:36:43	Seq Line:	10
Sample Name:	1932284005	Location:	Vial 80
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:	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
7.001	BBA	168474.5	5.0000	CLO4-89-ISTD

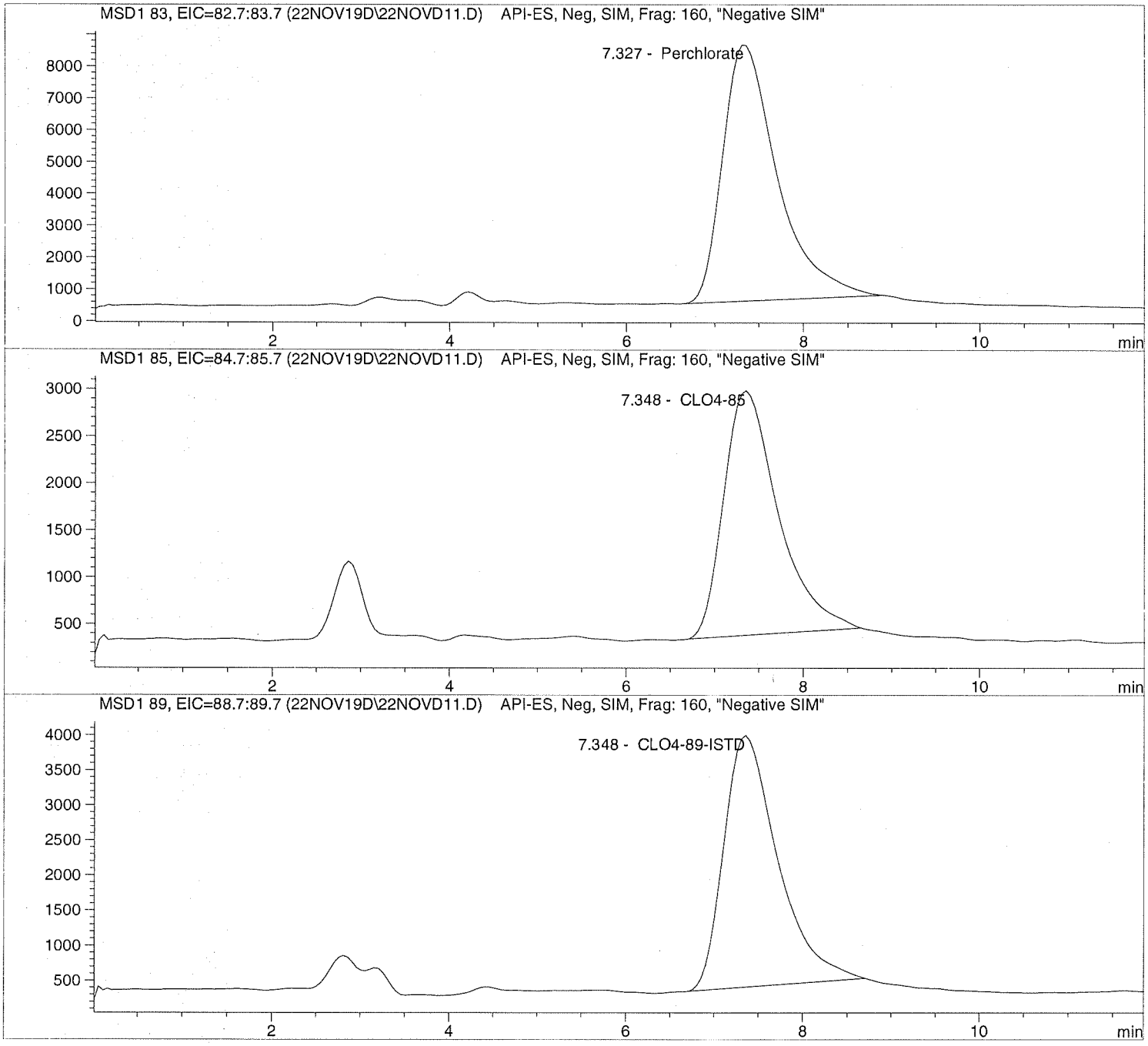
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD11.D Sample Name: 1932284006 10X

Injection Date:	11/22/2019 10:50:36	Seq Line:	11
Sample Name:	1932284006 10X	Location:	Vial 81
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\22NOV19D\22NOVD11.D Sample Name: 1932284006 10X

Injection Date:	11/22/2019 10:50:36	Seq Line:	11
Sample Name:	1932284006 10X	Location:	Vial 81
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:	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
7.327	PBA	345930.0	83.0708	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.348	PBA	111675.8	86.8934	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.348	PBA	152149.8	50.0000	CLO4-89-ISTD

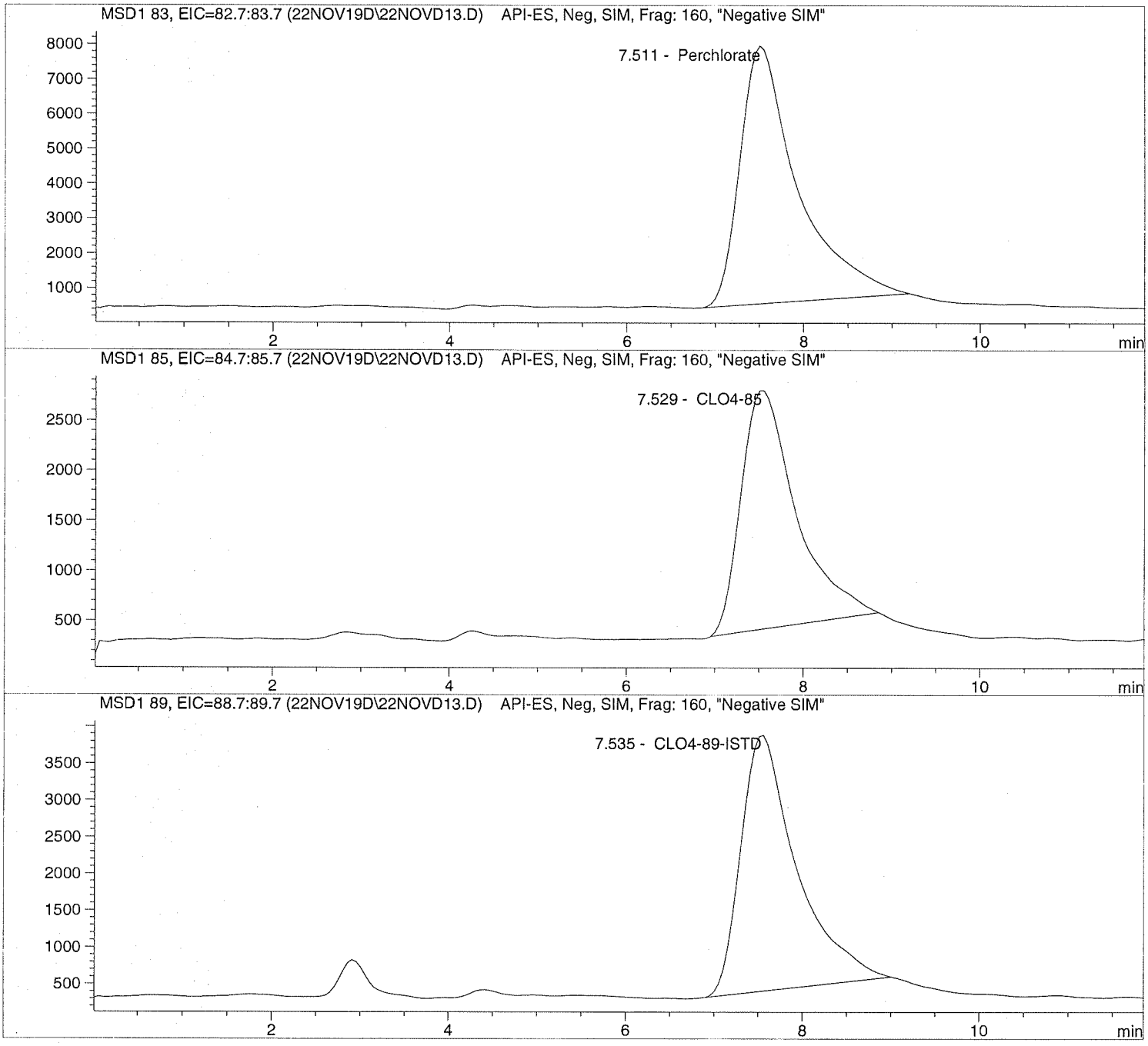
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD13.D Sample Name: 1932284008 1K

Injection Date:	11/22/2019 11:18:19	Seq Line:	13
Sample Name:	1932284008 1K	Location:	Vial 83
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\22NOV19D\22NOVD13.D Sample Name: 1932284008 1K

Injection Date:	11/22/2019 11:18:19	Seq Line:	13
Sample Name:	1932284008 1K	Location:	Vial 83
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:	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
7.511	PBA	333135.6	7986.4726	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.529	PBA	102889.4	7994.4321	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.535	PBA	152567.1	5000.0000	CLO4-89-ISTD

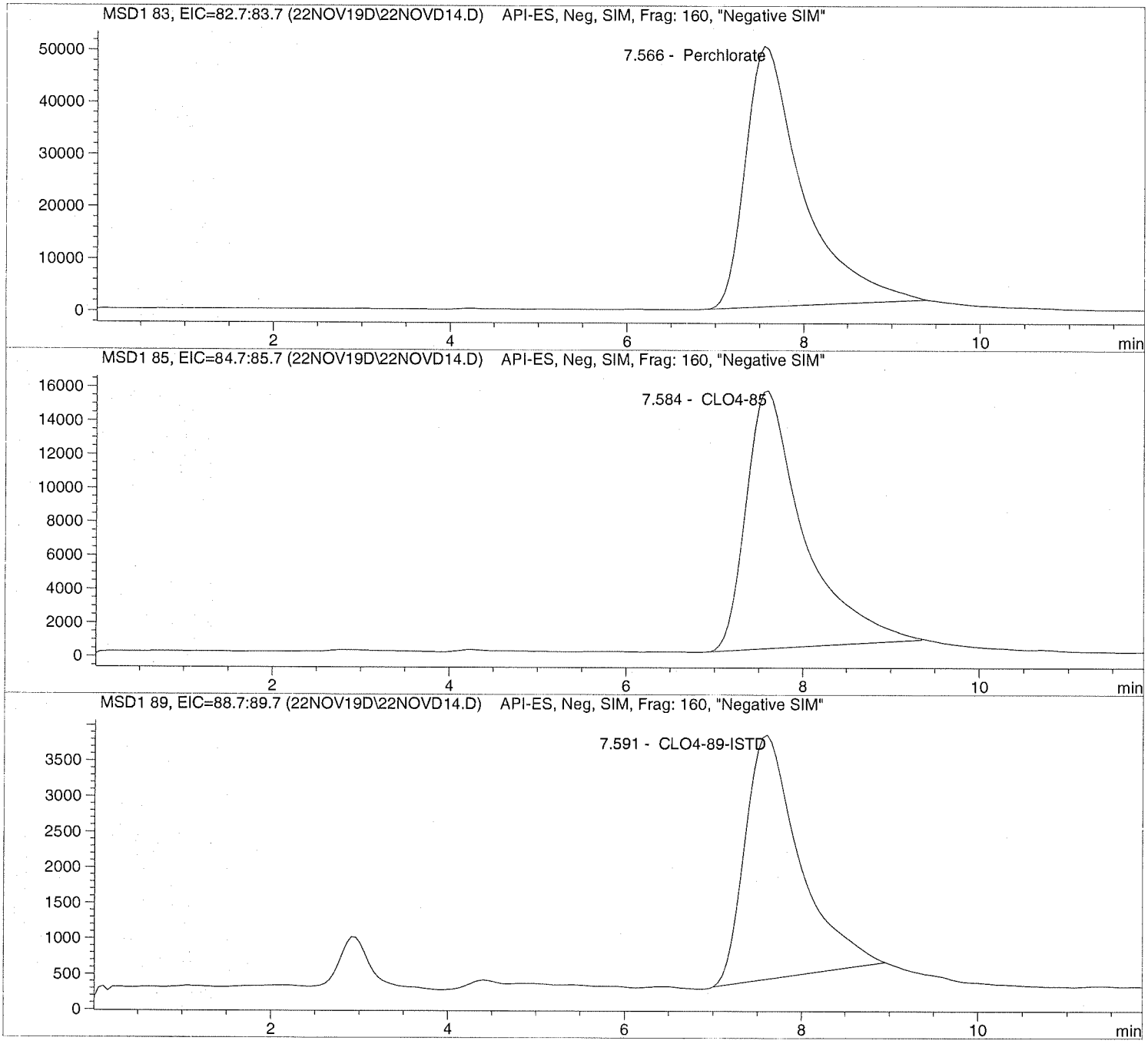
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD14.D Sample Name: 1932284009 1K

Injection Date:	11/22/2019 11:32:09	Seq Line:	14
Sample Name:	1932284009 1K	Location:	Vial 84
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\22NOV19D\22NOVD14.D Sample Name: 1932284009 1K

Injection Date:	11/22/2019 11:32:09	Seq Line:	14
Sample Name:	1932284009 1K	Location:	Vial 84
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:	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
7.566	PBA	2244256.0	47369.5432	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.584	PBA	695778.6	48329.8011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.591	PBA	148042.5	5000.0000	CLO4-89-ISTD

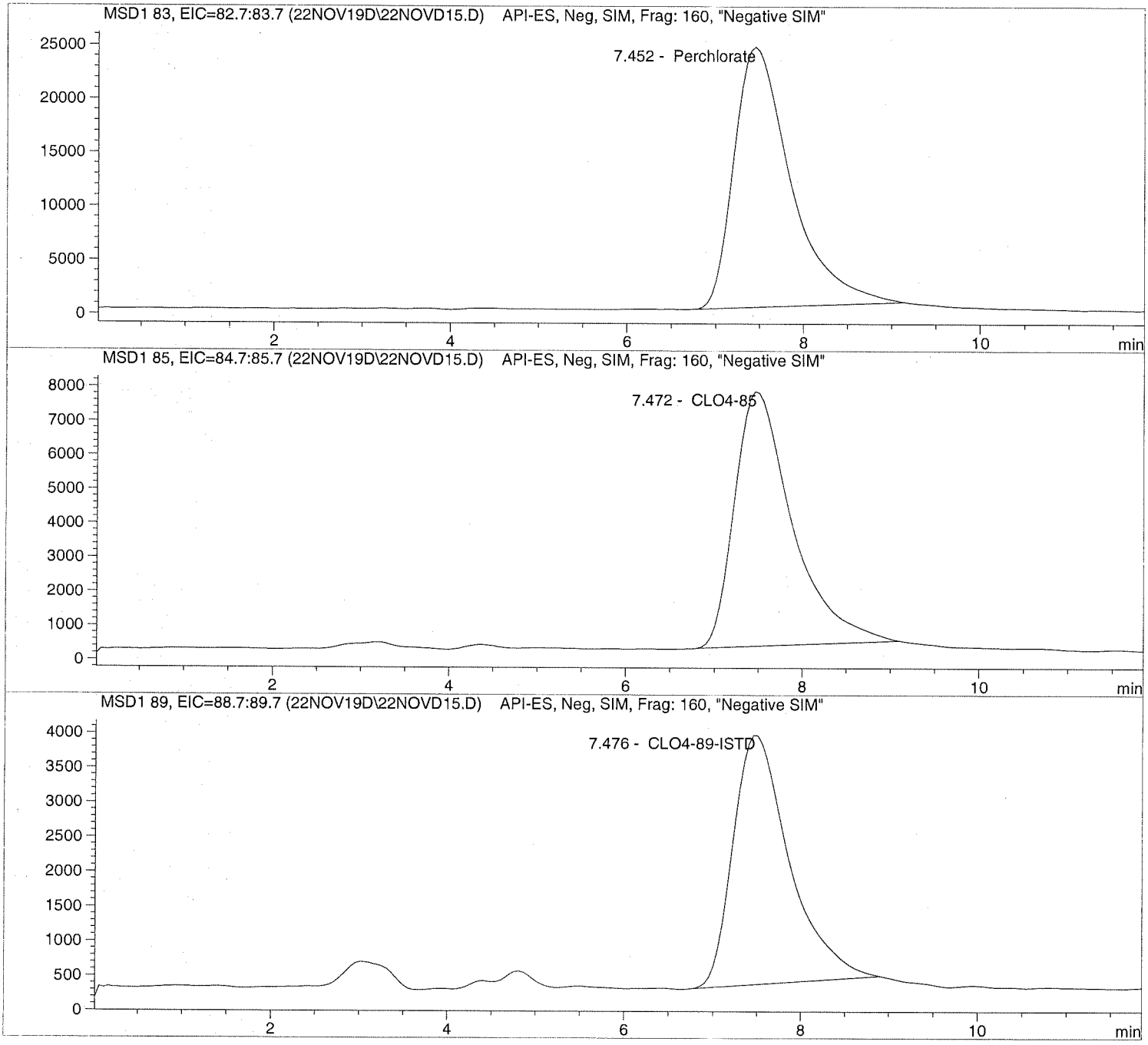
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD15.D Sample Name: 685443 CCV@25

Injection Date:	11/22/2019 11:46:00	Seq Line:	15
Sample Name:	685443 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\22NOV19D\22NOVD15.D Sample Name: 685443 CCV@25

Injection Date:	11/22/2019 11:46:00	Seq Line:	15
Sample Name:	685443 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
7.452	PBA	1087130.5	23.3638	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.472	PBA	340342.8	23.9212	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.476	PBA	160068.6	5.0000	CLO4-89-ISTD

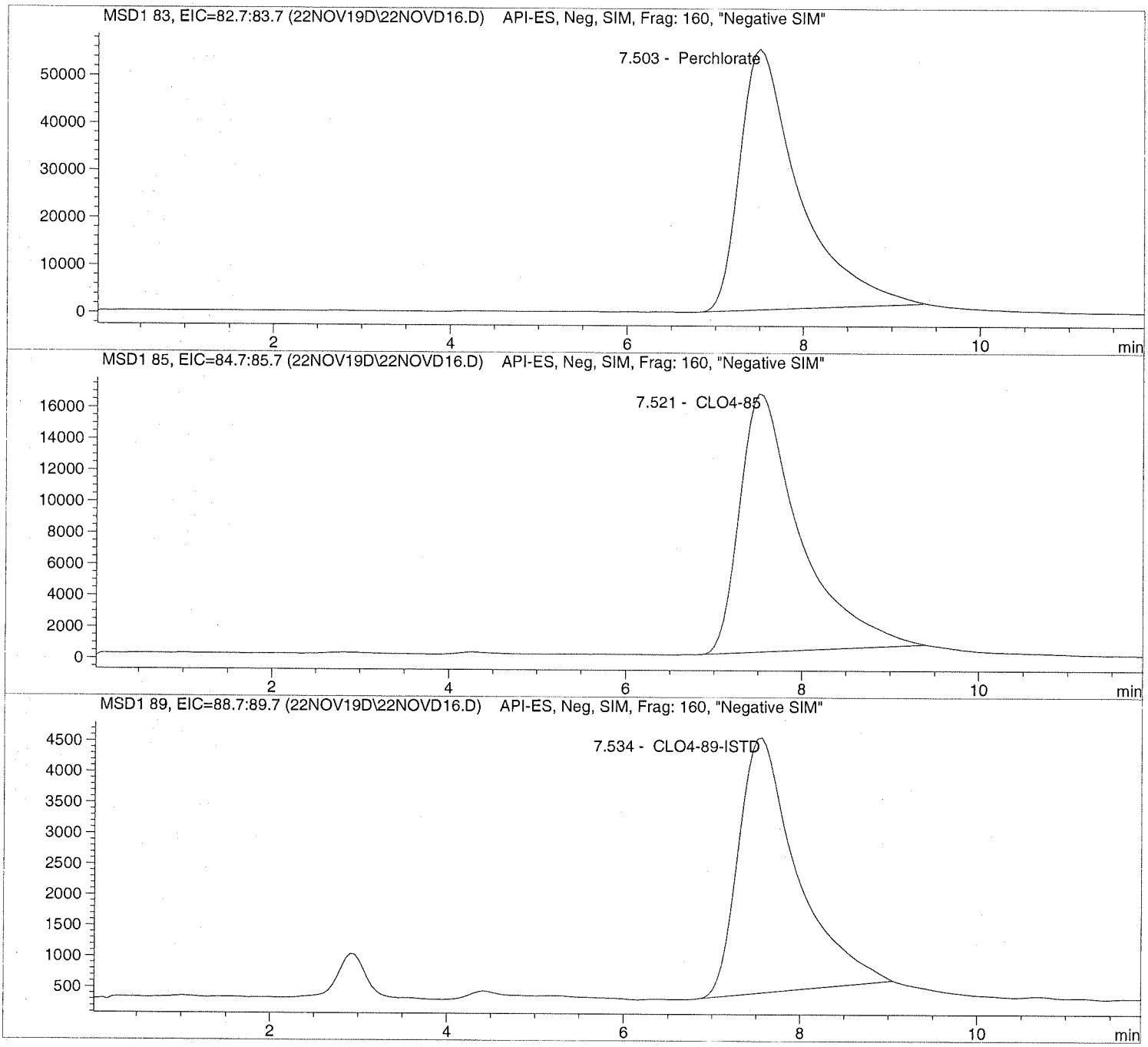
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD16.D Sample Name: 1932284010 1K

Injection Date:	11/22/2019 11:59:50	Seq Line:	16
Sample Name:	1932284010 1K	Location:	Vial 85
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\22NOV19D\22NOVD16.D Sample Name: 1932284010 1K

Injection Date:	11/22/2019 11:59:50	Seq Line:	16
Sample Name:	1932284010 1K	Location:	Vial 85
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:	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
7.503	PBA	2579132.0	42598.6907	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.521	PBA	787731.0	42868.3703	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.534	PBA	192723.4	5000.0000	CLO4-89-ISTD

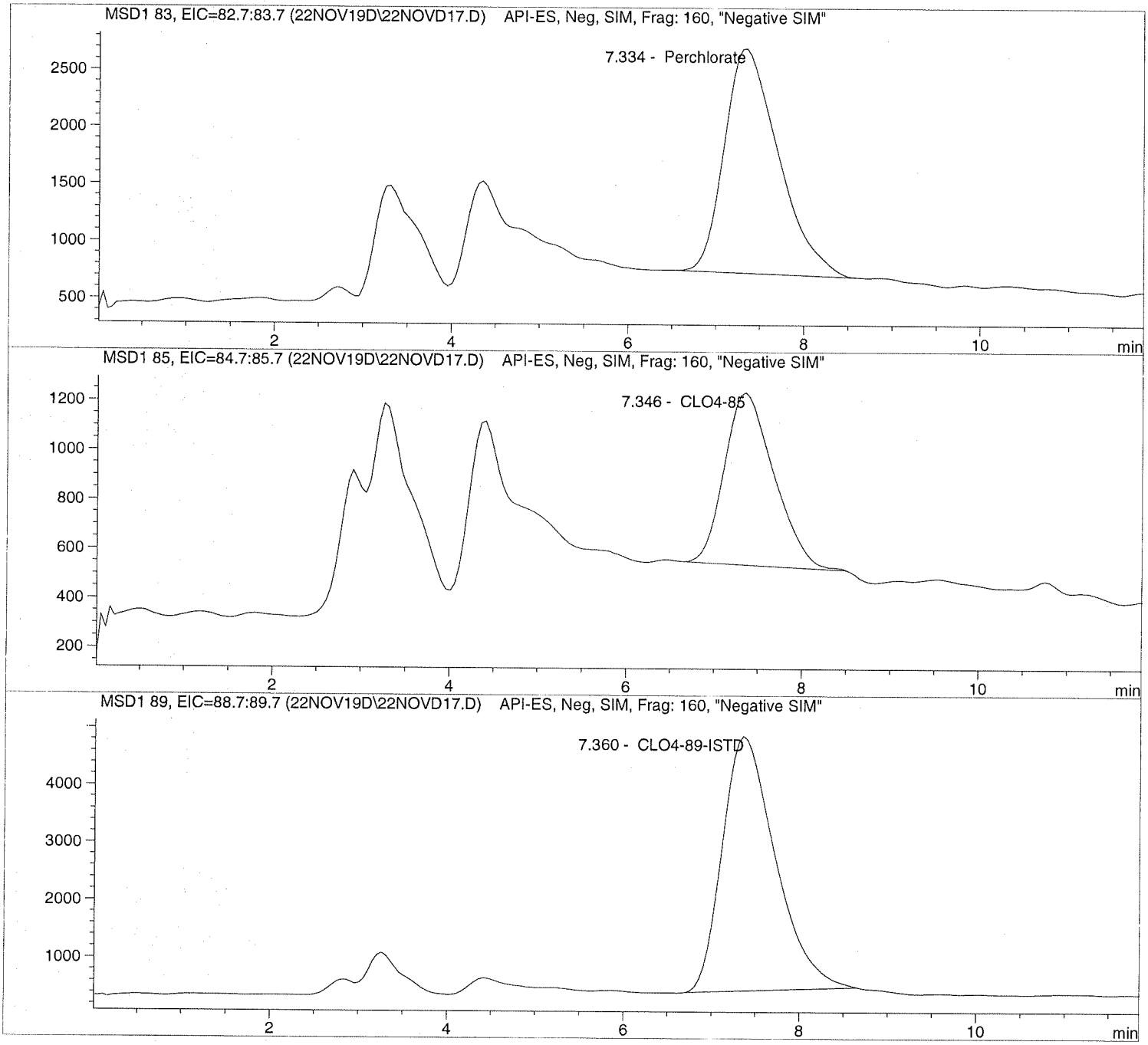
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD17.D Sample Name: 1932352001

Injection Date:	11/22/2019 12:13:41	Seq Line:	17
Sample Name:	1932352001	Location:	Vial 86
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\22NOV19D\22NOVD17.D Sample Name: 1932352001

Injection Date:	11/22/2019 12:13:41	Seq Line:	17
Sample Name:	1932352001	Location:	Vial 86
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:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.334	PBA	84513.2	1.6404	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.346	PBA	27333.2	1.6553	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.360	PBA	186562.4	5.0000	CLO4-89-ISTD

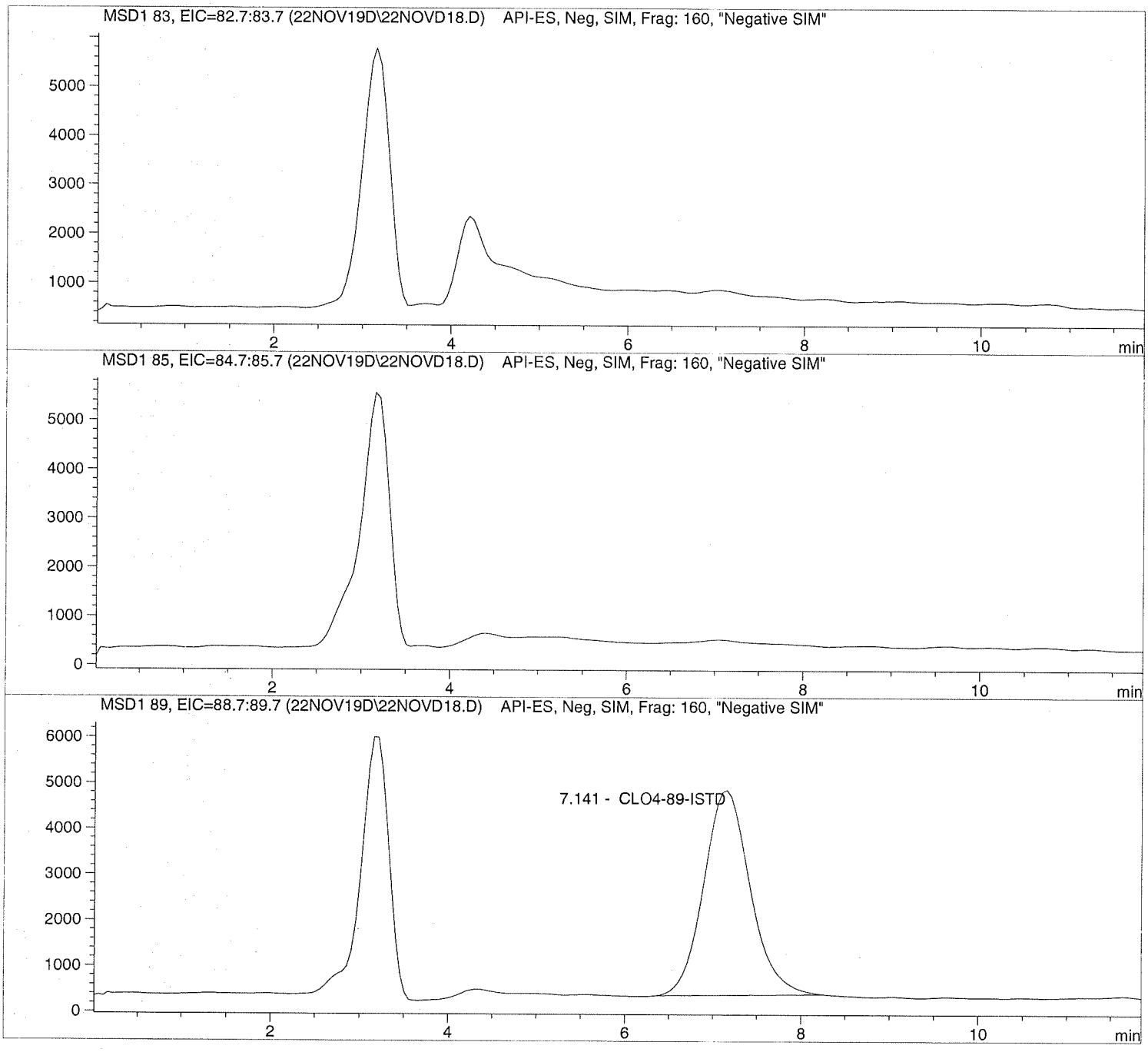
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD18.D Sample Name: 1932352002

Injection Date:	11/22/2019 12:27:35	Seq Line:	18
Sample Name:	1932352002	Location:	Vial 87
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\22NOV19D\22NOVD18.D Sample Name: 1932352002

Injection Date:	11/22/2019 12:27:35	Seq Line:	18
Sample Name:	1932352002	Location:	Vial 87
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:	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	PBA	164476.7	5.0000	CLO4-89-ISTD

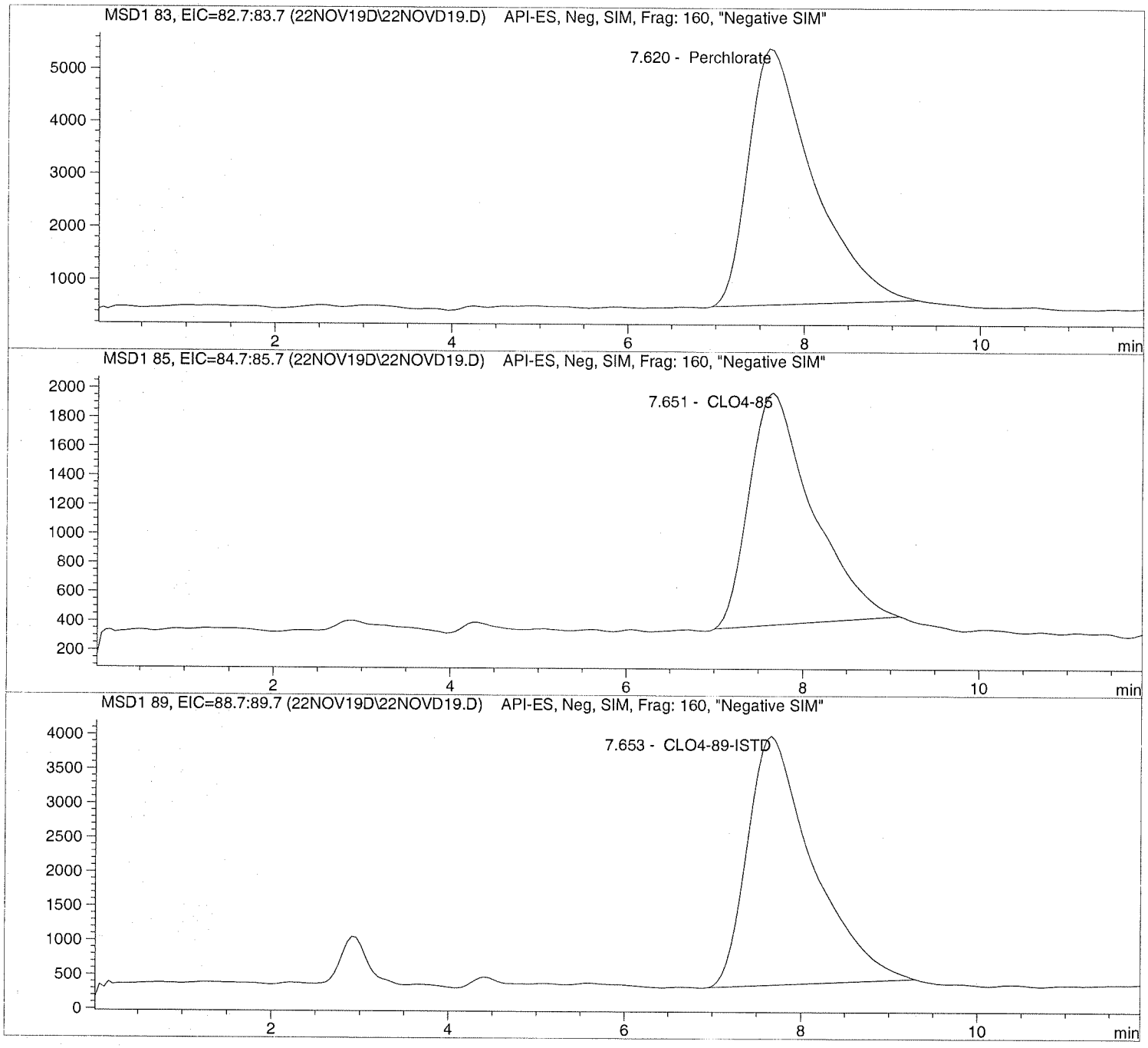
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD19.D Sample Name: 1932352003 1K

Injection Date:	11/22/2019 12:41:26	Seq Line:	19
Sample Name:	1932352003 1K	Location:	Vial 88
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\22NOV19D\22NOVD19.D Sample Name: 1932352003 1K

Injection Date:	11/22/2019 12:41:26	Seq Line:	19
Sample Name:	1932352003 1K	Location:	Vial 88
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:	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
7.620	PBA	246585.9	4887.0265	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.651	PBA	78880.7	5031.6524	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.653	PBA	185984.5	5000.0000	CLO4-89-ISTD

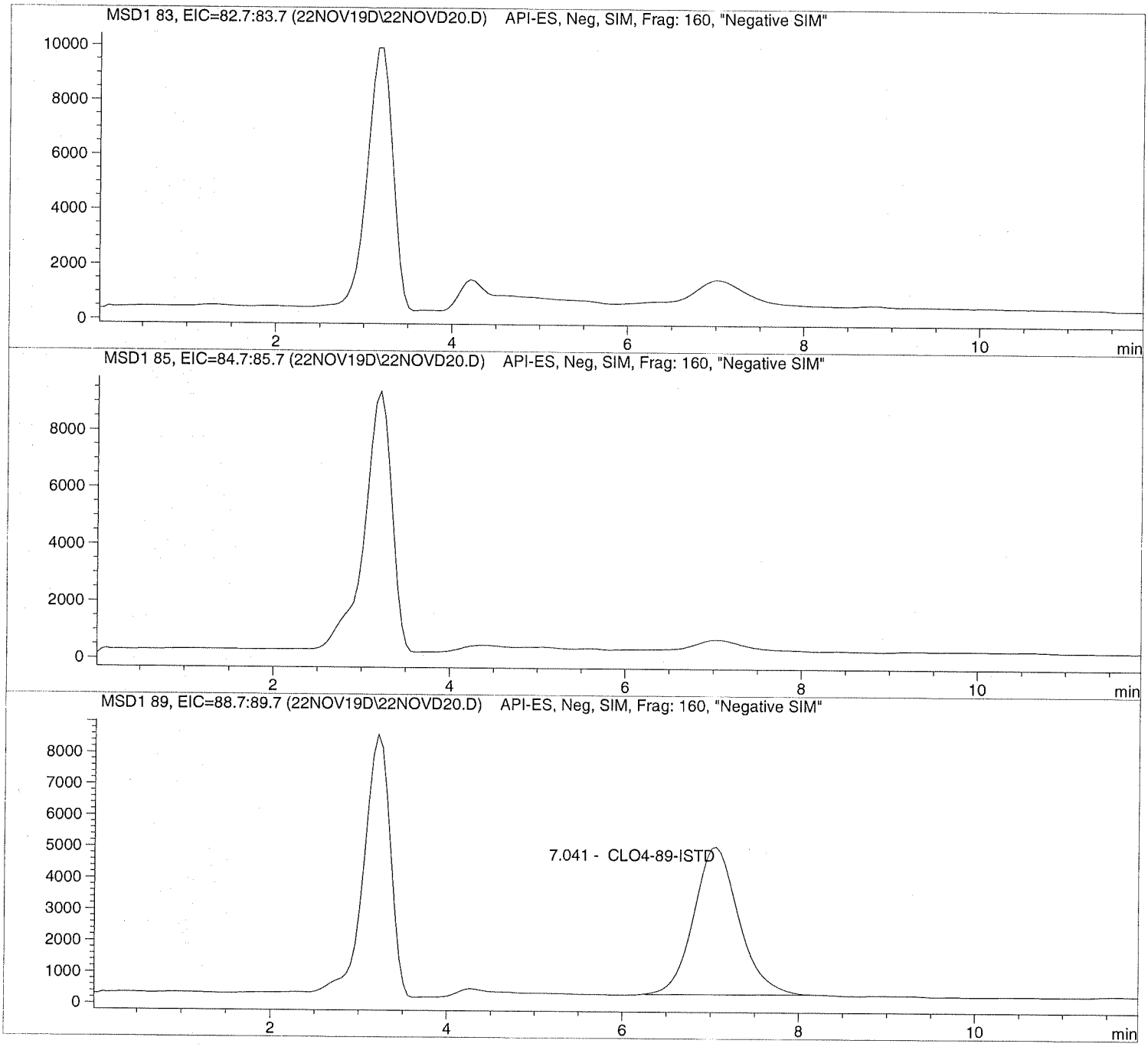
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD20.D Sample Name: 1932352004

Injection Date:	11/22/2019 12:55:21	Seq Line:	20
Sample Name:	1932352004	Location:	Vial 89
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\22NOV19D\22NOVD20.D Sample Name: 1932352004

Injection Date:	11/22/2019 12:55:21	Seq Line:	20
Sample Name:	1932352004	Location:	Vial 89
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:	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
7.041	BBA	167521.2	5.0000	CLO4-89-ISTD

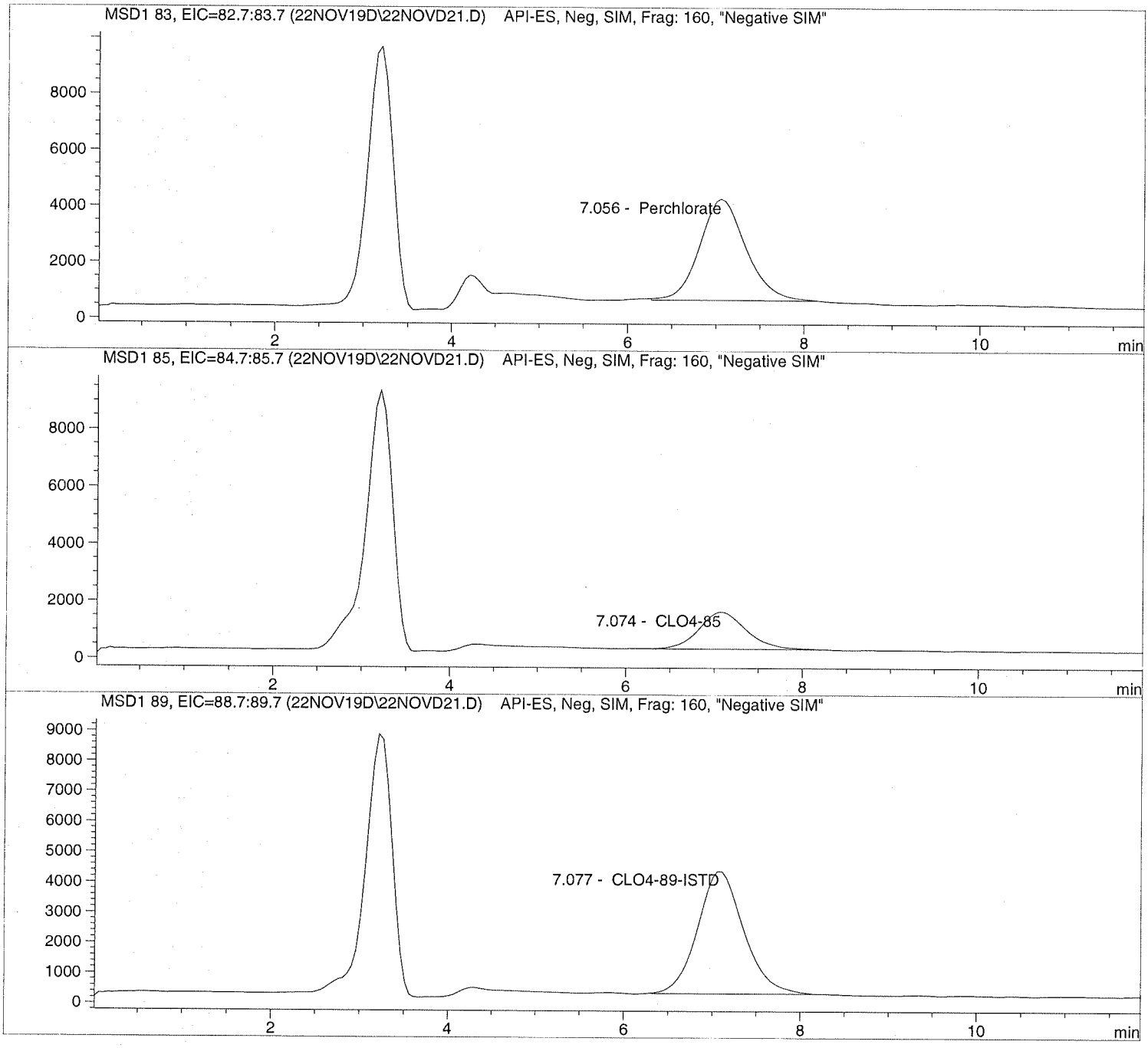
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD21.D Sample Name: 1932352005 MS

Injection Date:	11/22/2019 13:09:17	Seq Line:	21
Sample Name:	1932352005 MS	Location:	Vial 90
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\22NOV19D\22NOVD21.D Sample Name: 1932352005 MS

Injection Date:	11/22/2019 13:09:17	Seq Line:	21
Sample Name:	1932352005 MS	Location:	Vial 90
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:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.056	BBA	131207.6	3.2899	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.074	BBA	48283.1	3.8820	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.077	PBA	146896.4	5.0000	CLO4-89-ISTD

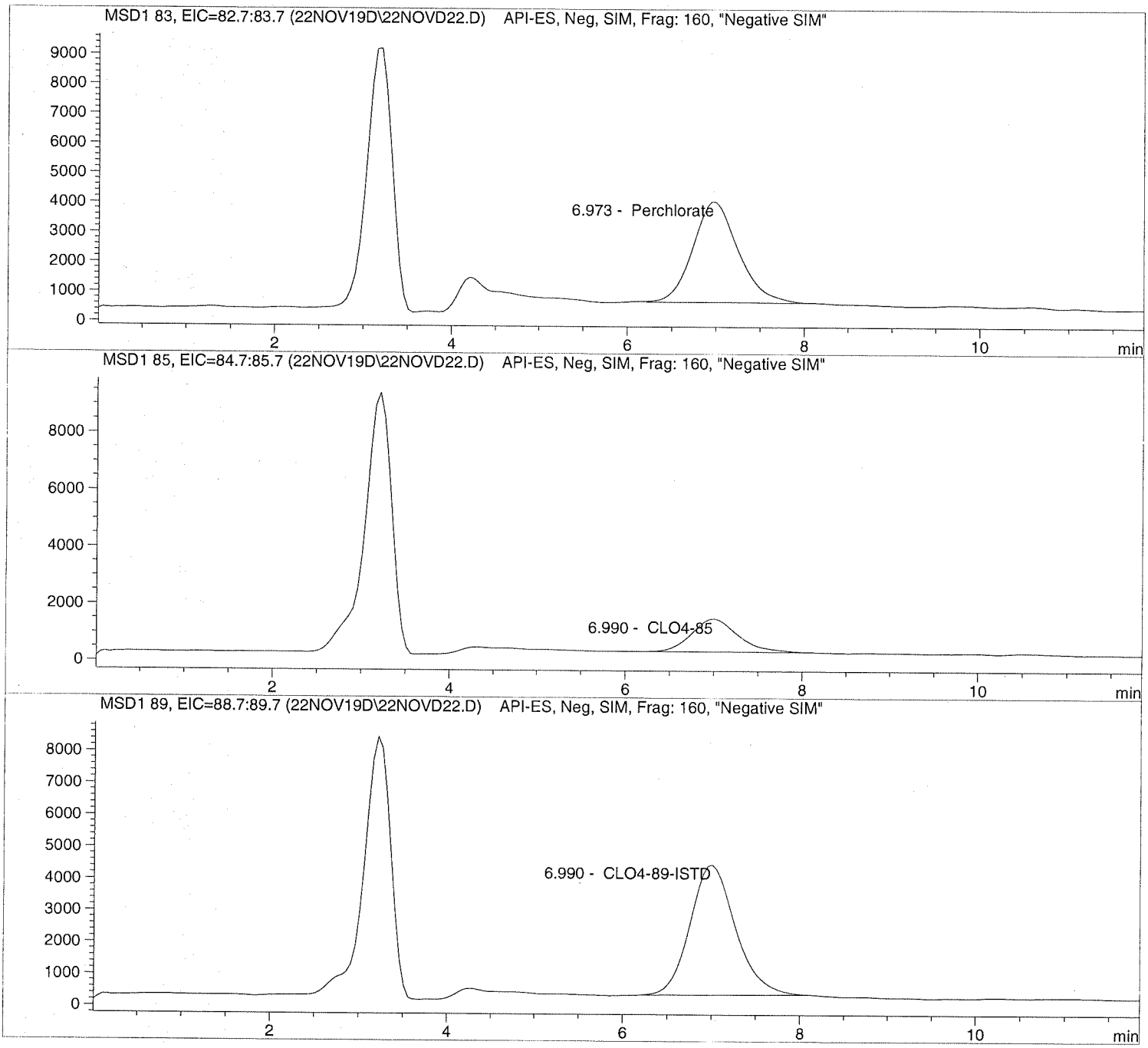
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD22.D Sample Name: 1932352006 MSD

Injection Date:	11/22/2019 13:23:12	Seq Line:	22
Sample Name:	1932352006 MSD	Location:	Vial 91
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\22NOV19D\22NOVD22.D Sample Name: 1932352006 MSD

Injection Date:	11/22/2019 13:23:12	Seq Line:	22
Sample Name:	1932352006 MSD	Location:	Vial 91
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:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.973	BBA	121738.6	3.0509	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.990	BBA	42568.5	3.4112	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.990	BBA	146852.0	5.0000	CLO4-89-ISTD

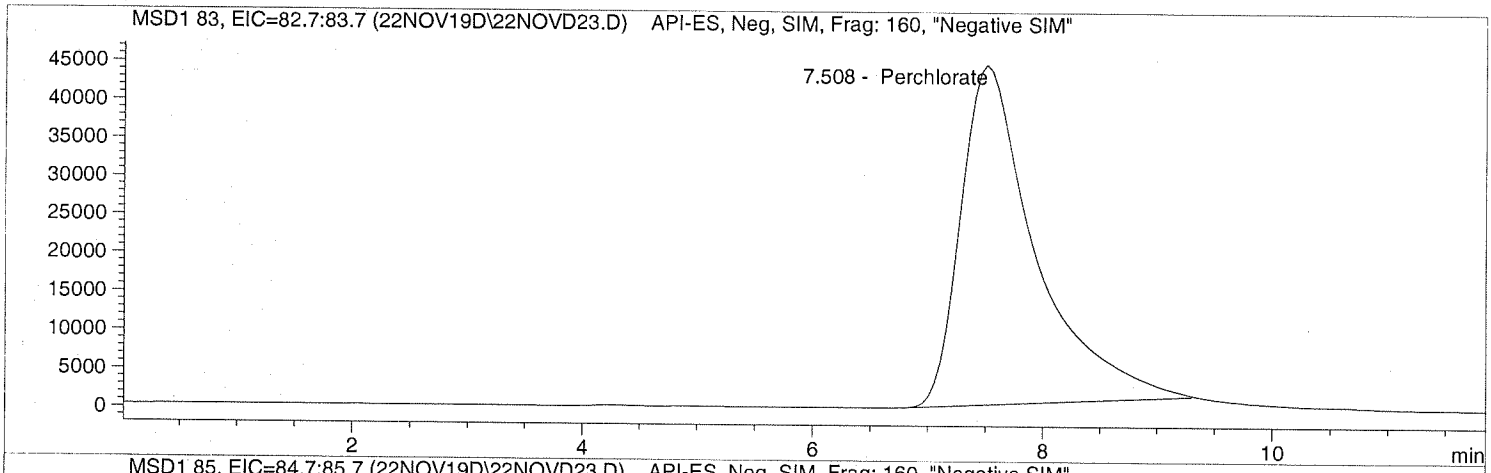
*** End of Report ***

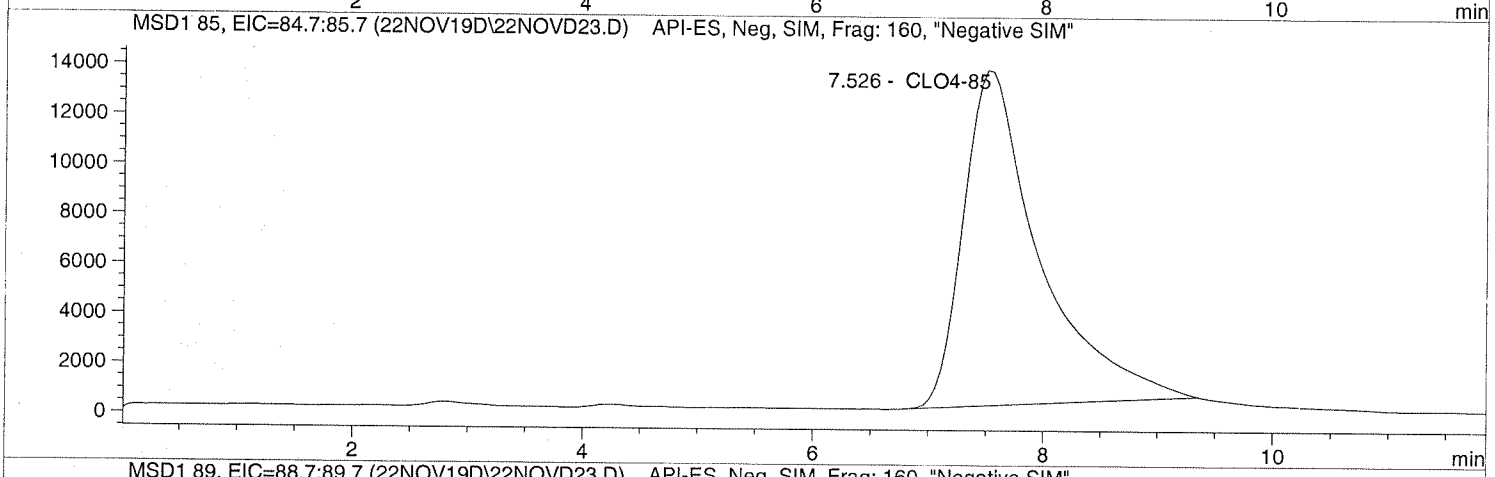
Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD23.D Sample Name: 1932284007 100

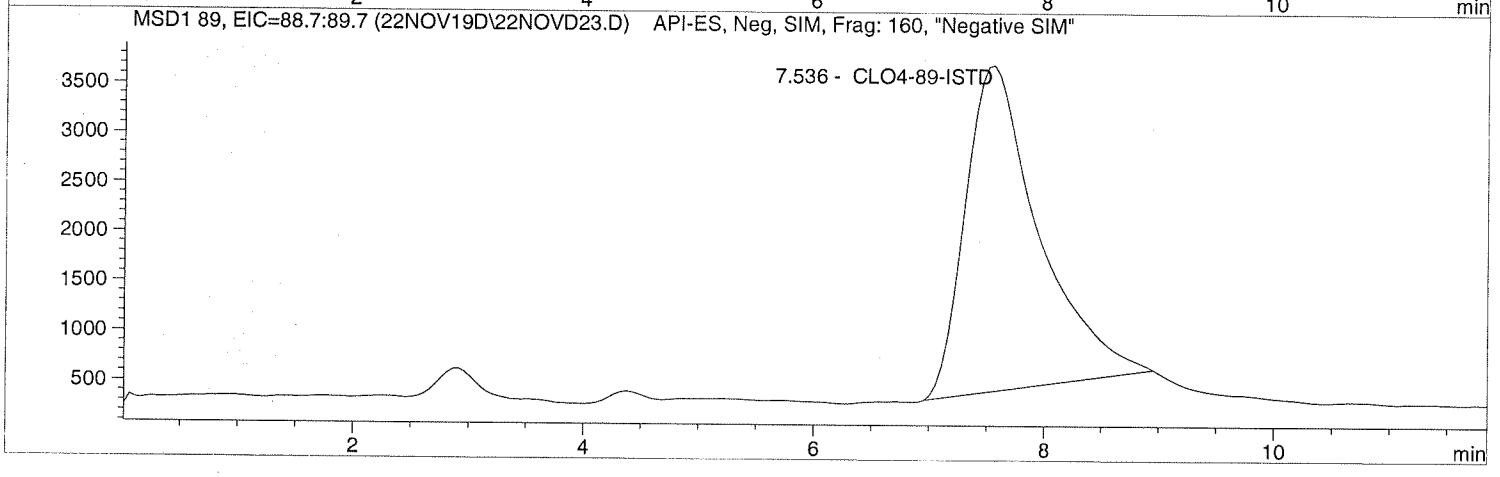
Injection Date:	11/22/2019 13:39:02	Seq Line:	23
Sample Name:	1932284007 100	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

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\22NOV19D\22NOVD23.D Sample Name: 1932284007 100

Injection Date:	11/22/2019 13:39:02	Seq Line:	23
Sample Name:	1932284007 100	Location:	Vial 92
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:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.508	PBA	2000966.8	4344.9859	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.526	PBA	621132.3	4434.8623	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.536	PBA	146104.5	500.0000	CLO4-89-ISTD

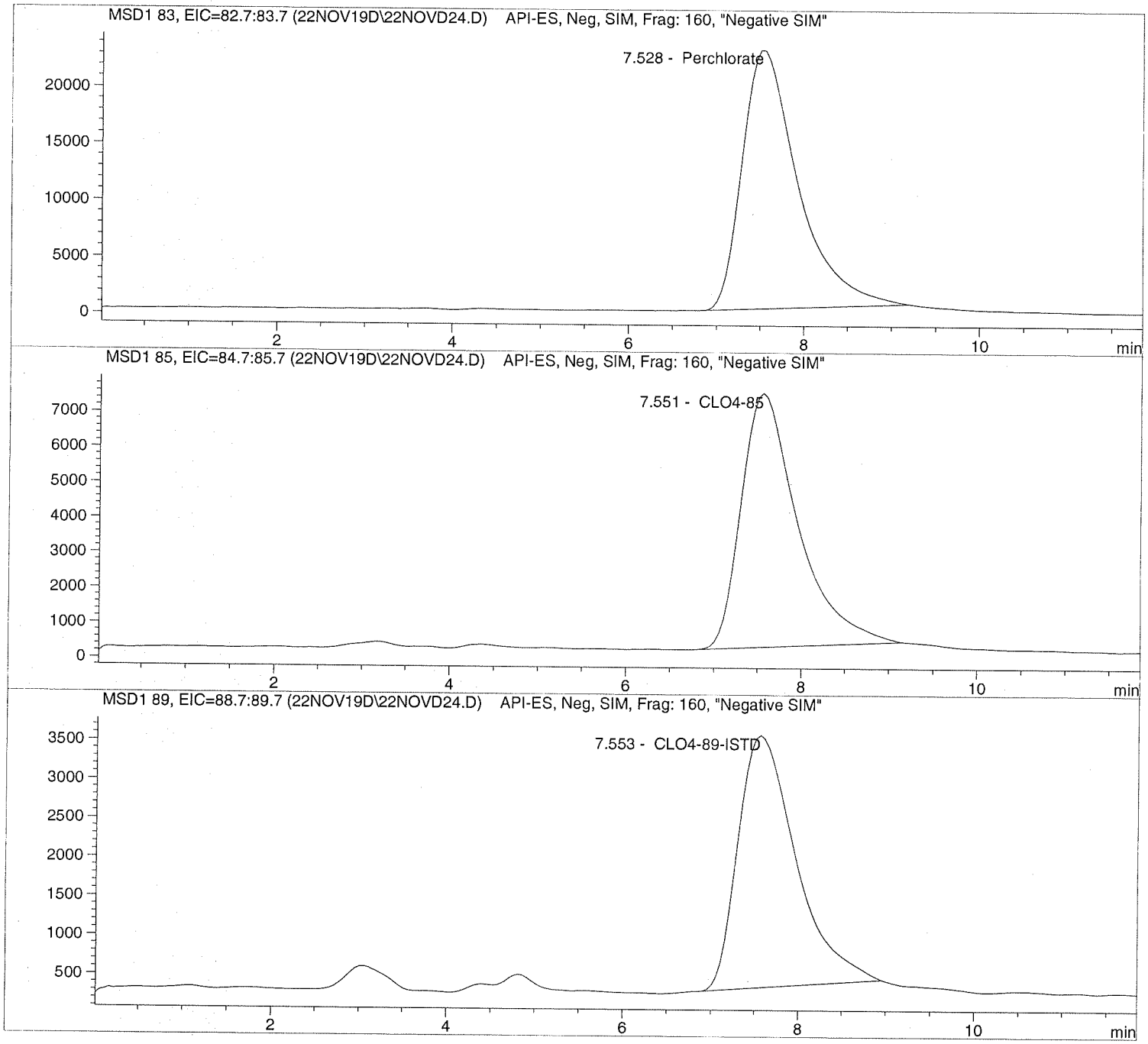
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD24.D Sample Name: 685444 CCV@25

Injection Date:	11/22/2019 13:54:23	Seq Line:	24
Sample Name:	685444 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\22NOV19D\22NOVD24.D Sample Name: 685444 CCV@25

Injection Date:	11/22/2019 13:54:23	Seq Line:	24
Sample Name:	685444 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
7.528	PBA	1013210.4	23.4184	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.551	PBA	326598.5	24.6282	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.553	PBA	148802.7	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

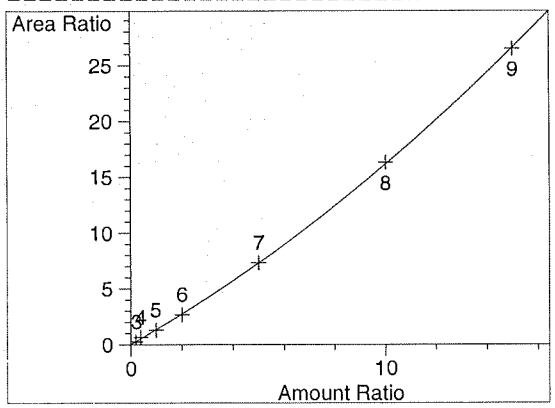
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

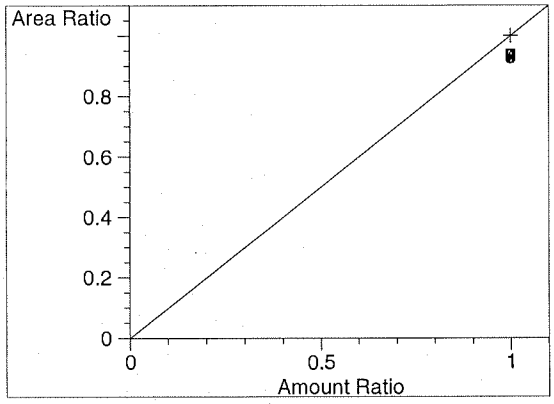
Peak Sum Table

No Entries in table

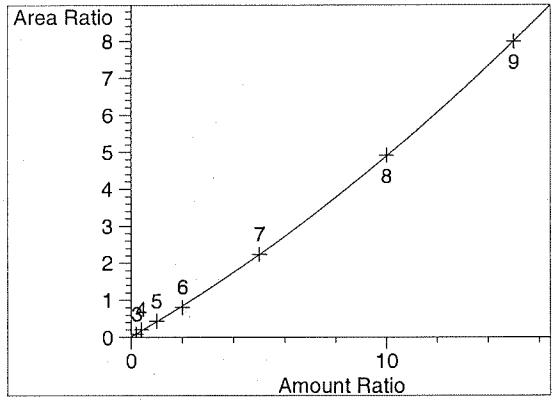
Calibration Curves



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 Table:

Method and Injection Info Part:

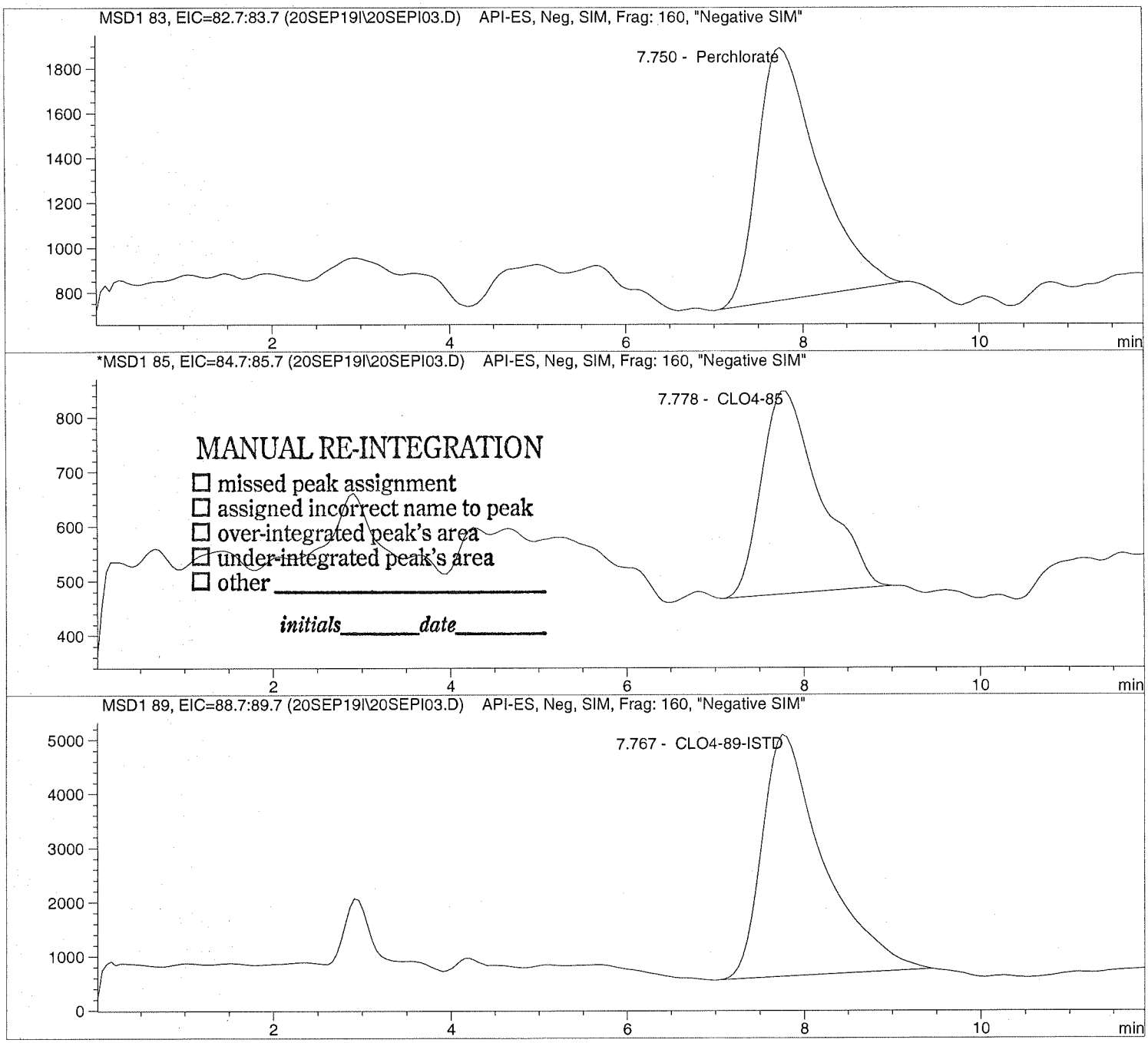
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

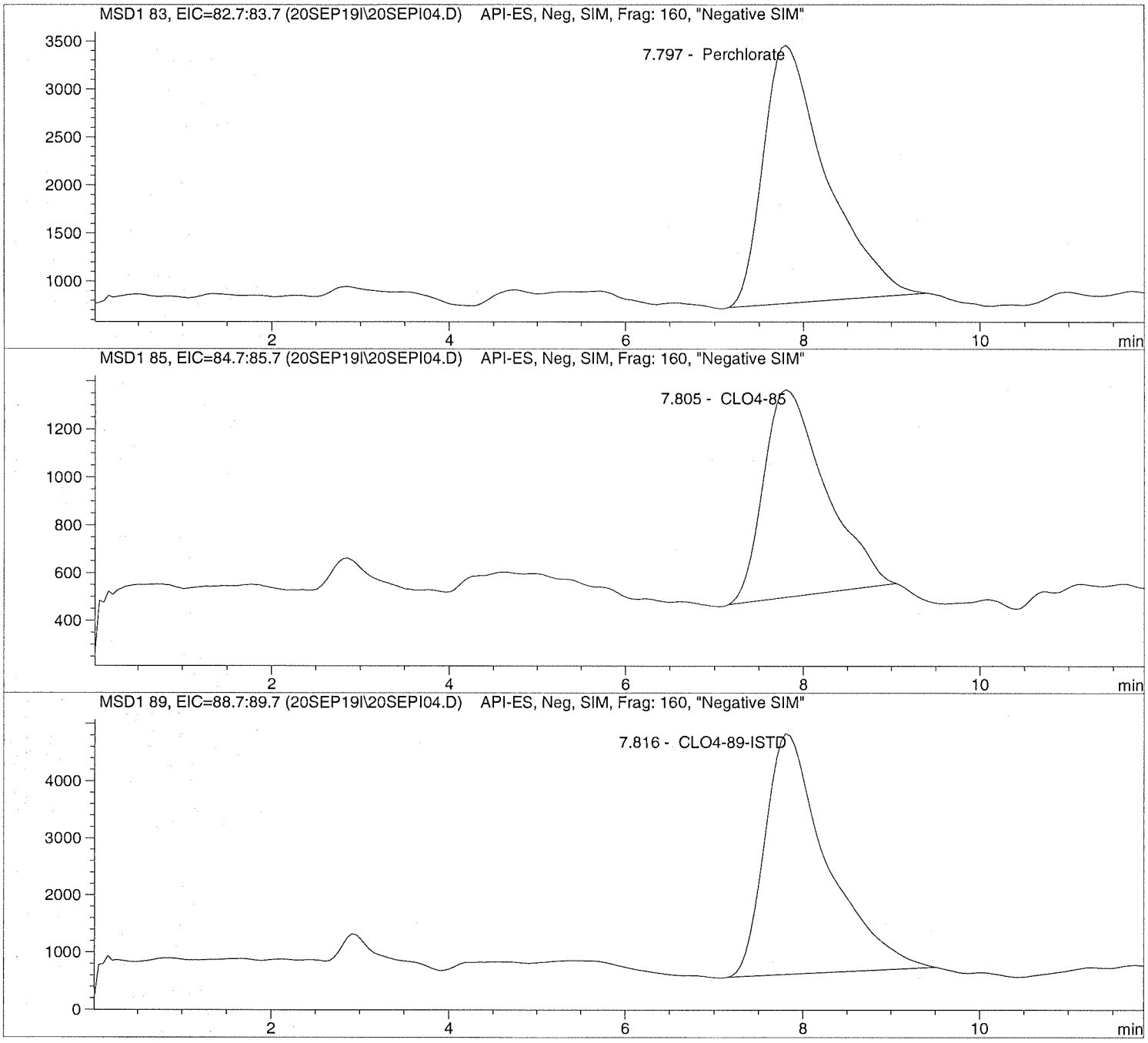
*** End of Report ***

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

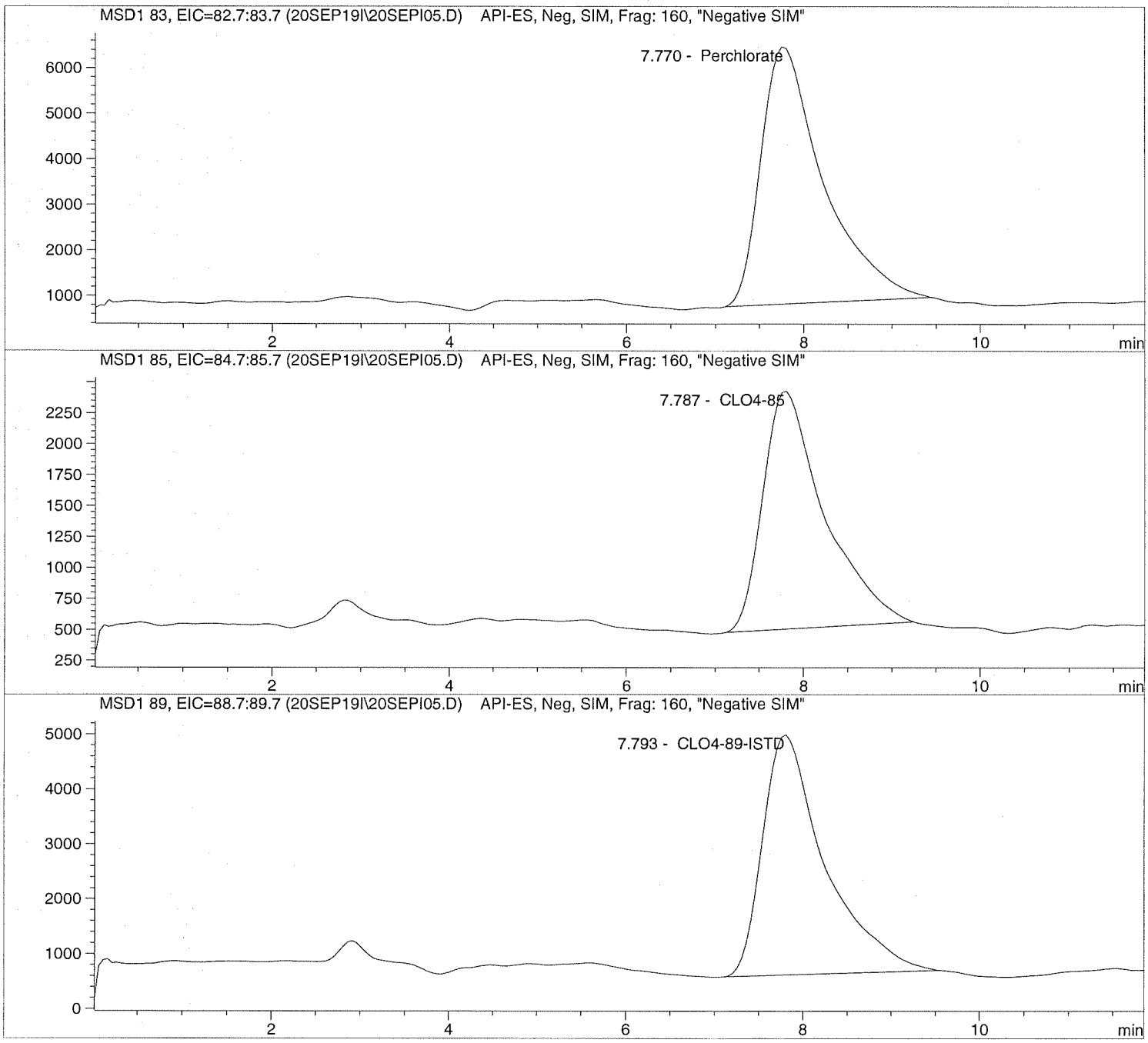
*** End of Report ***

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

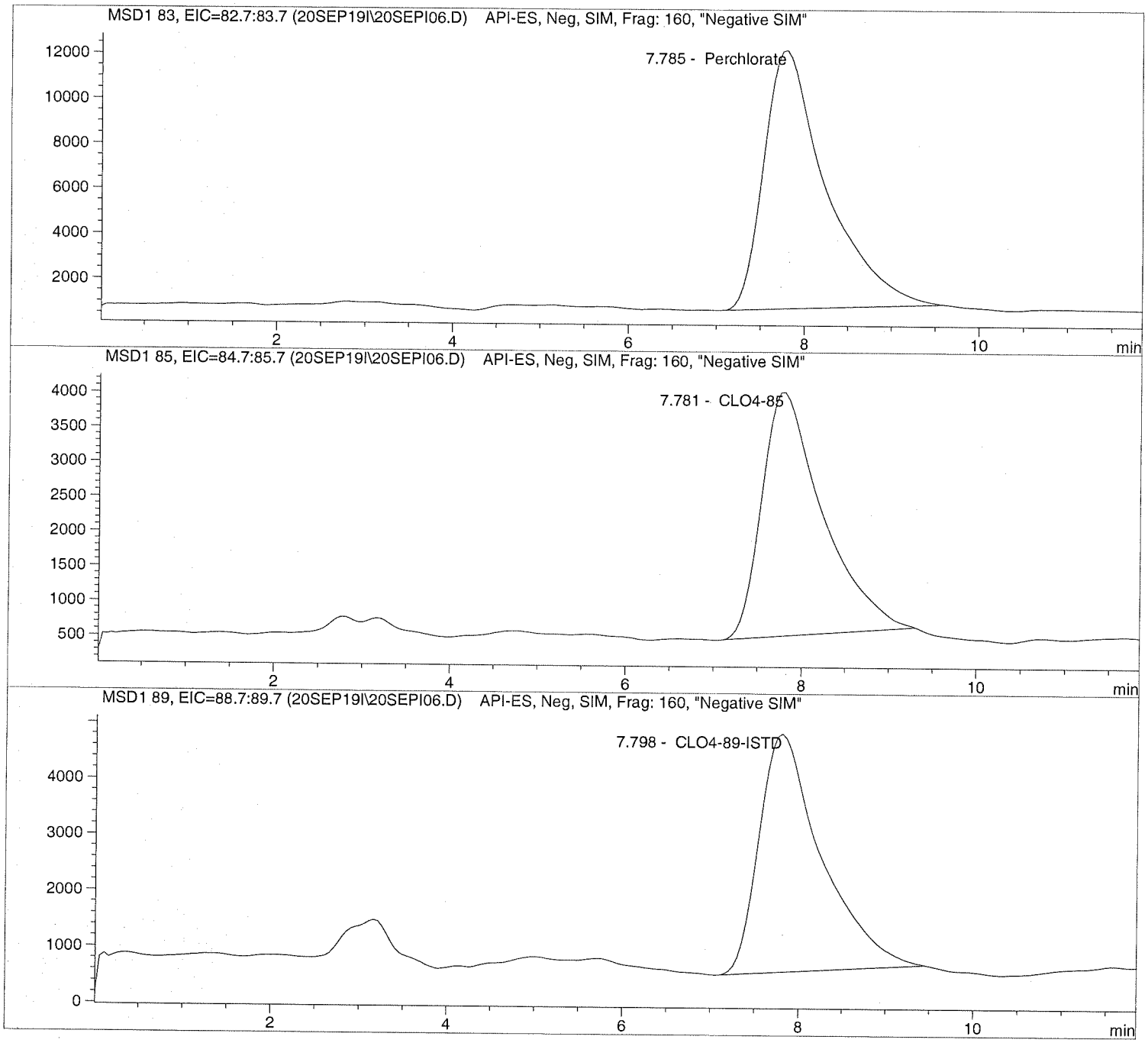
*** End of Report ***

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

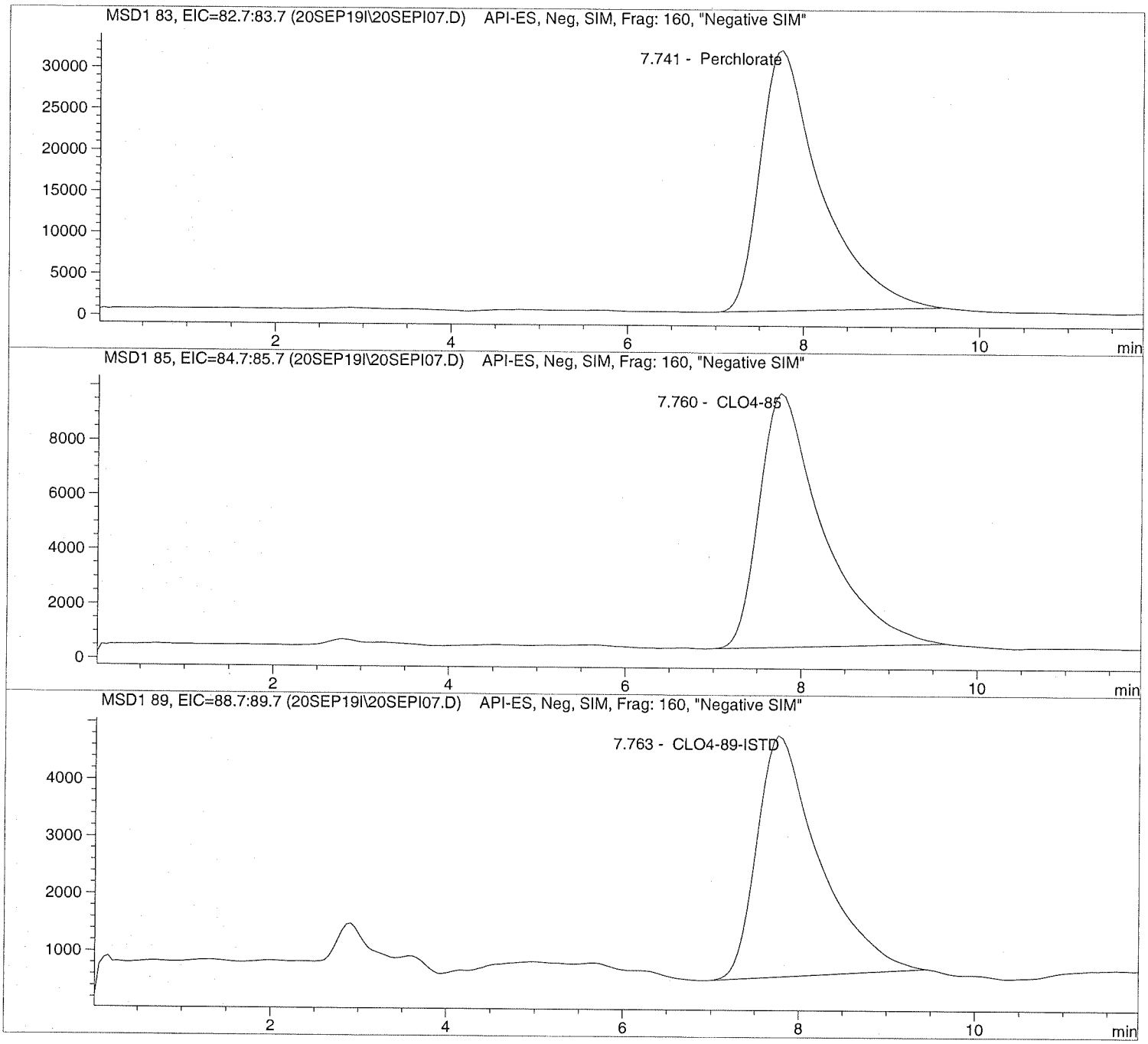
*** End of Report ***

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

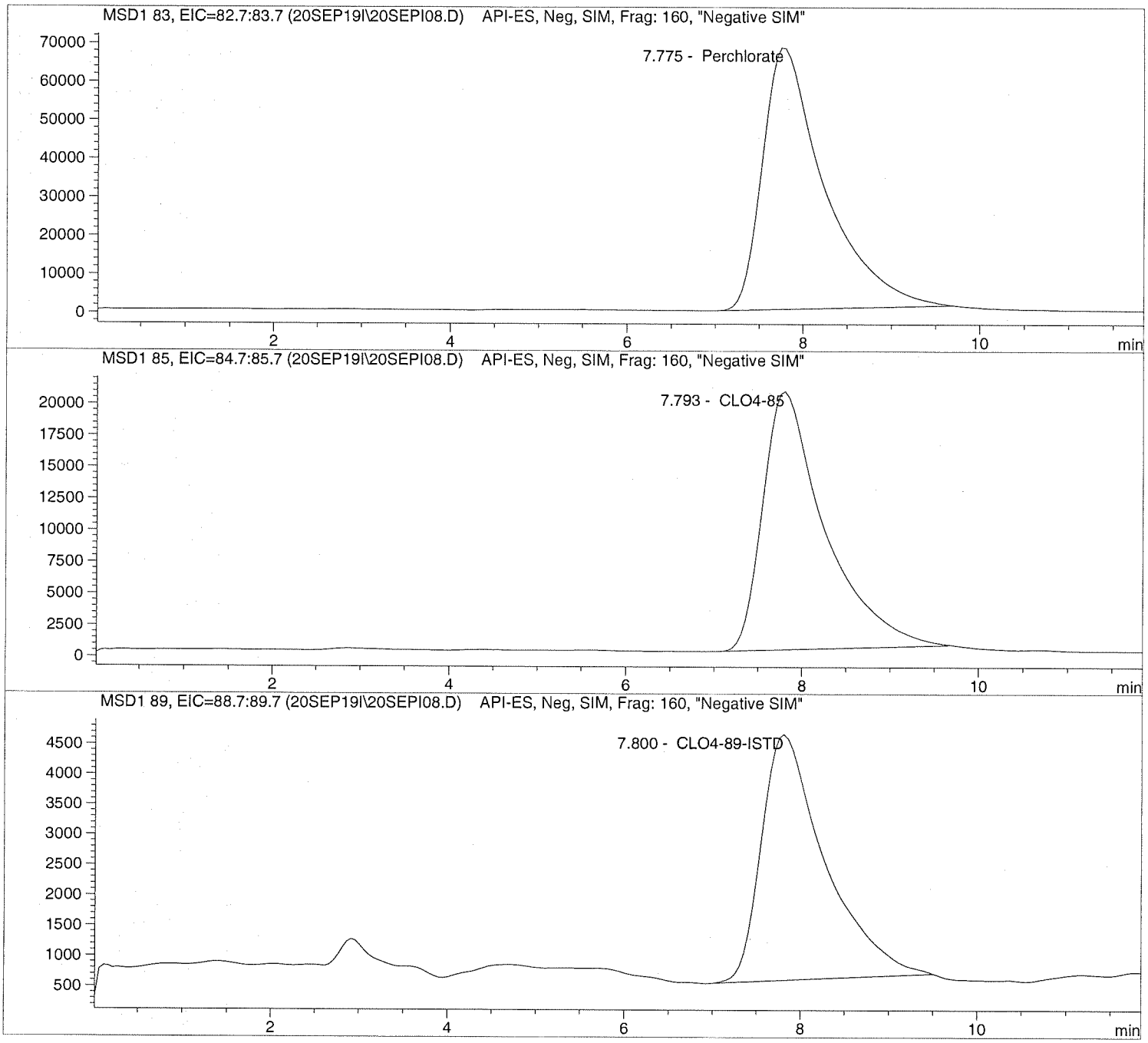
*** End of Report ***

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

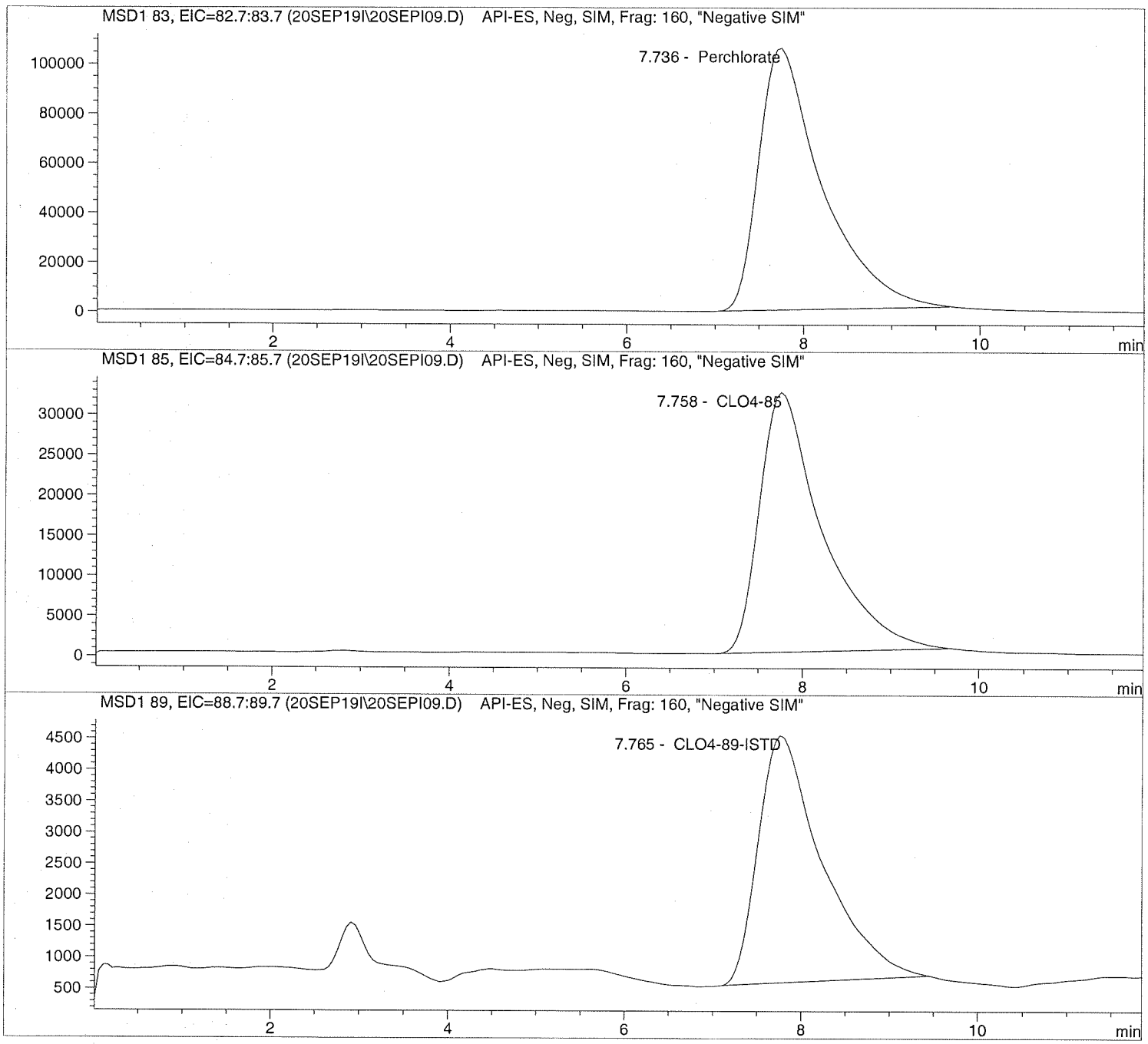
*** End of Report ***

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

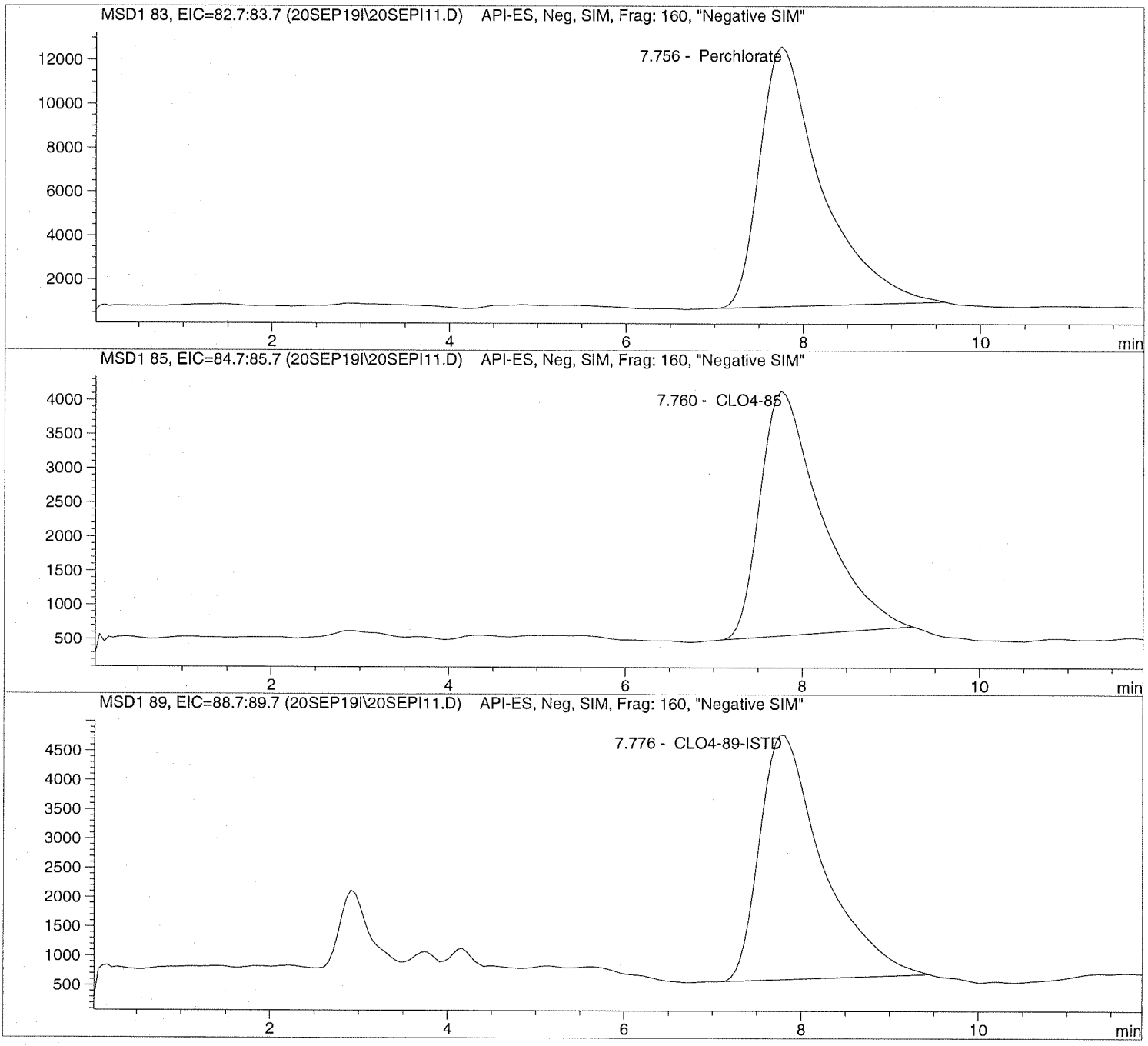
*** End of Report ***

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

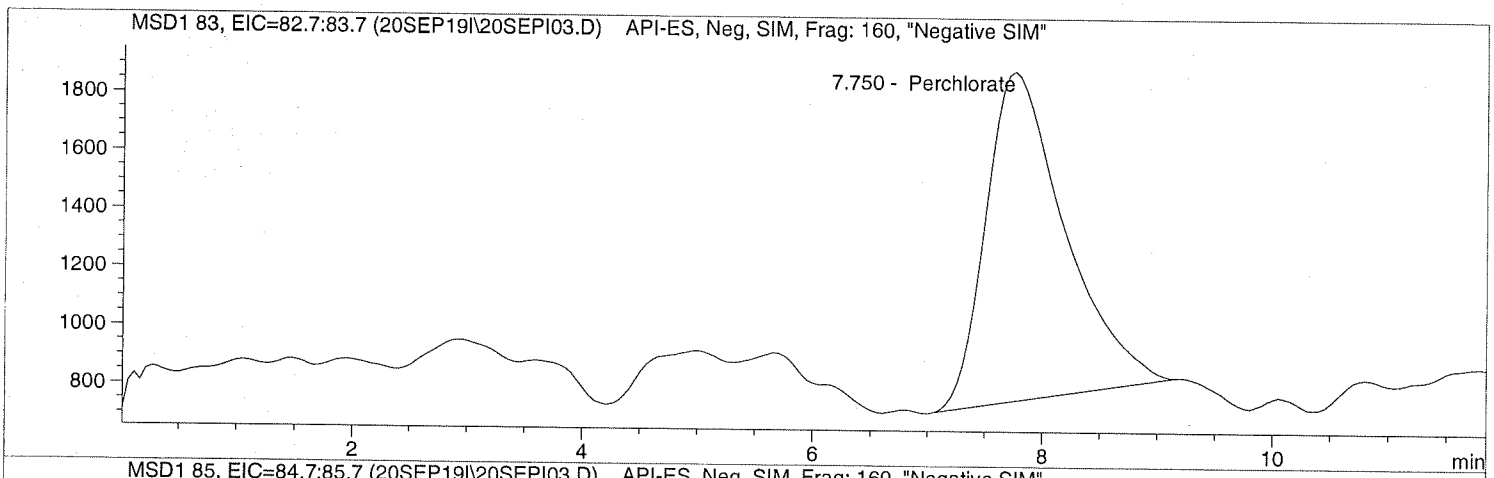
Unmodified

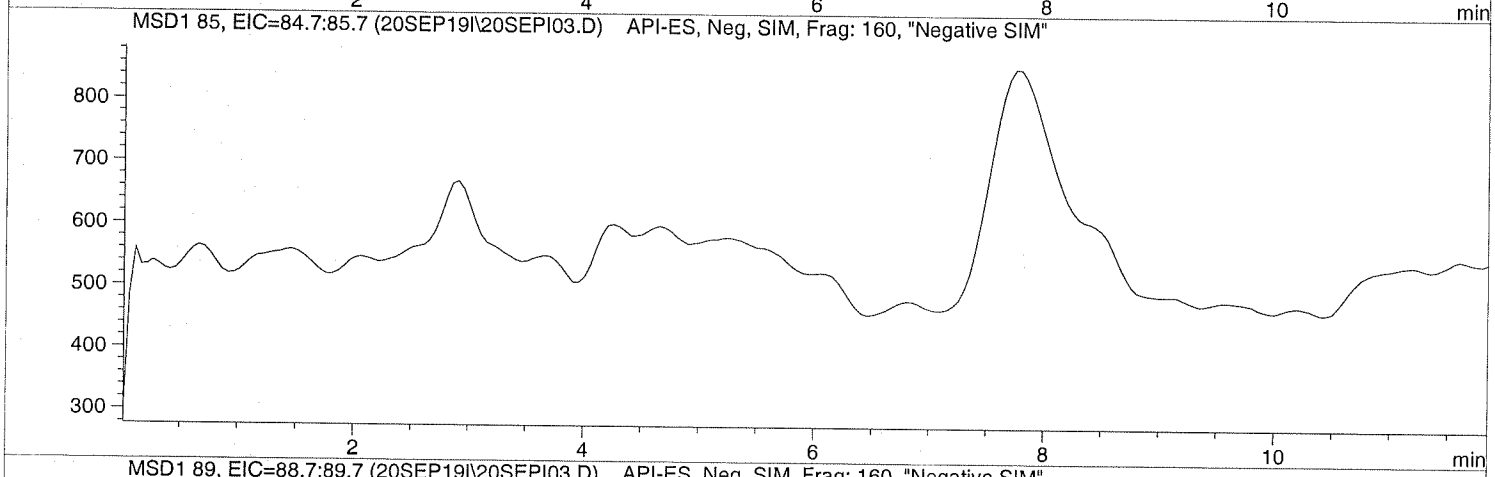
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

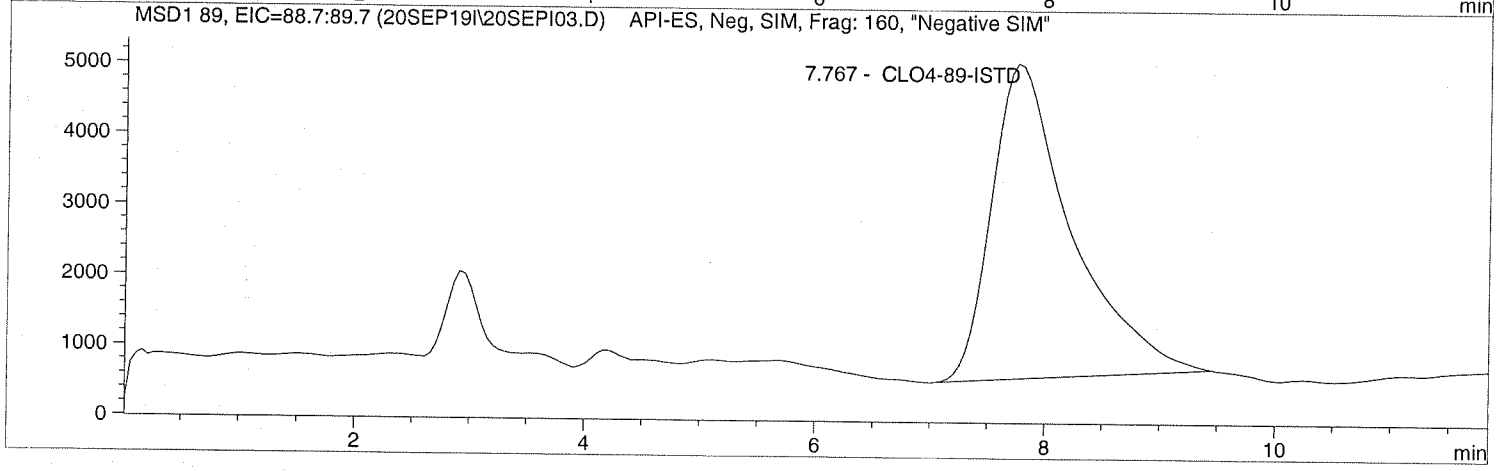
Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

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

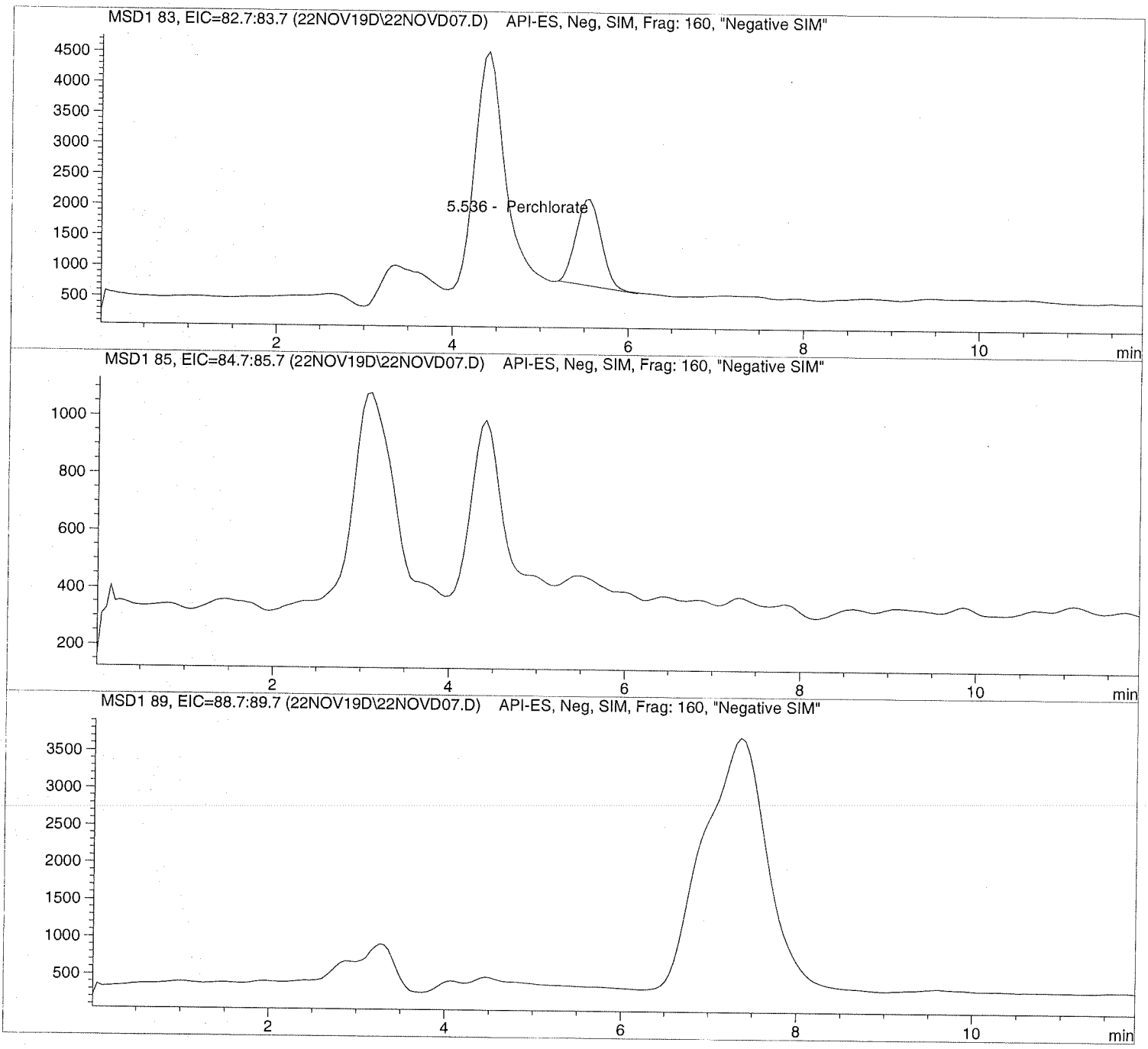
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD07.D Sample Name: 1932284002

Injection Date:	11/22/2019 09:55:02	Seq Line:	7
Sample Name:	1932284002	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\22NOV19D\22NOVD07.D Sample Name: 1932284002

Injection Date:	11/22/2019 09:55:02	Seq Line:	7
Sample Name:	1932284002	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:	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
5.536	PBA	27611.0	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
0.000		0.0	0.0000	CLO4-89-ISTD

*** End of Report ***

HS19110644 8260 Raw Data

ALS WO# HS19110644

MSVOA09 -Logbook

Batch: 38377
Date: 11-12-2019
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	11-12-2019 10:52 am	1.00	0.00 mL	0.00 mL	U111201.D	Liquid	Y	NA
	Auto find/purged									
2	VSTD000.25	ICAL1	11-12-2019 11:16 am	1.00	5.00 mL	0.00 mL	U111202.D	Liquid	Y	NA
3	VSTD000.5	ICAL2	11-12-2019 11:40 am	1.00	5.00 mL	0.00 mL	U111203.D	Liquid	Y	NA
4	VSTD001	ICAL3	11-12-2019 12:28 pm	1.00	5.00 mL	0.00 mL	U111204.D	Liquid	Y	NA
5	VSTD002	ICAL4	11-12-2019 12:52 pm	1.00	5.00 mL	0.00 mL	U111205.D	Liquid	Y	NA
6	VSTD005	ICAL5	11-12-2019 01:17 pm	1.00	5.00 mL	0.00 mL	U111206.D	Liquid	Y	NA
7	VSTD020	ICAL6	11-12-2019 01:41 pm	1.00	5.00 mL	0.00 mL	U111207.D	Liquid	Y	NA
8	VSTD050	ICAL7	11-12-2019 02:05 pm	1.00	5.00 mL	0.00 mL	U111208.D	Liquid	Y	NA
9	VSTD100	ICAL8	11-12-2019 02:29 pm	1.00	5.00 mL	0.00 mL	U111209.D	Liquid	Y	NA
10	VSTD150	ICAL9	11-12-2019 02:53 pm	1.00	5.00 mL	0.00 mL	U111210.D	Liquid	Y	NA
11	VSTD200	ICAL	11-12-2019 03:17 pm	1.00	5.00 mL	0.00 mL	U111211.D	Liquid	Y	NA
12	BLANK	SAMP	11-12-2019 03:41 pm	1.00	5.00 mL	0.00 mL	U111212.D	Liquid	Y	NA
13	BLANK	SAMP	11-12-2019 04:06 pm	1.00	5.00 mL	0.00 mL	U111213.D	Liquid	Y	NA
14	ICV	ICV	11-12-2019 04:30 pm	1.00	5.00 mL	0.00 mL	U111214.D	Liquid	Y	NA
15	VSTD050	SAMP	11-12-2019 04:54 pm	1.00	5.00 mL	0.00 mL	U111215.D	Liquid	Y	NA
16	VLCSW-191112	LCS	11-12-2019 05:18 pm	1.00	5.00 mL	0.00 mL	U111216.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
17	BLANK	SAMP	11-12-2019 05:43 pm	1.00	5.00 mL	0.00 mL	U111217.D	Liquid	Y	NA
18	VBLKW-191112	MBLK	11-12-2019 06:07 pm	1.00	5.00 mL	0.00 mL	U111218.D	Liquid	Y	NA
19	HS19110280-01	SAMP	11-12-2019 06:31 pm	1.00	5.00 mL	0.00 mL	U111219.D	Liquid	Y	NA
20	HS19110280-02	SAMP	11-12-2019 06:56 pm	1.00	5.00 mL	0.00 mL	U111220.D	Liquid	Y	NA
21	HS19110280-01MS	MS	11-12-2019 07:20 pm	1.00	5.00 mL	0.00 mL	U111221.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
22	HS19110280-01MSD	MSD	11-12-2019 07:44 pm	1.00	5.00 mL	0.00 mL	U111222.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
23	HS19110445-03	SAMP	11-12-2019 08:08 pm	1.00	5.00 mL	0.00 mL	U111223.D	Liquid	Y	NA
24	HS19110569-01	SAMP	11-12-2019 08:33 pm	1.00	5.00 mL	0.00 mL	U111224.D	Liquid	Y	NA
25	HS19110569-02	SAMP	11-12-2019 08:57 pm	1.00	5.00 mL	0.00 mL	U111225.D	Liquid	Y	NA
26	HS19110353-01	SAMP	11-12-2019 09:21 pm	1.00	5.00 mL	0.00 mL	U111226.D	Liquid	Y	NA
27	HS19110353-02	SAMP	11-12-2019 09:45 pm	1.00	5.00 mL	0.00 mL	U111227.D	Liquid	Y	NA
28	HS19110352-01	SAMP	11-12-2019 10:10 pm	1.00	5.00 mL	0.00 mL	U111228.D	Liquid	Y	NA
29	BFB	TUNE	11-12-2019 10:34 pm	1.00	0.00 mL	0.00 mL	V111201a.D	Liquid	Y	NA
	Auto find/purged									
30	BFB	TUNE	11-12-2019 10:58 pm	1.00	0.00 mL	0.00 mL	V111202.D	Liquid	Y	NA
	Auto find/purged									
31	VSTD050	CCV	11-12-2019 11:22 pm	1.00	5.00 mL	0.00 mL	V111203.D	Liquid	Y	NA
	10 uL cal/50 mL DI									
32	VLCSW-191112	LCS	11-12-2019 11:46 pm	1.00	5.00 mL	0.00 mL	V111204.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
33	BLANK	SAMP	11-13-2019 12:11 am	1.00	5.00 mL	0.00 mL	V111205.D	Liquid	Y	NA
34	VBLKW-191112	MBLK	11-13-2019 12:35 am	1.00	5.00 mL	0.00 mL	V111206.D	Liquid	Y	NA
35	HS19110353-03	SAMP	11-13-2019 12:59 am	1.00	5.00 mL	0.00 mL	V111207.D	Liquid	Y	NA
36	HS19110349-01	SAMP	11-13-2019 01:23 am	1.00	5.00 mL	0.00 mL	V111208.D	Liquid	Y	NA
37	HS19110349-02	SAMP	11-13-2019 01:48 am	1.00	5.00 mL	0.00 mL	V111209.D	Liquid	Y	NA

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
38	HS19110353-03MS	MS	11-13-2019 02:12 am	1.00	5.00 mL	0.00 mL	V111210.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
39	HS19110353-03MSD	MSD	11-13-2019 02:36 am	1.00	5.00 mL	0.00 mL	V111211.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
40	HS19110445-04	SAMP	11-13-2019 03:00 am	1.00	5.00 mL	0.00 mL	V111212.D	Liquid	Y	NA
41	MBLK-147407	MBLK	11-13-2019 03:25 am	20.00	5.00 mL	0.00 mL	V111213.D	Liquid	Y	NA
42	HS19110336-01	SAMP	11-13-2019 03:49 am	20.00	5.00 mL	0.00 mL	V111214.D	Liquid	Y	NA
43	HS19110353-04	SAMP	11-13-2019 04:13 am	1.00	5.00 mL	0.00 mL	V111215.D	Liquid	Y	NA
44	HS19110353-05	SAMP	11-13-2019 04:37 am	1.00	5.00 mL	0.00 mL	V111216.D	Liquid	Y	NA
45	HS19110353-06	SAMP	11-13-2019 05:01 am	1.00	5.00 mL	0.00 mL	V111217.D	Liquid	Y	NA
46	HS19110353-07	SAMP	11-13-2019 05:26 am	1.00	5.00 mL	0.00 mL	V111218.D	Liquid	Y	NA
47	HS19110452-02	SAMP	11-13-2019 05:50 am	1.00	5.00 mL	0.00 mL	V111219.D	Liquid	Y	NA
48	HS19110452-03	SAMP	11-13-2019 06:14 am	1.00	5.00 mL	0.00 mL	V111220.D	Liquid	Y	NA
49	HS19110452-01	SAMP	11-13-2019 06:38 am	5.00	5.00 mL	0.00 mL	V111221.D	Liquid	Y	NA
50	HS19110445-05	SAMP	11-13-2019 07:03 am	1.00	5.00 mL	0.00 mL	V111222.D	Liquid	Y	NA
51	HS19110445-06	SAMP	11-13-2019 07:27 am	1.00	5.00 mL	0.00 mL	V111223.D	Liquid	Y	NA
52	MBLK-147383	MBLK	11-13-2019 07:51 am	20.00	5.00 mL	0.00 mL	V111224.D	Liquid	Y	NA
53	HS19110437-01	SAMP	11-13-2019 08:15 am	100.0(	5.00 mL	0.00 mL	V111225.D	Liquid	Y	NA
54	HS19110454-01	SAMP	11-13-2019 08:39 am	1000.0	5.00 mL	0.00 mL	V111226.D	Liquid	Y	NA
55	HS19110441-01	SAMP	11-13-2019 09:04 am	100.0(	5.00 mL	0.00 mL	V111227.D	Liquid	Y	NA
56	HS19110447-01	SAMP	11-13-2019 09:28 am	1.00	5.00 mL	0.00 mL	V111228.D	Liquid	Y	NA
57	HS19110447-02	SAMP	11-13-2019 09:52 am	1.00	5.00 mL	0.00 mL	V111229.D	Liquid	Y	NA
58	HS19110452-01	SAMP	11-13-2019 10:16 am	25.00	5.00 mL	0.00 mL	V111230.D	Liquid	Y	NA

Chemical	Value
SURR SPK ID	31106-03-03
IS ID	31106-03-04
ICV STD ID	30603-91-01
LCS/MS ID	30603-91-01
CAL STD ID	31106-03-01/02
BFB ID	31106-04-03
pH Paper	634-64-11

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	50.00	57.35	115	80-120
trans-1,3-Dichloroprope	50.00	50.30	101	80-120
1,3-Dichlorobenzene	50.00	45.02	90	80-120
2,2-Dichloropropane	50.00	50.54	101	80-120
1,1-Dichloropropene	50.00	46.93	94	80-120
Dibromomethane	50.00	49.20	98	80-120
1,2-Dibromoethane	50.00	48.58	97	80-120
trans-1,2-Dichloroethen	50.00	45.31	91	80-120
1,1,1,2-Tetrachloroetha	50.00	48.22	96	80-120
1,1,1-Trichloroethane	50.00	45.72	91	80-120
1,1,2,2-Tetrachloroetha	50.00	48.94	98	80-120
Toluene	50.00	45.89	92	80-120
1,1,2-Trichloroethane	50.00	49.47	99	80-120
1,1-Dichloroethane	50.00	46.96	94	80-120
1,1-Dichloroethene	50.00	45.43	91	80-120
Trichlorofluoromethane	50.00	44.90	90	80-120
1,2,3-Trichlorobenzene	50.00	50.53	101	80-120
Tetrachloroethene	50.00	43.61	87	80-120
1,2,4-Trichlorobenzene	50.00	46.29	92	80-120
1,2,4-Trimethylbenzene	50.00	47.08	94	80-120
tert-Butylbenzene	50.00	45.31	91	80-120
Trichloroethene	50.00	48.06	96	80-120
1,2-Dichlorobenzene	50.00	47.46	95	80-120
1,2-Dichloroethane	50.00	46.11	92	80-120
1,2-Dichloropropane	50.00	53.86	108	80-120
1,3,5-Trimethylbenzene	50.00	45.82	92	80-120
1,3-Dichloropropane	50.00	50.82	102	80-120
1,4-Dichlorobenzene	50.00	45.38	91	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
2-Butanone	100.00	105.96	106	80-120
2-Chlorotoluene	50.00	47.72	95	80-120
2-Hexanone	100.00	92.98	93	80-120
4-Chlorotoluene	50.00	46.94	94	80-120
Styrene	50.00	49.38	99	80-120
4-Methyl-2-Pentanone	100.00	100.38	100	80-120
Acetone	100.00	111.32	111	80-120
Benzene	50.00	48.55	97	80-120
Bromobenzene	50.00	45.93	92	80-120
Bromochloromethane	50.00	48.14	96	80-120
Bromodichloromethane	50.00	52.64	105	80-120
Bromoform	50.00	46.55	93	80-120
Bromomethane	50.00	49.94	100	80-120
Carbon Disulfide	100.00	96.51	96	80-120
Carbon Tetrachloride	50.00	49.39	99	80-120
Chlorobenzene	50.00	45.35	91	80-120
Chloroethane	50.00	50.73	101	80-120
Chloroform	50.00	47.79	96	80-120
Chloromethane	50.00	51.64	103	80-120
cis-1,2-Dichloroethene	50.00	45.14	90	80-120
Dibromochloromethane	50.00	45.49	91	80-120
Dichlorodifluoromethane	50.00	44.52	89	80-120
Ethylbenzene	50.00	46.31	93	80-120
Hexachlorobutadiene	50.00	40.15	80	80-120
Isopropylbenzene	50.00	46.27	92	80-120
m,p-Xylenes	100.00	95.27	95	80-120
Methylene Chloride	50.00	48.55	97	80-120
n-Butylbenzene	50.00	44.21	88	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
n-Propylbenzene	50.00	45.67	91	80-120
Naphthalene	50.00	53.09	106	80-120
o-Xylene	50.00	46.63	93	80-120
sec-Butylbenzene	50.00	43.65	87	80-120
Vinyl Chloride	50.00	44.20	88	80-120
1,2,3-Trichloropropane	50.00	50.71	101	80-120
p-Isopropyltoluene	50.00	43.66	87	80-120
1,2-Dibromo-3-Chloropro	50.00	45.46	91	80-120
Freon TF	50.00	43.88	88	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Lab File ID: U111201 BFB Injection Date: 11/12/19

Instrument ID: VOA9 BFB Injection Time: 1052

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	51.3
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	0.0 (0.0)1
174	Greater than 50.0% of mass 95	120.4
175	5.0 - 9.0% of mass 174	10.3 (8.5)1
176	95.0 - 101.0% of mass 174	115.1 (95.7)1
177	5.0 - 9.0% of mass 176	7.7 (6.7)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	U111202	11/12/19	1116
02	VSTD000.5	VSTD000.5	U111203	11/12/19	1140
03	VSTD001	VSTD001	U111204	11/12/19	1228
04	VSTD002	VSTD002	U111205	11/12/19	1252
05	VSTD005	VSTD005	U111206	11/12/19	1317
06	VSTD020	VSTD020	U111207	11/12/19	1341
07	VSTD050	VSTD050	U111208	11/12/19	1405
08	VSTD100	VSTD100	U111209	11/12/19	1429
09	VSTD150	VSTD150	U111210	11/12/19	1453
10	VSTD200	VSTD200	U111211	11/12/19	1517
11	ICV	ICV	U111214	11/12/19	1630
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

LAB FILE ID: RF0.25: U111202 RF0.5: U111203 RF1: U111204
RF2: U111205 RF5: U111206 RF20: U111207

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
cis-1,3-Dichloropropene		0.287	0.356	0.298	0.341	0.399
trans-1,3-Dichloropropene		938	2761	4967	12829	62161
1,3-Dichlorobenzene		1.754	1.722	1.349	1.313	1.446
2,2-Dichloropropane		0.500	0.534	0.558	0.529	0.594
1,1-Dichloropropene		0.331	0.386	0.334	0.356	0.352
Dibromomethane		0.267	0.173	0.220	0.185	0.211
1,2-Dibromoethane		0.374	0.376	0.317	0.370	0.358
trans-1,2-Dichloroethene		1321	3398	4204	10913	45366
1,1,1,2-Tetrachloroethane		768	2340	4139	10434	49905
1,1,1-Trichloroethane		0.816	0.685	0.653	0.720	0.717
1,1,2,2-Tetrachloroethane		0.732	1.118	0.769	0.901	0.872
Toluene		1.560	1.598	1.356	1.441	1.398
1,1,2-Trichloroethane		0.232	0.298	0.244	0.265	0.262
1,1-Dichloroethane		0.667	0.810	0.732	0.748	0.709
1,1-Dichloroethene		1.121	1.341	1.174	1.245	1.181
Trichlorofluoromethane		2.080	2.413	2.199	2.385	2.206
1,2,3-Trichlorobenzene		0.612	0.705	0.717	0.834	0.855
Tetrachloroethene		0.356	0.377	0.409	0.397	0.366
1,2,4-Trichlorobenzene		0.766	1.035	0.851	0.864	0.877
1,2,4-Trimethylbenzene		2.142	2.522	2.174	2.274	2.327
tert-Butylbenzene		1.633	1.834	1.748	1.954	1.906
Trichloroethene		0.379	0.360	0.347	0.327	0.340
1,2-Dichlorobenzene		1.492	1.471	1.298	1.532	1.498
1,2-Dichloroethane		0.405	0.477	0.391	0.396	0.377
1,2-Dichloropropane		968	3031	3974	11076	42821
1,3,5-Trimethylbenzene		1.960	2.359	1.976	2.144	2.103
1,3-Dichloropropane		0.506	0.550	0.512	0.511	0.534
1,4-Dichlorobenzene		2.147	1.764	1.567	1.442	1.478
2-Butanone		1976	2961	4562	8511	39572
2-Chlorotoluene		1.427	1.731	1.567	1.626	1.638
2-Hexanone		0.252	0.236	0.200	0.201	0.226
4-Chlorotoluene		1.810	2.411	1.724	2.089	2.004
Styrene		0.902	1.018	0.940	1.083	1.057
4-Methyl-2-Pentanone		0.264	0.332	0.263	0.282	0.294
Acetone		9998	14328	15326	26993	85175
Benzene		1.039	1.277	1.036	1.156	1.109
Bromobenzene		1.125	1.091	0.807	0.781	0.853
Bromochloromethane		0.374	0.321	0.278	0.284	0.284
Bromodichloromethane		0.228	0.402	0.298	0.350	0.358
Bromoform		440	1218	2995	5749	35985
Bromomethane		4824	9435	16415	41828	145407
Carbon Disulfide		1.008	1.135	1.040	1.066	1.119
Carbon Tetrachloride		0.362	0.310	0.314	0.341	0.351
Chlorobenzene		1.097	1.105	0.970	1.022	0.941

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911064

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

LAB FILE ID: RF0.25: U111202 RF0.5: U111203 RF1: U111204
RF2: U111205 RF5: U111206 RF20: U111207

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
Chloroethane		1992	4623	7971	24112	80331
Chloroform		0.931	0.888	0.685	0.912	0.844
Chloromethane		1635	2772	5474	13392	54009
cis-1,2-Dichloroethene		0.595	0.648	0.613	0.542	0.555
Dibromochloromethane		924	2173	3565	10232	50243
Dichlorodifluoromethane		0.470	0.527	0.598	0.486	0.504
Ethylbenzene		0.458	0.576	0.456	0.518	0.492
Hexachlorobutadiene		0.412	0.303	0.267	0.291	0.285
Isopropylbenzene		1.328	1.420	1.317	1.417	1.412
m,p-Xylenes		0.506	0.594	0.540	0.612	0.601
Methylene Chloride		1984	2559	4577	11941	45816
n-Butylbenzene		2.183	1.857	1.660	1.917	1.848
n-Propylbenzene		2.723	3.157	2.712	3.019	2.944
Naphthalene		1.996	1.971	1.946	2.312	2.548
o-Xylene		0.644	0.567	0.525	0.610	0.621
sec-Butylbenzene		2.534	2.445	2.316	2.420	2.463
Vinyl Chloride		1.127	1.377	1.222	1.200	1.135
1,2,3-Trichloropropane		0.744	0.898	0.789	0.871	0.835
p-Isopropyltoluene		2.433	2.450	2.101	2.320	2.278
1,2-Dibromo-3-Chloropropane		18	416	995	2891	12005
Freon TF		0.906	1.152	1.246	1.267	1.181
4-Bromofluorobenzene		3090	4537	6587	15194	57298
Dibromofluoromethane		2954	4336	7231	13696	52362
Toluene-d8		10912	14345	24741	50004	186186
1,2-Dichloroethane-d4		3547	4108	6889	15774	52733

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911064

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

LAB FILE ID: RF50: U111208 RF100: U111209 RF150: U111210
RF200: U111211

COMPOUND	RF50	RF100	RF150	RF200
cis-1,3-Dichloropropene	0.417	0.395	0.399	0.383
trans-1,3-Dichloropropene	188731	454991	757873	1110034
1,3-Dichlorobenzene	1.413	1.370	1.476	1.472
2,2-Dichloropropane	0.586	0.588	0.638	0.634
1,1-Dichloropropene	0.334	0.308	0.316	0.300
Dibromomethane	0.208	0.190	0.190	0.180
1,2-Dibromoethane	0.360	0.387	0.412	0.433
trans-1,2-Dichloroethene	123828	275617	467765	682070
1,1,1,2-Tetrachloroethane	141983	338539	563042	826765
1,1,1-Trichloroethane	0.749	0.744	0.793	0.816
1,1,2,2-Tetrachloroethane	0.872	0.870	0.924	0.924
Toluene	1.447	1.510	1.627	1.639
1,1,2-Trichloroethane	0.265	0.250	0.264	0.257
1,1-Dichloroethane	0.674	0.670	0.692	0.683
1,1-Dichloroethene	1.137	1.109	1.102	1.101
Trichlorofluoromethane	2.126	1.961	1.989	1.950
1,2,3-Trichlorobenzene	0.814	0.807	0.855	0.879
Tetrachloroethene	0.371	0.364	0.392	0.380
1,2,4-Trichlorobenzene	0.891	0.865	0.922	0.940
1,2,4-Trimethylbenzene	2.283	2.270	2.438	2.440
tert-Butylbenzene	1.860	1.813	1.957	1.950
Trichloroethene	0.330	0.305	0.302	0.288
1,2-Dichlorobenzene	1.550	1.498	1.602	1.613
1,2-Dichloroethane	0.350	0.324	0.326	0.304
1,2-Dichloropropane	112389	248467	401214	597030
1,3,5-Trimethylbenzene	2.148	2.172	2.330	2.416
1,3-Dichloropropane	0.515	0.514	0.520	0.513
1,4-Dichlorobenzene	1.458	1.468	1.541	1.554
2-Butanone	100156	220020	338930	478432
2-Chlorotoluene	1.634	1.607	1.672	1.675
2-Hexanone	0.206	0.214	0.216	0.215
4-Chlorotoluene	2.020	2.012	2.135	2.178
Styrene	1.096	1.173	1.258	1.268
4-Methyl-2-Pentanone	0.292	0.292	0.302	0.304
Acetone	193875	378076	558030	787633
Benzene	1.074	1.018	1.035	0.982
Bromobenzene	0.834	0.830	0.912	0.903
Bromochloromethane	0.278	0.279	0.278	0.281
Bromodichloromethane	0.348	0.342	0.349	0.325
Bromoform	110280	292511	516985	787561
Bromomethane	367813	972459	2416063	
Carbon Disulfide	1.125	1.100	1.178	1.210
Carbon Tetrachloride	0.372	0.351	0.371	0.357
Chlorobenzene	0.966	0.973	1.017	1.023

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911064

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

LAB FILE ID: RF50: U111208 RF100: U111209 RF150: U111210
RF200: U111211

COMPOUND	RF50	RF100	RF150	RF200
Chloroethane	198912	424128	642369	907418
Chloroform	0.824	0.817	0.854	0.853
Chloromethane	127356	262348	396602	595821
cis-1,2-Dichloroethene	0.528	0.529	0.551	0.564
Dibromochloromethane	150176	353574	614850	900839
Dichlorodifluoromethane	0.492	0.478	0.510	0.510
Ethylbenzene	0.488	0.497	0.529	0.528
Hexachlorobutadiene	0.293	0.278	0.283	0.298
Isopropylbenzene	1.435	1.459	1.551	1.542
m,p-Xylenes	0.626	0.656	0.699	0.725
Methylene Chloride	122034	271871	438580	642406
n-Butylbenzene	1.959	1.949	2.083	2.109
n-Propylbenzene	2.901	2.831	3.011	3.007
Naphthalene	2.552	2.554	2.674	2.737
o-Xylene	0.628	0.639	0.690	0.710
sec-Butylbenzene	2.418	2.362	2.526	2.554
Vinyl Chloride	1.065	0.984	0.974	0.924
1,2,3-Trichloropropane	0.859	0.806	0.926	0.916
p-Isopropyltoluene	2.342	2.210	2.406	2.435
1,2-Dibromo-3-Chloropropane	39470	96733	149466	223916
Freon TF	1.097	1.062	1.066	1.062
4-Bromofluorobenzene	152807	362804	602187	874895
Dibromofluoromethane	136408	301818	489495	
Toluene-d8	511889	1157985	1922403	2782744
1,2-Dichloroethane-d4	139459	285285	476109	653758

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911064

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
cis-1,3-Dichloropropene	AVRG		0.36398456		12.910	20.000
trans-1,3-Dichloropropene	LINR	1.485e-002	2.39198748		0.9992784	0.9900000
1,3-Dichlorobenzene	AVRG		1.47940538		10.585	20.000
2,2-Dichloropropane	AVRG		0.57340937		8.243	20.000
1,1-Dichloropropene	AVRG		0.33530760		7.872	20.000
Dibromomethane	AVRG		0.20260872		14.125	20.000
1,2-Dibromoethane	AVRG		0.37625847		8.818	20.000
trans-1,2-Dichloroethene	LINR	3.751e-002	1.98170980		0.9978714	0.9900000
1,1,1,2-Tetrachloroethane	LINR	3.471e-002	2.69823867		0.9992695	0.9900000
1,1,1-Trichloroethane	AVRG		0.74377178		7.649	20.000
1,1,2,2-Tetrachloroethane	AVRG		0.88695306		12.295	20.000
Toluene	AVRG		1.50868344		6.851	20.000
1,1,2-Trichloroethane	AVRG		0.25977925		6.958	20.000
1,1-Dichloroethane	AVRG		0.70956192		6.655	20.000
1,1-Dichloroethene	AVRG		1.16786627		6.876	20.000
Trichlorofluoromethane	AVRG		2.14547710		8.024	20.000
1,2,3-Trichlorobenzene	AVRG		0.78647962		11.328	20.000
Tetrachloroethene	AVRG		0.37901683		4.568	20.000
1,2,4-Trichlorobenzene	AVRG		0.89018539		8.226	20.000
1,2,4-Trimethylbenzene	AVRG		2.31897147		5.455	20.000
tert-Butylbenzene	AVRG		1.85052530		5.886	20.000
Trichloroethene	AVRG		0.33104681		8.901	20.000
1,2-Dichlorobenzene	AVRG		1.50614619		6.111	20.000
1,2-Dichloroethane	AVRG		0.37219248		14.335	20.000
1,2-Dichloropropane	LINR	-3.18e-002	4.51075036		0.9993649	0.9900000
1,3,5-Trimethylbenzene	AVRG		2.17862341		7.401	20.000
1,3-Dichloropropane	AVRG		0.51950990		2.637	20.000
1,4-Dichlorobenzene	AVRG		1.60207214		14.132	20.000
2-Butanone	LINR	-3.46e-002	5.58542659		0.9998758	0.9900000
2-Chlorotoluene	AVRG		1.61978943		5.302	20.000
2-Hexanone	AVRG		0.21837891		7.880	20.000
4-Chlorotoluene	AVRG		2.04262018		9.845	20.000
Styrene	AVRG		1.08839940		11.760	20.000
4-Methyl-2-Pentanone	AVRG		0.29169112		7.193	20.000
Acetone	LINR	-0.2272548	3.45512163		0.9983713	0.9900000
Benzene	AVRG		1.08071887		8.317	20.000
Bromobenzene	AVRG		0.90414435		13.636	20.000
Bromochloromethane	AVRG		0.29516302		10.977	20.000
Bromodichloromethane	AVRG		0.33333052		14.439	20.000
Bromoform	2ORDR	3.921e-002	3.53248395	-0.5323046	0.9989115	0.9900000
Bromomethane	2ORDR	-1.63e-002	0.79991937	-5.3e-002	0.9996198	0.9900000
Carbon Disulfide	AVRG		1.10899983		5.788	20.000
Carbon Tetrachloride	AVRG		0.34754013		6.416	20.000
Chlorobenzene	AVRG		1.01251164		5.708	20.000

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911064

Instrument ID: VOA9 Calibration Date(s): 11/12/19 11/12/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1116 1517

COMPOUND	CURVE	COEFFICENTS A0	COEFFICENTS A1	COEFFICENTS A2	%RSD OR R^2	MAX %RSD OR R^2
Chloroethane	LINR	-3.5e-002	1.47514259		0.9995353	0.9900000
Chloroform	AVRG		0.84525572		8.430	20.000
Chloromethane	LINR	-2.44e-002	2.29809224		0.9986837	0.9900000
cis-1,2-Dichloroethene	AVRG		0.56953074		7.187	20.000
Dibromochloromethane	LINR	5.094e-002	2.47504203		0.9981488	0.9900000
Dichlorodifluoromethane	AVRG		0.50849627		7.468	20.000
Ethylbenzene	AVRG		0.50478352		7.513	20.000
Hexachlorobutadiene	AVRG		0.30124535		14.301	20.000
Isopropylbenzene	AVRG		1.43142287		5.621	20.000
m,p-Xylenes	AVRG		0.61772271		11.313	20.000
Methylene Chloride	LINR	1.803e-002	2.10716037		0.9991743	0.9900000
n-Butylbenzene	AVRG		1.95170837		8.127	20.000
n-Propylbenzene	AVRG		2.92274678		5.026	20.000
Naphthalene	AVRG		2.36540339		13.438	20.000
o-Xylene	AVRG		0.62592762		9.050	20.000
sec-Butylbenzene	AVRG		2.44870763		3.270	20.000
Vinyl Chloride	AVRG		1.11193907		12.878	20.000
1,2,3-Trichloropropane	AVRG		0.84953496		7.203	20.000
p-Isopropyltoluene	AVRG		2.33069251		5.072	20.000
1,2-Dibromo-3-Chloropropane	LINR	3.196e-002	5.55801281		0.9994699	0.9900000
Freon TF	AVRG		1.11541989		9.939	20.000
4-Bromofluorobenzene	LINR	1.311e-002	2.55439365		0.9993154	0.9900000
Dibromofluoromethane	2ORDR	-2.2e-002	2.13469600	-0.1301322	0.9999436	0.9900000
Toluene-d8	LINR	2.619e-003	0.80352398		0.9995727	0.9900000
1,2-Dichloroethane-d4	LINR	-1.9e-002	2.03958425		0.9990326	0.9900000

FORM VI VOA

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111201.D Page 1

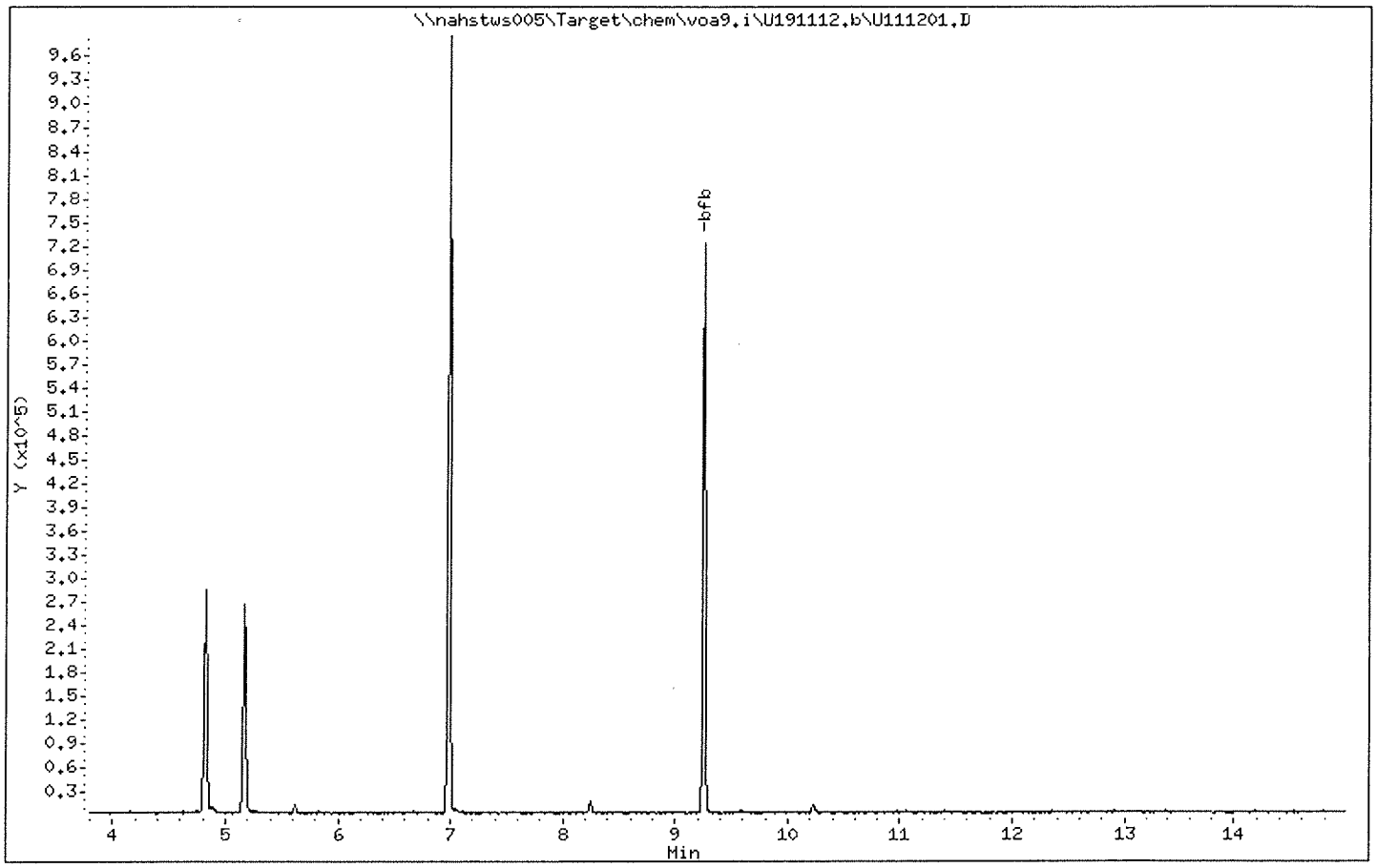
Date : 12-NOV-2019 10:52

Client ID: BFB Instrument: VOA9.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\voa9.i\U191112.b\U111201.D Page 2

Date : 12-NOV-2019 10:52

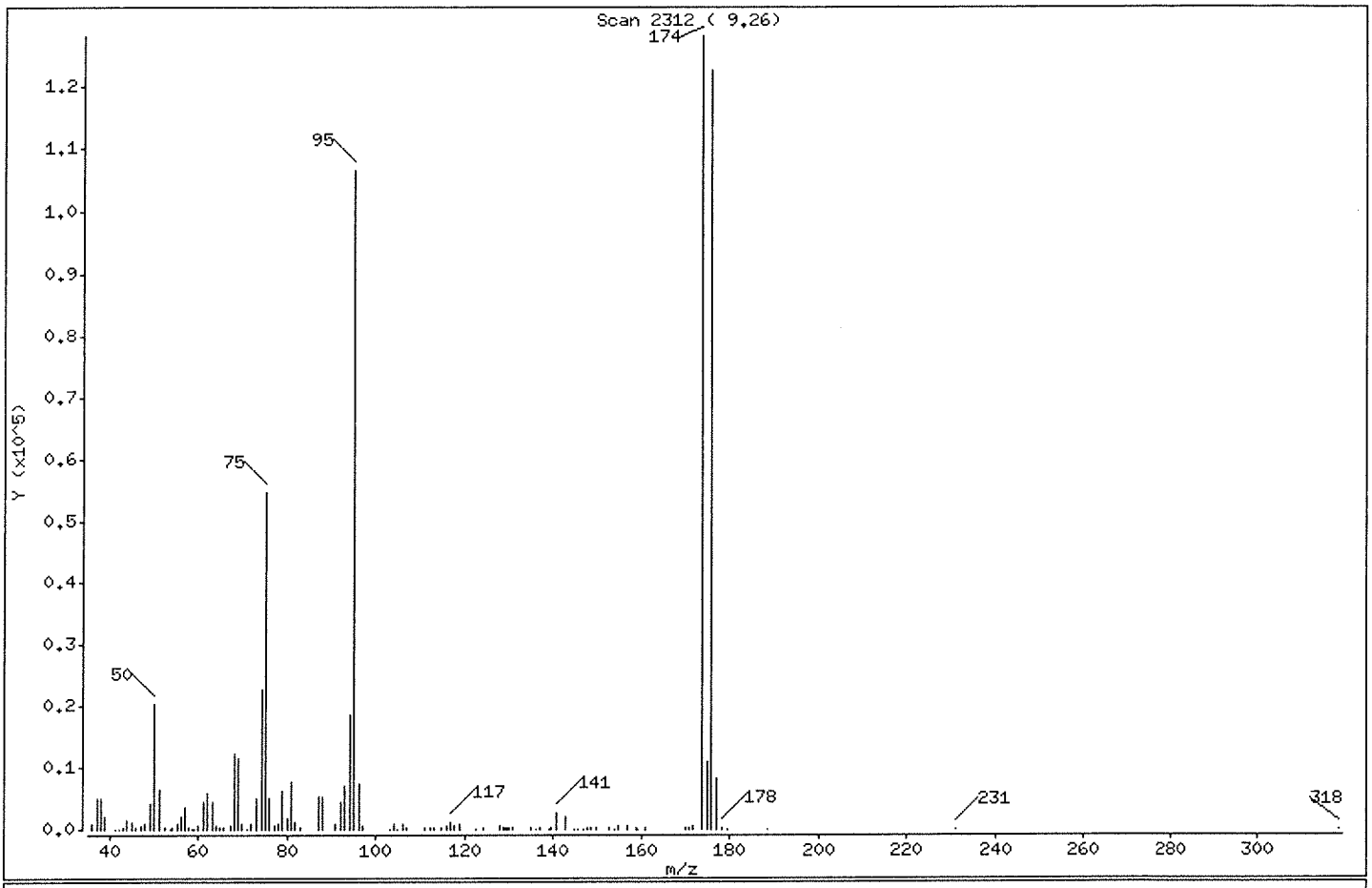
Client ID: BFB Instrument: VOA9.i

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	18.97
75	30.00 - 60.00% of mass 95	51.27
96	5.00 - 9.00% of mass 95	7.01
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	120.35
175	5.00 - 9.00% of mass 174	10.28 (8.55)
176	95.00 - 101.00% of mass 174	115.13 (95.66)
177	5.00 - 9.00% of mass 176	7.67 (6.67)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111201.D

Date : 12-NOV-2019 10:52

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: U111201.D
Spectrum: Scan 2312 (9.26)
Location of Maximum: 173.90
Number of points: 111

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	897	63.10	4500	96.00	7481	140.80	2621
37.00	5026	64.00	622	97.00	459	142.90	2000
38.00	5134	64.80	163	103.00	131	145.00	88
39.00	1978	65.80	165	104.00	801	145.70	118
41.40	106	67.20	707	104.80	147	146.80	63
42.20	137	68.00	12253	106.10	897	147.80	354
43.00	204	69.00	11545	107.00	220	148.70	241
43.90	1363	69.90	978	111.00	419	149.70	411
44.90	1055	71.10	91	112.10	193	152.90	285
46.00	268	72.00	919	113.10	264	154.00	114
47.10	675	73.10	5073	114.80	344	154.90	574
48.00	895	74.10	22776	115.90	686	157.00	622
49.00	4065	75.00	54688	116.90	1104	158.90	236
50.00	20240	76.00	5057	117.70	579	159.50	58
51.00	6590	77.00	583	118.90	1030	160.90	223
52.30	317	77.90	761	122.70	69	170.20	313
52.60	400	78.90	6205	124.10	157	171.00	157
53.70	124	79.90	1633	127.90	707	171.60	480
54.20	200	80.90	7619	128.60	388	173.90	128384
55.20	790	81.90	1307	129.00	390	175.00	10971
56.00	2059	82.80	399	129.70	382	176.00	122808
57.00	3648	87.00	5227	130.00	395	176.90	8187
57.90	227	88.00	5399	130.70	230	178.10	180
58.60	62	90.90	1022	134.90	431	179.40	74
59.10	102	92.00	4356	136.10	123	188.80	145
60.00	590	93.00	7185	136.90	226	230.90	110
61.00	4419	94.10	18448	139.00	116	318.40	113
62.00	5840	95.00	106672	139.70	320		

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111202.D Page 1
Report Date: 05-Dec-2019 15:54

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111202.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 12-NOV-2019 11:16
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.25;VSTD000.25;1;1;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 11:16 Cal File: U112102.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
*	1 Pentafluorobenzene	168	4.894	4.894	(1.000)	272635	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	427777	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	383752	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	194223	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	3693	0.25000	0.43(Ta)
$	69 4-Bromofluorobenzene	95	9.250	9.253	(1.122)	3643	0.25000	1.86(a)
$	30 Dibromofluoromethane	113	4.834	4.826	(0.988)	3086	0.25000	0.10(a)
$	48 Toluene-d8	98	6.986	6.989	(0.847)	9629	0.25000	1.13(a)
	60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	540	0.25000	1.92(aM)
	31 1,1,1-Trichloroethane	97	4.823	4.826	(0.985)	927	0.25000	0.22(a)
	68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	795	0.25000	0.23(aM)
	138 Freon TF	101	2.412	2.397	(0.493)	1859	0.25000	0.30(a)
	53 1,1,2-Trichloroethane	83	7.413	7.417	(0.899)	416	0.25000	0.20(aM)
	22 1,1-Dichloroethane	63	3.593	3.600	(0.734)	885	0.25000	0.22(aM)
	11 1,1-Dichloroethene	96	2.405	2.397	(0.491)	1632	0.25000	0.25(aM)
	32 1,1-Dichloropropene	75	4.999	5.002	(0.889)	737	0.25000	0.25(a)
	93 1,2,3-Trichlorobenzene	180	12.328	12.331	(1.205)	555	0.25000	0.18(aM)
	71 1,2,3-Trichloropropane	75	9.419	9.426	(0.921)	990	0.25000	0.30(a)
	90 1,2,4-Trichlorobenzene	180	11.923	11.919	(1.165)	922	0.25000	0.26(aM)
	79 1,2,4-Trimethylbenzene	105	9.936	9.939	(0.971)	2251	0.25000	0.24(a)
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	667	0.25000	0.23(aM)
	88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	1446	0.25000	0.24(a)
	33 1,2-Dichloroethane	62	5.254	5.250	(0.935)	1147	0.25000	0.36(a)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111202.D Page 2
Report Date: 05-Dec-2019 15:54

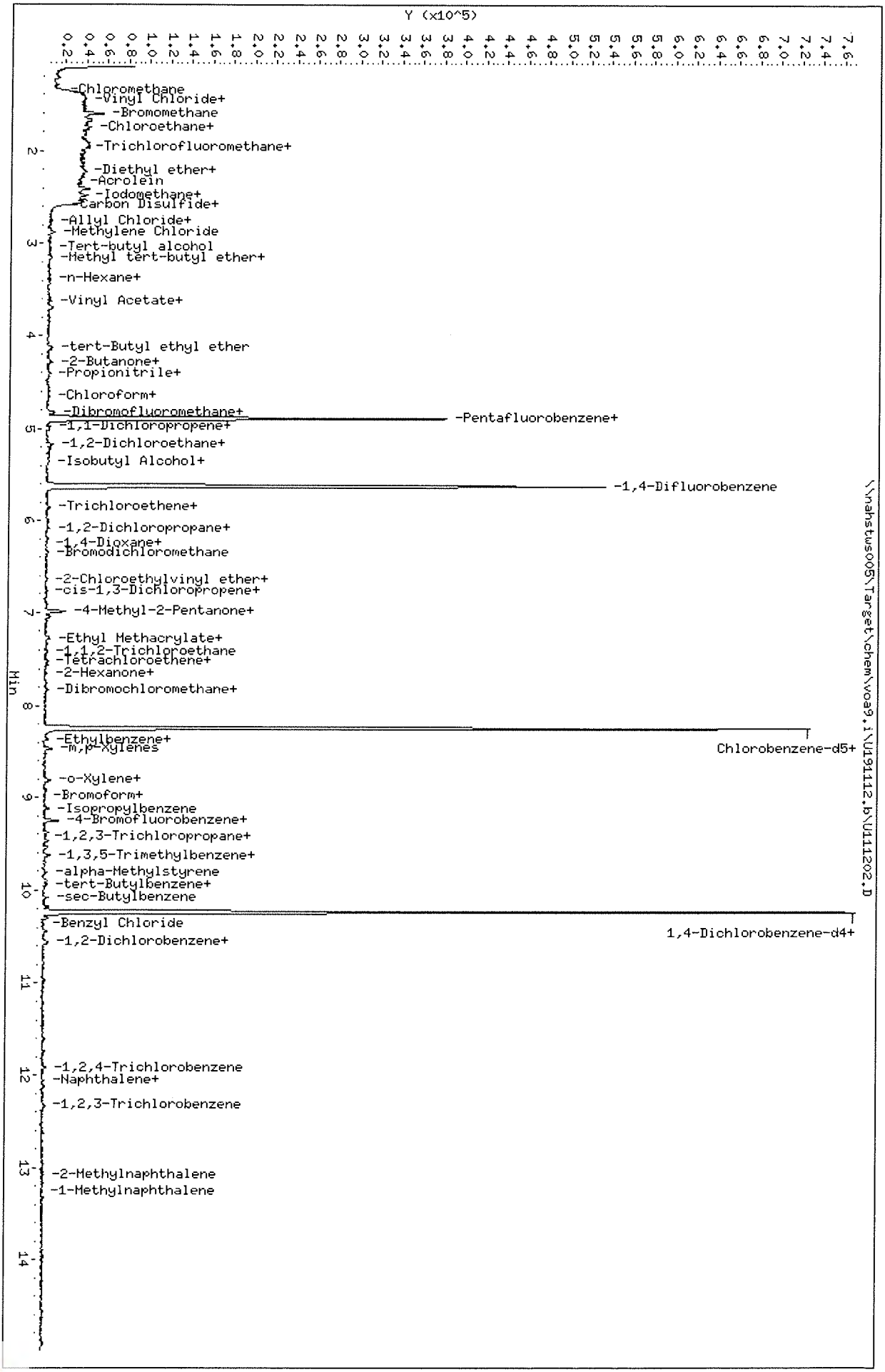
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
42	1,2-Dichloropropane	63	6.079	6.078	(1.081)	738	0.25000	(aM)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	1922	0.25000	0.22(a)
83	1,3-Dichlorobenzene	146	10.172	10.179	(0.994)	1748	0.25000	0.30(a)
54	1,3-Dichloropropane	76	7.555	7.563	(0.916)	1356	0.25000	0.34(aM)
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	1351	0.25000	0.21(a)
26	2,2-Dichloropropane	77	4.287	4.271	(0.876)	1109	0.25000	0.35(aM)
24	2-Butanone	43	4.335	4.339	(0.886)	618	0.50000	(aM)
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	1560	0.25000	0.24(a)
52	2-Hexanone	43	7.649	7.649	(0.928)	1096	0.50000	0.65(Ta)
77	4-Chlorotoluene	91	9.632	9.636	(0.941)	2024	0.25000	0.25(a)
82	p-Isopropyltoluene	119	10.202	10.209	(0.997)	2014	0.25000	0.22(aM)
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	1254	0.50000	0.56(a)
10	Acetone	43	2.480	2.483	(0.507)	6397	0.50000	(aM)
37	Benzene	78	5.220	5.216	(0.929)	2248	0.25000	0.24(a)
74	Bromobenzene	156	9.385	9.381	(0.917)	590	0.25000	0.16(aM)
29	Bromochloromethane	128	4.557	4.553	(0.931)	253	0.25000	0.15(aM)
39	Bromodichloromethane	83	6.352	6.344	(1.130)	590	0.25000	0.20(aM)
66	Bromoform	173	8.980	8.984	(1.089)	297	0.25000	2.09(aM)
6	Bromomethane	94	1.678	1.659	(0.343)	3249	0.25000	(a)
19	Carbon Disulfide	76	2.585	2.584	(0.528)	4159	0.50000	0.68(a)
34	Carbon Tetrachloride	117	4.995	4.995	(0.889)	532	0.25000	0.17(aM)
59	Chlorobenzene	112	8.271	8.271	(1.003)	2173	0.25000	0.27(a)
7	Chloroethane	64	1.753	1.741	(0.358)	1323	0.25000	(aM)
28	Chloroform	83	4.665	4.654	(0.953)	1035	0.25000	0.22(a)
3	Chloromethane	50	1.344	1.340	(0.275)	931	0.25000	(aM)
27	cis-1,2-Dichloroethene	96	4.305	4.283	(0.880)	1124	0.25000	0.36(aM)
46	cis-1,3-Dichloropropene	75	6.765	6.757	(1.203)	998	0.25000	0.32(aM)
55	Dibromochloromethane	129	7.750	7.758	(0.940)	383	0.25000	2.67(aM)
44	Dibromomethane	93	6.191	6.187	(1.101)	544	0.25000	0.31(aM)
2	Dichlorodifluoromethane	85	1.213	1.205	(0.248)	827	0.25000	0.29(aM)
61	Ethylbenzene	106	8.365	8.369	(1.015)	664	0.25000	0.17(a)
91	Hexachlorobutadiene	225	12.050	12.061	(1.178)	315	0.25000	0.26(aM)
67	Isopropylbenzene	105	9.122	9.126	(1.106)	2866	0.25000	0.26(a)
62	m,p-Xylenes	106	8.463	8.470	(1.026)	2799	0.50000	0.59(a)
17	Methylene Chloride	84	2.877	2.869	(0.588)	992	0.25000	1.28(aM)
87	n-Butylbenzene	91	10.551	10.554	(1.031)	2089	0.25000	0.27(aM)
73	n-Propylbenzene	91	9.471	9.475	(0.926)	3397	0.25000	0.29(a)
92	Naphthalene	128	12.129	12.129	(1.185)	1738	0.25000	0.18(a)
63	o-Xylene	106	8.808	8.807	(1.068)	1080	0.25000	0.22(a)
81	sec-Butylbenzene	105	10.078	10.086	(0.985)	2083	0.25000	0.21(aM)
64	Styrene	104	8.830	8.822	(1.071)	1824	0.25000	0.21(aM)
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	1801	0.25000	0.25(Ta)
56	Tetrachloroethene	166	7.522	7.522	(0.912)	883	0.25000	0.30(aM)
50	Toluene	91	7.049	7.045	(0.855)	3151	0.25000	0.27(a)
20	trans-1,2-Dichloroethene	96	3.151	3.139	(0.644)	672	0.25000	2.11(Ta)
51	trans-1,3-Dichloropropene	75	7.256	7.259	(1.291)	950	0.25000	1.00(aM)
38	Trichloroethene	130	5.854	5.861	(1.041)	853	0.25000	0.30(a)
8	Trichlorofluoromethane	101	1.959	1.951	(0.400)	2765	0.25000	0.23(a)
5	Vinyl Chloride	62	1.419	1.419	(0.290)	1085	0.25000	0.17(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

QC Flag Legend

M - Compound response manually integrated.



Data File: \\nahstws005\Target\chem\voa9,i\U191112,b\U111202,D
Date : 12-NOV-2019 11:16
Client ID: VSTD000,25
Sample Info: VSTD000,25;VSTD000,25;1;1;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D Page 1
Report Date: 05-Dec-2019 15:54

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D
Lab Smp Id: VSTD000.5 Client Smp ID: VSTD000.5
Inj Date : 12-NOV-2019 11:40
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.5;VSTD000.5;1;2;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 11:40 Cal File: U112103A.D
Als bottle: 3 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

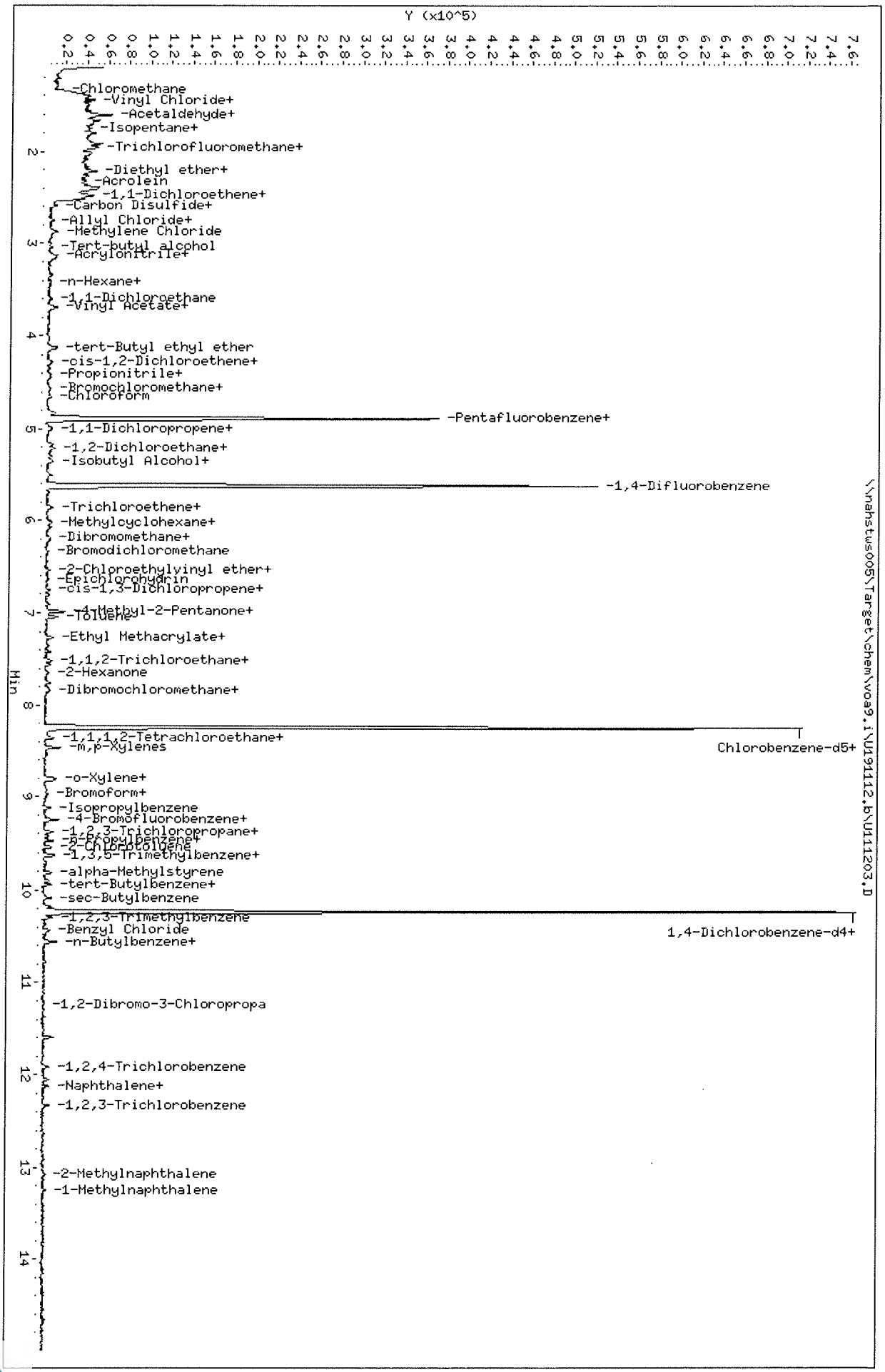
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.890	4.894	(1.000)	259604	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	402953	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	364213	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	183749	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.058)	3547	0.50000	0.44(a)
$	69 4-Bromofluorobenzene	95	9.257	9.253	(1.123)	3090	0.50000	1.73(a)
$	30 Dibromofluoromethane	113	4.830	4.826	(0.988)	2954	0.50000	0.11(a)
$	48 Toluene-d8	98	6.982	6.989	(0.847)	10912	0.50000	1.33(a)
	60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	768	0.50000	2.01(a)
	31 1,1,1-Trichloroethane	97	4.823	4.826	(0.986)	2118	0.50000	0.54(a)
	68 1,1,2,2-Tetrachloroethane	83	9.385	9.388	(0.917)	1345	0.50000	0.41(aM)
	138 Freon TF	101	2.397	2.397	(0.490)	2351	0.50000	0.40(a)
	53 1,1,2-Trichloroethane	83	7.420	7.417	(0.900)	847	0.50000	0.44(a)
	22 1,1-Dichloroethane	63	3.608	3.600	(0.738)	1732	0.50000	0.47(Ta)
	11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	2911	0.50000	0.48(a)
	32 1,1-Dichloropropene	75	4.991	5.002	(0.888)	1334	0.50000	0.49(a)
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	1124	0.50000	0.38(aM)
	71 1,2,3-Trichloropropane	75	9.418	9.426	(0.921)	1368	0.50000	0.43(a)
	90 1,2,4-Trichlorobenzene	180	11.923	11.919	(1.165)	1408	0.50000	0.43(aM)
	79 1,2,4-Trimethylbenzene	105	9.936	9.939	(0.971)	3937	0.50000	0.46(a)
	89 1,2-Dibromo-3-Chloropropane	155	11.237	11.229	(1.098)	18	0.50000	1.62(aM)
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	1362	0.50000	0.49(a)
	88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	2742	0.50000	0.49(a)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D Page 2
Report Date: 05-Dec-2019 15:54

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.250	(0.933)	1632	0.50000	0.54(a)
42	1,2-Dichloropropane	63	6.071	6.078	(1.080)	968	0.50000	(aM)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	3602	0.50000	0.44(a)
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	3223	0.50000	0.59(a)
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	1842	0.50000	0.48(a)
84	1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	3945	0.50000	0.67(a)
26	2,2-Dichloropropane	77	4.268	4.271	(0.873)	1297	0.50000	0.43(aM)
24	2-Butanone	43	4.350	4.339	(0.890)	1976	1.00000	0.39(aM)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	2622	0.50000	0.44(a)
52	2-Hexanone	43	7.645	7.649	(0.927)	1840	1.00000	1.15(a)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	3326	0.50000	0.44(a)
82	p-Isopropyltoluene	119	10.209	10.209	(0.998)	4471	0.50000	0.52(a)
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	1926	1.00000	0.90(a)
10	Acetone	43	2.480	2.483	(0.507)	9998	1.00000	(aM)
37	Benzene	78	5.212	5.216	(0.927)	4188	0.50000	0.48(a)
74	Bromobenzene	156	9.377	9.381	(0.916)	2068	0.50000	0.62(a)
29	Bromochloromethane	128	4.549	4.553	(0.930)	970	0.50000	0.63(a)
39	Bromodichloromethane	83	6.341	6.344	(1.128)	918	0.50000	0.34(aM)
66	Bromoform	173	8.972	8.984	(1.088)	440	0.50000	2.17(aM)
6	Bromomethane	94	1.670	1.659	(0.342)	4824	0.50000	(aM)
19	Carbon Disulfide	76	2.588	2.584	(0.529)	5232	1.00000	0.90(a)
34	Carbon Tetrachloride	117	4.995	4.995	(0.889)	1457	0.50000	0.52(aM)
59	Chlorobenzene	112	8.271	8.271	(1.003)	3996	0.50000	0.54(a)
7	Chloroethane	64	1.749	1.741	(0.358)	1992	0.50000	(aM)
28	Chloroform	83	4.658	4.654	(0.952)	2416	0.50000	0.55(a)
3	Chloromethane	50	1.340	1.340	(0.274)	1635	0.50000	(a)
27	cis-1,2-Dichloroethene	96	4.279	4.283	(0.875)	1544	0.50000	0.52(a)
46	cis-1,3-Dichloropropene	75	6.749	6.757	(1.201)	1155	0.50000	0.39(aM)
55	Dibromochloromethane	129	7.754	7.758	(0.940)	924	0.50000	2.86(a)
44	Dibromomethane	93	6.180	6.187	(1.099)	1075	0.50000	0.65(a)
2	Dichlorodifluoromethane	85	1.201	1.205	(0.246)	1221	0.50000	0.46(aM)
61	Ethylbenzene	106	8.373	8.369	(1.015)	1668	0.50000	0.45(a)
91	Hexachlorobutadiene	225	12.058	12.061	(1.178)	758	0.50000	0.68(aM)
67	Isopropylbenzene	105	9.122	9.126	(1.106)	4837	0.50000	0.46(a)
62	m,p-Xylenes	106	8.466	8.470	(1.027)	3686	1.00000	0.81(a)
17	Methylene Chloride	84	2.870	2.869	(0.587)	1984	0.50000	1.70(a)
87	n-Butylbenzene	91	10.554	10.554	(1.032)	4011	0.50000	0.55(a)
73	n-Propylbenzene	91	9.471	9.475	(0.926)	5003	0.50000	0.46(a)
92	Naphthalene	128	12.125	12.129	(1.185)	3667	0.50000	0.42(a)
63	o-Xylene	106	8.807	8.807	(1.068)	2347	0.50000	0.51(a)
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	4656	0.50000	0.51(a)
64	Styrene	104	8.822	8.822	(1.070)	3285	0.50000	0.41(a)
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	3000	0.50000	0.44(a)
56	Tetrachloroethene	166	7.510	7.522	(0.911)	1296	0.50000	0.46(a)
50	Toluene	91	7.046	7.045	(0.855)	5683	0.50000	0.51(a)
20	trans-1,2-Dichloroethene	96	3.128	3.139	(0.640)	1321	0.50000	2.37(TaM)
51	trans-1,3-Dichloropropene	75	7.252	7.259	(1.290)	938	0.50000	1.02(a)
38	Trichloroethene	130	5.857	5.861	(1.042)	1529	0.50000	0.57(a)
8	Trichlorofluoromethane	101	1.955	1.951	(0.400)	5400	0.50000	0.48(a)
5	Vinyl Chloride	62	1.419	1.419	(0.290)	2925	0.50000	0.50(a)

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.



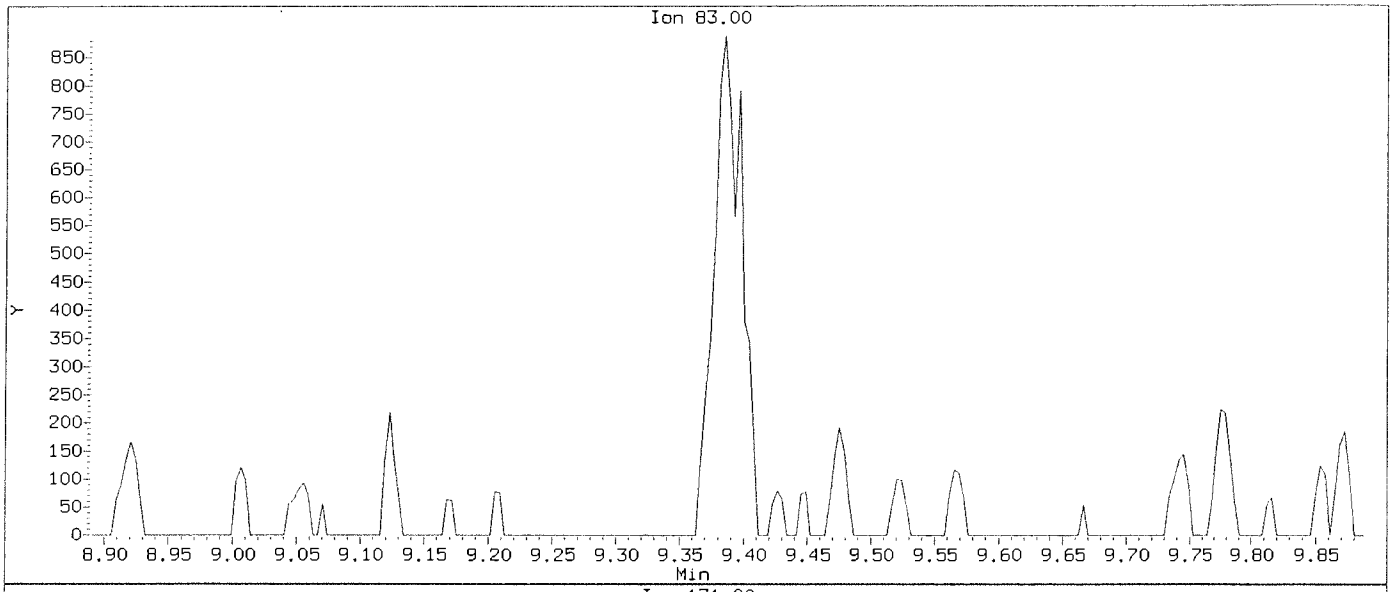
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Sample Info: VSTD000.5;VSTD000.5;1;2;
Purge Volume: 5.0
Column phase: DB624

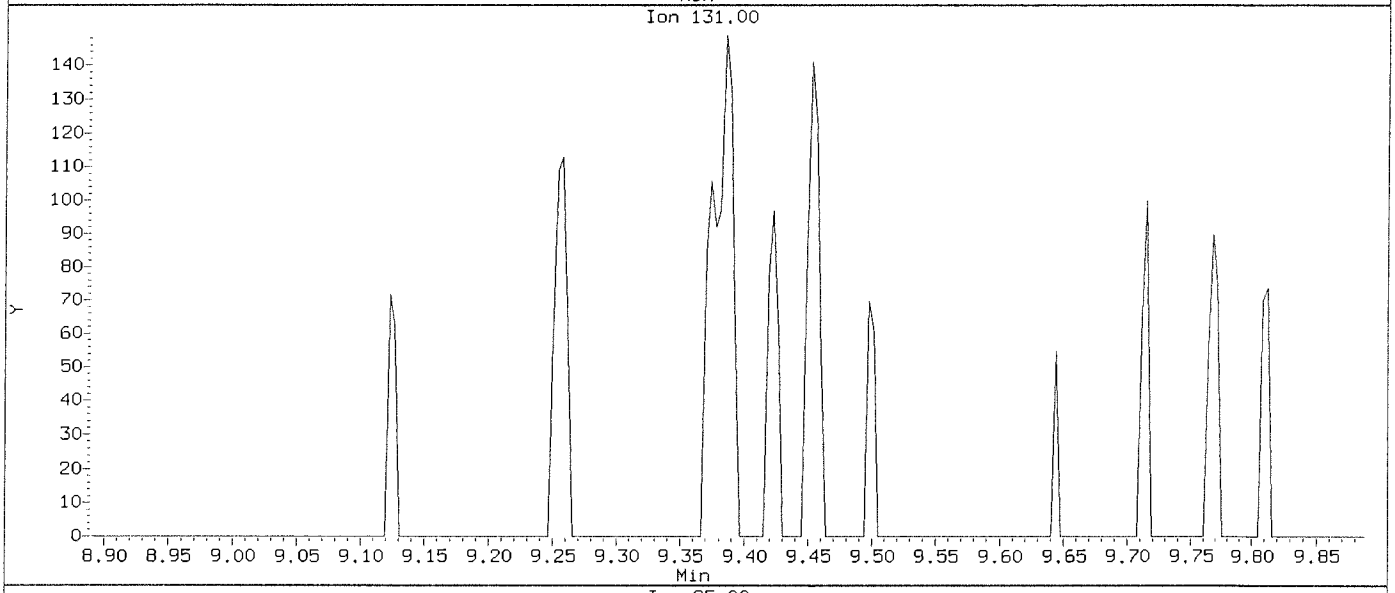
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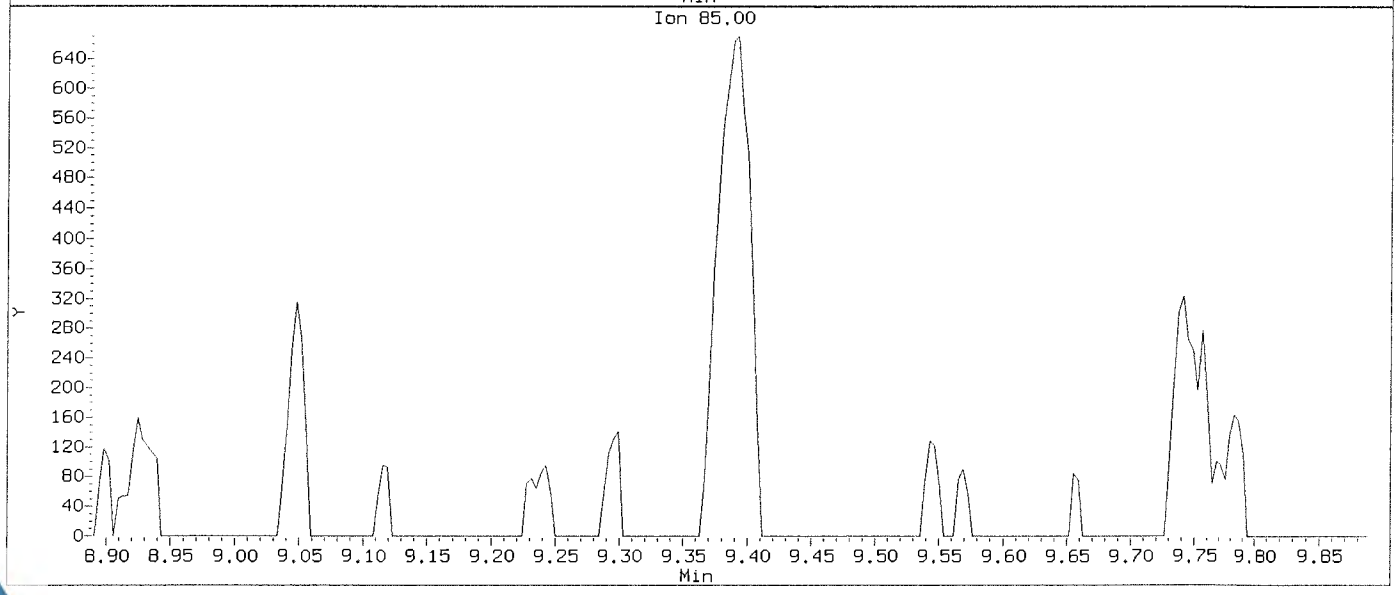
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Client Sample ID: VSTD000.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

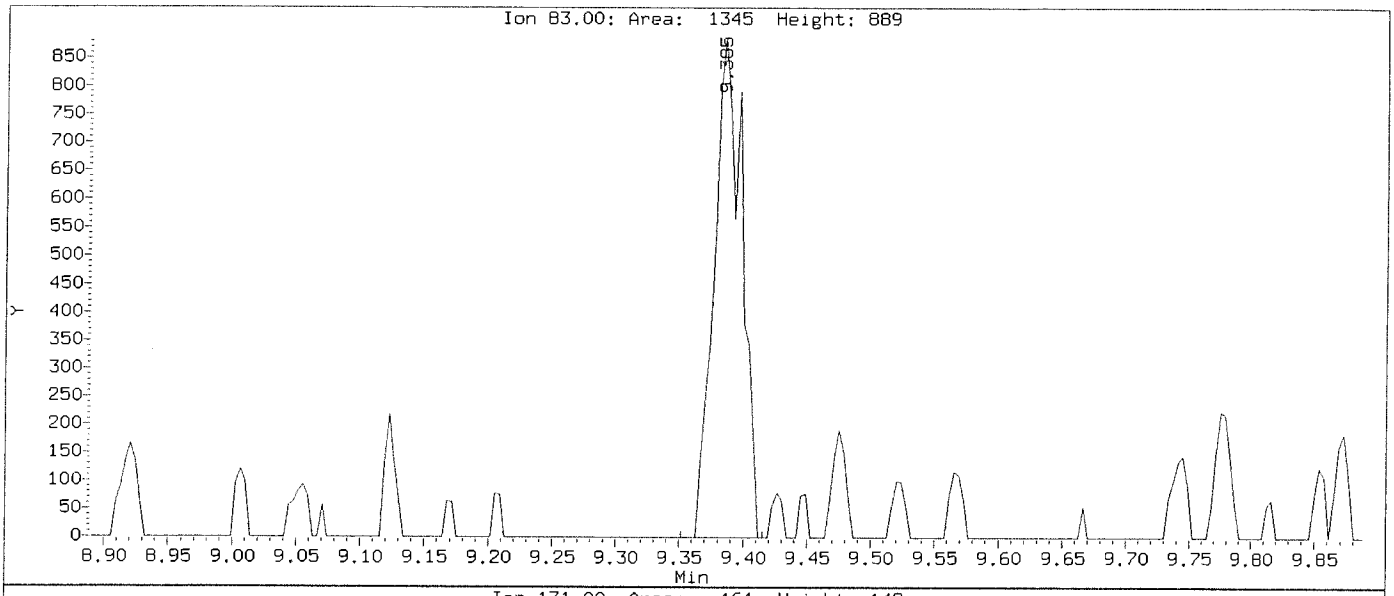


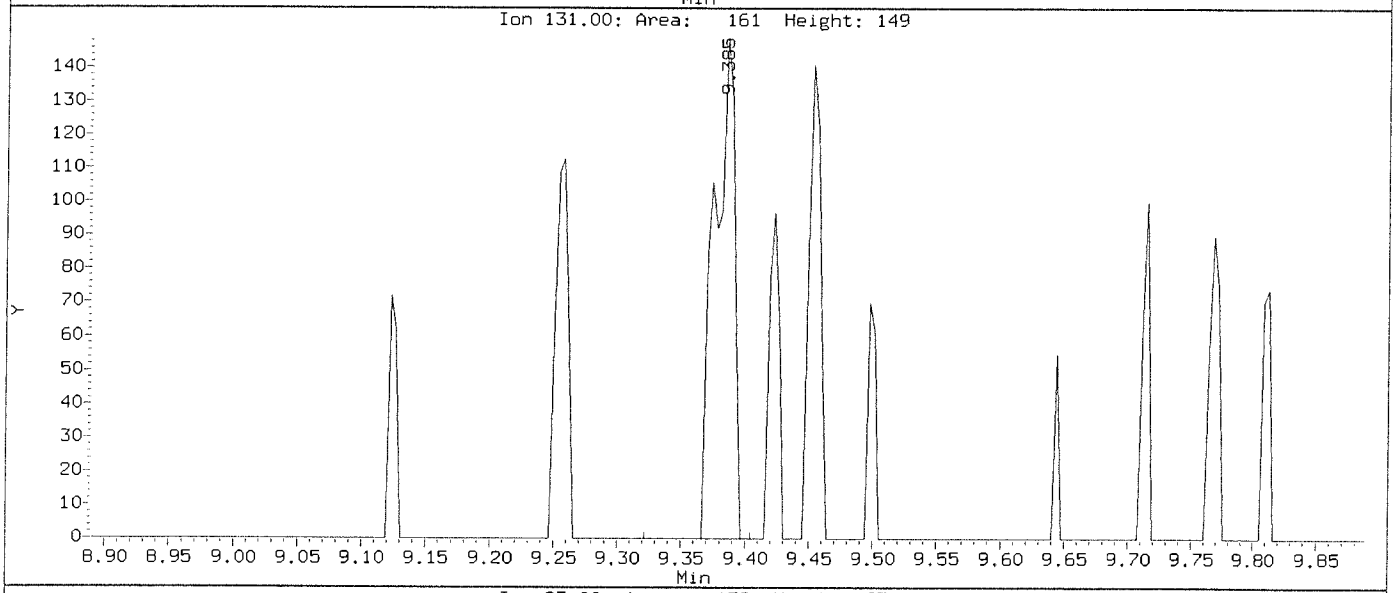


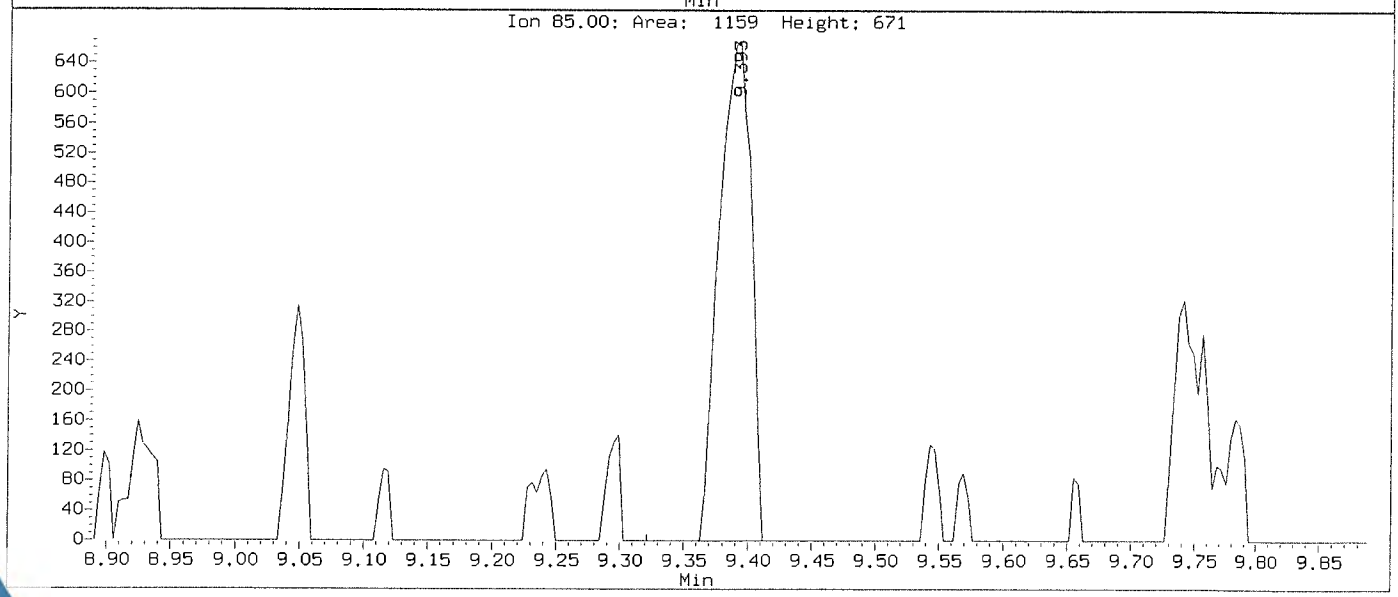


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Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

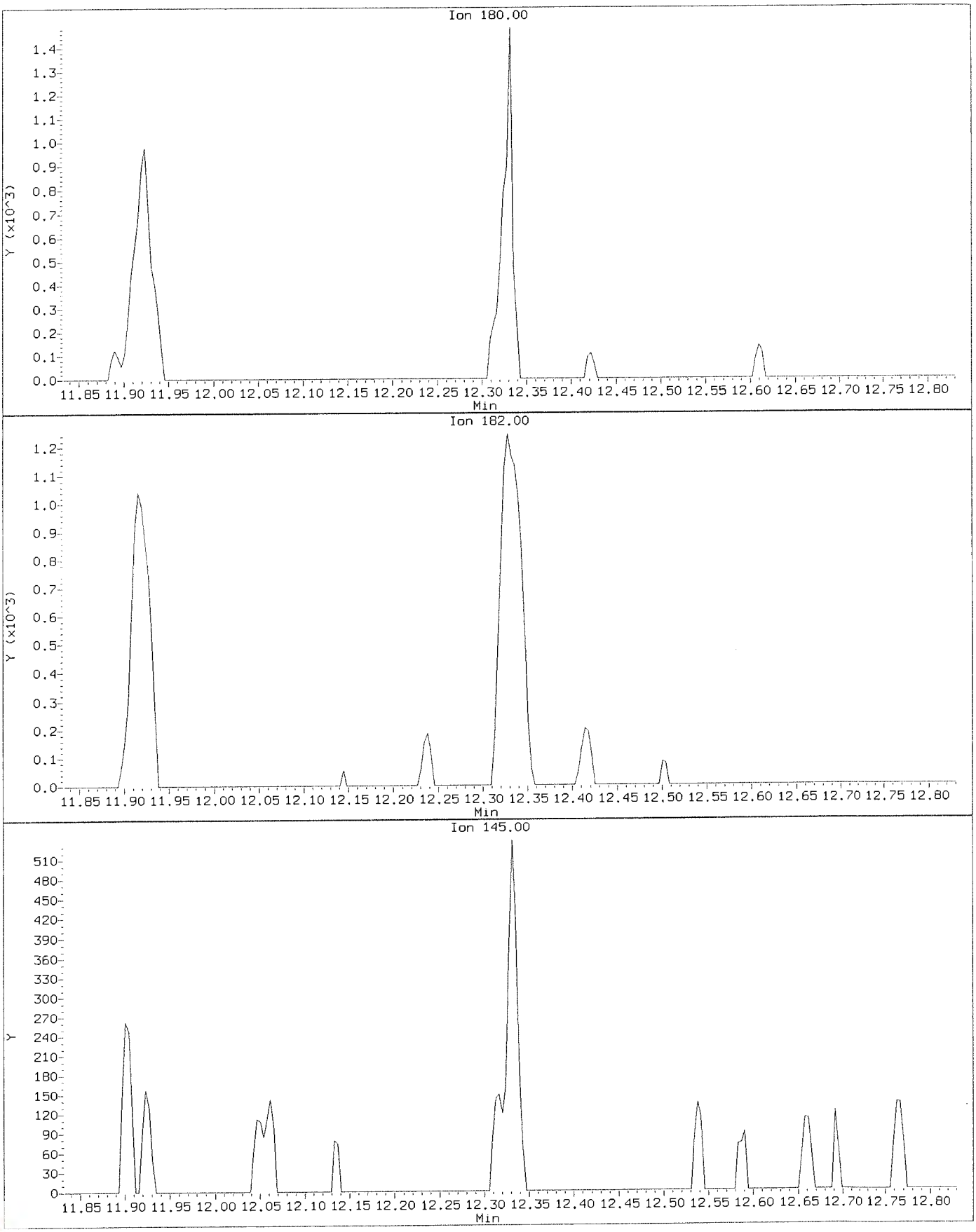






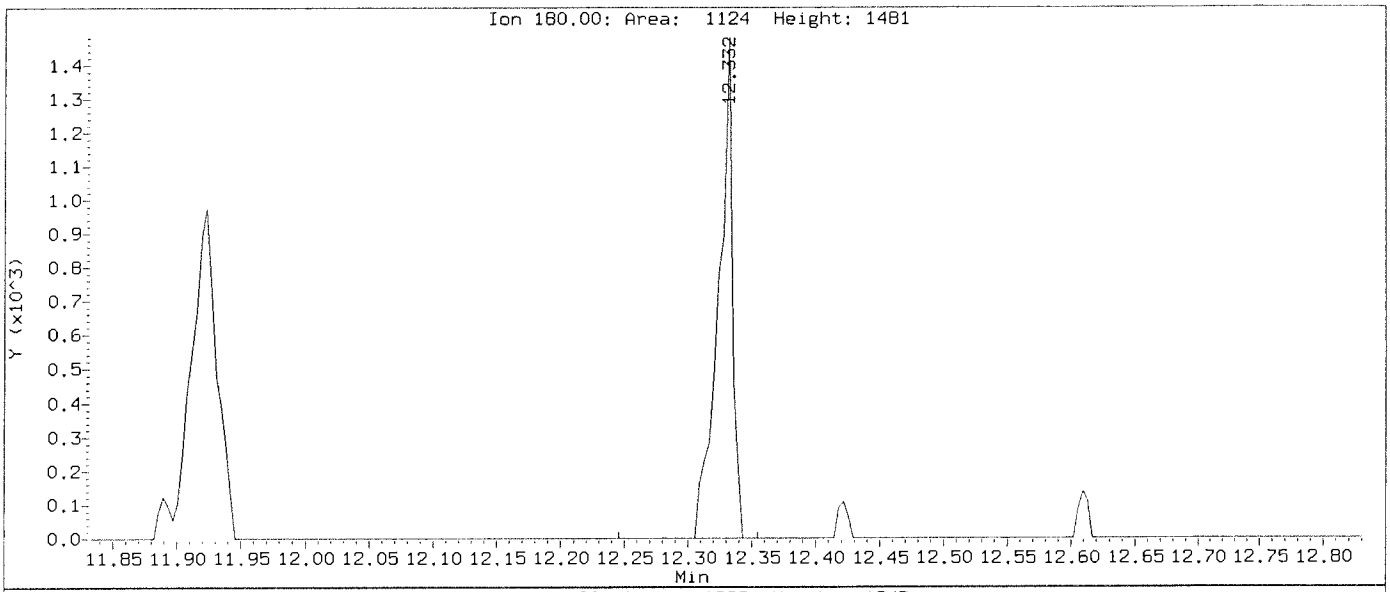
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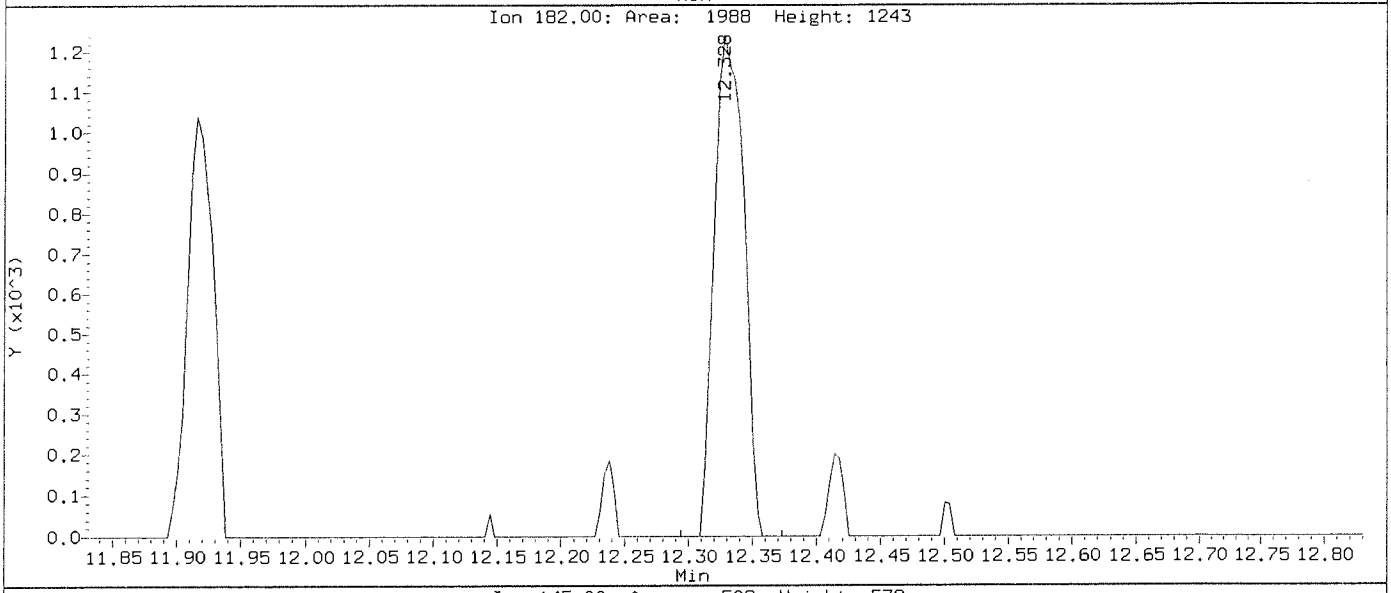
Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6

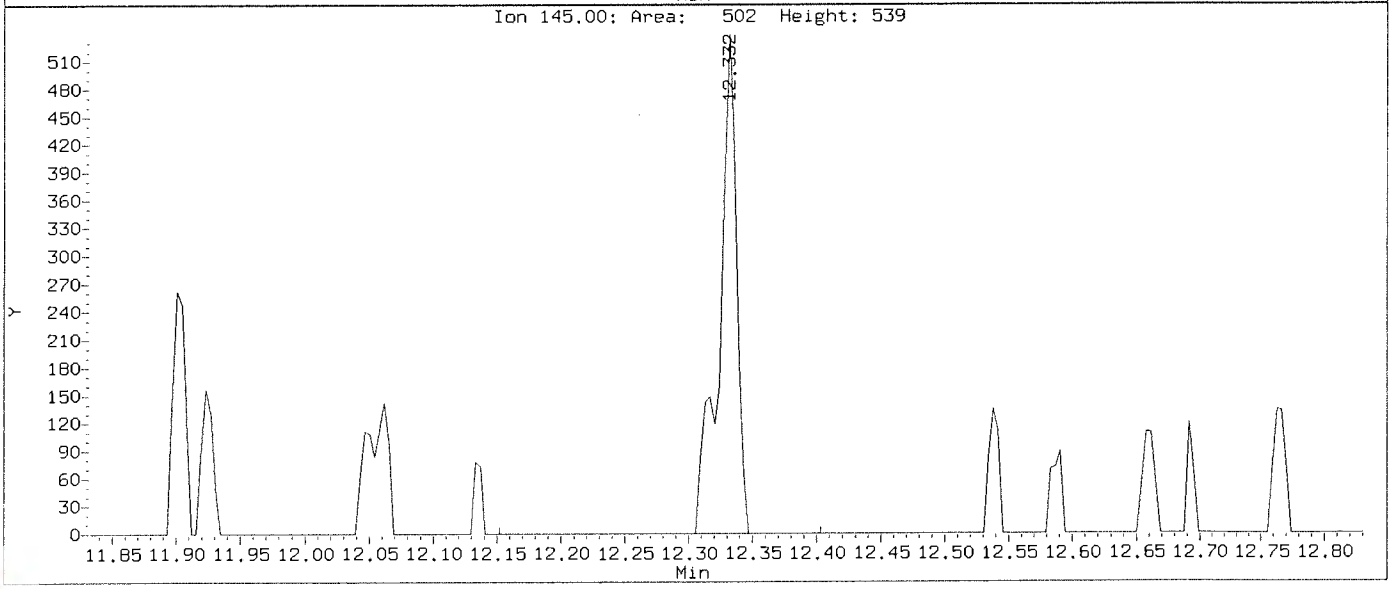


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Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6

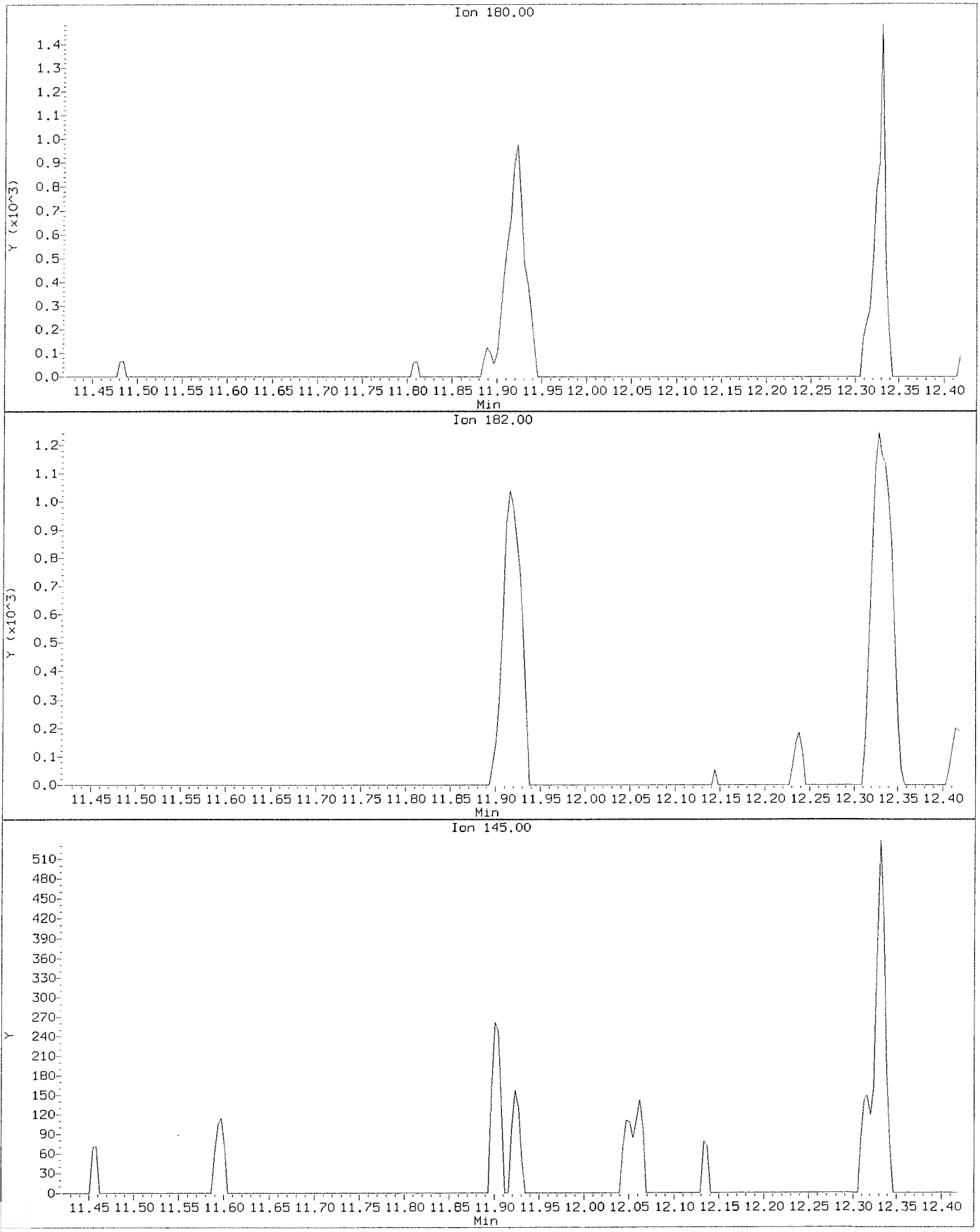






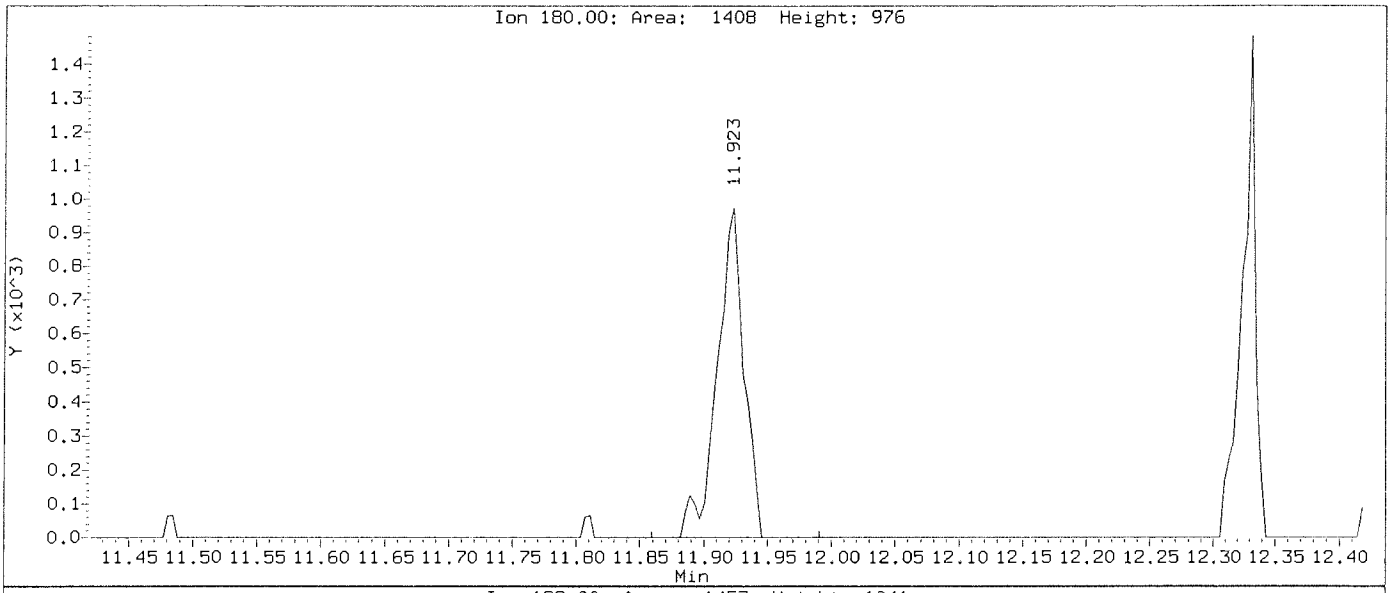
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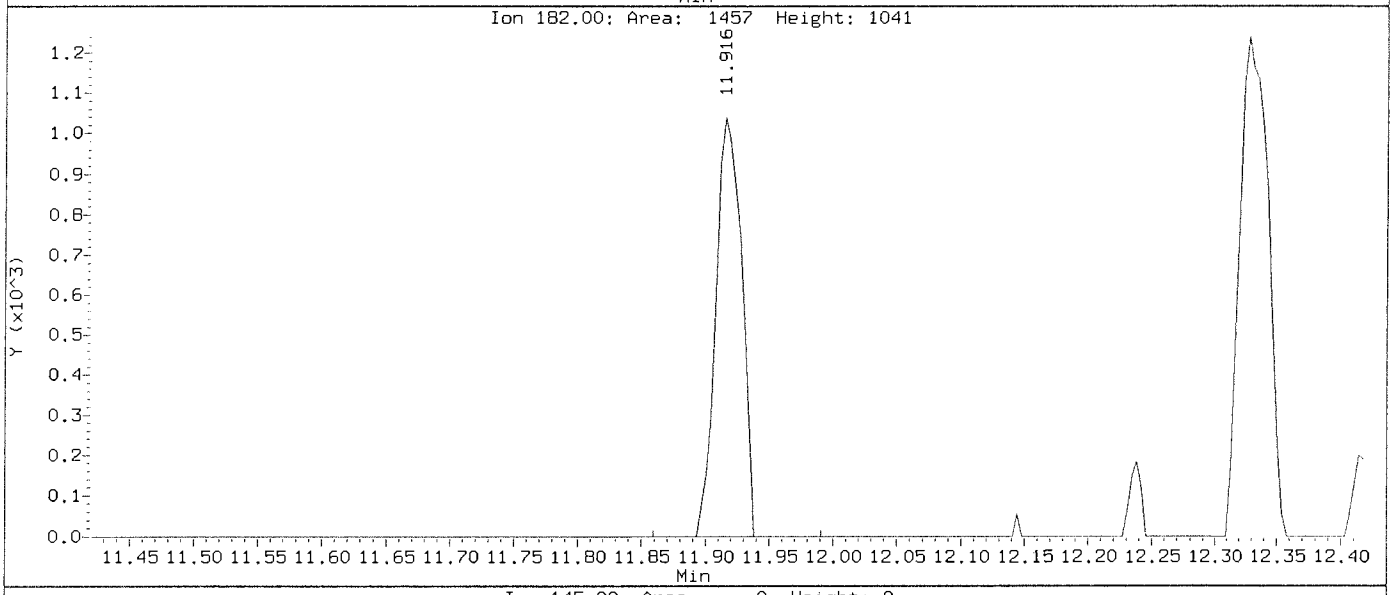
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CAS Number: 120-82-1

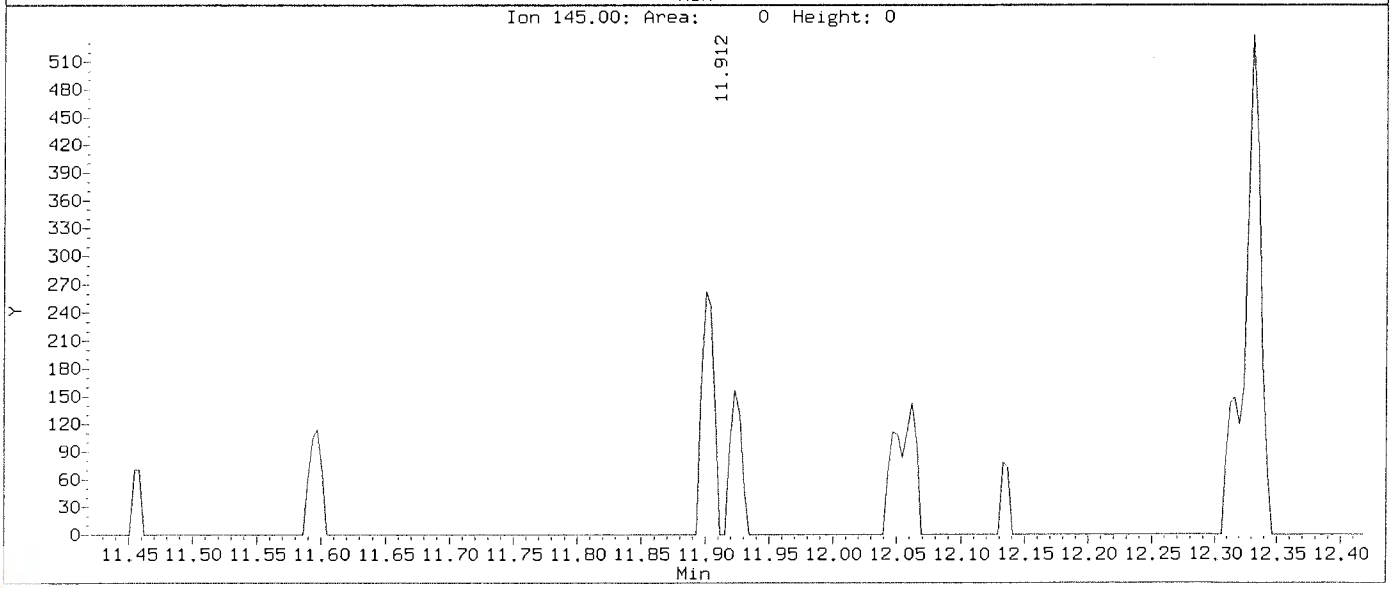


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Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1

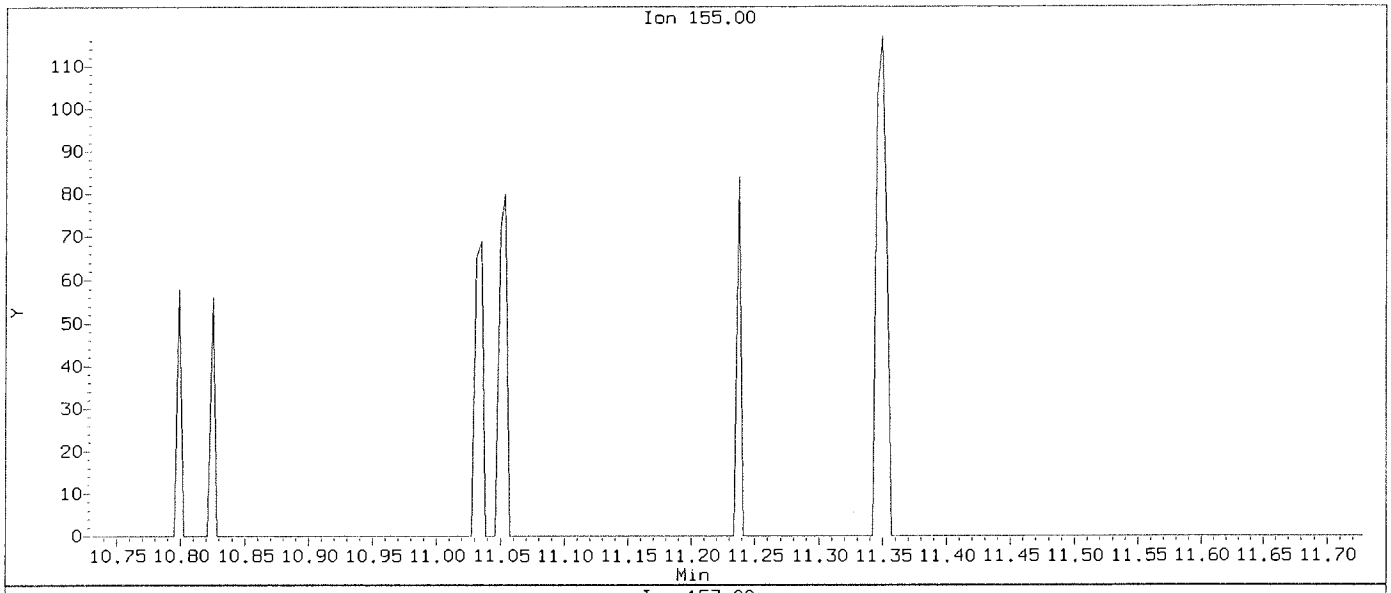


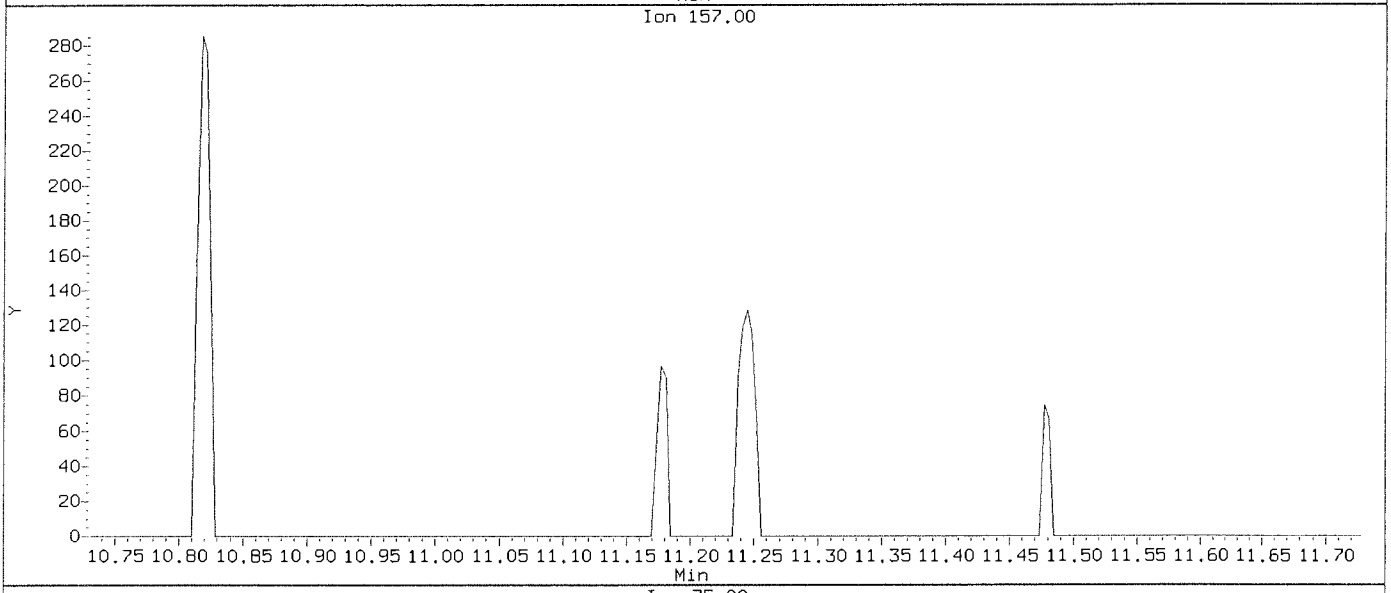


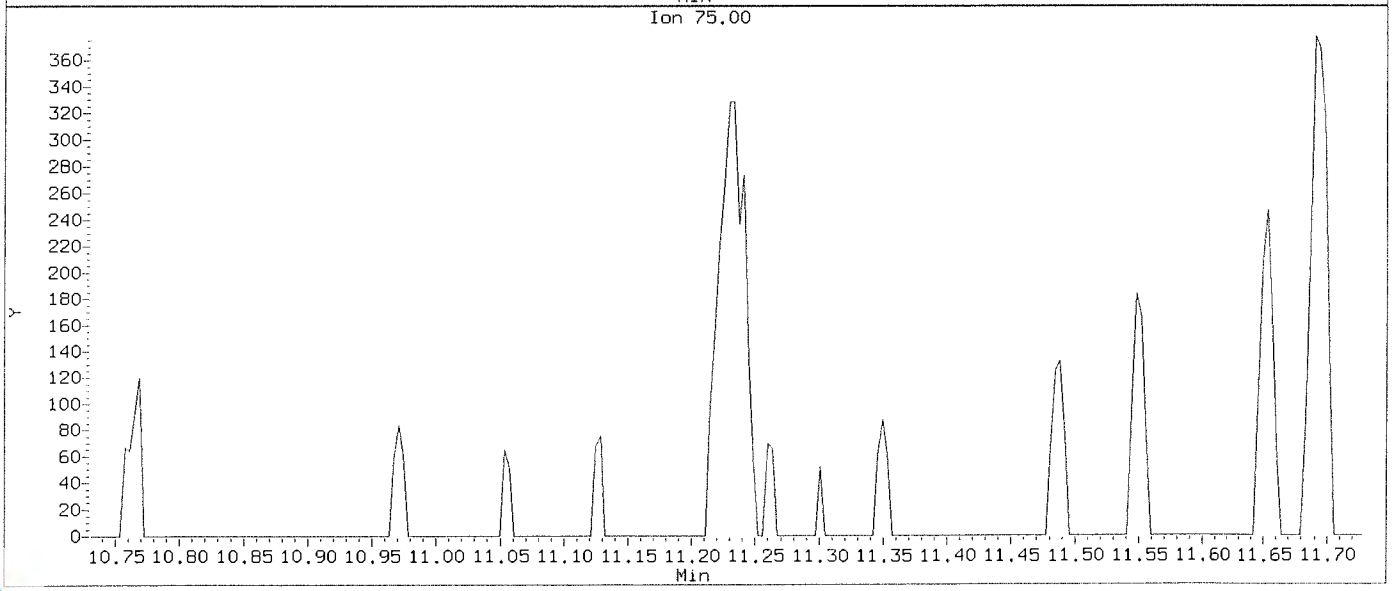


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Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

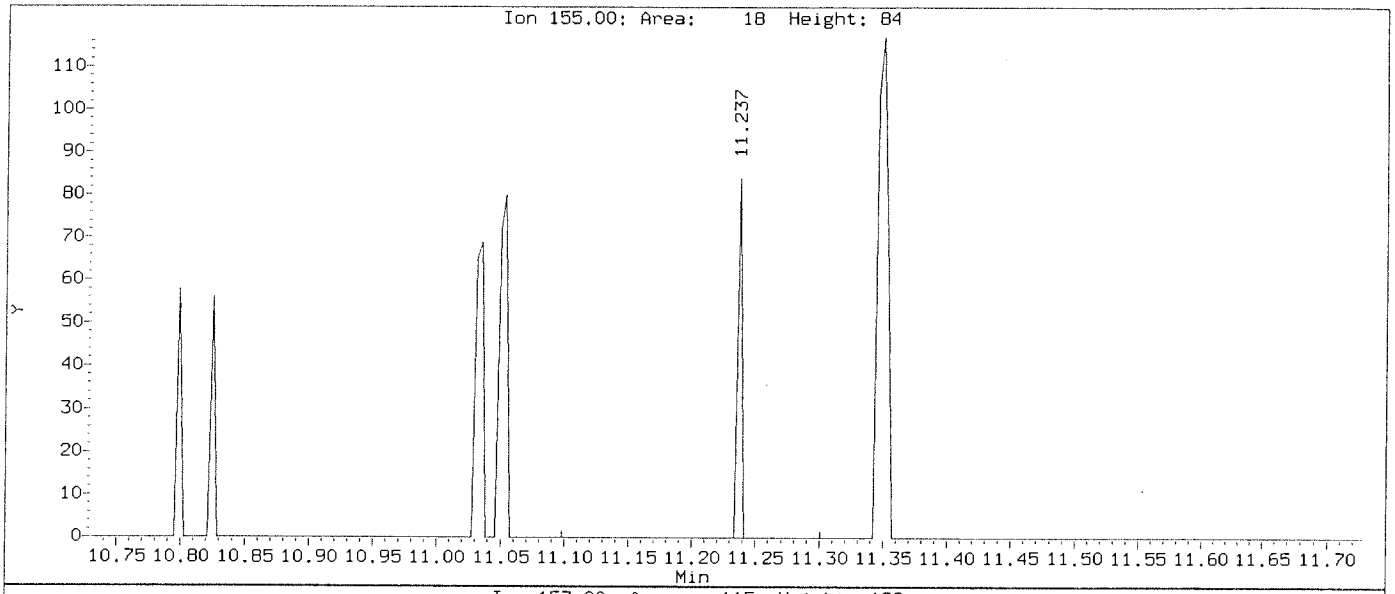


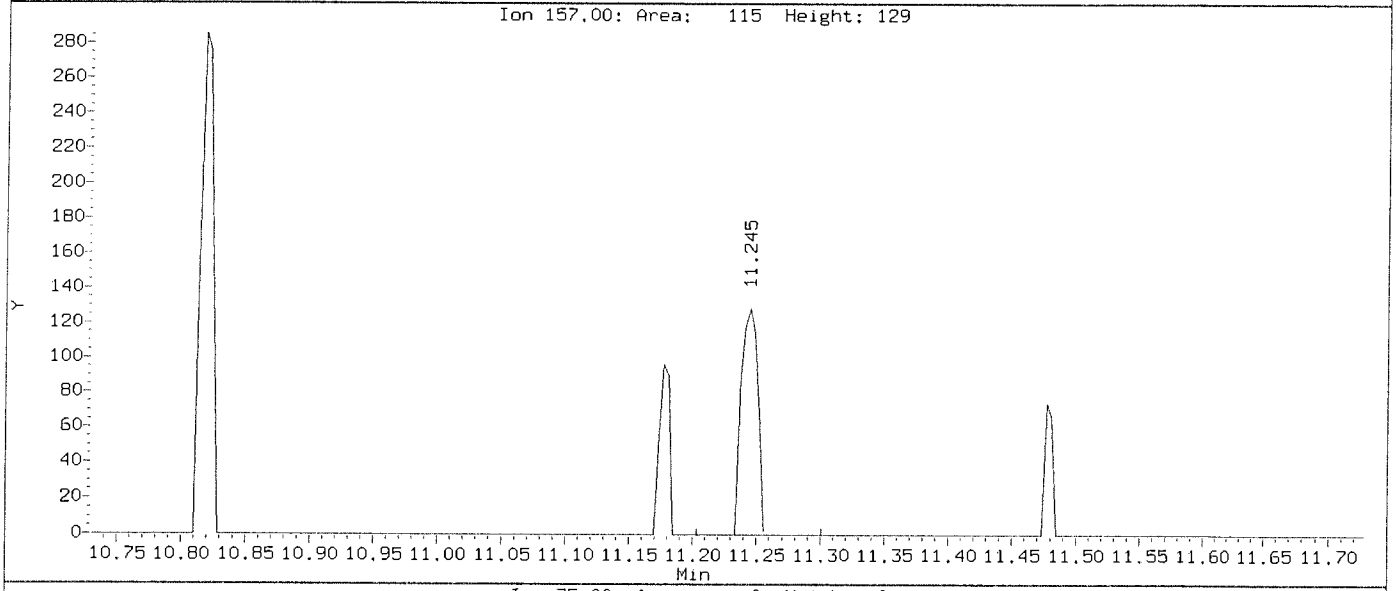


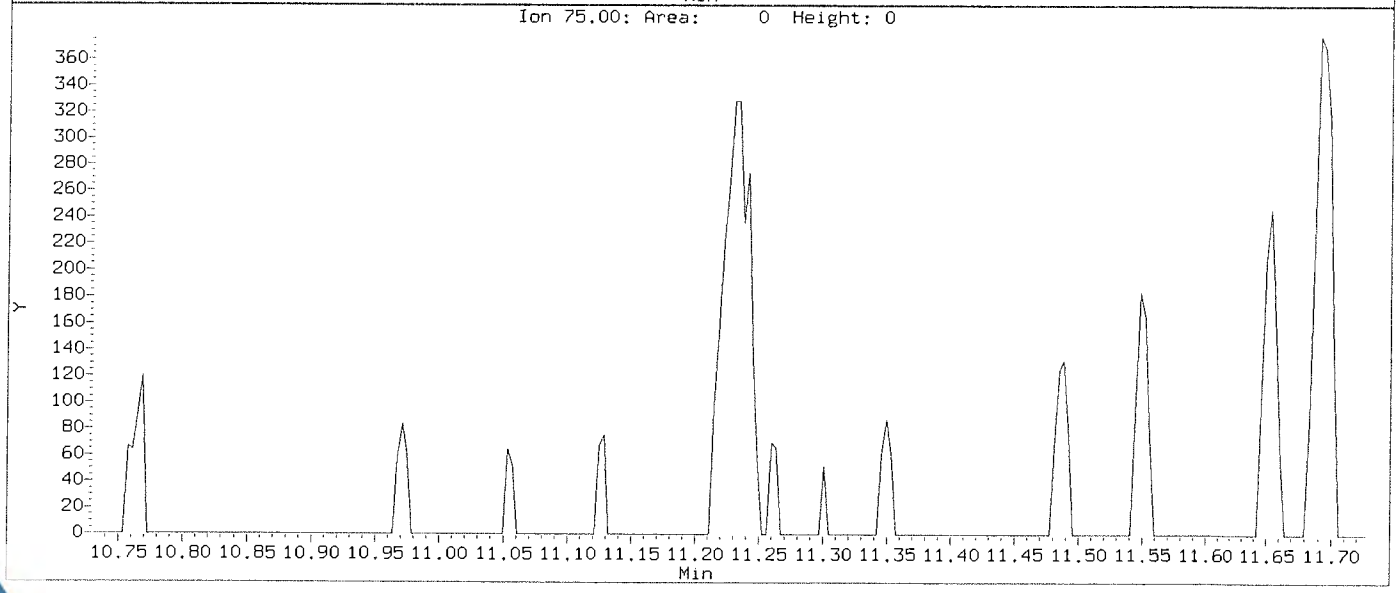


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Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

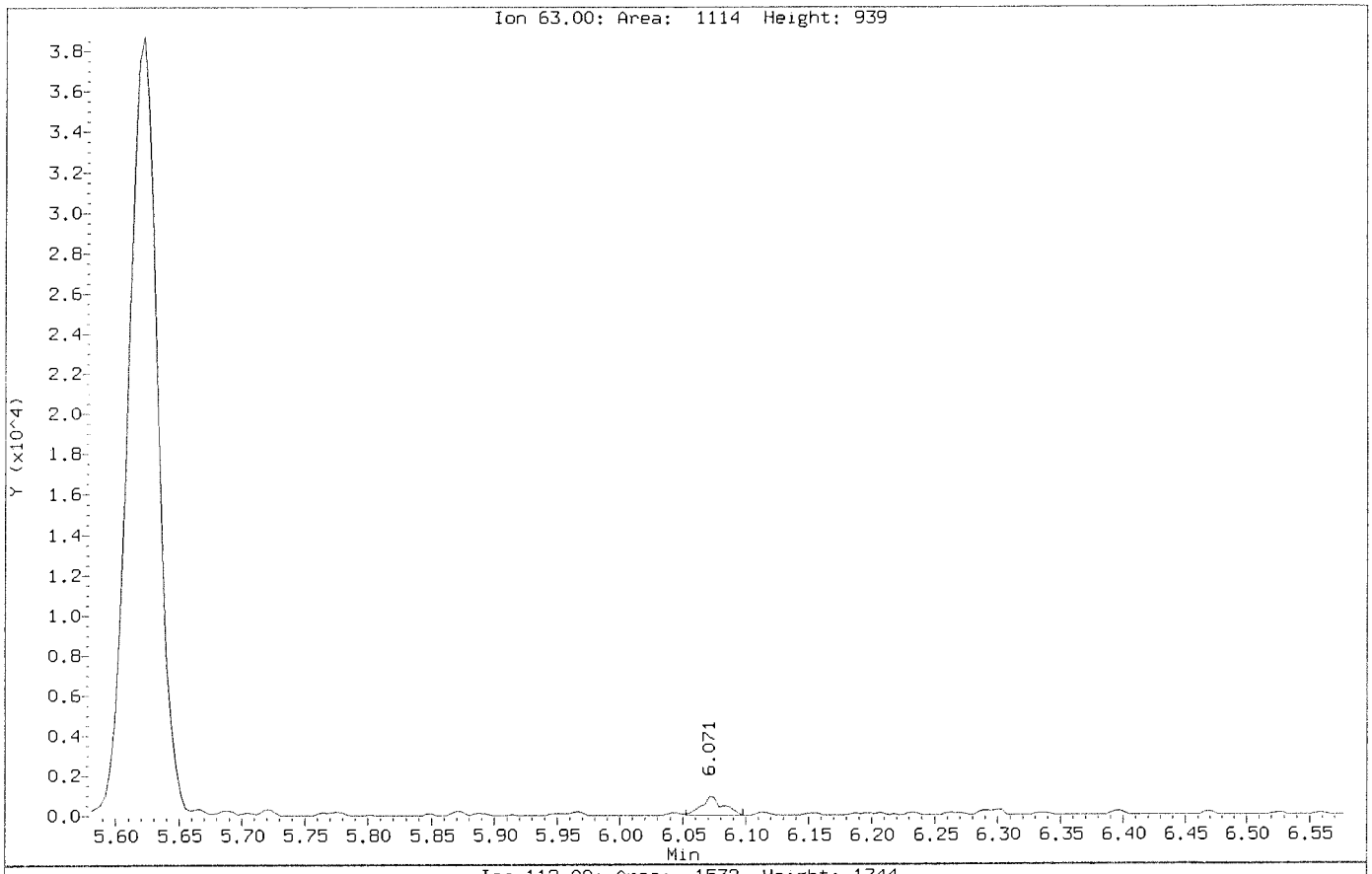


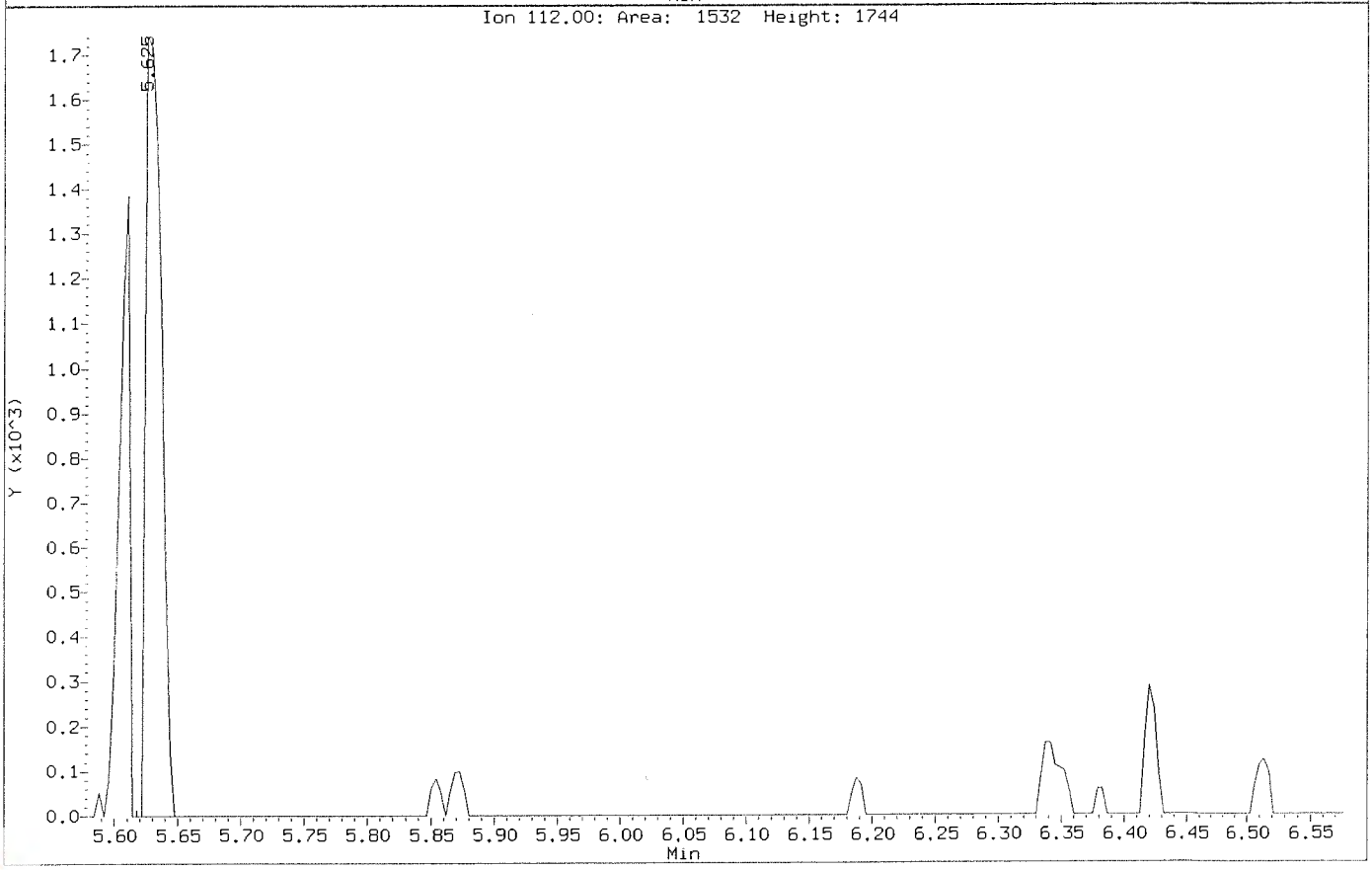




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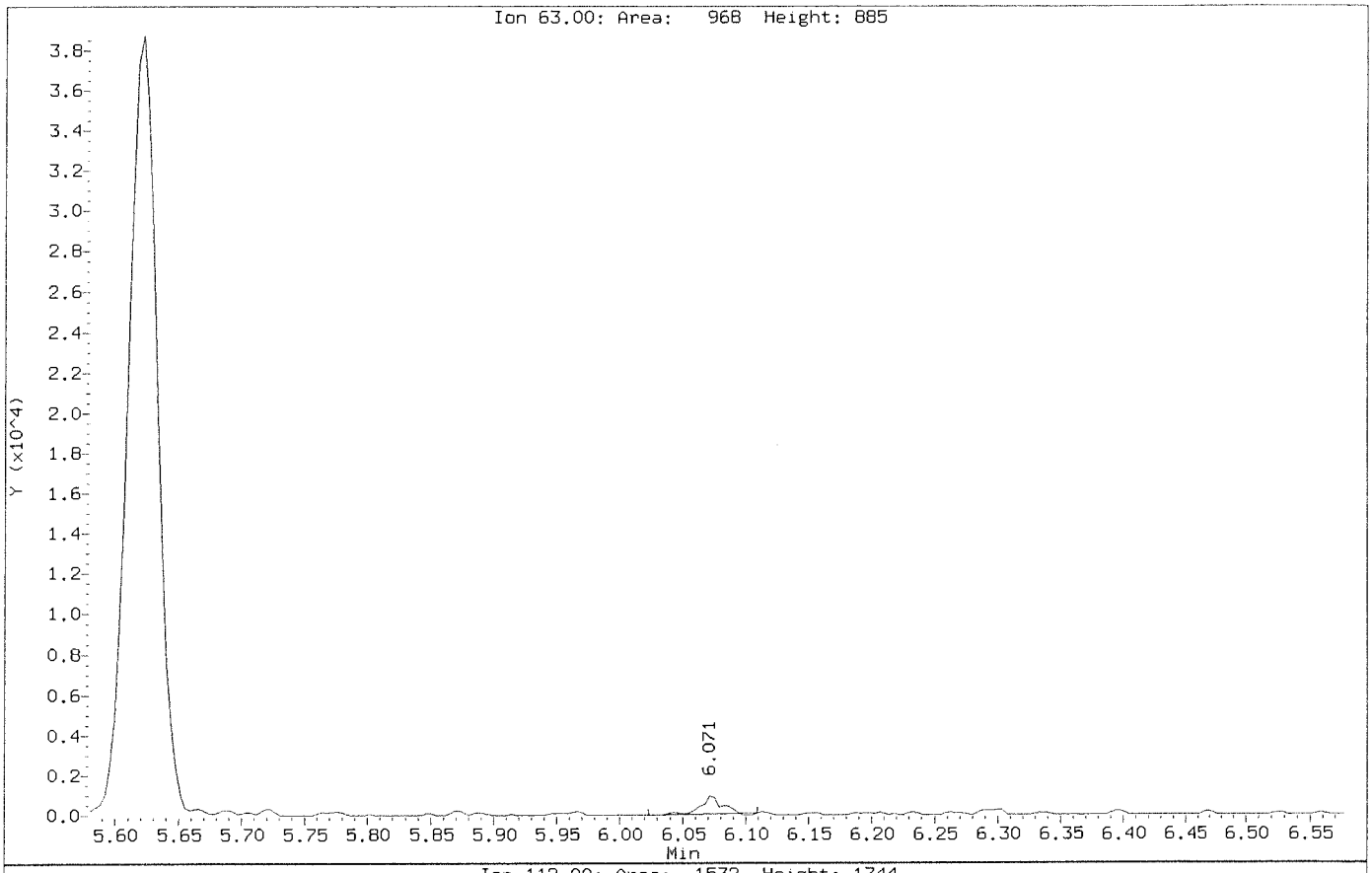
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

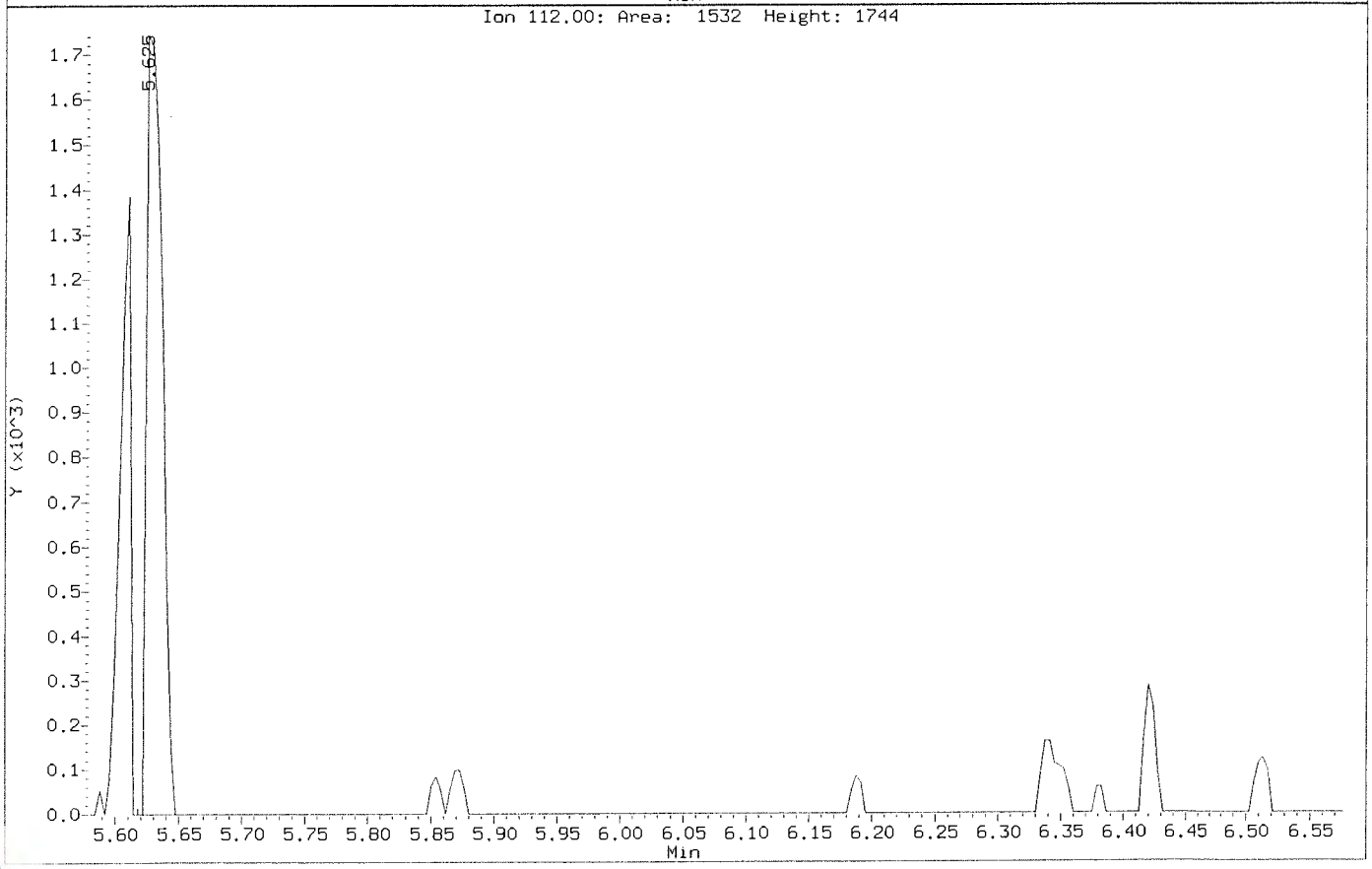




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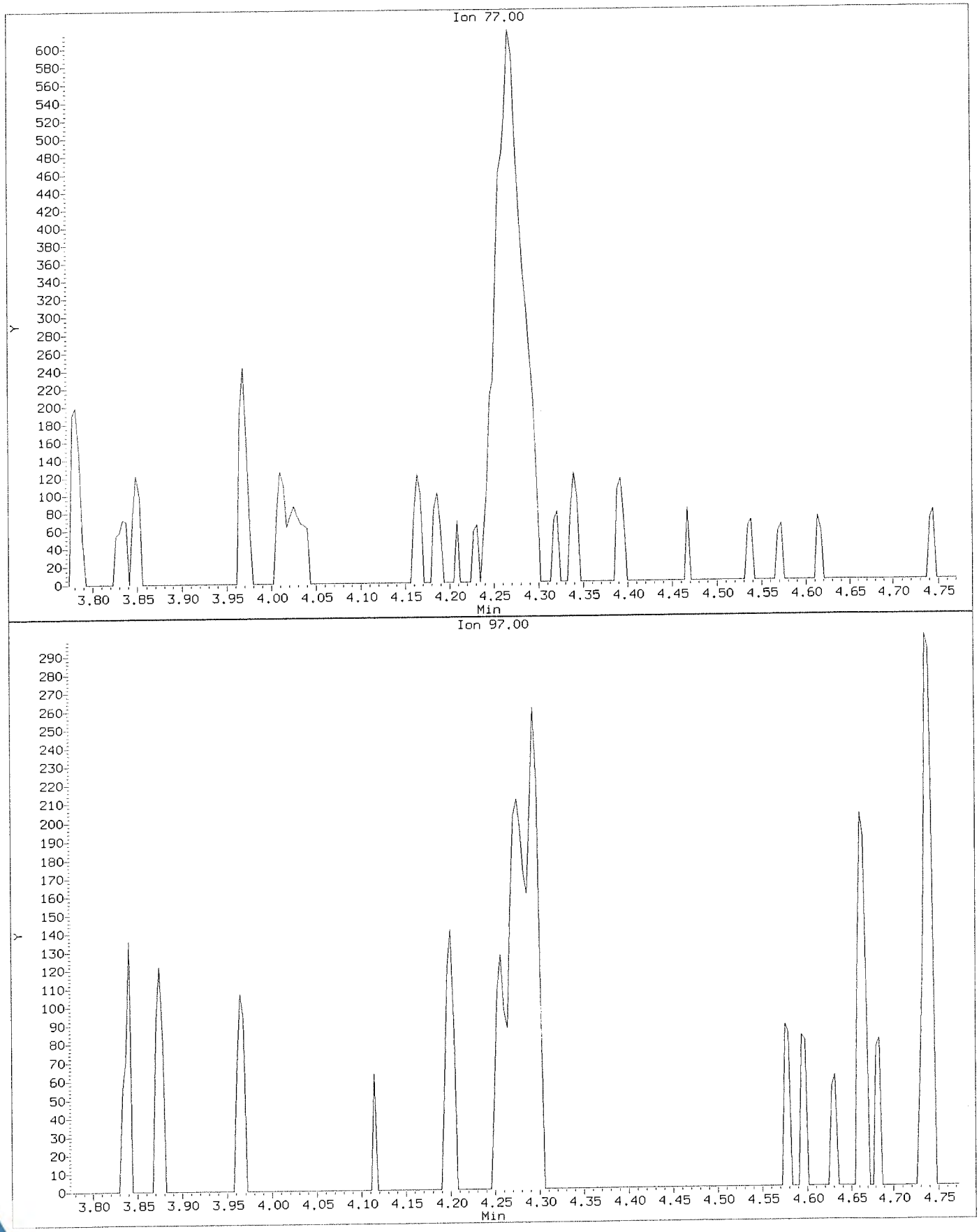
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5





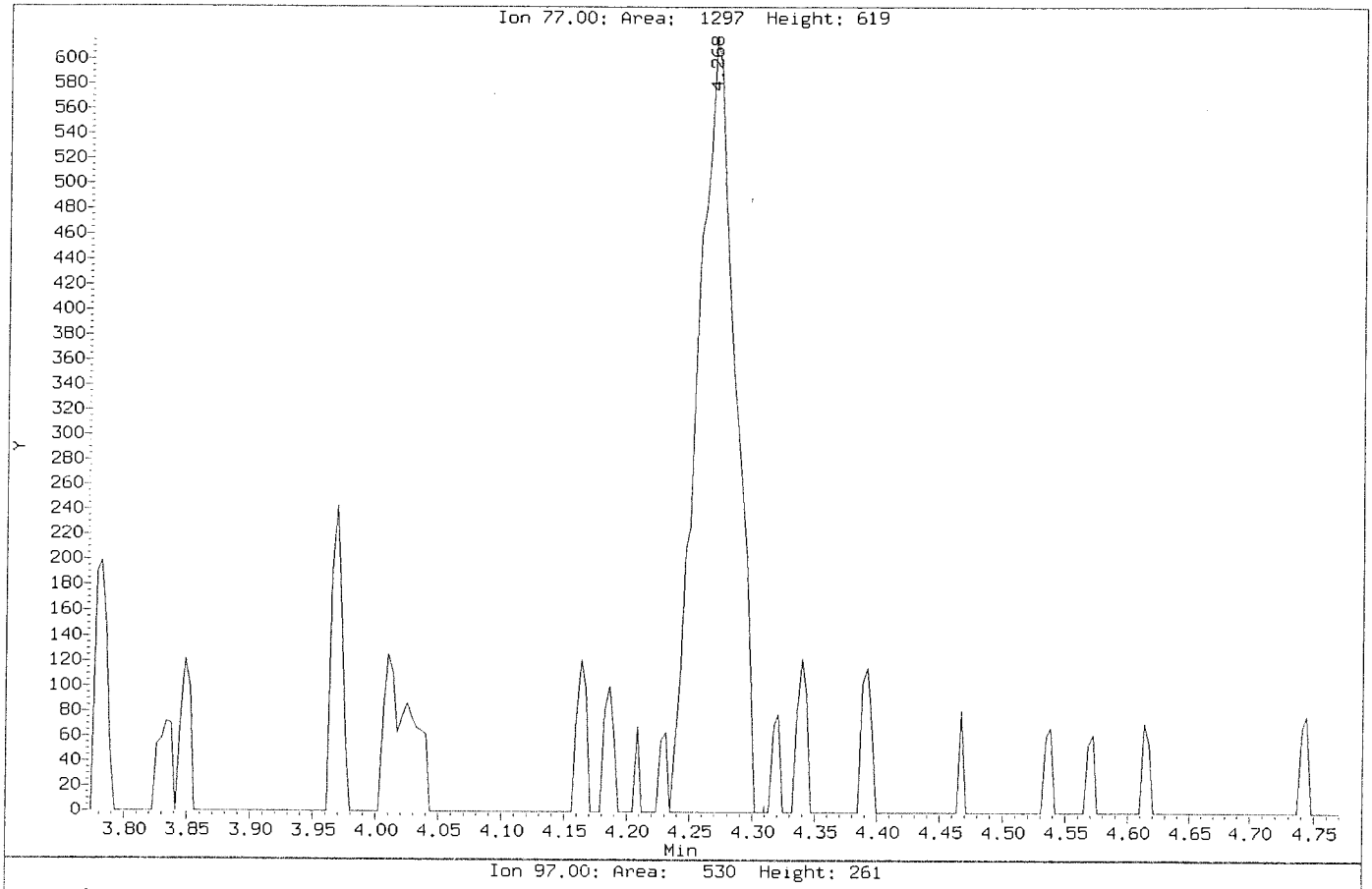
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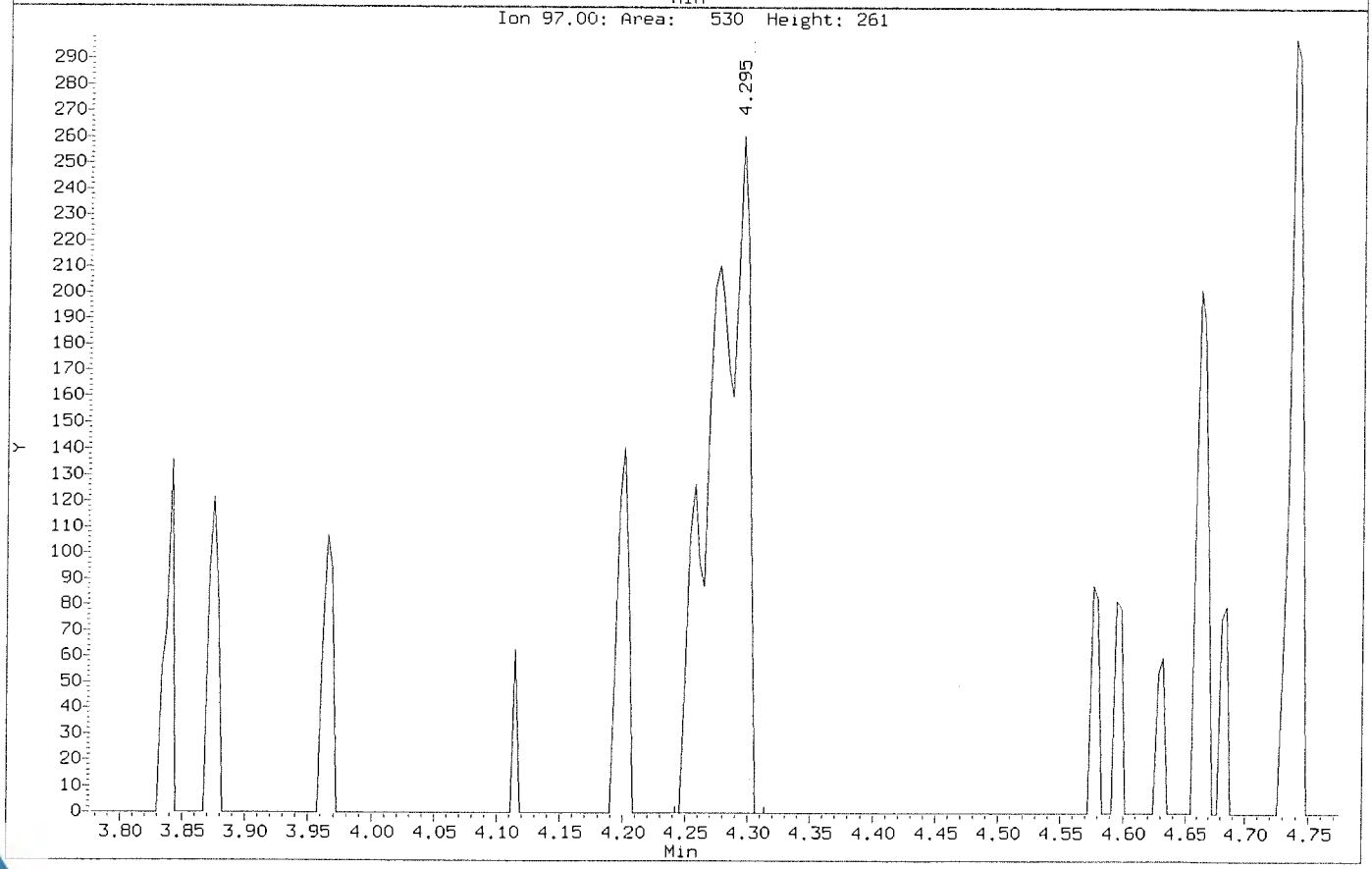
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7



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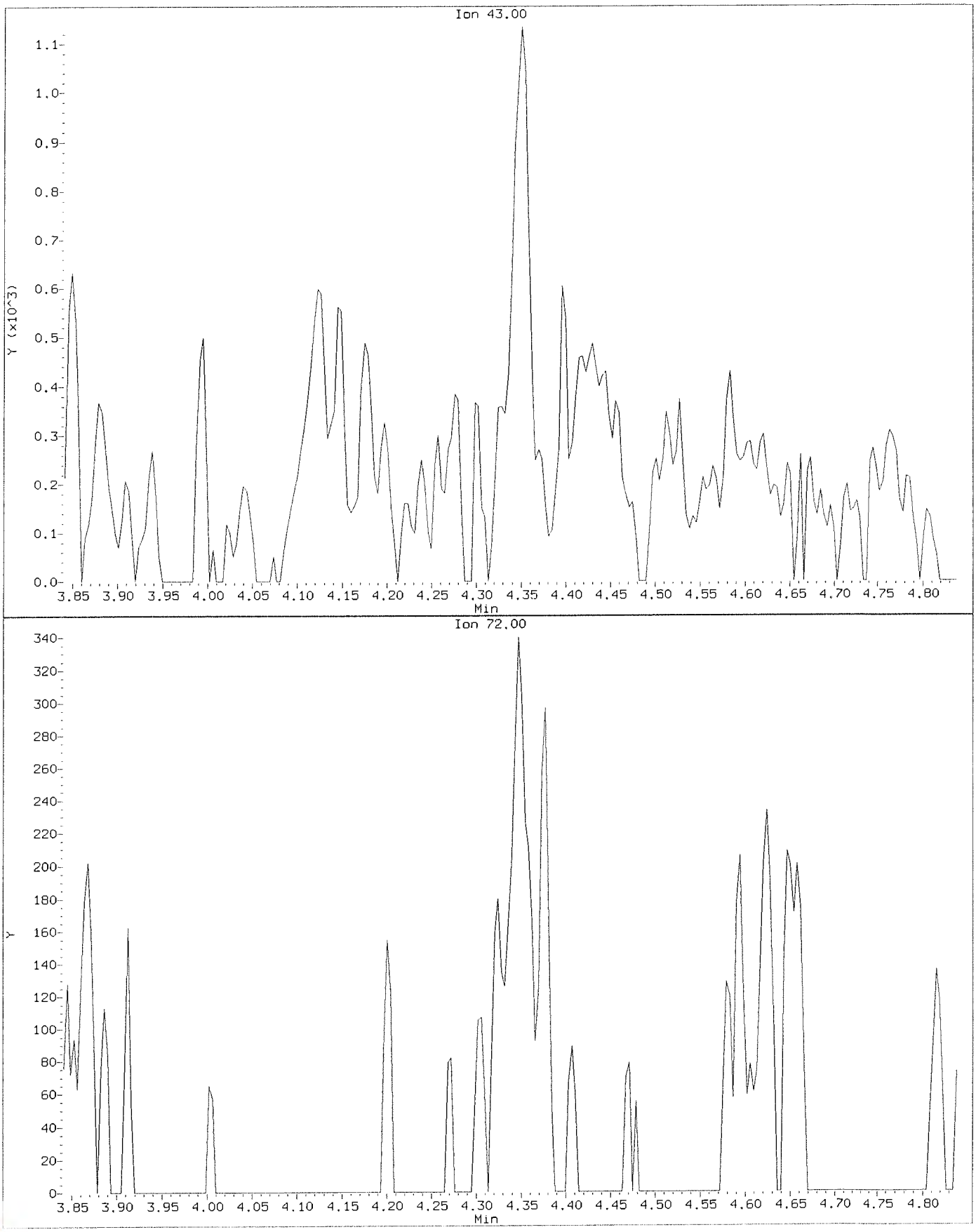
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





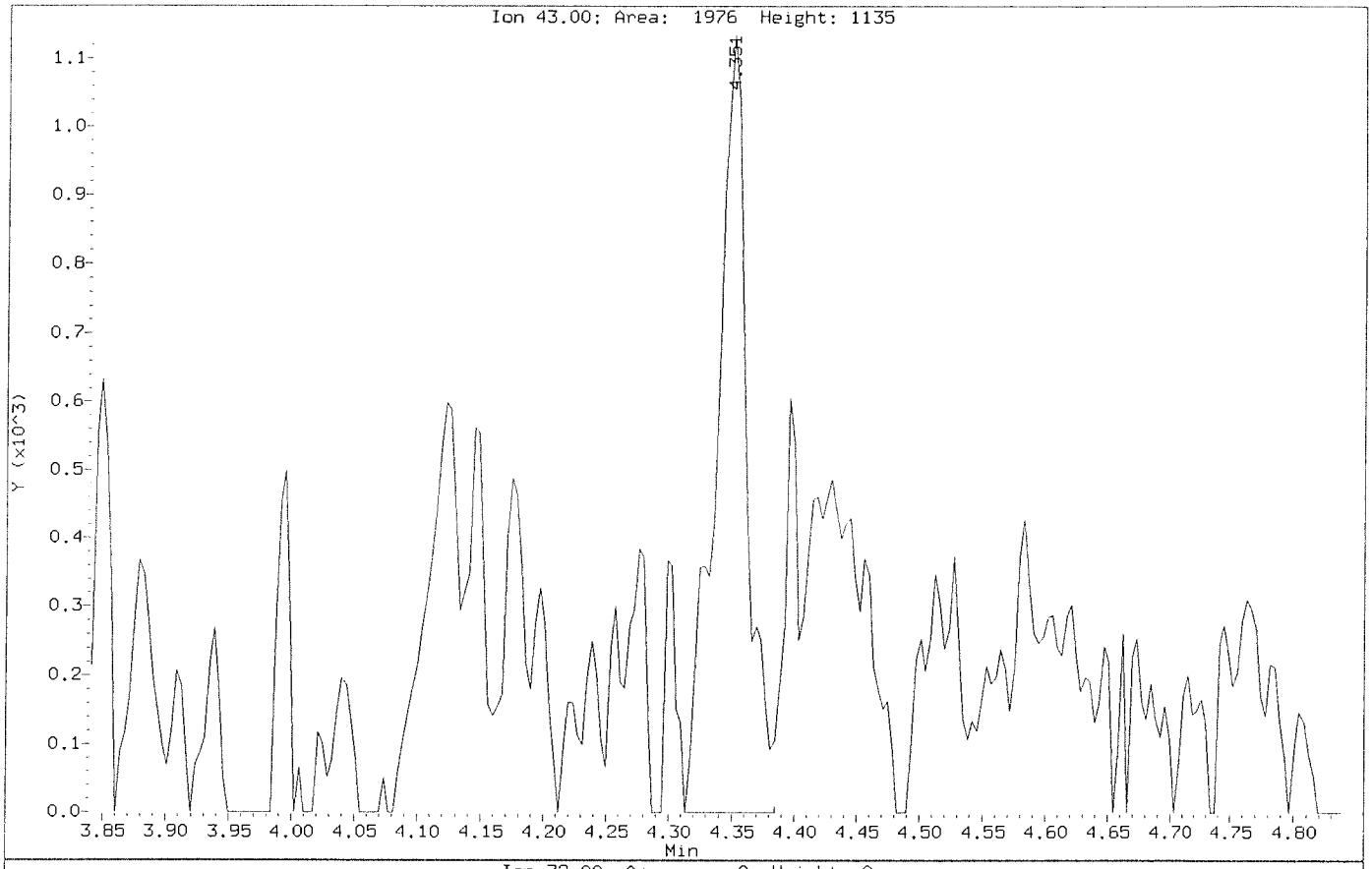
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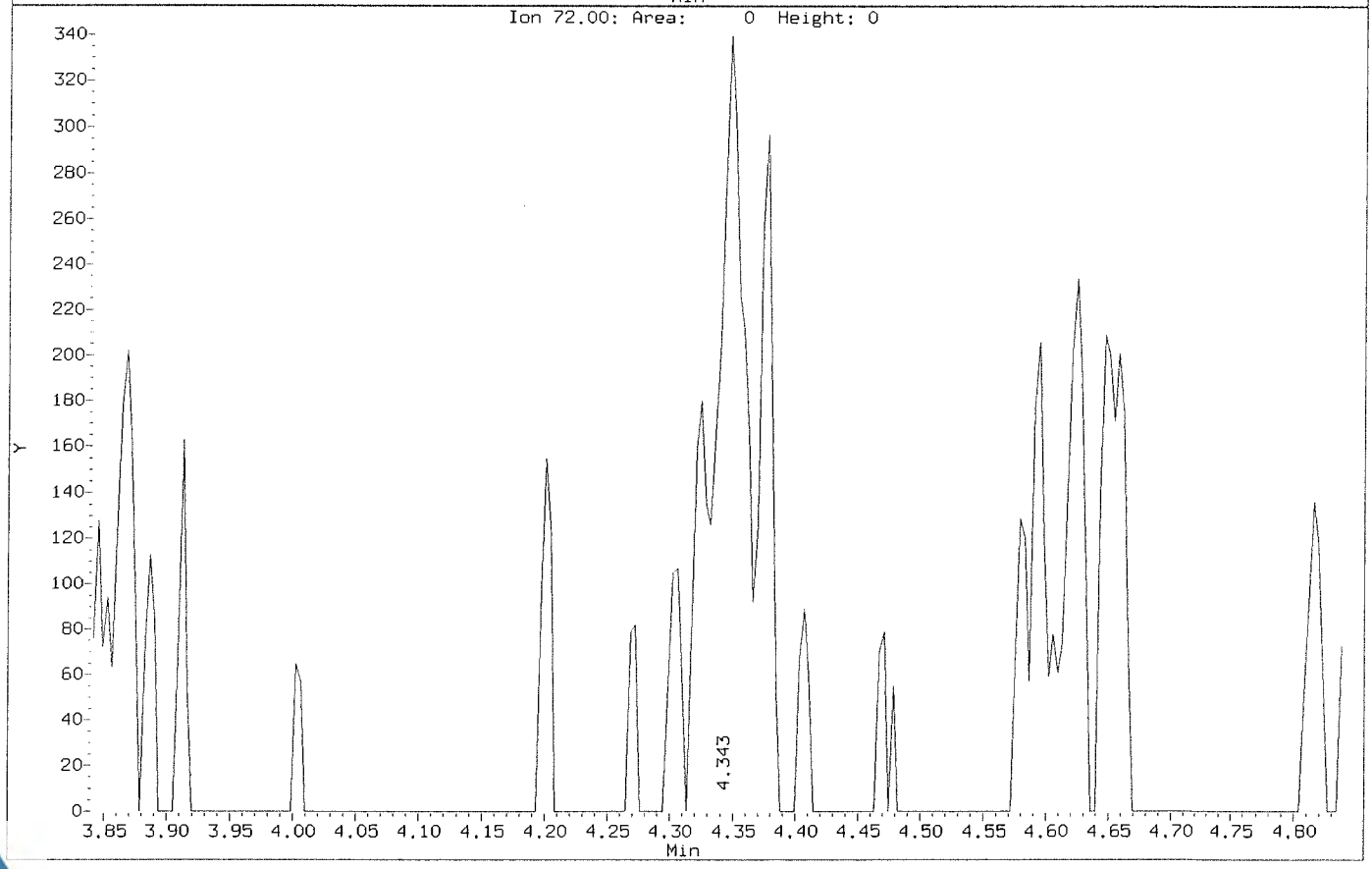
Compound: 2-Butanone
CAS Number: 78-93-3



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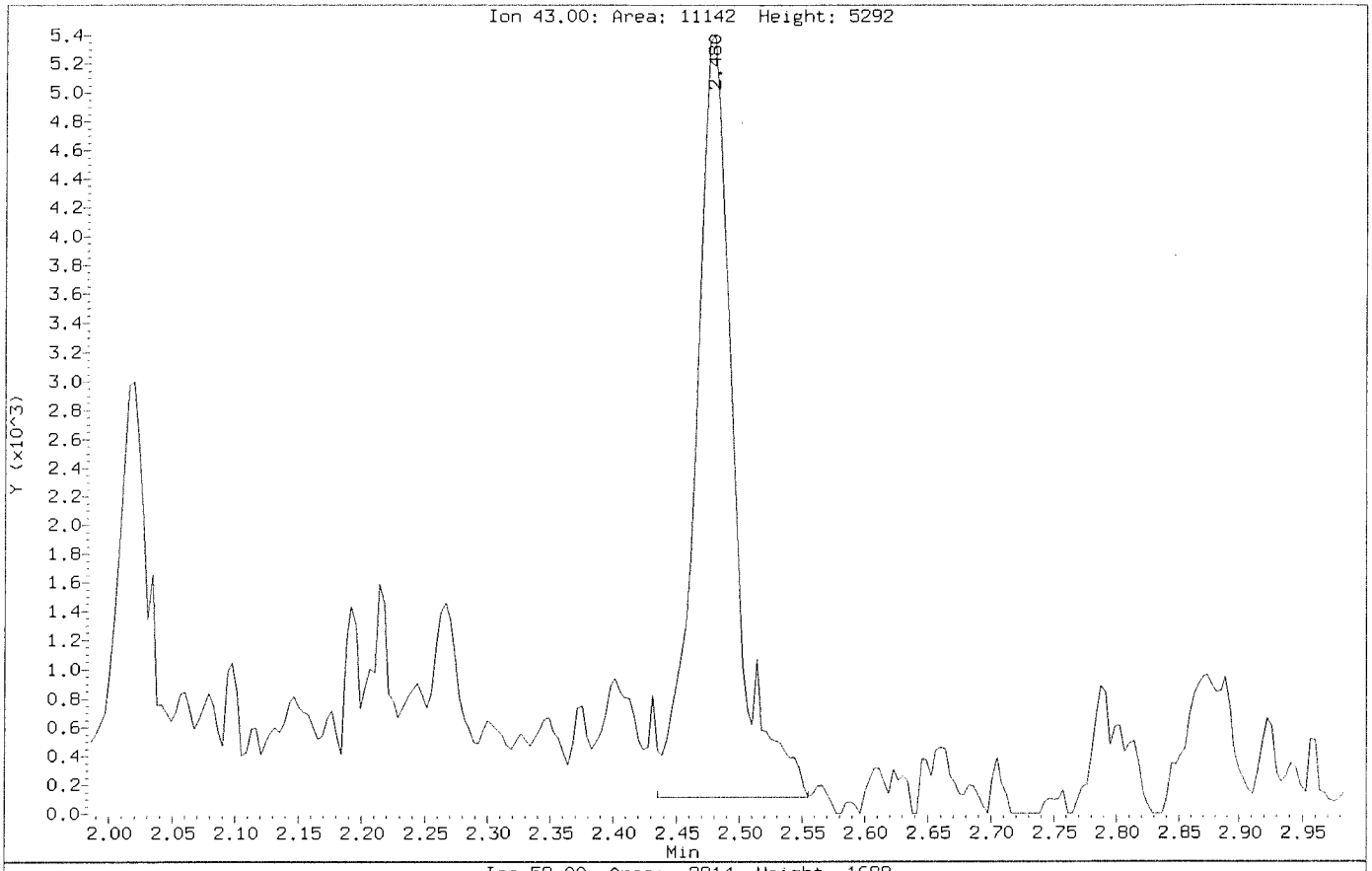
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CAS Number: 78-93-3

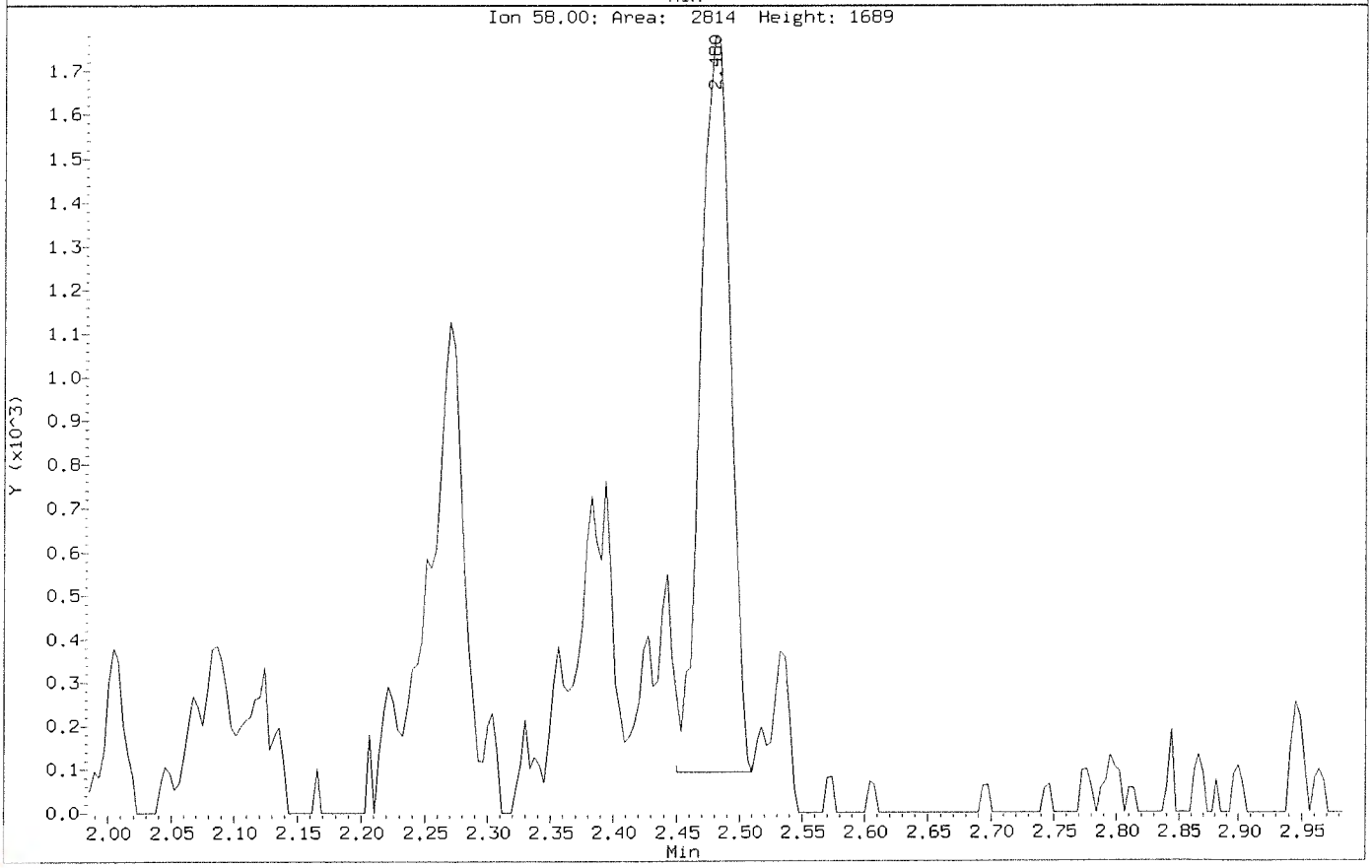




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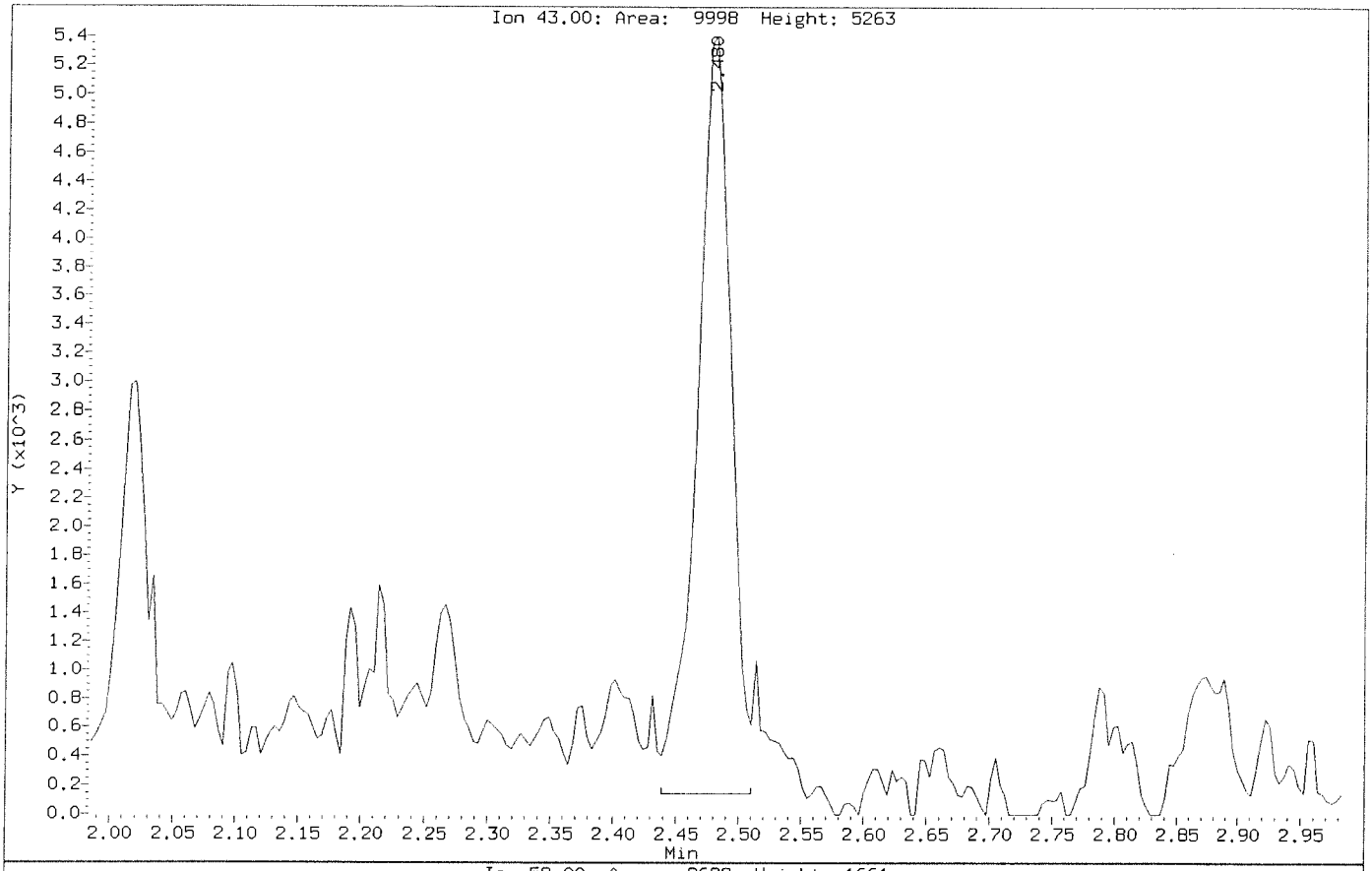
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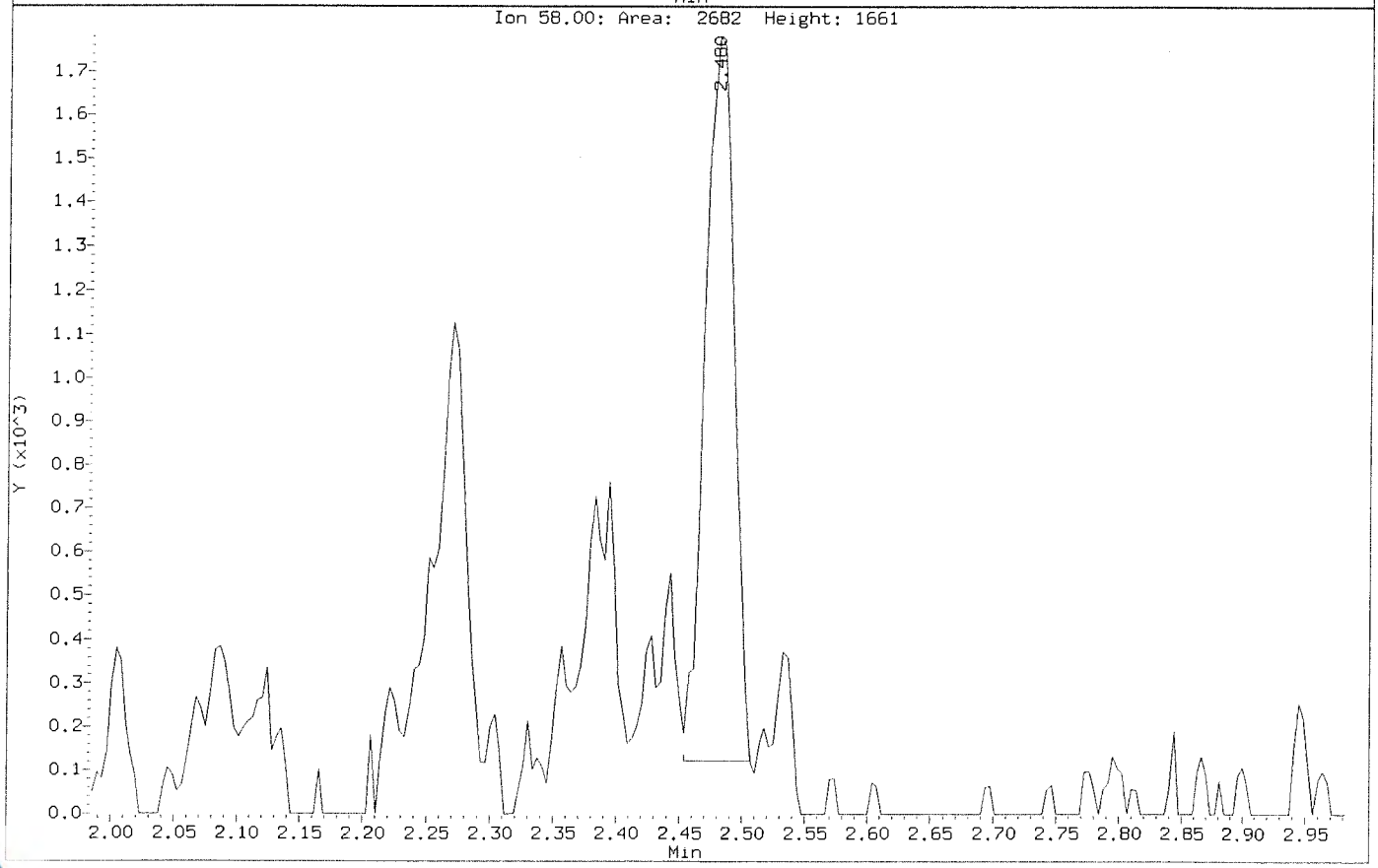




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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

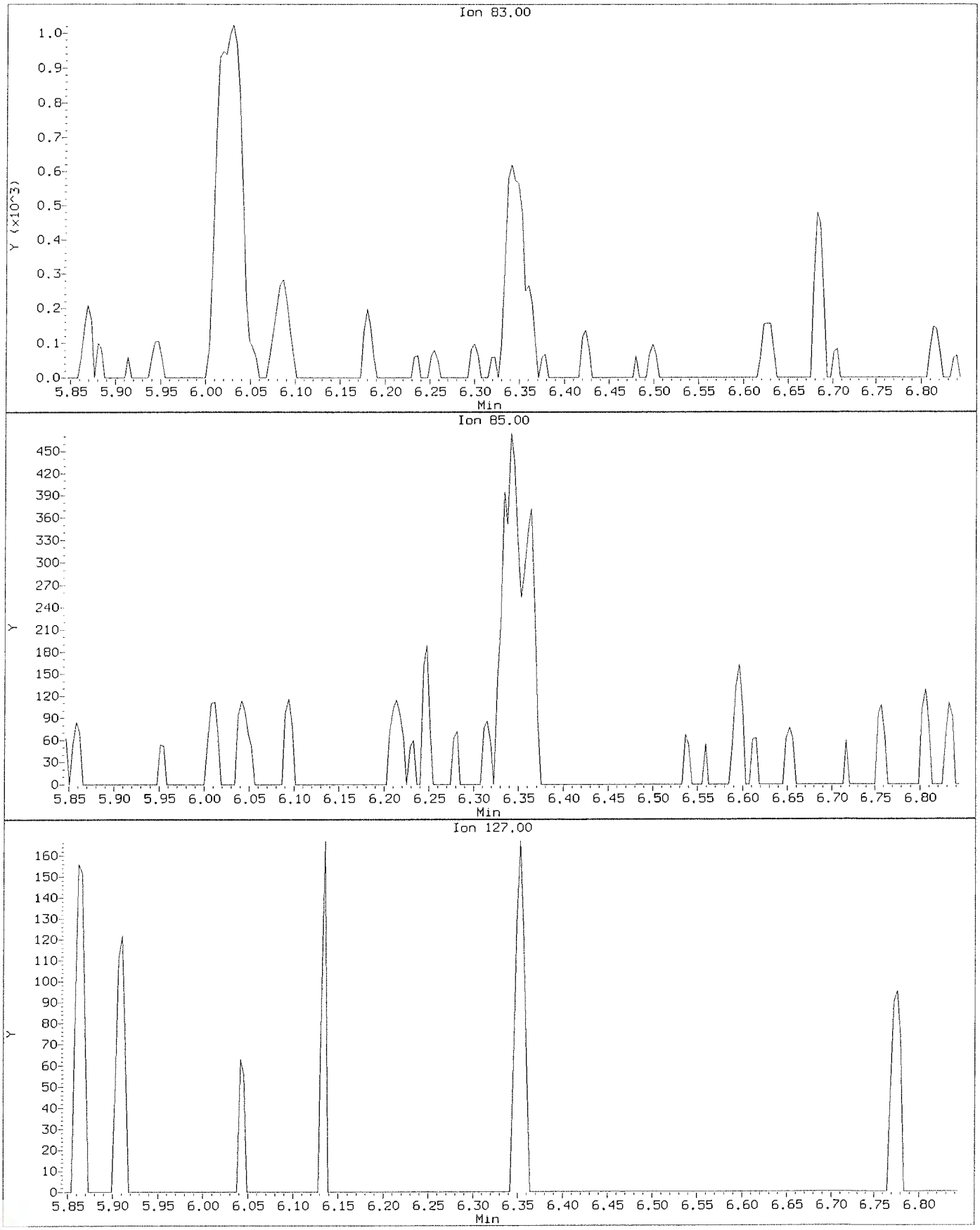
Compound: Acetone
CAS Number: 67-64-1





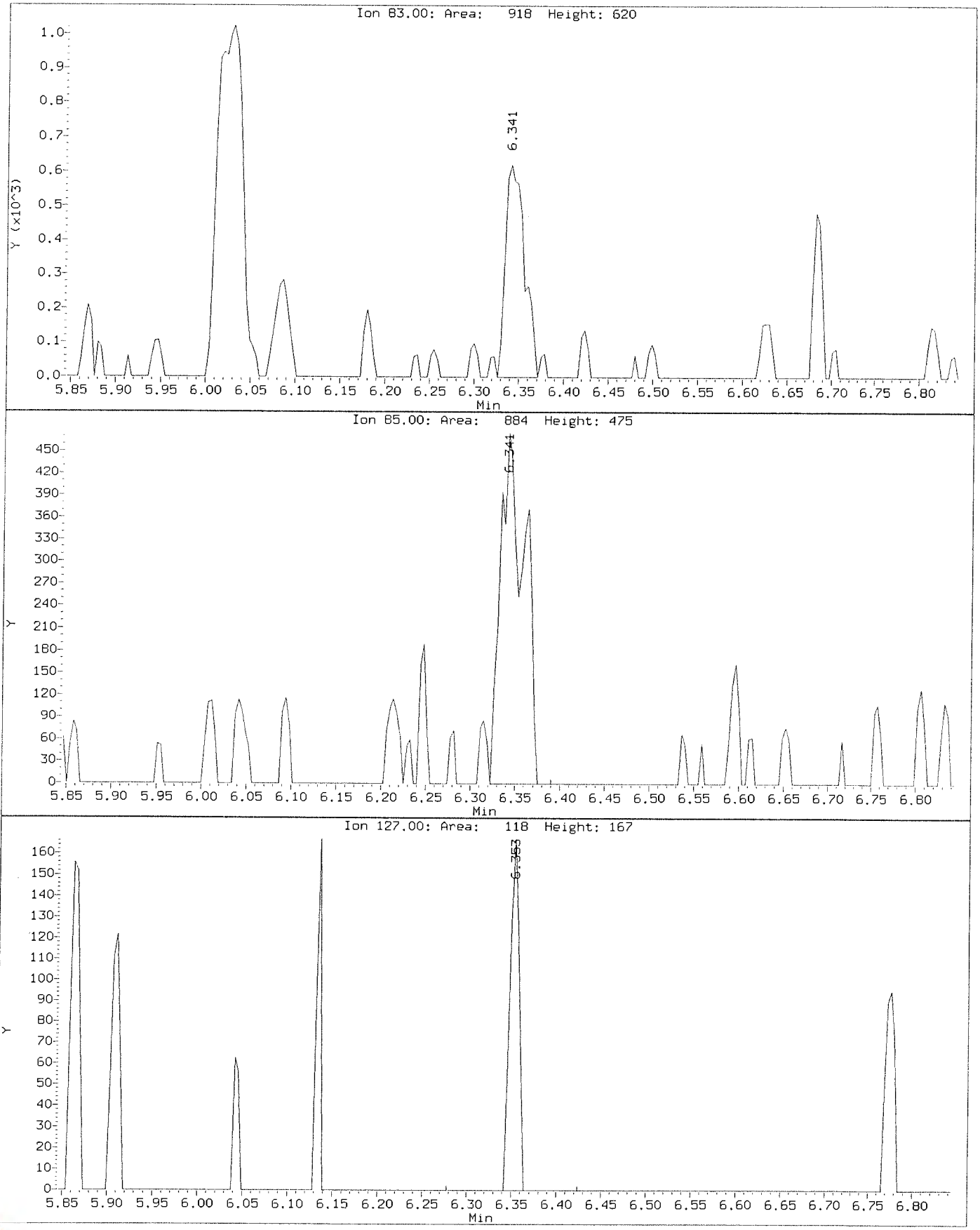
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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromodichloromethane
CAS Number: 75-27-4



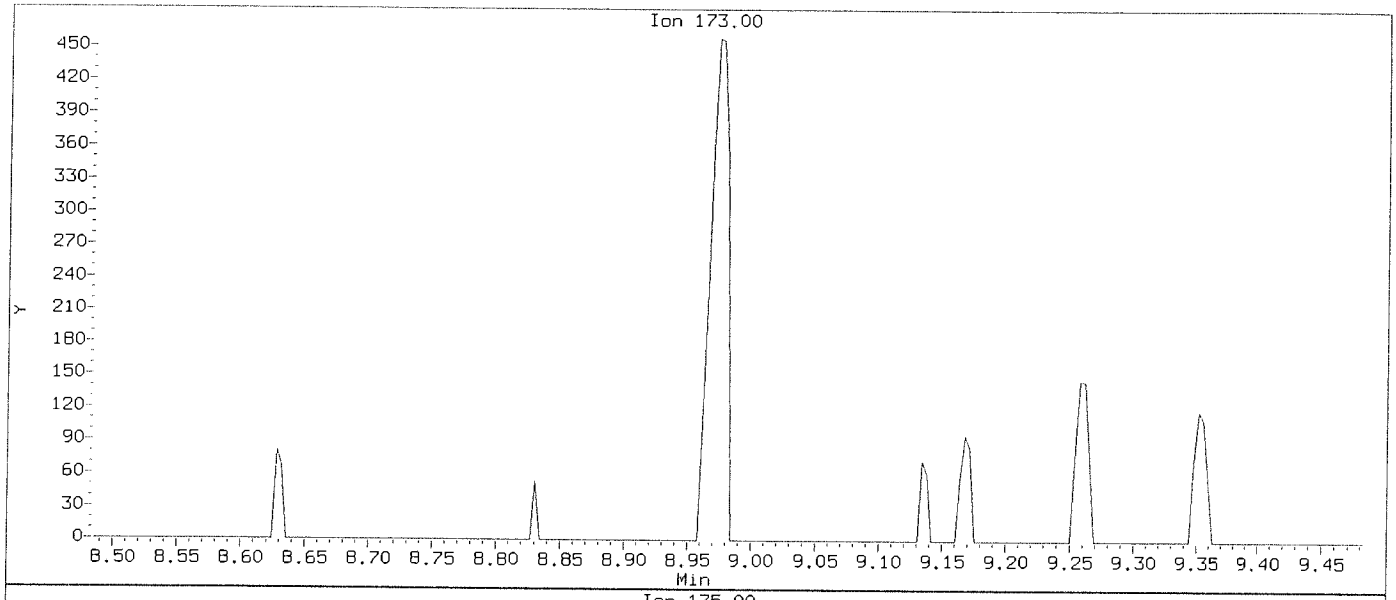
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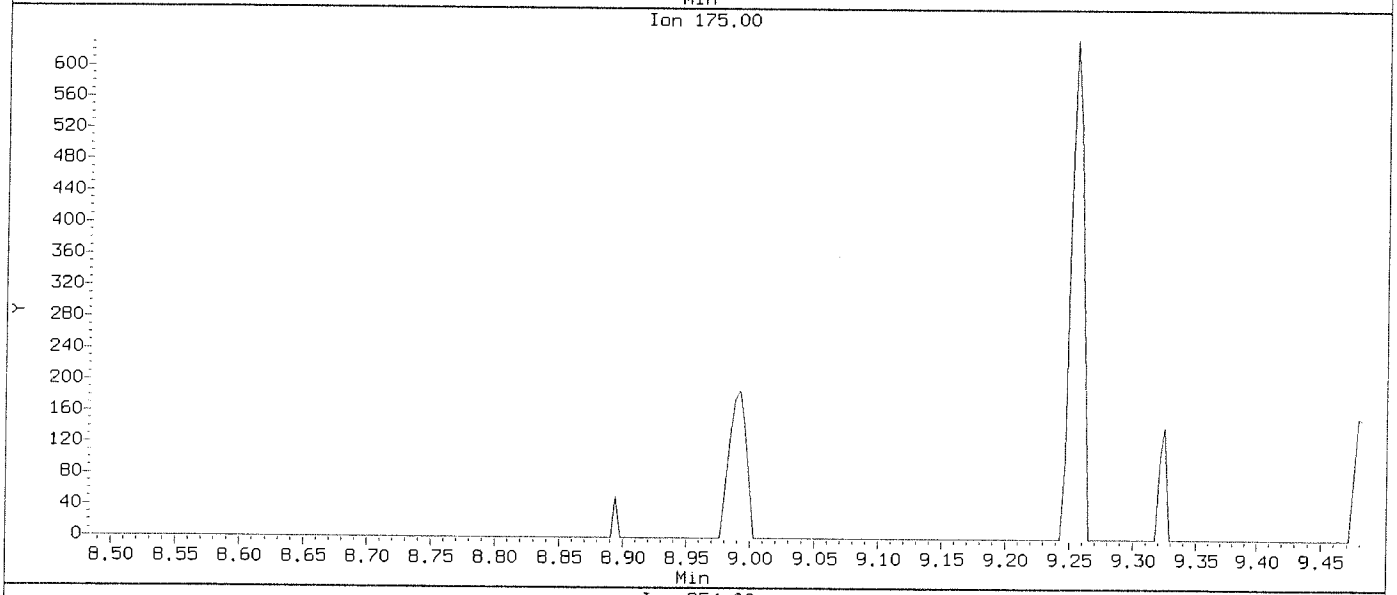
Compound: Bromodichloromethane
CAS Number: 75-27-4

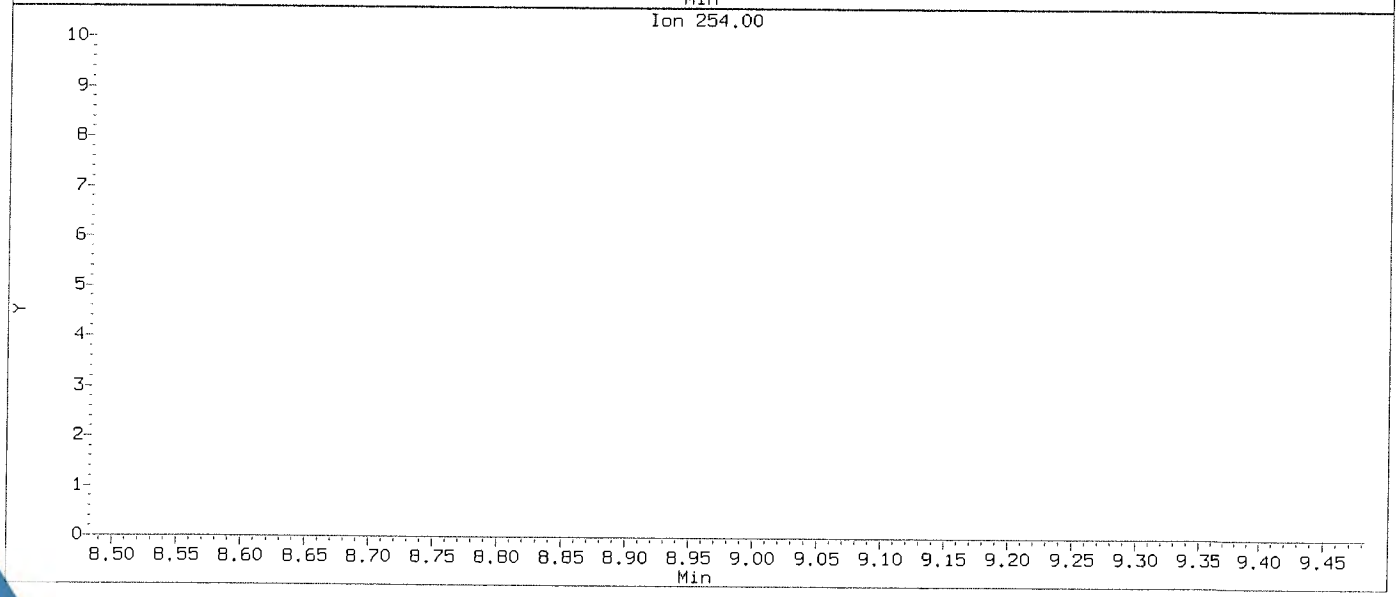


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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromoform
CAS Number: 75-25-2

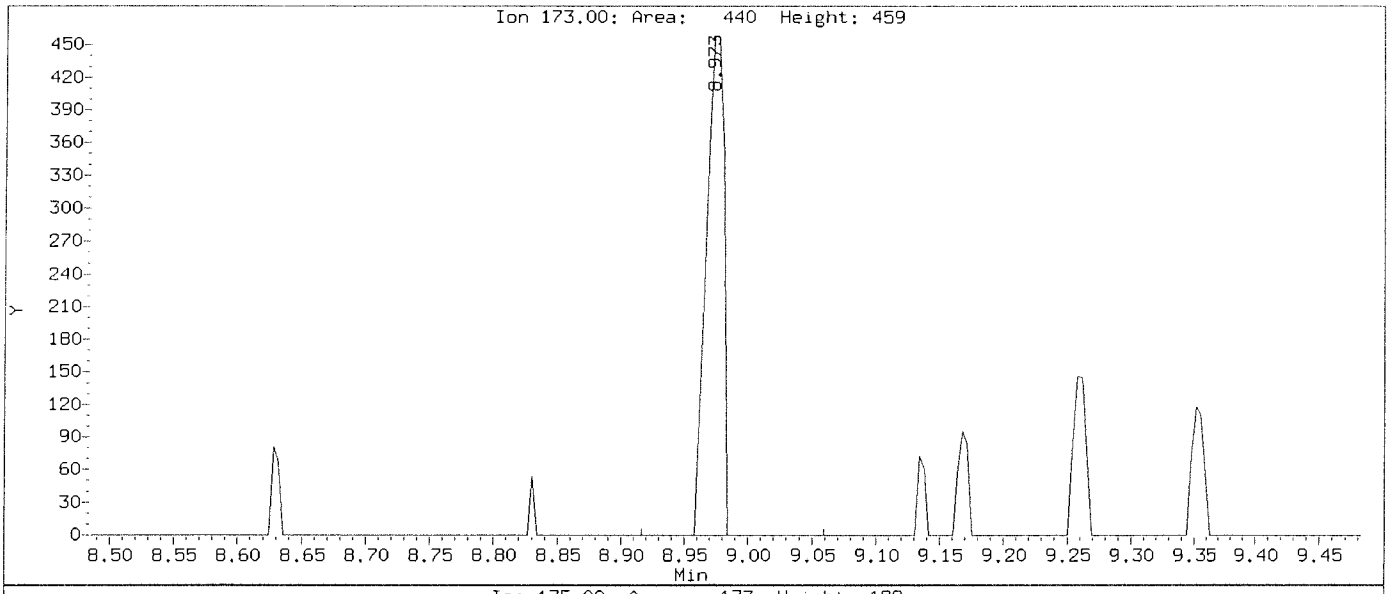


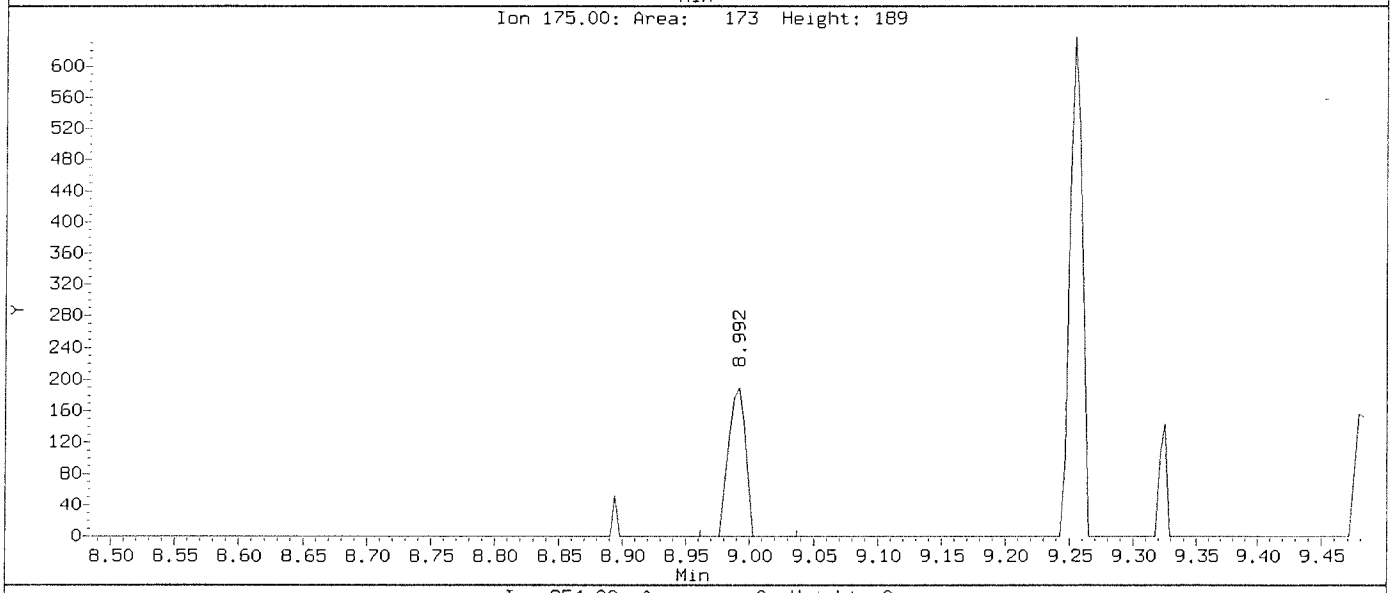


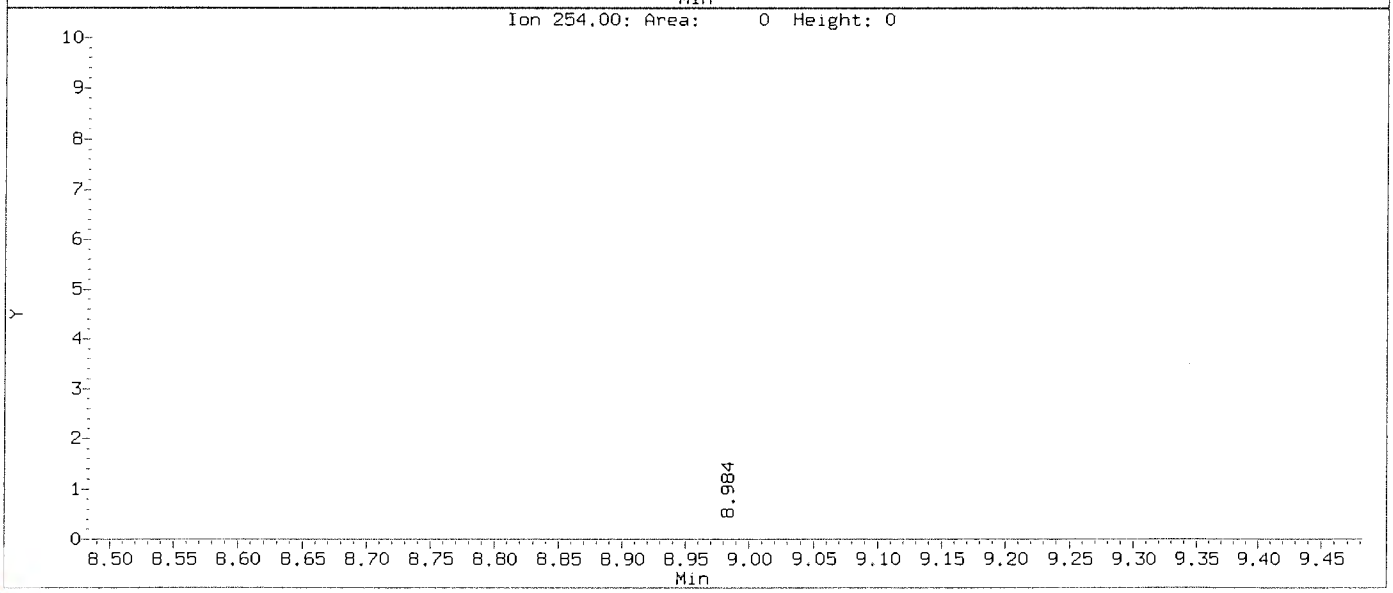


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Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Bromoform
CAS Number: 75-25-2

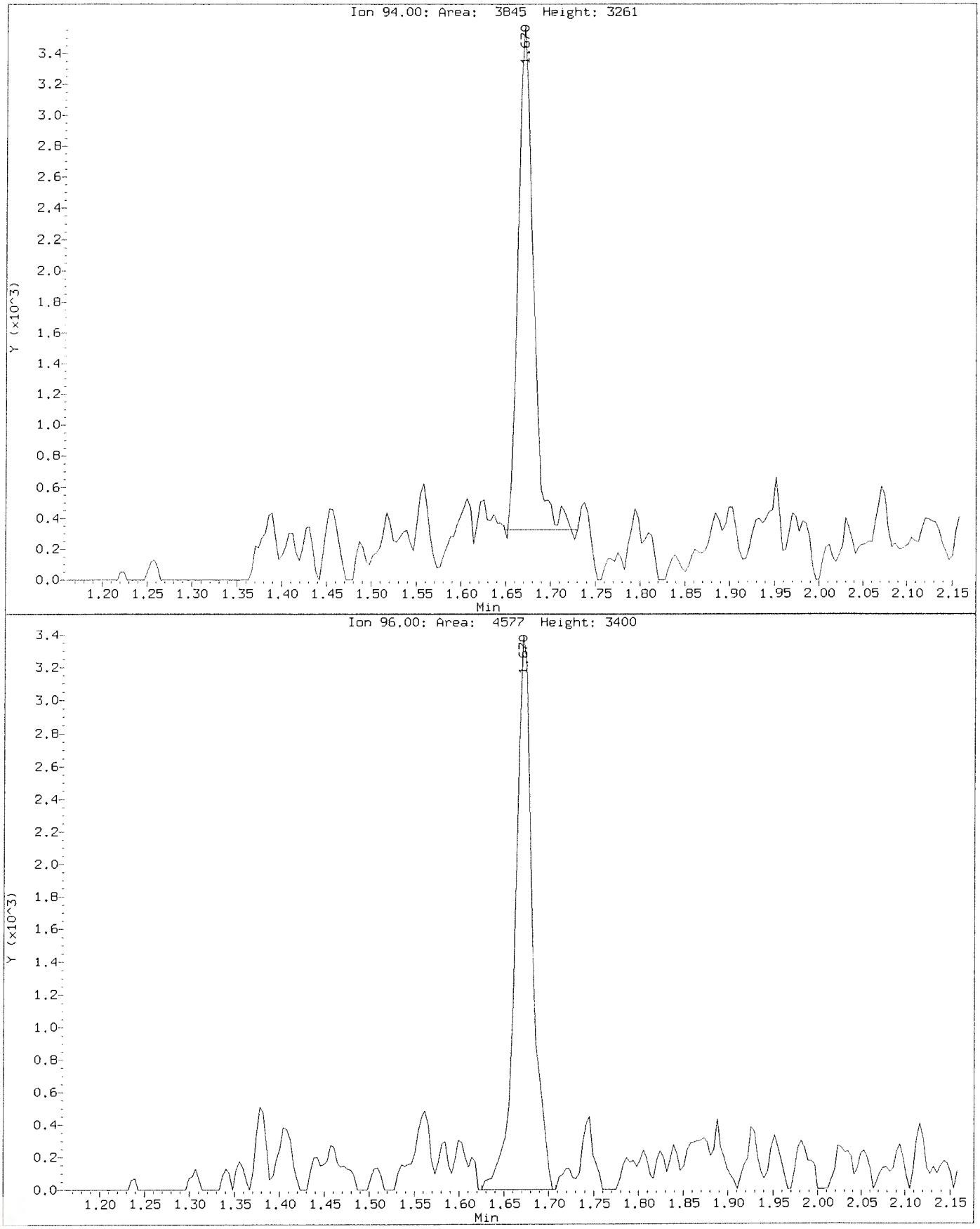






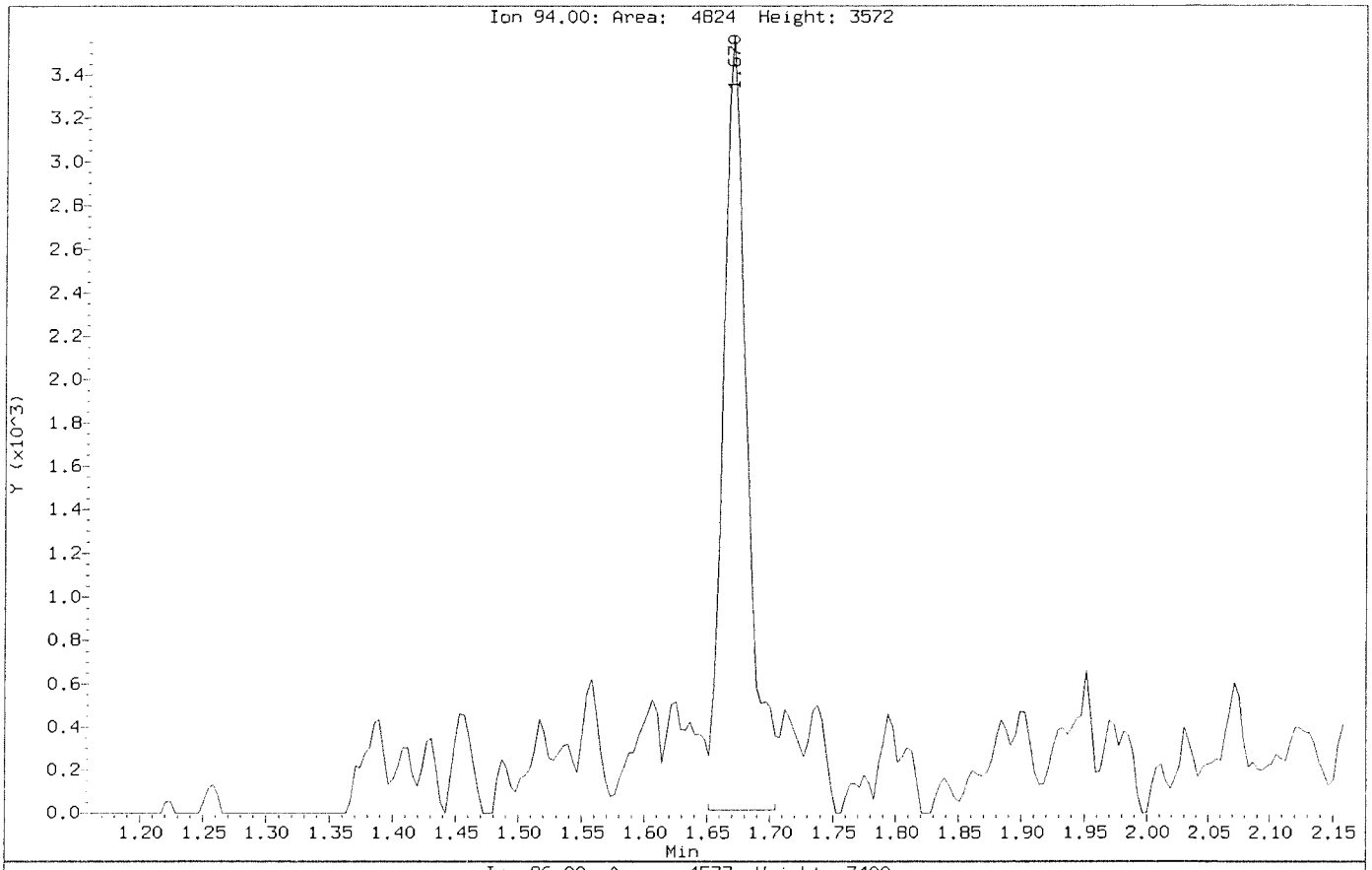
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Client Sample ID: VSTD000.5

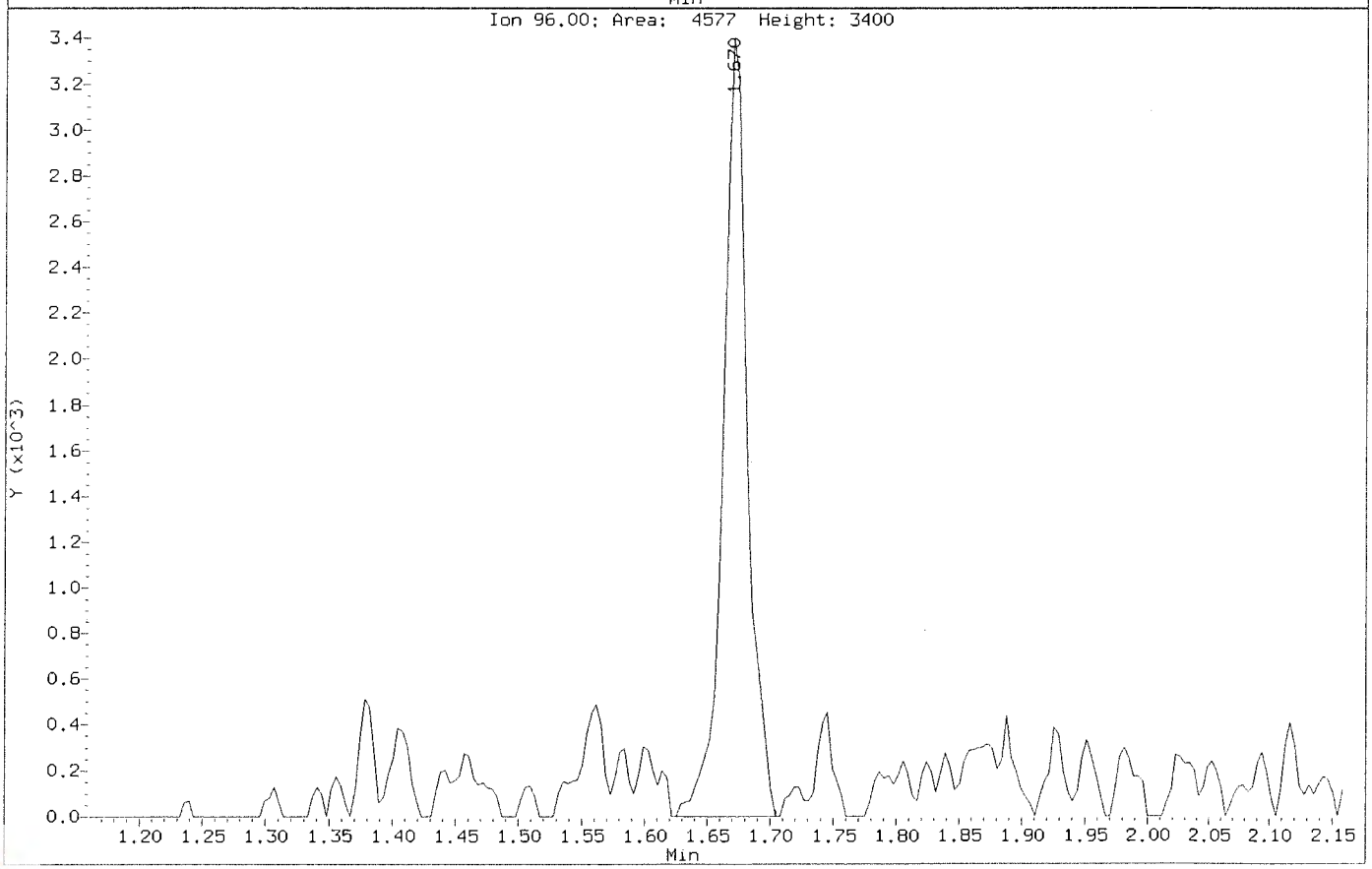
Compound: Bromomethane
CAS Number: 74-83-9



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

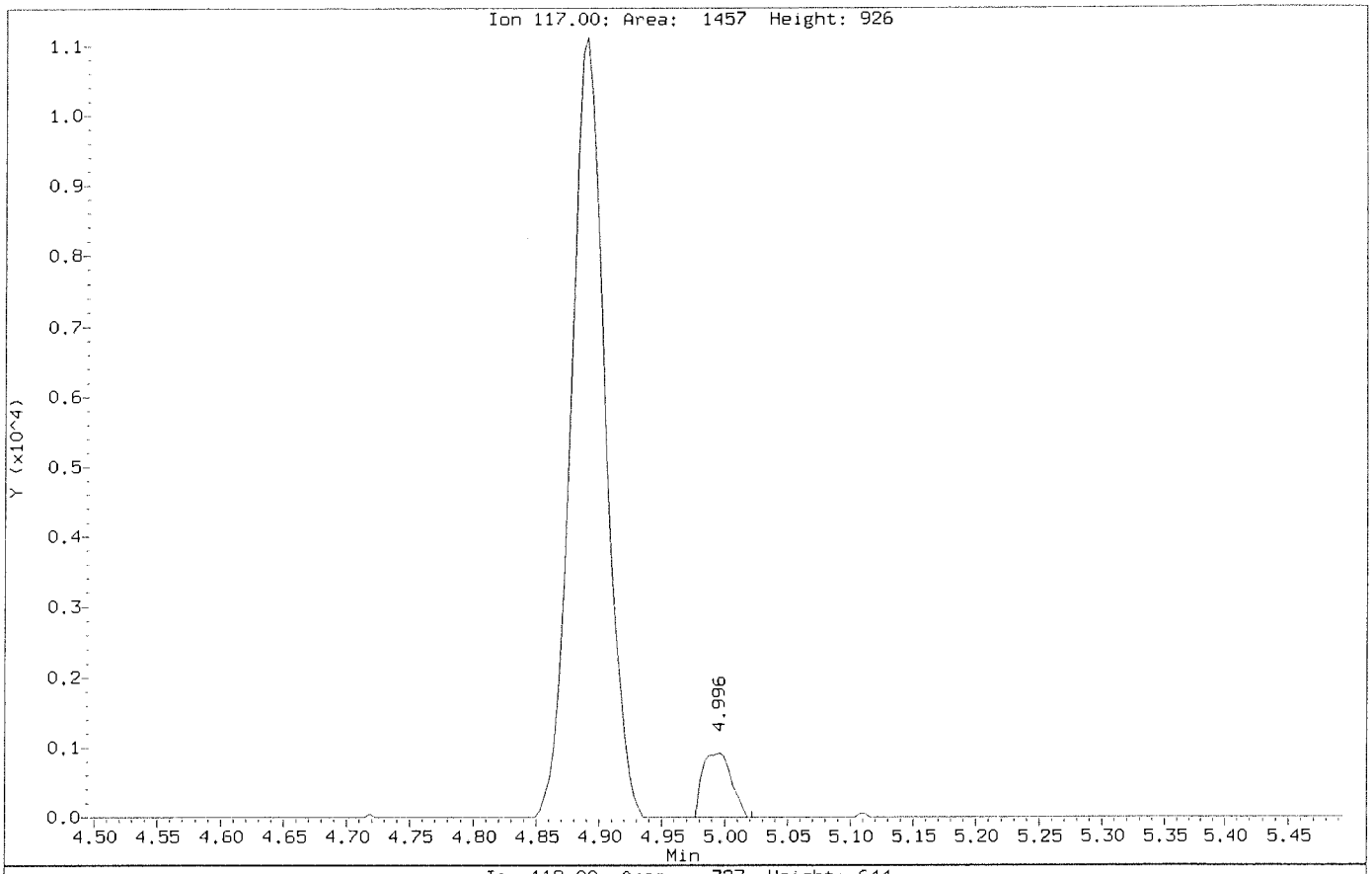
Compound: Bromomethane
CAS Number: 74-83-9

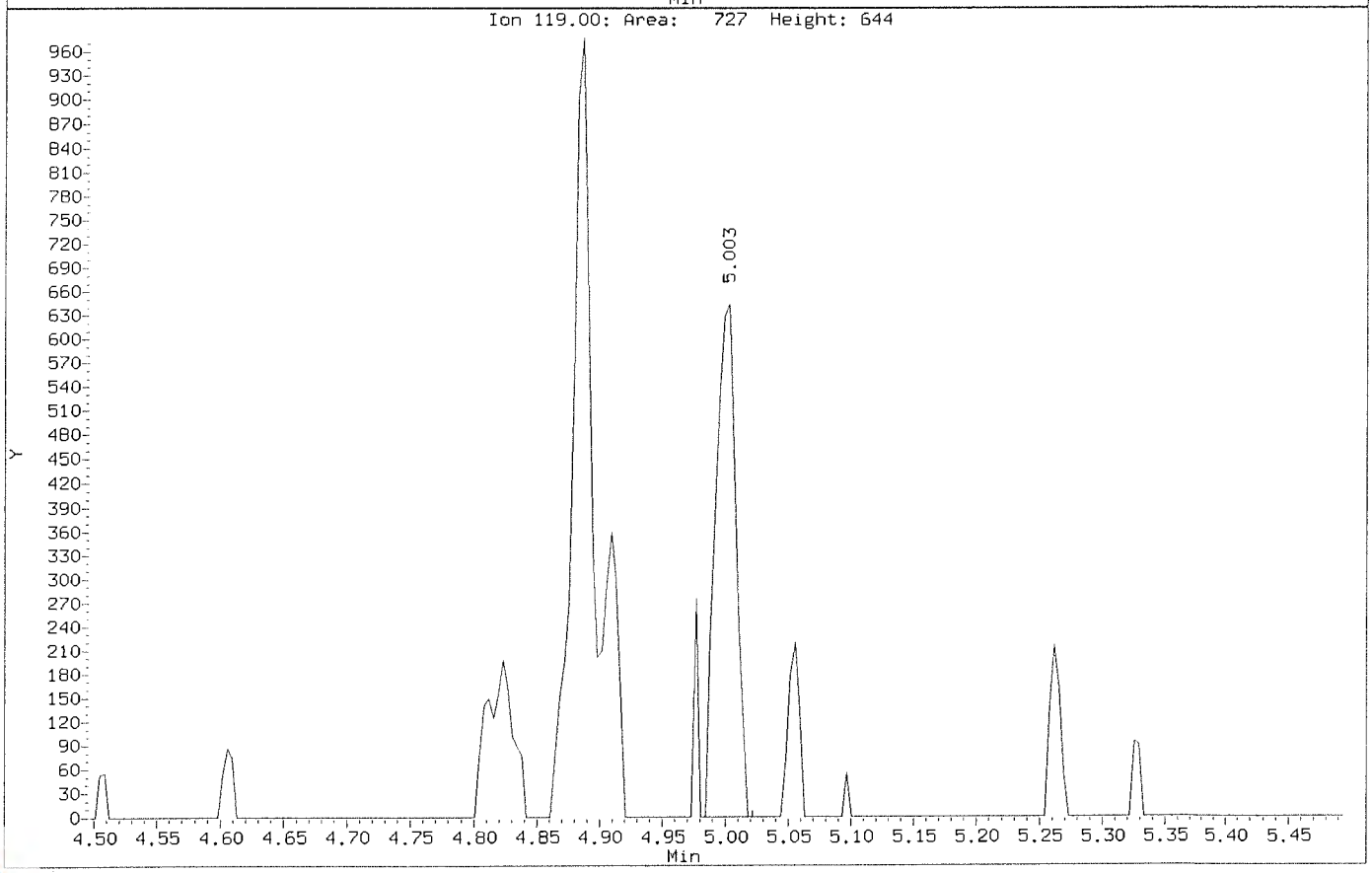




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Client Sample ID: VSTD000.5

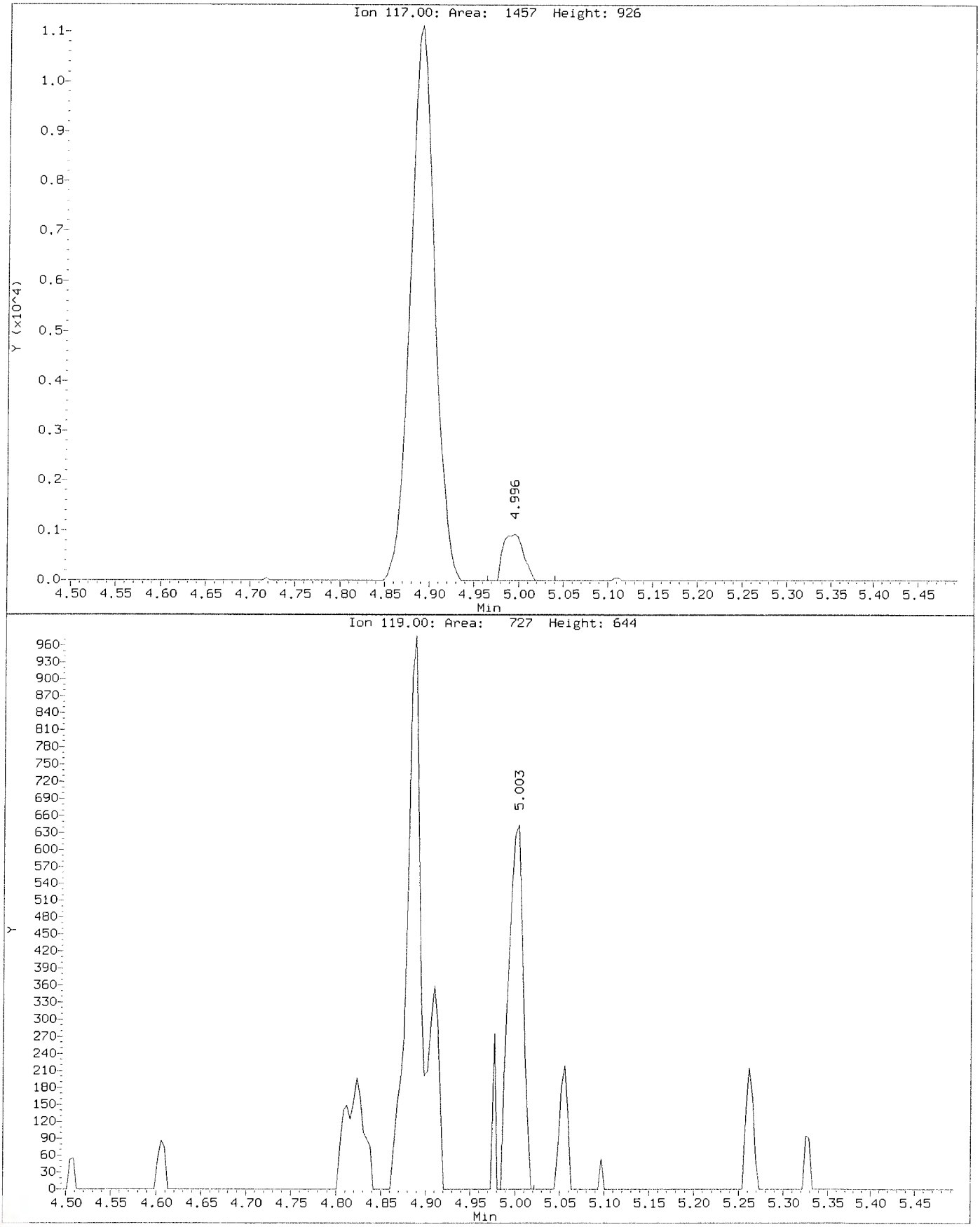
Compound: Carbon Tetrachloride
CAS Number: 56-23-5





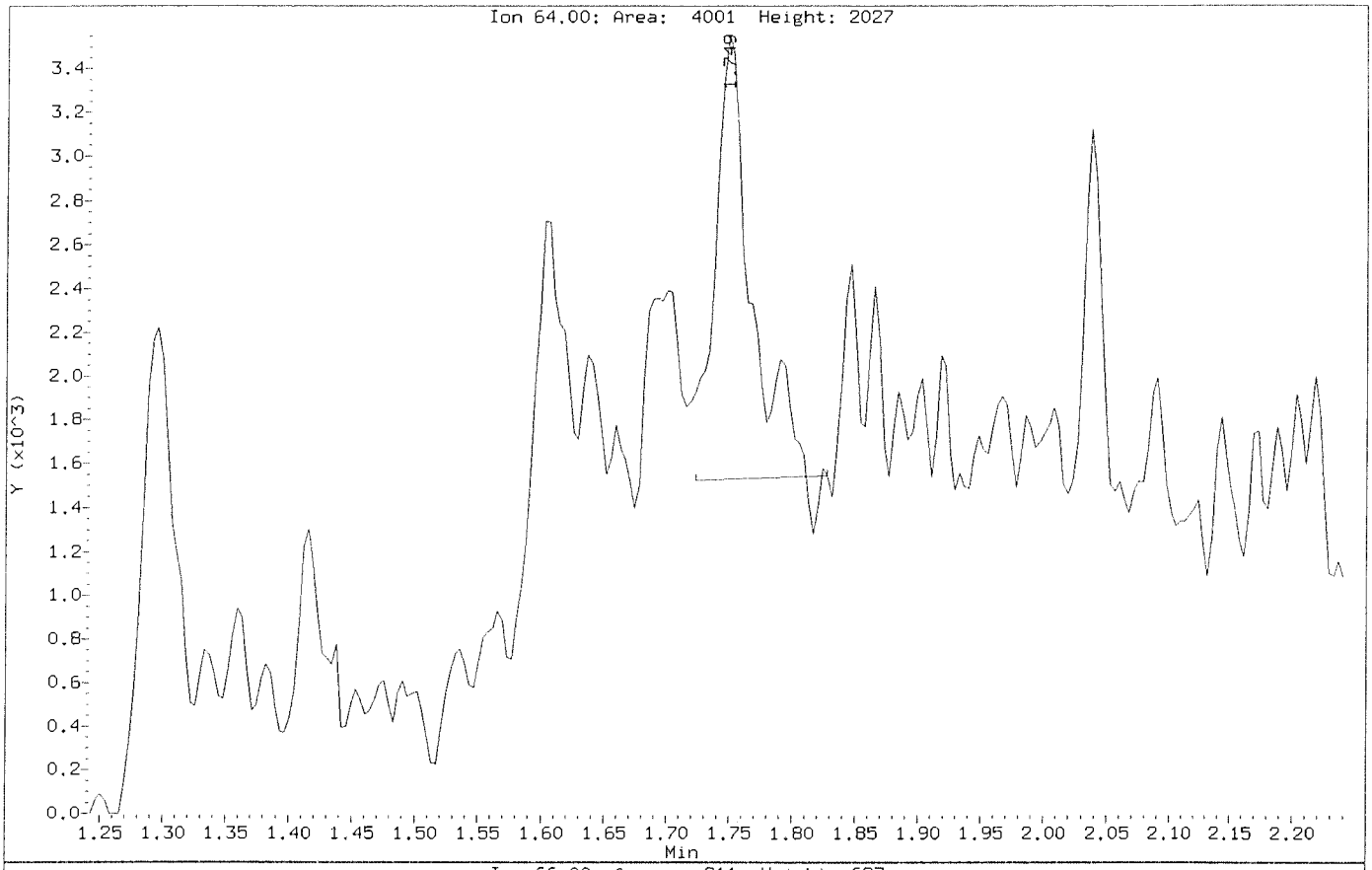
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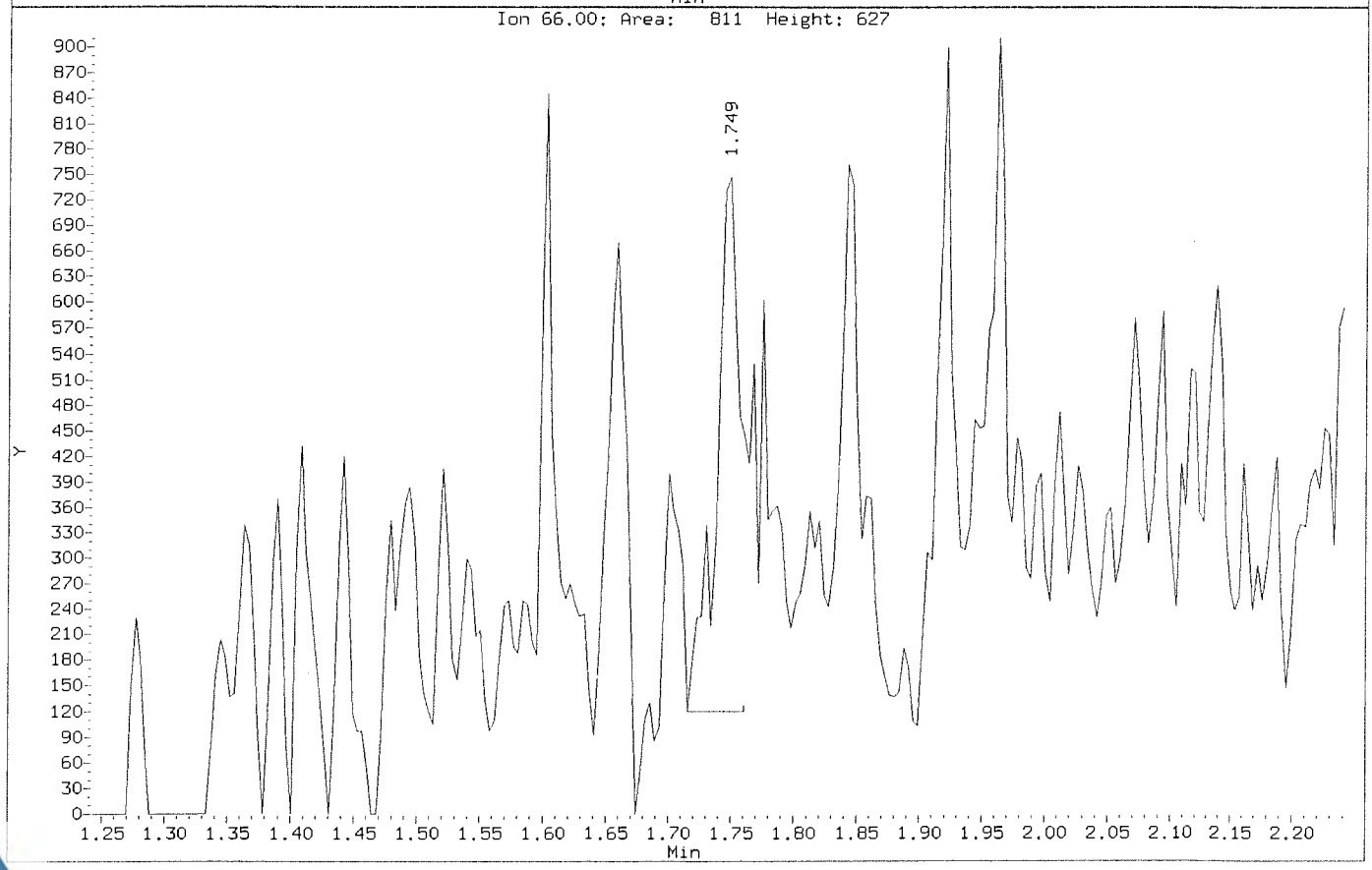
Compound: Carbon Tetrachloride
CAS Number: 56-23-5



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Client Sample ID: VSTD000.5

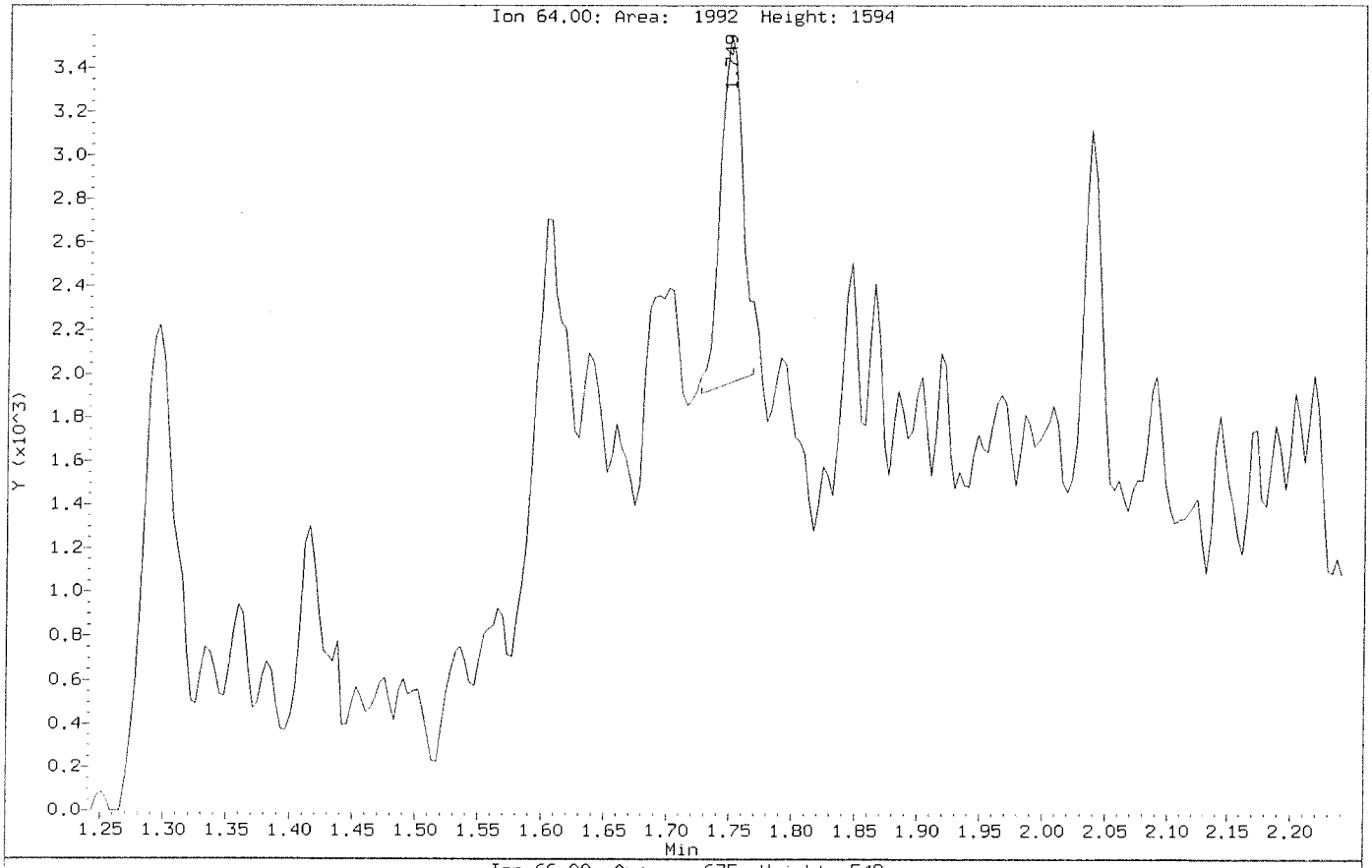
Compound: Chloroethane
CAS Number: 75-00-3

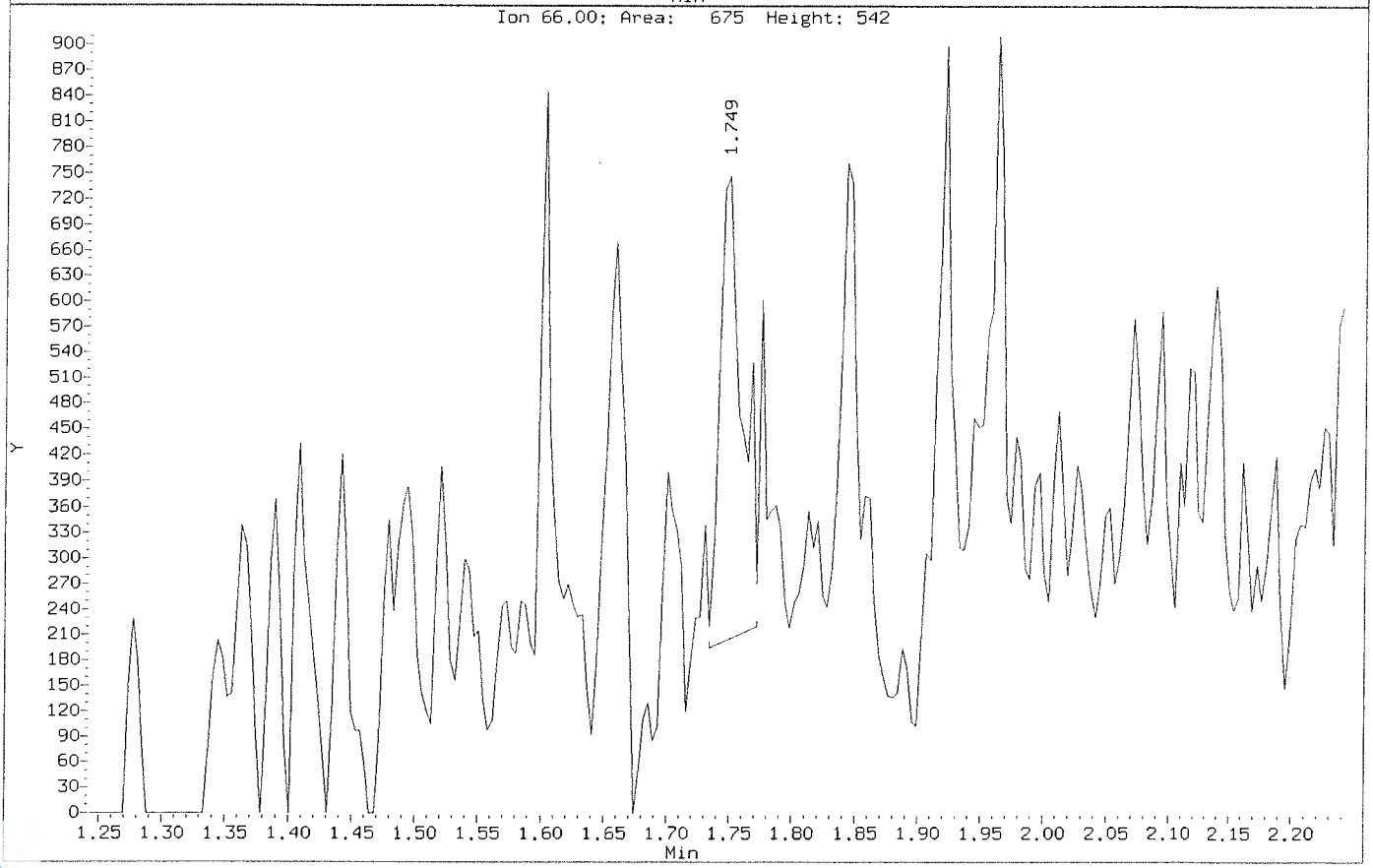




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Instrument: VOA9.i
Client Sample ID: VSTD000.5

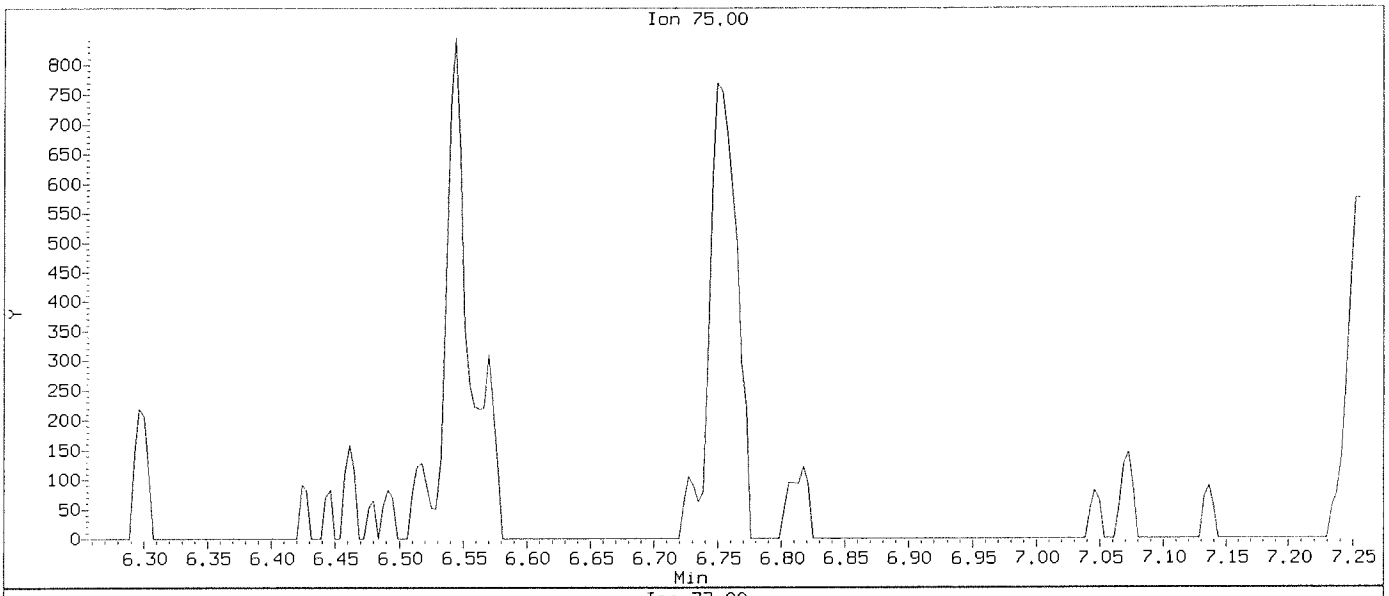
Compound: Chloroethane
CAS Number: 75-00-3

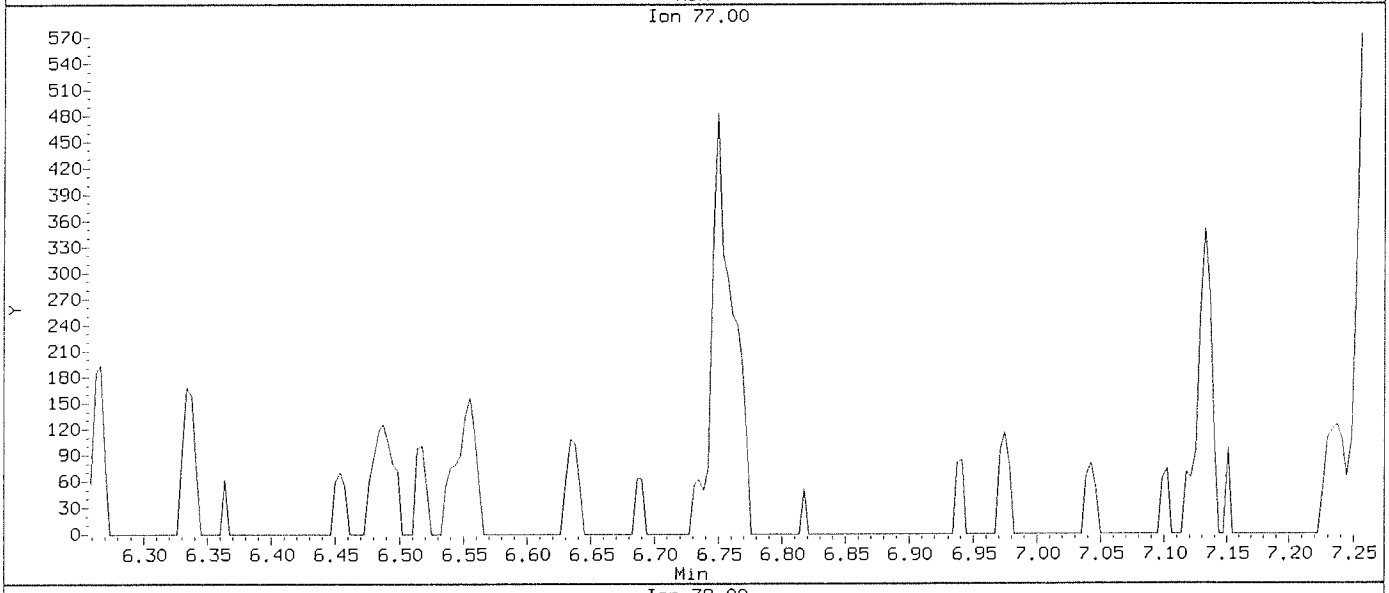


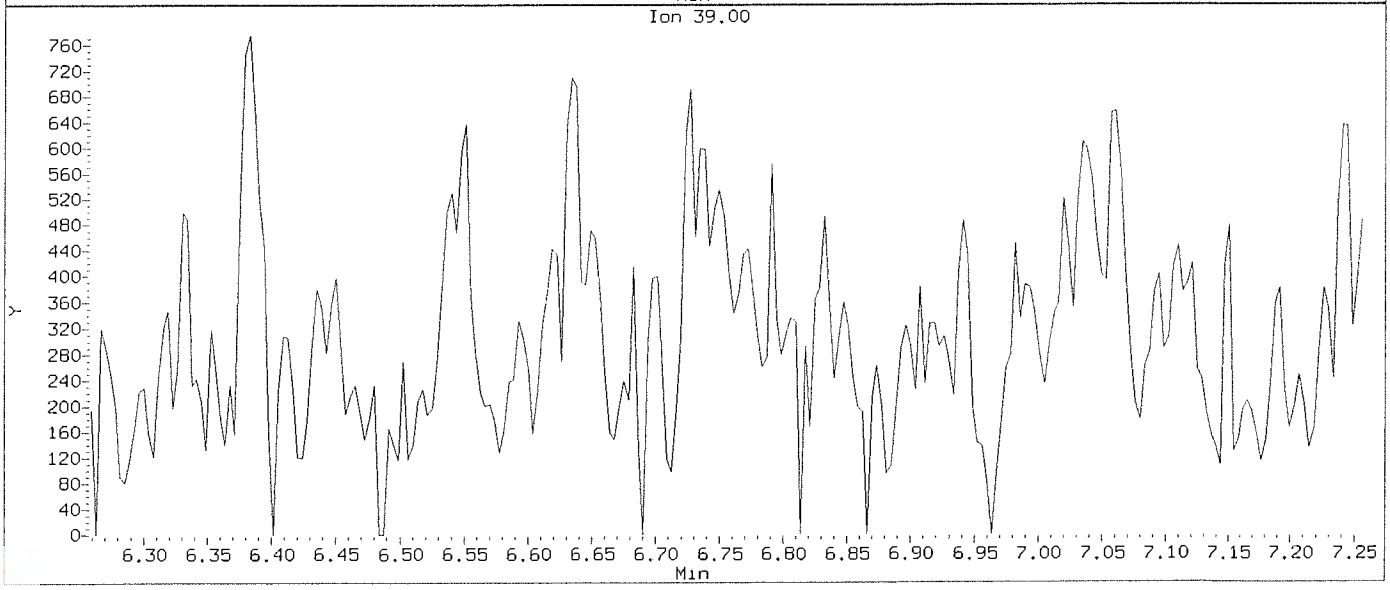


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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5

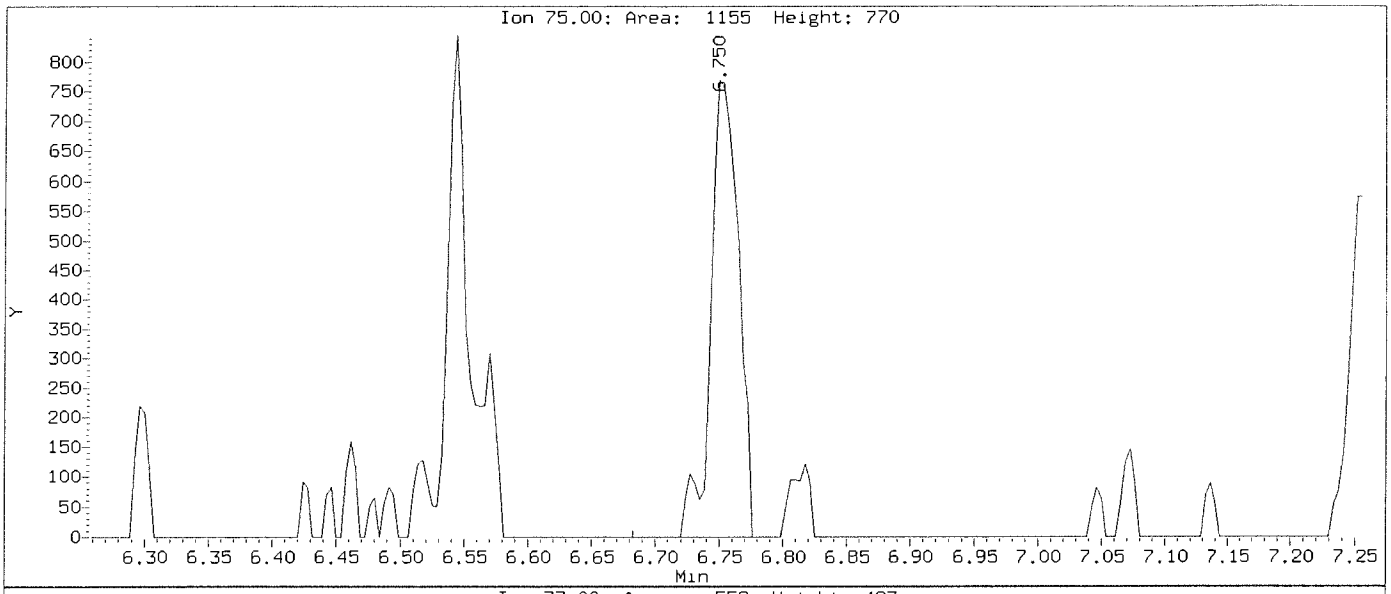


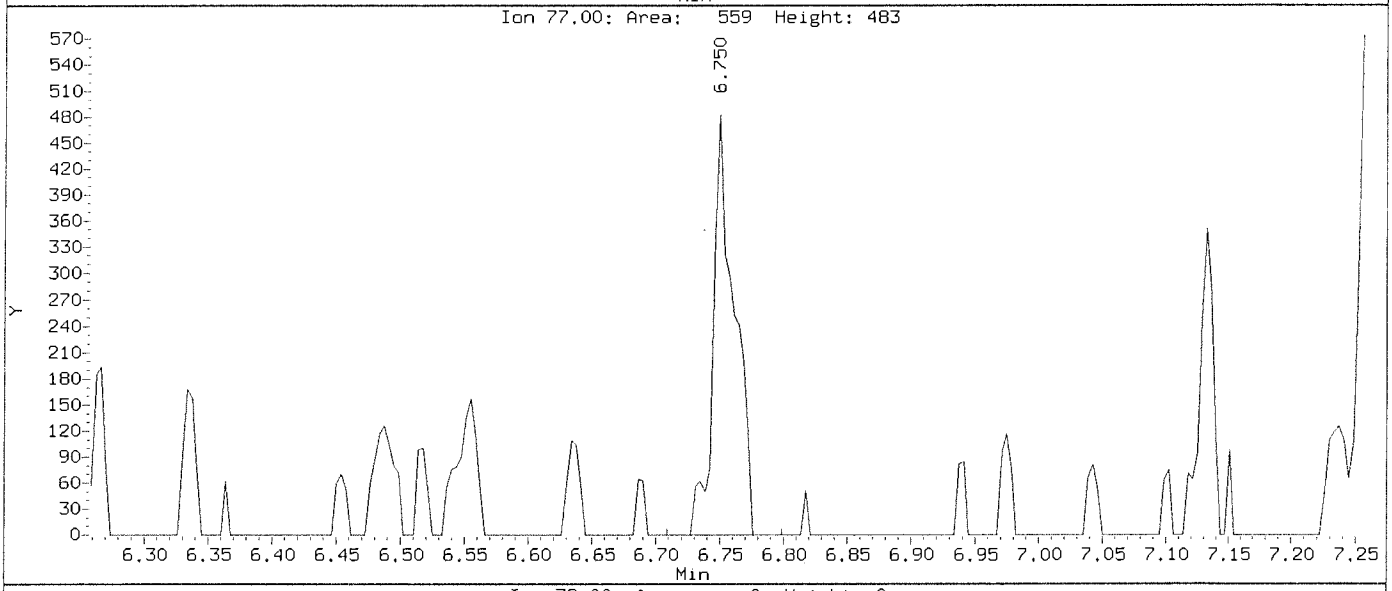


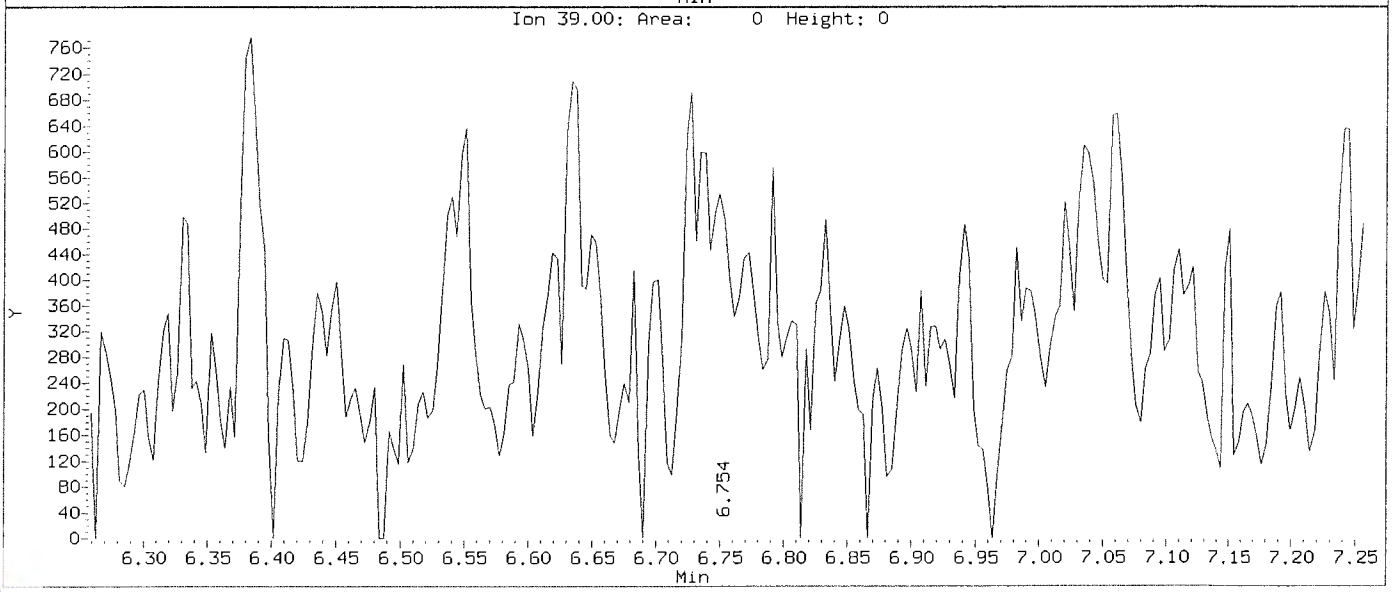


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Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: cis-1,3-Dichloropropene
CAS Number: 10061-01-5

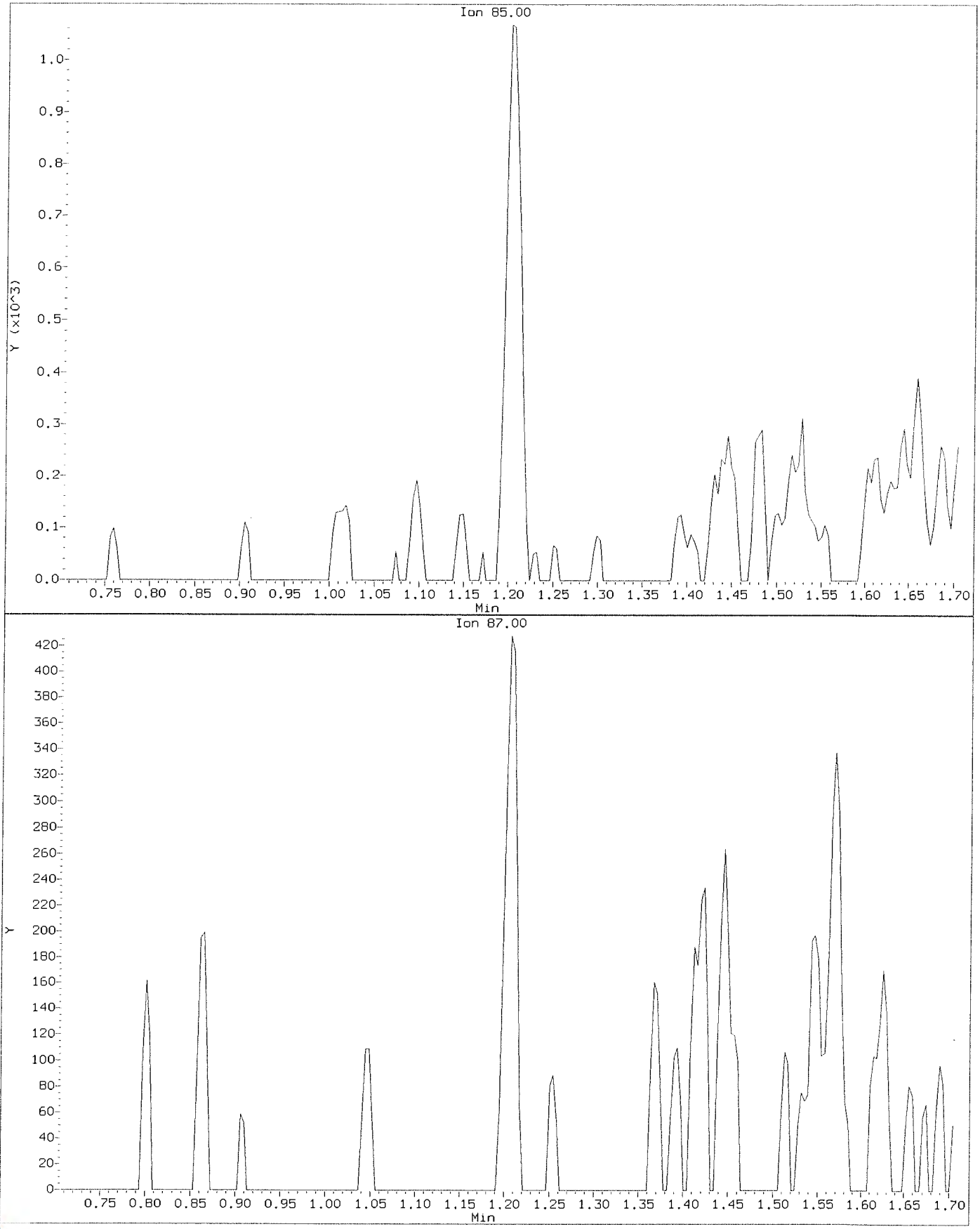






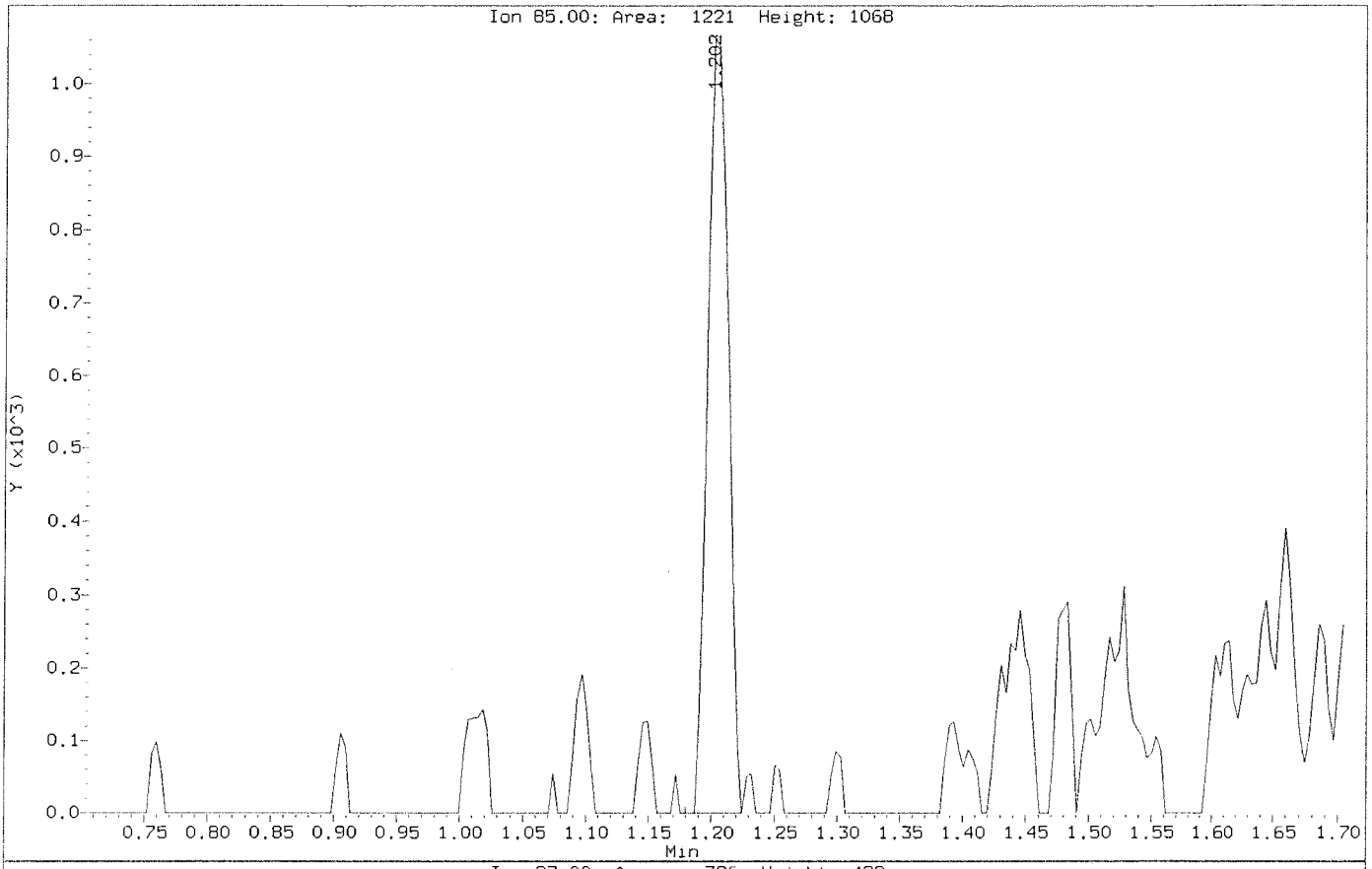
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

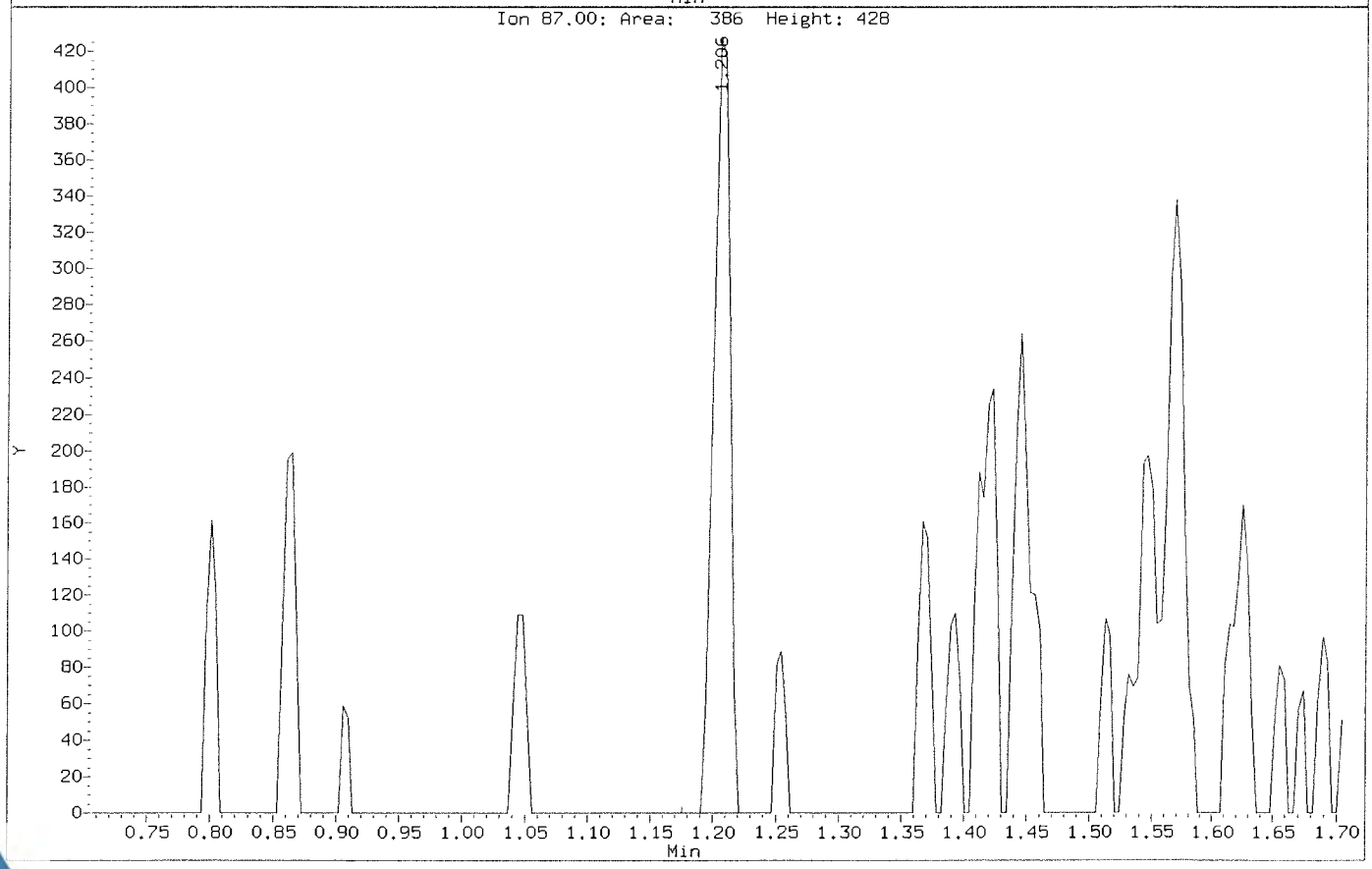
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111203.D
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

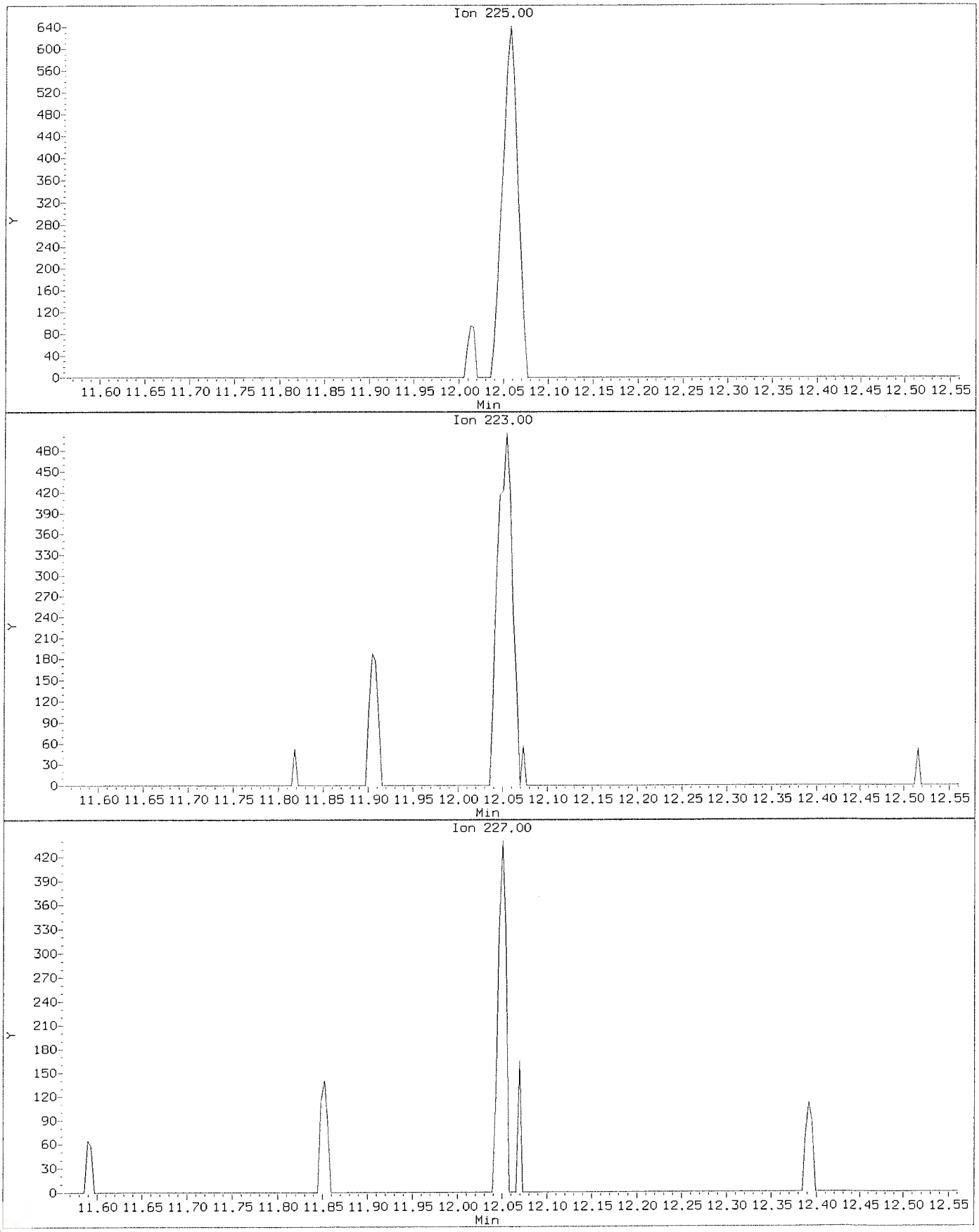
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





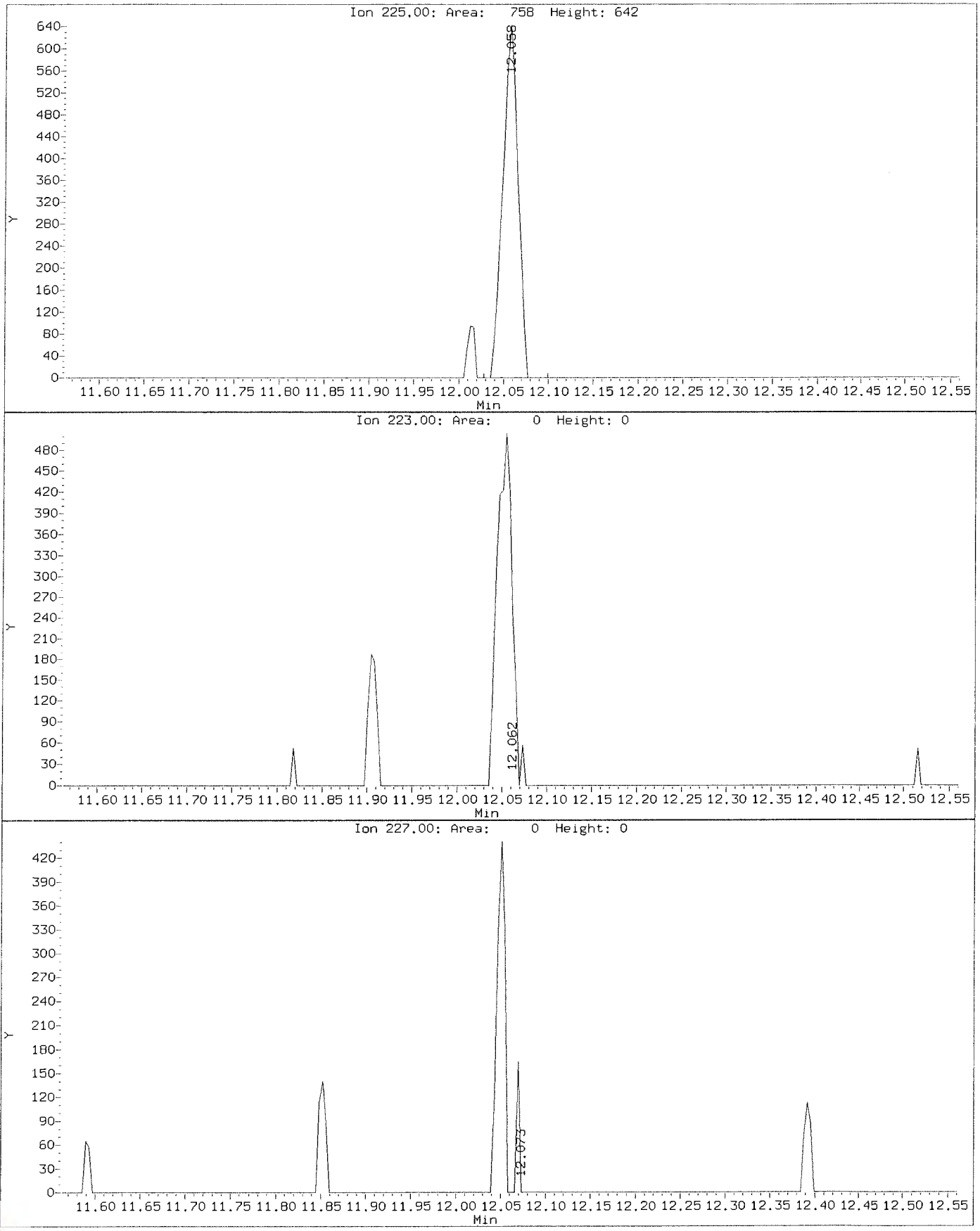
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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



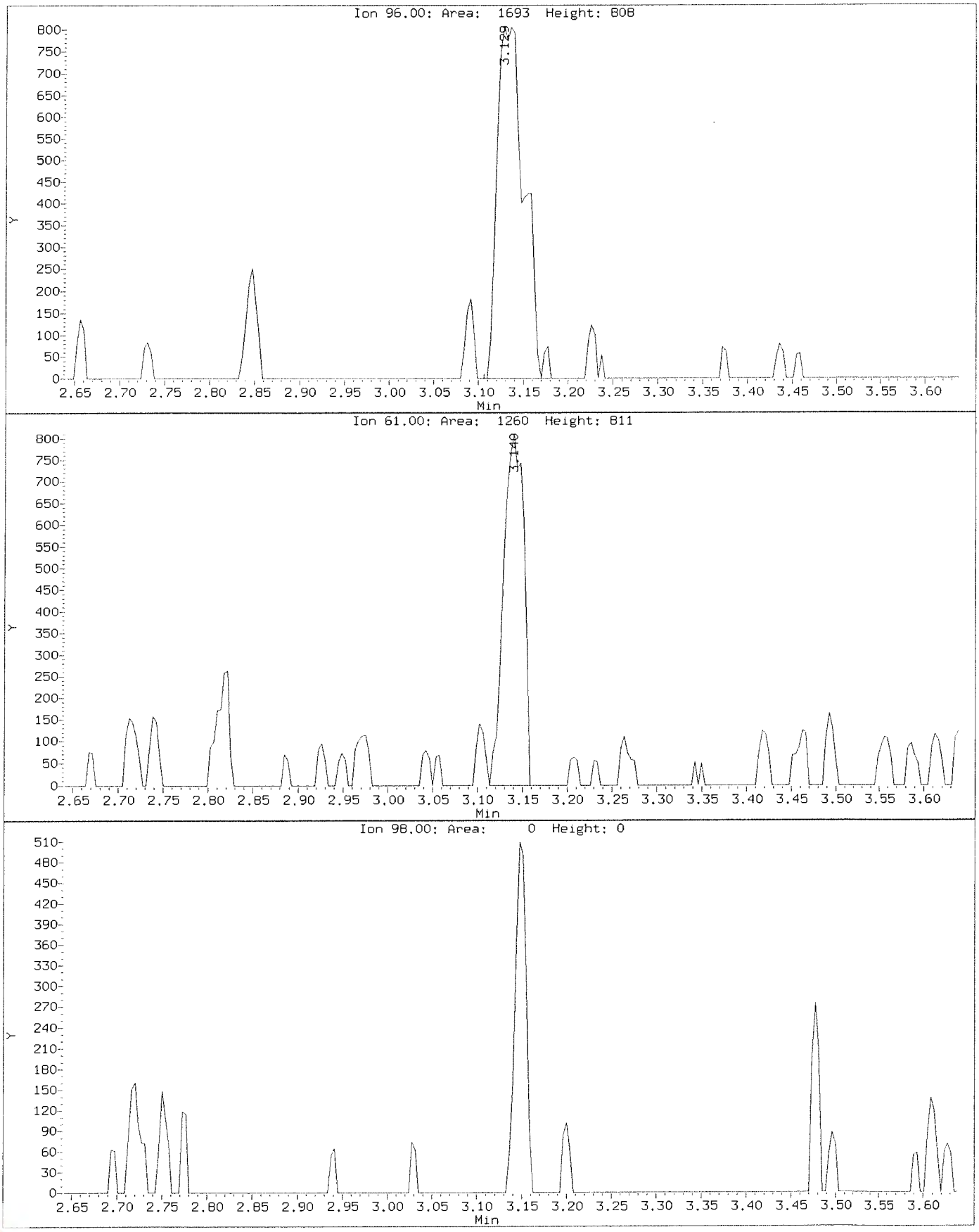
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Client Sample ID: VSTD000.5

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



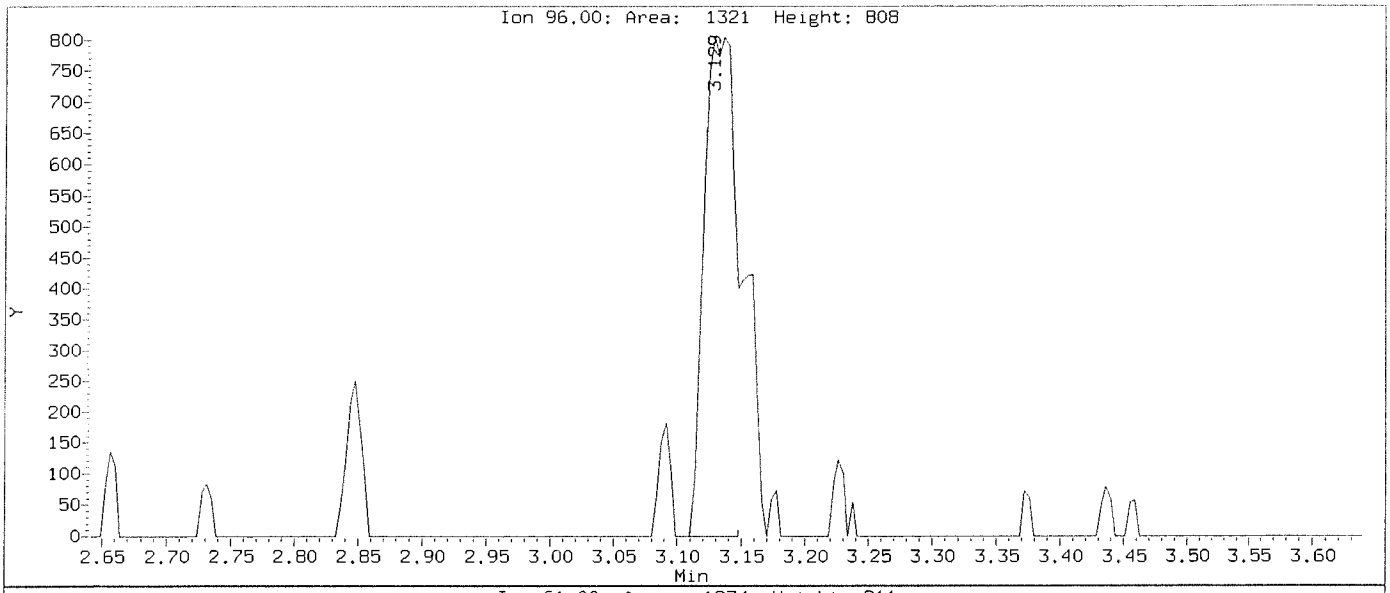
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Instrument: VOA9.i
Client Sample ID: VSTD000.5

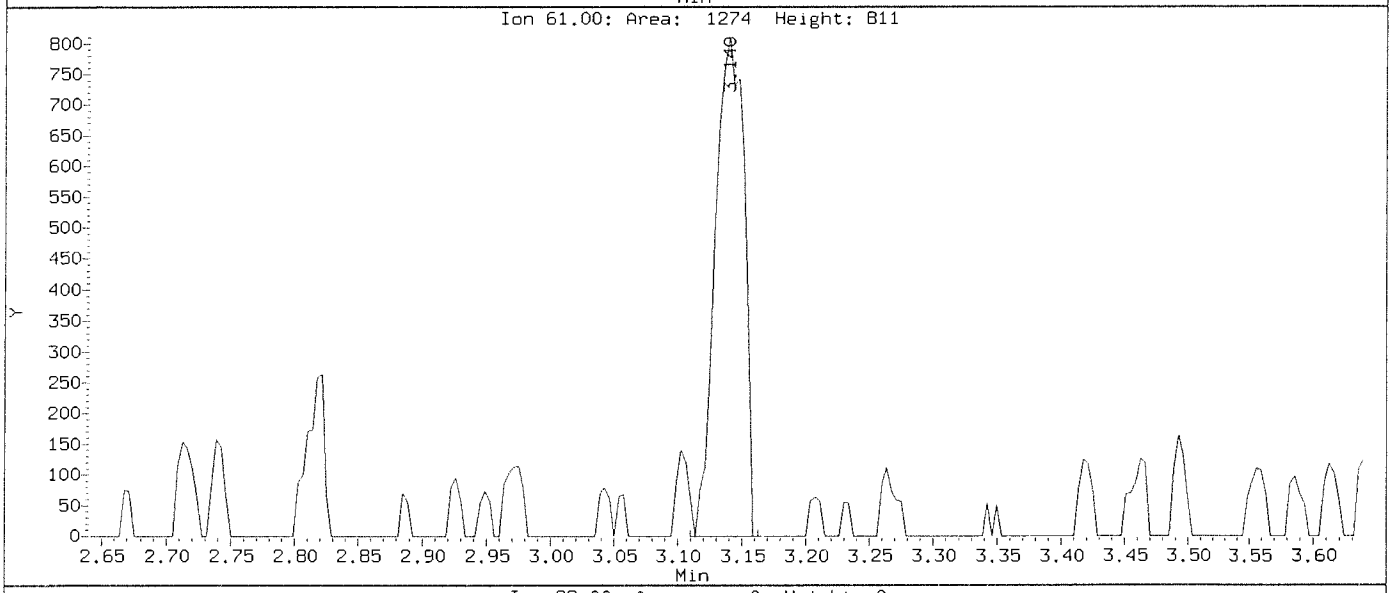
Compound: trans-1,2-Dichloroethene
CAS Number: 156-60-5

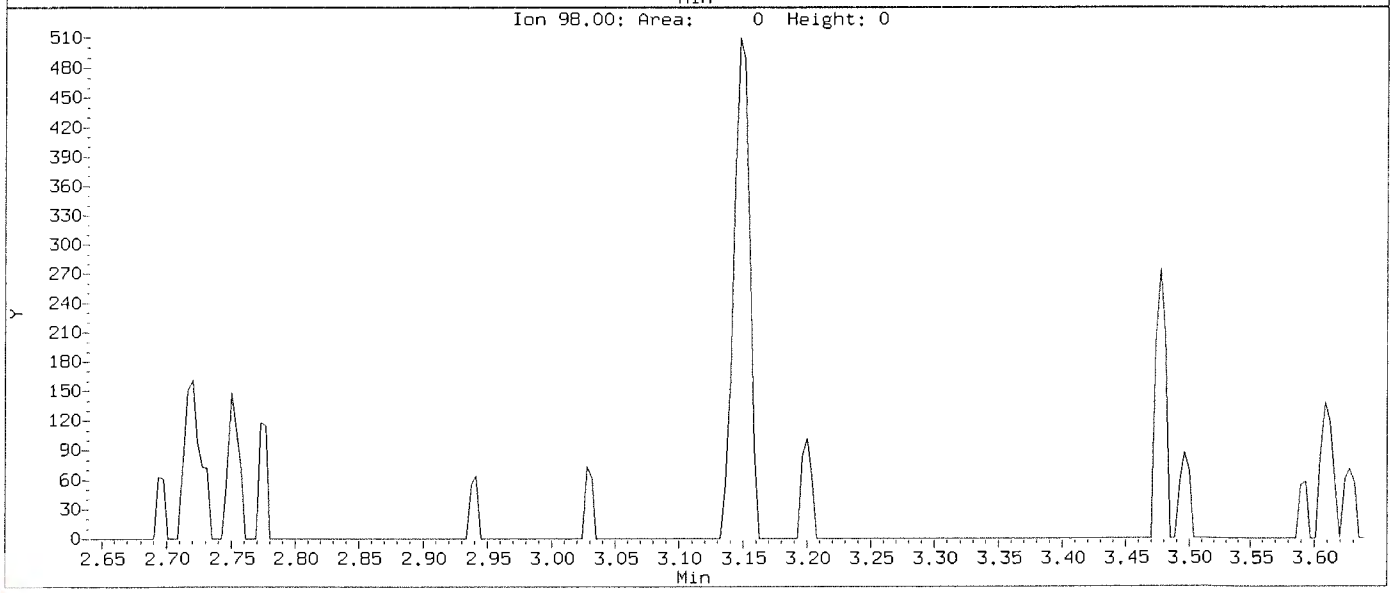


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Injection Date: 12-NOV-2019 11:40
Instrument: VOA9.i
Client Sample ID: VSTD000.5

Compound: trans-1,2-Dichloroethene
CAS Number: 156-60-5







Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111204.D Page 1
Report Date: 05-Dec-2019 15:54

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111204.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 12-NOV-2019 12:28
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD001;VSTD001;1;3;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 12:28 Cal File: U112104.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

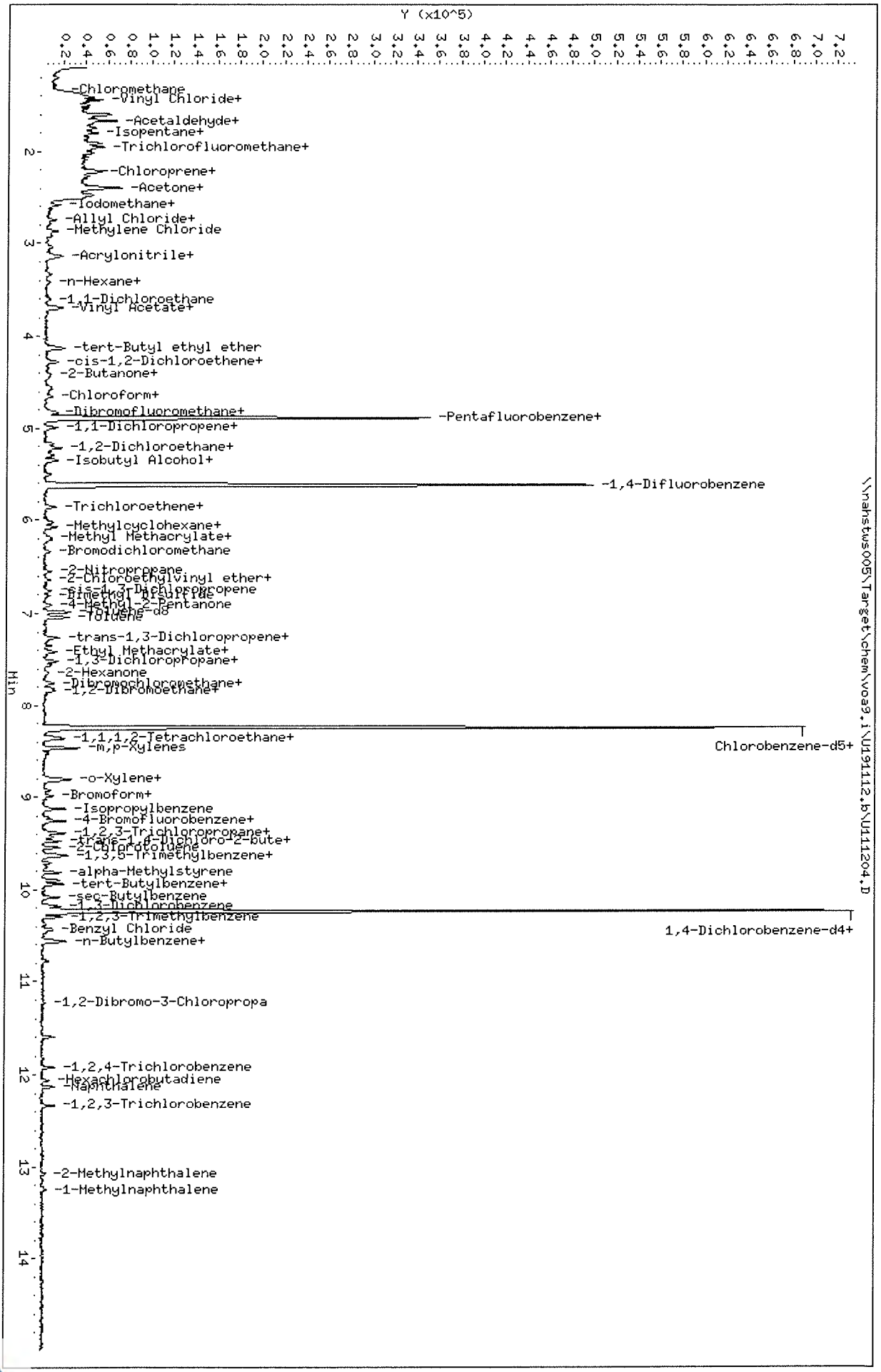
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	245751	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	396596	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	356611	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	180182	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	4108	1.00000	0.75(a)
$ 69 4-Bromofluorobenzene	95	9.257	9.253	(1.123)	4537	1.00000	2.28(a)
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.988)	4336	1.00000	0.78(a)
$ 48 Toluene-d8	98	6.985	6.989	(0.847)	14345	1.00000	1.74(a)
60 1,1,1,2-Tetrachloroethane	131	8.350	8.346	(1.013)	2340	1.00000	2.62(a)
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.987)	3369	1.00000	0.92(a)
68 1,1,2,2-Tetrachloroethane	83	9.388	9.388	(0.918)	4030	1.00000	1.26(aM)
138 Freon TF	101	2.397	2.397	(0.490)	5665	1.00000	1.03(a)
53 1,1,2-Trichloroethane	83	7.416	7.417	(0.900)	2126	1.00000	1.14(a)
22 1,1-Dichloroethane	63	3.593	3.600	(0.735)	3983	1.00000	1.14(a)
11 1,1-Dichloroethene	96	2.401	2.397	(0.491)	6591	1.00000	1.14(a)
32 1,1-Dichloropropene	75	4.995	5.002	(0.889)	3059	1.00000	1.15(a)
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	2541	1.00000	0.89(a)
71 1,2,3-Trichloropropane	75	9.418	9.426	(0.920)	3238	1.00000	1.05(a)
90 1,2,4-Trichlorobenzene	180	11.922	11.919	(1.165)	3730	1.00000	1.16(a)
79 1,2,4-Trimethylbenzene	105	9.939	9.939	(0.971)	9088	1.00000	1.08(a)
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	416	1.00000	2.23(aM)
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	2681	1.00000	0.99(a)
88 1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	5302	1.00000	0.97(a)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111204.D Page 2
Report Date: 05-Dec-2019 15:54

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.934)	3786	1.00000	1.28(a)
42	1,2-Dichloropropane	63	6.071	6.078	(1.080)	3031	1.00000	0.13(aM)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	8502	1.00000	1.08(a)
83	1,3-Dichlorobenzene	146	10.175	10.179	(0.995)	6204	1.00000	1.16(a)
54	1,3-Dichloropropane	76	7.555	7.563	(0.916)	3920	1.00000	1.05(a)
84	1,4-Dichlorobenzene	146	10.250	10.254	(1.002)	6357	1.00000	1.10(a)
26	2,2-Dichloropropane	77	4.279	4.271	(0.875)	2623	1.00000	0.93(aM)
24	2-Butanone	43	4.350	4.339	(0.890)	2961	2.00000	1.63(a)
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	6239	1.00000	1.06(a)
52	2-Hexanone	43	7.645	7.649	(0.927)	3361	2.00000	2.15(a)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	8689	1.00000	1.18(a)
82	p-Isopropyltoluene	119	10.209	10.209	(0.998)	8829	1.00000	1.05(a)
45	4-Methyl-2-Pentanone	43	6.910	6.914	(0.838)	4734	2.00000	2.27(a)
10	Acetone	43	2.479	2.483	(0.507)	14328	2.00000	(a)
37	Benzene	78	5.216	5.216	(0.928)	10131	1.00000	1.18(a)
74	Bromobenzene	156	9.381	9.381	(0.917)	3932	1.00000	1.20(a)
29	Bromochloromethane	128	4.556	4.553	(0.932)	1576	1.00000	1.08(a)
39	Bromodichloromethane	83	6.341	6.344	(1.128)	3185	1.00000	1.20(aM)
66	Bromoform	173	8.980	8.984	(1.089)	1218	1.00000	2.56(Ta)
6	Bromomethane	94	1.670	1.659	(0.342)	9435	1.00000	0.71(aM)
19	Carbon Disulfide	76	2.584	2.584	(0.529)	11154	2.00000	2.04(a)
34	Carbon Tetrachloride	117	4.991	4.995	(0.888)	2463	1.00000	0.89(aM)
59	Chlorobenzene	112	8.267	8.271	(1.003)	7883	1.00000	1.09(a)
7	Chloroethane	64	1.745	1.741	(0.357)	4623	1.00000	(aM)
28	Chloroform	83	4.646	4.654	(0.950)	4367	1.00000	1.05(a)
3	Chloromethane	50	1.340	1.340	(0.274)	2772	1.00000	0.07(aM)
27	cis-1,2-Dichloroethene	96	4.283	4.283	(0.876)	3187	1.00000	1.13(a)
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	2828	1.00000	0.97(a)
55	Dibromochloromethane	129	7.754	7.758	(0.940)	2173	1.00000	3.30(a)
44	Dibromomethane	93	6.187	6.187	(1.101)	1371	1.00000	0.85(a)
2	Dichlorodifluoromethane	85	1.201	1.205	(0.246)	2591	1.00000	1.03(a)
61	Ethylbenzene	106	8.365	8.369	(1.015)	4110	1.00000	1.14(a)
91	Hexachlorobutadiene	225	12.057	12.061	(1.178)	1091	1.00000	1.00(aM)
67	Isopropylbenzene	105	9.122	9.126	(1.106)	10132	1.00000	0.99(a)
62	m,p-Xylenes	106	8.470	8.470	(1.027)	8469	2.00000	1.92(a)
17	Methylene Chloride	84	2.866	2.869	(0.586)	2559	1.00000	1.99(a)
87	n-Butylbenzene	91	10.550	10.554	(1.031)	6691	1.00000	0.95(a)
73	n-Propylbenzene	91	9.471	9.475	(0.926)	11376	1.00000	1.08(a)
92	Naphthalene	128	12.129	12.129	(1.185)	7102	1.00000	0.83(a)
63	o-Xylene	106	8.803	8.807	(1.068)	4042	1.00000	0.90(a)
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	8812	1.00000	0.99(a)
64	Styrene	104	8.822	8.822	(1.070)	7262	1.00000	0.93(a)
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	6608	1.00000	0.99(a)
56	Tetrachloroethene	166	7.514	7.522	(0.911)	2686	1.00000	0.99(a)
50	Toluene	91	7.045	7.045	(0.855)	11400	1.00000	1.05(a)
20	trans-1,2-Dichloroethene	96	3.132	3.139	(0.640)	3398	1.00000	3.24(a)
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	2761	1.00000	1.57(a)
38	Trichloroethene	130	5.857	5.861	(1.042)	2859	1.00000	1.08(a)
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	11861	1.00000	1.12(a)
5	Vinyl Chloride	62	1.415	1.419	(0.289)	6769	1.00000	1.23(a)

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.

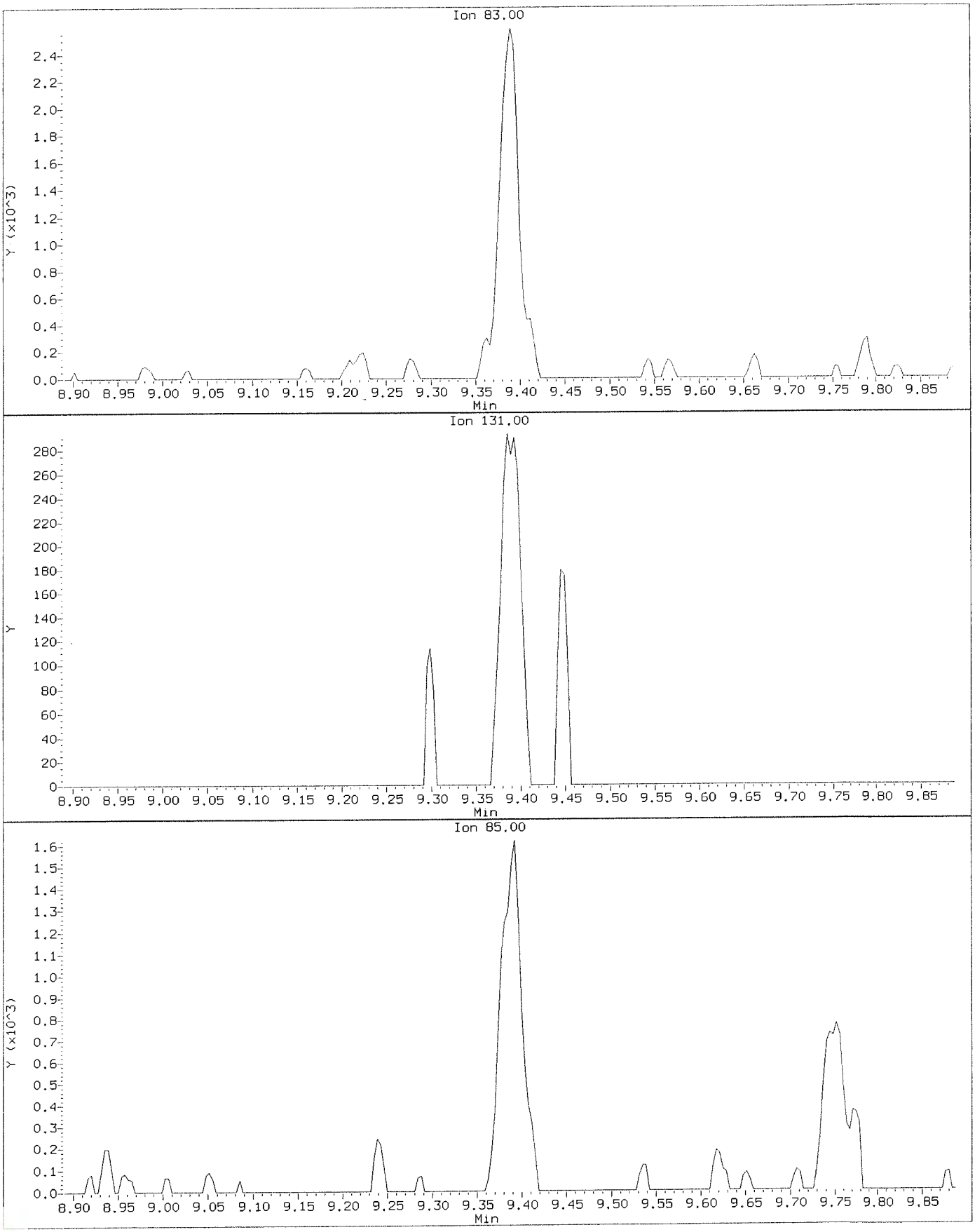


Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111204.D
Date : 12-NOV-2019 12:28
Client ID: VSTD001
Sample Info: VSTD001,VSTD001,1,3;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

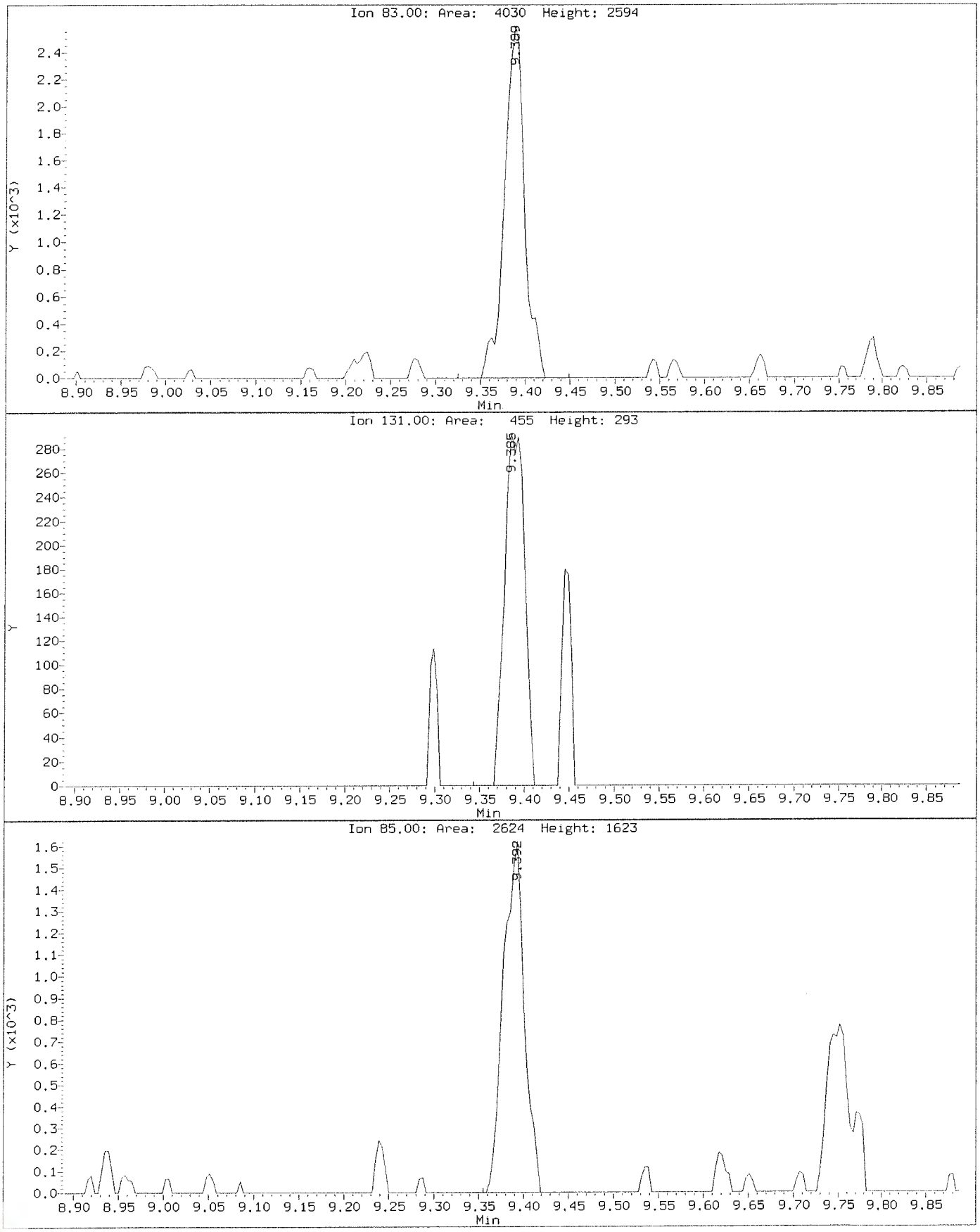
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Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



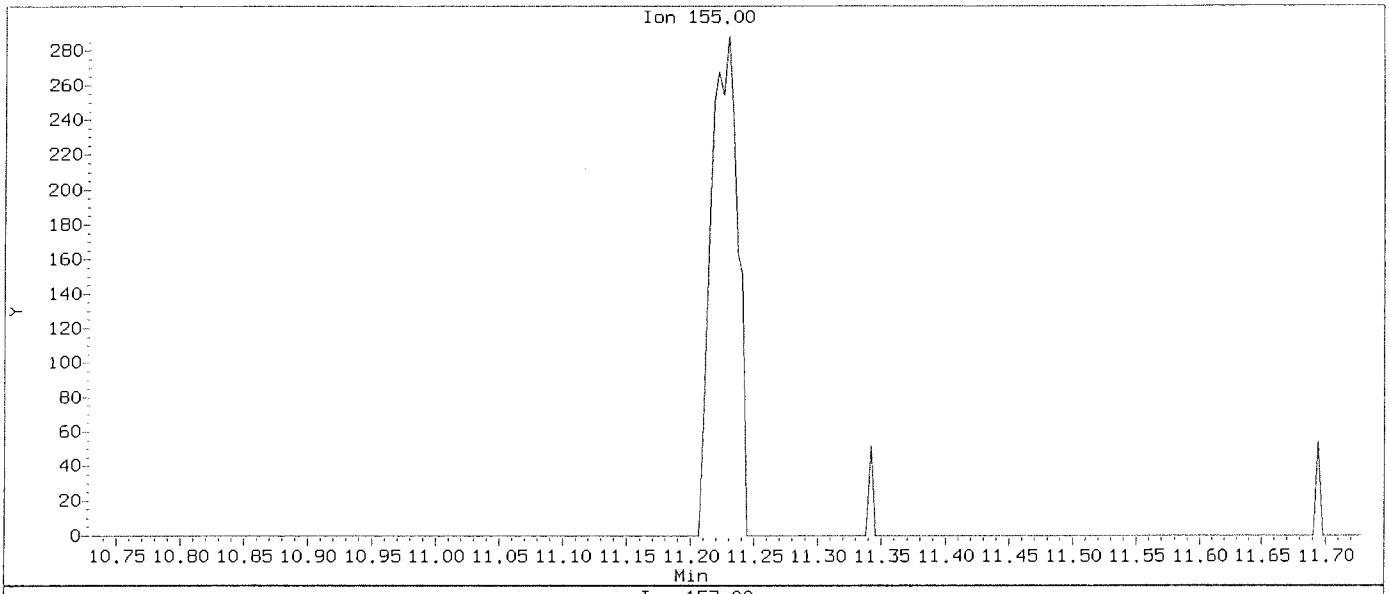
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Instrument: VOA9.i
Client Sample ID: VSTD001

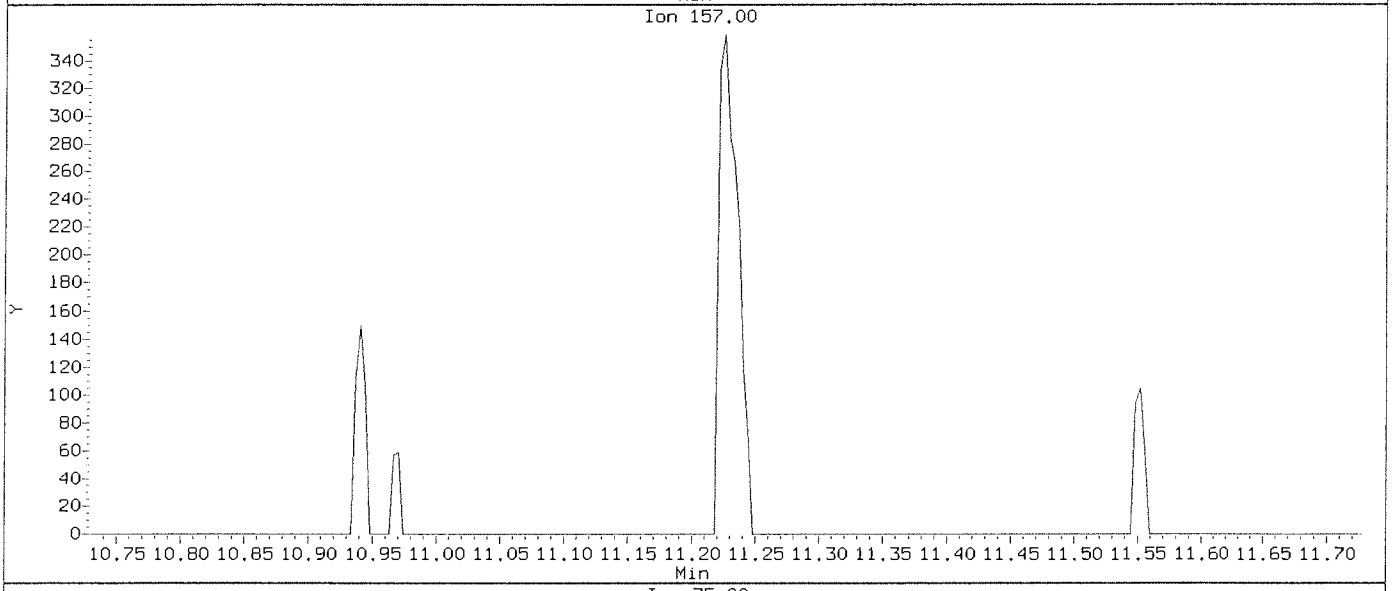
Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

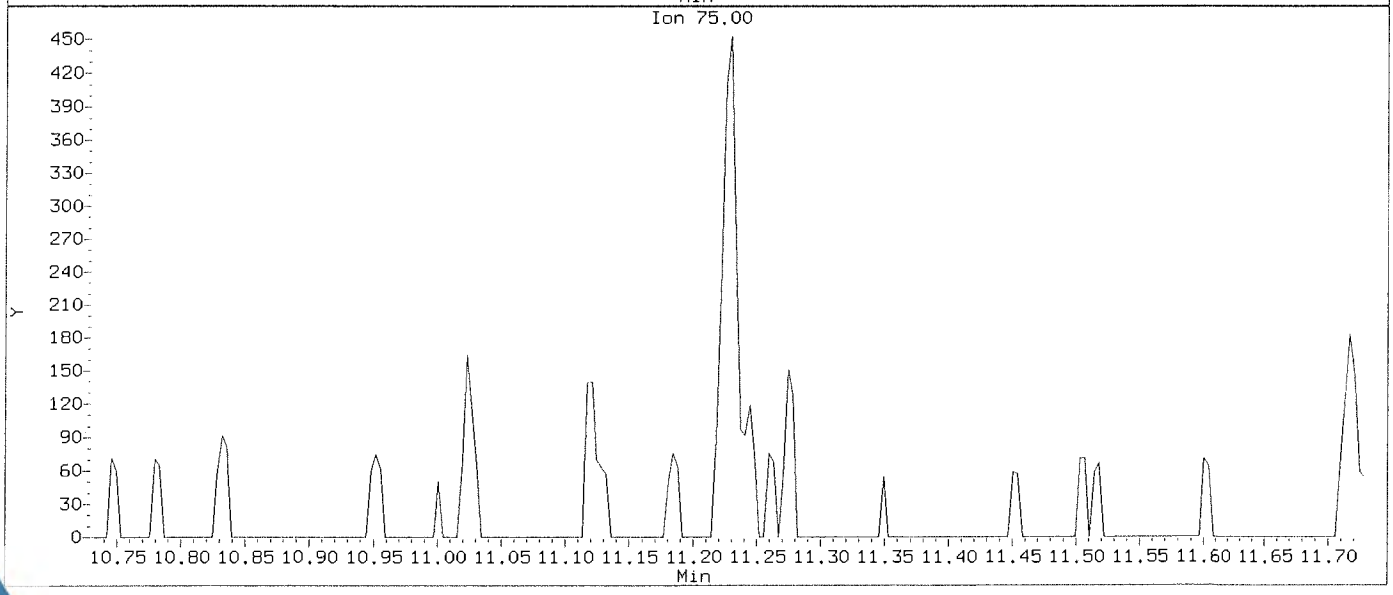


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Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

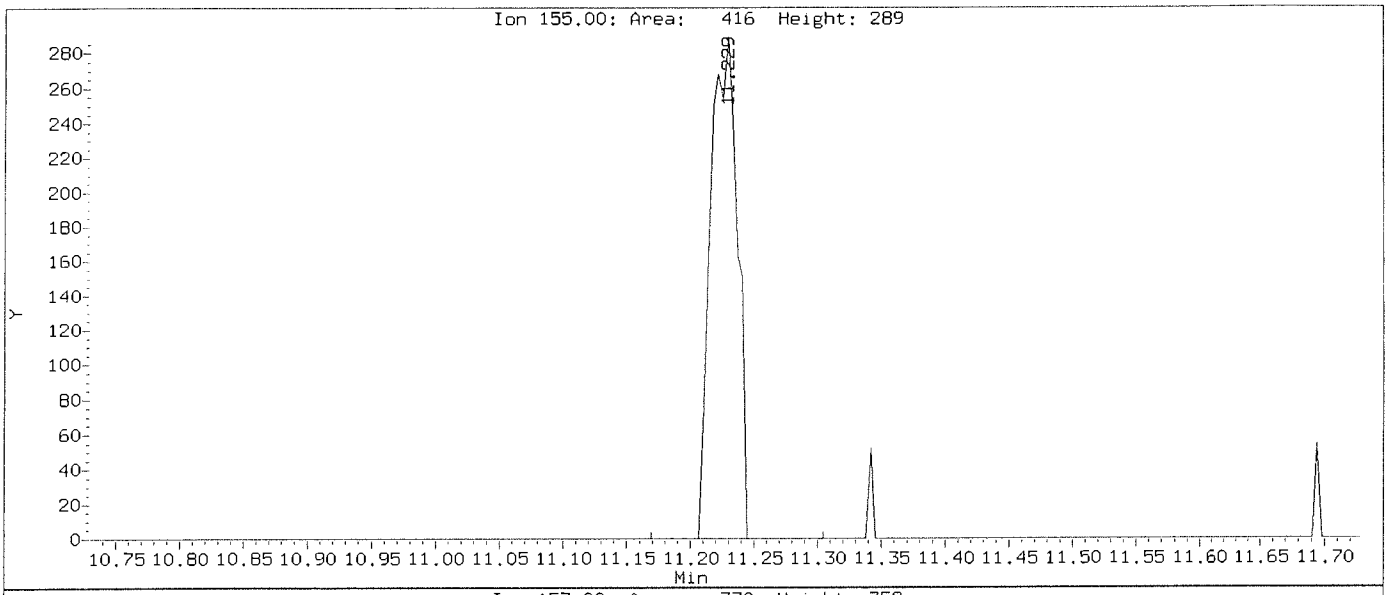


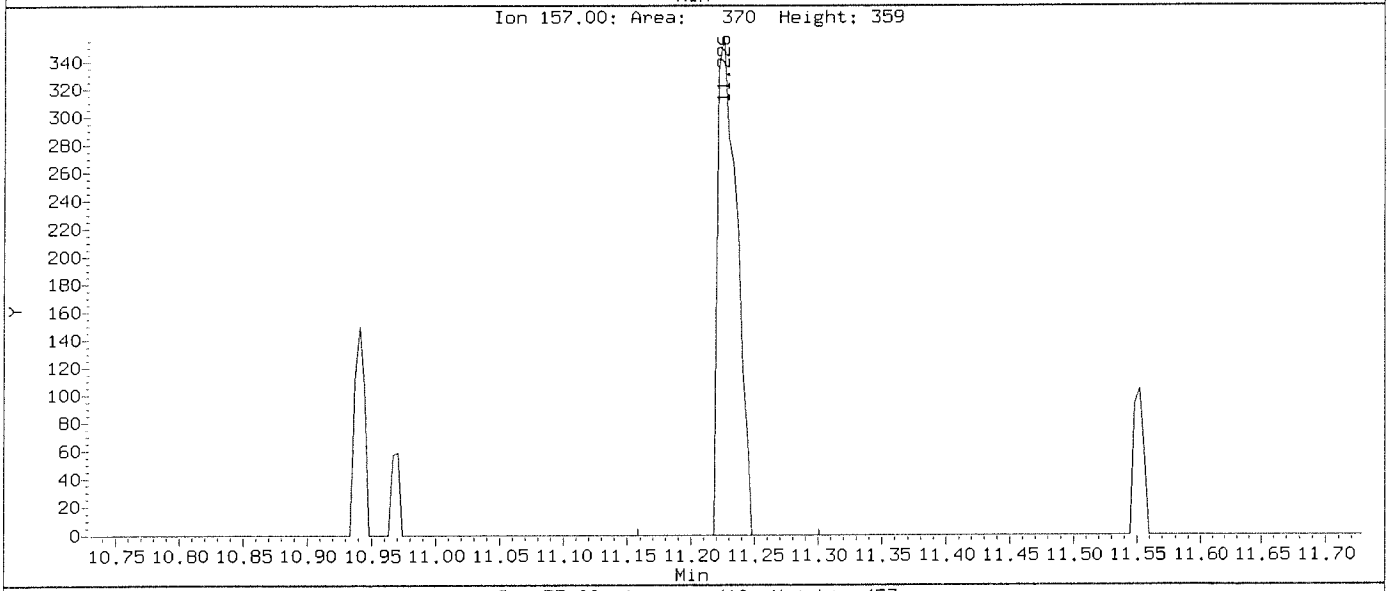


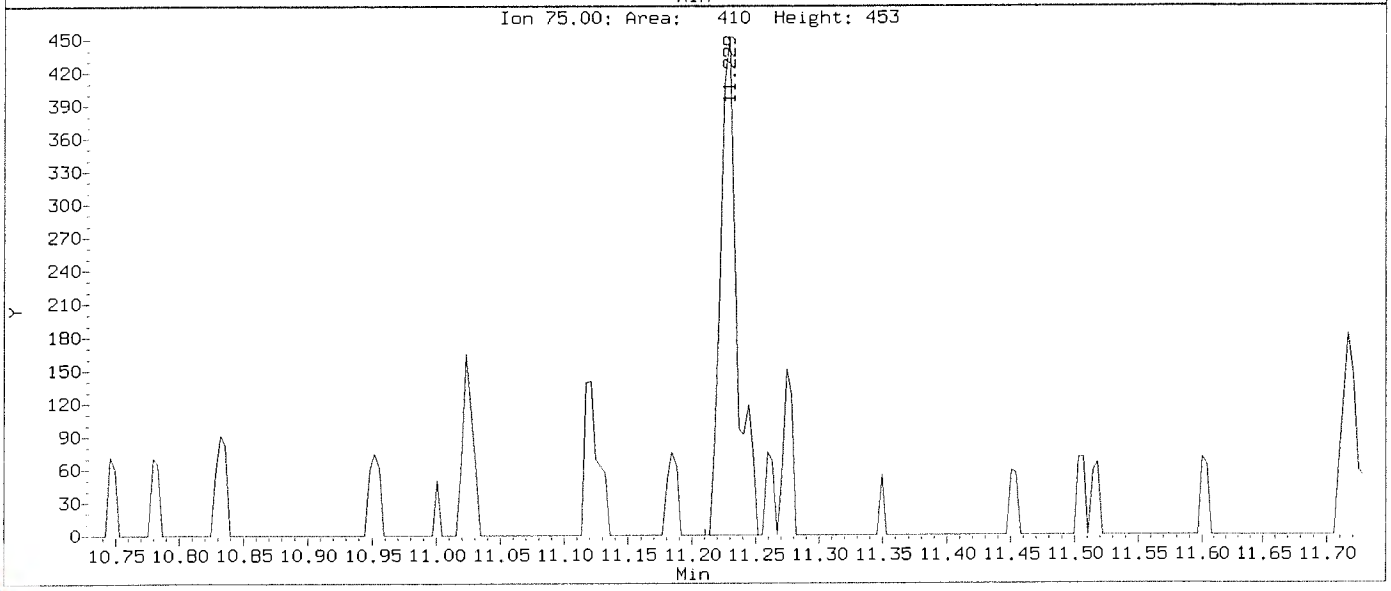


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Client Sample ID: VSTD001

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

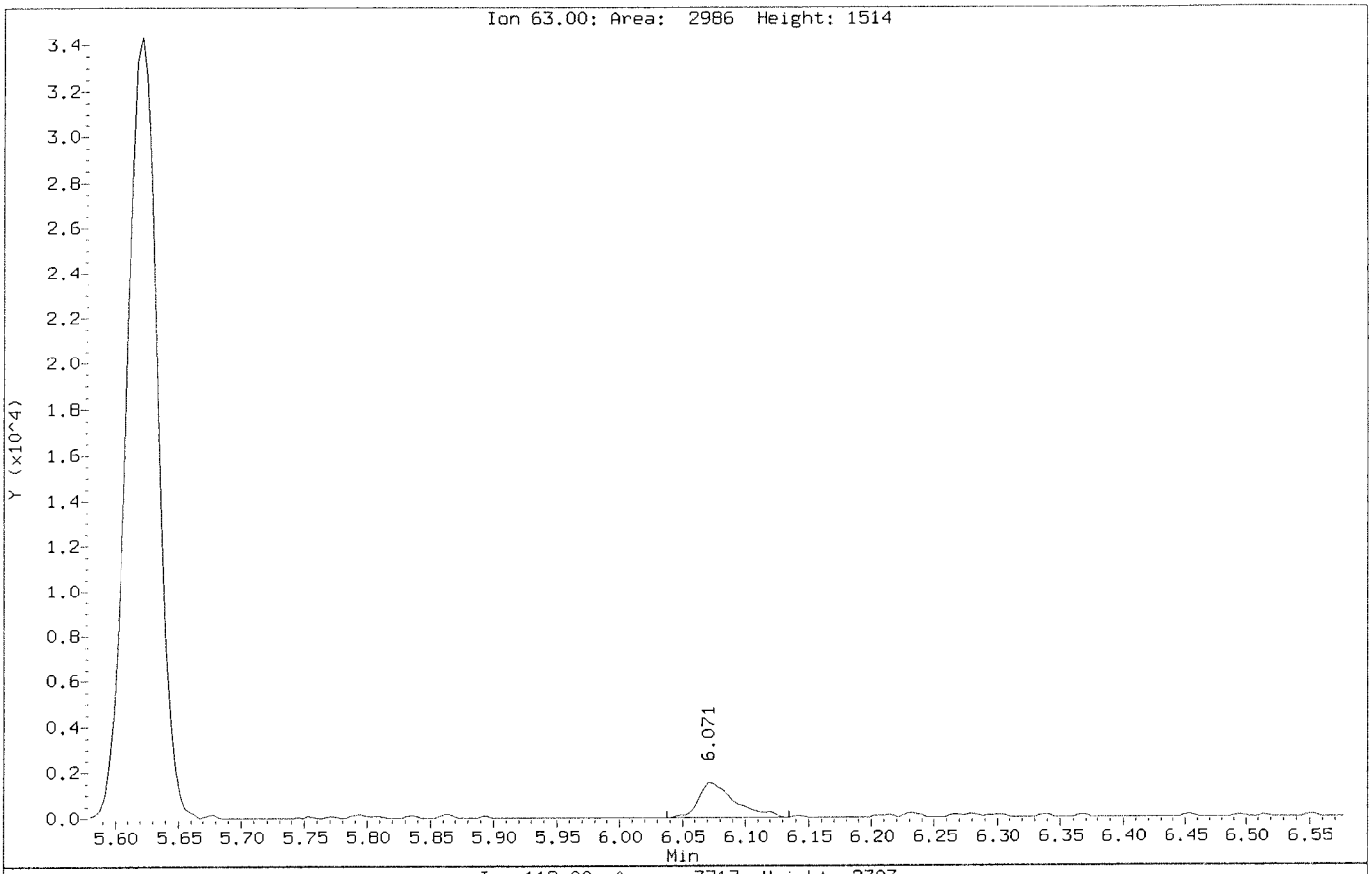


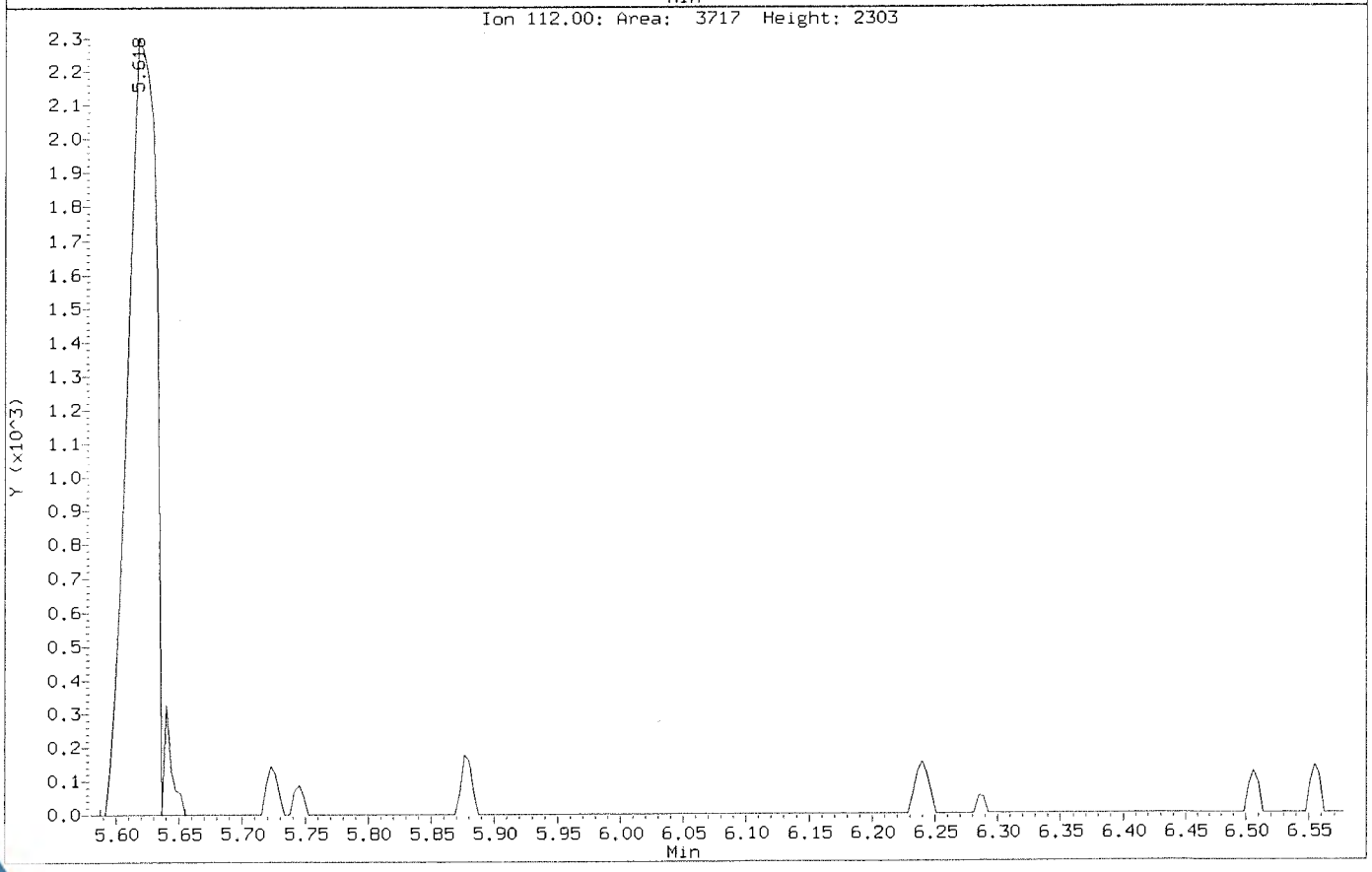




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Instrument: VOA9.i
Client Sample ID: VSTD001

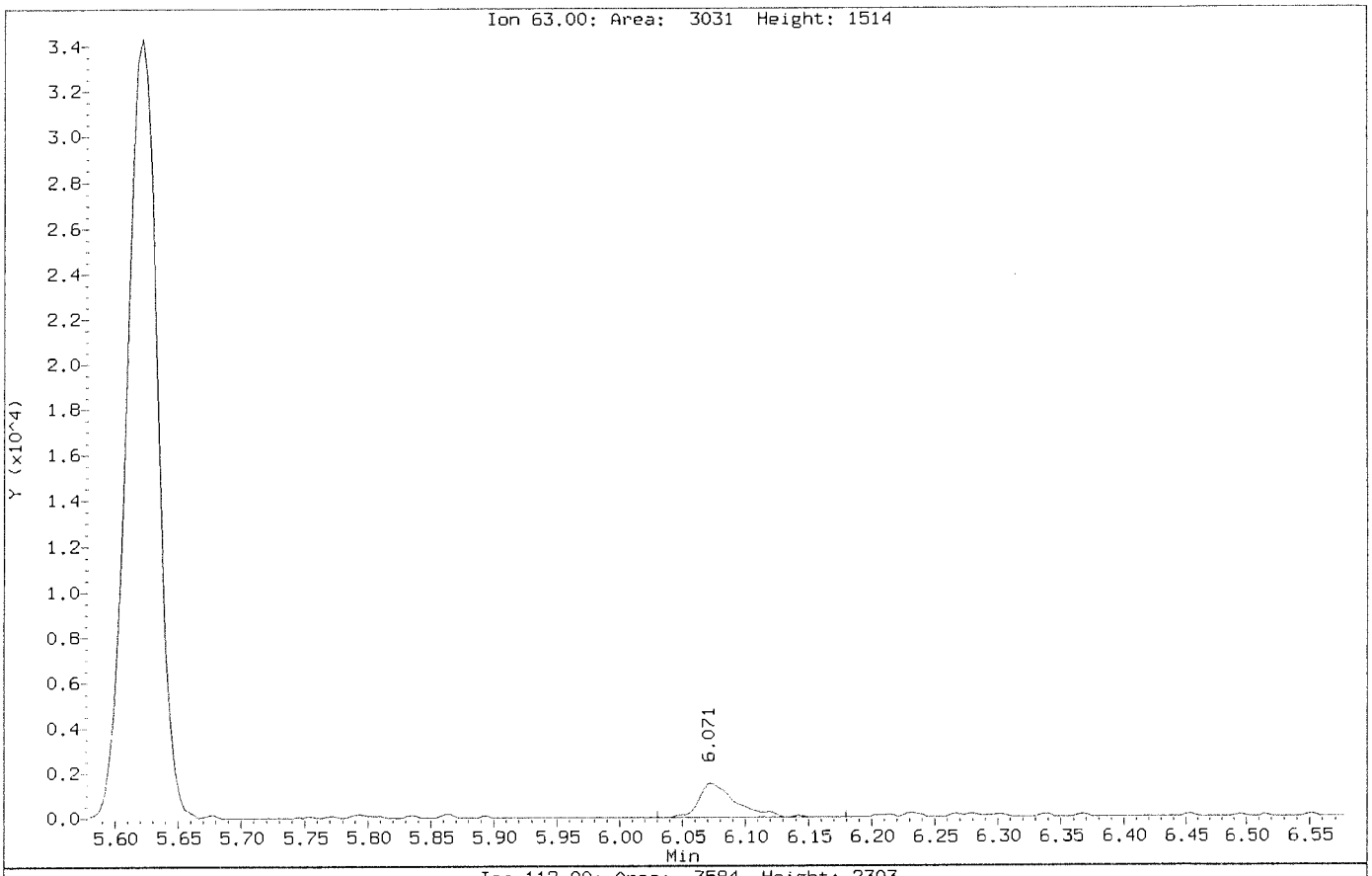
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

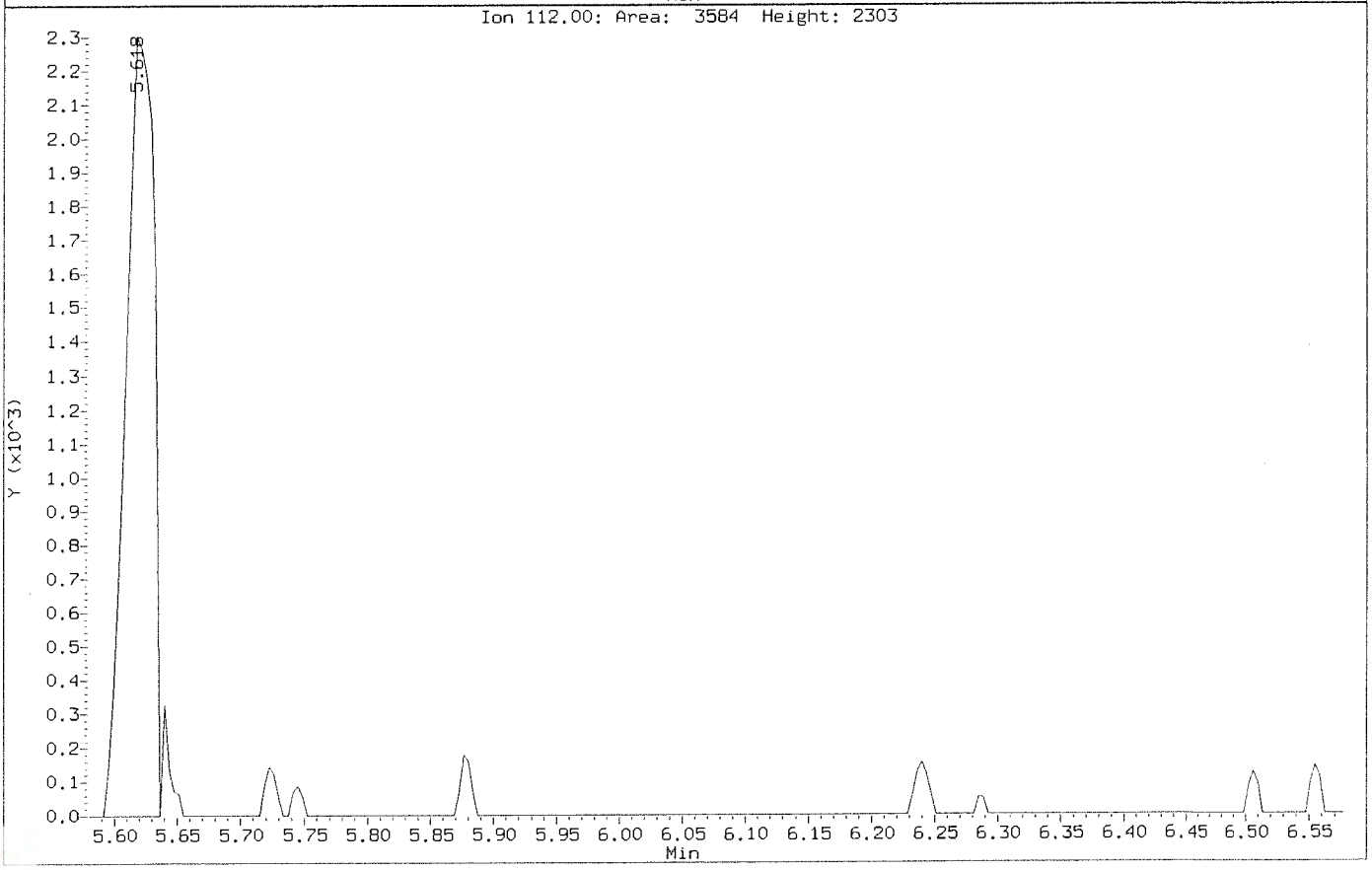




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Instrument: VOA9.i
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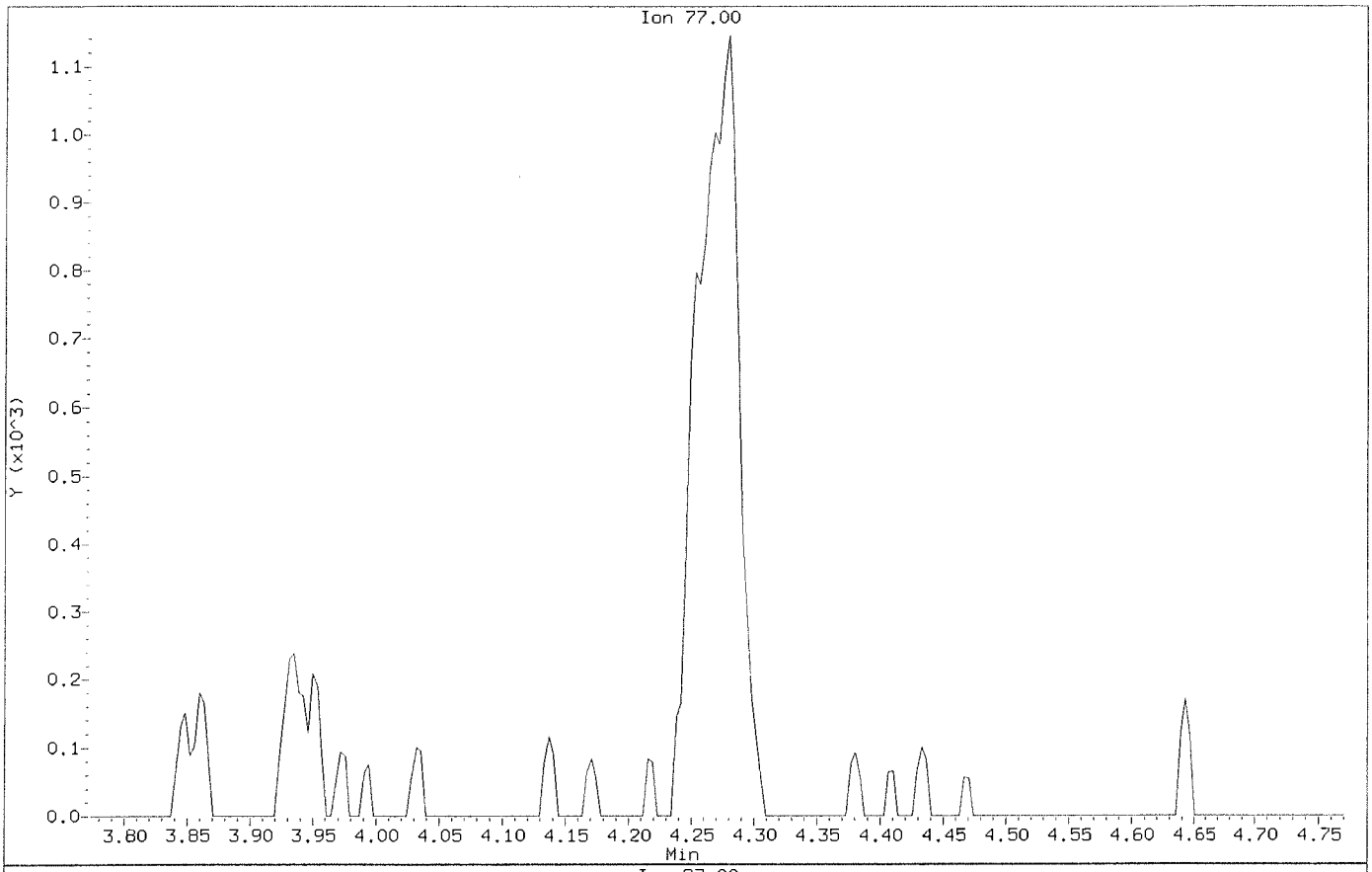
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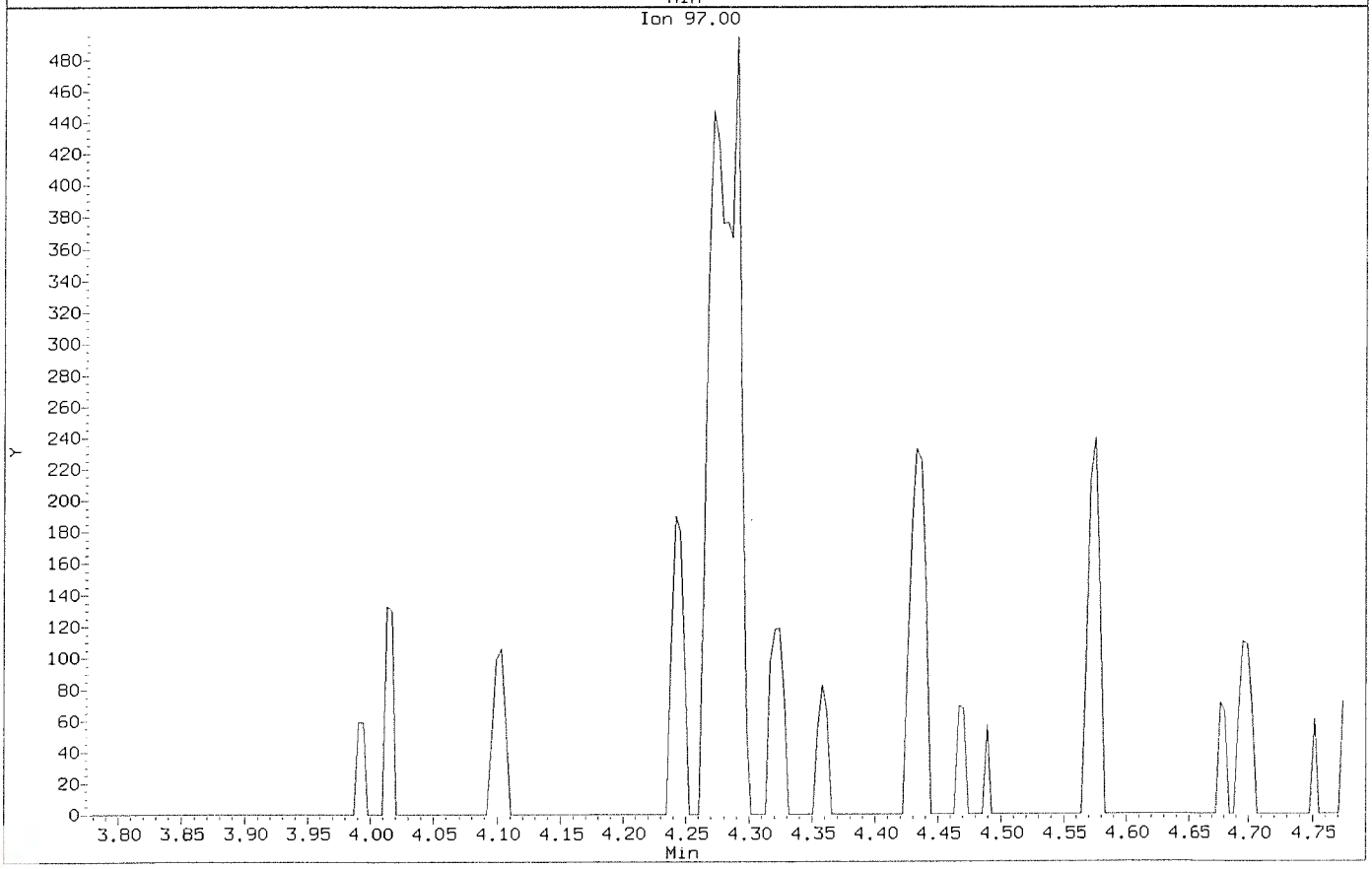




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Instrument: VOA9.i
Client Sample ID: VSTD001

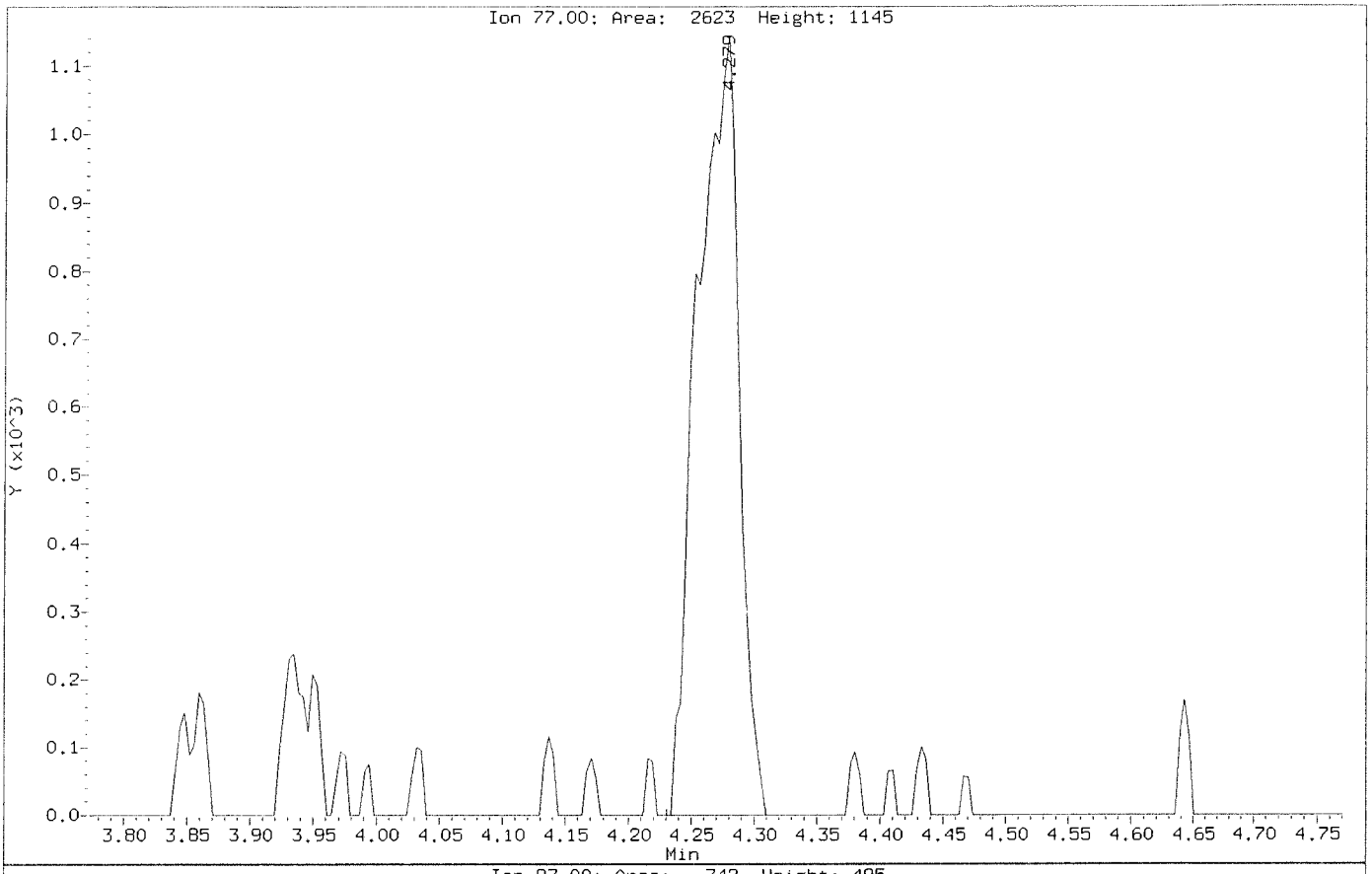
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7

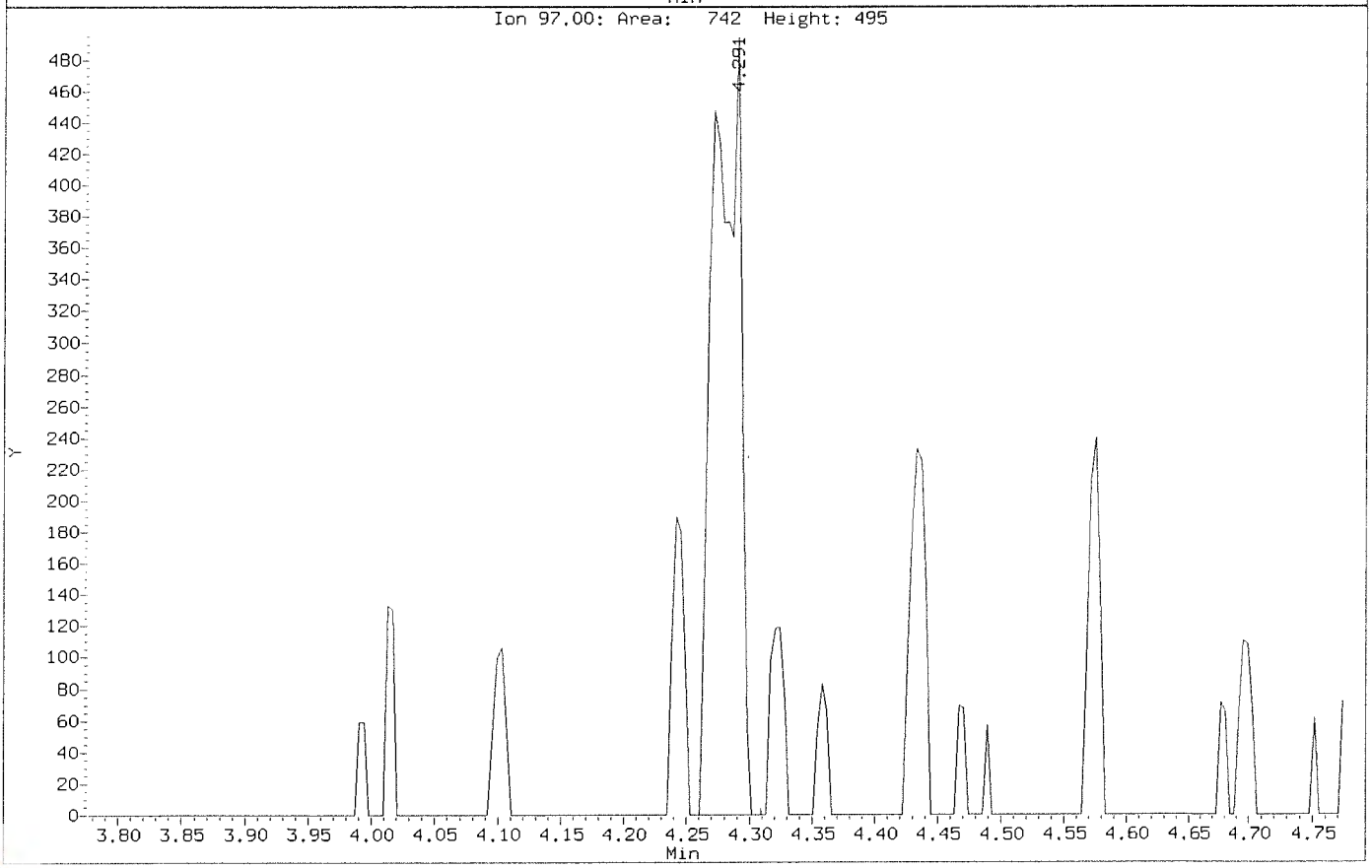




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Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

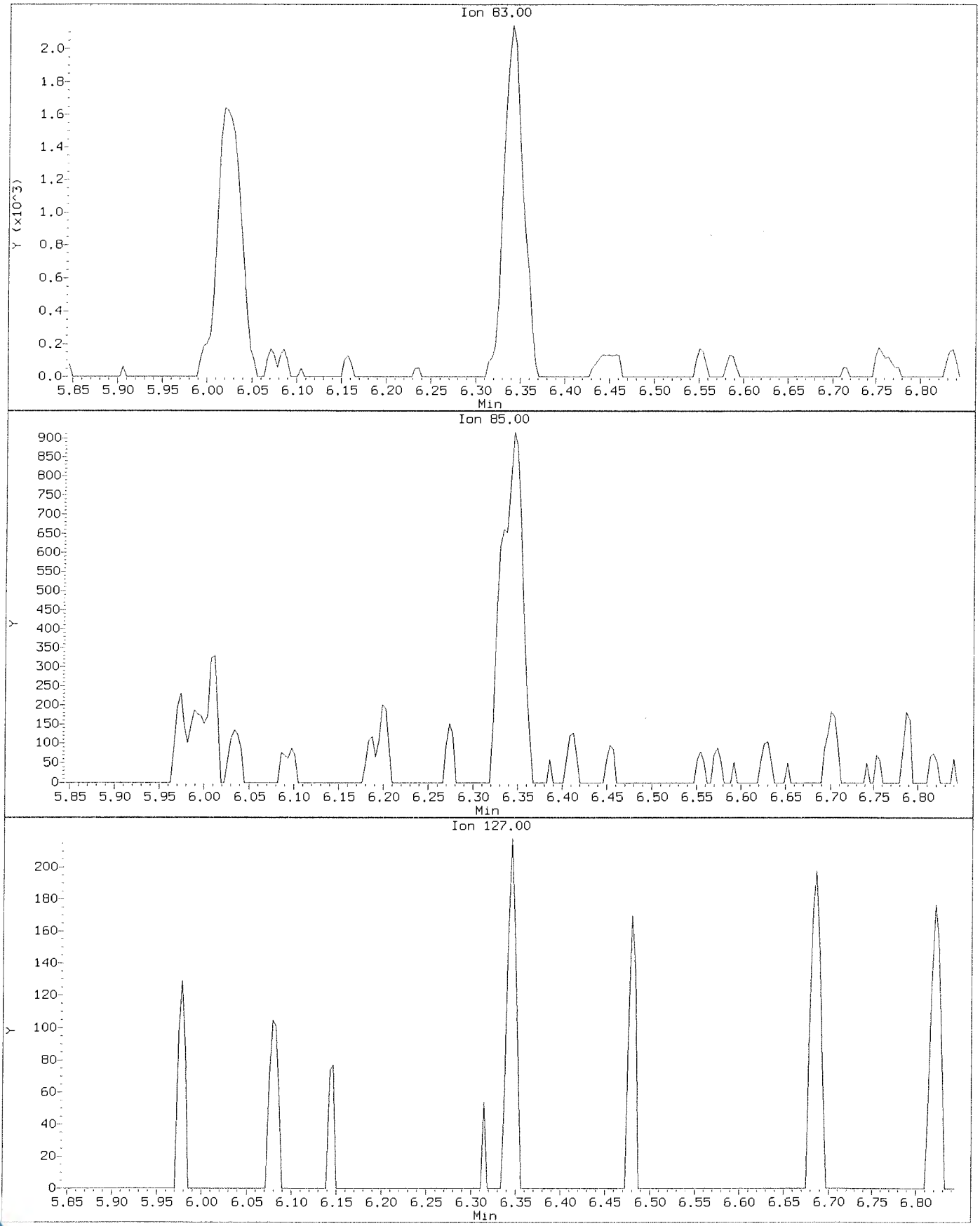
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





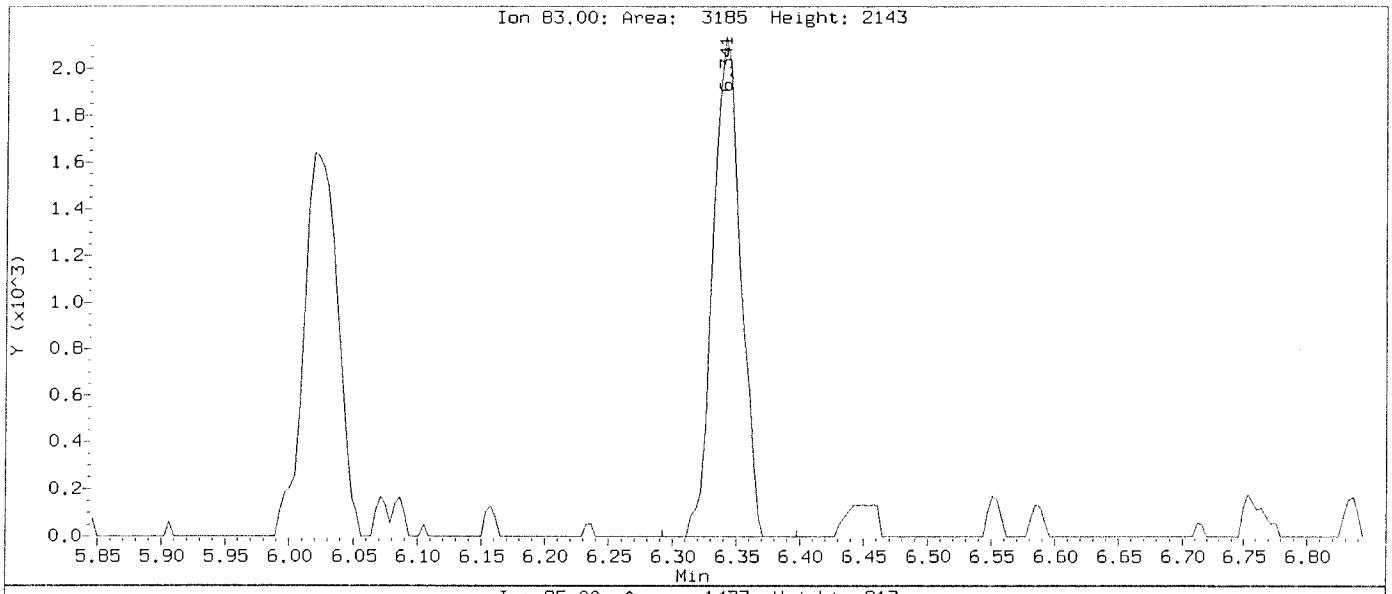
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Instrument: VOA9.i
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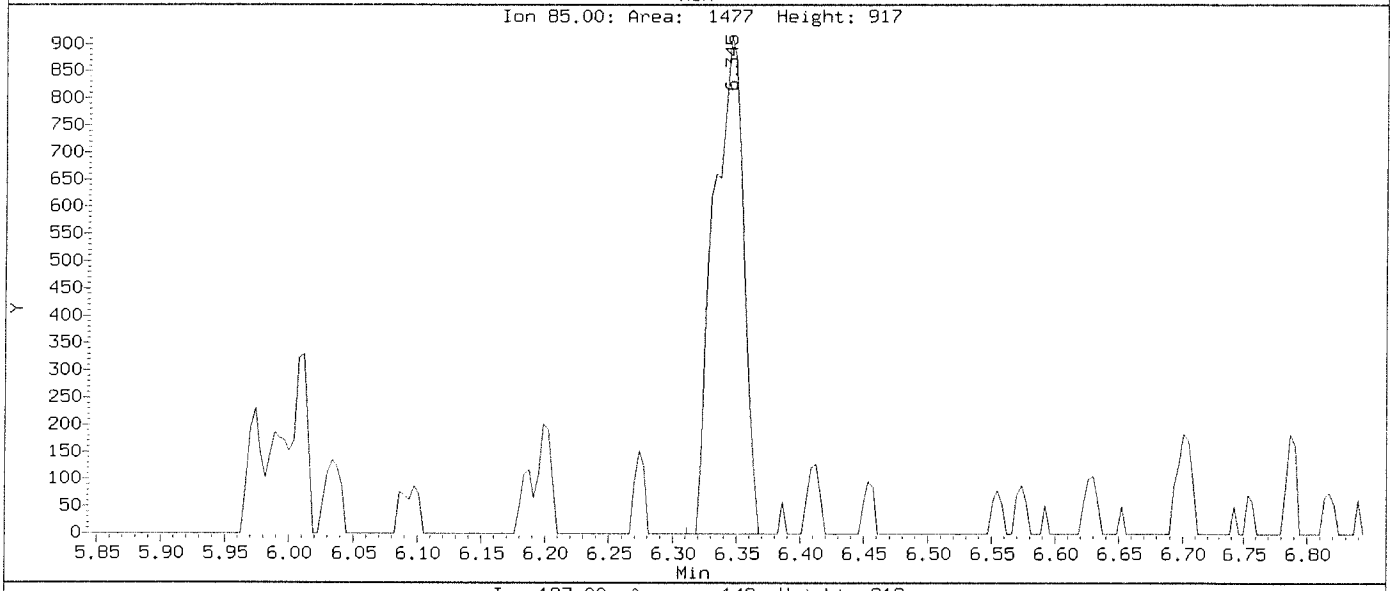
Compound: Bromodichloromethane
CAS Number: 75-27-4

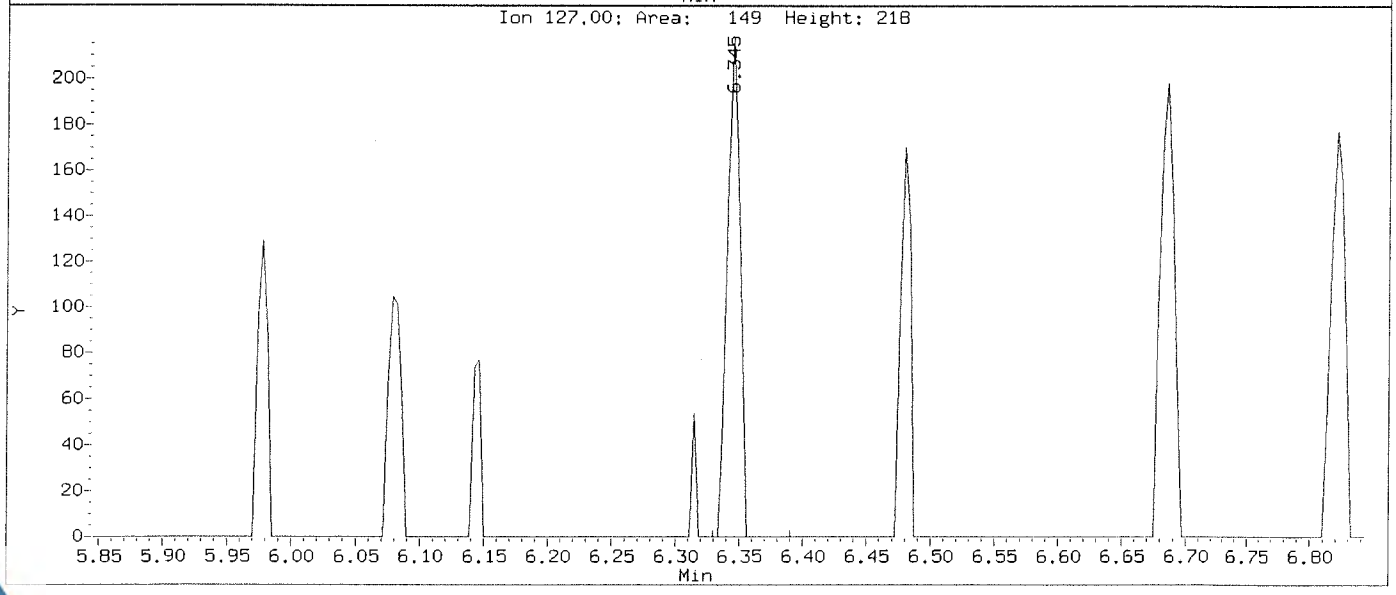


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Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4

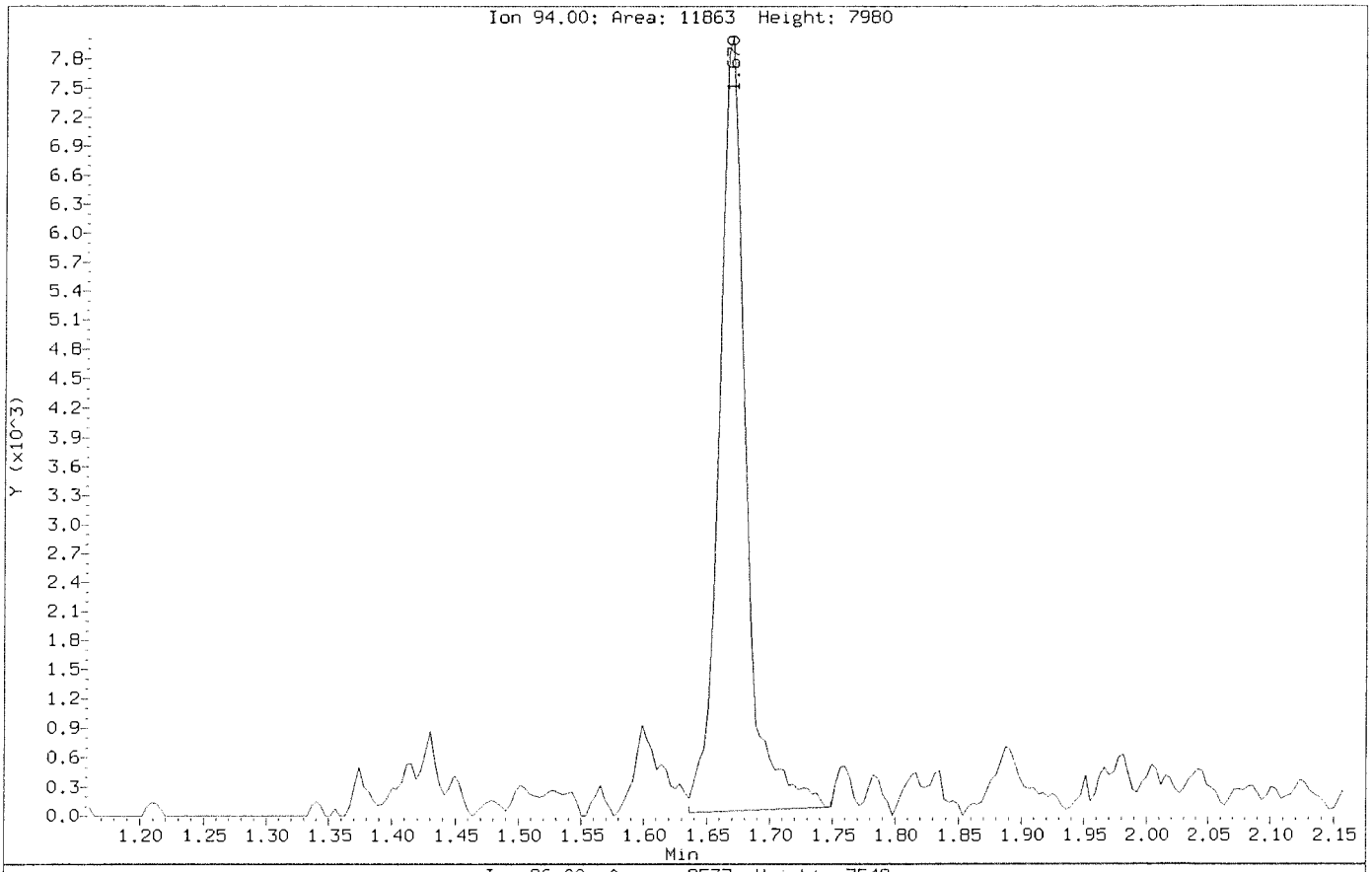


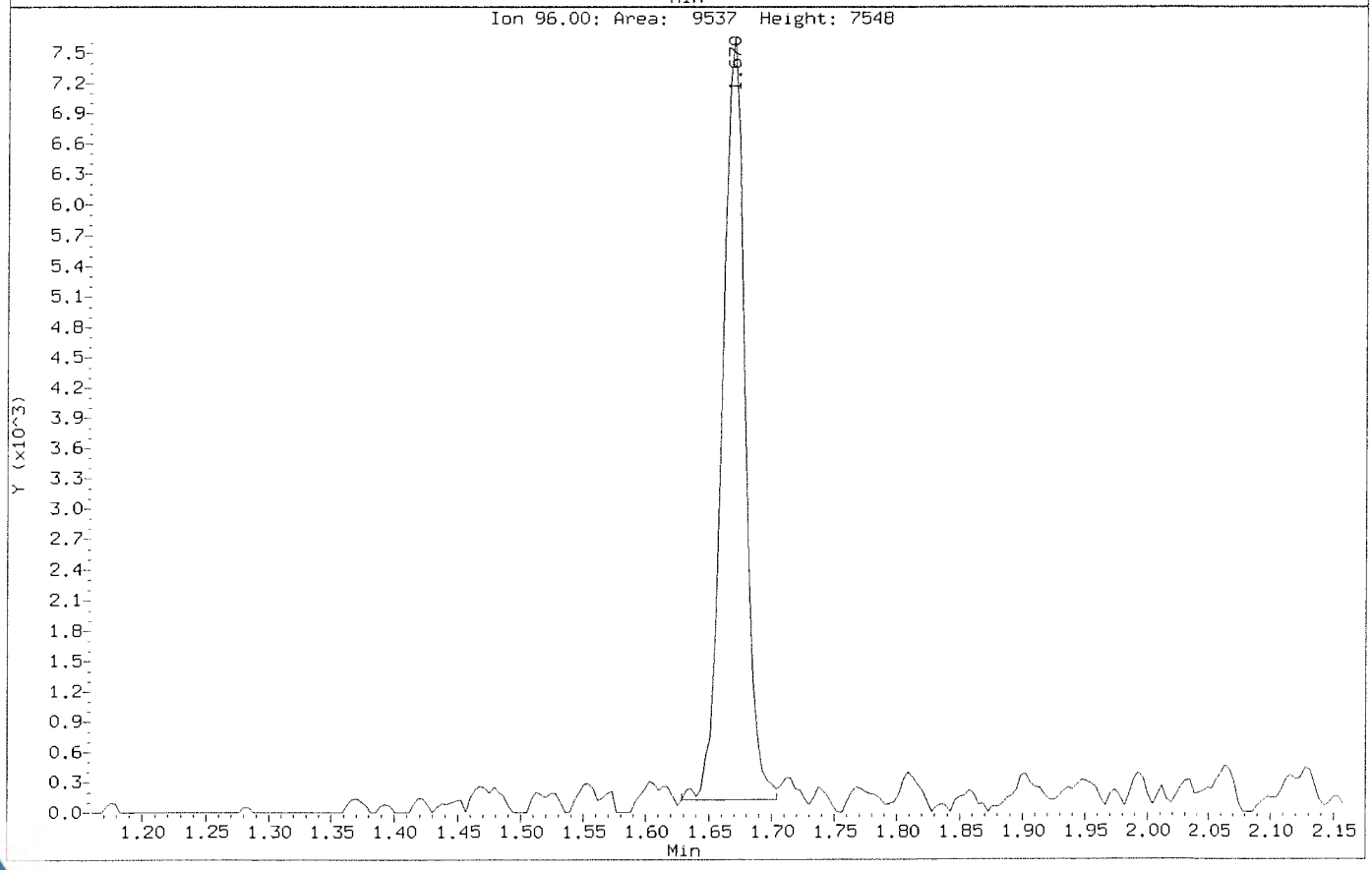




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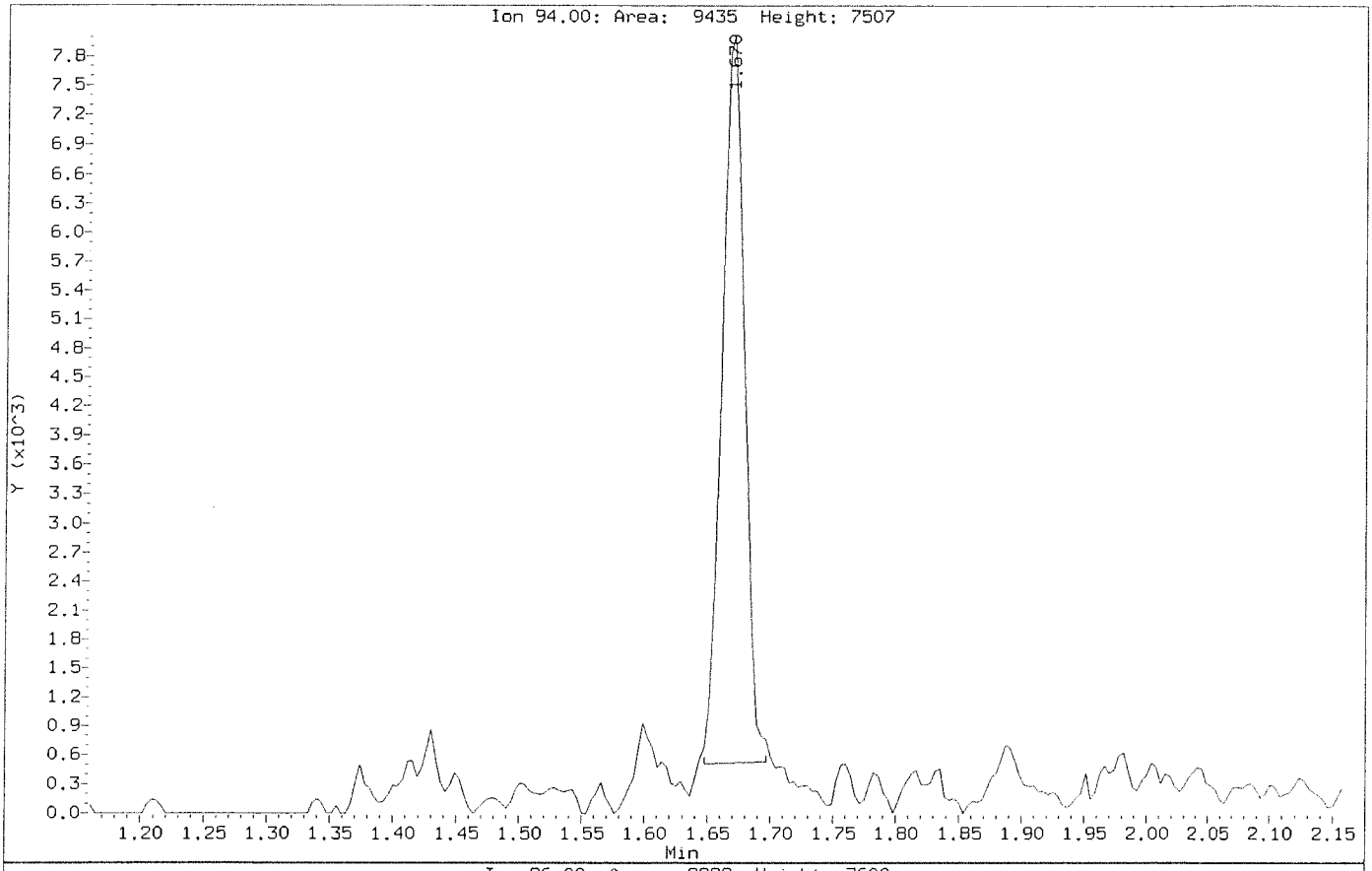
Compound: Bromomethane
CAS Number: 74-83-9

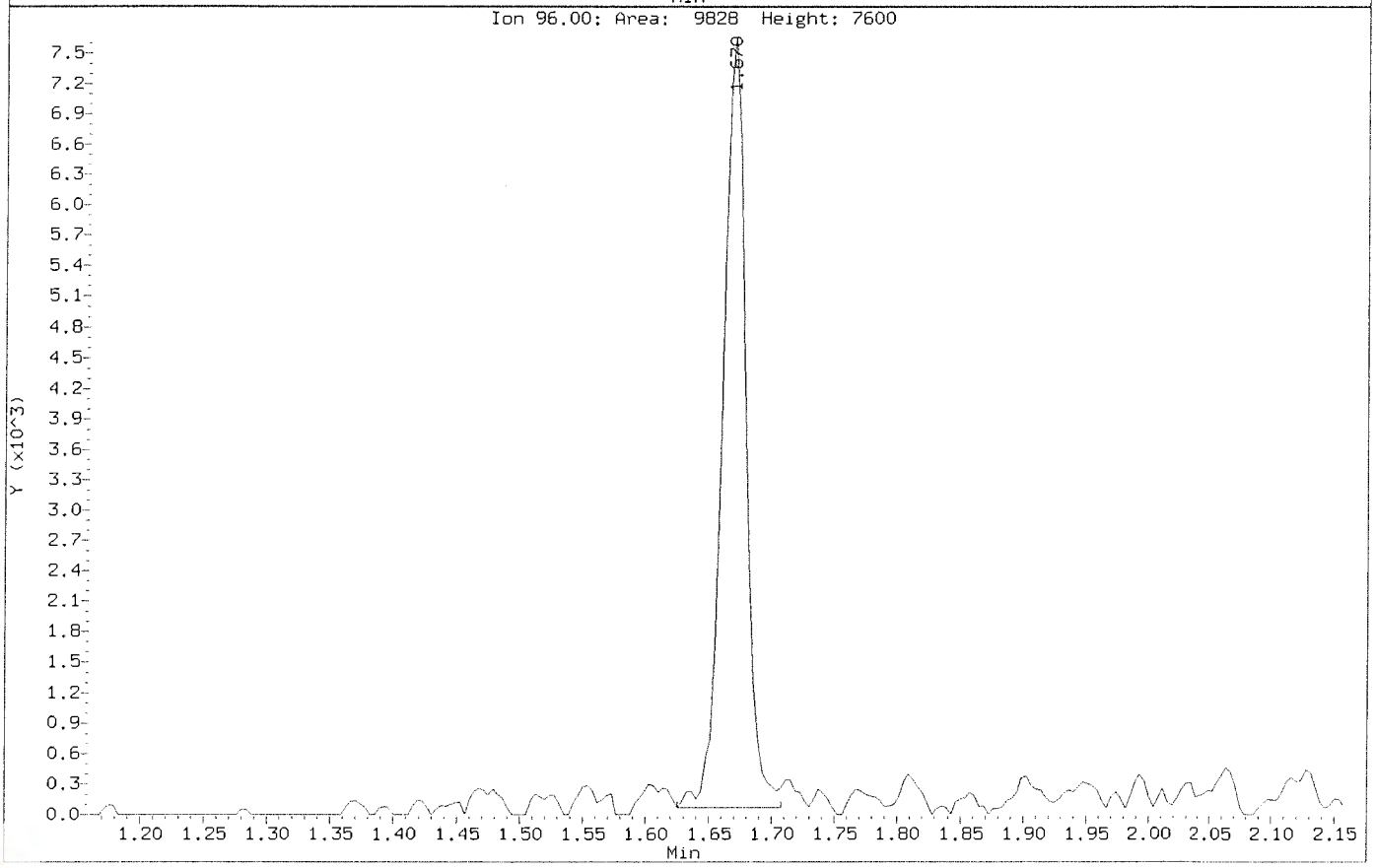




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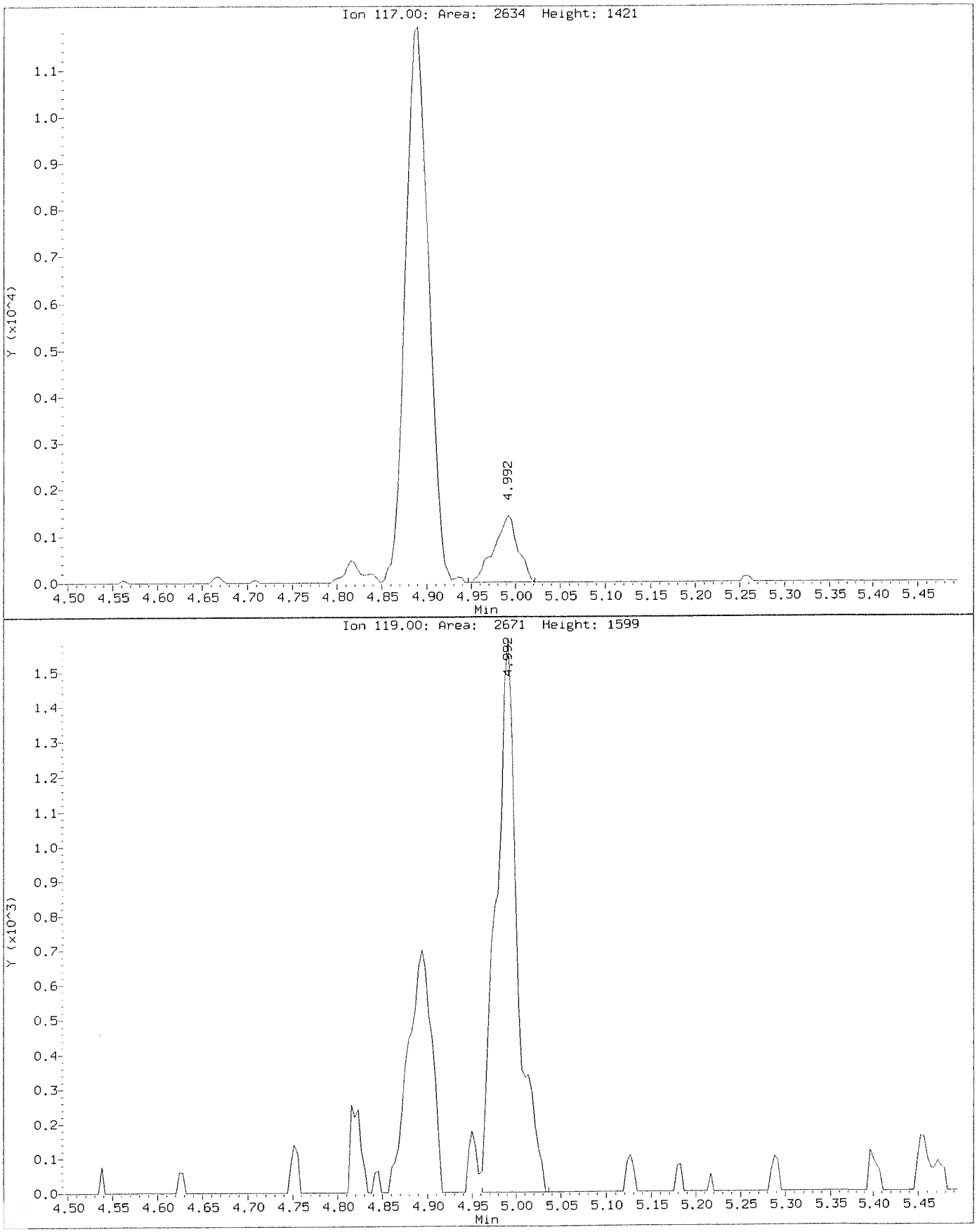
Compound: Bromomethane
CAS Number: 74-83-9





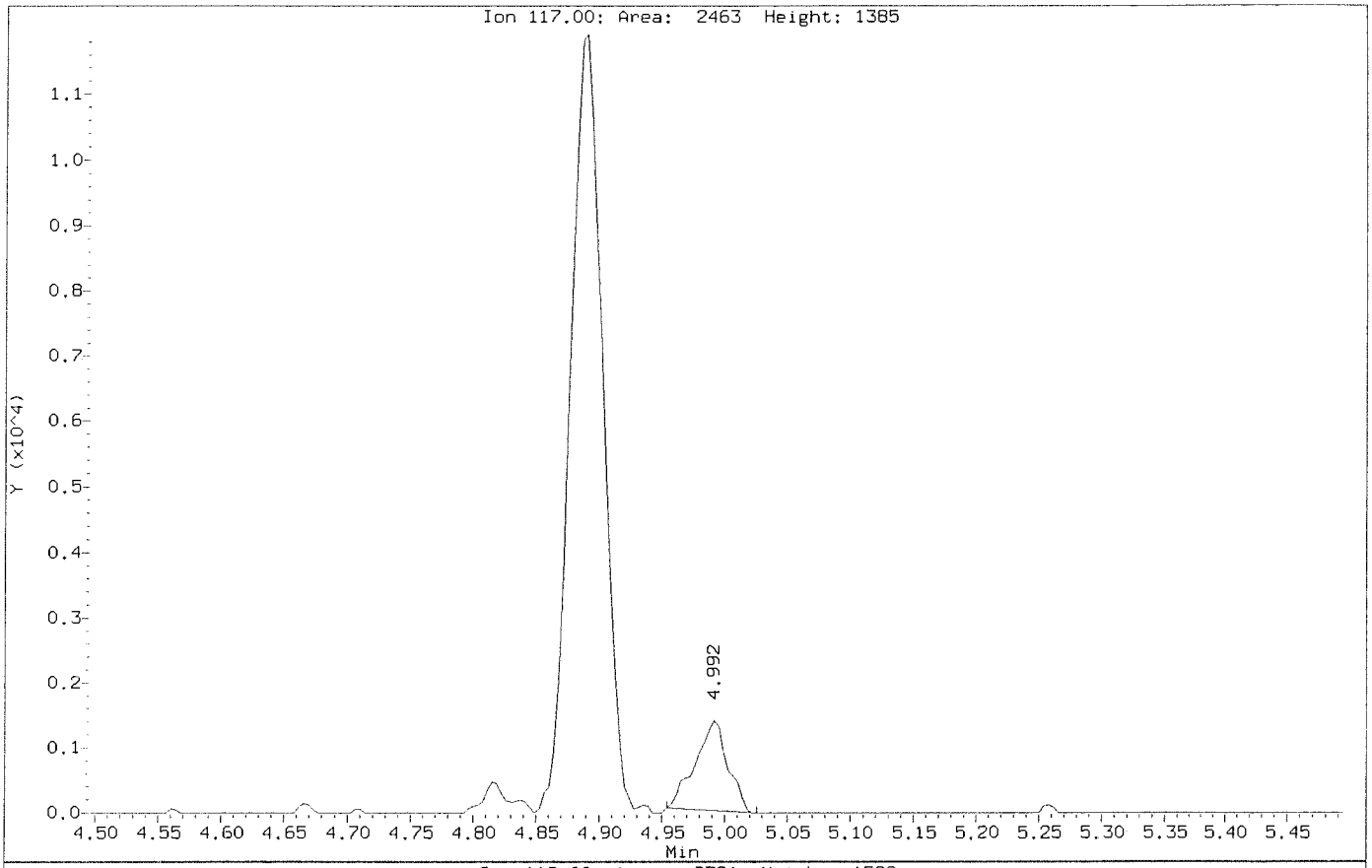
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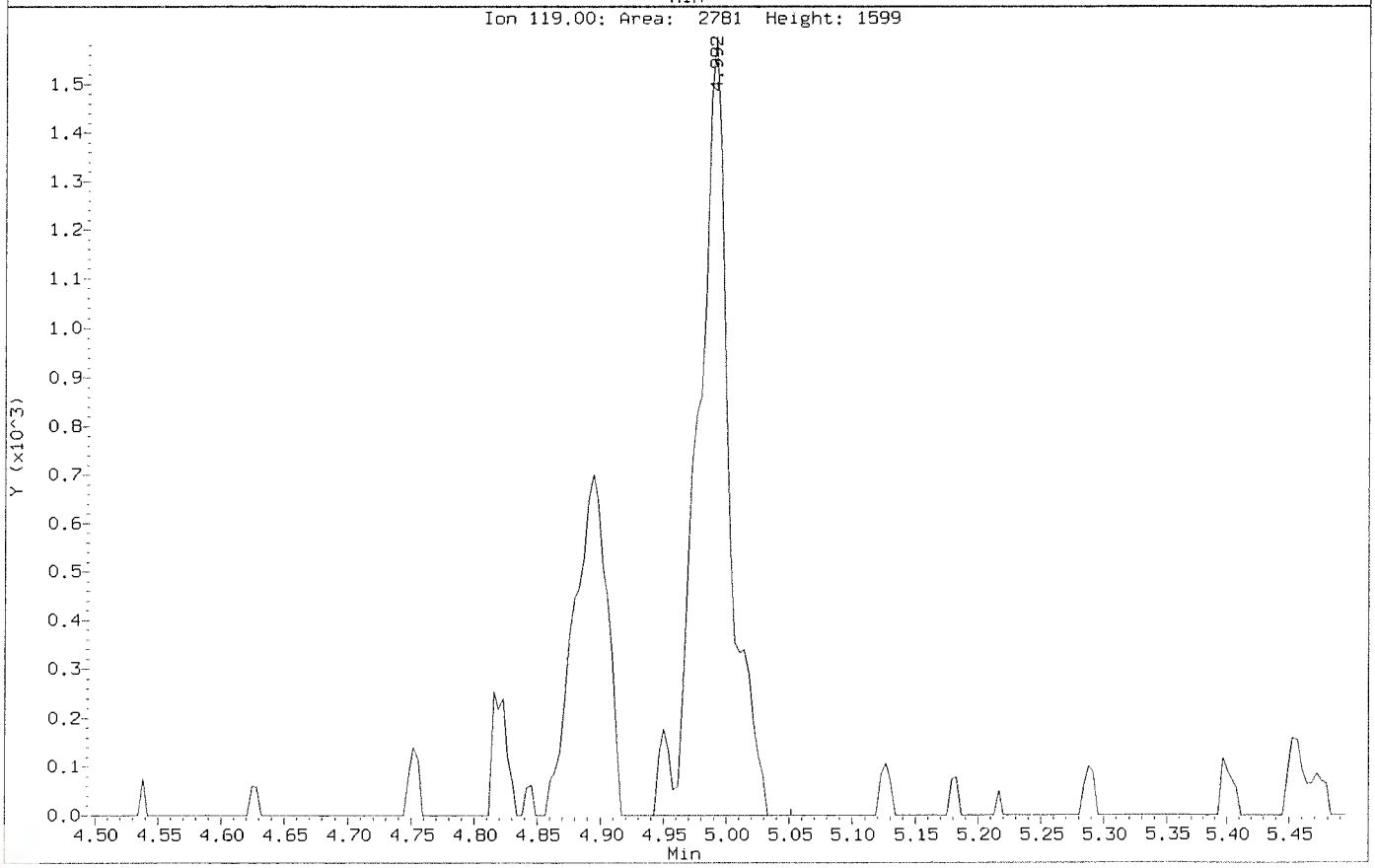
Compound: Carbon Tetrachloride
CAS Number: 56-23-5



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Instrument: VOA9.i
Client Sample ID: VSTD001

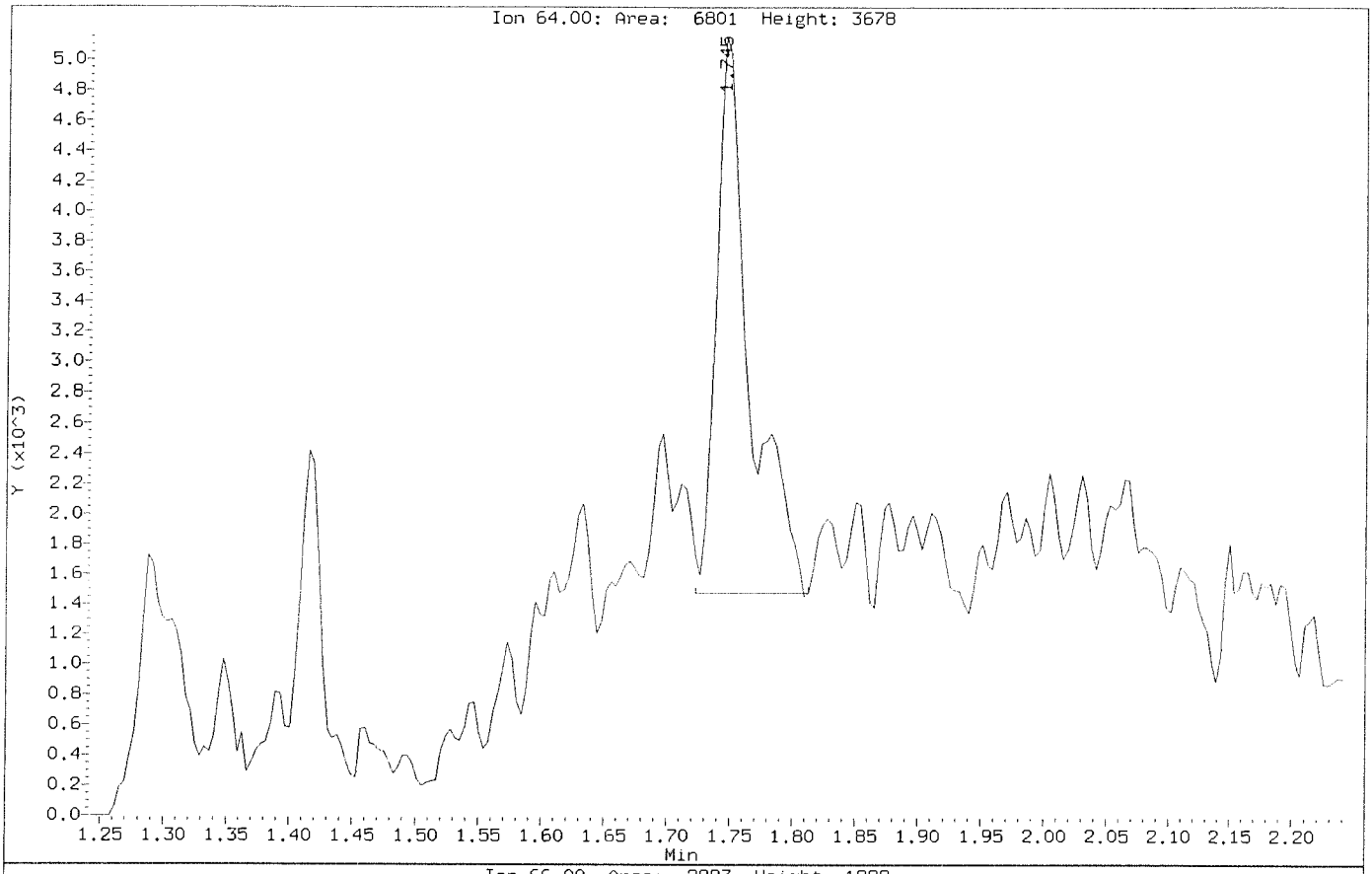
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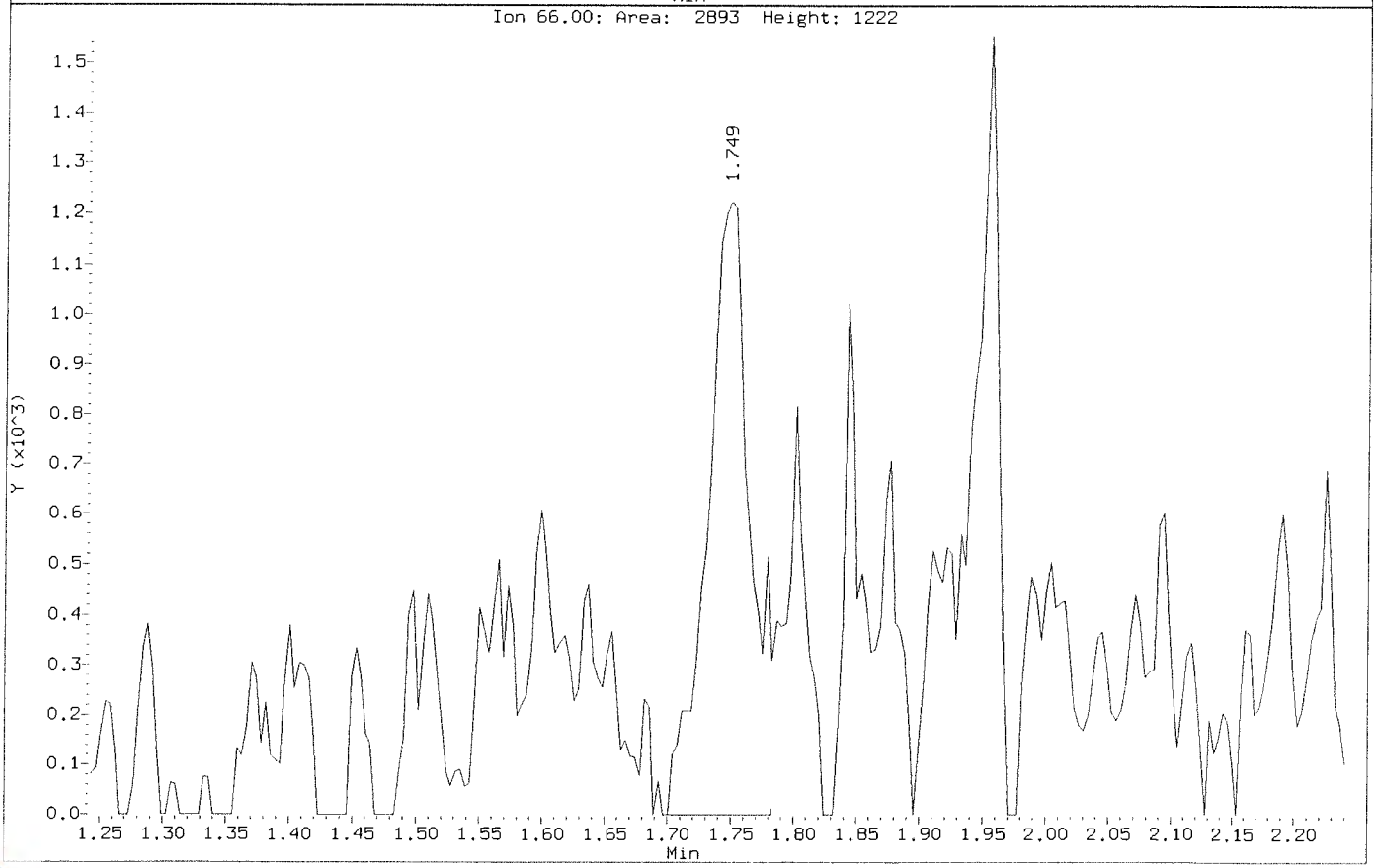




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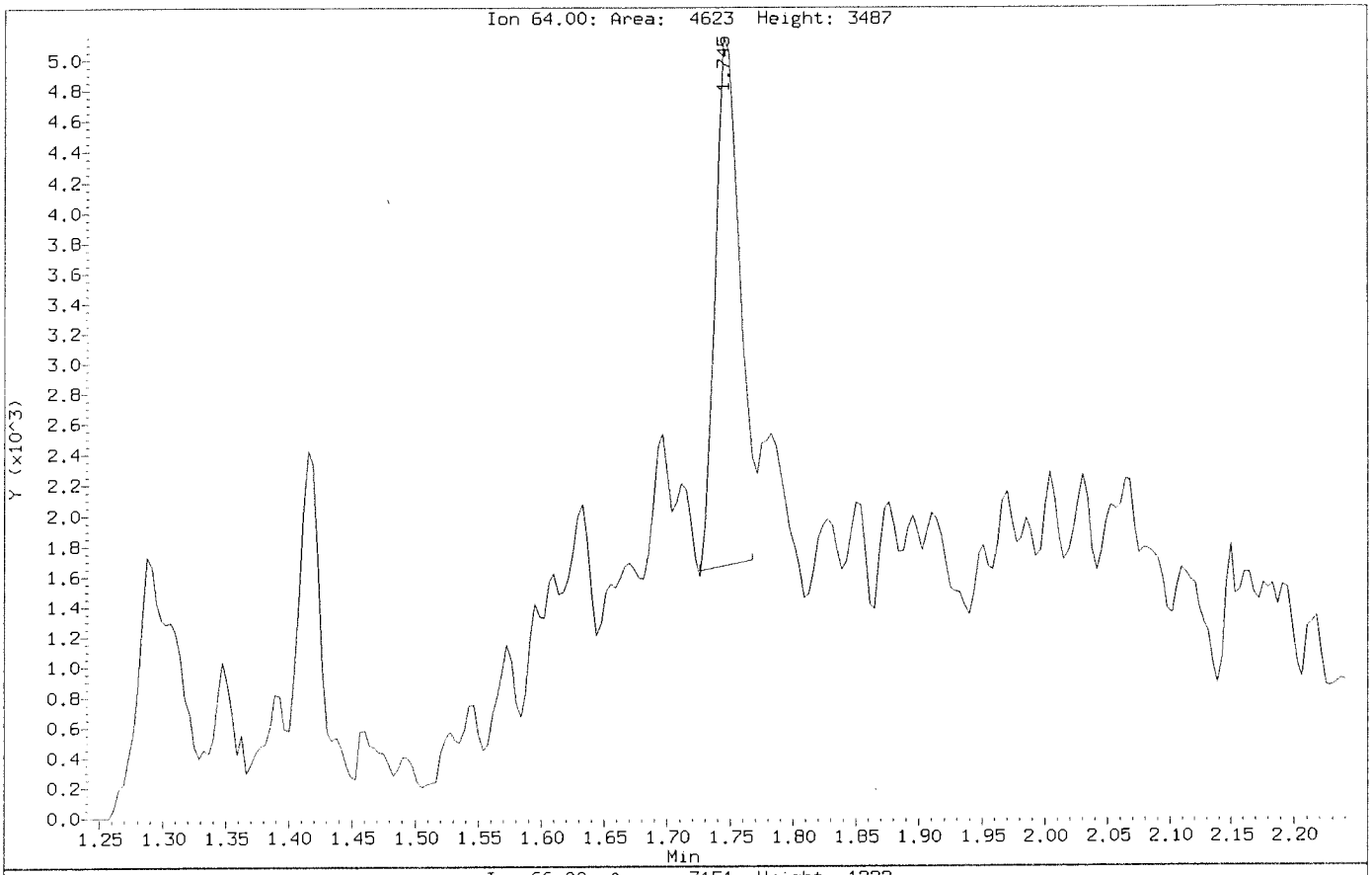
Compound: Chloroethane
CAS Number: 75-00-3

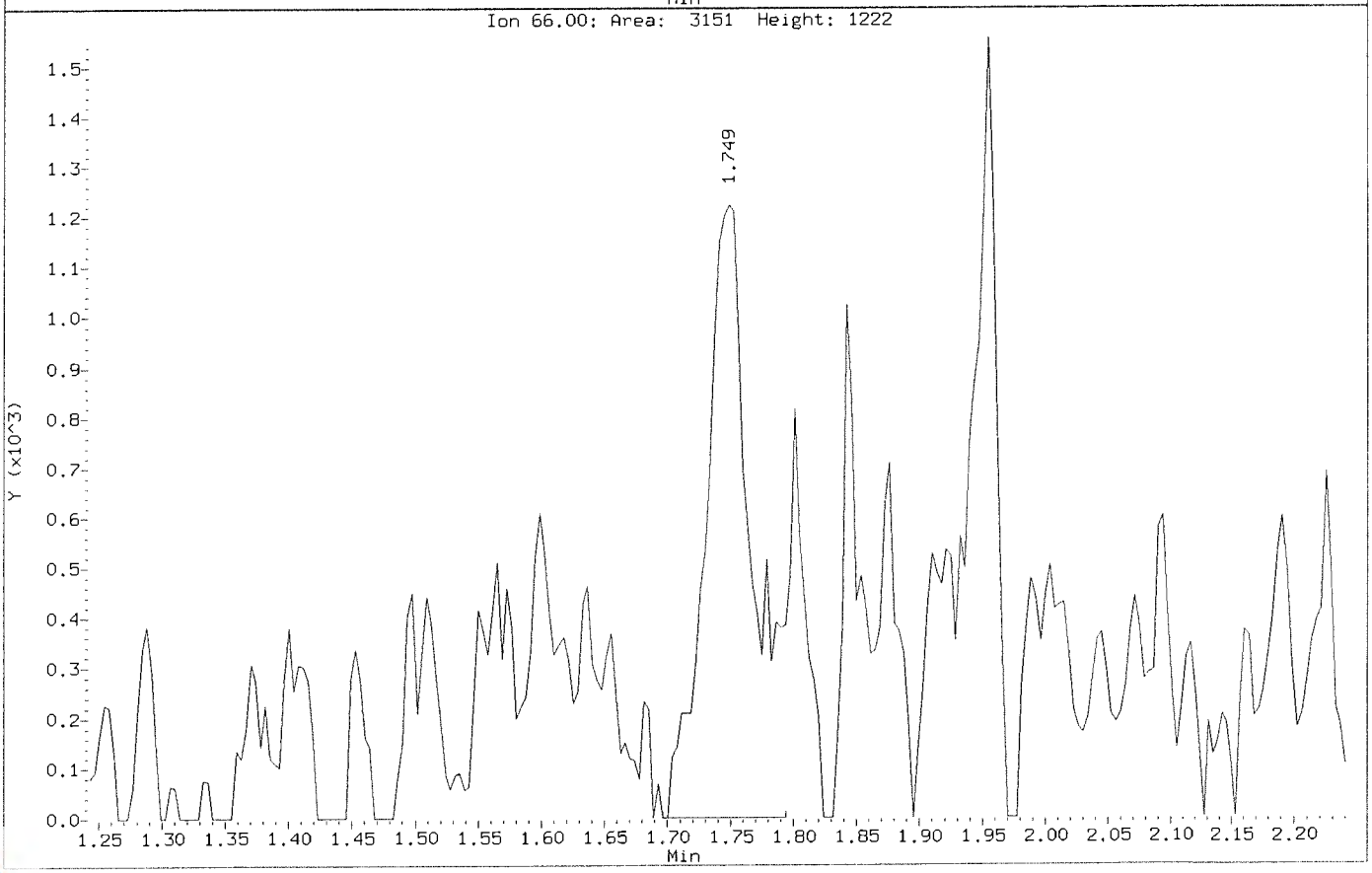




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Instrument: VOA9.i
Client Sample ID: VSTD001

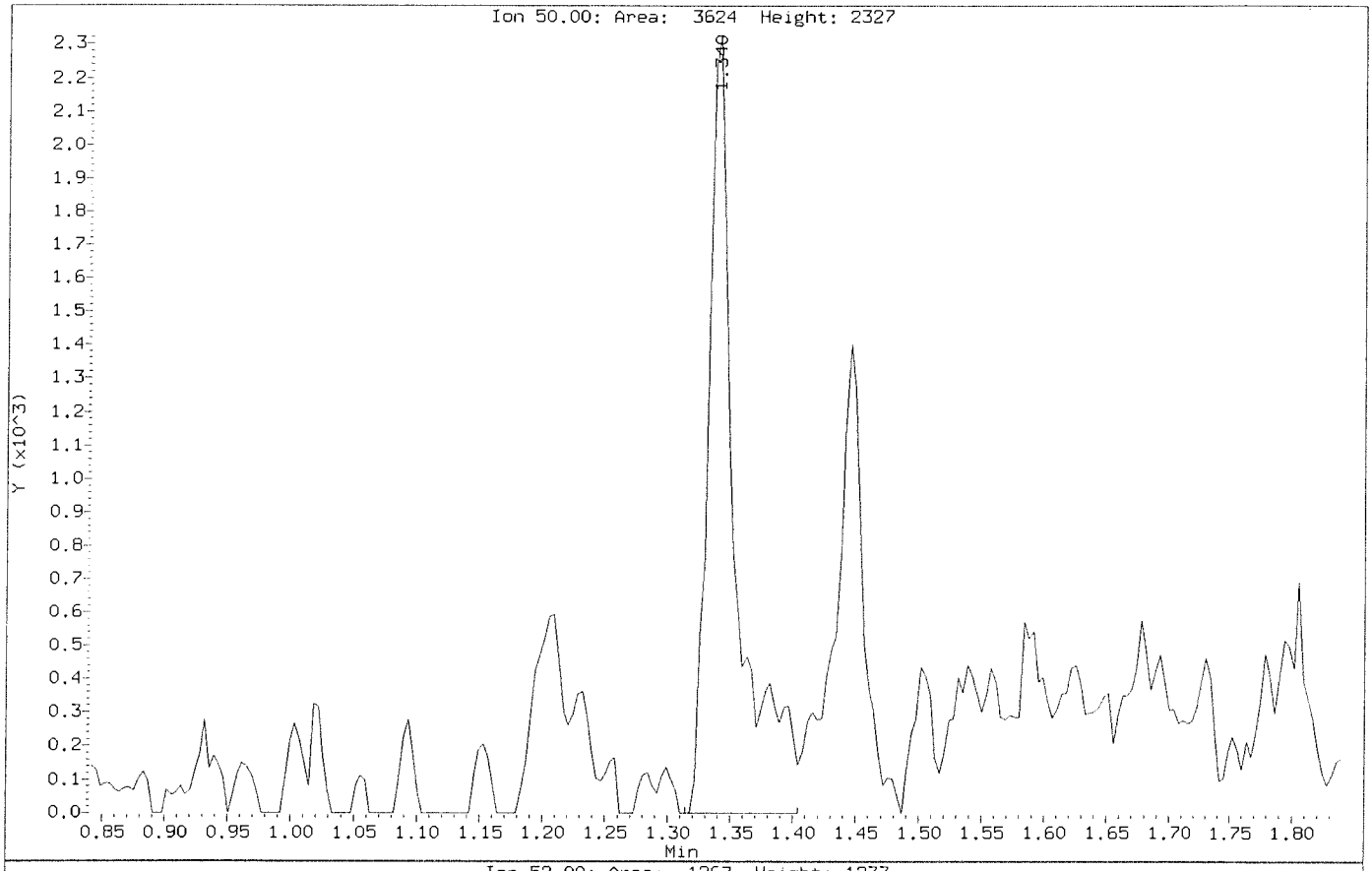
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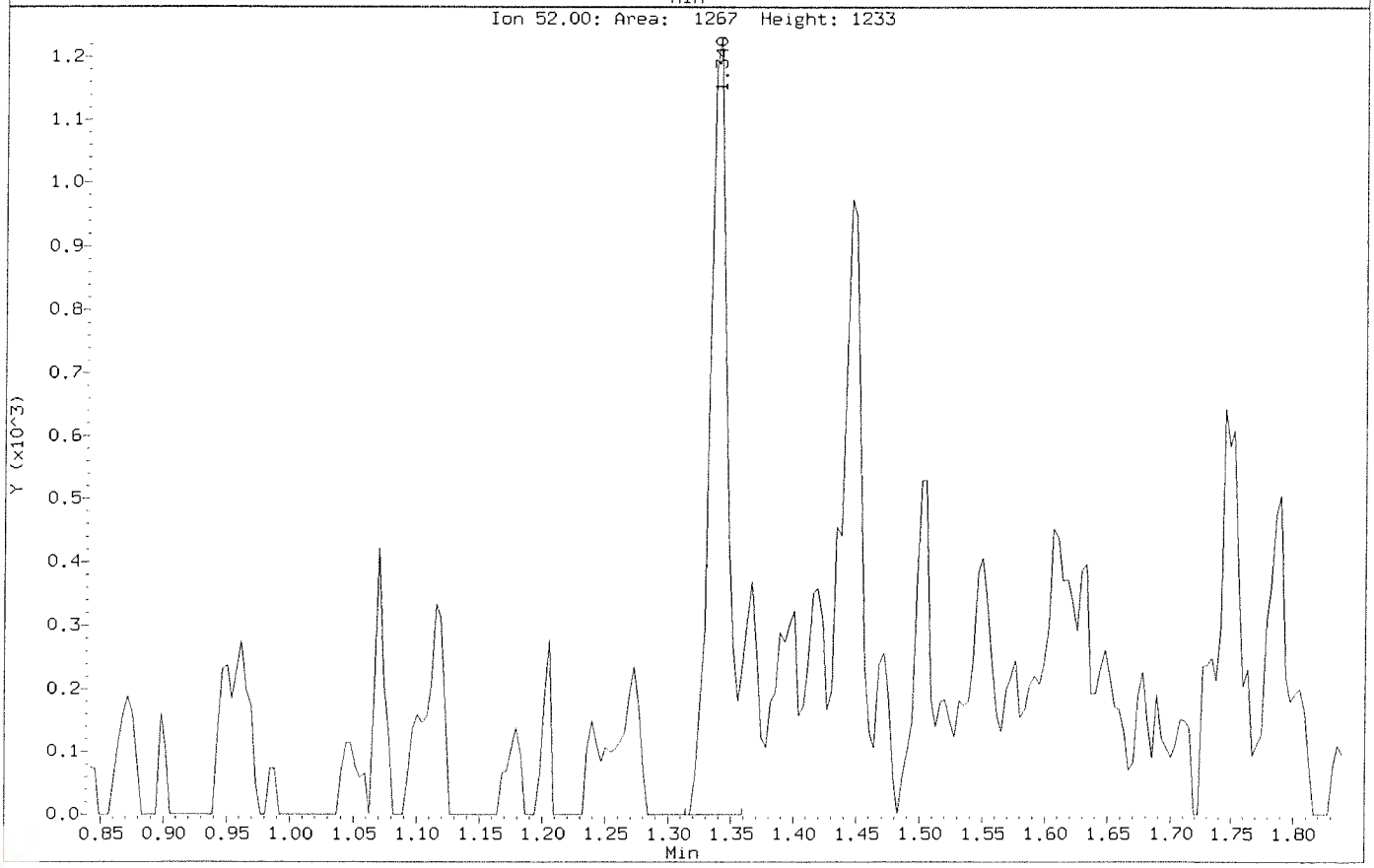




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Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

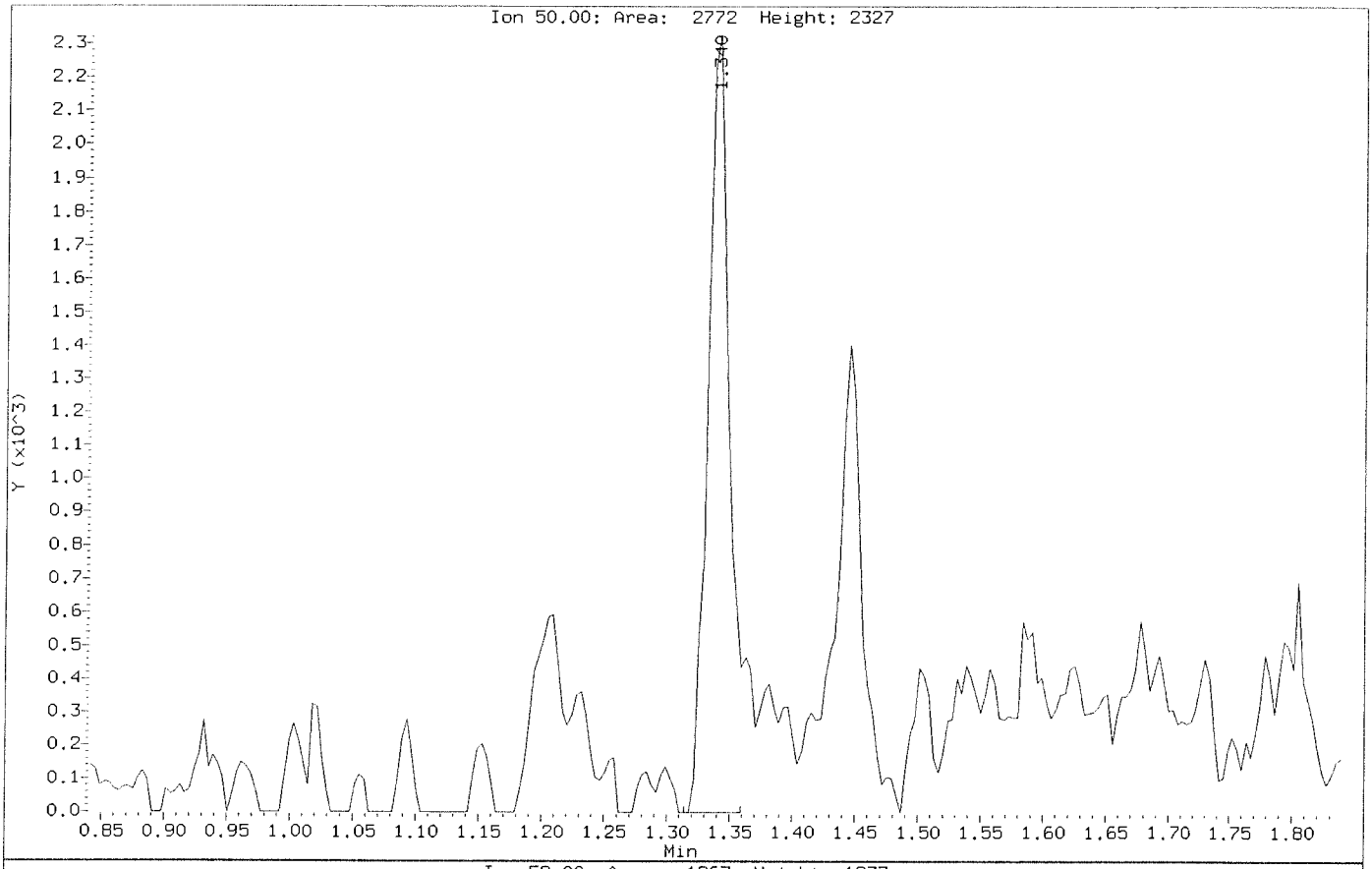
Compound: Chloromethane
CAS Number: 74-87-3

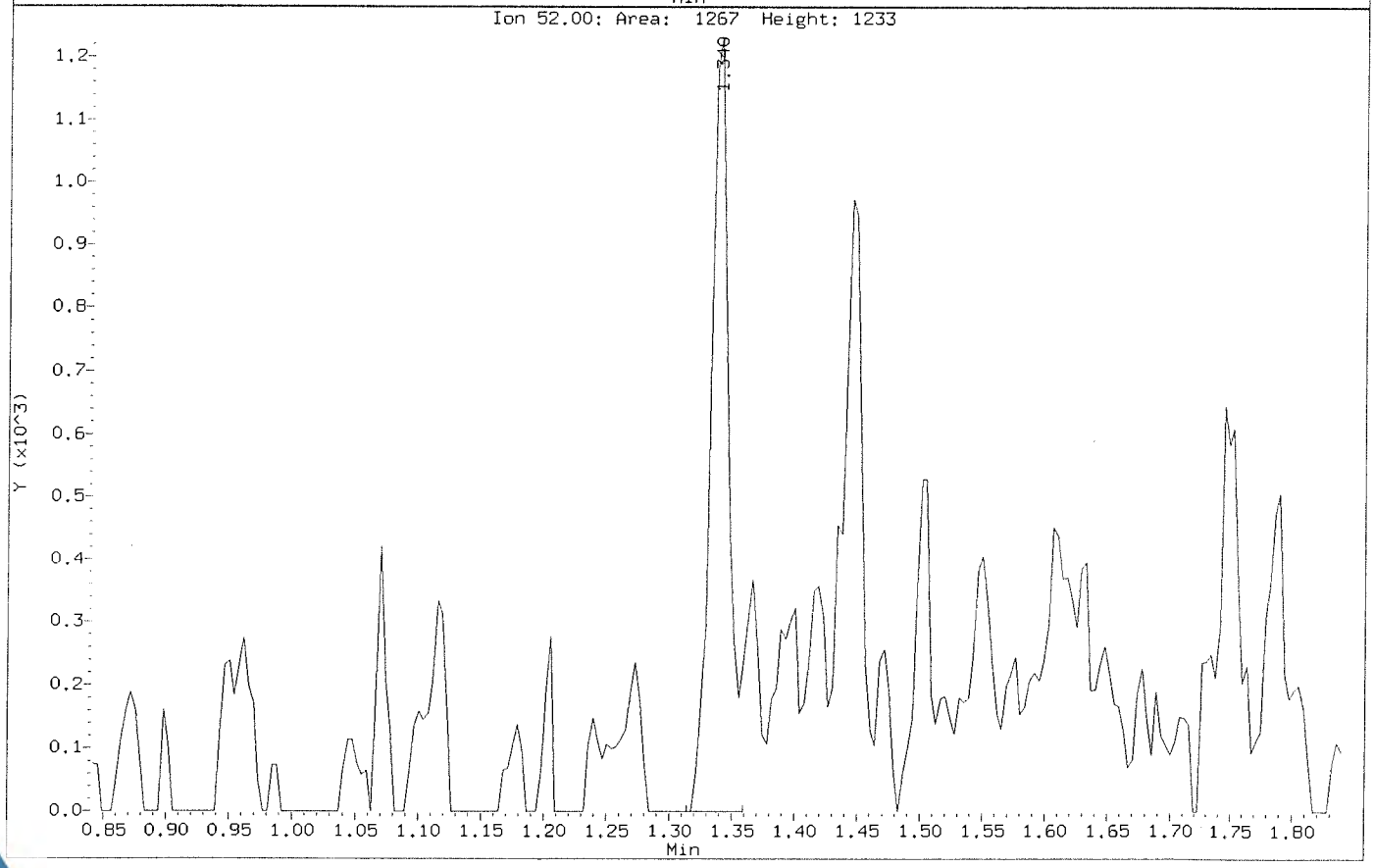




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Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

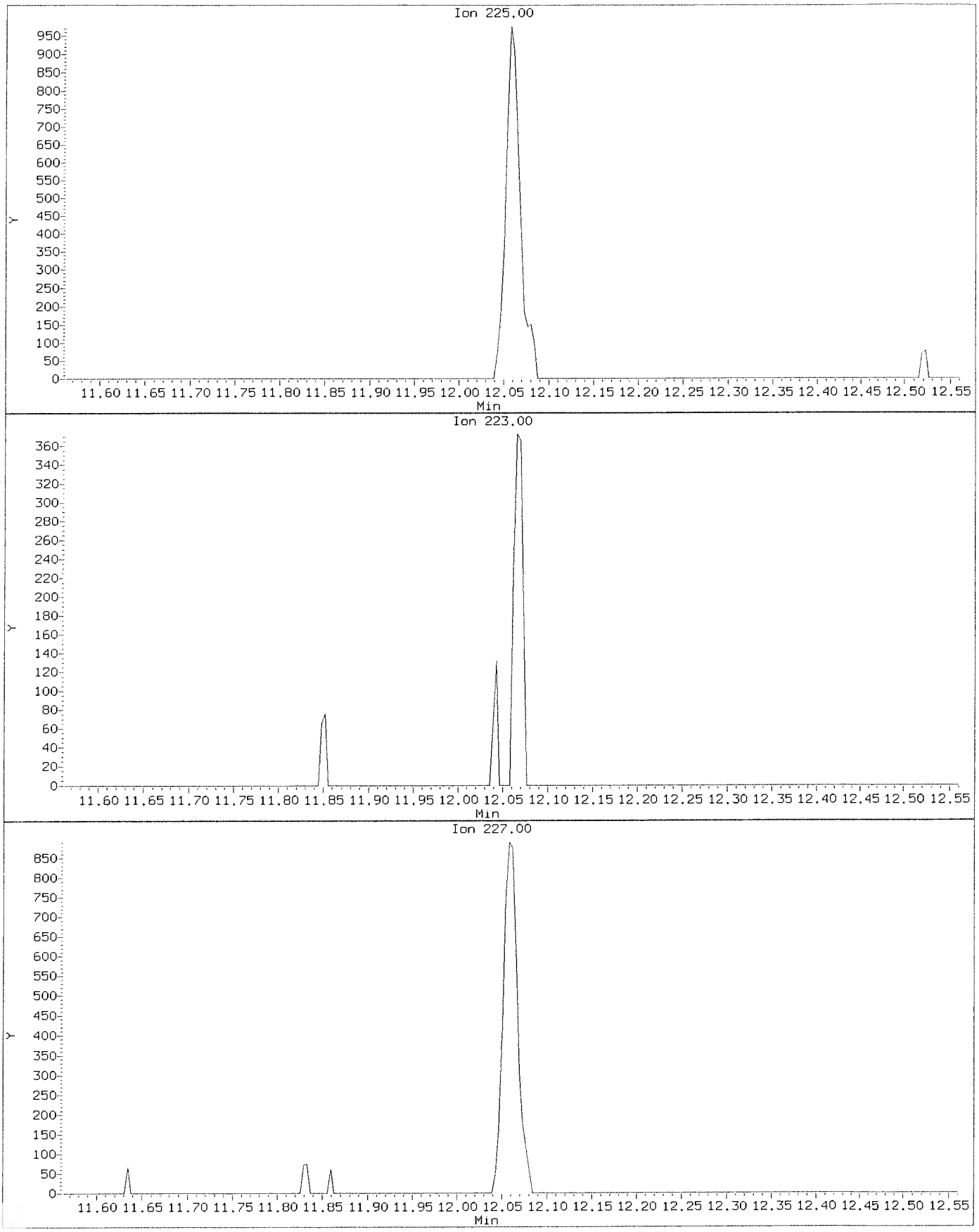
Compound: Chloromethane
CAS Number: 74-87-3





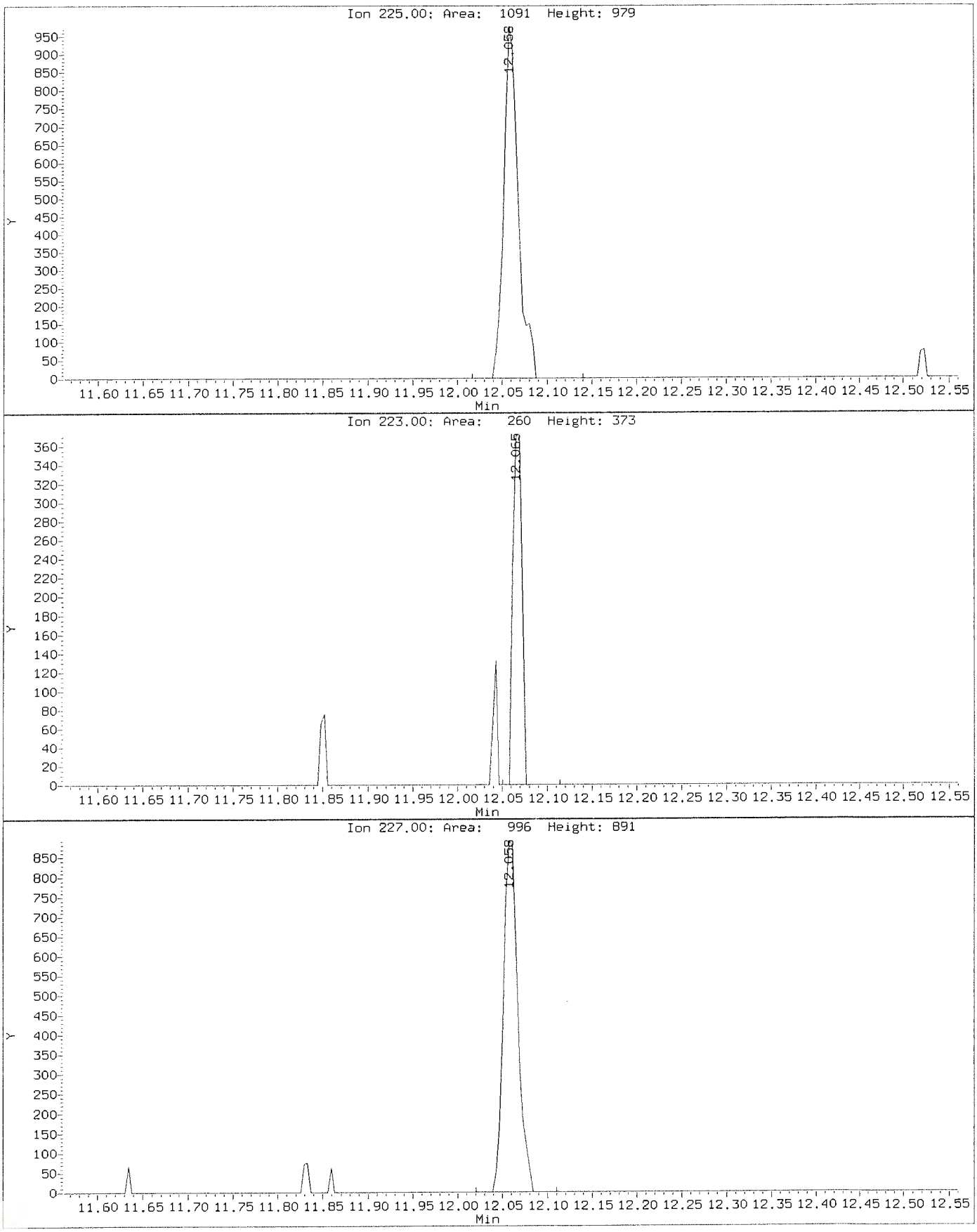
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Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111204.D
Injection Date: 12-NOV-2019 12:28
Instrument: VOA9.i
Client Sample ID: VSTD001

Compound: Hexachlorobutadiene
CAS Number: 87-68-3



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111205.D Page 1
Report Date: 05-Dec-2019 15:54

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Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111205.D
Lab Smp Id: VSTD002 Client Smp ID: VSTD002
Inj Date : 12-NOV-2019 12:52
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD002;VSTD002;1;4;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 12:52 Cal File: U112105.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

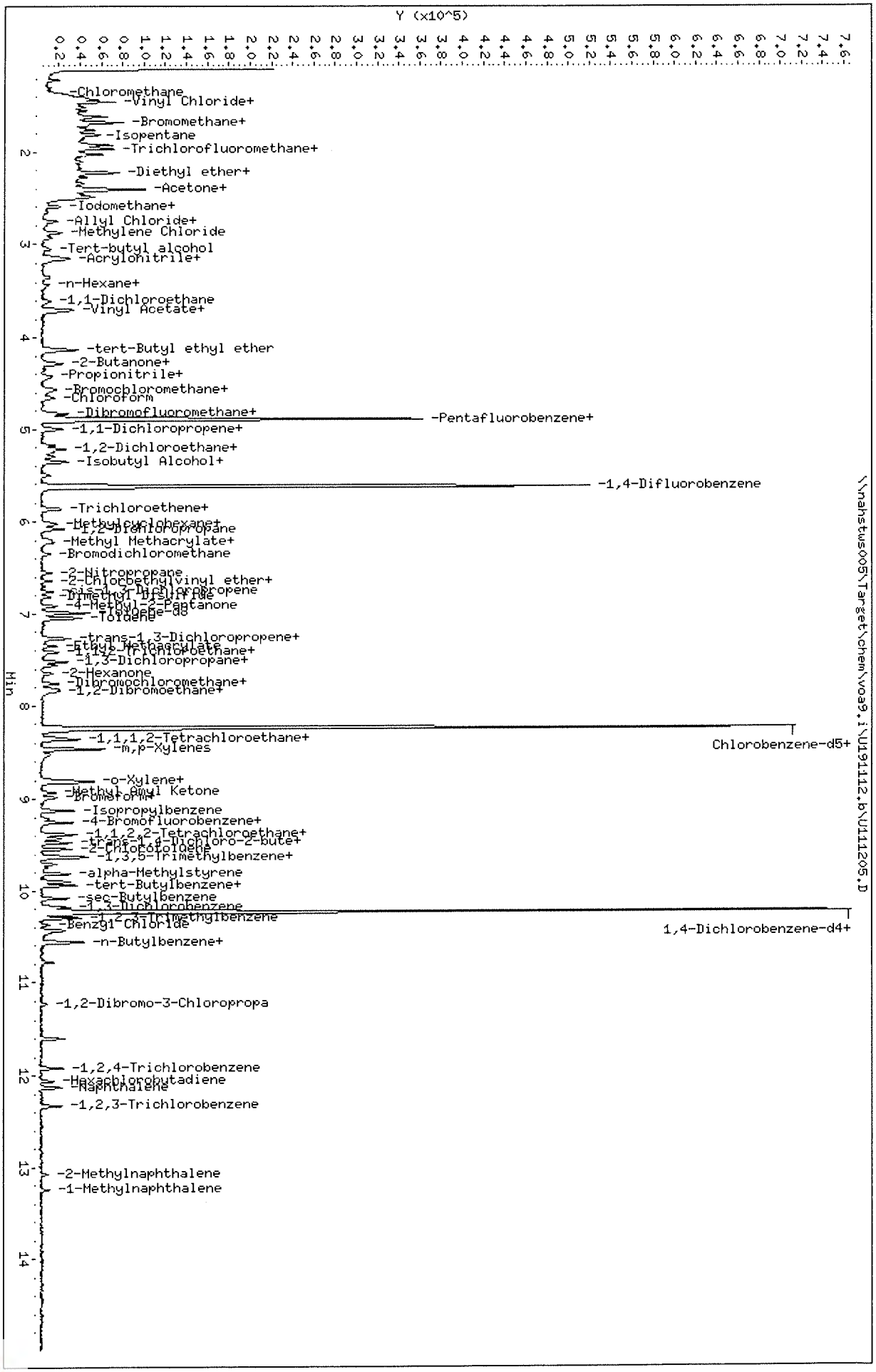
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	251708	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	409900	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	368054	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	189809	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	6889	2.00000	1.84(a)
$ 69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	6587	2.00000	2.94(a)
$ 30 Dibromofluoromethane	113	4.834	4.826	(0.988)	7231	2.00000	1.96(a)
$ 48 Toluene-d8	98	6.986	6.989	(0.847)	24741	2.00000	2.83(a)
60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	4139	2.00000	3.25(a)
31 1,1,1-Trichloroethane	97	4.830	4.826	(0.987)	6571	2.00000	1.75(a)
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	5838	2.00000	1.73(a)
138 Freon TF	101	2.412	2.397	(0.493)	12548	2.00000	2.23(a)
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	3597	2.00000	1.88(a)
22 1,1-Dichloroethane	63	3.601	3.600	(0.736)	7371	2.00000	2.06(a)
11 1,1-Dichloroethene	96	2.409	2.397	(0.492)	11818	2.00000	2.01(a)
32 1,1-Dichloropropene	75	5.003	5.002	(0.889)	5481	2.00000	1.99(a)
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	5442	2.00000	1.82(a)
71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	5994	2.00000	1.85(a)
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	6462	2.00000	1.91(a)
79 1,2,4-Trimethylbenzene	105	9.936	9.939	(0.971)	16506	2.00000	1.87(a)
89 1,2-Dibromo-3-Chloropropane	155	11.226	11.229	(1.097)	995	2.00000	3.05(a)
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	4671	2.00000	1.68(a)
88 1,2-Dichlorobenzene	146	10.570	10.569	(1.033)	9858	2.00000	1.72(a)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111205.D Page 2
Report Date: 05-Dec-2019 15:54

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33 1,2-Dichloroethane	62	5.254	5.250	(0.934)	6419	2.00000	2.10(a)
42 1,2-Dichloropropane	63	6.079	6.078	(1.081)	3974	2.00000	0.59(aM)
75 1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	15005	2.00000	1.81(a)
83 1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	10245	2.00000	1.82(a)
54 1,3-Dichloropropane	76	7.559	7.563	(0.917)	7536	2.00000	1.97(a)
84 1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	11896	2.00000	1.95(a)
26 2,2-Dichloropropane	77	4.272	4.271	(0.873)	5617	2.00000	1.94(a)
24 2-Butanone	43	4.347	4.339	(0.888)	4562	4.00000	3.32(a)
76 2-Chlorotoluene	91	9.546	9.546	(0.933)	11897	2.00000	1.93(a)
52 2-Hexanone	43	7.649	7.649	(0.928)	5875	4.00000	3.65(a)
77 4-Chlorotoluene	91	9.636	9.636	(0.942)	13088	2.00000	1.68(a)
82 p-Isopropyltoluene	119	10.206	10.209	(0.997)	15950	2.00000	1.80(a)
45 4-Methyl-2-Pentanone	43	6.915	6.914	(0.839)	7754	4.00000	3.61(a)
10 Acetone	43	2.487	2.483	(0.508)	15326	4.00000	(a)
37 Benzene	78	5.216	5.216	(0.927)	16996	2.00000	1.91(a)
74 Bromobenzene	156	9.377	9.381	(0.916)	6126	2.00000	1.78(a)
29 Bromochloromethane	128	4.557	4.553	(0.931)	2799	2.00000	1.88(a)
39 Bromodichloromethane	83	6.349	6.344	(1.129)	4892	2.00000	1.79(aM)
66 Bromoform	173	8.976	8.984	(1.089)	2995	2.00000	3.39(Ta)
6 Bromomethane	94	1.678	1.659	(0.343)	16415	2.00000	1.78(a)
19 Carbon Disulfide	76	2.596	2.584	(0.530)	20943	4.00000	3.75(a)
34 Carbon Tetrachloride	117	5.003	4.995	(0.889)	5143	2.00000	1.80(aM)
59 Chlorobenzene	112	8.272	8.271	(1.003)	14274	2.00000	1.91(a)
7 Chloroethane	64	1.760	1.741	(0.360)	7971	2.00000	0.58(a)
28 Chloroform	83	4.658	4.654	(0.952)	6898	2.00000	1.62(a)
3 Chloromethane	50	1.348	1.340	(0.275)	5474	2.00000	1.28(a)
27 cis-1,2-Dichloroethene	96	4.294	4.283	(0.877)	6169	2.00000	2.15(a)
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	4878	2.00000	1.63(a)
55 Dibromochloromethane	129	7.754	7.758	(0.940)	3565	2.00000	3.74(a)
44 Dibromomethane	93	6.184	6.187	(1.099)	3603	2.00000	2.16(aM)
2 Dichlorodifluoromethane	85	1.213	1.205	(0.248)	6022	2.00000	2.35(a)
61 Ethylbenzene	106	8.365	8.369	(1.015)	6710	2.00000	1.80(a)
91 Hexachlorobutadiene	225	12.054	12.061	(1.178)	2029	2.00000	1.77(a)
67 Isopropylbenzene	105	9.123	9.126	(1.106)	19396	2.00000	1.84(a)
62 m,p-Xylenes	106	8.470	8.470	(1.027)	15903	4.00000	3.49(a)
17 Methylene Chloride	84	2.877	2.869	(0.588)	4577	2.00000	2.81(a)
87 n-Butylbenzene	91	10.555	10.554	(1.032)	12607	2.00000	1.70(a)
73 n-Propylbenzene	91	9.471	9.475	(0.926)	20591	2.00000	1.85(a)
92 Naphthalene	128	12.133	12.129	(1.186)	14773	2.00000	1.64(a)
63 o-Xylene	106	8.808	8.807	(1.068)	7729	2.00000	1.67(a)
81 sec-Butylbenzene	105	10.082	10.086	(0.985)	17582	2.00000	1.89(a)
64 Styrene	104	8.819	8.822	(1.070)	13838	2.00000	1.72(a)
78 tert-Butylbenzene	119	9.899	9.898	(0.967)	13268	2.00000	1.88(a)
56 Tetrachloroethene	166	7.522	7.522	(0.912)	6017	2.00000	2.15(a)
50 Toluene	91	7.046	7.045	(0.855)	19969	2.00000	1.79(a)
20 trans-1,2-Dichloroethene	96	3.147	3.139	(0.643)	4204	2.00000	3.53(a)
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	4967	2.00000	2.19(a)
38 Trichloroethene	130	5.861	5.861	(1.042)	5688	2.00000	2.09(a)
8 Trichlorofluoromethane	101	1.963	1.951	(0.401)	22144	2.00000	2.05(a)
5 Vinyl Chloride	62	1.426	1.419	(0.292)	12300	2.00000	2.19(a)

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.



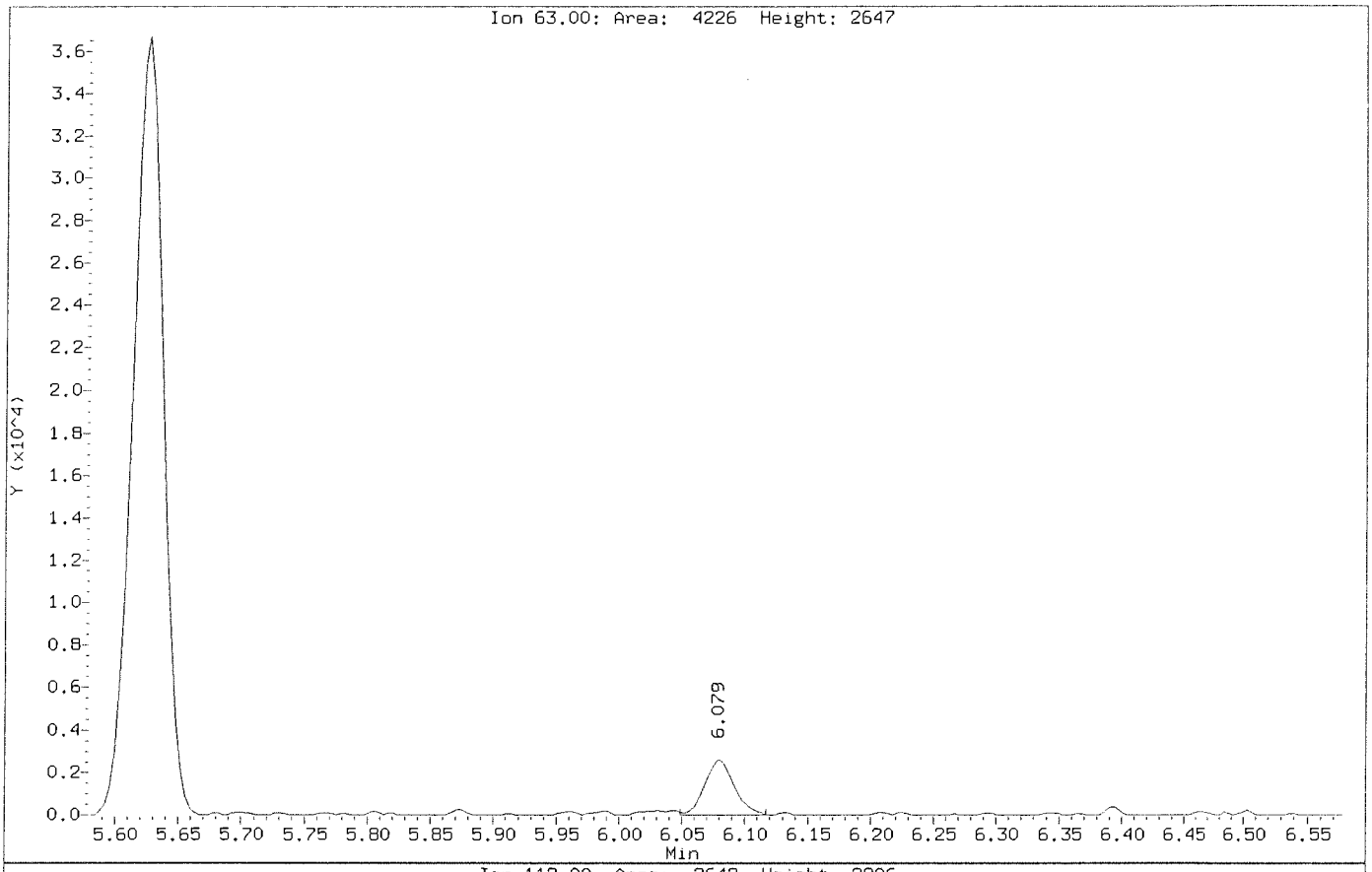
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Sample Info: VSTD002;VSTD002;1;4;
Purge Volume: 5.0
Column phase: DB624

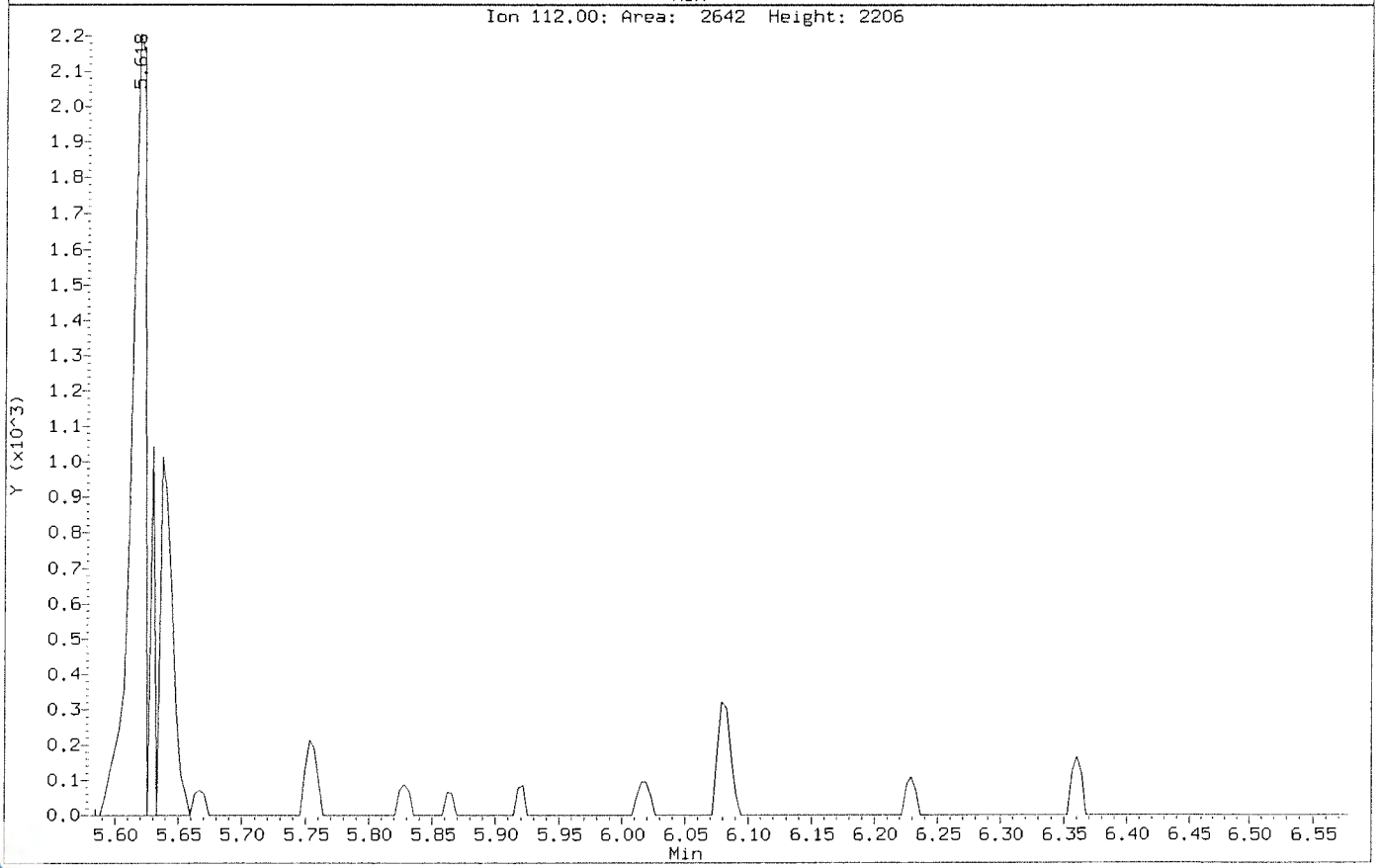
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Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111205.D
Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

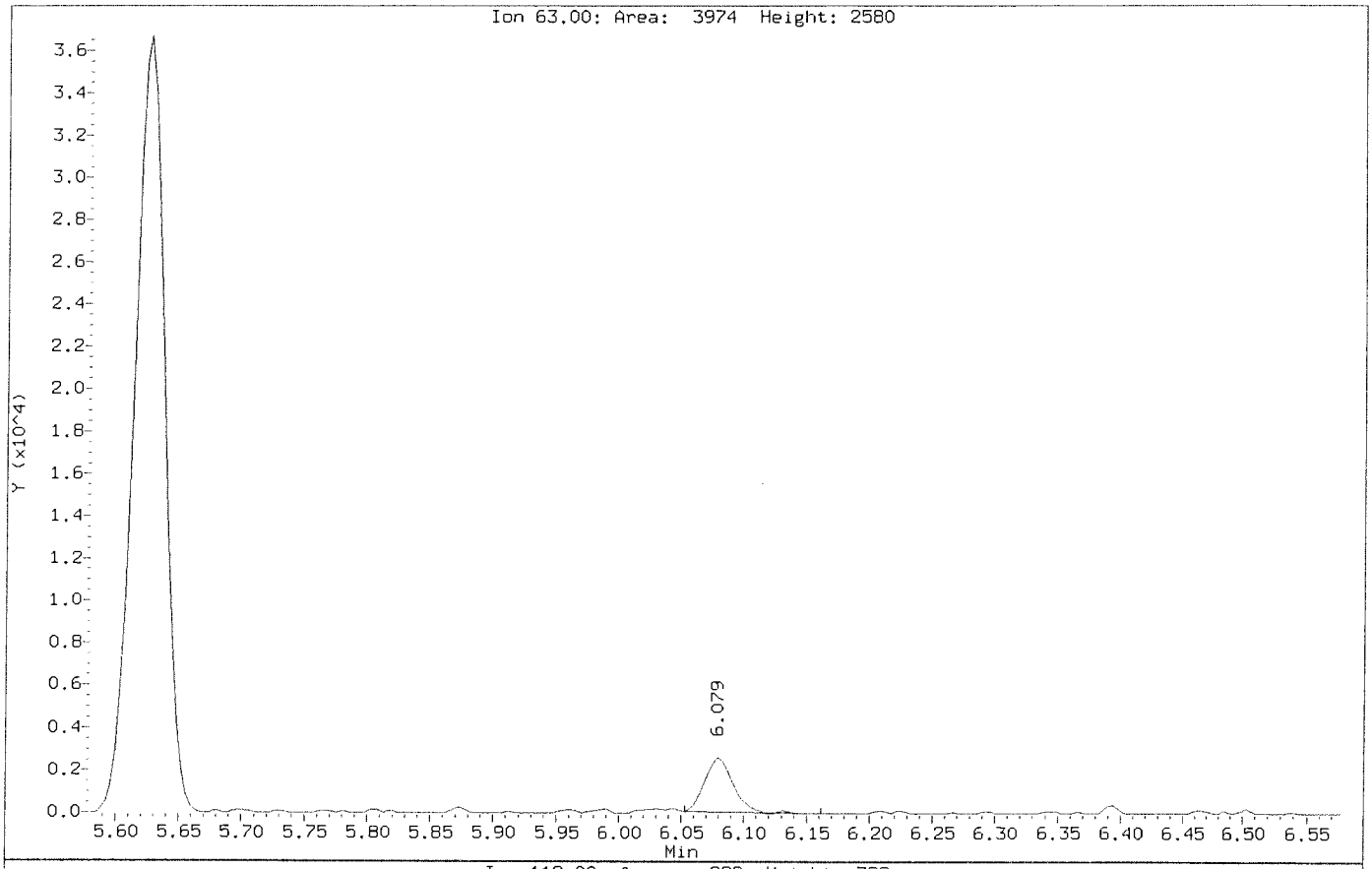
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

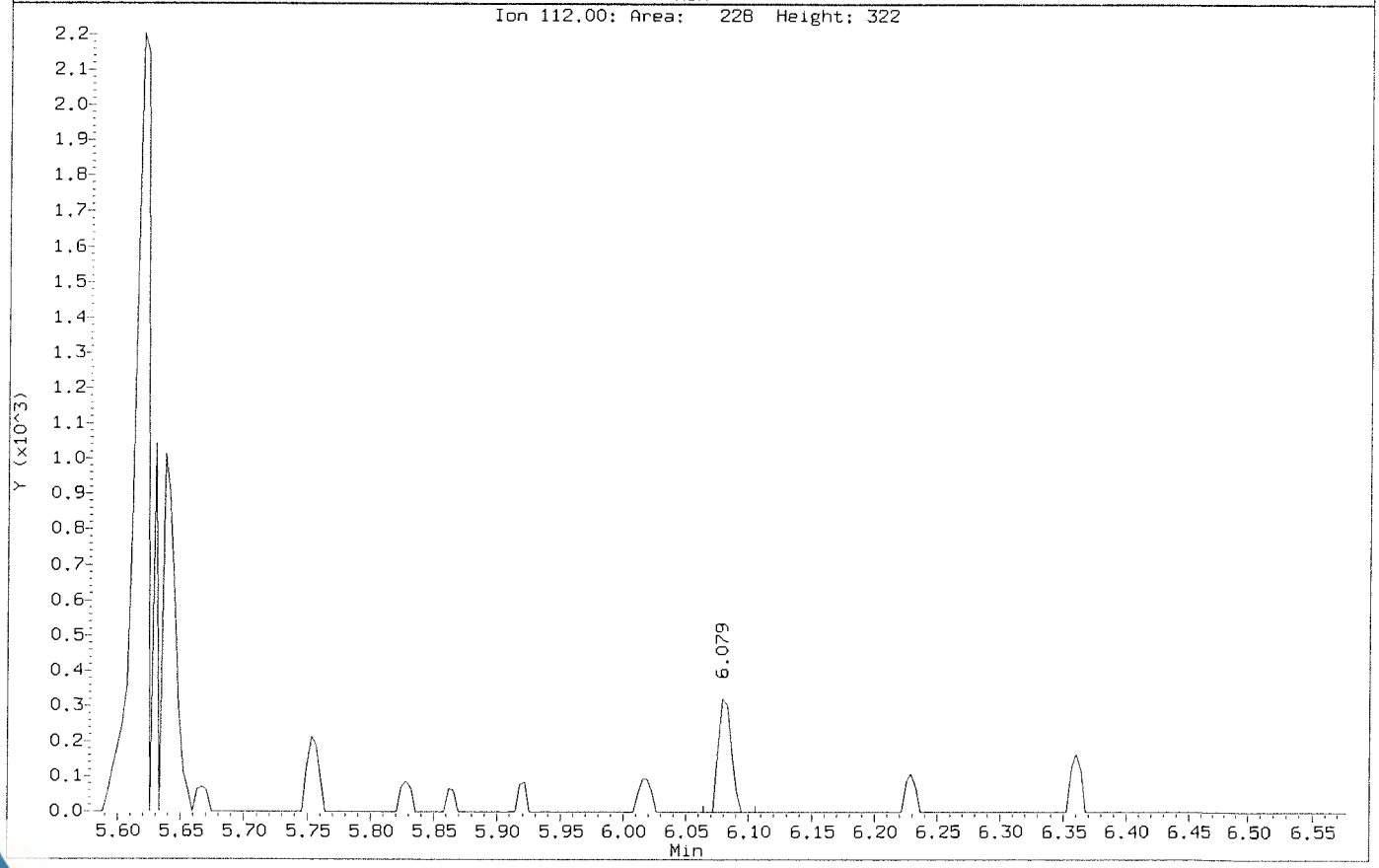




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Instrument: VOA9.i
Client Sample ID: VSTD002

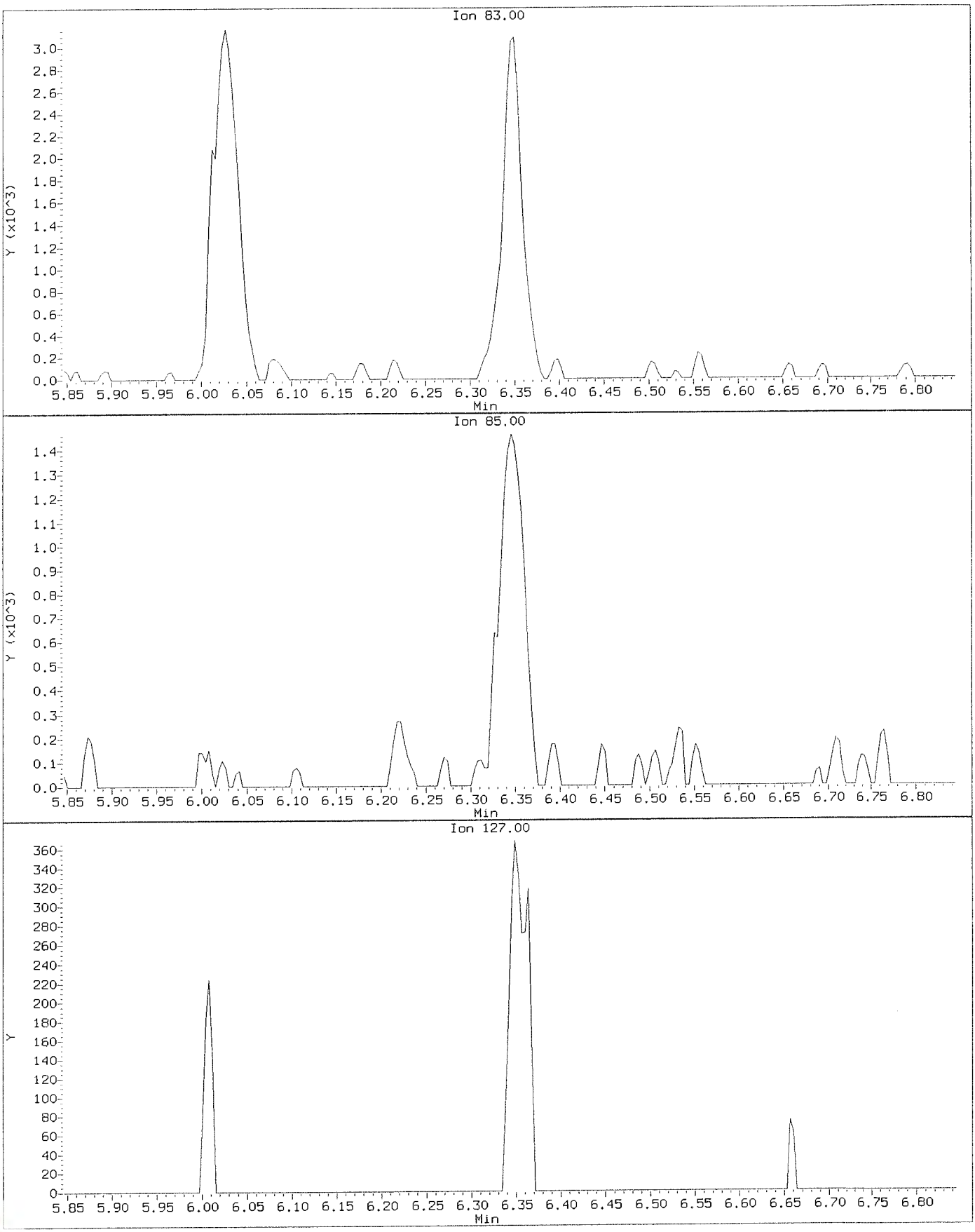
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5





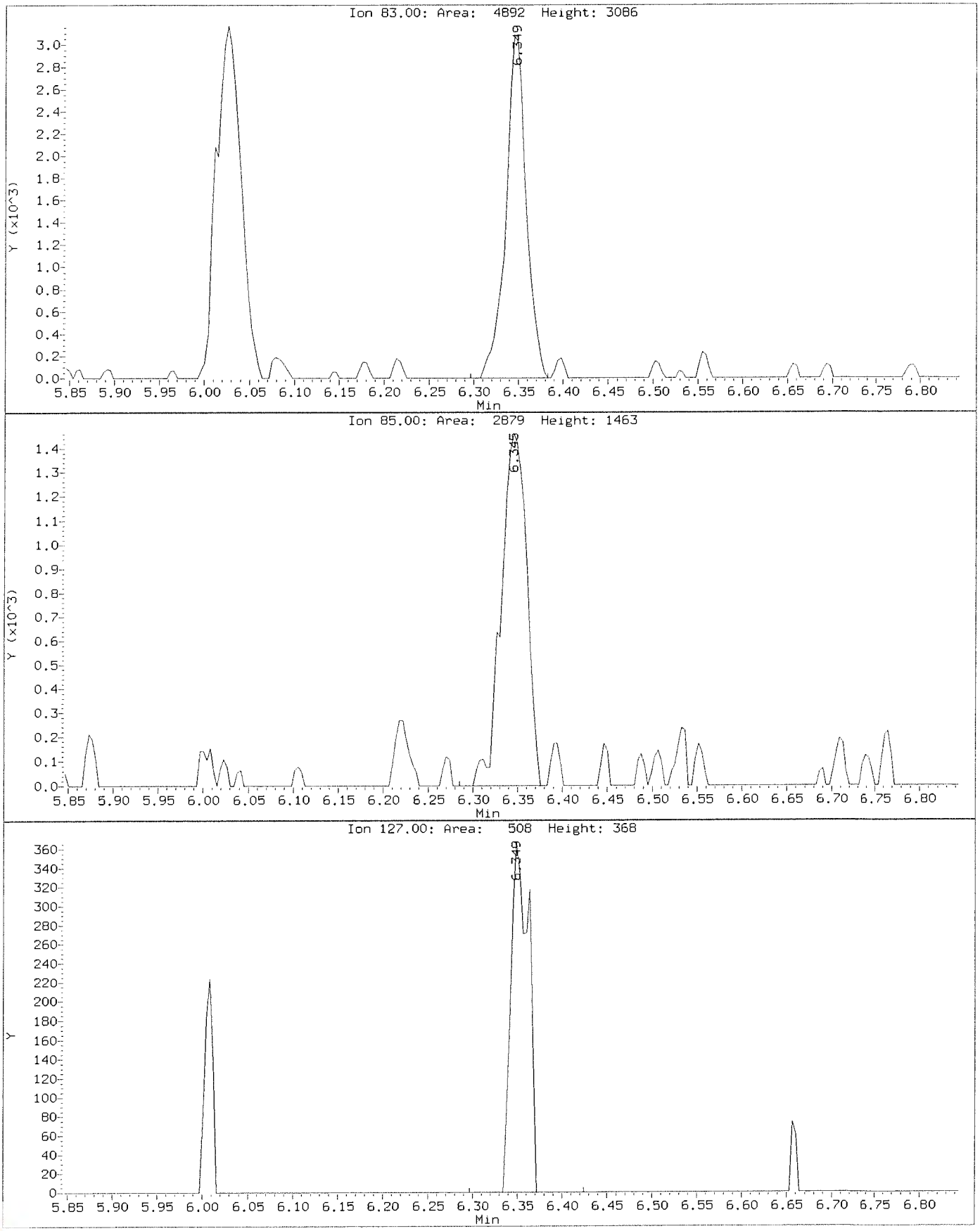
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Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Bromodichloromethane
CAS Number: 75-27-4



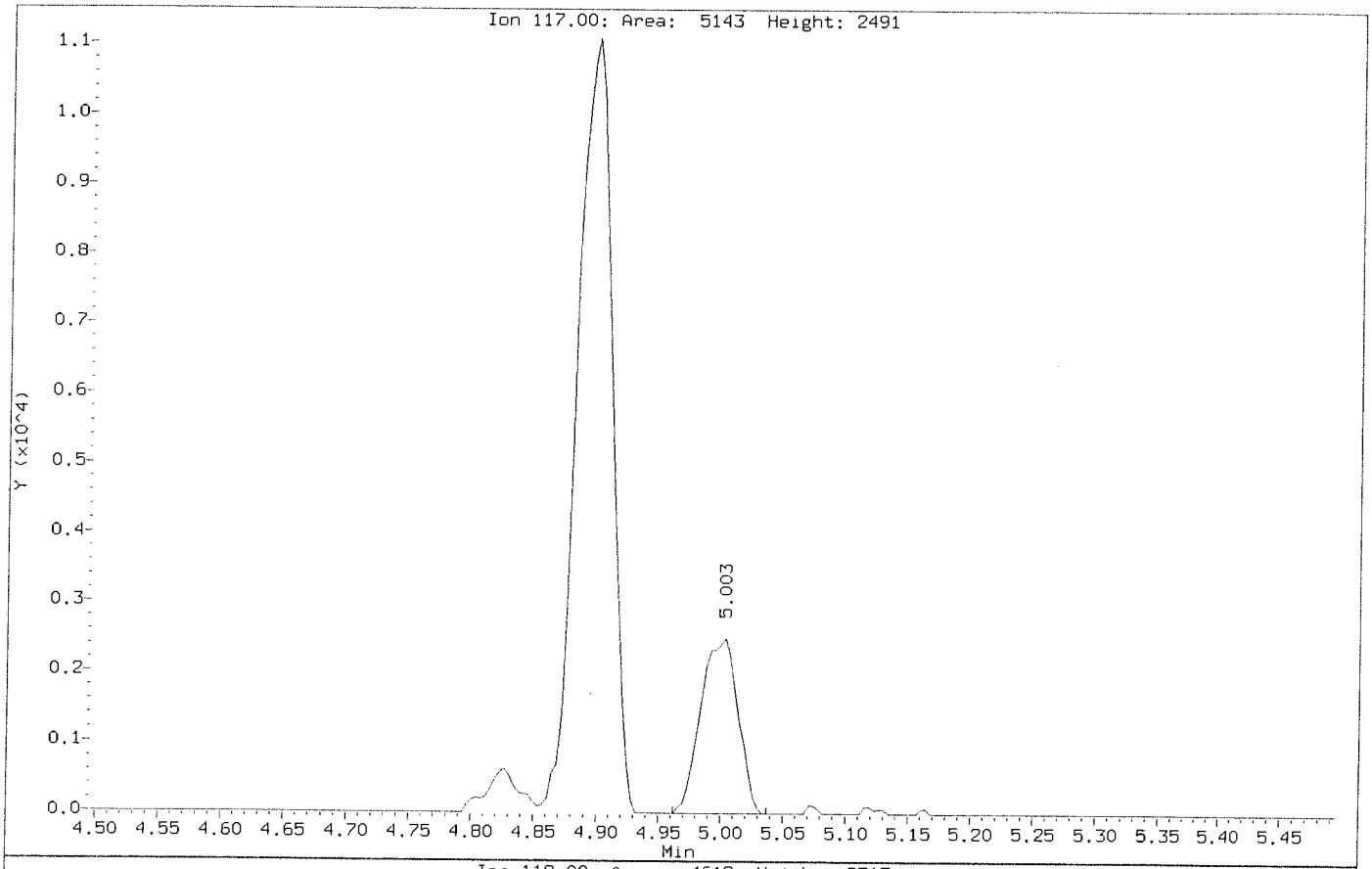
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Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

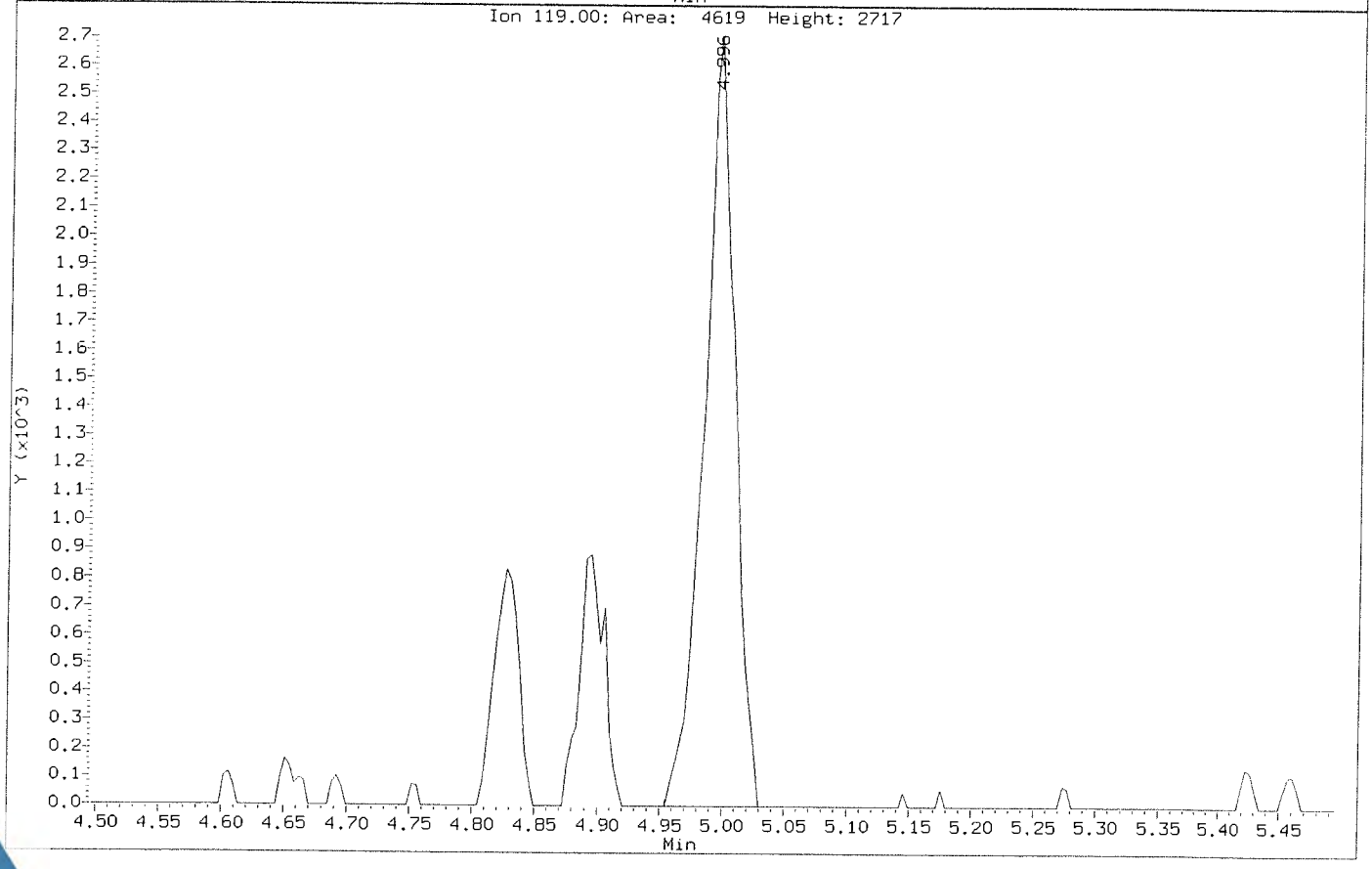
Compound: Bromodichloromethane
CAS Number: 75-27-4



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111205.D
Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

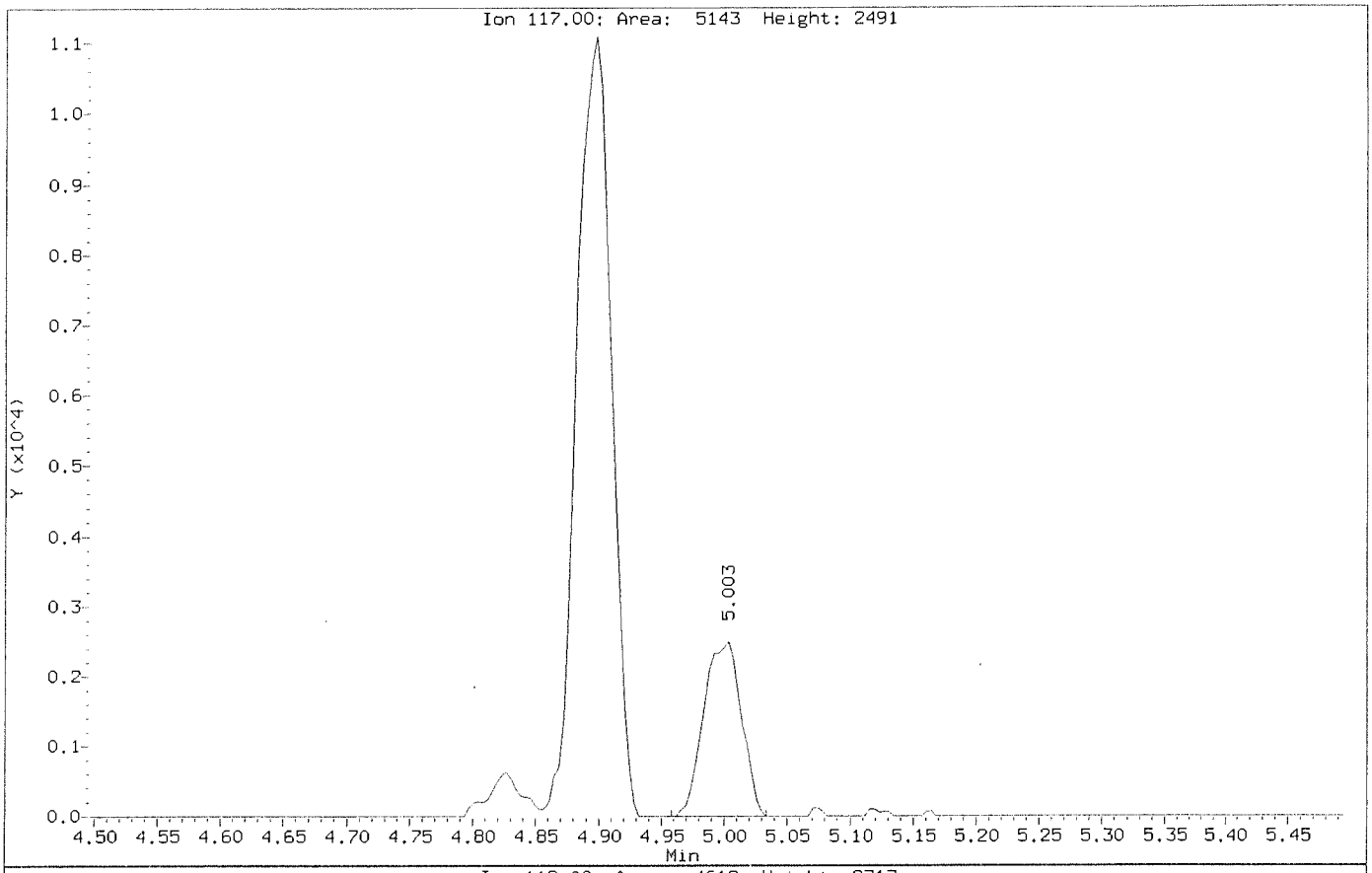
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

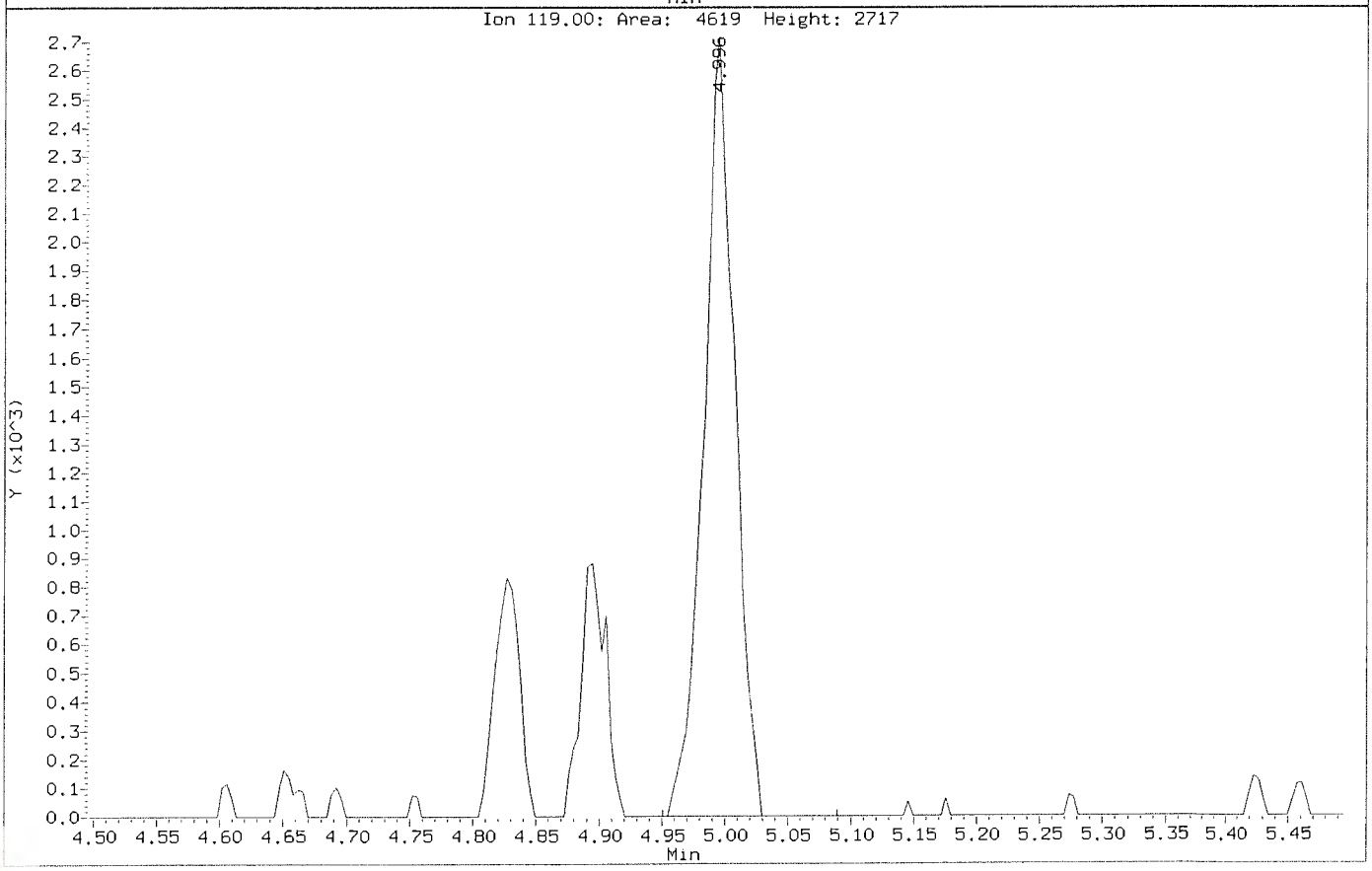




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Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

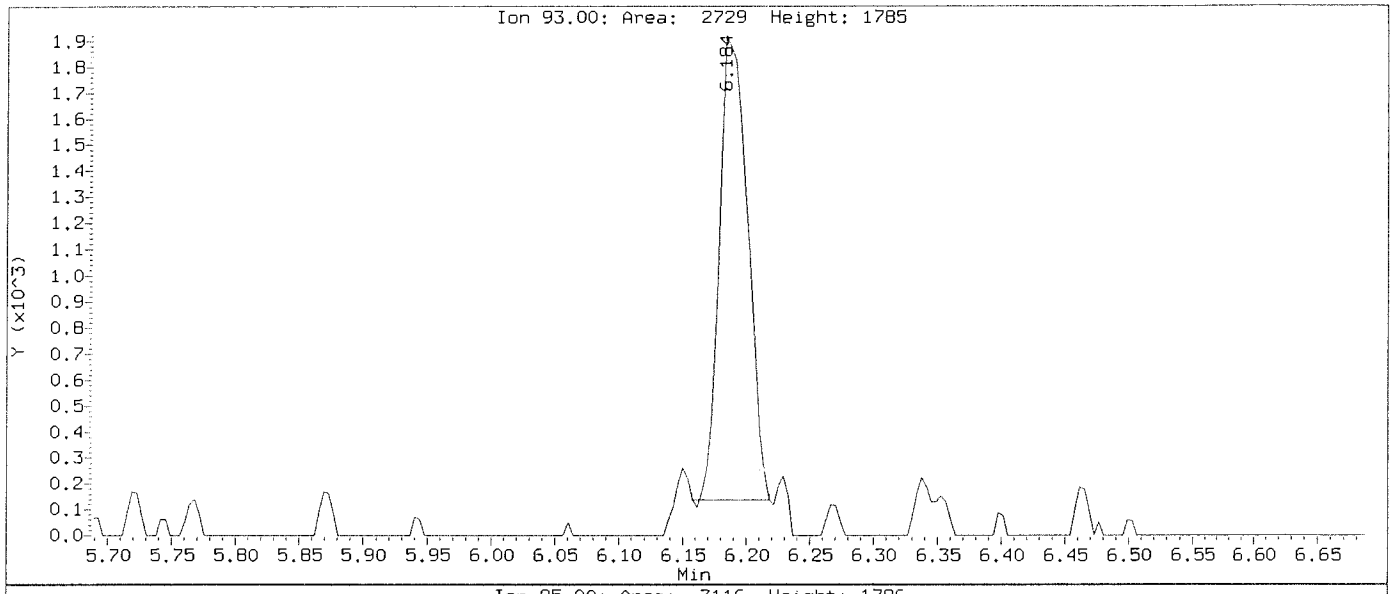
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

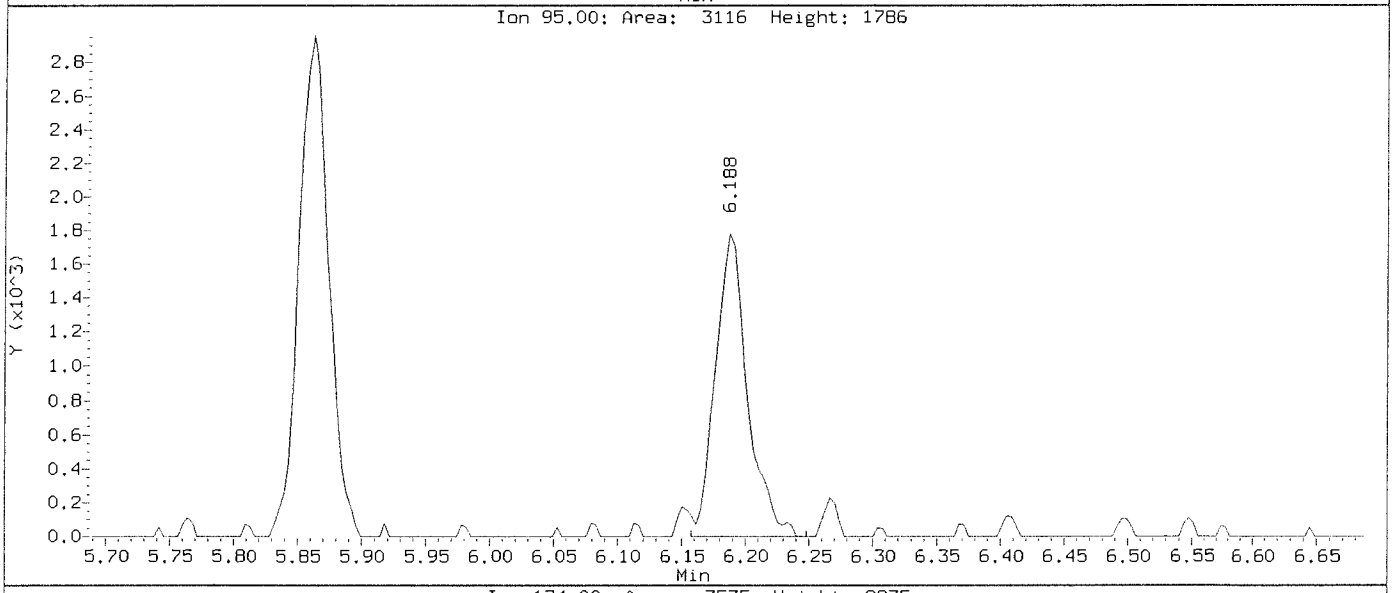


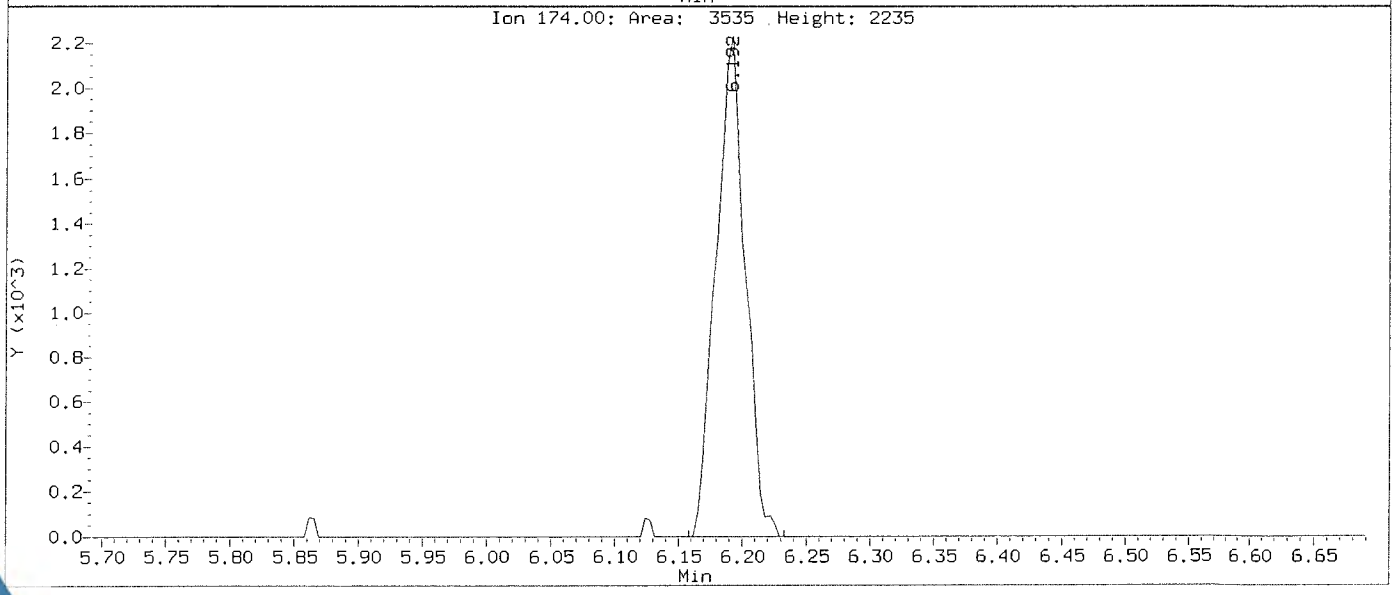


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Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Dibromomethane
CAS Number: 74-95-3

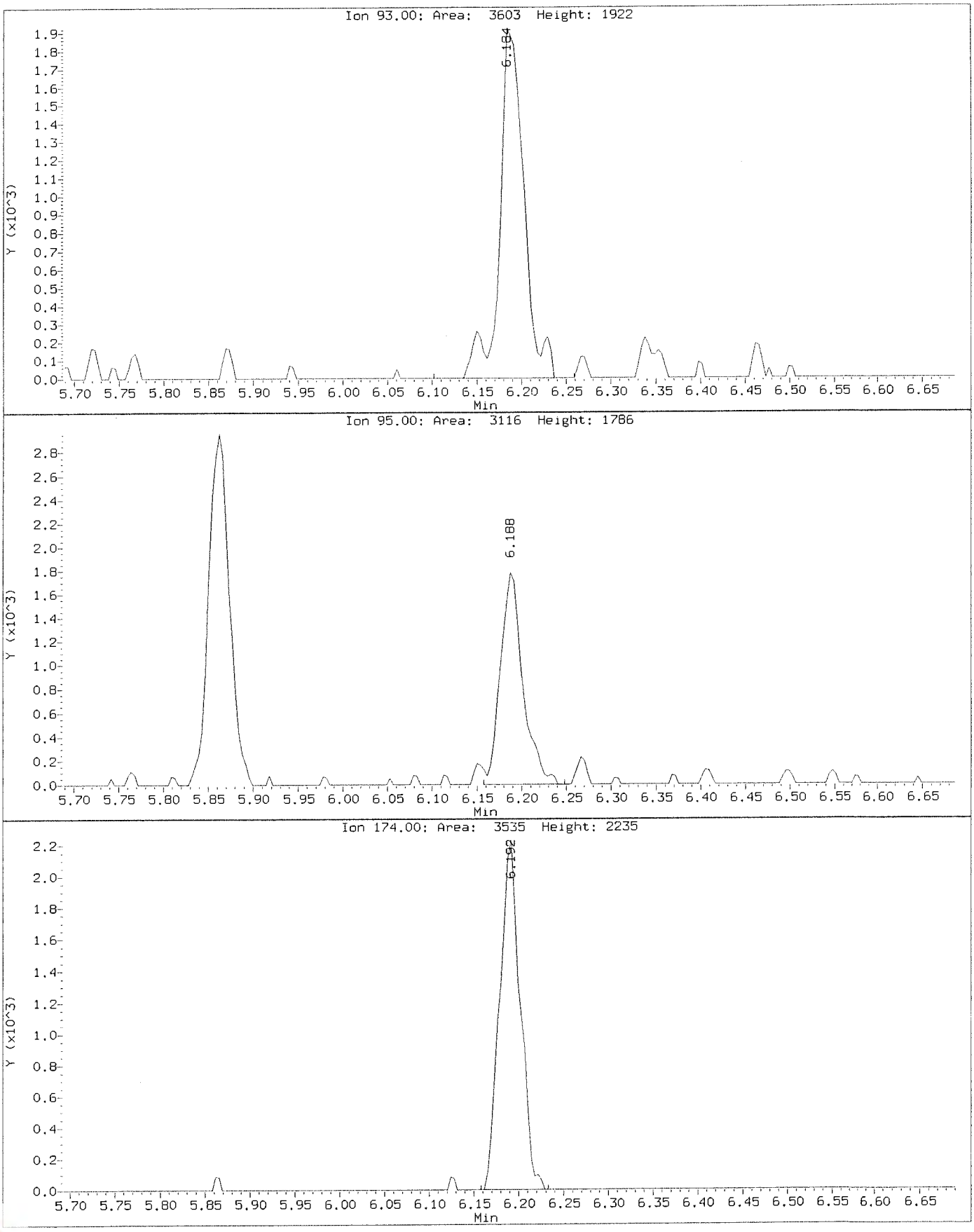






Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111205.D
Injection Date: 12-NOV-2019 12:52
Instrument: VOA9.i
Client Sample ID: VSTD002

Compound: Dibromomethane
CAS Number: 74-95-3



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111206.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111206.D
Lab Smp Id: VSTD005 Client Smp ID: VSTD005
Inj Date : 12-NOV-2019 13:17
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD005;VSTD005;1;5;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 13:17 Cal File: U112106.D
Als bottle: 7 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

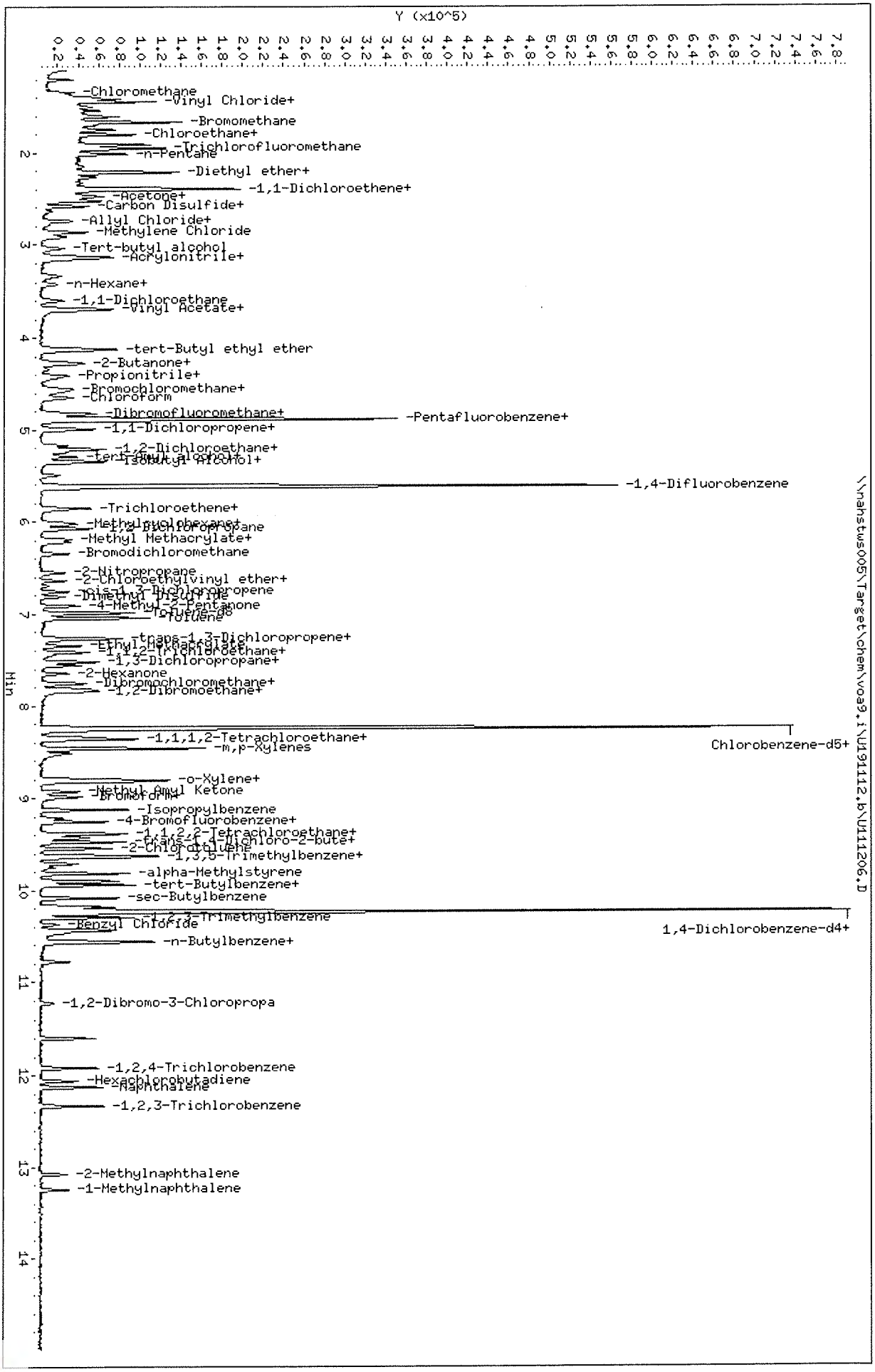
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.890	4.894	(1.000)	238428	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	405677	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	364050	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	191978	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	15774	5.00000	5.79
$	69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	15194	5.00000	5.98
$	30 Dibromofluoromethane	113	4.823	4.826	(0.986)	13696	5.00000	5.01
$	48 Toluene-d8	98	6.986	6.989	(0.847)	50004	5.00000	5.64
	60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	10434	5.00000	5.60
	31 1,1,1-Trichloroethane	97	4.826	4.826	(0.987)	17175	5.00000	4.84(a)
	68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	17306	5.00000	5.08
	138 Freon TF	101	2.397	2.397	(0.490)	30204	5.00000	5.67
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	9665	5.00000	5.10
	22 1,1-Dichloroethane	63	3.597	3.600	(0.736)	17840	5.00000	5.27
	11 1,1-Dichloroethene	96	2.394	2.397	(0.490)	29690	5.00000	5.33
	32 1,1-Dichloropropene	75	4.995	5.002	(0.889)	14445	5.00000	5.30
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	16005	5.00000	5.30
	71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	16719	5.00000	5.12
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	16585	5.00000	4.85(a)
	79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	43657	5.00000	4.90(a)
	89 1,2-Dibromo-3-Chloropropane	155	11.225	11.229	(1.097)	2891	5.00000	5.78
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	13453	5.00000	4.91(a)
	88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	29413	5.00000	5.08

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111206.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.934)	16072	5.00000	5.32
42	1,2-Dichloropropane	63	6.078	6.078	(1.081)	11076	5.00000	4.56(aM)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	41154	5.00000	4.91(a)
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	25204	5.00000	4.43(a)
54	1,3-Dichloropropane	76	7.559	7.563	(0.917)	18612	5.00000	4.92(a)
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	27683	5.00000	4.50(a)
26	2,2-Dichloropropane	77	4.268	4.271	(0.873)	12618	5.00000	4.61(a)
24	2-Butanone	43	4.339	4.339	(0.887)	8511	10.0000	8.23
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	31211	5.00000	5.01
52	2-Hexanone	43	7.645	7.649	(0.927)	14647	10.0000	9.21
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	40107	5.00000	5.11
82	p-Isopropyltoluene	119	10.206	10.209	(0.997)	44546	5.00000	4.97(a)
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	20503	10.0000	9.65
10	Acetone	43	2.472	2.483	(0.506)	26993	10.0000	8.19
37	Benzene	78	5.213	5.216	(0.927)	46900	5.00000	5.34
74	Bromobenzene	156	9.377	9.381	(0.916)	14994	5.00000	4.31(a)
29	Bromochloromethane	128	4.553	4.553	(0.931)	6772	5.00000	4.81(a)
39	Bromodichloromethane	83	6.341	6.344	(1.128)	14190	5.00000	5.24
66	Bromoform	173	8.984	8.984	(1.090)	5749	5.00000	4.74(Ta)
6	Bromomethane	94	1.666	1.659	(0.341)	41828	5.00000	6.11
19	Carbon Disulfide	76	2.581	2.584	(0.528)	50830	10.0000	9.61
34	Carbon Tetrachloride	117	4.988	4.995	(0.887)	13853	5.00000	4.91(aM)
59	Chlorobenzene	112	8.271	8.271	(1.003)	37197	5.00000	5.04
7	Chloroethane	64	1.745	1.741	(0.357)	24112	5.00000	5.70
28	Chloroform	83	4.650	4.654	(0.951)	21736	5.00000	5.39
3	Chloromethane	50	1.336	1.340	(0.273)	13392	5.00000	5.23
27	cis-1,2-Dichloroethene	96	4.279	4.283	(0.875)	12916	5.00000	4.75(a)
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	13834	5.00000	4.68(a)
55	Dibromochloromethane	129	7.754	7.758	(0.940)	10232	5.00000	6.02
44	Dibromomethane	93	6.183	6.187	(1.100)	7516	5.00000	4.57(a)
2	Dichlorodifluoromethane	85	1.198	1.205	(0.245)	11592	5.00000	4.78(a)
61	Ethylbenzene	106	8.365	8.369	(1.015)	18853	5.00000	5.12
91	Hexachlorobutadiene	225	12.058	12.061	(1.178)	5585	5.00000	4.82(a)
67	Isopropylbenzene	105	9.122	9.126	(1.106)	51577	5.00000	4.94(a)
62	m,p-Xylenes	106	8.466	8.470	(1.027)	44540	10.0000	9.90
17	Methylene Chloride	84	2.866	2.869	(0.586)	11941	5.00000	6.17
87	n-Butylbenzene	91	10.551	10.554	(1.031)	36803	5.00000	4.91(a)
73	n-Propylbenzene	91	9.471	9.475	(0.926)	57962	5.00000	5.16
92	Naphthalene	128	12.129	12.129	(1.185)	44381	5.00000	4.88(a)
63	o-Xylene	106	8.808	8.807	(1.068)	22203	5.00000	4.87(a)
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	46463	5.00000	4.94(a)
64	Styrene	104	8.823	8.822	(1.070)	39434	5.00000	4.97(a)
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	37509	5.00000	5.27
56	Tetrachloroethene	166	7.522	7.522	(0.912)	14449	5.00000	5.23
50	Toluene	91	7.042	7.045	(0.854)	52477	5.00000	4.77(a)
20	trans-1,2-Dichloroethene	96	3.136	3.139	(0.641)	10913	5.00000	6.41
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	12829	5.00000	4.52(a)
38	Trichloroethene	130	5.857	5.861	(1.042)	13269	5.00000	4.94(a)
8	Trichlorofluoromethane	101	1.947	1.951	(0.398)	56856	5.00000	5.55
5	Vinyl Chloride	62	1.411	1.419	(0.289)	28621	5.00000	5.39

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.

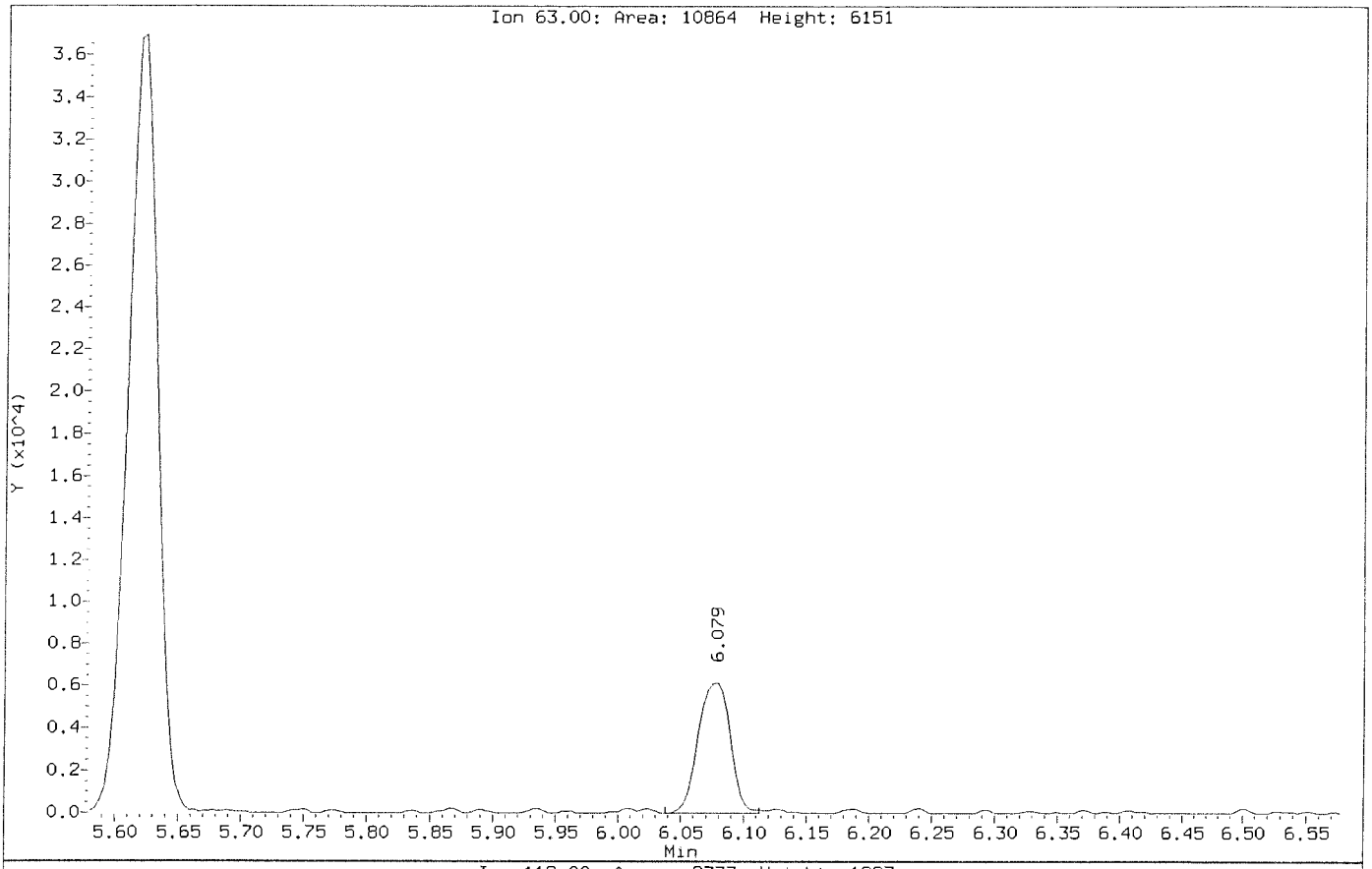


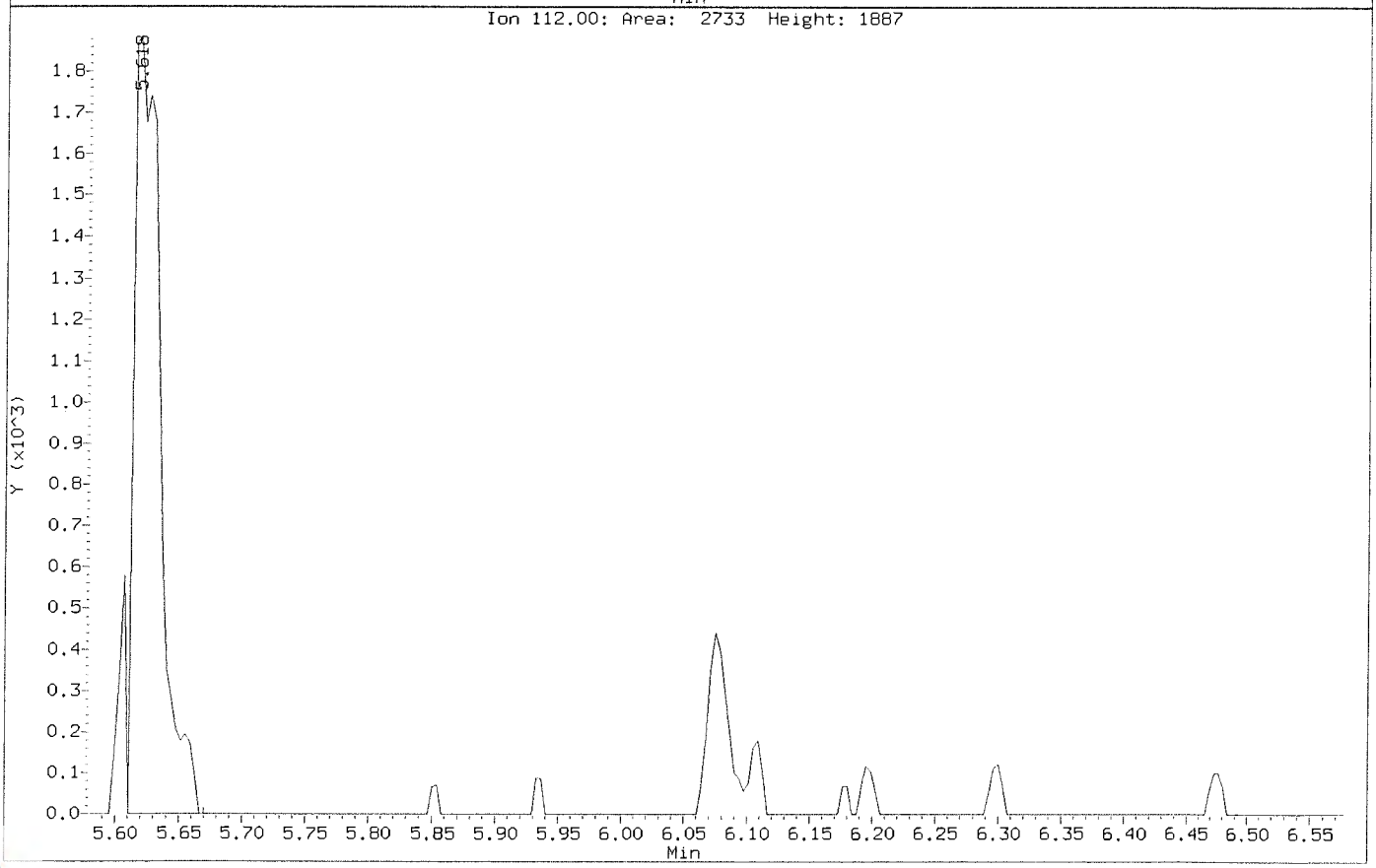
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Client ID: VSTD005
Sample Info: VSTD005;VSTD005;1;5;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111206.D
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Client Sample ID: VSTD005

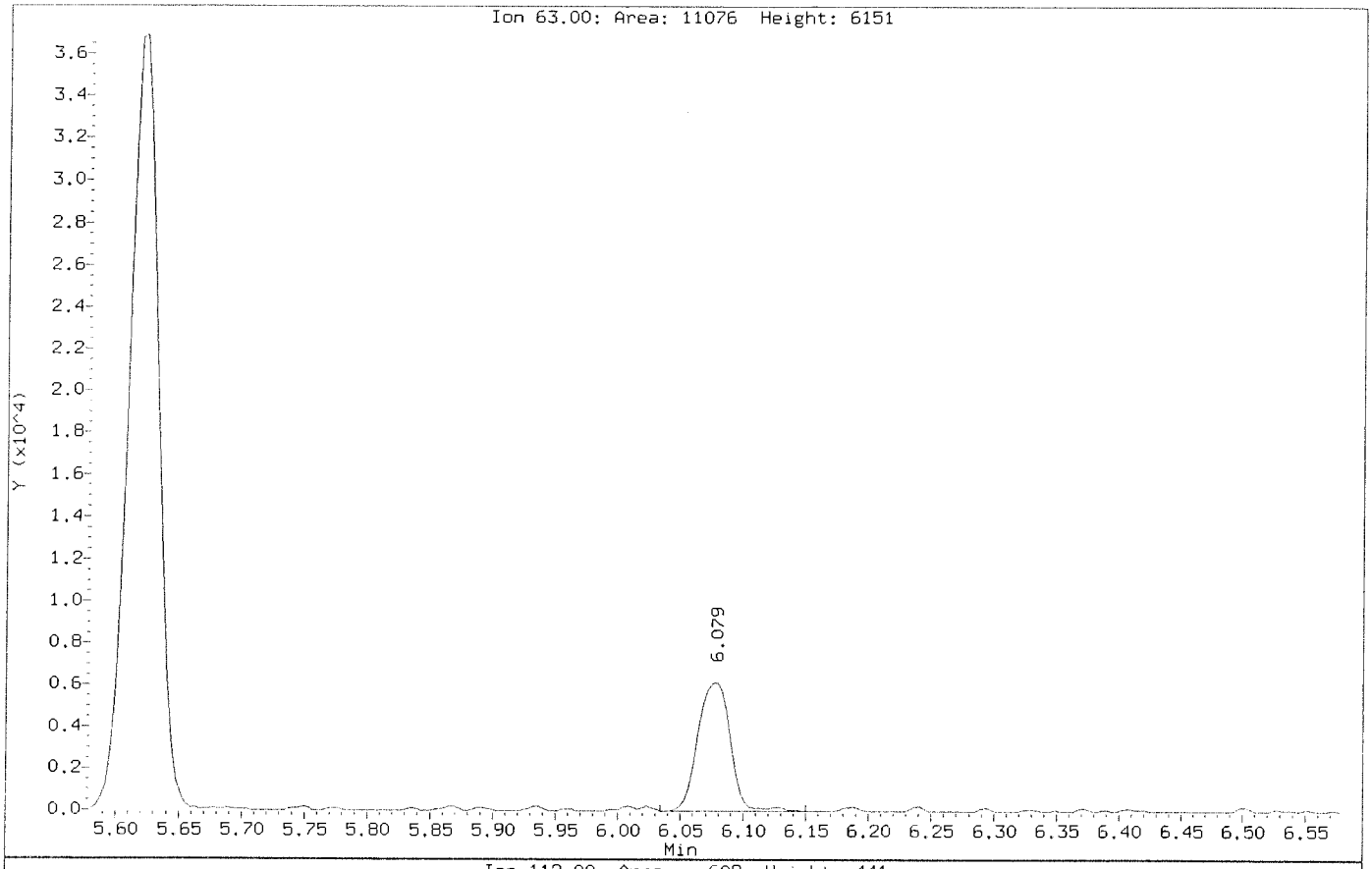
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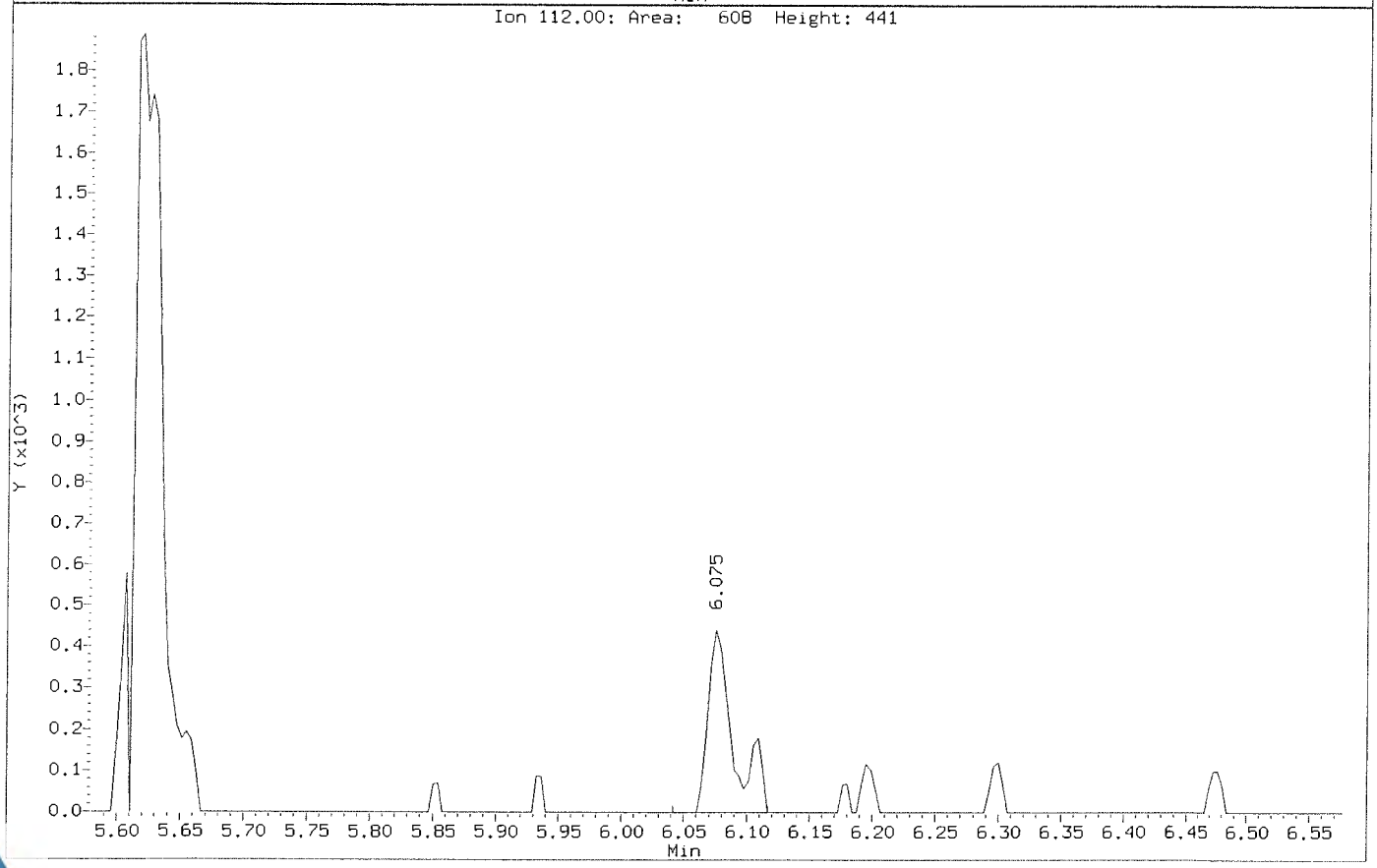




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Instrument: VOA9.i
Client Sample ID: VSTD005

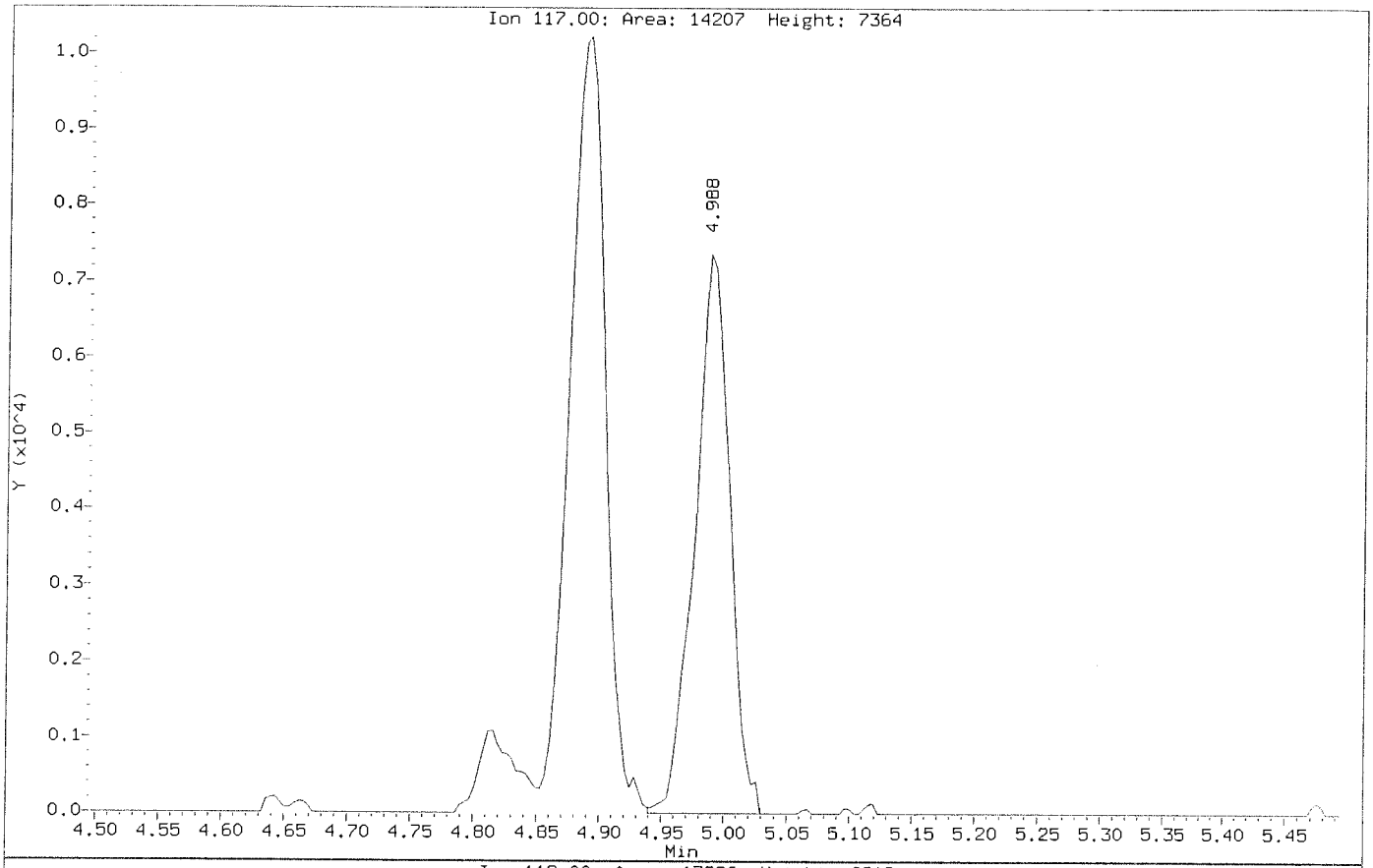
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CAS Number: 78-87-5

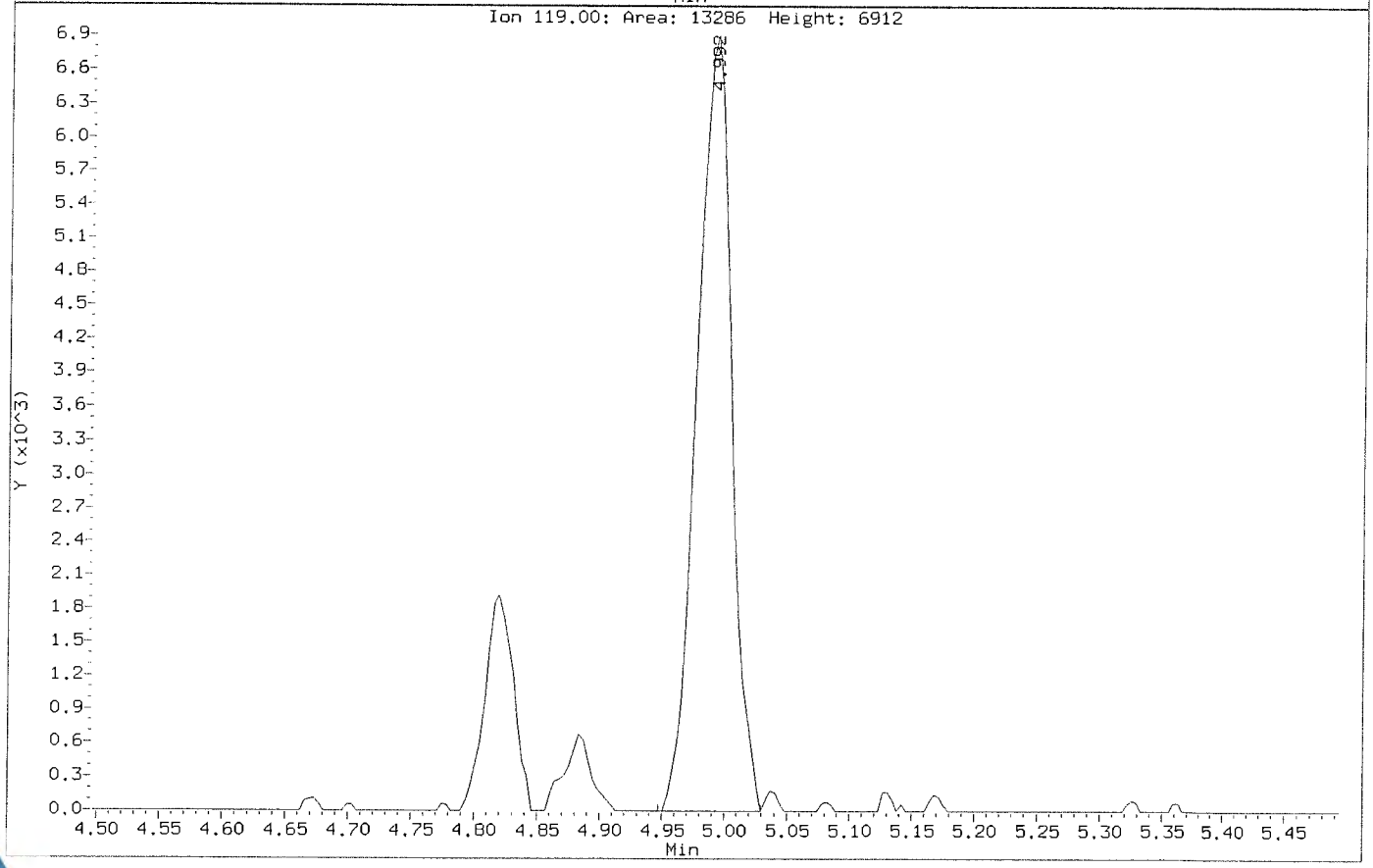




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Injection Date: 12-NOV-2019 13:17
Instrument: VOA9.i
Client Sample ID: VSTD005

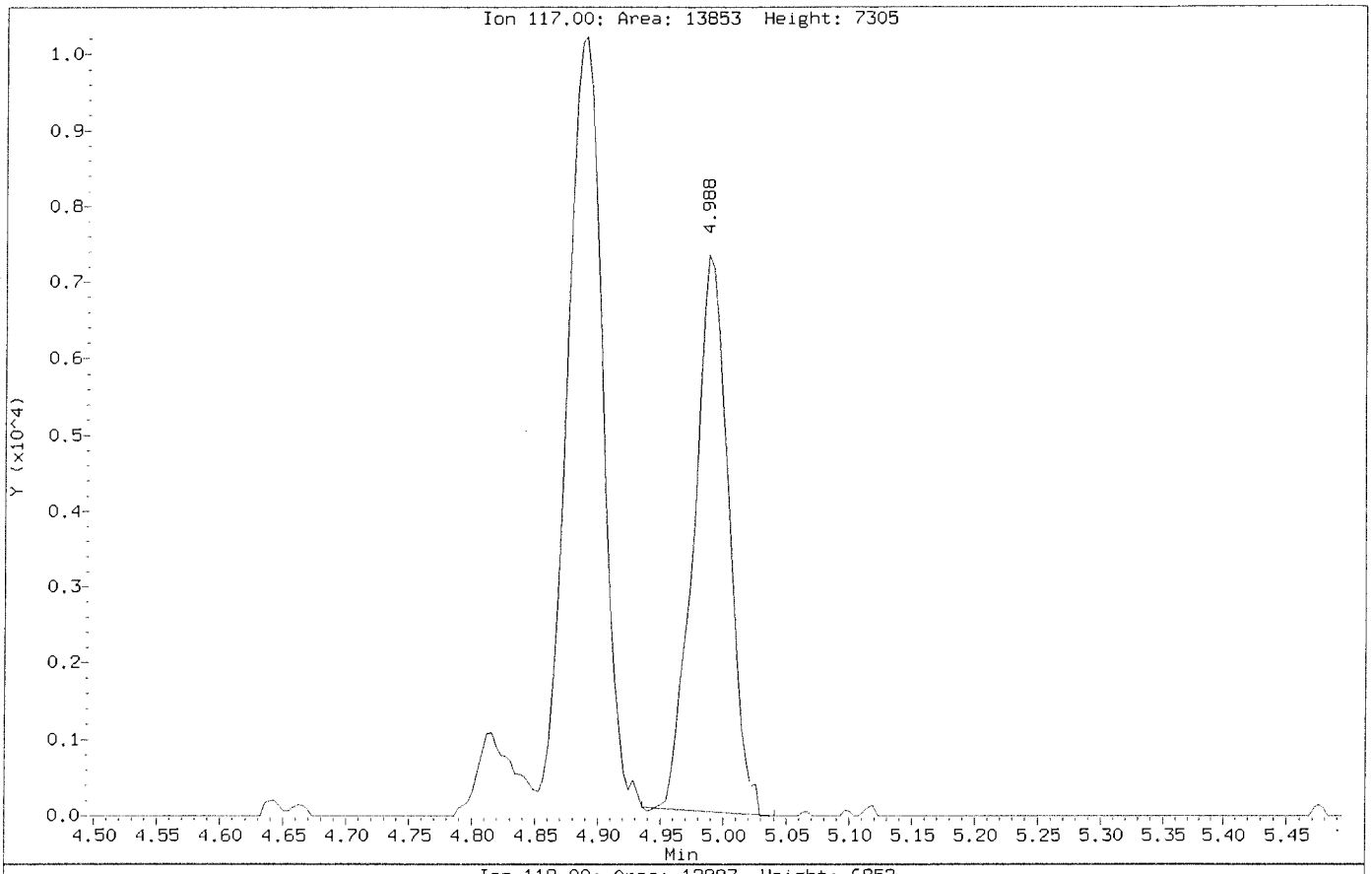
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

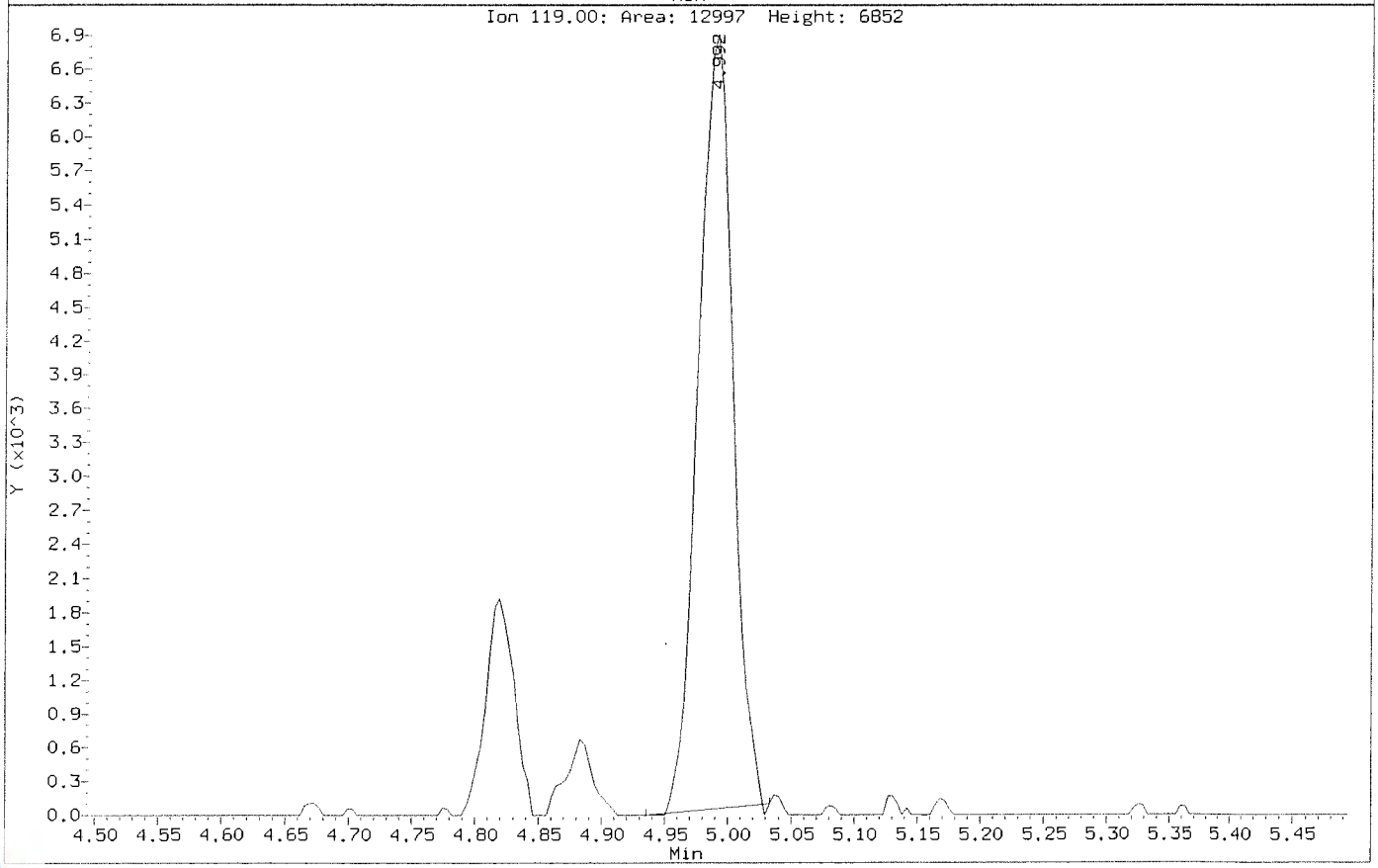




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Injection Date: 12-NOV-2019 13:17
Instrument: VOA9.i
Client Sample ID: VSTD005

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111207.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111207.D
Lab Smp Id: VSTD020 Client Smp ID: VSTD020
Inj Date : 12-NOV-2019 13:41
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD020;VSTD020;1;6;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 13:41 Cal File: U112107.D
Als bottle: 8 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

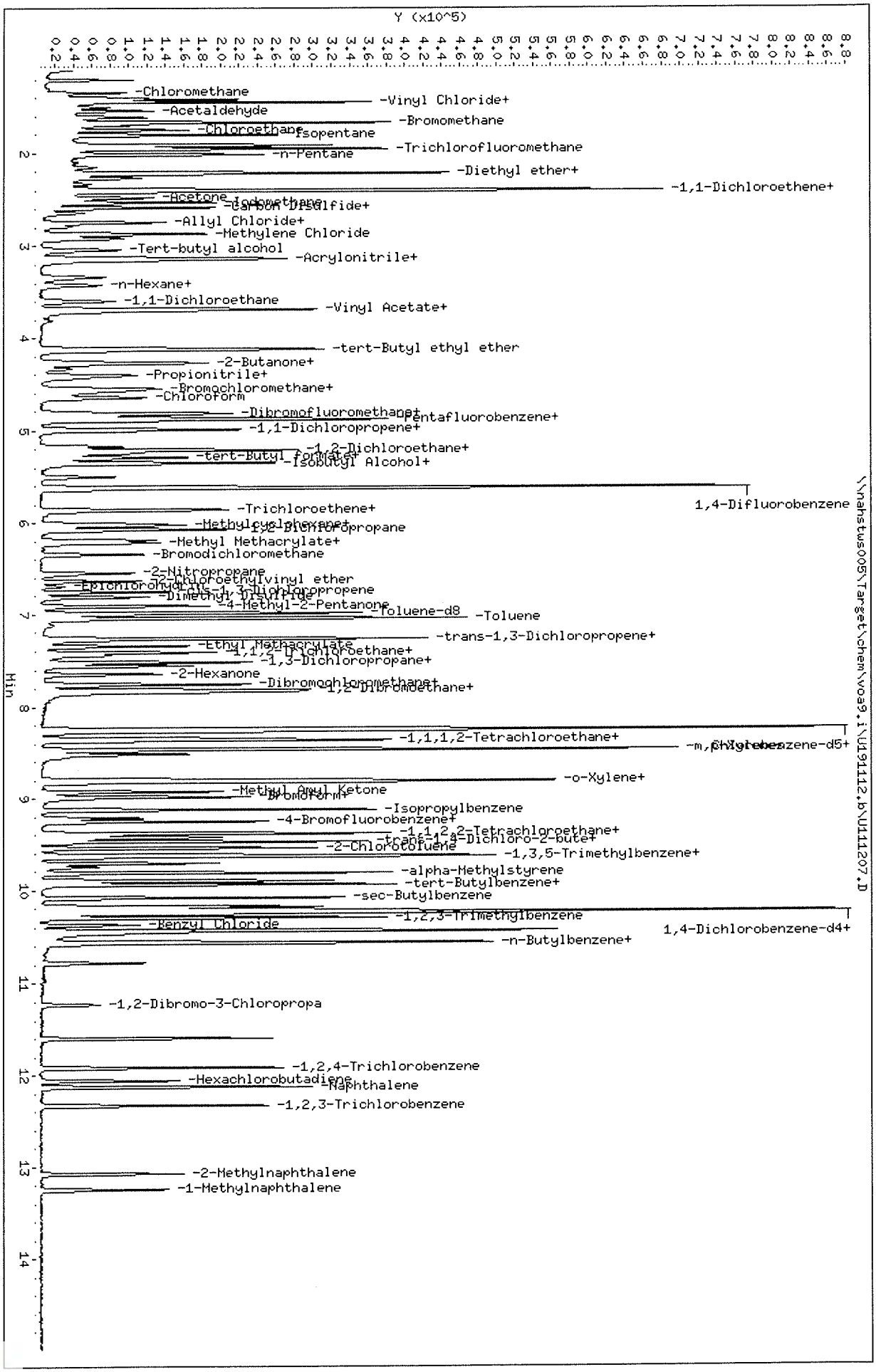
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	252365	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	426364	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	393720	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	207703	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	52733	20.0000	20.35
$ 69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	57298	20.0000	19.24
$ 30 Dibromofluoromethane	113	4.827	4.826	(0.987)	52362	20.0000	20.76
$ 48 Toluene-d8	98	6.986	6.989	(0.847)	186186	20.0000	19.12
60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	49905	20.0000	18.83
31 1,1,1-Trichloroethane	97	4.823	4.826	(0.986)	72360	20.0000	19.27
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	72455	20.0000	19.66
138 Freon TF	101	2.397	2.397	(0.490)	119226	20.0000	21.17
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	41199	20.0000	20.14
22 1,1-Dichloroethane	63	3.601	3.600	(0.736)	71605	20.0000	19.99
11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	119195	20.0000	20.22
32 1,1-Dichloropropene	75	4.999	5.002	(0.889)	59990	20.0000	20.98
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	71068	20.0000	21.75
71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	69380	20.0000	19.65
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	72888	20.0000	19.71
79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	193360	20.0000	20.07
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	12005	20.0000	17.66
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	56331	20.0000	19.01
88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	124504	20.0000	19.89

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111207.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.250	(0.933)	64241	20.0000	20.24
42	1,2-Dichloropropane	63	6.079	6.078	(1.081)	42821	20.0000	21.06(M)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	174754	20.0000	19.30
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	120102	20.0000	19.54
54	1,3-Dichloropropane	76	7.559	7.563	(0.917)	84028	20.0000	20.54
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	122825	20.0000	18.45
26	2,2-Dichloropropane	77	4.272	4.271	(0.874)	60002	20.0000	20.73
24	2-Butanone	43	4.336	4.339	(0.887)	39572	40.0000	42.05
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	136106	20.0000	20.22
52	2-Hexanone	43	7.646	7.649	(0.927)	71069	40.0000	41.32
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	166537	20.0000	19.62
82	p-Isopropyltoluene	119	10.206	10.209	(0.997)	189235	20.0000	19.54
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	92447	40.0000	40.24
10	Acetone	43	2.476	2.483	(0.506)	85175	40.0000	46.94
37	Benzene	78	5.213	5.216	(0.927)	189103	20.0000	20.51
74	Bromobenzene	156	9.378	9.381	(0.916)	70845	20.0000	18.86
29	Bromochloromethane	128	4.553	4.553	(0.931)	28635	20.0000	19.22
39	Bromodichloromethane	83	6.341	6.344	(1.128)	61138	20.0000	21.50
66	Bromoform	173	8.980	8.984	(1.089)	35985	20.0000	17.88
6	Bromomethane	94	1.666	1.659	(0.341)	145407	20.0000	21.34
19	Carbon Disulfide	76	2.585	2.584	(0.529)	225887	40.0000	40.35
34	Carbon Tetrachloride	117	4.992	4.995	(0.888)	59830	20.0000	20.18(M)
59	Chlorobenzene	112	8.272	8.271	(1.003)	148149	20.0000	18.58
7	Chloroethane	64	1.749	1.741	(0.358)	80331	20.0000	21.72
28	Chloroform	83	4.654	4.654	(0.952)	85208	20.0000	19.97
3	Chloromethane	50	1.340	1.340	(0.274)	54009	20.0000	23.37
27	cis-1,2-Dichloroethene	96	4.279	4.283	(0.875)	56053	20.0000	19.49
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	68022	20.0000	21.91
55	Dibromochloromethane	129	7.754	7.758	(0.940)	50243	20.0000	18.33
44	Dibromomethane	93	6.184	6.187	(1.100)	36038	20.0000	20.85
2	Dichlorodifluoromethane	85	1.202	1.205	(0.246)	50854	20.0000	19.81
61	Ethylbenzene	106	8.369	8.369	(1.015)	77455	20.0000	19.48
91	Hexachlorobutadiene	225	12.058	12.061	(1.178)	23698	20.0000	18.93
67	Isopropylbenzene	105	9.123	9.126	(1.106)	222410	20.0000	19.73
62	m,p-Xylenes	106	8.470	8.470	(1.027)	189422	40.0000	38.94
17	Methylene Chloride	84	2.866	2.869	(0.586)	45816	20.0000	20.02
87	n-Butylbenzene	91	10.551	10.554	(1.031)	153530	20.0000	18.93
73	n-Propylbenzene	91	9.471	9.475	(0.926)	244573	20.0000	20.14
92	Naphthalene	128	12.129	12.129	(1.185)	211657	20.0000	21.54
63	o-Xylene	106	8.808	8.807	(1.068)	97807	20.0000	19.84
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	204634	20.0000	20.11
64	Styrene	104	8.819	8.822	(1.070)	166410	20.0000	19.41
78	tert-Butylbenzene	119	9.899	9.898	(0.967)	158372	20.0000	20.60
56	Tetrachloroethene	166	7.522	7.522	(0.912)	57583	20.0000	19.29
50	Toluene	91	7.042	7.045	(0.854)	220147	20.0000	18.53
20	trans-1,2-Dichloroethene	96	3.136	3.139	(0.641)	45366	20.0000	19.68
51	trans-1,3-Dichloropropene	75	7.256	7.259	(1.291)	62161	20.0000	18.17
38	Trichloroethene	130	5.857	5.861	(1.042)	58073	20.0000	20.57
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	222709	20.0000	20.56
5	Vinyl Chloride	62	1.415	1.419	(0.289)	114548	20.0000	20.41

QC Flag Legend

M - Compound response manually integrated.

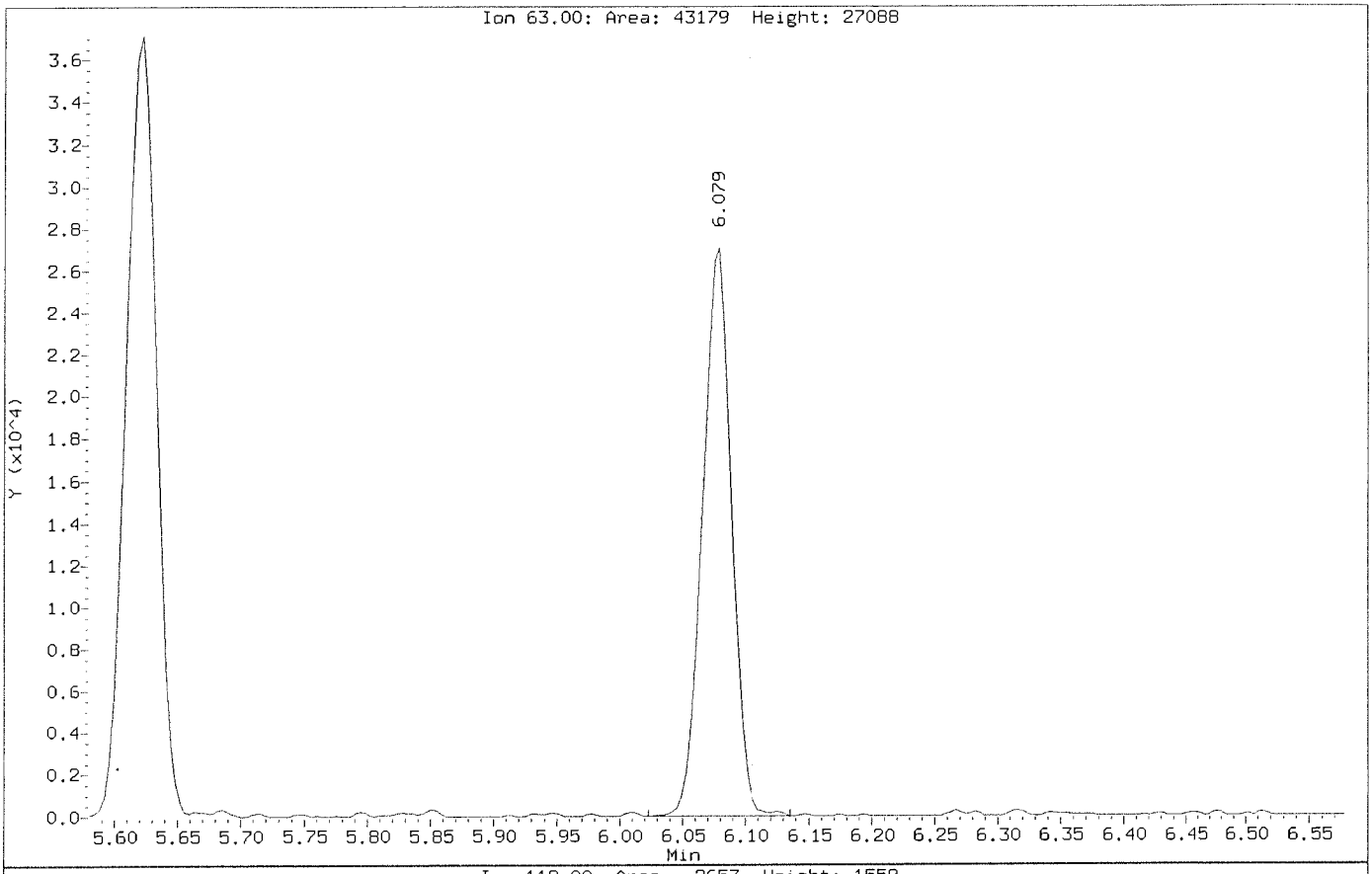


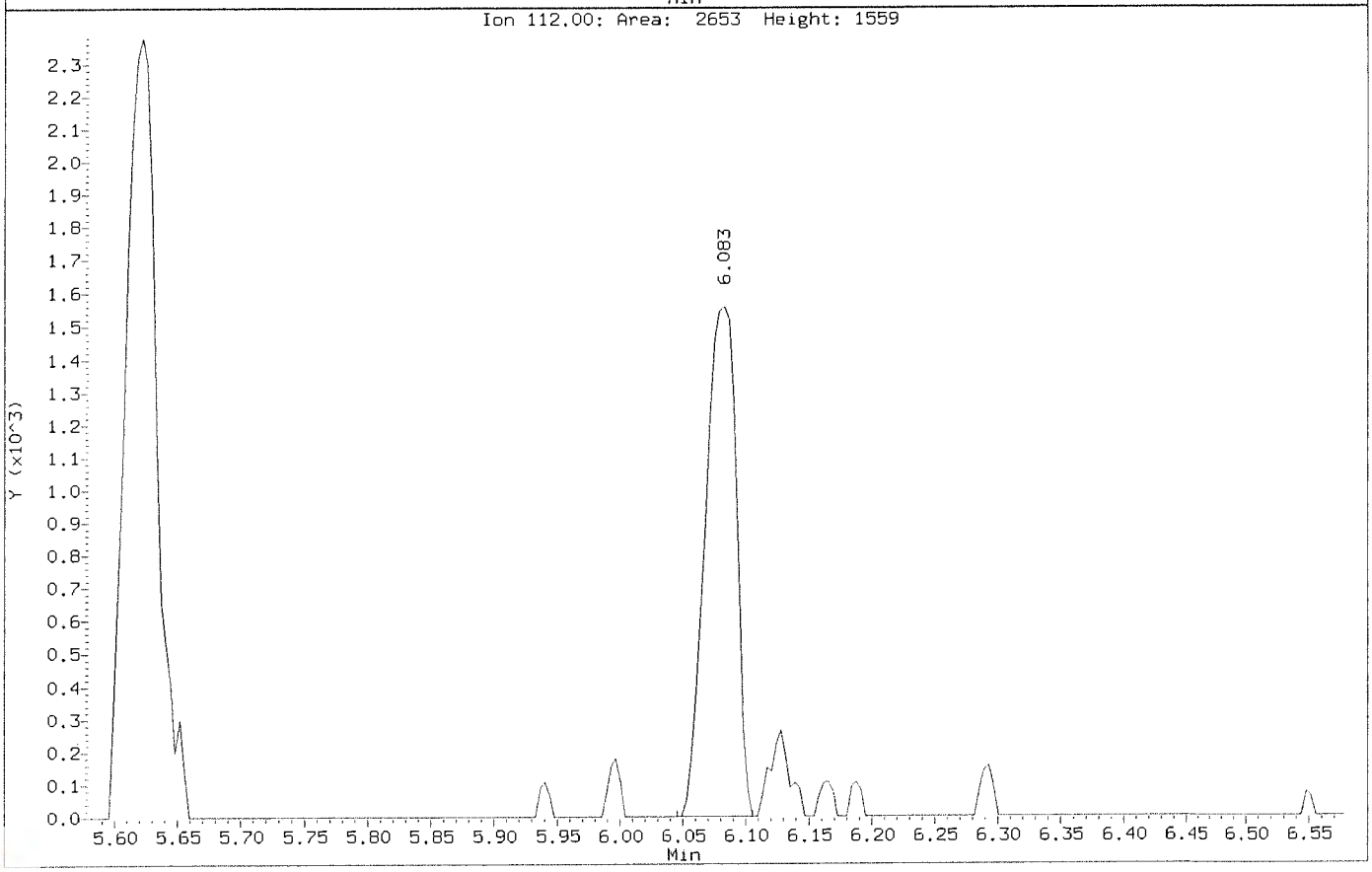
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Client ID: VSTD020
Sample Info: VSTD020;VSTD020;1;6;
Purge Volume: 5.0
Column phase: DB624

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Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111207.D
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Instrument: VOA9.i
Client Sample ID: VSTD020

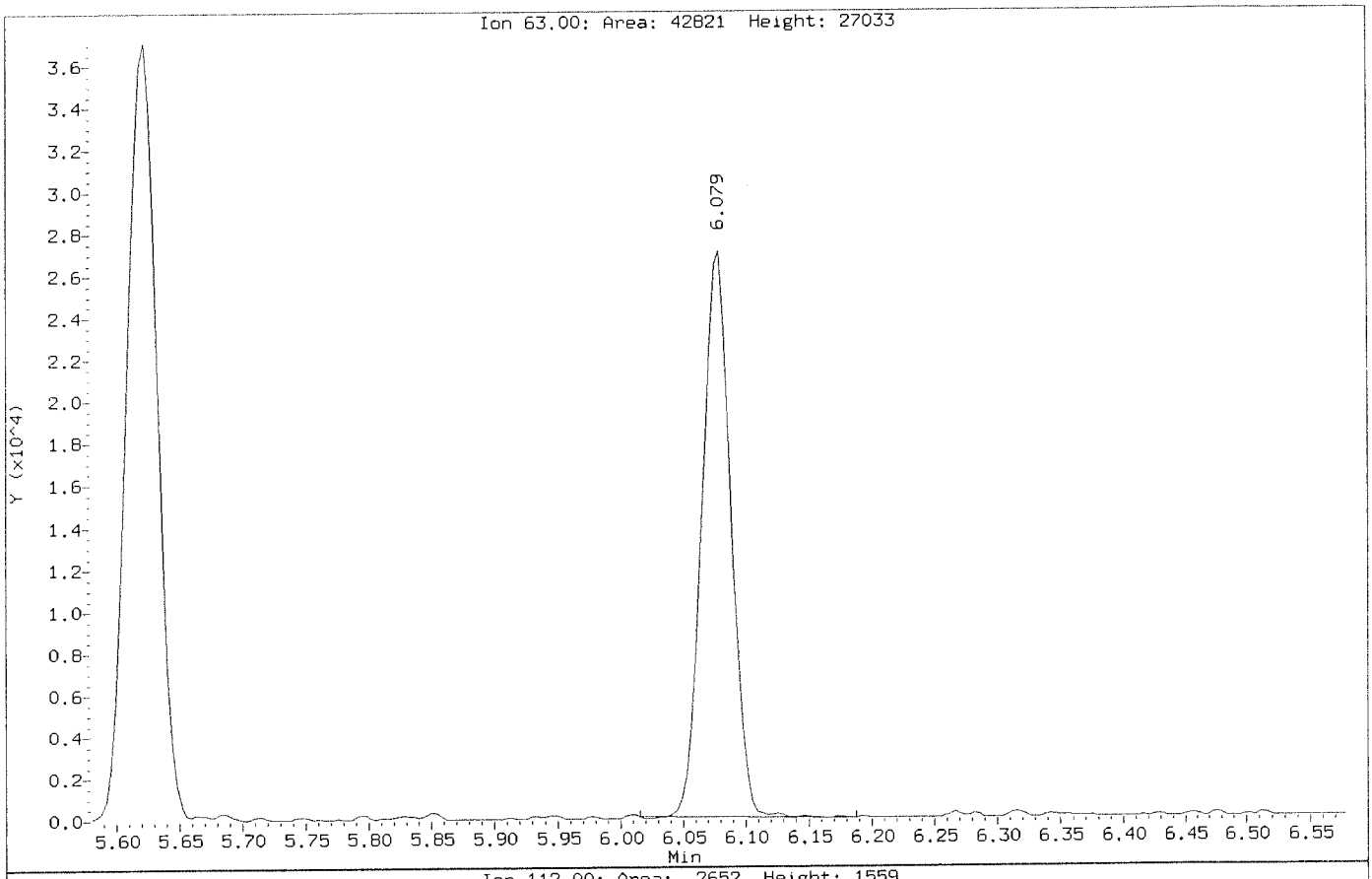
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

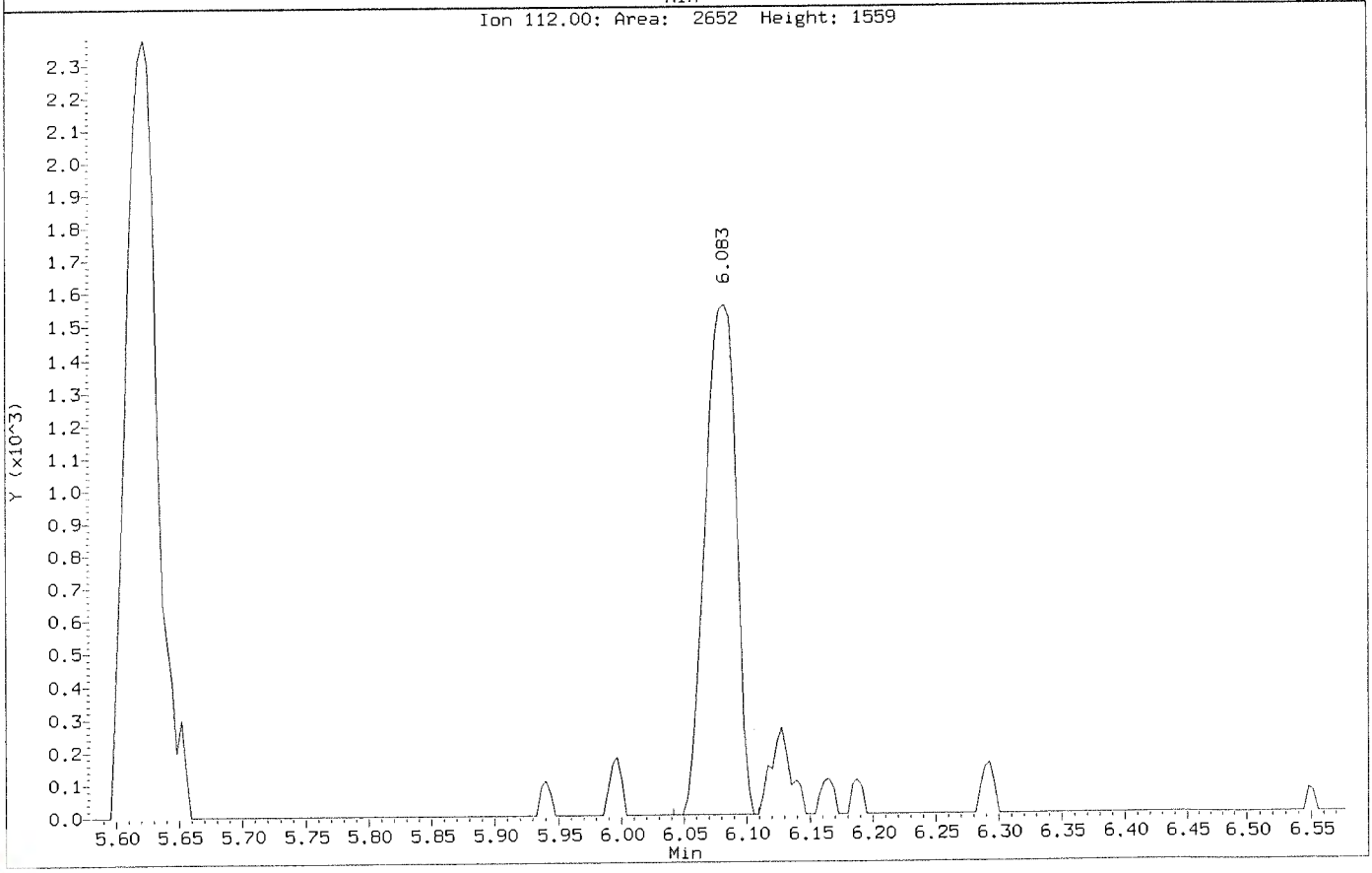




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Instrument: VOA9.i
Client Sample ID: VSTD020

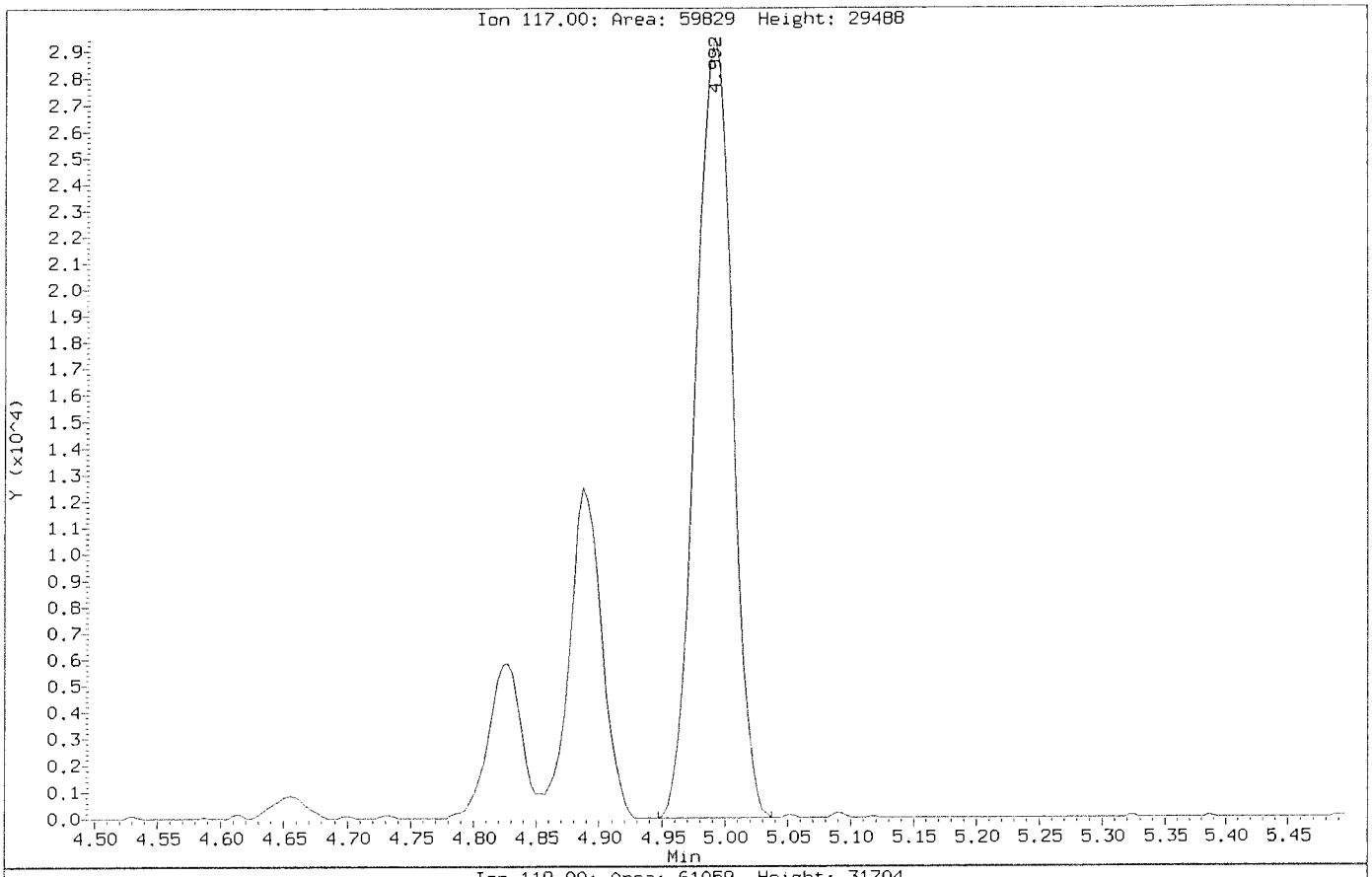
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

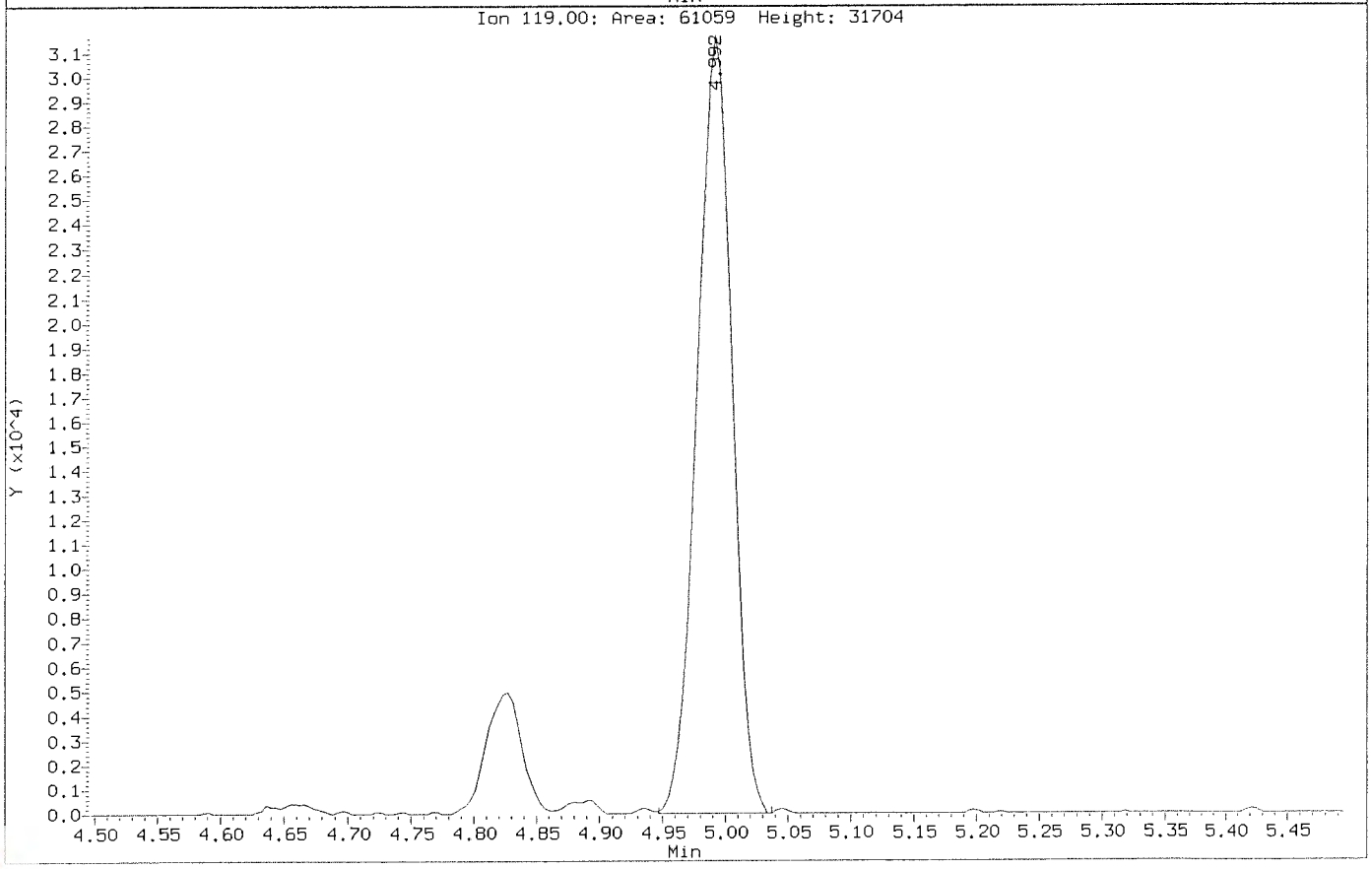




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Injection Date: 12-NOV-2019 13:41
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Client Sample ID: VSTD020

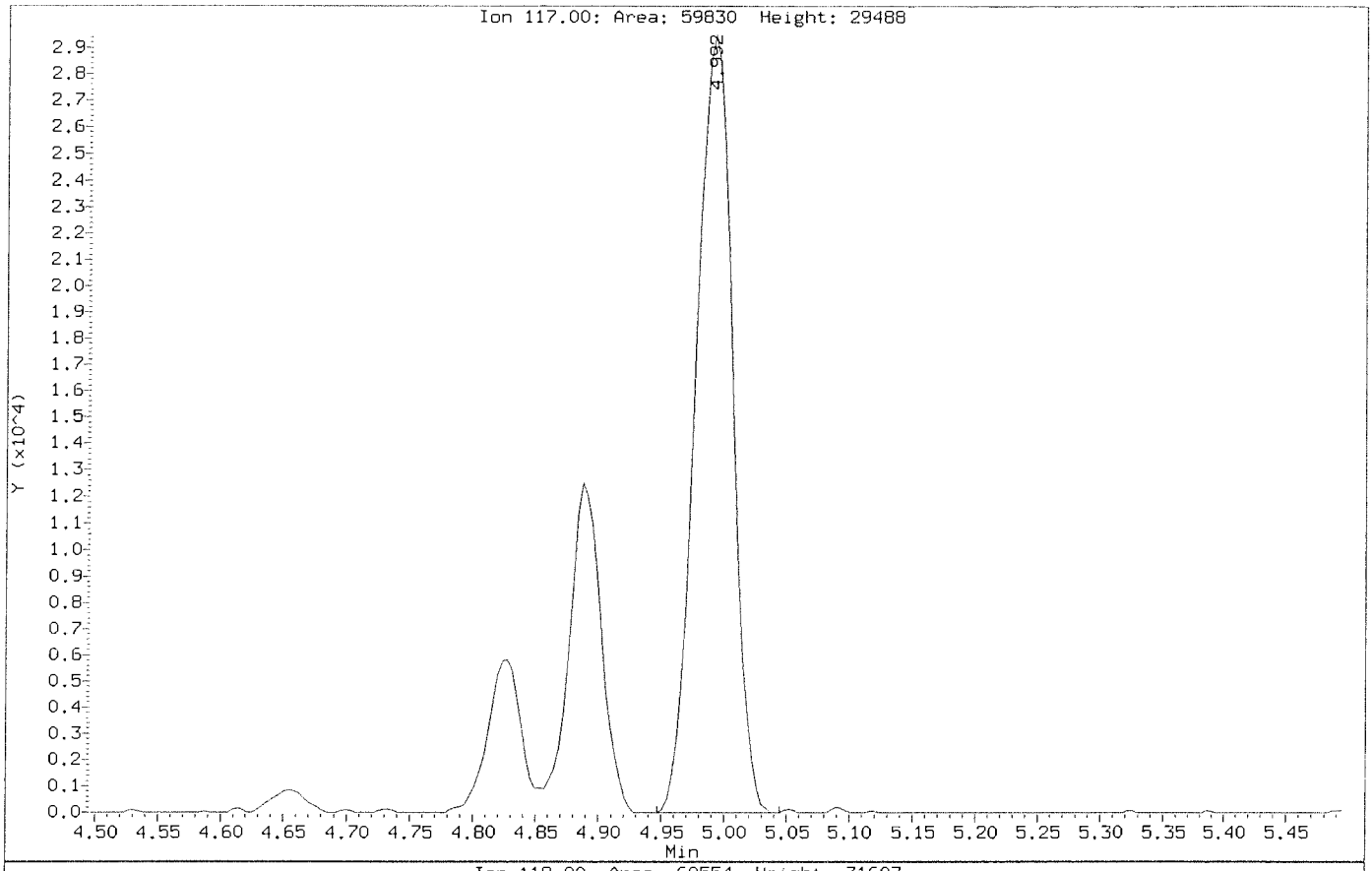
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

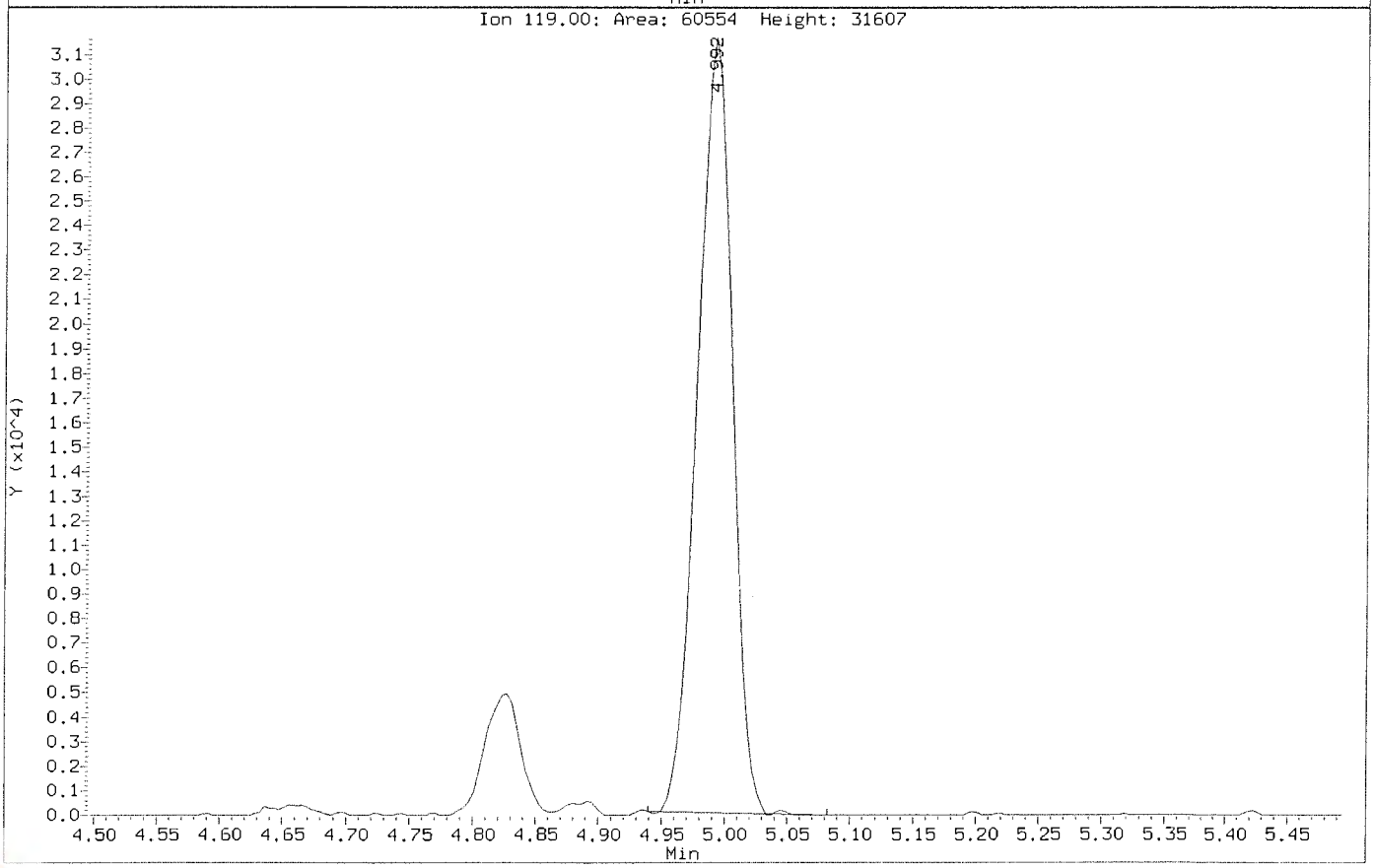




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Injection Date: 12-NOV-2019 13:41
Instrument: VOA9.i
Client Sample ID: VSTD020

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111208.D Page 1
Report Date: 05-Dec-2019 15:55

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Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111208.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 12-NOV-2019 14:05
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;1;7;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U112108.D
Als bottle: 9 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

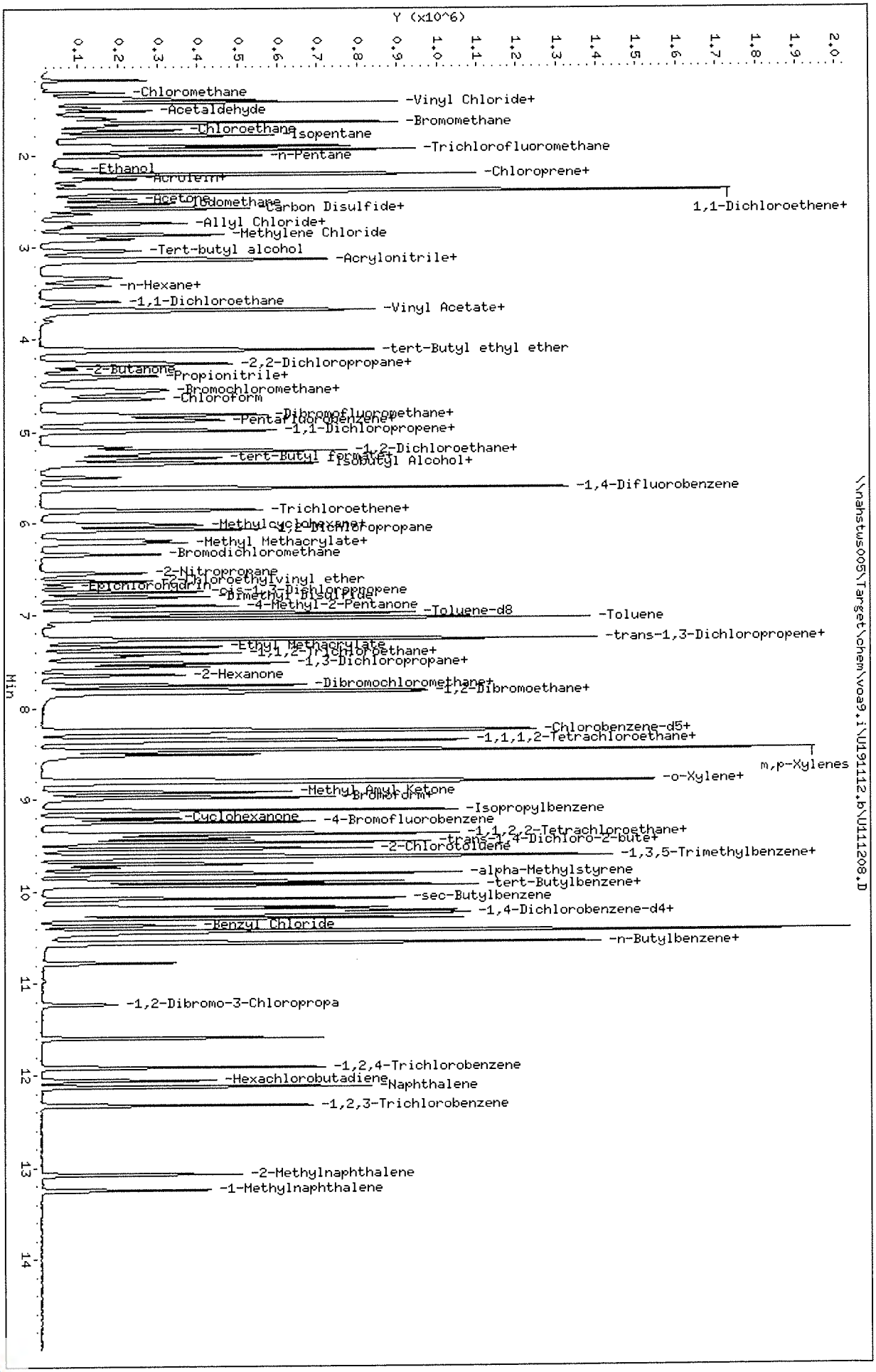
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.886	4.894	(1.000)	274984	50.0000	
*	36 1,4-Difluorobenzene	114	5.617	5.625	(1.000)	462686	50.0000	
*	47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	425551	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	234180	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.168	5.175	(1.058)	139459	50.0000	50.76
$	69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	152807	50.0000	46.51
$	30 Dibromofluoromethane	113	4.823	4.826	(0.987)	136408	50.0000	50.24
$	48 Toluene-d8	98	6.986	6.989	(0.847)	511889	50.0000	48.45
	60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	141983	50.0000	46.74
	31 1,1,1-Trichloroethane	97	4.819	4.826	(0.986)	206054	50.0000	50.37
	68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	204249	50.0000	49.16
	138 Freon TF	101	2.394	2.397	(0.490)	301725	50.0000	49.18
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	112669	50.0000	50.95
	22 1,1-Dichloroethane	63	3.593	3.600	(0.735)	185329	50.0000	47.49
	11 1,1-Dichloroethene	96	2.390	2.397	(0.489)	312659	50.0000	48.67
	32 1,1-Dichloropropene	75	4.999	5.002	(0.890)	154684	50.0000	49.85
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	190715	50.0000	51.77
	71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	201165	50.0000	50.55
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	208615	50.0000	50.03
	79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	534556	50.0000	49.21
	89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	39470	50.0000	48.43
	57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	153059	50.0000	47.79
	88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	362890	50.0000	51.44

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111208.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.250	(0.934)	161783	50.0000	46.97
42	1,2-Dichloropropane	63	6.075	6.078	(1.081)	112389	50.0000	53.19(M)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	502987	50.0000	49.29
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	330950	50.0000	47.76
54	1,3-Dichloropropane	76	7.559	7.563	(0.917)	219357	50.0000	49.61
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	341529	50.0000	45.51
26	2,2-Dichloropropane	77	4.268	4.271	(0.873)	161244	50.0000	51.13
24	2-Butanone	43	4.328	4.339	(0.886)	100156	100.000	99.98
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	382775	50.0000	50.45
52	2-Hexanone	43	7.646	7.649	(0.927)	175084	100.000	94.20
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	472934	50.0000	49.43
82	p-Isopropyltoluene	119	10.206	10.209	(0.997)	548499	50.0000	50.24
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	248819	100.000	100.22
10	Acetone	43	2.472	2.483	(0.506)	193875	100.000	110.43
37	Benzene	78	5.213	5.216	(0.928)	496740	50.0000	49.67
74	Bromobenzene	156	9.377	9.381	(0.916)	195409	50.0000	46.14
29	Bromochloromethane	128	4.545	4.553	(0.930)	76376	50.0000	47.04
39	Bromodichloromethane	83	6.341	6.344	(1.129)	161027	50.0000	52.20
66	Bromoform	173	8.980	8.984	(1.089)	110280	50.0000	45.94
6	Bromomethane	94	1.655	1.659	(0.339)	367813	50.0000	47.93(M)
19	Carbon Disulfide	76	2.581	2.584	(0.528)	618744	100.000	101.44
34	Carbon Tetrachloride	117	4.988	4.995	(0.888)	172023	50.0000	53.48(M)
59	Chlorobenzene	112	8.272	8.271	(1.003)	411095	50.0000	47.70
7	Chloroethane	64	1.741	1.741	(0.356)	198912	50.0000	51.60
28	Chloroform	83	4.650	4.654	(0.952)	226516	50.0000	48.72
3	Chloromethane	50	1.333	1.340	(0.273)	127356	50.0000	51.99
27	cis-1,2-Dichloroethene	96	4.275	4.283	(0.875)	145273	50.0000	46.37
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.202)	193167	50.0000	57.35
55	Dibromochloromethane	129	7.754	7.758	(0.940)	150176	50.0000	46.21
44	Dibromomethane	93	6.184	6.187	(1.101)	96316	50.0000	51.37
2	Dichlorodifluoromethane	85	1.198	1.205	(0.245)	135245	50.0000	48.36
61	Ethylbenzene	106	8.365	8.369	(1.015)	207872	50.0000	48.38
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	68602	50.0000	48.62
67	Isopropylbenzene	105	9.123	9.126	(1.106)	610611	50.0000	50.12
62	m,p-Xylenes	106	8.466	8.470	(1.027)	532797	100.000	101.34
17	Methylene Chloride	84	2.862	2.869	(0.586)	122034	50.0000	47.65
87	n-Butylbenzene	91	10.555	10.554	(1.032)	458736	50.0000	50.18
73	n-Propylbenzene	91	9.471	9.475	(0.926)	679374	50.0000	49.62
92	Naphthalene	128	12.129	12.129	(1.185)	597688	50.0000	53.94
63	o-Xylene	106	8.808	8.807	(1.068)	267074	50.0000	50.13
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	566279	50.0000	49.37
64	Styrene	104	8.819	8.822	(1.070)	466594	50.0000	50.36
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	435678	50.0000	50.26
56	Tetrachloroethene	166	7.522	7.522	(0.912)	157812	50.0000	48.92
50	Toluene	91	7.042	7.045	(0.854)	615947	50.0000	47.96
20	trans-1,2-Dichloroethene	96	3.132	3.139	(0.641)	123828	50.0000	46.49
51	trans-1,3-Dichloropropene	75	7.256	7.259	(1.292)	188731	50.0000	49.52
38	Trichloroethene	130	5.857	5.861	(1.043)	152615	50.0000	49.81
8	Trichlorofluoromethane	101	1.944	1.951	(0.398)	584721	50.0000	49.55
5	Vinyl Chloride	62	1.411	1.419	(0.289)	292963	50.0000	47.90

QC Flag Legend

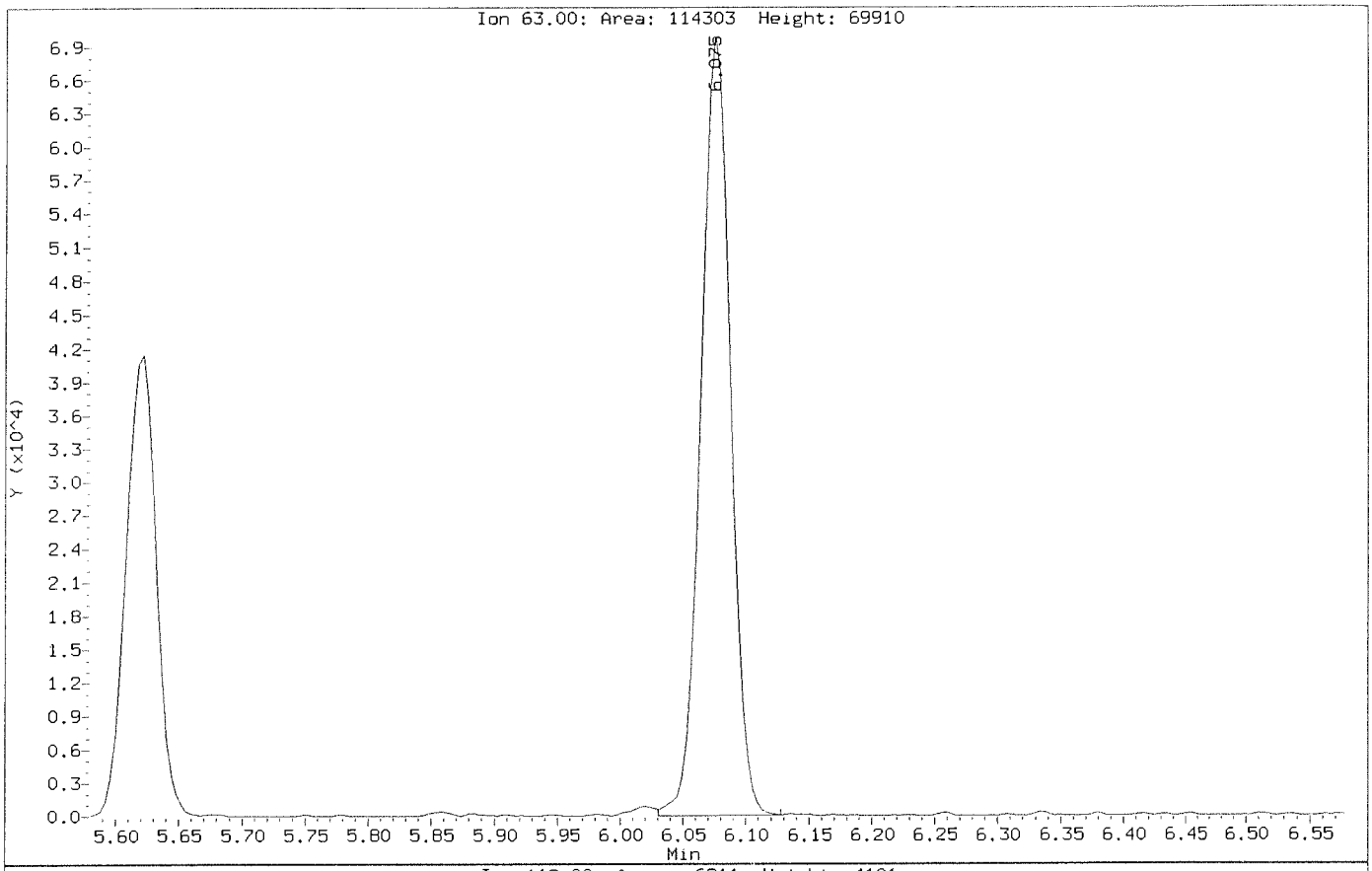
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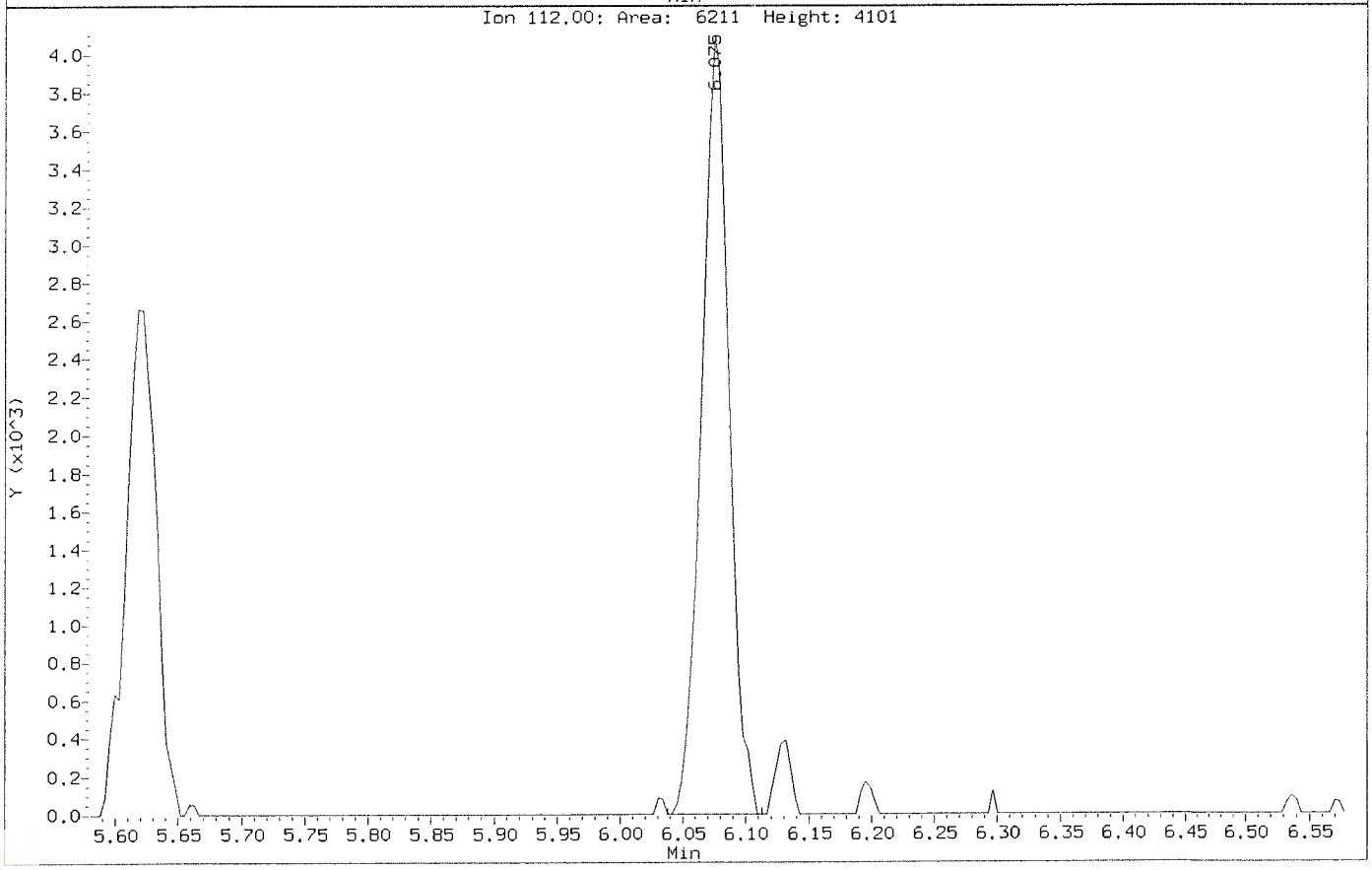


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Date : 12-NOV-2019 14:05
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;1;7;
Purge Volume: 5.0
Column phase: DB624
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

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Injection Date: 12-NOV-2019 14:05
Instrument: VOA9.i
Client Sample ID: VSTD050

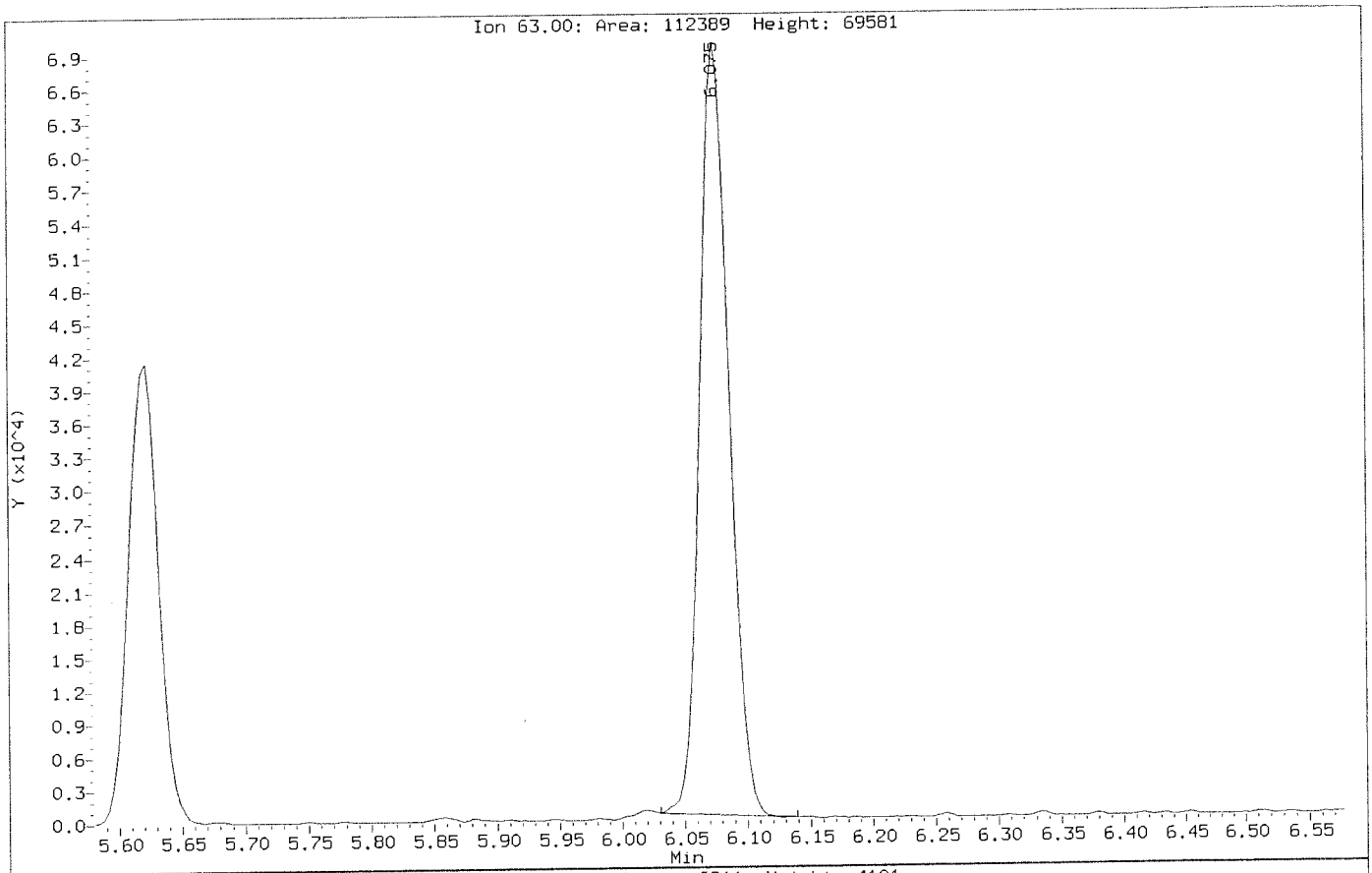
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

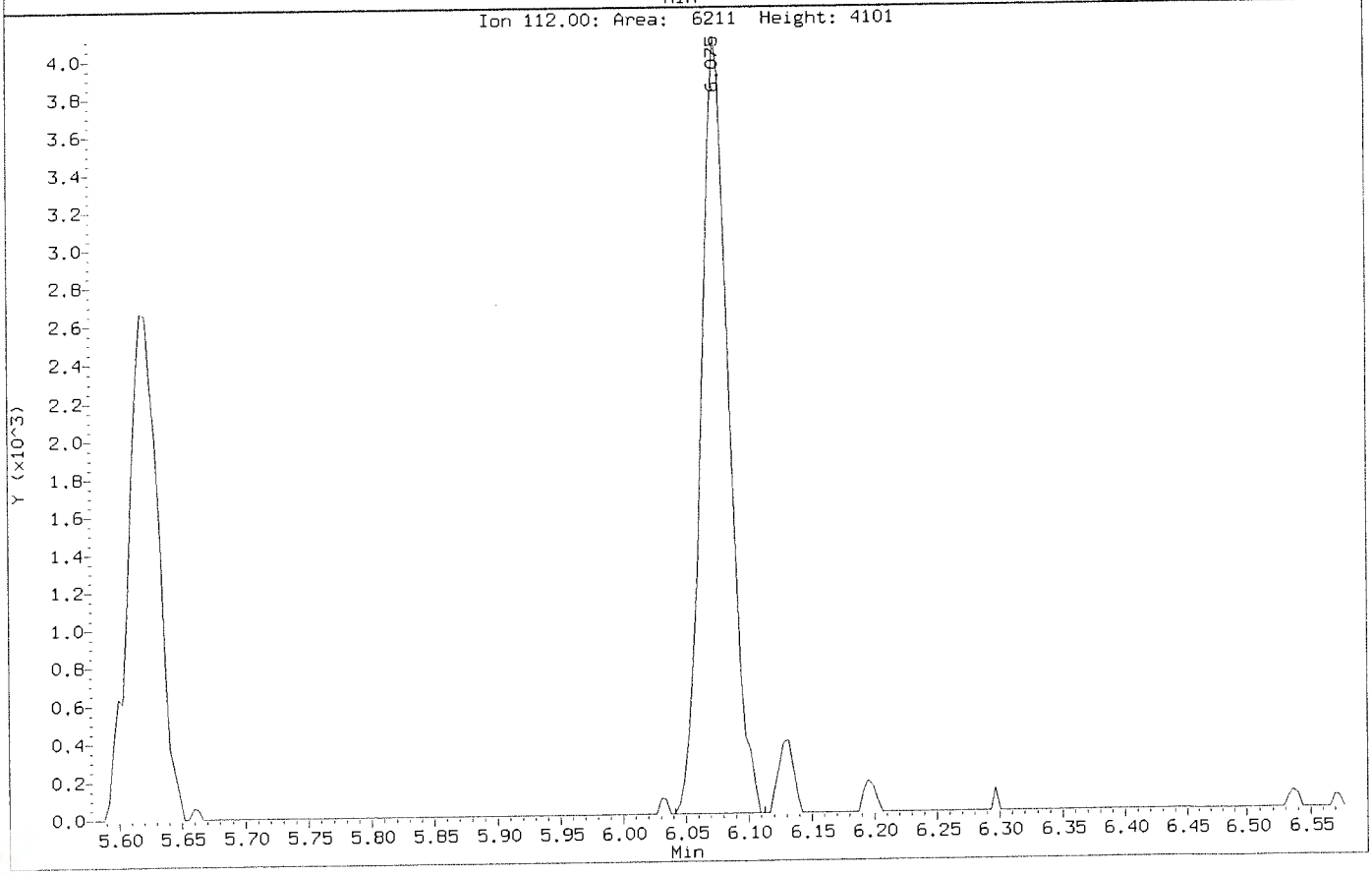




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Instrument: VOA9.i
Client Sample ID: VSTD050

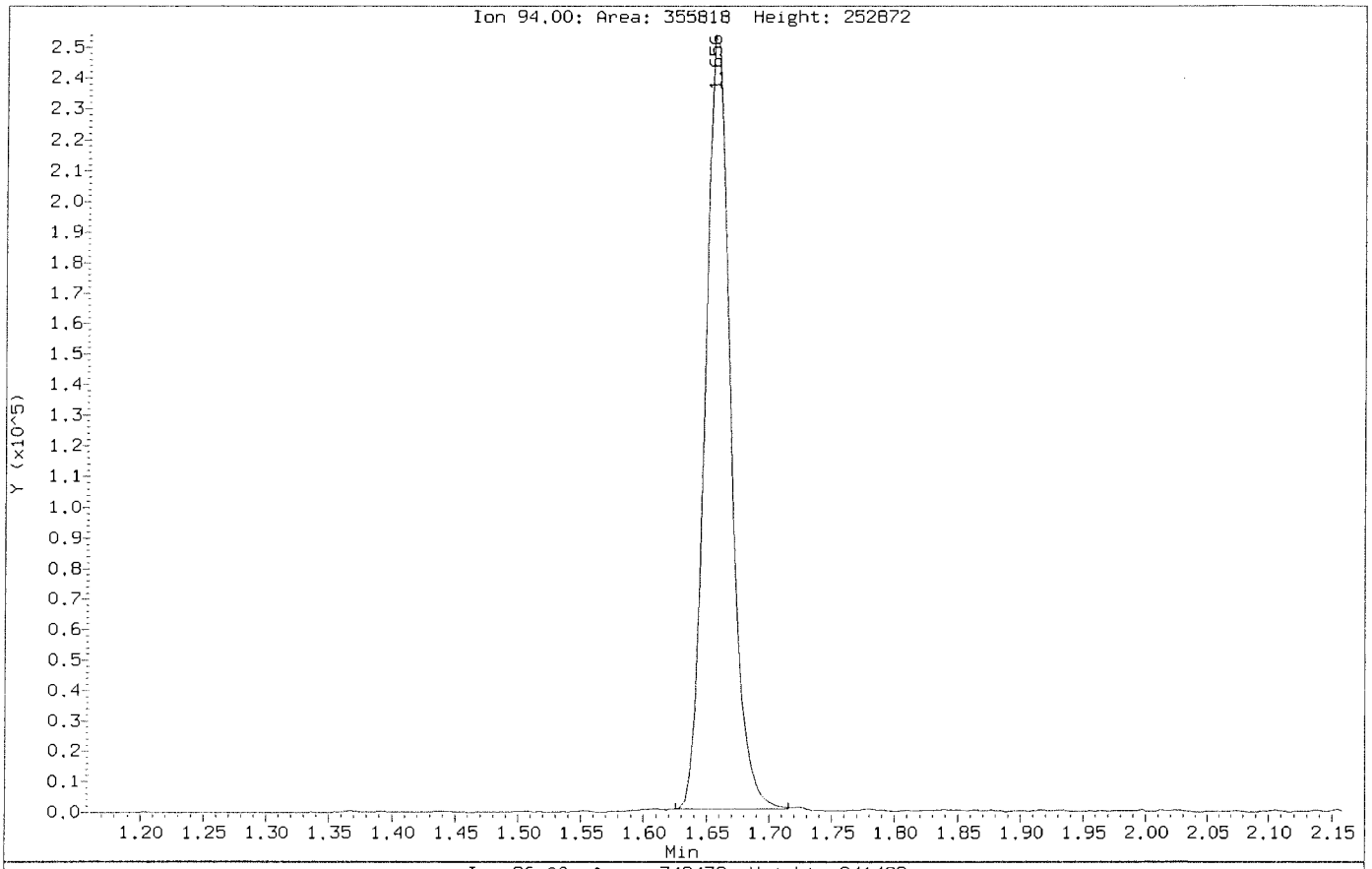
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

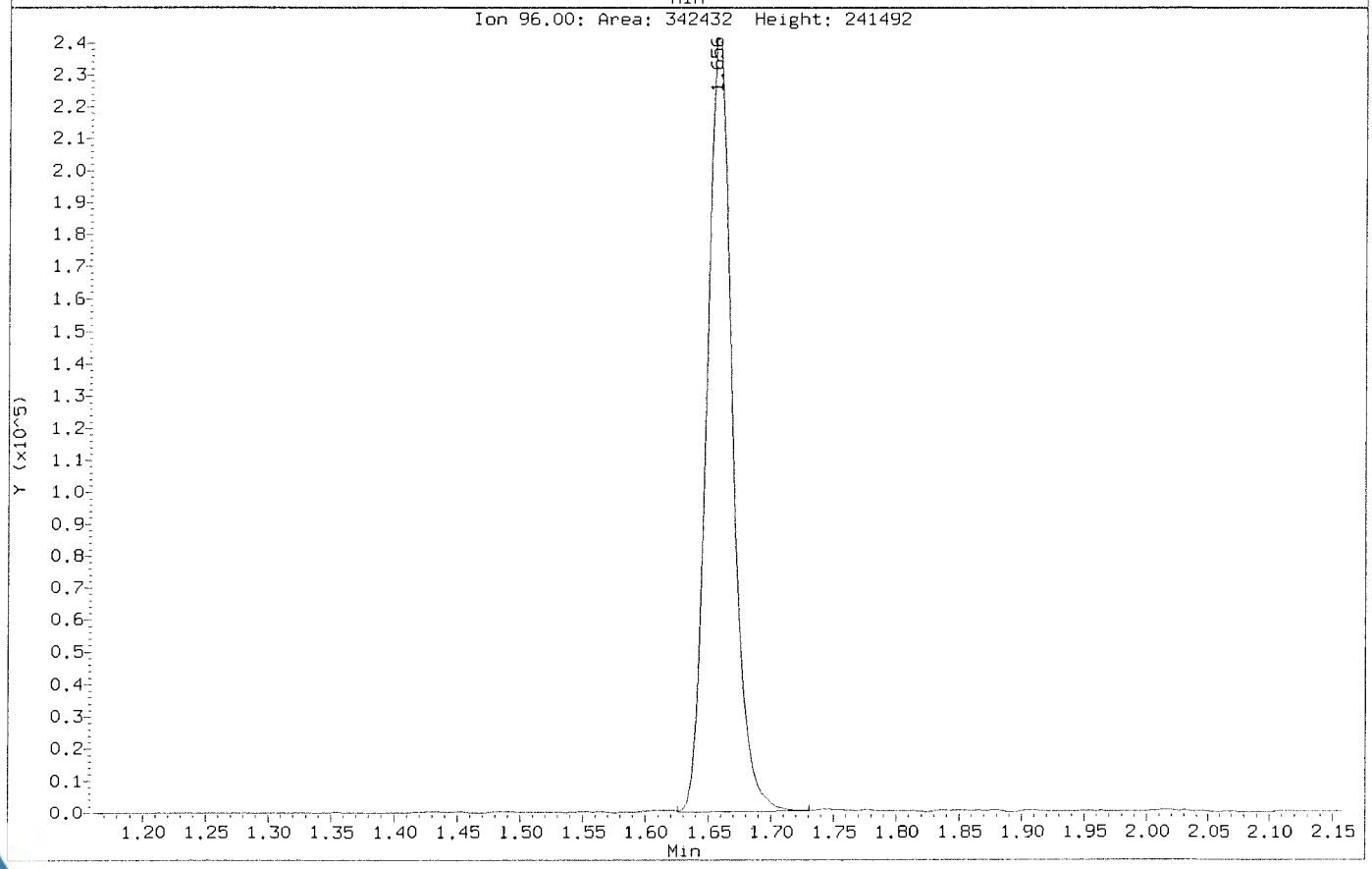




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Injection Date: 12-NOV-2019 14:05
Instrument: VOA9.i
Client Sample ID: VSTD050

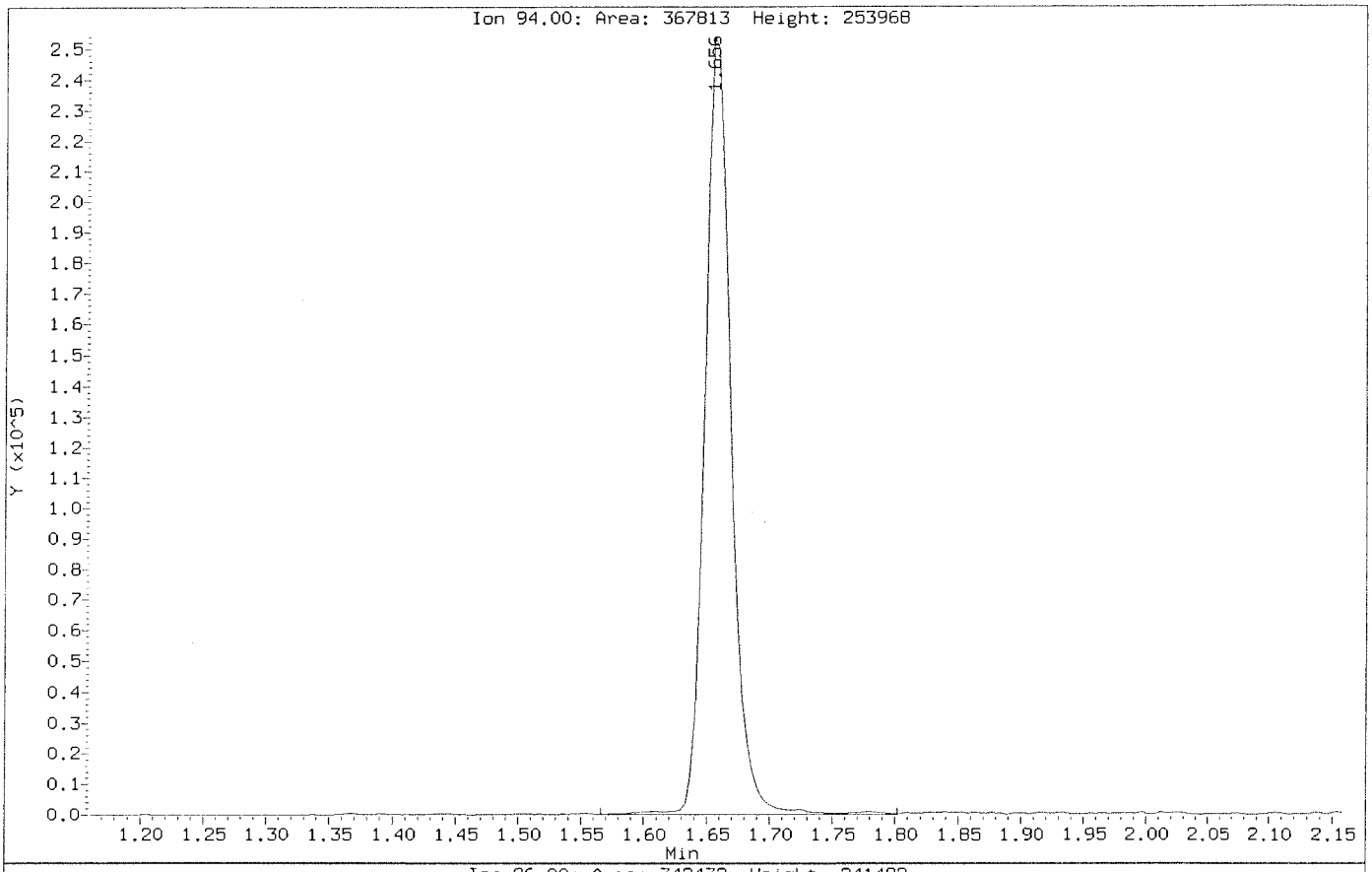
Compound: Bromomethane
CAS Number: 74-83-9

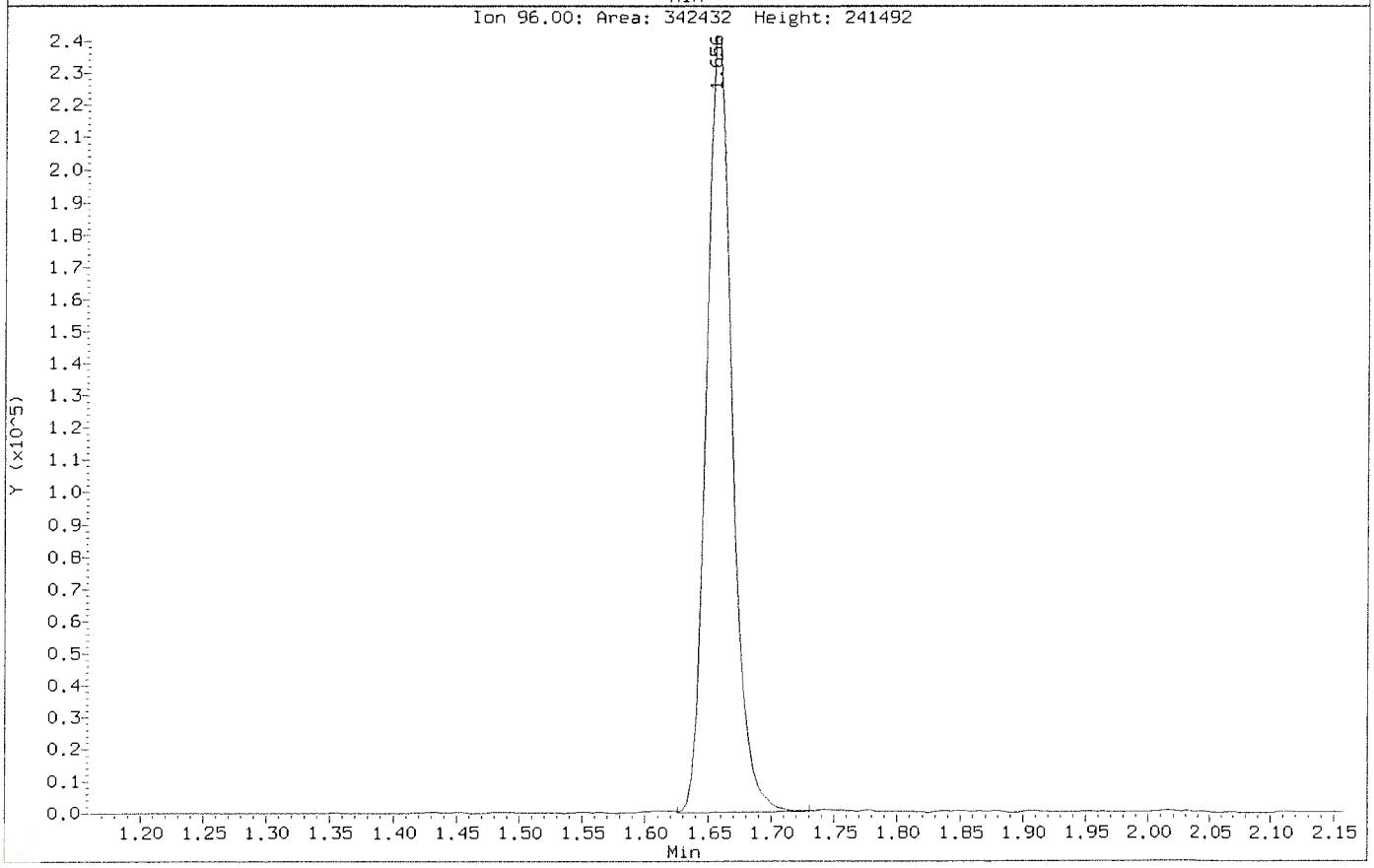




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Injection Date: 12-NOV-2019 14:05
Instrument: VOA9.i
Client Sample ID: VSTD050

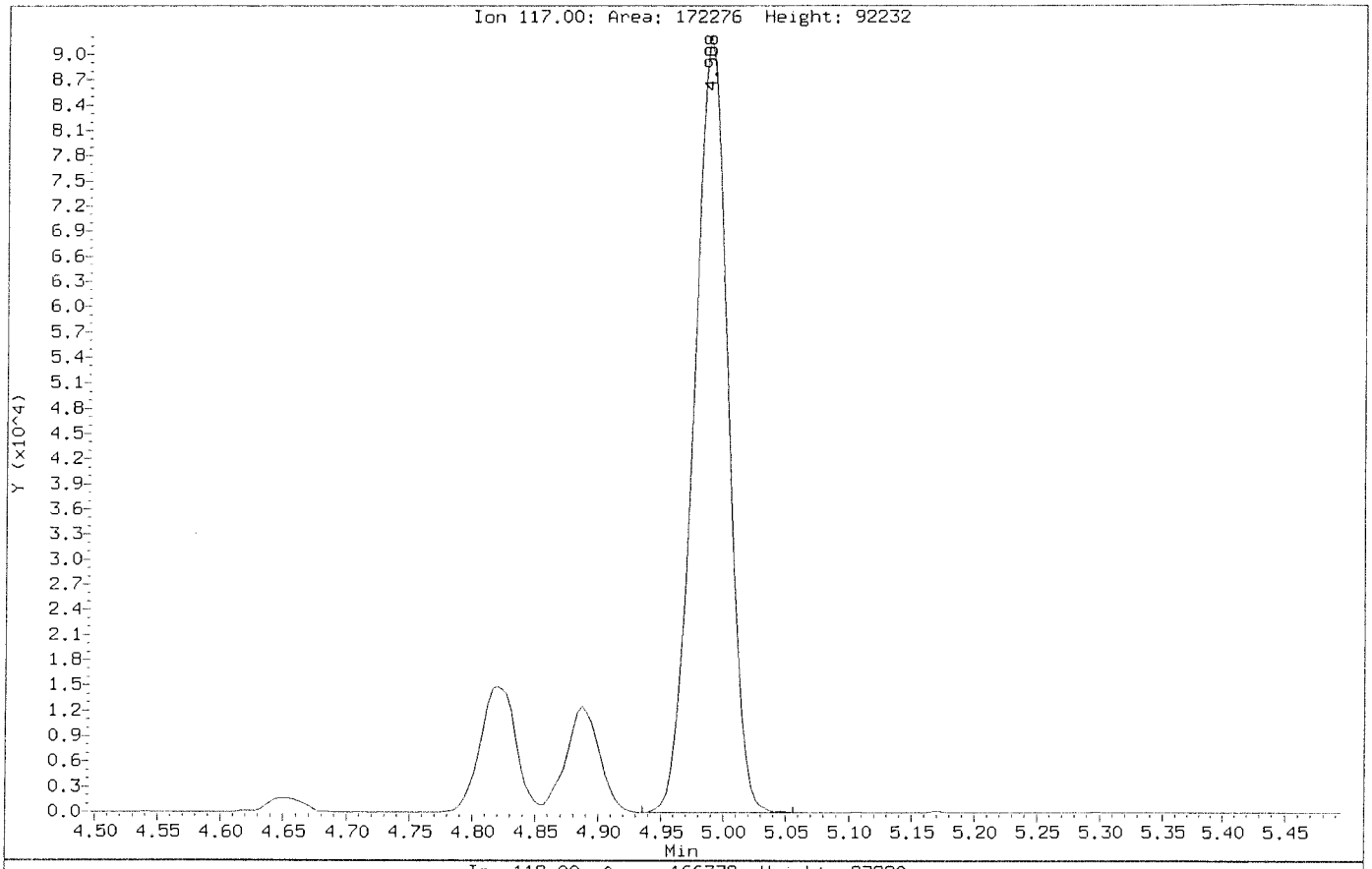
Compound: Bromomethane
CAS Number: 74-83-9

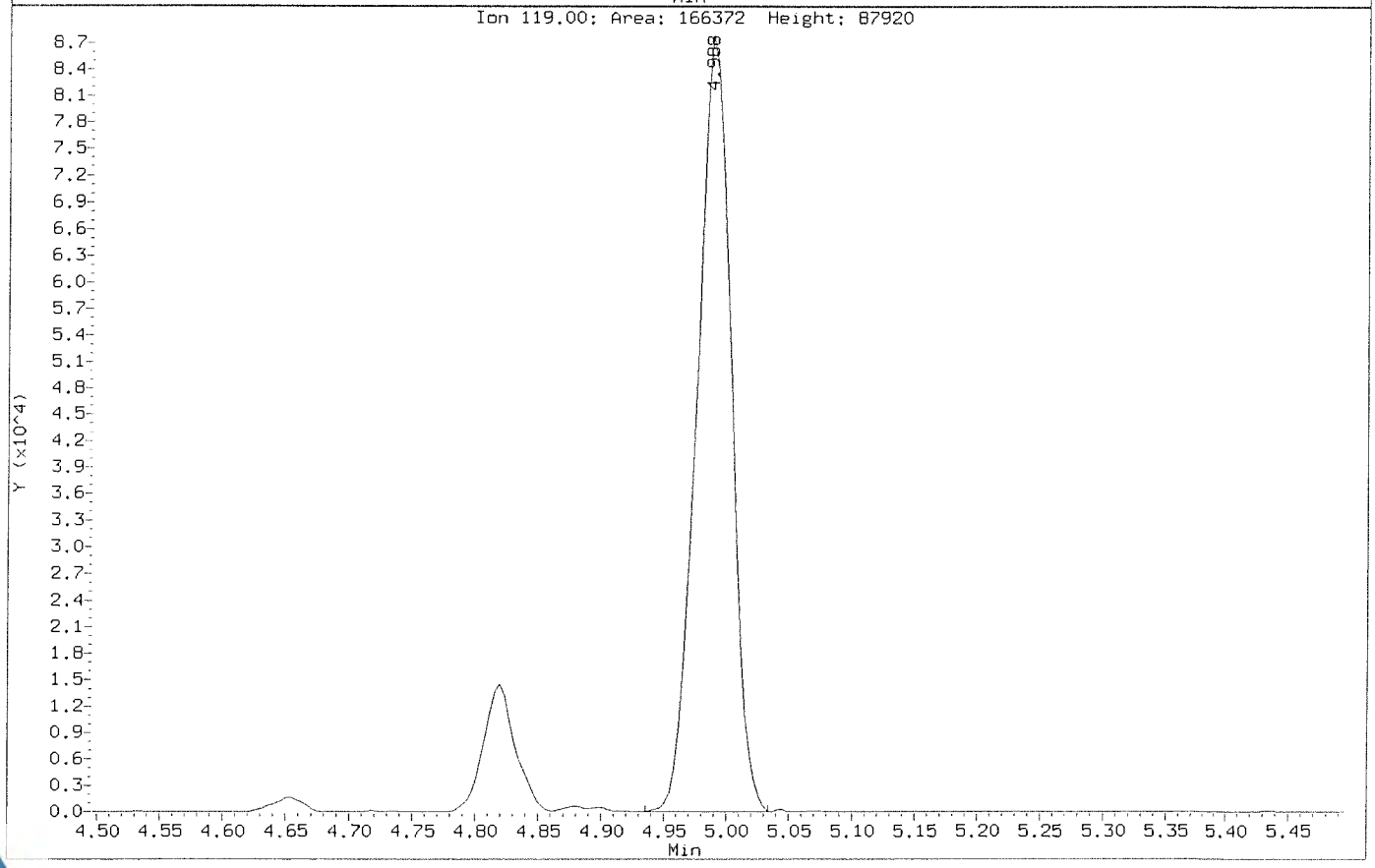




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Injection Date: 12-NOV-2019 14:05
Instrument: VOA9.i
Client Sample ID: VSTD050

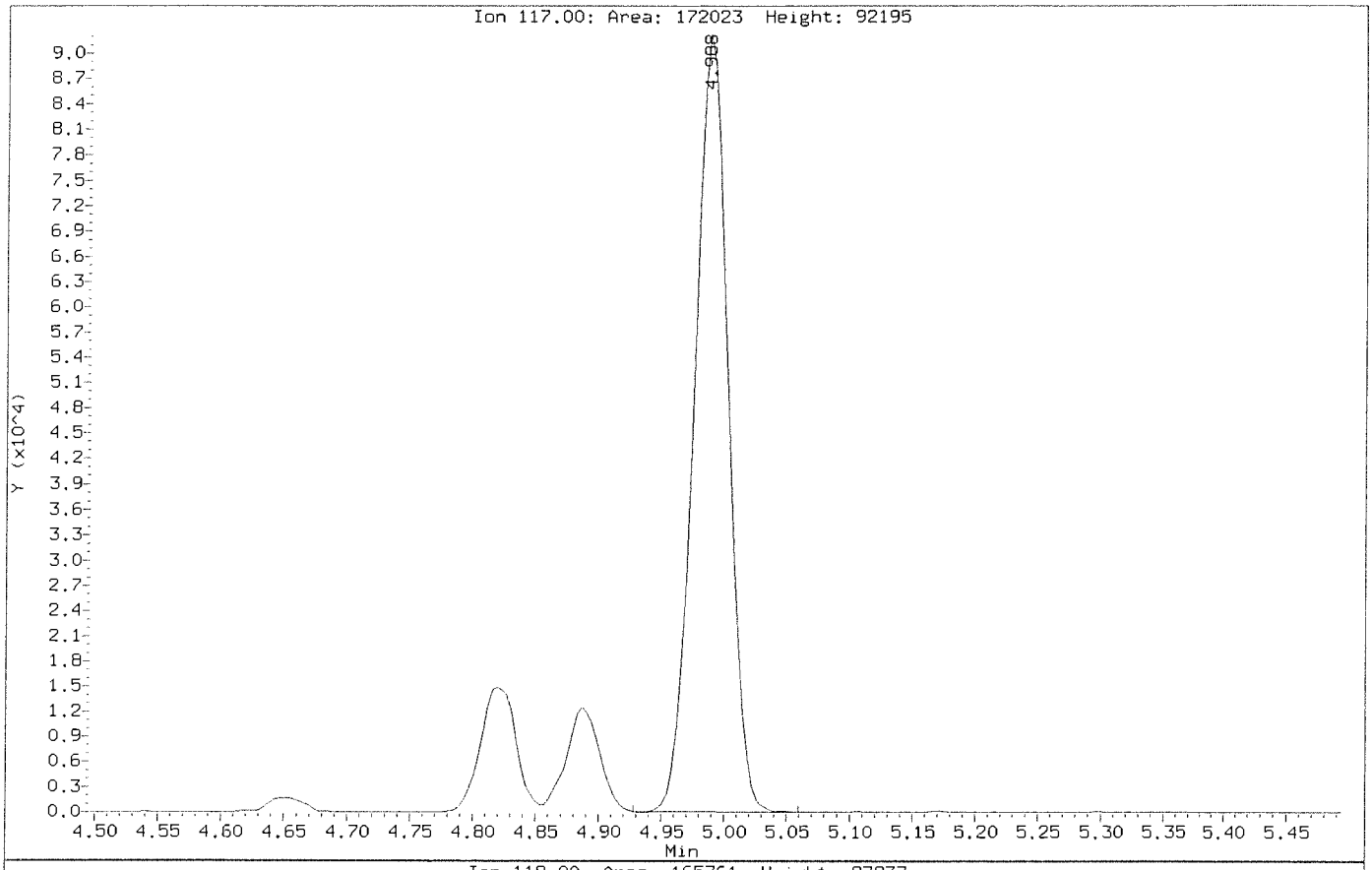
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

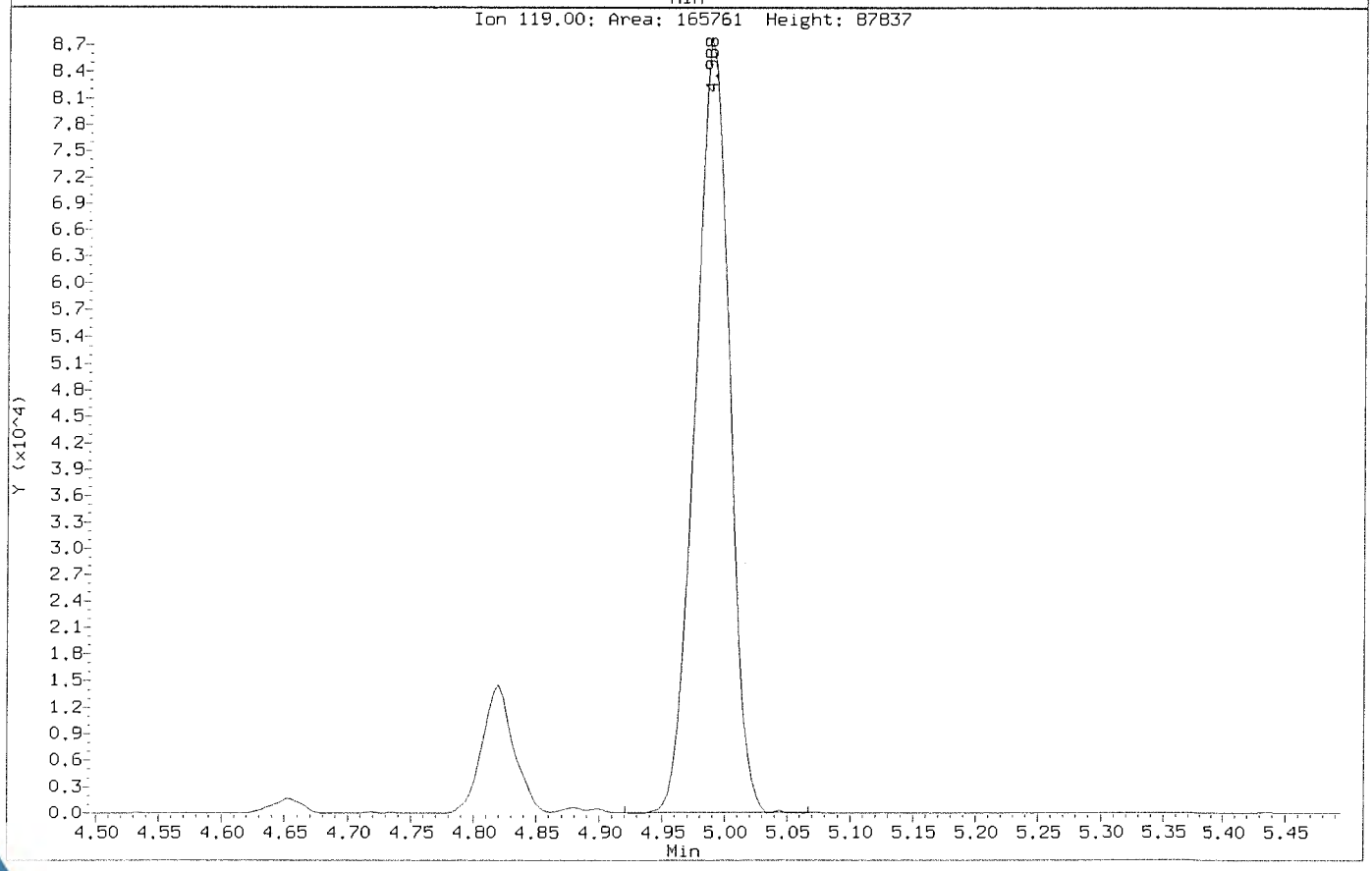




Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111208.D
Injection Date: 12-NOV-2019 14:05
Instrument: VOA9.i
Client Sample ID: VSTD050

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111209.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111209.D
Lab Smp Id: VSTD100 Client Smp ID: VSTD100
Inj Date : 12-NOV-2019 14:29
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD100;VSTD100;1;8;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:29 Cal File: U112109.D
Als bottle: 10 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

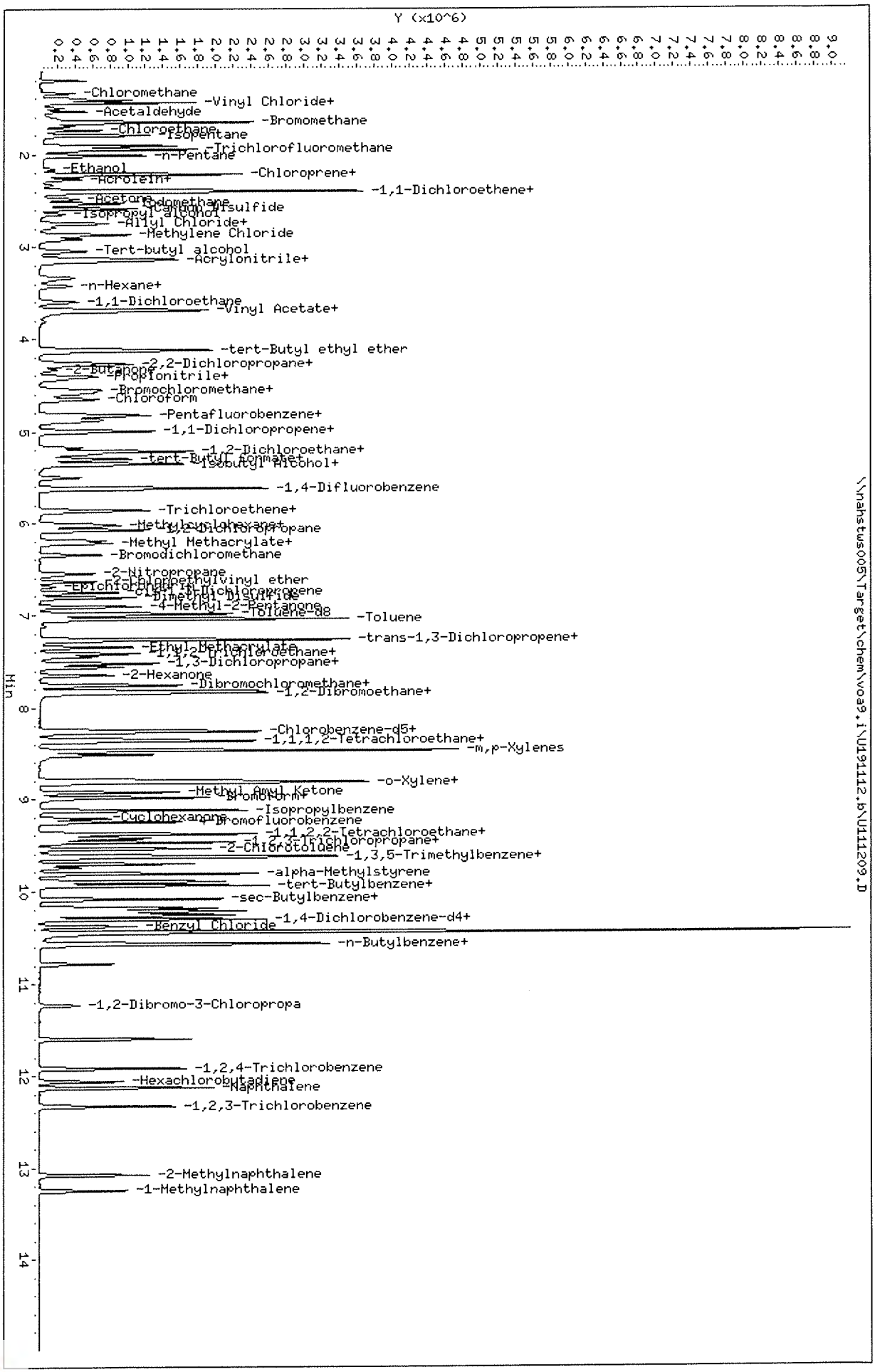
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	300922	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	544824	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	480390	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	274263	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	285285	100.000	95.73
$ 69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	362804	100.000	97.11
$ 30 Dibromofluoromethane	113	4.823	4.826	(0.986)	301818	100.000	99.40
$ 48 Toluene-d8	98	6.986	6.989	(0.847)	1157985	100.000	96.97
60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	338539	100.000	96.81
31 1,1,1-Trichloroethane	97	4.823	4.826	(0.986)	447831	100.000	100.04
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	477140	100.000	98.07
138 Freon TF	101	2.393	2.397	(0.490)	638869	100.000	95.16
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.899)	240719	100.000	96.44
22 1,1-Dichloroethane	63	3.597	3.600	(0.736)	402984	100.000	94.36
11 1,1-Dichloroethene	96	2.393	2.397	(0.490)	667300	100.000	94.93
32 1,1-Dichloropropene	75	4.999	5.002	(0.889)	336009	100.000	91.96
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	442676	100.000	102.61
71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	442241	100.000	94.90
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	474342	100.000	97.14
79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	1245043	100.000	97.87
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	96733	100.000	99.61
57 1,2-Dibromoethane	107	7.848	7.848	(0.951)	371512	100.000	102.76
88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	821917	100.000	99.48

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111209.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.246	5.250	(0.933)	352611	100.000	86.94
42	1,2-Dichloropropane	63	6.075	6.078	(1.081)	248467	100.000	101.26(M)
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	1191246	100.000	99.68
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	751741	100.000	92.63
54	1,3-Dichloropropane	76	7.559	7.563	(0.916)	494160	100.000	99.00
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	805087	100.000	91.61
26	2,2-Dichloropropane	77	4.268	4.271	(0.873)	353587	100.000	102.45
24	2-Butanone	43	4.332	4.339	(0.886)	220020	200.000	202.45(A)
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	881402	100.000	99.20
52	2-Hexanone	43	7.649	7.649	(0.927)	410859	200.000	195.82
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	1103642	100.000	98.50
82	p-Isopropyltoluene	119	10.206	10.209	(0.997)	1212445	100.000	94.83
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	561832	200.000	200.47(A)
10	Acetone	43	2.476	2.483	(0.506)	378076	200.000	205.68(A)
37	Benzene	78	5.212	5.216	(0.927)	1109034	100.000	94.17
74	Bromobenzene	156	9.381	9.381	(0.917)	455377	100.000	91.81
29	Bromochloromethane	128	4.549	4.553	(0.930)	168162	100.000	94.66
39	Bromodichloromethane	83	6.345	6.344	(1.129)	372904	100.000	102.66
66	Bromoform	173	8.980	8.984	(1.089)	292511	100.000	99.63
6	Bromomethane	94	1.655	1.659	(0.339)	972459	100.000	100.74
19	Carbon Disulfide	76	2.581	2.584	(0.528)	1324595	200.000	198.45
34	Carbon Tetrachloride	117	4.988	4.995	(0.887)	382151	100.000	100.91(M)
59	Chlorobenzene	112	8.271	8.271	(1.003)	934530	100.000	96.06
7	Chloroethane	64	1.741	1.741	(0.356)	424128	100.000	102.20
28	Chloroform	83	4.650	4.654	(0.951)	491588	100.000	96.63
3	Chloromethane	50	1.336	1.340	(0.273)	262348	100.000	98.95
27	cis-1,2-Dichloroethene	96	4.279	4.283	(0.875)	318400	100.000	92.89
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	430904	100.000	108.64
55	Dibromochloromethane	129	7.754	7.758	(0.940)	353574	100.000	93.63
44	Dibromomethane	93	6.187	6.187	(1.101)	206920	100.000	93.72
2	Dichlorodifluoromethane	85	1.198	1.205	(0.245)	288007	100.000	94.10
61	Ethylbenzene	106	8.369	8.369	(1.015)	477942	100.000	98.54
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	152536	100.000	92.31
67	Isopropylbenzene	105	9.122	9.126	(1.106)	1402159	100.000	101.95
62	m,p-Xylenes	106	8.470	8.470	(1.027)	1261599	200.000	212.57(A)
17	Methylene Chloride	84	2.862	2.869	(0.585)	271871	100.000	96.08
87	n-Butylbenzene	91	10.554	10.554	(1.032)	1069283	100.000	99.88
73	n-Propylbenzene	91	9.471	9.475	(0.926)	1552935	100.000	96.86
92	Naphthalene	128	12.129	12.129	(1.185)	1400730	100.000	107.95
63	o-Xylene	106	8.807	8.807	(1.068)	613623	100.000	102.03
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	1295898	100.000	96.47
64	Styrene	104	8.822	8.822	(1.070)	1127032	100.000	107.77
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	994487	100.000	97.97
56	Tetrachloroethene	166	7.522	7.522	(0.912)	349766	100.000	96.04
50	Toluene	91	7.046	7.045	(0.854)	1450936	100.000	100.09
20	trans-1,2-Dichloroethene	96	3.136	3.139	(0.641)	275617	100.000	92.62
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	454991	100.000	100.62
38	Trichloroethene	130	5.857	5.861	(1.042)	332739	100.000	92.24
8	Trichlorofluoromethane	101	1.947	1.951	(0.398)	1180049	100.000	91.38
5	Vinyl Chloride	62	1.415	1.419	(0.289)	592169	100.000	88.48

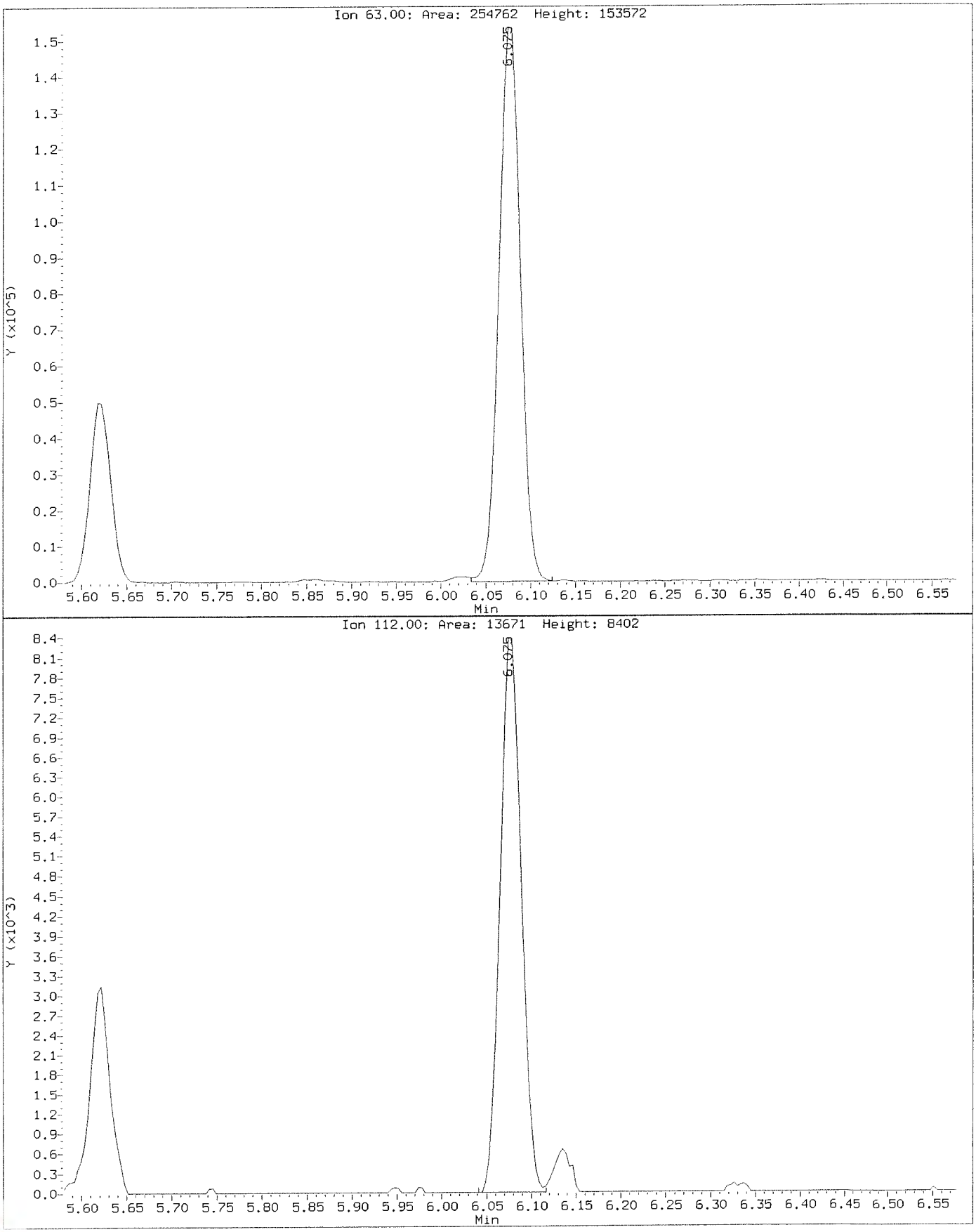
QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.


Y (x10^6)
Min
-Chloromethane
-Vinyl Chloride+
-Acetaldehyde
-Bromomethane
-Chloroethane
-Isopentane
-Trichlorofluoromethane
-n-Pentane
-Ethanol
-Chloroprene+
-Acrolein+
-1,1-Dichloroethene+
-Acetone
-Iodomethane
-Carbon disulfide
-Isopropyl alcohol
-Allyl Chloride+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-n-Hexane+
-1,1-Dichloroethane
-Vinyl Acetate+
-tert-Butyl ethyl ether
-2-Butanone
-2,2-Dichloropropane+
-Propionitrile+
-Bromochloromethane+
-Chloroform
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-tert-Butyl Alcohol+
-Isobutyl Alcohol+
-1,4-Difluorobenzene
-Trichloroethene+
-Methylcyclohexane+
-1,2-Dichloropropane
-Methyl Methacrylate+
-Bromodichloromethane
-2-Nitropropane
-Chloroethylvinyl ether
-cis-1,3-Dichloropropene
-Dibromofluoromethane
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene
-trans-1,3-Dichloropropene+
-Ethyl Methacrylate
-1,1,2-Trichloroethane+
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane+
-1,2-Dibromoethane+
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes
-o-Xylene+
-Methyl Amyl Ketone
-Bromoform+
-Isopropylbenzene
-Cyclohexanone
-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-1,2,3-Trichloropropane+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene+
-sec-Butylbenzene+
-1,4-Dichlorobenzene-d4+
-Benzyl Chloride
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
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Date : 12-NOV-2019 14:29
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Column phase: DB624
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

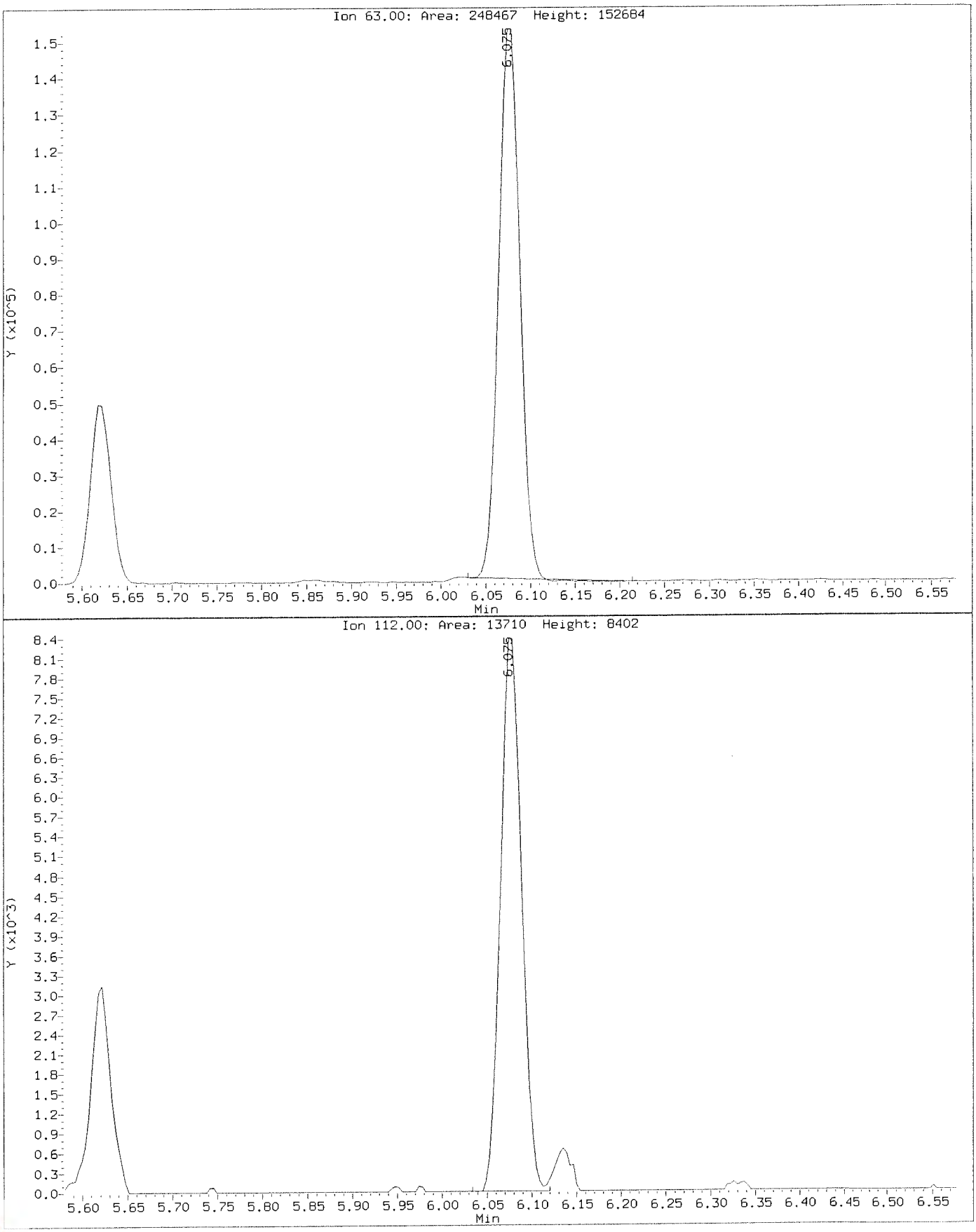
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Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: 1,2-Dichloropropane
CAS Number: 78-87-5



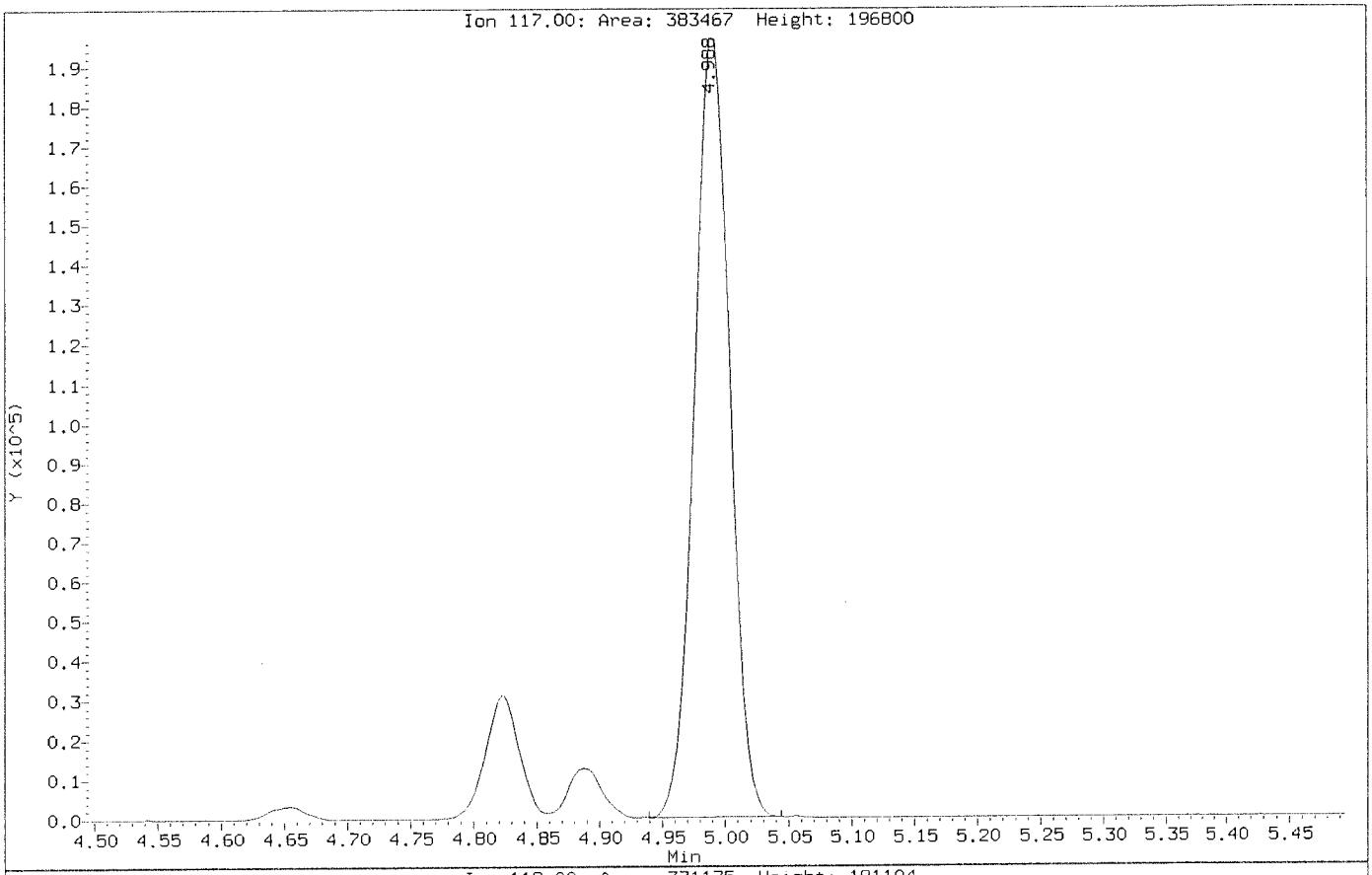
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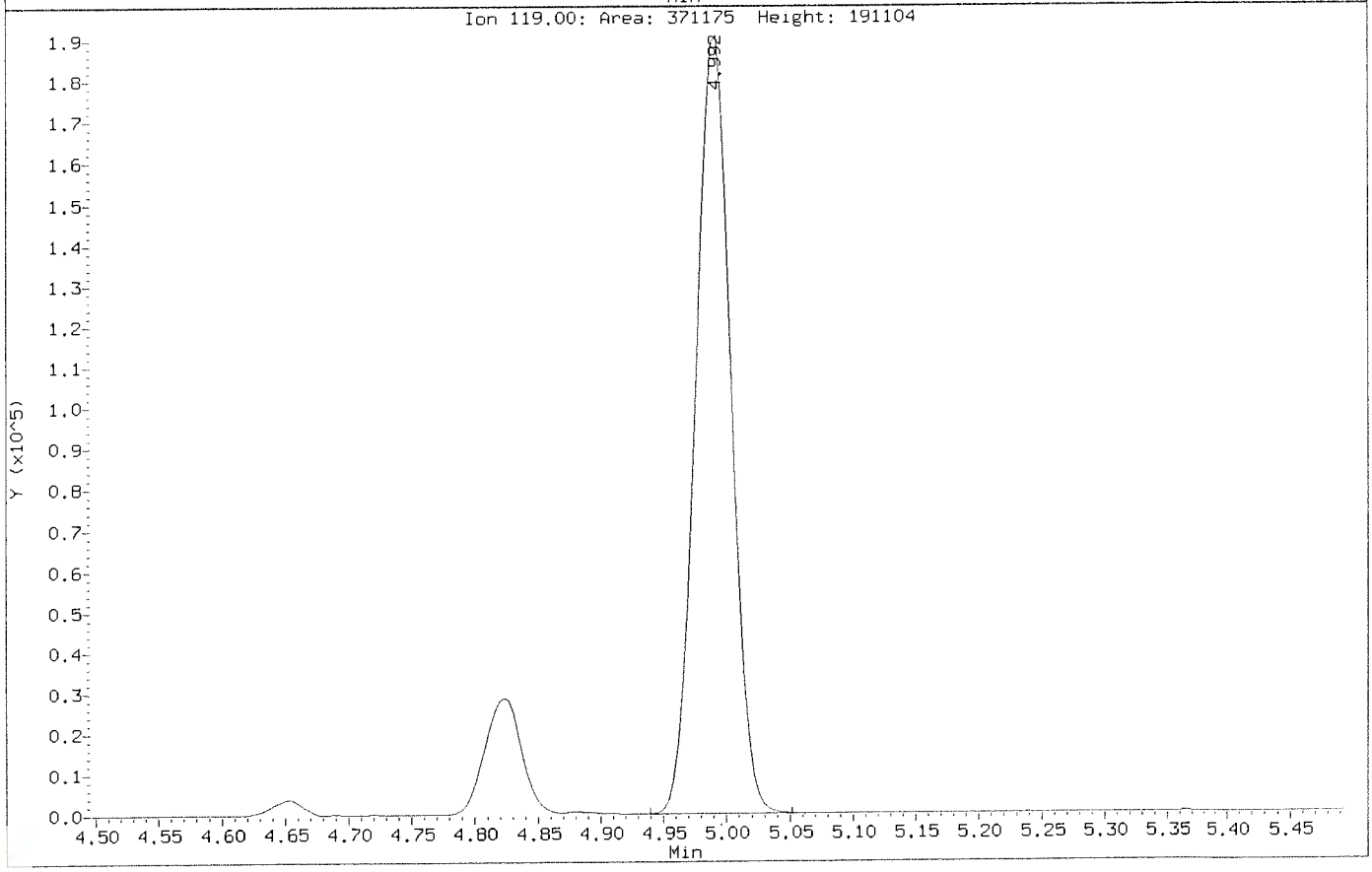
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CAS Number: 78-87-5



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Instrument: VOA9.i
Client Sample ID: VSTD100

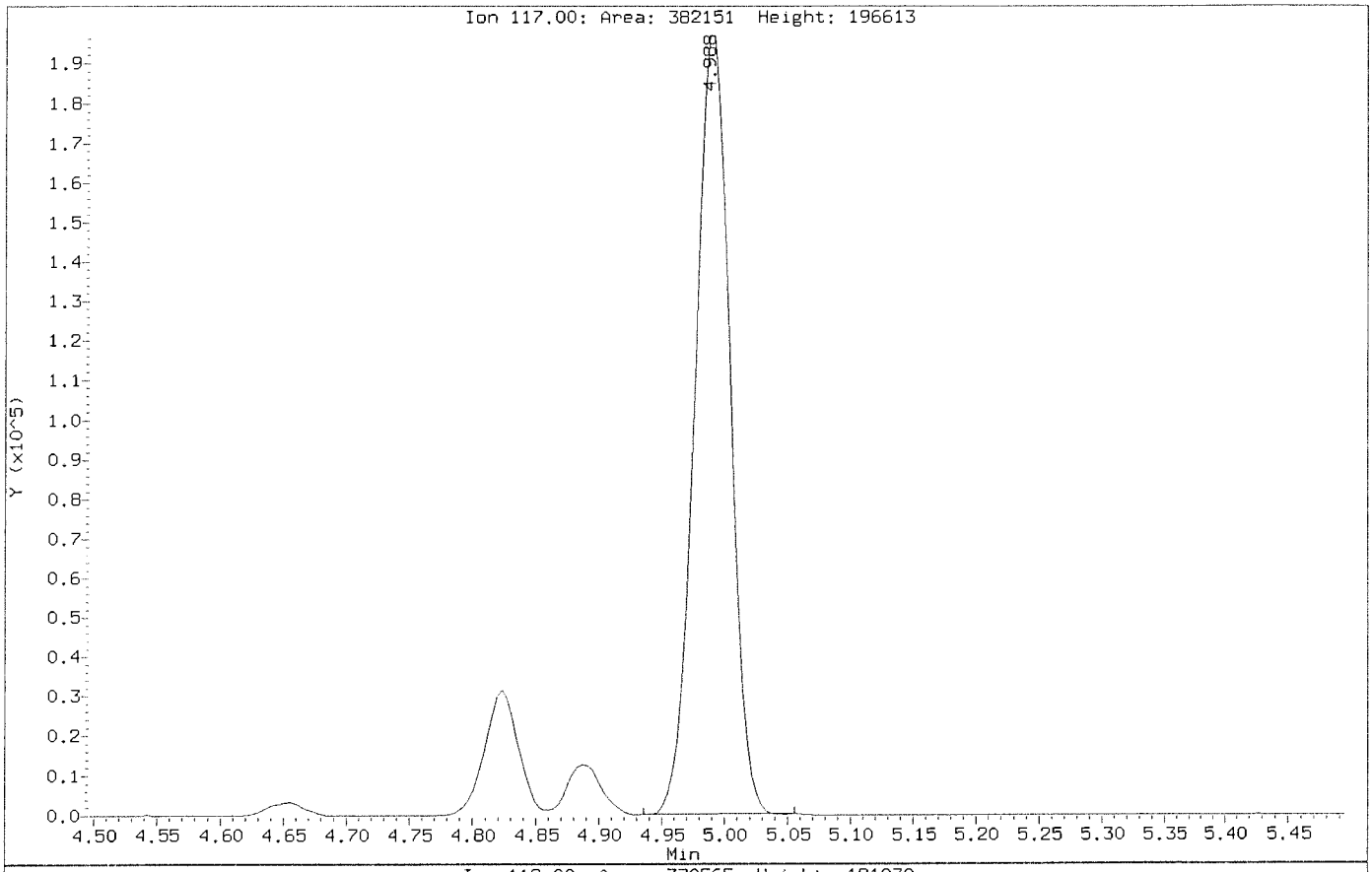
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

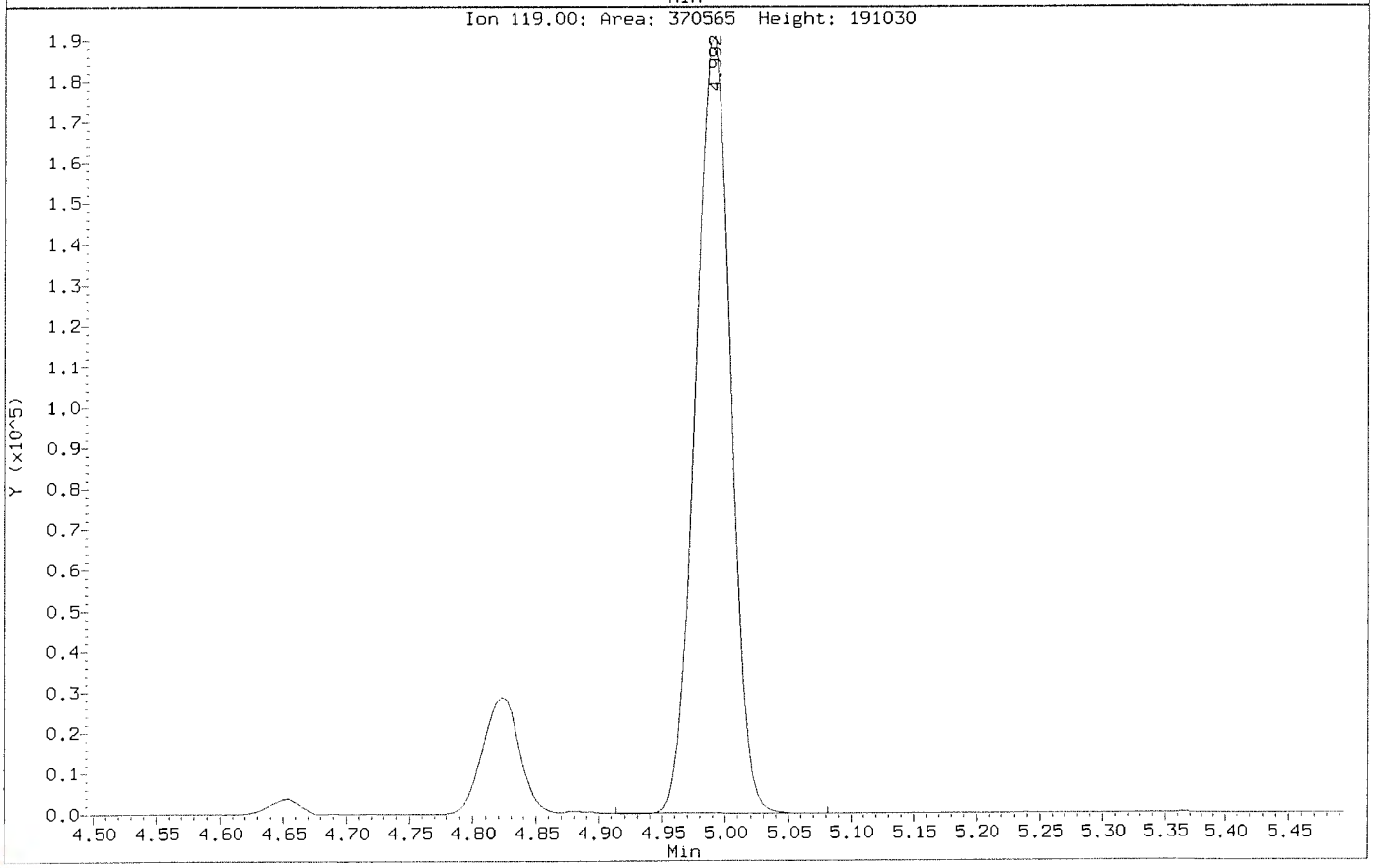




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Injection Date: 12-NOV-2019 14:29
Instrument: VOA9.i
Client Sample ID: VSTD100

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111210.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111210.D
Lab Smp Id: VSTD150 Client Smp ID: VSTD150
Inj Date : 12-NOV-2019 14:53
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD150;VSTD150;1;9;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 14:53 Cal File: U112110.D
Als bottle: 11 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

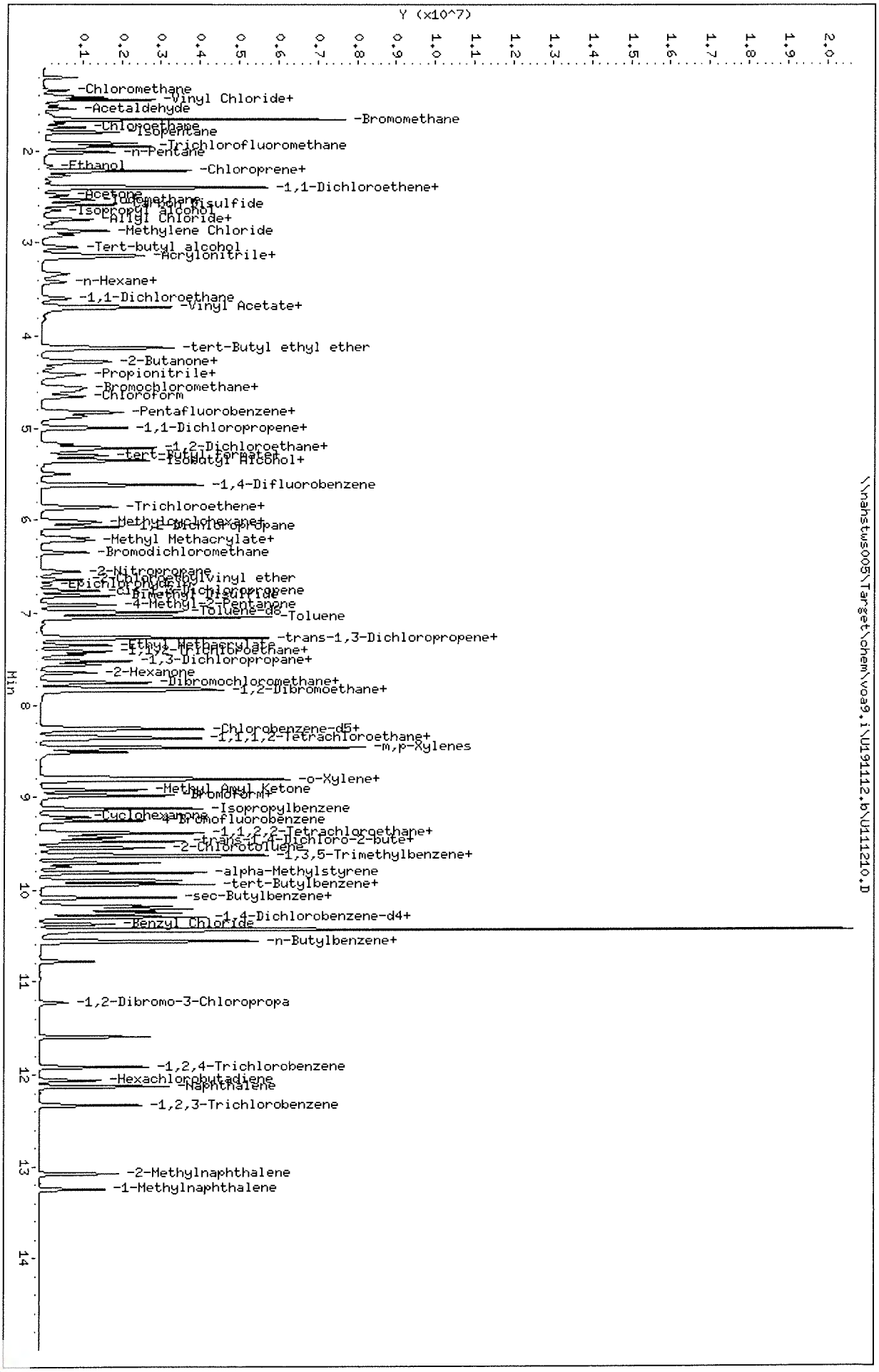
		QUANT SIG					AMOUNTS	
	Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.890	4.894	(1.000)	312318	50.0000	
*	36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	591064	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	508377	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	284288	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	476109	150.000	154.51
$	69 4-Bromofluorobenzene	95	9.253	9.253	(1.122)	602187	150.000	151.94
$	30 Dibromofluoromethane	113	4.826	4.826	(0.987)	489495	150.000	150.20
$	48 Toluene-d8	98	6.986	6.989	(0.847)	1922403	150.000	152.05
	60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	563042	150.000	151.15
	31 1,1,1-Trichloroethane	97	4.823	4.826	(0.986)	743329	150.000	159.99
	68 1,1,2,2-Tetrachloroethane	83	9.388	9.388	(0.918)	787815	150.000	156.21
	138 Freon TF	101	2.397	2.397	(0.490)	998632	150.000	143.33
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.899)	401889	150.000	152.15
	22 1,1-Dichloroethane	63	3.600	3.600	(0.736)	648899	150.000	146.40
	11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	1032754	150.000	141.57
	32 1,1-Dichloropropene	75	4.999	5.002	(0.889)	559734	150.000	141.21
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	729086	150.000	163.04
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	790058	150.000	163.56
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	786608	150.000	155.41
	79 1,2,4-Trimethylbenzene	105	9.939	9.939	(0.971)	2079681	150.000	157.72
	89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	149466	150.000	147.70
	57 1,2-Dibromoethane	107	7.848	7.848	(0.951)	629032	150.000	164.42
	88 1,2-Dichlorobenzene	146	10.565	10.569	(1.033)	1365995	150.000	159.51

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111210.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.934)	577895	150.000	131.34
42	1,2-Dichloropropane	63	6.078	6.078	(1.081)	401214	150.000	151.50(M)
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.941)	1986758	150.000	160.38
83	1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	1258692	150.000	149.63
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	793707	150.000	150.26
84	1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	1313959	150.000	144.24
26	2,2-Dichloropropane	77	4.271	4.271	(0.874)	597572	150.000	166.83
24	2-Butanone	43	4.335	4.339	(0.887)	338930	300.000	301.33(A)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	1426072	150.000	154.84
52	2-Hexanone	43	7.649	7.649	(0.927)	659222	300.000	296.89(A)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	1820976	150.000	156.79
82	p-Isopropyltoluene	119	10.209	10.209	(0.998)	2052153	150.000	154.85
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	920575	300.000	310.39(A)
10	Acetone	43	2.480	2.483	(0.507)	558030	300.000	297.30(A)
37	Benzene	78	5.216	5.216	(0.928)	1835912	150.000	143.70
74	Bromobenzene	156	9.381	9.381	(0.917)	777921	150.000	151.32
29	Bromochloromethane	128	4.553	4.553	(0.931)	260463	150.000	141.27
39	Bromodichloromethane	83	6.344	6.344	(1.129)	619016	150.000	157.09
66	Bromoform	173	8.980	8.984	(1.089)	516985	150.000	154.05
6	Bromomethane	94	1.655	1.659	(0.338)	2416063	150.000	149.92
19	Carbon Disulfide	76	2.585	2.584	(0.529)	2208091	300.000	318.75(A)
34	Carbon Tetrachloride	117	4.991	4.995	(0.888)	657302	150.000	159.99(M)
59	Chlorobenzene	112	8.271	8.271	(1.003)	1550733	150.000	150.63
7	Chloroethane	64	1.741	1.741	(0.356)	642369	150.000	149.95
28	Chloroform	83	4.654	4.654	(0.952)	799796	150.000	151.48
3	Chloromethane	50	1.340	1.340	(0.274)	396602	150.000	144.69
27	cis-1,2-Dichloroethene	96	4.283	4.283	(0.876)	516477	150.000	145.18
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.202)	707974	150.000	164.53
55	Dibromochloromethane	129	7.754	7.758	(0.940)	614850	150.000	152.21
44	Dibromomethane	93	6.187	6.187	(1.101)	336119	150.000	140.33
2	Dichlorodifluoromethane	85	1.205	1.205	(0.247)	477888	150.000	150.45
61	Ethylbenzene	106	8.369	8.369	(1.015)	806599	150.000	157.15
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	241383	150.000	140.92
67	Isopropylbenzene	105	9.122	9.126	(1.106)	2366152	150.000	162.57
62	m,p-Xylenes	106	8.470	8.470	(1.027)	2132020	300.000	339.45(A)
17	Methylene Chloride	84	2.866	2.869	(0.586)	438580	150.000	148.85
87	n-Butylbenzene	91	10.554	10.554	(1.032)	1776457	150.000	160.08
73	n-Propylbenzene	91	9.475	9.475	(0.926)	2567960	150.000	154.52
92	Naphthalene	128	12.129	12.129	(1.185)	2280838	150.000	169.59
63	o-Xylene	106	8.807	8.807	(1.068)	1051971	150.000	165.29
81	sec-Butylbenzene	105	10.082	10.086	(0.985)	2154156	150.000	154.72
64	Styrene	104	8.822	8.822	(1.070)	1918737	150.000	173.38
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	1668815	150.000	158.60
56	Tetrachloroethene	166	7.522	7.522	(0.912)	598635	150.000	155.34
50	Toluene	91	7.045	7.045	(0.854)	2481749	150.000	161.78
20	trans-1,2-Dichloroethene	96	3.139	3.139	(0.642)	467765	150.000	150.27
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	757873	150.000	154.09
38	Trichloroethene	130	5.857	5.861	(1.042)	536044	150.000	136.97
8	Trichlorofluoromethane	101	1.947	1.951	(0.398)	1863654	150.000	139.06
5	Vinyl Chloride	62	1.419	1.419	(0.290)	912225	150.000	131.33

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

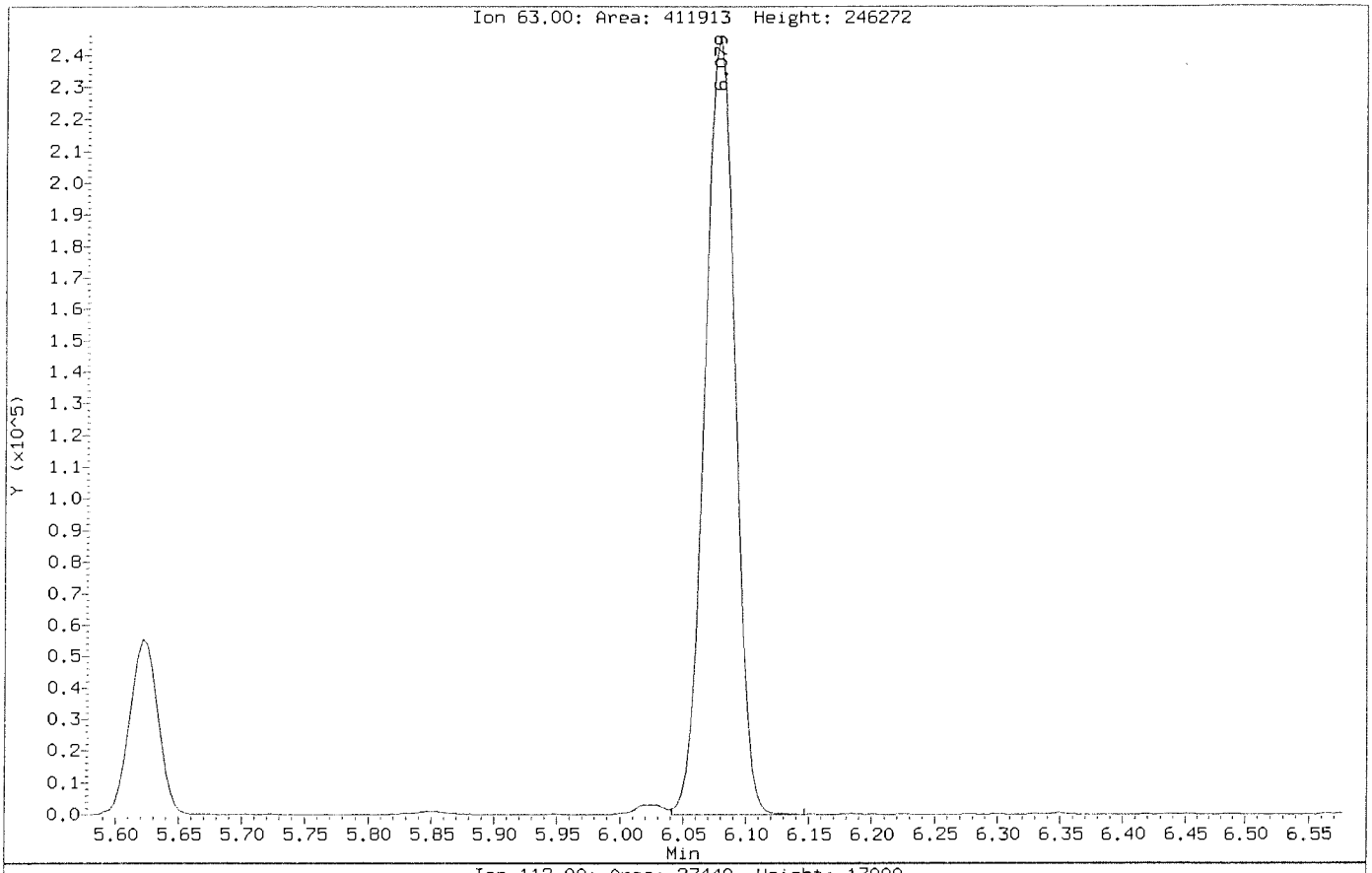


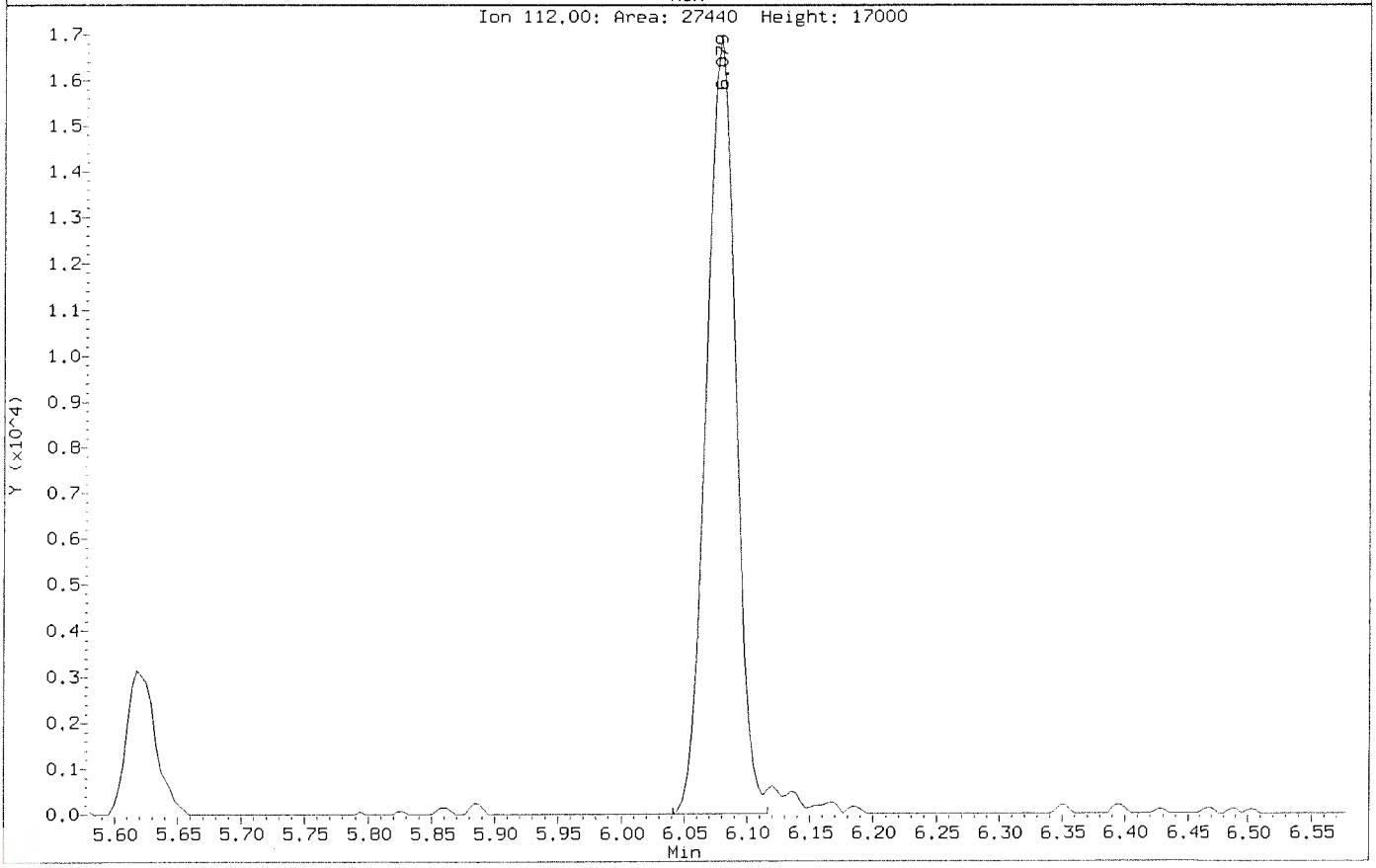
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Client ID: VSTD150
Sample Info: VSTD150;VSTD150;1;9;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111210.D
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Instrument: VOA9.i
Client Sample ID: VSTD150

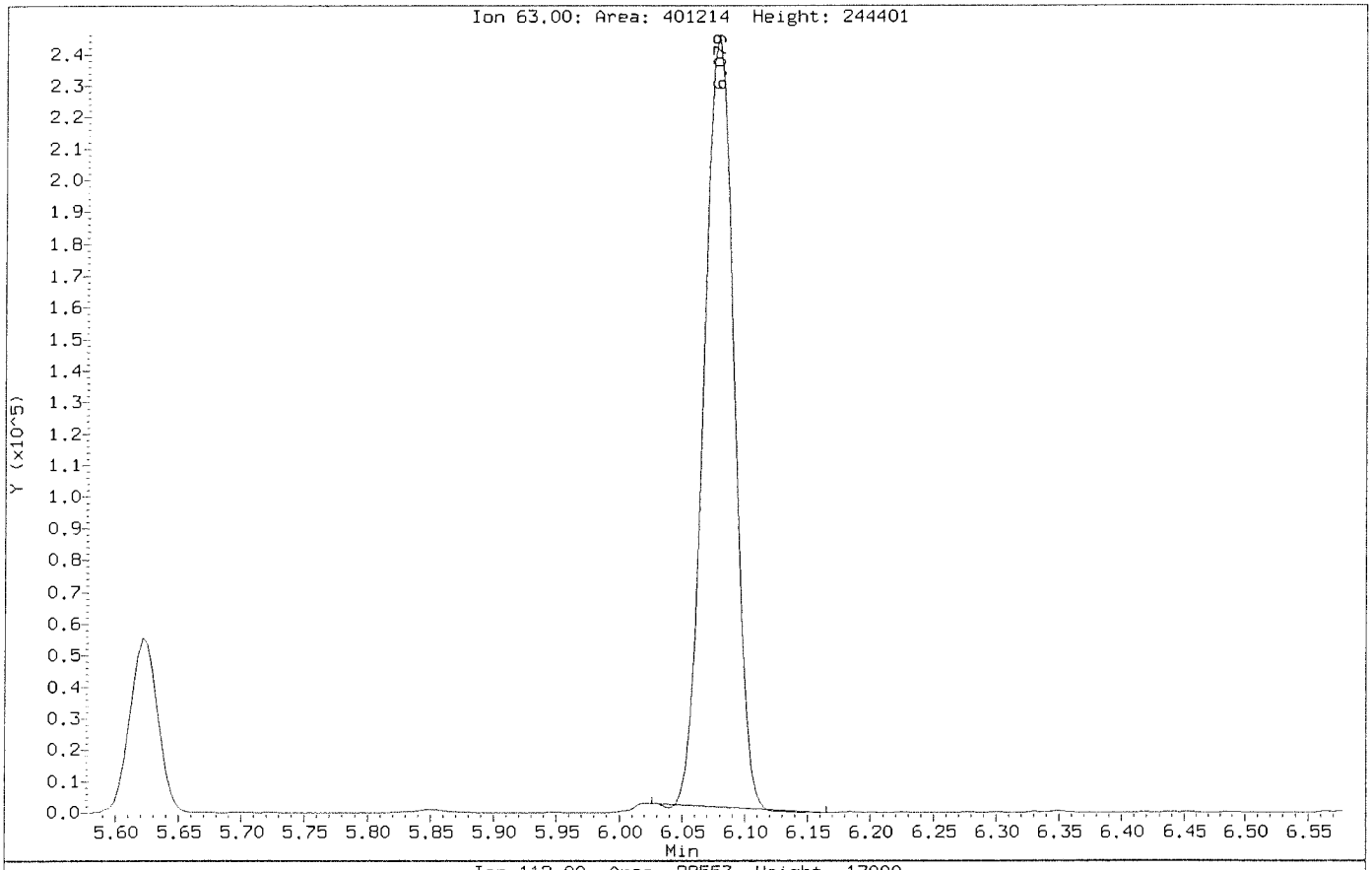
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

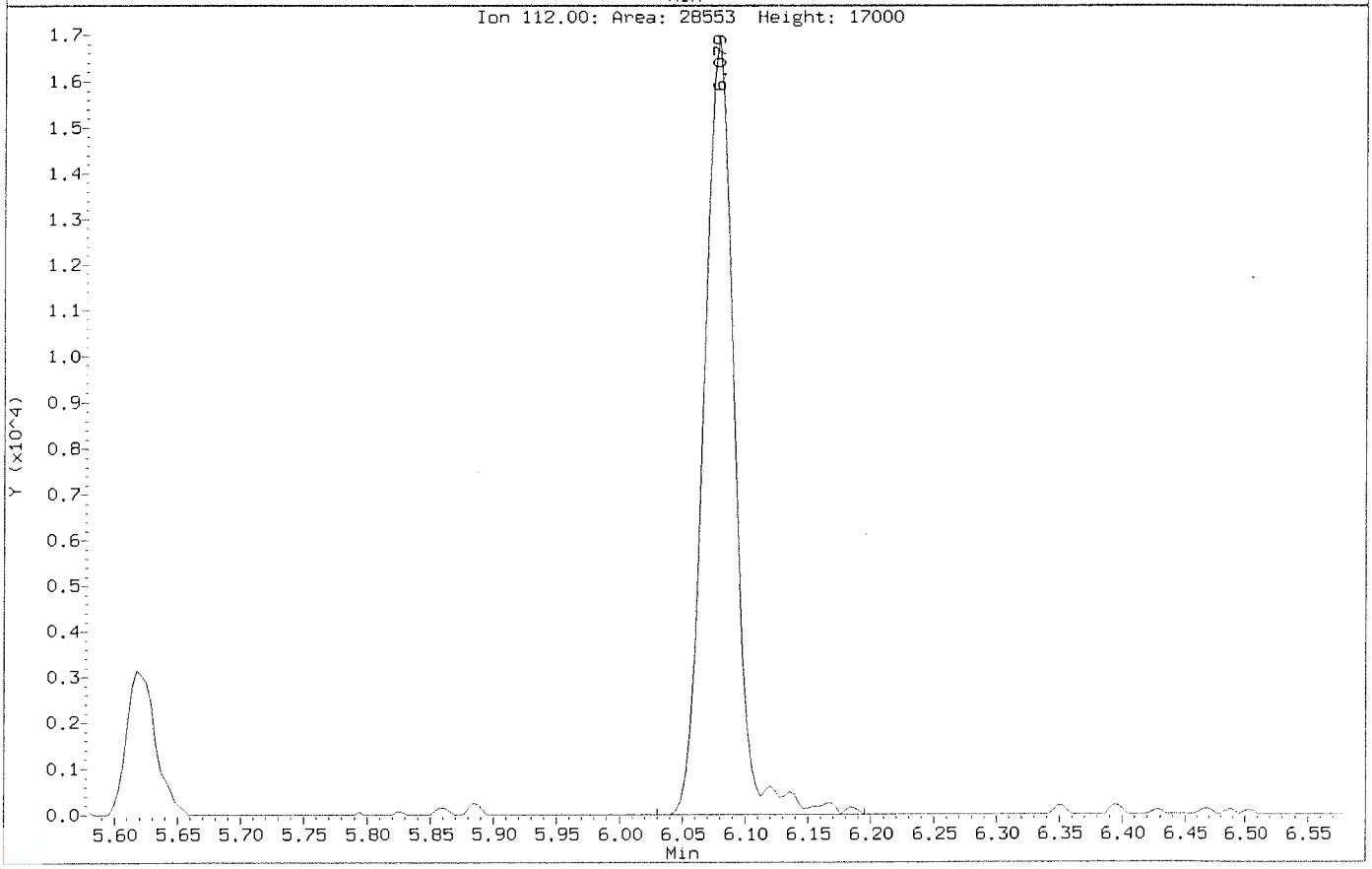




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Client Sample ID: VSTD150

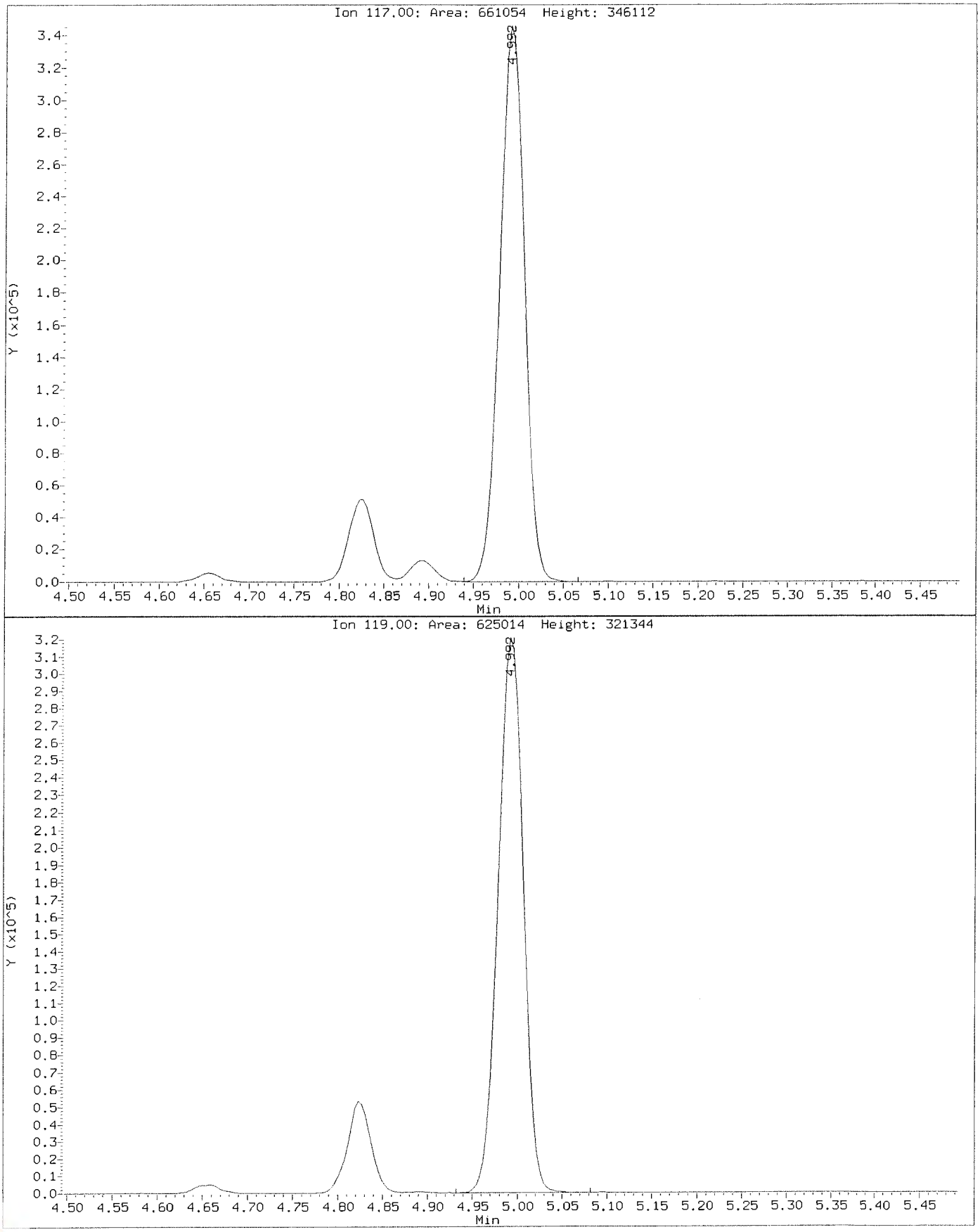
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5





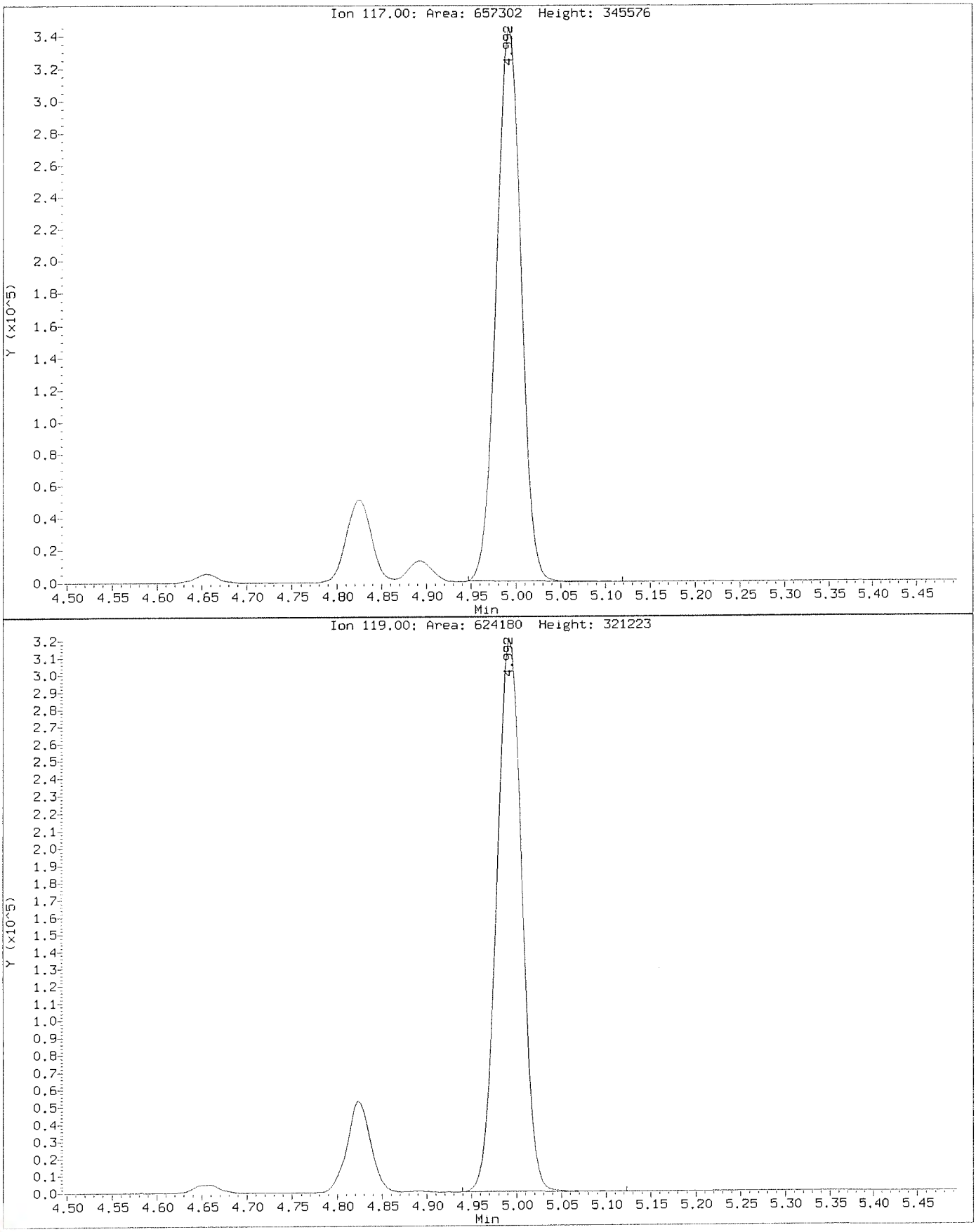
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Instrument: VOA9.i
Client Sample ID: VSTD150

Compound: Carbon Tetrachloride
CAS Number: 56-23-5



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111210.D
Injection Date: 12-NOV-2019 14:53
Instrument: VOA9.i
Client Sample ID: VSTD150

Compound: Carbon Tetrachloride
CAS Number: 56-23-5



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111211.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111211.D
Lab Smp Id: VSTD200 Client Smp ID: VSTD200
Inj Date : 12-NOV-2019 15:17
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD200;VSTD200;1;10;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 15:17 Cal File: U112111.D
Als bottle: 12 Calibration Sample, Level: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

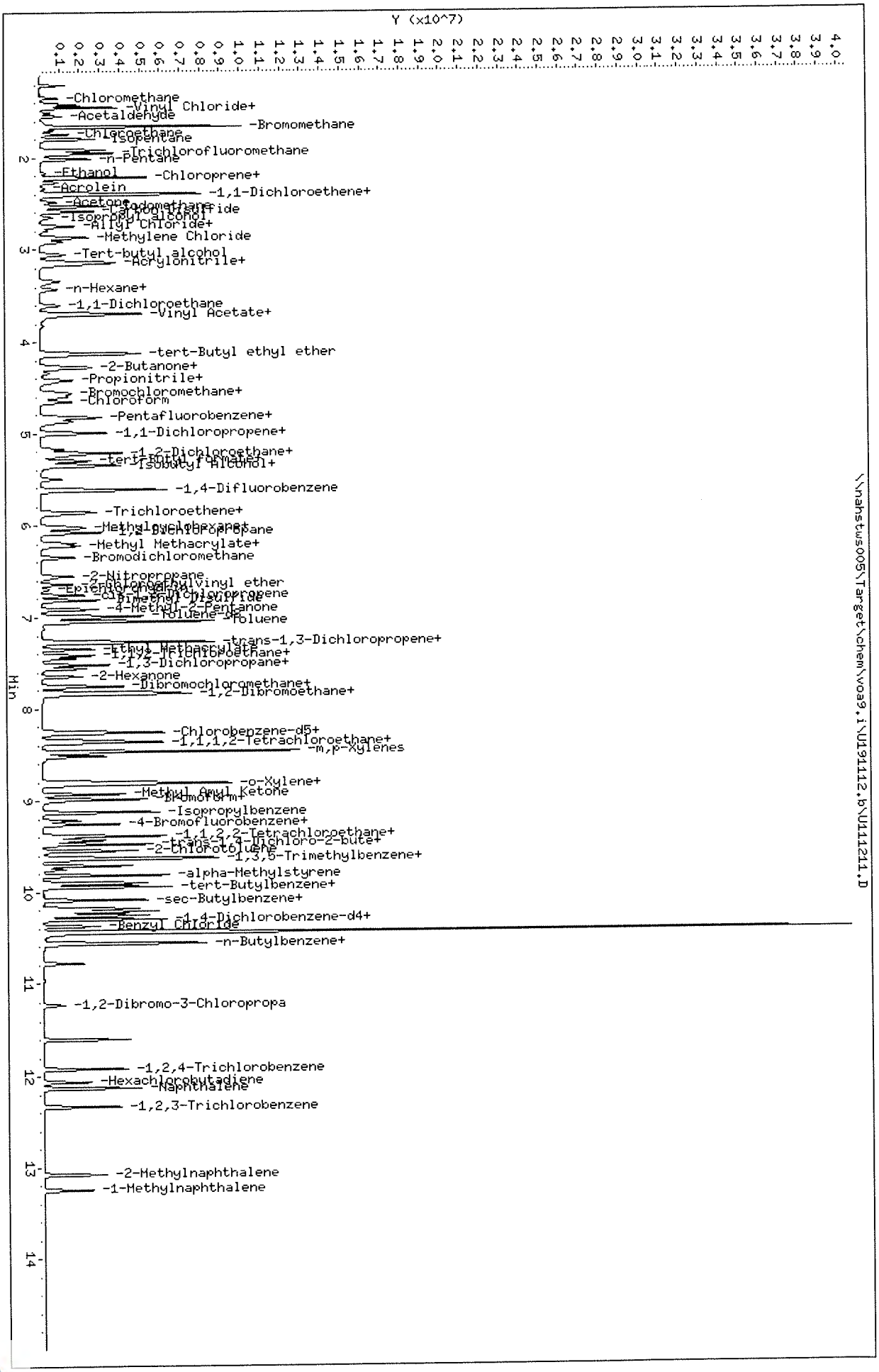
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.894	4.894	(1.000)	334619	50.0000	
*	36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	677271	50.0000	
*	47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	558479	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	309917	50.0000	
$	35 1,2-Dichloroethane-d4	65	5.175	5.175	(1.057)	653758	200.000	198.29
$	69 4-Bromofluorobenzene	95	9.253	9.253	(1.122)	874895	200.000	200.73(A)
$	30 Dibromofluoromethane	113	4.826	4.826	(0.986)	711540	200.000	196.44
$	48 Toluene-d8	98	6.989	6.989	(0.847)	2782744	200.000	200.31(A)
	60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	826765	200.000	201.45(A)
	31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	1092276	200.000	219.43(A)
	68 1,1,2,2-Tetrachloroethane	83	9.388	9.388	(0.918)	1145484	200.000	208.35(A)
	138 Freon TF	101	2.397	2.397	(0.490)	1421216	200.000	190.38
	53 1,1,2-Trichloroethane	83	7.417	7.417	(0.899)	574439	200.000	197.97
	22 1,1-Dichloroethane	63	3.600	3.600	(0.736)	913824	200.000	192.43
	11 1,1-Dichloroethene	96	2.397	2.397	(0.490)	1473218	200.000	188.49
	32 1,1-Dichloropropene	75	5.002	5.002	(0.889)	814337	200.000	179.29
	93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	1090083	200.000	223.61(A)
	71 1,2,3-Trichloropropane	75	9.426	9.426	(0.921)	1135197	200.000	215.58(A)
	90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	1165422	200.000	211.21(A)
	79 1,2,4-Trimethylbenzene	105	9.939	9.939	(0.971)	3024621	200.000	210.42(A)
	89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	223916	200.000	202.38(A)
	57 1,2-Dibromoethane	107	7.848	7.848	(0.951)	967680	200.000	230.25(A)
	88 1,2-Dichlorobenzene	146	10.569	10.569	(1.033)	1999573	200.000	214.18(A)

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111211.D Page 2
Report Date: 05-Dec-2019 15:55

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.933)	823258	200.000	163.29
42	1,2-Dichloropropane	63	6.078	6.078	(1.081)	597030	200.000	197.22(M)
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.941)	2994446	200.000	221.74(A)
83	1,3-Dichlorobenzene	146	10.179	10.179	(0.995)	1824355	200.000	198.95
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	1146723	200.000	197.61
84	1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	1926041	200.000	193.95
26	2,2-Dichloropropane	77	4.271	4.271	(0.873)	848917	200.000	221.21(A)
24	2-Butanone	43	4.339	4.339	(0.887)	478432	400.000	397.56(A)
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	2076951	200.000	206.86(A)
52	2-Hexanone	43	7.649	7.649	(0.927)	961525	400.000	394.19(A)
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	2700197	200.000	213.27(A)
82	p-Isopropyltoluene	119	10.209	10.209	(0.998)	3019027	200.000	208.98(A)
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	1358044	400.000	416.82(A)
10	Acetone	43	2.483	2.483	(0.507)	787633	400.000	395.27(A)
37	Benzene	78	5.216	5.216	(0.927)	2659337	200.000	181.66
74	Bromobenzene	156	9.381	9.381	(0.917)	1119880	200.000	199.82
29	Bromochloromethane	128	4.553	4.553	(0.930)	376553	200.000	190.62
39	Bromodichloromethane	83	6.344	6.344	(1.128)	879452	200.000	194.78
66	Bromoform	173	8.984	8.984	(1.089)	787561	200.000	198.10
6	Bromomethane	94	1.659	1.659	(0.339)	3452678	200.000	129.59
19	Carbon Disulfide	76	2.584	2.584	(0.528)	3238986	400.000	436.41(A)
34	Carbon Tetrachloride	117	4.995	4.995	(0.888)	966070	200.000	205.21(AM)
59	Chlorobenzene	112	8.271	8.271	(1.003)	2284557	200.000	202.00(A)
7	Chloroethane	64	1.741	1.741	(0.356)	907418	200.000	198.26
28	Chloroform	83	4.654	4.654	(0.951)	1141910	200.000	201.86(A)
3	Chloromethane	50	1.340	1.340	(0.274)	595821	200.000	203.37(A)
27	cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	755344	200.000	198.17
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	1037887	200.000	210.51(A)
55	Dibromochloromethane	129	7.758	7.758	(0.940)	900839	200.000	202.16(A)
44	Dibromomethane	93	6.187	6.187	(1.100)	487374	200.000	177.58
2	Dichlorodifluoromethane	85	1.205	1.205	(0.246)	683277	200.000	200.78(A)
61	Ethylbenzene	106	8.369	8.369	(1.015)	1180757	200.000	209.42(A)
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	370021	200.000	198.16
67	Isopropylbenzene	105	9.126	9.126	(1.106)	3444634	200.000	215.44(A)
62	m,p-Xylenes	106	8.470	8.470	(1.027)	3239304	400.000	469.48(A)
17	Methylene Chloride	84	2.869	2.869	(0.586)	642406	200.000	203.16(A)
87	n-Butylbenzene	91	10.554	10.554	(1.032)	2614564	200.000	216.12(A)
73	n-Propylbenzene	91	9.475	9.475	(0.926)	3727632	200.000	205.76(A)
92	Naphthalene	128	12.129	12.129	(1.185)	3392769	200.000	231.40(A)
63	o-Xylene	106	8.807	8.807	(1.068)	1586689	200.000	226.95(A)
81	sec-Butylbenzene	105	10.086	10.086	(0.986)	3165742	200.000	208.57(A)
64	Styrene	104	8.822	8.822	(1.070)	2832806	200.000	233.01(A)
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	2418087	200.000	210.81(A)
56	Tetrachloroethene	166	7.522	7.522	(0.912)	849071	200.000	200.56(A)
50	Toluene	91	7.045	7.045	(0.854)	3661108	200.000	217.25(A)
20	trans-1,2-Dichloroethene	96	3.139	3.139	(0.642)	682070	200.000	203.84(A)
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	1110034	200.000	196.76
38	Trichloroethene	130	5.861	5.861	(1.042)	778879	200.000	173.69
8	Trichlorofluoromethane	101	1.951	1.951	(0.399)	2609513	200.000	181.74
5	Vinyl Chloride	62	1.419	1.419	(0.290)	1236500	200.000	166.16

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

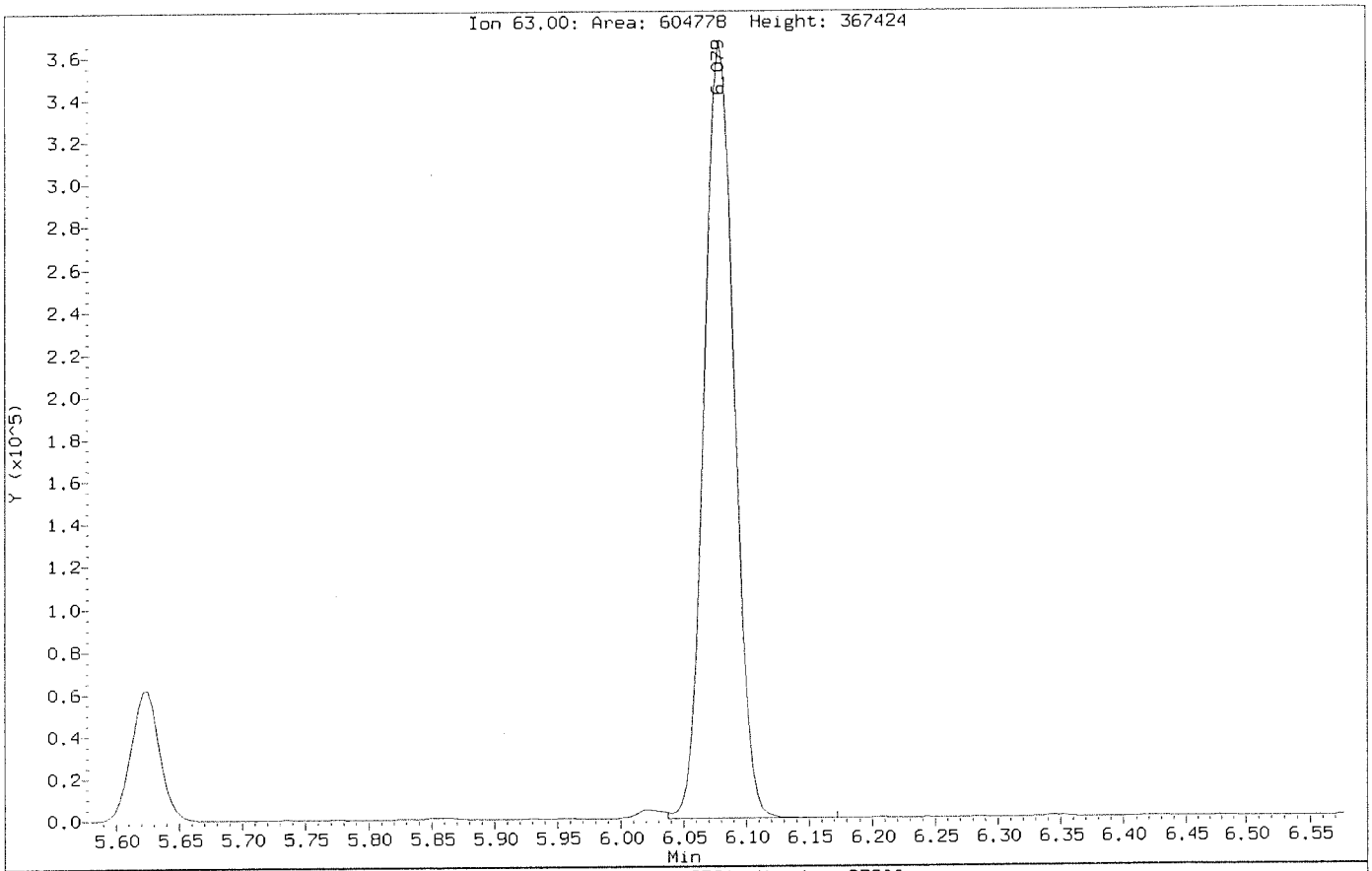


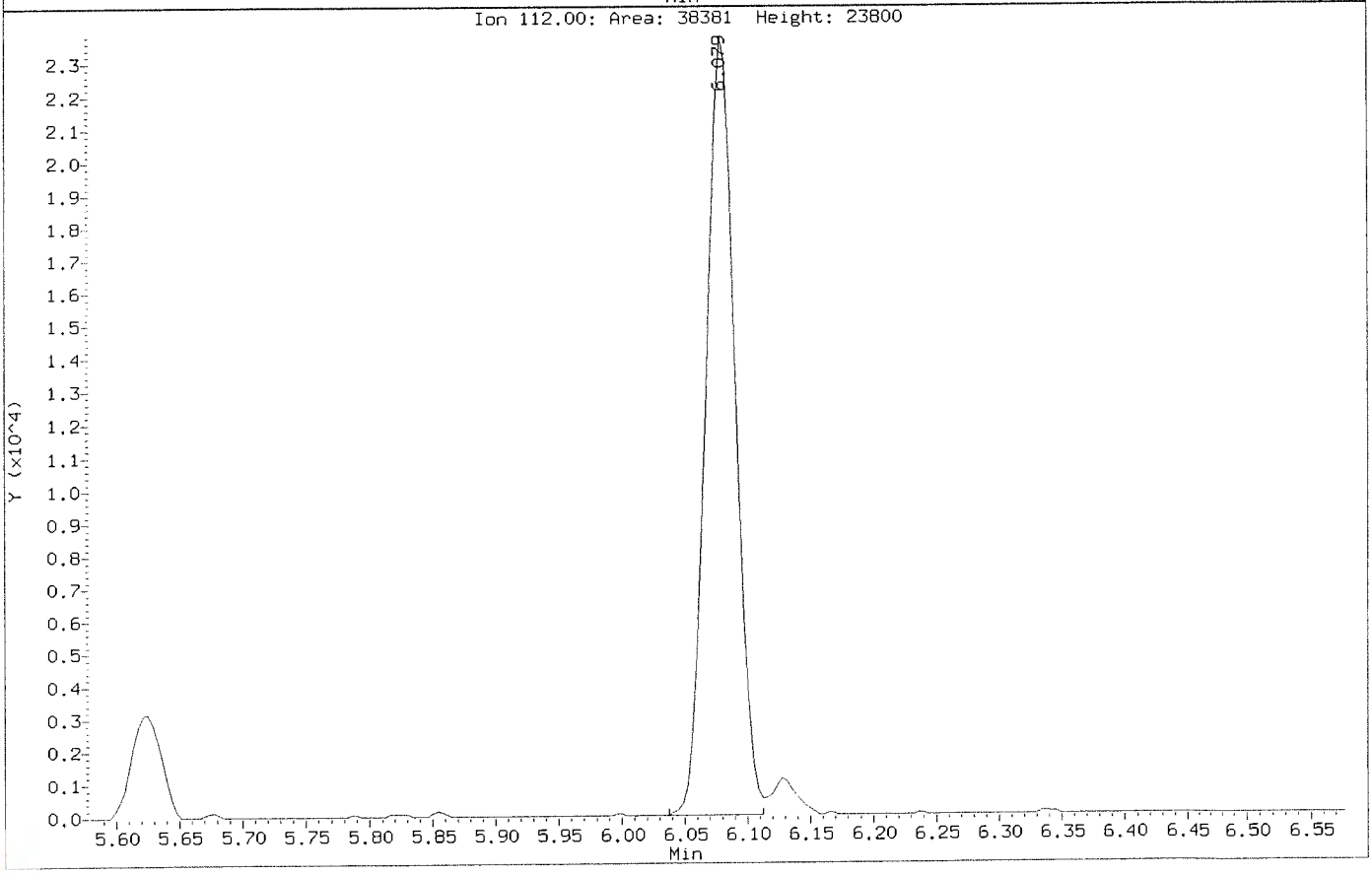
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Sample Info: VSTD200;VSTD200;1;10;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\BEFORE\U111211.D
Injection Date: 12-NOV-2019 15:17
Instrument: VOA9.i
Client Sample ID: VSTD200

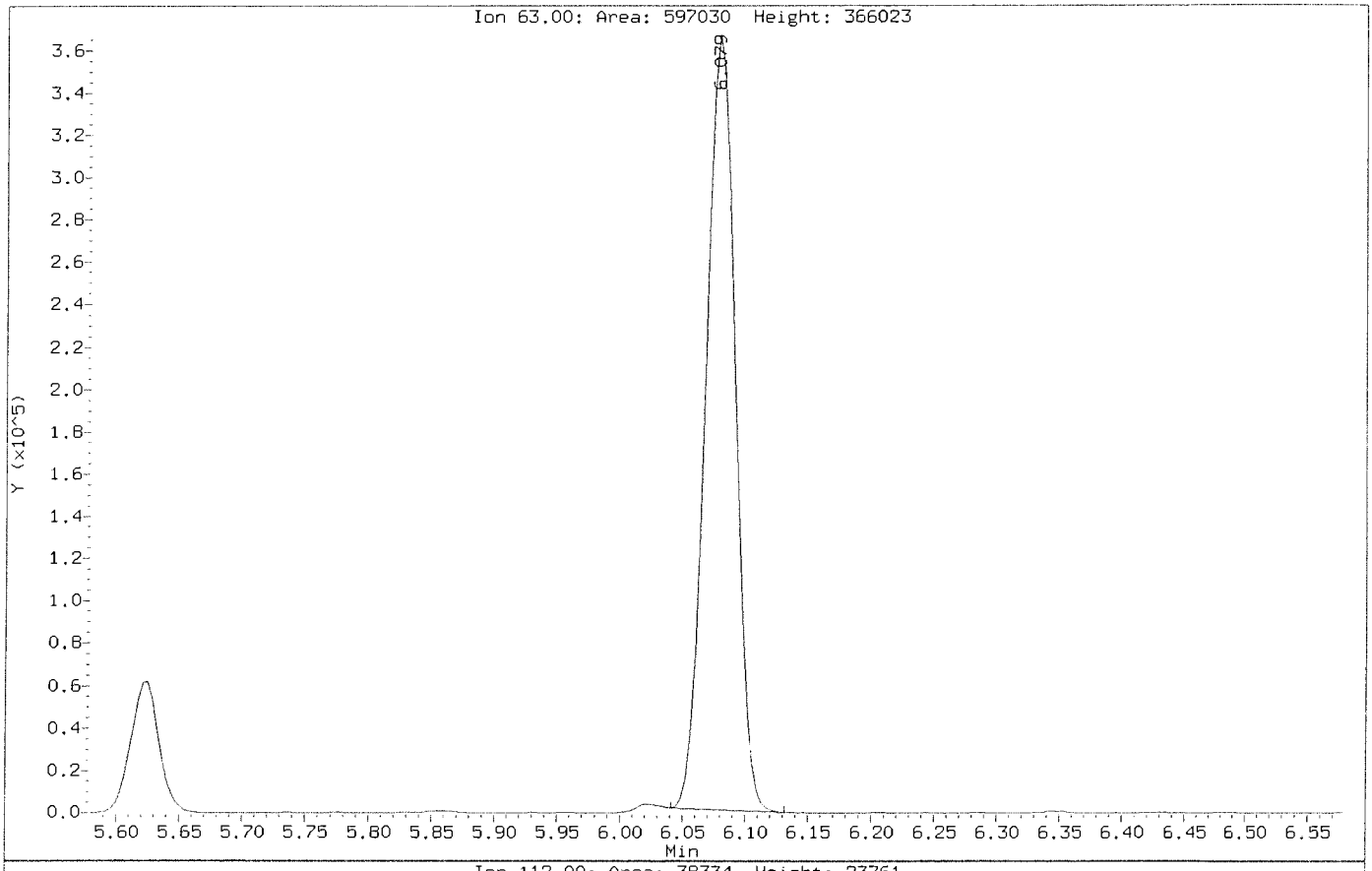
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

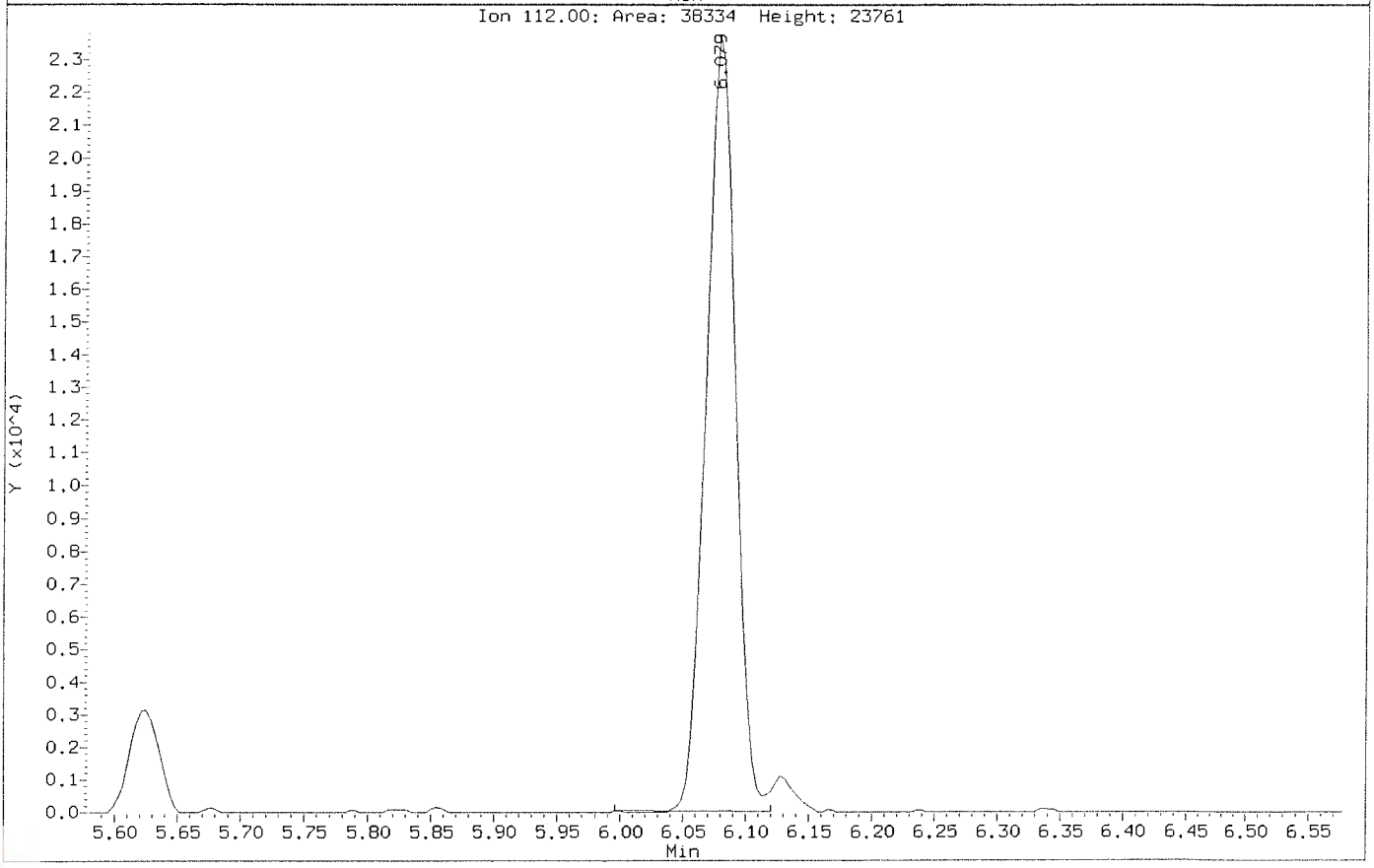




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Instrument: VOA9.i
Client Sample ID: VSTD200

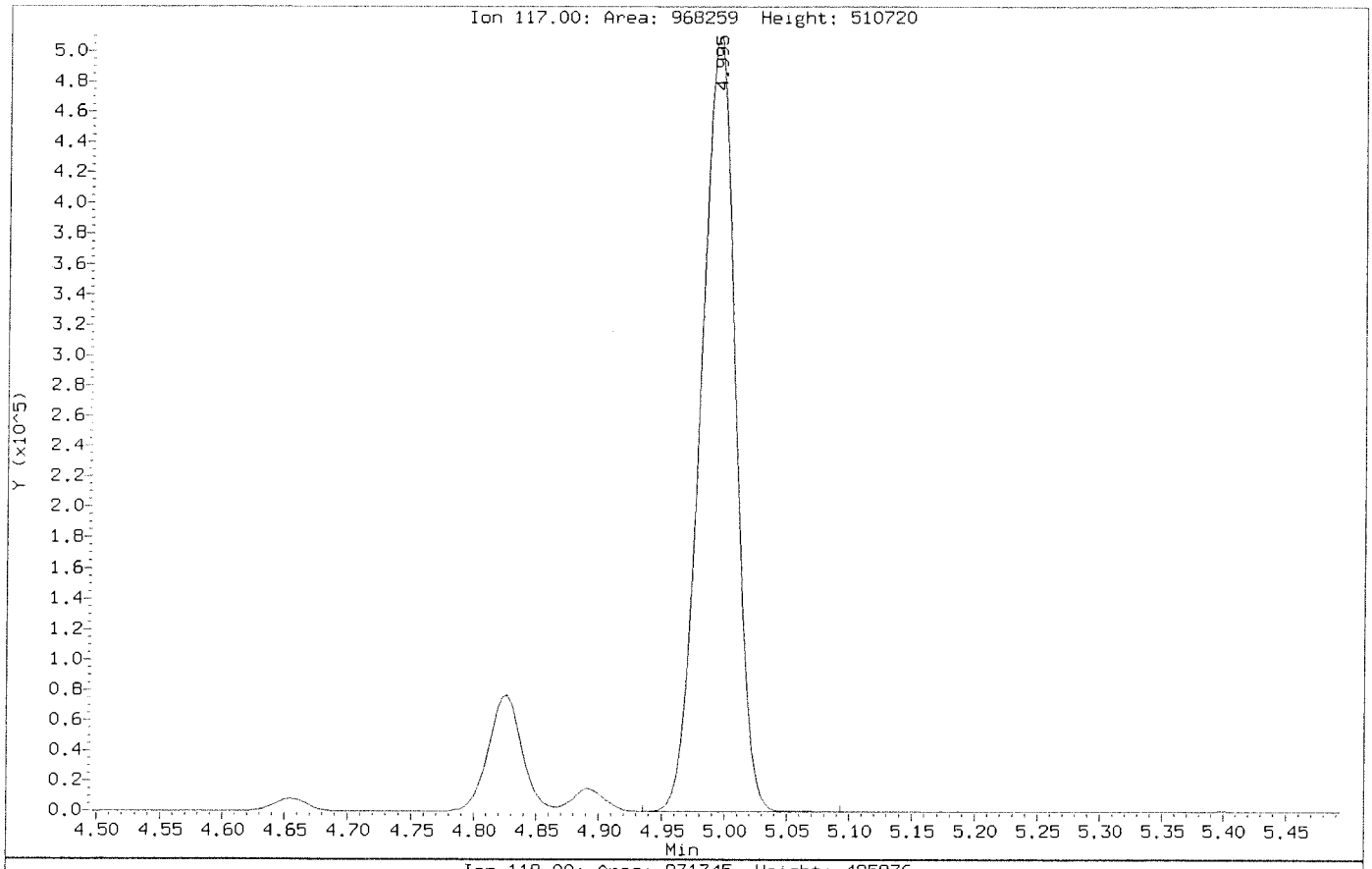
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

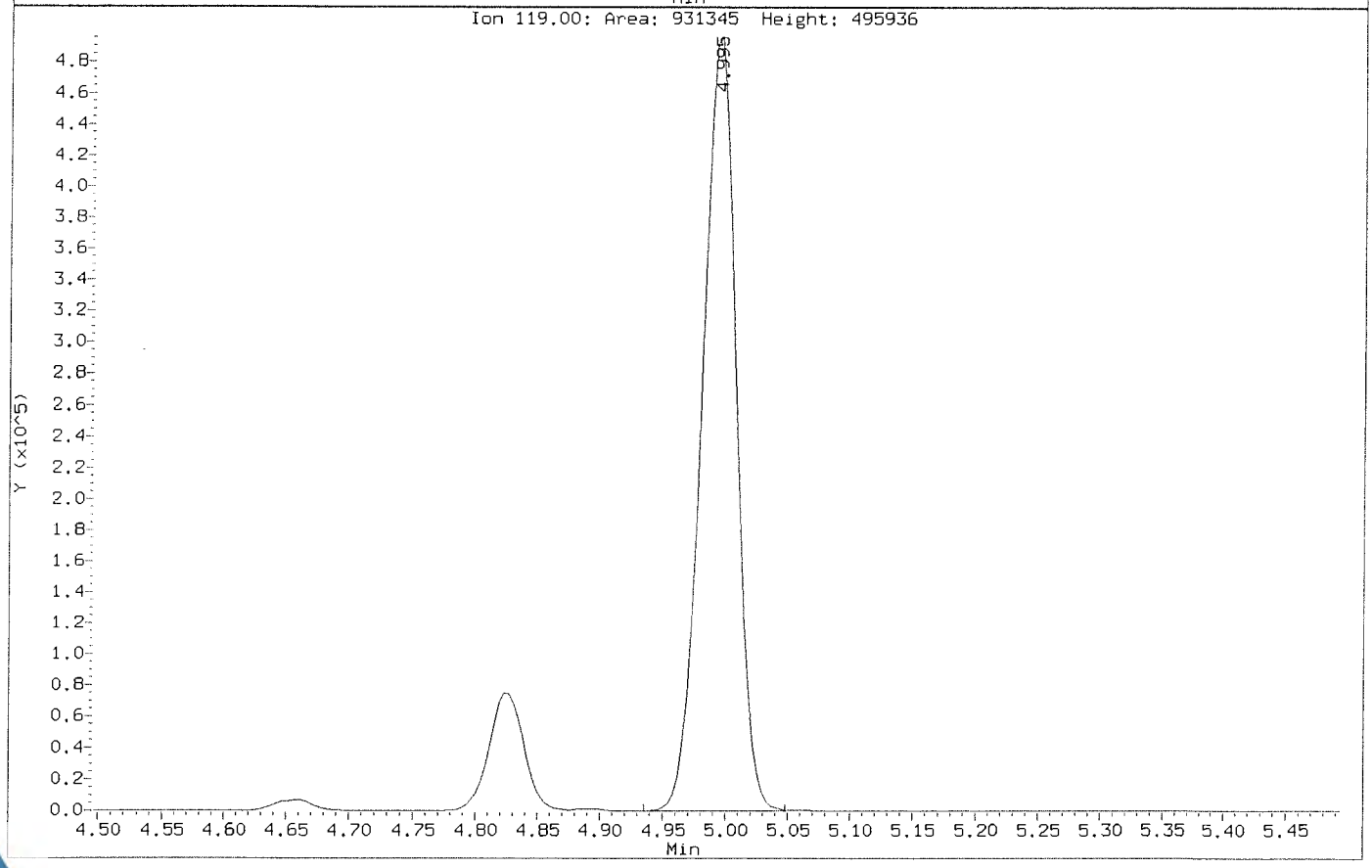




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Instrument: VOA9.i
Client Sample ID: VSTD200

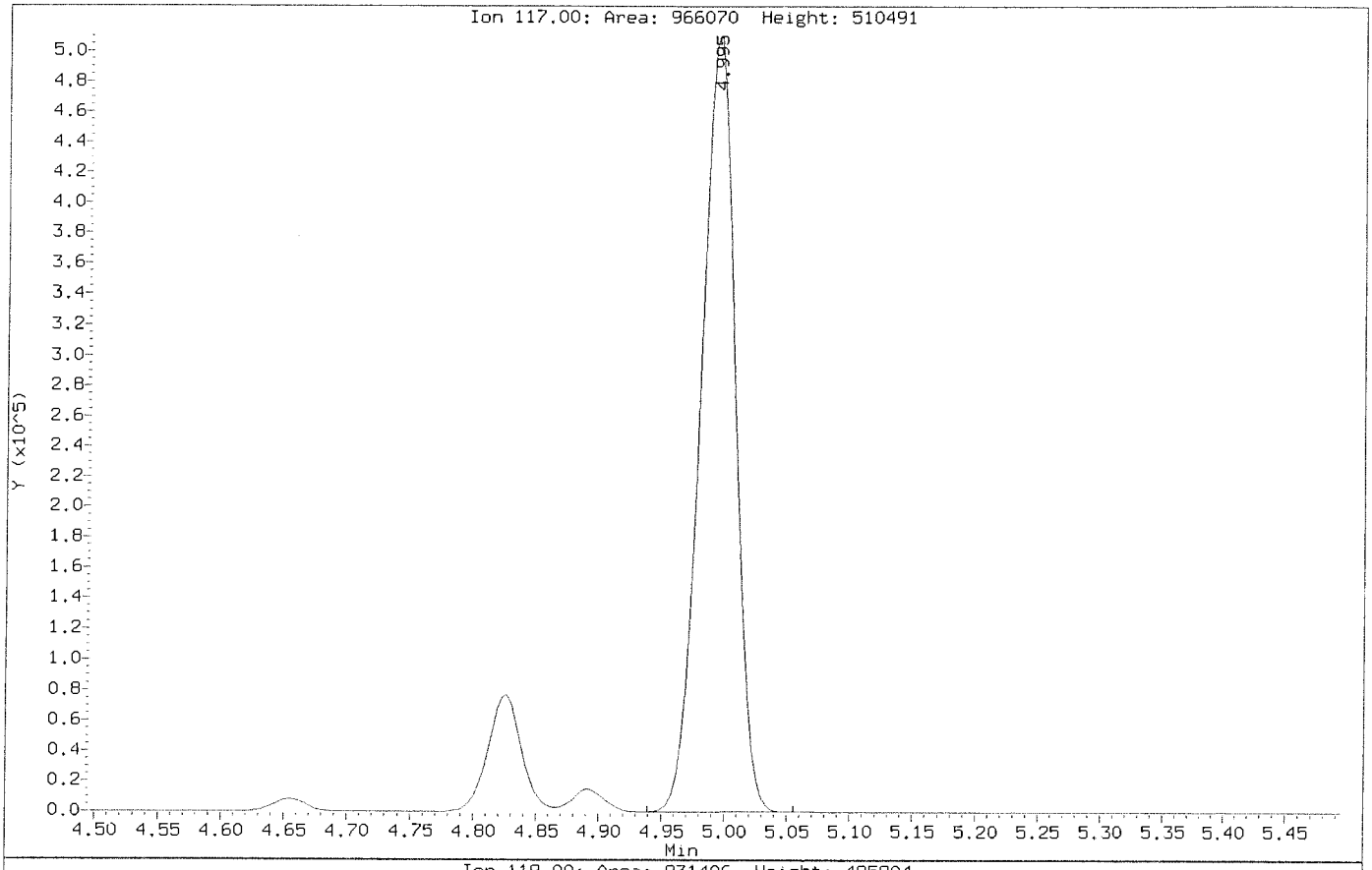
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

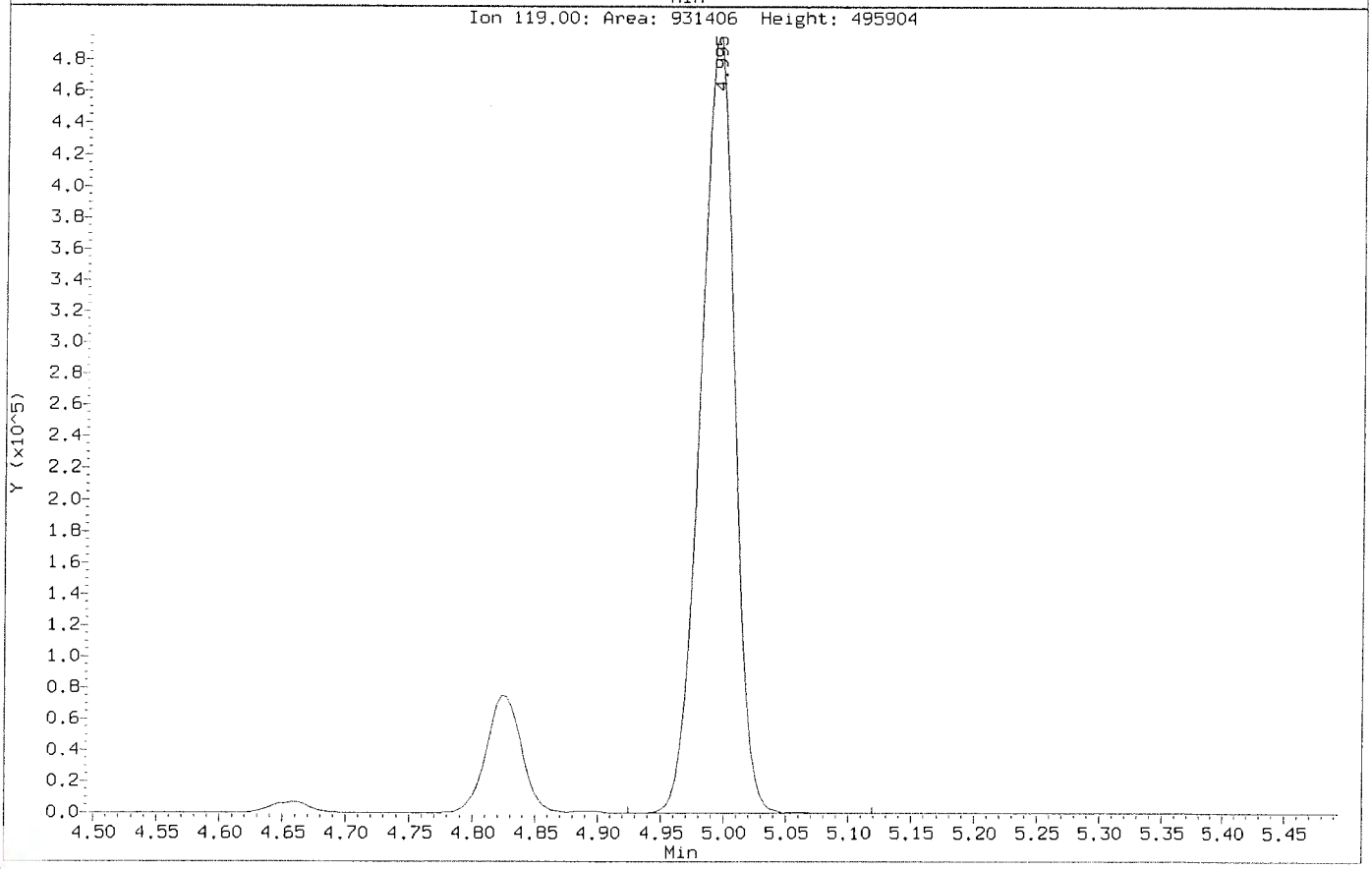




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Injection Date: 12-NOV-2019 15:17
Instrument: VOA9.i
Client Sample ID: VSTD200

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111214.D Page 1
Report Date: 05-Dec-2019 15:55

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191112.b\U111214.D
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 12-NOV-2019 16:30
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;ICV
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191112.b\8260C.m
Meth Date : 05-Dec-2019 15:53 VOA9.i Quant Type: ISTD
Cal Date : 12-NOV-2019 15:17 Cal File: U111211.D
Als bottle: 15 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

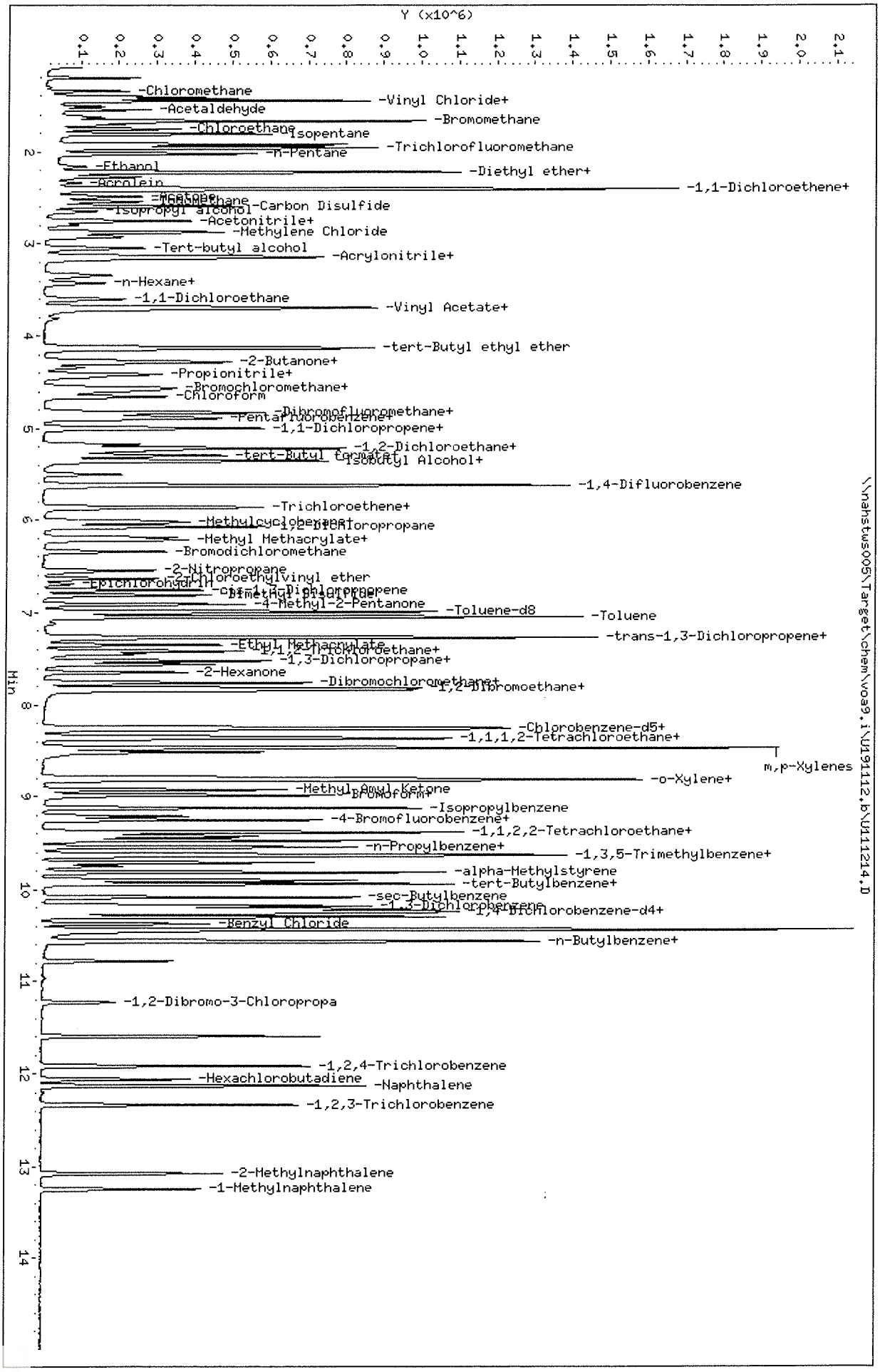
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	290824	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	490400	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	450077	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	244843	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.175	(1.057)	146385	50.3813	50.38
$ 69 4-Bromofluorobenzene	95	9.254	9.253	(1.122)	170506	49.0405	49.04
$ 30 Dibromofluoromethane	113	4.827	4.826	(0.986)	151033	52.5772	52.57
$ 48 Toluene-d8	98	6.986	6.989	(0.847)	554888	49.6631	49.66
60 1,1,1,2-Tetrachloroethane	131	8.347	8.346	(1.012)	155102	48.2276	48.22
31 1,1,1-Trichloroethane	97	4.827	4.826	(0.986)	197795	45.7210	45.72
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	212602	48.9496	48.94
138 Freon TF	101	2.405	2.397	(0.491)	284710	43.8838	43.88
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	115690	49.4737	49.47
22 1,1-Dichloroethane	63	3.604	3.600	(0.737)	193837	46.9663	46.96
11 1,1-Dichloroethene	96	2.401	2.397	(0.491)	308625	45.4337	45.43
32 1,1-Dichloropropene	75	5.003	5.002	(0.890)	154351	46.9338	46.93
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	194624	50.5349	50.53
71 1,2,3-Trichloropropane	75	9.422	9.426	(0.921)	210975	50.7145	50.71
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	201793	46.2922	46.29
79 1,2,4-Trimethylbenzene	105	9.940	9.939	(0.971)	534628	47.0802	47.08
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.229	(1.097)	38646	45.4616	45.46
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	164565	48.5886	48.58
88 1,2-Dichlorobenzene	146	10.566	10.569	(1.033)	350052	47.4622	47.46

Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111214.D Page 2
Report Date: 05-Dec-2019 15:55

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
33 1,2-Dichloroethane	62	5.250	5.250	(0.934)	168338	46.1141	46.11
42 1,2-Dichloropropane	63	6.079	6.078	(1.081)	120576	53.8632	53.86
75 1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	488895	45.8264	45.82
83 1,3-Dichlorobenzene	146	10.176	10.179	(0.995)	326152	45.0210	45.02
54 1,3-Dichloropropane	76	7.559	7.563	(0.917)	237672	50.8238	50.82
84 1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	356016	45.3806	45.38
26 2,2-Dichloropropane	77	4.275	4.271	(0.874)	168568	50.5417	50.54
24 2-Butanone	43	4.339	4.339	(0.887)	112154	105.967	105.96
76 2-Chlorotoluene	91	9.542	9.546	(0.933)	378540	47.7239	47.72
52 2-Hexanone	43	7.649	7.649	(0.928)	182787	92.9860	92.98
77 4-Chlorotoluene	91	9.636	9.636	(0.942)	469559	46.9445	46.94
82 p-Isopropyltoluene	119	10.206	10.209	(0.997)	498390	43.6683	43.66
45 4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	263585	100.388	100.38
10 Acetone	43	2.484	2.483	(0.508)	206539	111.326	111.32
37 Benzene	78	5.216	5.216	(0.928)	514641	48.5525	48.55
74 Bromobenzene	156	9.381	9.381	(0.917)	203368	45.9332	45.93
29 Bromochloromethane	128	4.553	4.553	(0.930)	82651	48.1422	48.14
39 Bromodichloromethane	83	6.345	6.344	(1.129)	172114	52.6454	52.64
66 Bromoform	173	8.980	8.984	(1.089)	118321	46.5540	46.55
6 Bromomethane	94	1.666	1.659	(0.341)	406858	49.9489	49.94
19 Carbon Disulfide	76	2.589	2.584	(0.529)	622559	96.5137	96.51
34 Carbon Tetrachloride	117	4.995	4.995	(0.889)	168384	49.3987	49.39
59 Chlorobenzene	112	8.272	8.271	(1.003)	413410	45.3591	45.35
7 Chloroethane	64	1.753	1.741	(0.358)	206943	50.7337	50.73
28 Chloroform	83	4.658	4.654	(0.952)	234981	47.7952	47.79
3 Chloromethane	50	1.344	1.340	(0.275)	133807	51.6485	51.64
27 cis-1,2-Dichloroethene	96	4.283	4.283	(0.875)	149534	45.1401	45.14
46 cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	204739	57.3505	57.35
55 Dibromochloromethane	129	7.754	7.758	(0.940)	156192	45.4931	45.49
44 Dibromomethane	93	6.187	6.187	(1.101)	97781	49.2058	49.20
2 Dichlorodifluoromethane	85	1.209	1.205	(0.247)	131693	44.5261	44.52
61 Ethylbenzene	106	8.369	8.369	(1.015)	210450	46.3156	46.31
91 Hexachlorobutadiene	225	12.058	12.061	(1.178)	59234	40.1544	40.15
67 Isopropylbenzene	105	9.123	9.126	(1.106)	596256	46.2752	46.27
62 m,p-Xylenes	106	8.470	8.470	(1.027)	529787	95.2776	95.27
17 Methylene Chloride	84	2.873	2.869	(0.587)	131549	48.5585	48.55
87 n-Butylbenzene	91	10.551	10.554	(1.031)	422612	44.2190	44.21
73 n-Propylbenzene	91	9.471	9.475	(0.926)	653748	45.6774	45.67
92 Naphthalene	128	12.129	12.129	(1.185)	615028	53.0972	53.09
63 o-Xylene	106	8.808	8.807	(1.068)	262747	46.6334	46.63
81 sec-Butylbenzene	105	10.082	10.086	(0.985)	523468	43.6552	43.65
64 Styrene	104	8.823	8.822	(1.070)	483840	49.3852	49.38
78 tert-Butylbenzene	119	9.899	9.898	(0.967)	410663	45.3182	45.31
56 Tetrachloroethene	166	7.522	7.522	(0.912)	148804	43.6153	43.61
50 Toluene	91	7.046	7.045	(0.855)	623236	45.8921	45.89
20 trans-1,2-Dichloroethene	96	3.143	3.139	(0.642)	127491	45.3123	45.31
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	203227	50.3058	50.30
38 Trichloroethene	130	5.861	5.861	(1.043)	156076	48.0691	48.06
8 Trichlorofluoromethane	101	1.955	1.951	(0.400)	560418	44.9084	44.90
5 Vinyl Chloride	62	1.423	1.419	(0.291)	285870	44.2005	44.20



Data File: \\nahstws005\Target\chem\voa9.i\U191112.b\U111214.D
Date : 12-NOV-2019 16:30
Client ID: ICV
Sample Info: VSTD050;VSTD050;2;;ICV
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

MSVOA09 -Logbook

Batch: 38380 **Analyst:** Devak Giga

Date: 11-15-2019 **Reviewer:**

Method: 8260 **Laboratory:** Houston

Comments:

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	11-15-2019 10:42 am	1.00	0.00 mL	0.00 mL	U111501.D	Liquid	Y	NA
	Auto find/purged									
2	VSTD050	CCV	11-15-2019 11:06 am	1.00	5.00 mL	0.00 mL	U111502a.D	Liquid	Y	NA
	10 uL cal/50 mL DI									
3	VSTD050	CCV	11-15-2019 11:30 am	1.00	5.00 mL	0.00 mL	U111503.D	Liquid	Y	NA
	10 uL cal/50 mL DI									
4	CCB	SAMP	11-15-2019 11:54 am	1.00	5.00 mL	0.00 mL	U111504.D	Liquid	Y	NA
	CCB									
5	VLCSW-191115	LCS	11-15-2019 12:19 pm	1.00	5.00 mL	0.00 mL	U111505.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
6	BLANK	SAMP	11-15-2019 12:43 pm	1.00	5.00 mL	0.00 mL	U111506.D	Liquid	Y	NA
7	VBLKW-191115	MBLK	11-15-2019 01:07 pm	1.00	5.00 mL	0.00 mL	U111507.D	Liquid	Y	NA
8	HS19110644-11	SAMP	11-15-2019 01:32 pm	1.00	5.00 mL	0.00 mL	U111508.D	Liquid	Y	NA
9	HS19110644-01	SAMP	11-15-2019 01:56 pm	1.00	5.00 mL	0.00 mL	U111509.D	Liquid	Y	NA
10	HS19110644-09	SAMP	11-15-2019 02:20 pm	1.00	5.00 mL	0.00 mL	U111510.D	Liquid	Y	NA
11	HS19110644-10	SAMP	11-15-2019 02:45 pm	1.00	5.00 mL	0.00 mL	U111511.D	Liquid	Y	NA
12	HS19110644-06	SAMP	11-15-2019 03:09 pm	1.00	5.00 mL	0.00 mL	U111512.D	Liquid	Y	NA
13	HS19110644-08	SAMP	11-15-2019 03:33 pm	10.00	5.00 mL	0.00 mL	U111513.D	Liquid	Y	NA
14	HS19110644-01MS	MS	11-15-2019 03:58 pm	1.00	5.00 mL	0.00 mL	U111514.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
15	HS19110644-01MSD	MSD	11-15-2019 04:22 pm	1.00	5.00 mL	0.00 mL	U111515.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
16	HS19110644-08	SAMP	11-15-2019 04:46 pm	100.0(	5.00 mL	0.00 mL	U111516.D	Liquid	Y	NA
17	HS19110644-06	SAMP	11-15-2019 05:10 pm	10.00	5.00 mL	0.00 mL	U111517.D	Liquid	Y	NA
18	HS19110644-09	SAMP	11-15-2019 05:35 pm	5.00	5.00 mL	0.00 mL	U111518.D	Liquid	Y	NA
19	HS19110644-10	SAMP	11-15-2019 05:59 pm	5.00	5.00 mL	0.00 mL	U111519.D	Liquid	Y	NA
20	HS19110644-02	SAMP	11-15-2019 06:23 pm	1.00	5.00 mL	0.00 mL	U111520.D	Liquid	Y	NA
21	HS19110644-03	SAMP	11-15-2019 06:48 pm	1.00	5.00 mL	0.00 mL	U111521.D	Liquid	Y	NA
22	HS19110644-04	SAMP	11-15-2019 07:12 pm	1.00	5.00 mL	0.00 mL	U111522.D	Liquid	Y	NA
23	HS19110644-05	SAMP	11-15-2019 07:36 pm	1.00	5.00 mL	0.00 mL	U111523.D	Liquid	Y	NA
24	HS19110644-07	SAMP	11-15-2019 08:01 pm	1.00	5.00 mL	0.00 mL	U111524.D	Liquid	Y	NA
25	CCV-END	CCV	11-15-2019 08:25 pm	1.00	5.00 mL	0.00 mL	U111525.D	Liquid	Y	NA
	10 uL cal/50 mL DI									
26	HS19110716-06	SAMP	11-15-2019 08:49 pm	1.00	5.00 mL	0.00 mL	U111526.D	Liquid	Y	NA
27	HS19110776-01	SAMP	11-15-2019 09:13 pm	1.00	5.00 mL	0.00 mL	U111527.D	Liquid	Y	NA
28	HS19110776-02	SAMP	11-15-2019 09:38 pm	1.00	5.00 mL	0.00 mL	U111528.D	Liquid	Y	NA
29	HS19110638-01	SAMP	11-15-2019 10:02 pm	100.0(	5.00 mL	0.00 mL	U111529.D	Liquid	Y	NA
30	HS19110692-09	SAMP	11-15-2019 10:27 pm	1.00	5.00 mL	0.00 mL	U111530.D	Liquid	Y	NA
31	BFB	TUNE	11-15-2019 10:51 pm	1.00	0.00 mL	0.00 mL	V111501a.D	Liquid	Y	NA
	Auto find/purged									
32	BFB	TUNE	11-15-2019 11:15 pm	1.00	0.00 mL	0.00 mL	V111502.D	Liquid	Y	NA
	Auto find/purged									
33	VSTD050	CCV	11-15-2019 11:39 pm	1.00	5.00 mL	0.00 mL	V111503.D	Liquid	Y	NA
	10 uL cal/50 mL DI									
34	VLCSW-191115	LCS	11-16-2019 12:03 am	1.00	5.00 mL	0.00 mL	V111504.D	Liquid	Y	NA
	4 uL LCS std/50 mL DI									
35	BLANK	SAMP	11-16-2019 12:27 am	1.00	5.00 mL	0.00 mL	V111505.D	Liquid	Y	NA

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
36	VBLKW-191115	MBLK	11-16-2019 12:52 am	1.00	5.00 mL	0.00 mL	V111506.D	Liquid	Y	NA
37	HS19110673-01	SAMP	11-16-2019 01:16 am	1.00	5.00 mL	0.00 mL	V111507.D	Liquid	Y	NA
38	HS19110345-09	SAMP	11-16-2019 01:40 am	1.00	5.00 mL	0.00 mL	V111508.D	Liquid	Y	NA
39	HS19110673-01MS	MS	11-16-2019 02:04 am	1.00	5.00 mL	0.00 mL	V111509.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
40	HS19110673-01MSD	MSD	11-16-2019 02:29 am	1.00	5.00 mL	0.00 mL	V111510.D	Liquid	Y	NA
	3.2 uL cal std/40 mL sample									
41	HS19110640-01	SAMP	11-16-2019 02:53 am	2500.0	5.00 mL	0.00 mL	V111511.D	Liquid	Y	NA
42	HS19110640-03	SAMP	11-16-2019 03:17 am	2500.0	5.00 mL	0.00 mL	V111512.D	Liquid	Y	NA
43	HS19110640-05	SAMP	11-16-2019 03:42 am	500.0(	5.00 mL	0.00 mL	V111513.D	Liquid	Y	NA
44	HS19110640-06	SAMP	11-16-2019 04:06 am	2500.0	5.00 mL	0.00 mL	V111514.D	Liquid	Y	NA
45	HS19110649-02	SAMP	11-16-2019 04:30 am	50.00	5.00 mL	0.00 mL	V111515.D	Liquid	Y	NA
46	HS19110649-07	SAMP	11-16-2019 04:55 am	50.00	5.00 mL	0.00 mL	V111516.D	Liquid	Y	NA
47	MBLK-147498	MBLK	11-16-2019 05:19 am	1.00	5.00 mL	0.00 mL	V111517.D	Liquid	Y	NA
48	HS19110617-01	SAMP	11-16-2019 05:43 am	1.00	5.00 mL	0.00 mL	V111518.D	Liquid	Y	NA
49	HS19110617-02	SAMP	11-16-2019 06:07 am	1.00	5.00 mL	0.00 mL	V111519.D	Liquid	Y	NA
50	MBLK-147567	MBLK	11-16-2019 06:32 am	20.00	5.00 mL	0.00 mL	V111520.D	Liquid	Y	NA
51	HS19110681-01	SAMP	11-16-2019 06:56 am	20.00	5.00 mL	0.00 mL	V111521.D	Liquid	Y	NA
52	HS19110717-01	SAMP	11-16-2019 07:20 am	20.00	5.00 mL	0.00 mL	V111522.D	Liquid	Y	NA
53	HS19110718-01	SAMP	11-16-2019 07:45 am	20.00	5.00 mL	0.00 mL	V111523.D	Liquid	Y	NA
54	HS19110687-03	SAMP	11-16-2019 08:09 am	20.00	5.00 mL	0.00 mL	V111524.D	Liquid	Y	NA
55	HS19110747-01	SAMP	11-16-2019 08:33 am	100.0(	5.00 mL	0.00 mL	V111525.D	Liquid	Y	NA
56	HS19110687-02	SAMP	11-16-2019 08:57 am	100.0(	5.00 mL	0.00 mL	V111526.D	Liquid	Y	NA
57	HS19110687-01	SAMP	11-16-2019 09:22 am	100.0(	5.00 mL	0.00 mL	V111527.D	Liquid	Y	NA
58	HS19110627-01	SAMP	11-16-2019 09:46 am	1.00	5.00 mL	0.00 mL	V111528.D	Liquid	Y	NA
59	HS19110729-01	SAMP	11-16-2019 10:10 am	1.00	5.00 mL	0.00 mL	V111529.D	Liquid	Y	NA

Chemical	Value
SURR SPK ID	31106-03-03
IS ID	31106-03-04
ICV STD ID	30603-91-01
LCS/MS ID	30603-91-01
CAL STD ID	31106-03-01/02
BFB ID	31106-04-03
pH Paper	634-64-11

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

	CLIENT SAMPLE NO.	SMC1 #	SMC2 #	SMC3 (TOL) #	OTHER (DCE) #	TOT OUT
01	VLCSW-191115	95	107	101	116	0
02	VBLKW-191115	94	89	104	98	0
03	HS19110644-11	97	89	110	96	0
04	HS19110644-01	96	87	108	96	0
05	HS19110644-09	90	86	106	98	0
06	HS19110644-10	96	89	106	101	0
07	HS19110644-06	92	91	105	101	0
08	HS19110644-08	94	92	106	100	0
09	HS19110644-01	99	96	104	99	0
10	HS19110644-01	100	93	103	97	0
11	HS19110644-08	95	89	106	100	0
12	HS19110644-06	98	92	104	101	0
13	HS19110644-09	94	95	105	109	0
14	HS19110644-10	102	84	109	100	0
15	HS19110644-02	96	90	106	96	0
16	HS19110644-03	90	88	107	101	0
17	HS19110644-04	94	91	108	99	0
18	HS19110644-05	97	87	106	102	0
19	HS19110644-07	95	92	106	101	0
20						
21						
22						
23						
24						
25						
26						
27						
28						

		QC LIMITS
SMC1	= 4-Bromofluorobenzene	(70-130)
SMC2	= Dibromofluoromethane	(70-130)
SMC3 (TOL)	= Toluene-d8	(0-130)
OTHER(DCE)	= 1,2-Dichloroethane-d4	(0-130)

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-191115

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Lab File ID: U111507 Lab Sample ID: VBLKW-191115

Date Analyzed: 11/15/19 Time Analyzed: 1307

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA9

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VLCSW-191115	VLCSW-191115	U111505	1219
02	HS19110644-1	HS19110644-11	U111508	1332
03	HS19110644-0	HS19110644-01	U111509	1356
04	HS19110644-0	HS19110644-09	U111510	1420
05	HS19110644-1	HS19110644-10	U111511	1445
06	HS19110644-0	HS19110644-06	U111512	1509
07	HS19110644-0	HS19110644-08	U111513	1533
08	HS19110644-0	HS19110644-01M	U111514	1558
09	HS19110644-0	HS19110644-01M	U111515	1622
10	HS19110644-0	HS19110644-08	U111516	1646
11	HS19110644-0	HS19110644-06	U111517	1710
12	HS19110644-0	HS19110644-09	U111518	1735
13	HS19110644-1	HS19110644-10	U111519	1759
14	HS19110644-0	HS19110644-02	U111520	1823
15	HS19110644-0	HS19110644-03	U111521	1848
16	HS19110644-0	HS19110644-04	U111522	1912
17	HS19110644-0	HS19110644-05	U111523	1936
18	HS19110644-0	HS19110644-07	U111524	2001
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Lab File ID: U111501 BFB Injection Date: 11/15/19

Instrument ID: VOA9 BFB Injection Time: 1042

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	21.7
75	30.0 - 60.0% of mass 95	51.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.1
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	101.4
175	5.0 - 9.0% of mass 174	9.0 (8.9)1
176	95.0 - 101.0% of mass 174	97.9 (96.5)1
177	5.0 - 9.0% of mass 176	5.8 (6.0)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	U111503	11/15/19	1130
02	VLCSW-191115	VLCSW-191115	U111505	11/15/19	1219
03	VBLKW-191115	VBLKW-191115	U111507	11/15/19	1307
04	HS19110644-1	HS19110644-11	U111508	11/15/19	1332
05	HS19110644-0	HS19110644-01	U111509	11/15/19	1356
06	HS19110644-0	HS19110644-09	U111510	11/15/19	1420
07	HS19110644-1	HS19110644-10	U111511	11/15/19	1445
08	HS19110644-0	HS19110644-06	U111512	11/15/19	1509
09	HS19110644-0	HS19110644-08	U111513	11/15/19	1533
10	HS19110644-0	HS19110644-01M	U111514	11/15/19	1558
11	HS19110644-0	HS19110644-01M	U111515	11/15/19	1622
12	HS19110644-0	HS19110644-08	U111516	11/15/19	1646
13	HS19110644-0	HS19110644-06	U111517	11/15/19	1710
14	HS19110644-0	HS19110644-09	U111518	11/15/19	1735
15	HS19110644-1	HS19110644-10	U111519	11/15/19	1759
16	HS19110644-0	HS19110644-02	U111520	11/15/19	1823
17	HS19110644-0	HS19110644-03	U111521	11/15/19	1848
18	HS19110644-0	HS19110644-04	U111522	11/15/19	1912
19	HS19110644-0	HS19110644-05	U111523	11/15/19	1936
20	HS19110644-0	HS19110644-07	U111524	11/15/19	2001
21	CCV-END	CCV-END	U111525	11/15/19	2025
22					

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Instrument ID: VOA9 Calibration Date: 11/15/19 Time: 1130

Lab File ID: U111503 Init. Calib. Date(s): 11/12/19 11/12/19

Init. Calib. Times: 1116 1517

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	
cis-1,3-Dichloropropene	0.3640000	0.3907317	0.3907317	0.2	-7.34	20.00	AVRG	
trans-1,3-Dichloropropene	46.576469	50.000000	0.3832287	0.1	6.85	20.00	LINR	
1,3-Dichlorobenzene	1.4790000	1.2884419	1.2884419	0.6	12.88	20.00	AVRG	
2,2-Dichloropropane	0.5730000	0.5172644	0.5172644	0.1	9.73	20.00	AVRG	
1,1-Dichloropropene	0.3350000	0.3188171	0.3188171	0.1	4.83	20.00	AVRG	
Dibromomethane	0.2030000	0.1934805	0.1934805	0.1	4.69	20.00	AVRG	
1,2-Dibromoethane	0.3760000	0.3633619	0.3633619	0.1	3.36	20.00	AVRG	
trans-1,2-Dichloroethene	46.029776	50.000000	0.4456194	0.1	7.94	20.00	LINR	
1,1,1,2-Tetrachloroethane	43.421807	50.000000	0.3089904	0.1	13.16	20.00	LINR	
1,1,1-Trichloroethane	0.7440000	0.6790763	0.6790763	0.1	8.73	20.00	AVRG	
1,1,2,2-Tetrachloroethane	0.8870000	0.9231377	0.9231377	0.3	-4.07	20.00	AVRG	
Toluene	1.5080000	1.4143647	1.4143647	0.4	6.21	20.00	AVRG	
1,1,2-Trichloroethane	0.2600000	0.2630137	0.2630137	0.1	-1.16	20.00	AVRG	
1,1-Dichloroethane	0.7090000	0.7208478	0.7208478	0.2	-1.67	20.00	AVRG	
1,1-Dichloroethene	1.1680000	1.1680205	1.1680205	0.1	-0.00	20.00	AVRG	
Trichlorofluoromethane	2.1450000	2.0170048	2.0170048	0.1	5.97	20.00	AVRG	
1,2,3-Trichlorobenzene	0.7860000	0.7324190	0.7324190	0.1	6.82	20.00	AVRG	
Tetrachloroethene	0.3790000	0.3105852	0.3105852	0.2	18.05	20.00	AVRG	
1,2,4-Trichlorobenzene	0.8900000	0.7780518	0.7780518	0.2	12.58	20.00	AVRG	
1,2,4-Trimethylbenzene	2.3190000	2.1745587	2.1745587	0.1	6.23	20.00	AVRG	
tert-Butylbenzene	1.8500000	1.6953980	1.6953980	0.1	8.36	20.00	AVRG	
Trichloroethene	0.3310000	0.2995771	0.2995771	0.2	9.49	20.00	AVRG	
1,2-Dichlorobenzene	1.5060000	1.3504121	1.3504121	0.4	10.33	20.00	AVRG	
1,2-Dichloroethane	0.3720000	0.3535879	0.3535879	0.1	4.95	20.00	AVRG	
1,2-Dichloropropane	57.389778	50.000000	0.2615092	0.1	-14.78	20.00	LINR	
1,3,5-Trimethylbenzene	2.1790000	2.0367469	2.0367469	0.1	6.53	20.00	AVRG	
1,3-Dichloropropane	0.5190000	0.5414979	0.5414979	0.1	-4.33	20.00	AVRG	
1,4-Dichlorobenzene	1.6020000	1.3515725	1.3515725	0.4	15.63	20.00	AVRG	
2-Butanone	103.61165	100.00000	0.1886037	0.1	-3.61	20.00	LINR	
2-Chlorotoluene	1.6200000	1.5652151	1.5652151	0.1	3.38	20.00	AVRG	
2-Hexanone	0.2180000	0.2159538	0.2159538	0.1	0.94	20.00	AVRG	
4-Chlorotoluene	2.0420000	1.9481782	1.9481782	0.1	4.59	20.00	AVRG	
Styrene	1.0880000	1.0501898	1.0501898	0.3	3.48	20.00	AVRG	
4-Methyl-2-Pentanone	0.2920000	0.3033517	0.3033517	0.1	-3.89	20.00	AVRG	
Acetone	127.78942	100.00000	0.4027417	0.1	-27.79	20.00	LINR	<-
Benzene	1.0810000	1.0939807	1.0939807	0.5	-1.20	20.00	AVRG	
Bromobenzene	0.9040000	0.7721959	0.7721959	0.1	14.58	20.00	AVRG	
Bromochloromethane	0.2950000	0.2846067	0.2846067	0.1	3.52	20.00	AVRG	
Bromodichloromethane	0.3330000	0.3493897	0.3493897	0.2	-4.92	20.00	AVRG	
Bromoform	43.419008	50.000000	0.2436740	0.1	13.16	20.00	2RDR	
Bromomethane	53.285076	50.000000	1.5022599	0.1	-6.57	20.00	2RDR	
Carbon Disulfide	1.1090000	1.1397725	1.1397725	0.1	-2.77	20.00	AVRG	

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911064

Instrument ID: VOA9 Calibration Date: 11/15/19 Time: 1130

Lab File ID: U111503 Init. Calib. Date(s): 11/12/19 11/12/19

Init. Calib. Times: 1116 1517

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
Carbon Tetrachloride	0.3480000	0.3181695	0.3181695	0.1	8.57	20.00	AVRG
Chlorobenzene	1.0130000	0.9143121	0.9143121	0.5	9.74	20.00	AVRG
Chloroethane	58.582275	50.000000	0.8179864	0.1	-17.16	20.00	LINR
Chloroform	0.8450000	0.8531294	0.8531294	0.2	-0.96	20.00	AVRG
Chloromethane	57.105552	50.000000	0.5075880	0.1	-14.21	20.00	LINR
cis-1,2-Dichloroethene	0.5690000	0.5387484	0.5387484	0.1	5.32	20.00	AVRG
Dibromochloromethane	42.808730	50.000000	0.3253422	0.1	14.38	20.00	LINR
Dichlorodifluoromethane	0.5080000	0.4724677	0.4724677	0.1	6.99	20.00	AVRG
Ethylbenzene	0.5050000	0.4759484	0.4759484	0.1	5.75	20.00	AVRG
Hexachlorobutadiene	0.3010000	0.2693539	0.2693539	0.1	10.51	20.00	AVRG
Isopropylbenzene	1.4310000	1.2784160	1.2784160	0.1	10.66	20.00	AVRG
m,p-Xylenes	0.6180000	0.5811167	0.5811167	0.1	5.97	20.00	AVRG
Methylene Chloride	49.430253	50.000000	0.4606059	0.1	1.14	20.00	LINR
n-Butylbenzene	1.9520000	1.8752324	1.8752324	0.5	3.93	20.00	AVRG
n-Propylbenzene	2.9230000	2.8329143	2.8329143	0.1	3.08	20.00	AVRG
Naphthalene	2.3660000	2.3934554	2.3934554	0.2	-1.16	20.00	AVRG
o-Xylene	0.6260000	0.5927196	0.5927196	0.3	5.32	20.00	AVRG
sec-Butylbenzene	2.4490000	2.2415090	2.2415090	0.1	8.47	20.00	AVRG
Vinyl Chloride	1.1120000	1.1621777	1.1621777	0.1	-4.51	20.00	AVRG
1,2,3-Trichloropropane	0.8490000	0.8741794	0.8741794	0.1	-2.96	20.00	AVRG
p-Isopropyltoluene	2.3300000	2.0513275	2.0513275	0.1	11.96	20.00	AVRG
1,2-Dibromo-3-Chloropropane	40.127193	50.000000	0.1386444	0.05	19.74	20.00	LINR
Freon TF	1.1150000	1.0868256	1.0868256	0.1	2.53	20.00	AVRG
4-Bromofluorobenzene	49.550047	50.000000	0.3828266	0.1	0.90	20.00	LINR
Dibromofluoromethane	53.859600	50.000000	0.5321651	0.1	-7.72	20.00	2RDR
Toluene-d8	50.604848	50.000000	1.2563132	0.1	-1.21	20.00	LINR
1,2-Dichloroethane-d4	55.076958	50.000000	0.5493911	0.1	-10.15	20.00	LINR

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Instrument ID: VOA9 Calibration Date: 11/15/19 Time: 2025

Lab File ID: U111525 Init. Calib. Date(s): 11/12/19 11/12/19

Init. Calib. Times: 1116 1517

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
cis-1,3-Dichloropropene	0.3640000	0.3985455	0.3985455	0.2	-9.49	50.00	AVRG
trans-1,3-Dichloropropene	47.120690	50.000000	0.3877791	0.1	5.76	50.00	LINR
1,3-Dichlorobenzene	1.4790000	1.3955654	1.3955654	0.6	5.64	50.00	AVRG
2,2-Dichloropropane	0.5730000	0.4185131	0.4185131	0.1	26.96	50.00	AVRG
1,1-Dichloropropene	0.3350000	0.3538858	0.3538858	0.1	-5.64	50.00	AVRG
Dibromomethane	0.2030000	0.2233015	0.2233015	0.1	-10.00	50.00	AVRG
1,2-Dibromoethane	0.3760000	0.3792782	0.3792782	0.1	-0.87	50.00	AVRG
trans-1,2-Dichloroethene	53.131687	50.000000	0.5172940	0.1	-6.26	50.00	LINR
1,1,1,2-Tetrachloroethane	44.497044	50.000000	0.3169603	0.1	11.00	50.00	LINR
1,1,1-Trichloroethane	0.7440000	0.7787216	0.7787216	0.1	-4.67	50.00	AVRG
1,1,2,2-Tetrachloroethane	0.8870000	1.0137280	1.0137280	0.3	-14.29	50.00	AVRG
Toluene	1.5080000	1.5606069	1.5606069	0.4	-3.49	50.00	AVRG
1,1,2-Trichloroethane	0.2600000	0.2902733	0.2902733	0.1	-11.64	50.00	AVRG
1,1-Dichloroethane	0.7090000	0.8312906	0.8312906	0.2	-17.25	50.00	AVRG
1,1-Dichloroethene	1.1680000	1.3607319	1.3607319	0.1	-16.50	50.00	AVRG
Trichlorofluoromethane	2.1450000	2.3861004	2.3861004	0.1	-11.24	50.00	AVRG
1,2,3-Trichlorobenzene	0.7860000	0.7918483	0.7918483	0.1	-0.74	50.00	AVRG
Tetrachloroethene	0.3790000	0.3597695	0.3597695	0.2	5.07	50.00	AVRG
1,2,4-Trichlorobenzene	0.8900000	0.8456843	0.8456843	0.2	4.98	50.00	AVRG
1,2,4-Trimethylbenzene	2.3190000	2.4647649	2.4647649	0.1	-6.28	50.00	AVRG
tert-Butylbenzene	1.8500000	1.9397803	1.9397803	0.1	-4.85	50.00	AVRG
Trichloroethene	0.3310000	0.3185146	0.3185146	0.2	3.77	50.00	AVRG
1,2-Dichlorobenzene	1.5060000	1.5629222	1.5629222	0.4	-3.78	50.00	AVRG
1,2-Dichloroethane	0.3720000	0.3836453	0.3836453	0.1	-3.13	50.00	AVRG
1,2-Dichloropropane	62.334082	50.000000	0.2834315	0.1	-24.67	50.00	LINR
1,3,5-Trimethylbenzene	2.1790000	2.2606137	2.2606137	0.1	-3.74	50.00	AVRG
1,3-Dichloropropane	0.5190000	0.5856602	0.5856602	0.1	-12.84	50.00	AVRG
1,4-Dichlorobenzene	1.6020000	1.5182179	1.5182179	0.4	5.23	50.00	AVRG
2-Butanone	127.93403	100.00000	0.2321499	0.1	-27.93	50.00	LINR
2-Chlorotoluene	1.6200000	1.7633708	1.7633708	0.1	-8.85	50.00	AVRG
2-Hexanone	0.2180000	0.2420209	0.2420209	0.1	-11.02	50.00	AVRG
4-Chlorotoluene	2.0420000	2.1366358	2.1366358	0.1	-4.63	50.00	AVRG
Styrene	1.0880000	1.1623957	1.1623957	0.3	-6.84	50.00	AVRG
4-Methyl-2-Pentanone	0.2920000	0.3370141	0.3370141	0.1	-15.42	50.00	AVRG
Acetone	137.77096	100.00000	0.4316308	0.1	-37.77	50.00	LINR
Benzene	1.0810000	1.2084479	1.2084479	0.5	-11.79	50.00	AVRG
Bromobenzene	0.9040000	0.8555031	0.8555031	0.1	5.36	50.00	AVRG
Bromochloromethane	0.2950000	0.3182656	0.3182656	0.1	-7.89	50.00	AVRG
Bromodichloromethane	0.3330000	0.3703830	0.3703830	0.2	-11.23	50.00	AVRG
Bromoform	43.191312	50.000000	0.2422830	0.1	13.62	50.00	2RDR
Bromomethane	57.598765	50.000000	1.6384721	0.1	-15.20	50.00	2RDR
Carbon Disulfide	1.1090000	1.2879656	1.2879656	0.1	-16.14	50.00	AVRG

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911064

Instrument ID: VOA9 Calibration Date: 11/15/19 Time: 2025

Lab File ID: U111525 Init. Calib. Date(s): 11/12/19 11/12/19

Init. Calib. Times: 1116 1517

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
Carbon Tetrachloride	0.3480000	0.3385143	0.3385143	0.1	2.72	50.00	AVRG
Chlorobenzene	1.0130000	0.9860615	0.9860615	0.5	2.66	50.00	AVRG
Chloroethane	69.414138	50.000000	0.9648449	0.1	-38.83	50.00	LINR
Chloroform	0.8450000	0.9769867	0.9769867	0.2	-15.62	50.00	AVRG
Chloromethane	61.973369	50.000000	0.5499520	0.1	-23.95	50.00	LINR
cis-1,2-Dichloroethene	0.5690000	0.5980776	0.5980776	0.1	-5.11	50.00	AVRG
Dibromochloromethane	44.630655	50.000000	0.3400646	0.1	10.74	50.00	LINR
Dichlorodifluoromethane	0.5080000	0.5149823	0.5149823	0.1	-1.37	50.00	AVRG
Ethylbenzene	0.5050000	0.5037017	0.5037017	0.1	0.26	50.00	AVRG
Hexachlorobutadiene	0.3010000	0.2447517	0.2447517	0.1	18.69	50.00	AVRG
Isopropylbenzene	1.4310000	1.4822923	1.4822923	0.1	-3.58	50.00	AVRG
m,p-Xylenes	0.6180000	0.6481019	0.6481019	0.1	-4.87	50.00	AVRG
Methylene Chloride	56.959485	50.000000	0.5320692	0.1	-13.92	50.00	LINR
n-Butylbenzene	1.9520000	1.9840954	1.9840954	0.5	-1.64	50.00	AVRG
n-Propylbenzene	2.9230000	3.1876083	3.1876083	0.1	-9.05	50.00	AVRG
Naphthalene	2.3660000	2.6849484	2.6849484	0.2	-13.48	50.00	AVRG
o-Xylene	0.6260000	0.6314860	0.6314860	0.3	-0.88	50.00	AVRG
sec-Butylbenzene	2.4490000	2.5521550	2.5521550	0.1	-4.21	50.00	AVRG
Vinyl Chloride	1.1120000	1.3761886	1.3761886	0.1	-23.76	50.00	AVRG
1,2,3-Trichloropropane	0.8490000	0.9287760	0.9287760	0.1	-9.40	50.00	AVRG
p-Isopropyltoluene	2.3300000	2.3167296	2.3167296	0.1	0.57	50.00	AVRG
1,2-Dibromo-3-Chloropropane	48.145211	50.000000	0.1674965	0.05	3.71	50.00	LINR
Freon TF	1.1150000	1.2656257	1.2656257	0.1	-13.51	50.00	AVRG
4-Bromofluorobenzene	50.536544	50.000000	0.3905505	0.1	-1.07	50.00	LINR
Dibromofluoromethane	57.833873	50.000000	0.5720875	0.1	-15.67	50.00	2RDR
Toluene-d8	51.887964	50.000000	1.2882504	0.1	-3.78	50.00	LINR
1,2-Dichloroethane-d4	59.285809	50.000000	0.5906628	0.1	-18.57	50.00	LINR

FORM VII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Lab File ID (Standard): U111503 Date Analyzed: 11/15/19

Instrument ID: VOA9 Time Analyzed: 1130

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(DCB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DFB) AREA #	RT #
	12 HOUR STD	186138	10.23	351765	8.25	390644	5.63
	UPPER LIMIT	372276	10.73	703530	8.75	781288	6.13
	LOWER LIMIT	93069	9.73	175883	7.75	195322	5.13
	CLIENT SAMPLE NO.						
01	VLCSW-191115	167115	10.23	323901	8.25	349198	5.62
02	VBLKW-191115	122676	10.23	257390	8.25	280493	5.63
03	HS19110644-11	124394	10.23	242418	8.25	282006	5.62
04	HS19110644-01	117064	10.23	244984	8.25	283544	5.62
05	HS19110644-09	123284	10.23	250381	8.25	276454	5.63
06	HS19110644-10	121979	10.23	244366	8.25	277033	5.62
07	HS19110644-06	112732	10.23	243352	8.25	266097	5.63
08	HS19110644-08	115045	10.23	239751	8.25	270018	5.63
09	HS19110644-01	143094	10.23	258814	8.25	282528	5.62
10	HS19110644-01	141537	10.23	261349	8.25	282127	5.63
11	HS19110644-08	121431	10.23	242964	8.25	276335	5.63
12	HS19110644-06	116688	10.23	243389	8.25	272418	5.62
13	HS19110644-09	120499	10.23	242034	8.25	264555	5.62
14	HS19110644-10	111480	10.23	230422	8.25	260124	5.62
15	HS19110644-02	116005	10.23	234865	8.25	259641	5.62
16	HS19110644-03	116479	10.23	243592	8.25	276444	5.62
17	HS19110644-04	116102	10.23	237894	8.25	273946	5.62
18	HS19110644-05	111779	10.23	228414	8.25	252069	5.62
19	HS19110644-07	116714	10.23	226011	8.25	260689	5.62
20							

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (CBZ) = Chlorobenzene-d5
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 VIII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110644

Lab File ID (Standard): U111503 Date Analyzed: 11/15/19

Instrument ID: VOA9 Time Analyzed: 1130

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	221467	4.89				
	UPPER LIMIT	442934	5.39				
	LOWER LIMIT	110734	4.39				
	CLIENT SAMPLE NO.						
01	VLCSW-191115	203635	4.89				
02	VBLKW-191115	185581	4.89				
03	HS19110644-11	182572	4.89				
04	HS19110644-01	185132	4.89				
05	HS19110644-09	183765	4.89				
06	HS19110644-10	176131	4.89				
07	HS19110644-06	169031	4.89				
08	HS19110644-08	173627	4.89				
09	HS19110644-01	178169	4.89				
10	HS19110644-01	185145	4.89				
11	HS19110644-08	182341	4.89				
12	HS19110644-06	172534	4.89				
13	HS19110644-09	164529	4.89				
14	HS19110644-10	173424	4.89				
15	HS19110644-02	176311	4.89				
16	HS19110644-03	179689	4.89				
17	HS19110644-04	172951	4.89				
18	HS19110644-05	169439	4.89				
19	HS19110644-07	164948	4.89				
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\voa9.i\U191115.b\U111501.D

Date : 15-NOV-2019 10:42

Client ID: BFB

Instrument: VOA9.i

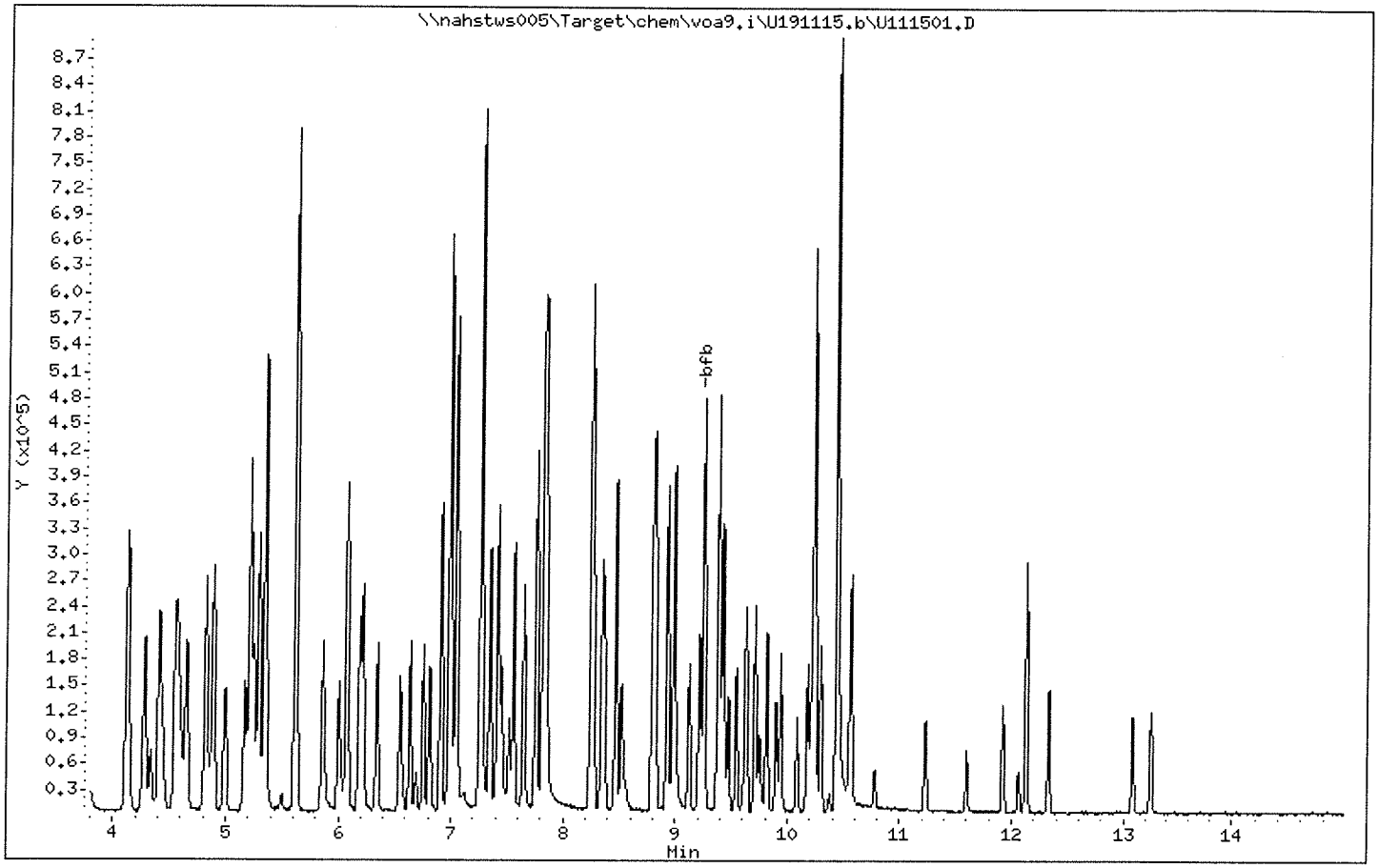
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111501.D

Date : 15-NOV-2019 10:42

Client ID: BFB

Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

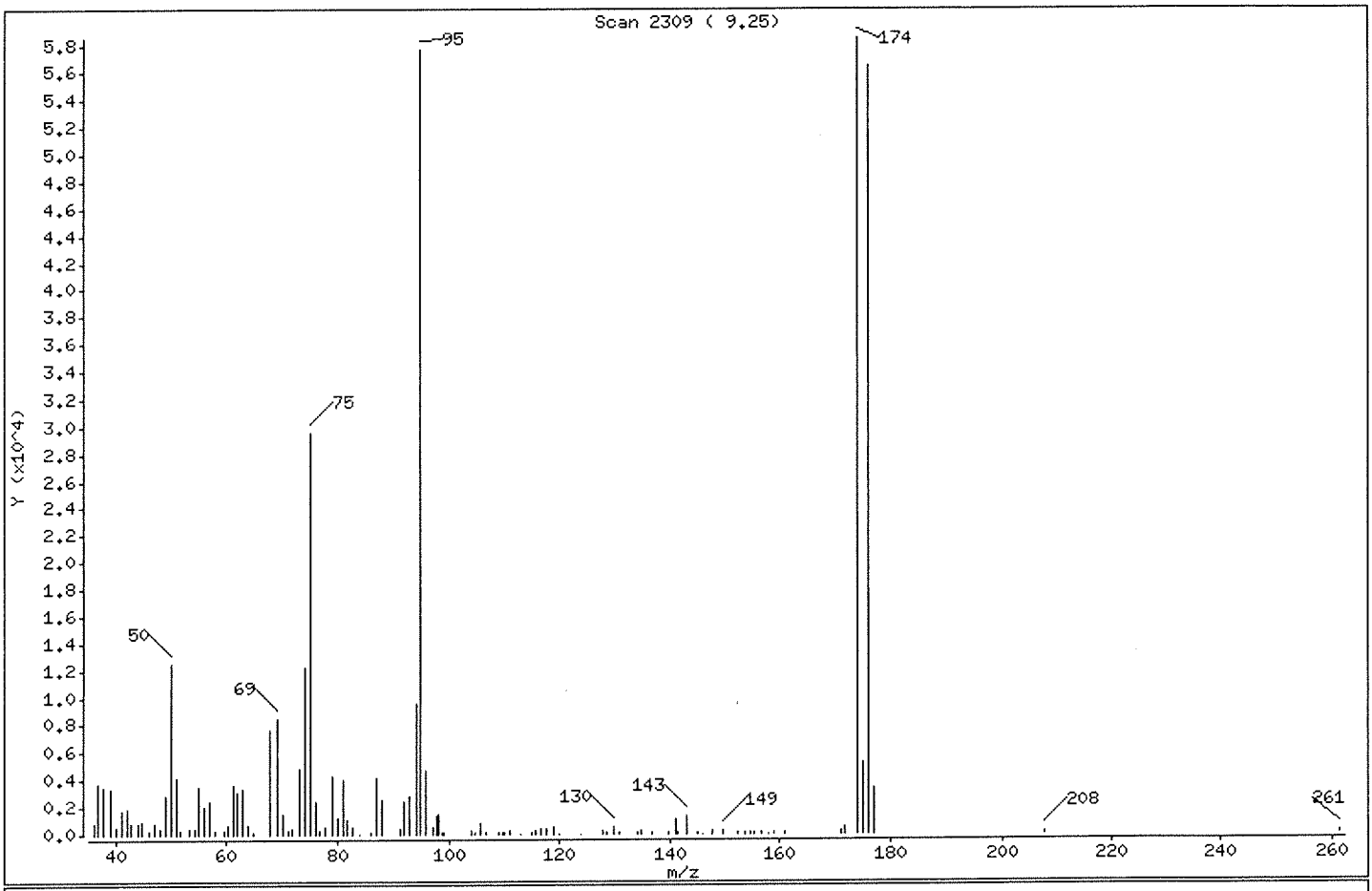
Volume Injected (uL): 2.0

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	21.73
75	30.00 - 60.00% of mass 95	51.29
96	5.00 - 9.00% of mass 95	8.14
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	101.44
175	5.00 - 9.00% of mass 174	9.02 (8.89)
176	95.00 - 101.00% of mass 174	97.92 (96.53)
177	5.00 - 9.00% of mass 176	5.84 (5.97)

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111501.D

Date : 15-NOV-2019 10:42

Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

Data File: U111501.D
Spectrum: Scan 2309 (9.25)
Location of Maximum: 173.95
Number of points: 108

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.20	842	64.00	660	97.10	488	139.80	135
37.00	3732	64.80	106	97.90	1401	140.90	1026
38.00	3488	68.00	7718	98.10	1421	141.50	161
39.00	3329	69.10	8493	98.80	134	143.00	1396
40.00	566	70.00	1539	99.20	99	145.00	94
41.10	1763	71.20	222	104.00	237	146.00	57
42.00	1878	71.90	415	104.90	106	147.70	251
42.80	763	73.00	4790	105.90	783	149.60	255
44.00	851	74.00	12253	106.90	193	152.20	138
44.90	967	75.00	29568	109.00	160	153.60	148
46.00	298	76.00	2459	109.60	69	154.70	193
47.00	821	76.80	216	110.00	104	155.20	151
47.90	378	77.90	563	111.00	228	156.70	69
49.00	2761	78.90	4328	112.90	61	158.00	57
50.00	12529	80.00	1267	115.00	75	158.70	105
51.00	4106	80.90	4054	115.80	244	161.00	116
51.80	300	81.80	1058	116.80	357	171.20	282
53.20	342	82.80	573	117.80	449	171.70	524
54.20	373	83.90	52	118.90	478	173.90	58480
55.00	3549	86.10	93	119.80	60	174.90	5197
56.00	2068	86.90	4107	123.90	58	175.90	56448
56.90	2472	88.00	2605	127.90	248	176.90	3369
58.10	323	91.20	436	128.60	201	207.70	184
59.60	306	92.00	2477	129.90	516	261.40	120
60.20	653	93.00	2769	130.90	167		
61.10	3606	94.10	9582	134.20	82		
62.00	3071	95.00	57648	134.90	259		
63.00	3314	96.00	4694	136.60	194		

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111503.D Page 1
Report Date: 05-Dec-2019 16:56

ALS Laboratory Group

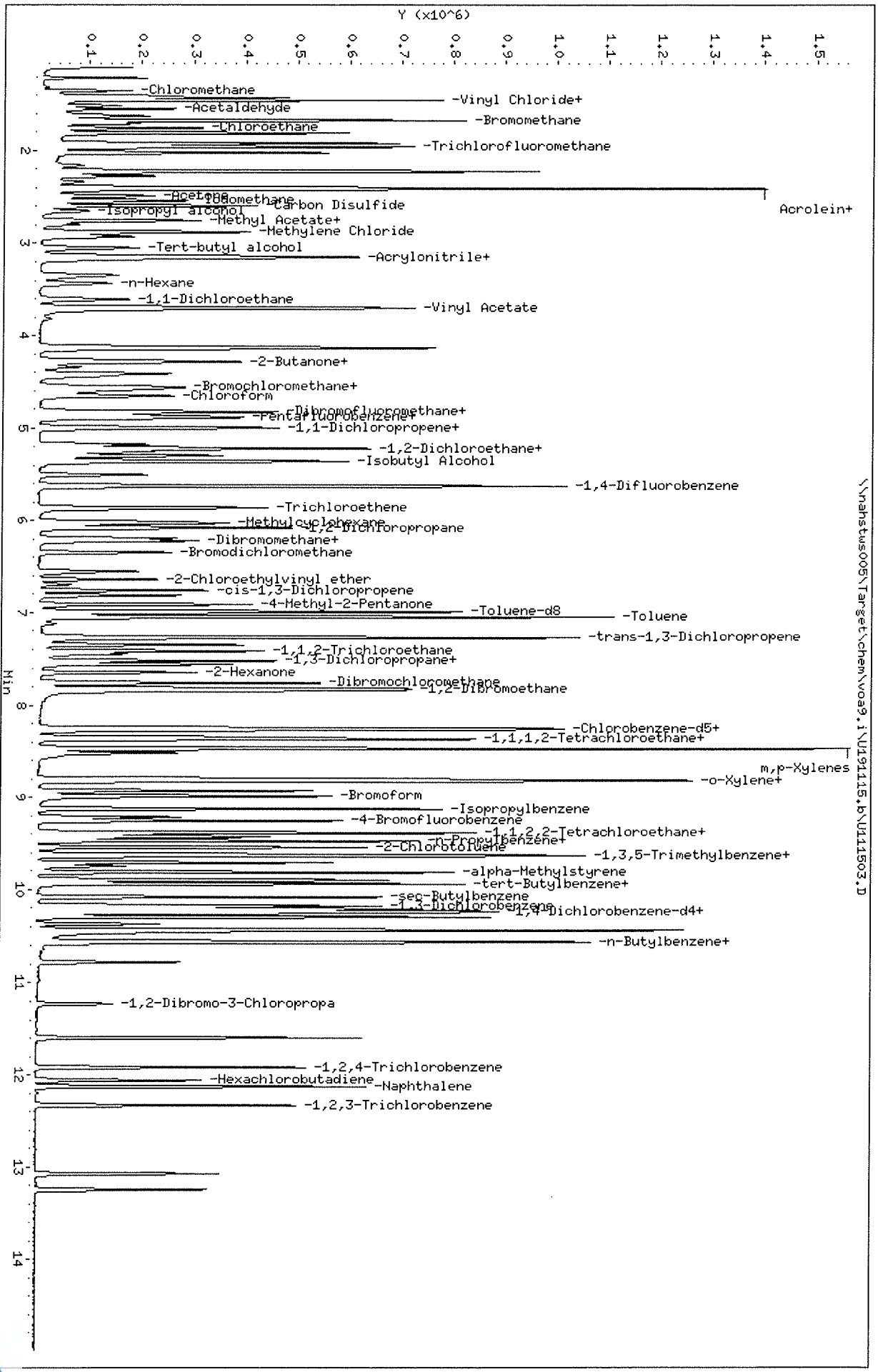
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Lab Smp Id: CCV Client Smp ID: CCV
Inj Date : 15-NOV-2019 11:30
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD050;VSTD050;2;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:55 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 3 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	221467	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	390644	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	351765	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	186138	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	121672	50.0000	55.07
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	134665	50.0000	49.55
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	117857	50.0000	53.85
$ 48 Toluene-d8	98	6.989	6.986	(0.848)	441927	50.0000	50.60
60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	108692	50.0000	43.42
31 1,1,1-Trichloroethane	97	4.830	4.826	(0.987)	150393	50.0000	45.65
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	171831	50.0000	52.03
138 Freon TF	101	2.409	2.405	(0.492)	240696	50.0000	48.71
53 1,1,2-Trichloroethane	83	7.421	7.417	(0.900)	92519	50.0000	50.62
22 1,1-Dichloroethane	63	3.608	3.600	(0.737)	159644	50.0000	50.79
11 1,1-Dichloroethene	96	2.405	2.401	(0.491)	258678	50.0000	50.00
32 1,1-Dichloropropene	75	5.006	5.002	(0.890)	124544	50.0000	47.54
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	136331	50.0000	46.56
71 1,2,3-Trichloropropane	75	9.426	9.422	(0.921)	162718	50.0000	51.45
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	144825	50.0000	43.70
79 1,2,4-Trimethylbenzene	105	9.940	9.940	(0.971)	404768	50.0000	46.88
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.233	(1.097)	25807	50.0000	40.12
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	127818	50.0000	48.28
88 1,2-Dichlorobenzene	146	10.566	10.566	(1.033)	251363	50.0000	44.83

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33 1,2-Dichloroethane	62	5.254	5.250	(0.934)	138127	50.0000	47.50
42 1,2-Dichloropropane	63	6.082	6.078	(1.081)	102157	50.0000	57.38
75 1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	379116	50.0000	46.74
83 1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	239828	50.0000	43.54
54 1,3-Dichloropropane	76	7.563	7.563	(0.917)	190480	50.0000	52.11
84 1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	251579	50.0000	42.18
26 2,2-Dichloropropane	77	4.279	4.272	(0.874)	114557	50.0000	45.10
24 2-Butanone	43	4.343	4.339	(0.887)	83539	100.000	103.61
76 2-Chlorotoluene	91	9.546	9.546	(0.933)	291346	50.0000	48.31
52 2-Hexanone	43	7.649	7.649	(0.928)	151930	100.000	98.88
77 4-Chlorotoluene	91	9.636	9.636	(0.942)	362630	50.0000	47.68
82 p-Isopropyltoluene	119	10.206	10.206	(0.997)	381830	50.0000	44.00
45 4-Methyl-2-Pentanone	43	6.914	6.914	(0.839)	213417	100.000	103.99
10 Acetone	43	2.487	2.483	(0.508)	178388	100.000	127.78
37 Benzene	78	5.220	5.216	(0.928)	427357	50.0000	50.61
74 Bromobenzene	156	9.381	9.377	(0.917)	143735	50.0000	42.70
29 Bromochloromethane	128	4.557	4.556	(0.931)	63031	50.0000	48.21
39 Bromodichloromethane	83	6.345	6.345	(1.128)	136487	50.0000	52.40
66 Bromoform	173	8.980	8.980	(1.089)	85716	50.0000	43.41
6 Bromomethane	94	1.674	1.666	(0.342)	332701	50.0000	53.28
19 Carbon Disulfide	76	2.596	2.588	(0.530)	504844	100.000	102.77
34 Carbon Tetrachloride	117	4.995	4.995	(0.888)	124291	50.0000	45.77
59 Chlorobenzene	112	8.272	8.271	(1.003)	321623	50.0000	45.15
7 Chloroethane	64	1.760	1.752	(0.360)	181157	50.0000	58.58
28 Chloroform	83	4.658	4.654	(0.952)	188940	50.0000	50.46
3 Chloromethane	50	1.348	1.344	(0.275)	112414	50.0000	57.10
27 cis-1,2-Dichloroethene	96	4.290	4.286	(0.877)	119315	50.0000	47.29
46 cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	152637	50.0000	53.67
55 Dibromochloromethane	129	7.754	7.758	(0.940)	114444	50.0000	42.80
44 Dibromomethane	93	6.191	6.187	(1.101)	75582	50.0000	47.74
2 Dichlorodifluoromethane	85	1.213	1.205	(0.248)	104636	50.0000	46.45
61 Ethylbenzene	106	8.369	8.369	(1.015)	167422	50.0000	47.14
91 Hexachlorobutadiene	225	12.061	12.061	(1.179)	50137	50.0000	44.70
67 Isopropylbenzene	105	9.122	9.122	(1.106)	449702	50.0000	44.65
62 m,p-Xylenes	106	8.470	8.470	(1.027)	408833	100.000	94.07
17 Methylene Chloride	84	2.877	2.869	(0.588)	102009	50.0000	49.43
87 n-Butylbenzene	91	10.554	10.554	(1.032)	349052	50.0000	48.04
73 n-Propylbenzene	91	9.471	9.471	(0.926)	527313	50.0000	48.46
92 Naphthalene	128	12.129	12.129	(1.185)	445513	50.0000	50.59
63 o-Xylene	106	8.808	8.807	(1.068)	208498	50.0000	47.34
81 sec-Butylbenzene	105	10.082	10.082	(0.985)	417230	50.0000	45.76
64 Styrene	104	8.823	8.822	(1.070)	369420	50.0000	48.24
78 tert-Butylbenzene	119	9.898	9.898	(0.967)	315578	50.0000	45.80
56 Tetrachloroethene	166	7.522	7.522	(0.912)	109253	50.0000	40.97
50 Toluene	91	7.046	7.046	(0.855)	497524	50.0000	46.87
20 trans-1,2-Dichloroethene	96	3.147	3.143	(0.643)	98690	50.0000	46.02
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	149706	50.0000	46.57
38 Trichloroethene	130	5.861	5.861	(1.042)	117028	50.0000	45.24
8 Trichlorofluoromethane	101	1.962	1.955	(0.401)	446700	50.0000	47.00
5 Vinyl Chloride	62	1.426	1.422	(0.292)	257384	50.0000	52.25



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111503.D
Date : 15-NOV-2019 11:30
Client ID: CCV
Sample Info: VSTD050;VSTD050;2;;
Purge Volume: 5.0
Column phase: DB624

\\nahstws005\Target\chem\voa9.i\U191115.b\U111503.D

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111505.D Page 1
Report Date: 05-Dec-2019 16:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111505.D
Lab Smp Id: VLCSW-191115 Client Smp ID: VLCSW-191115
Inj Date : 15-NOV-2019 12:19
Operator : PC Inst ID: VOA9.i
Smp Info : VLCSW-191115;VLCSW-191115;3;;LCS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:55 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 5 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

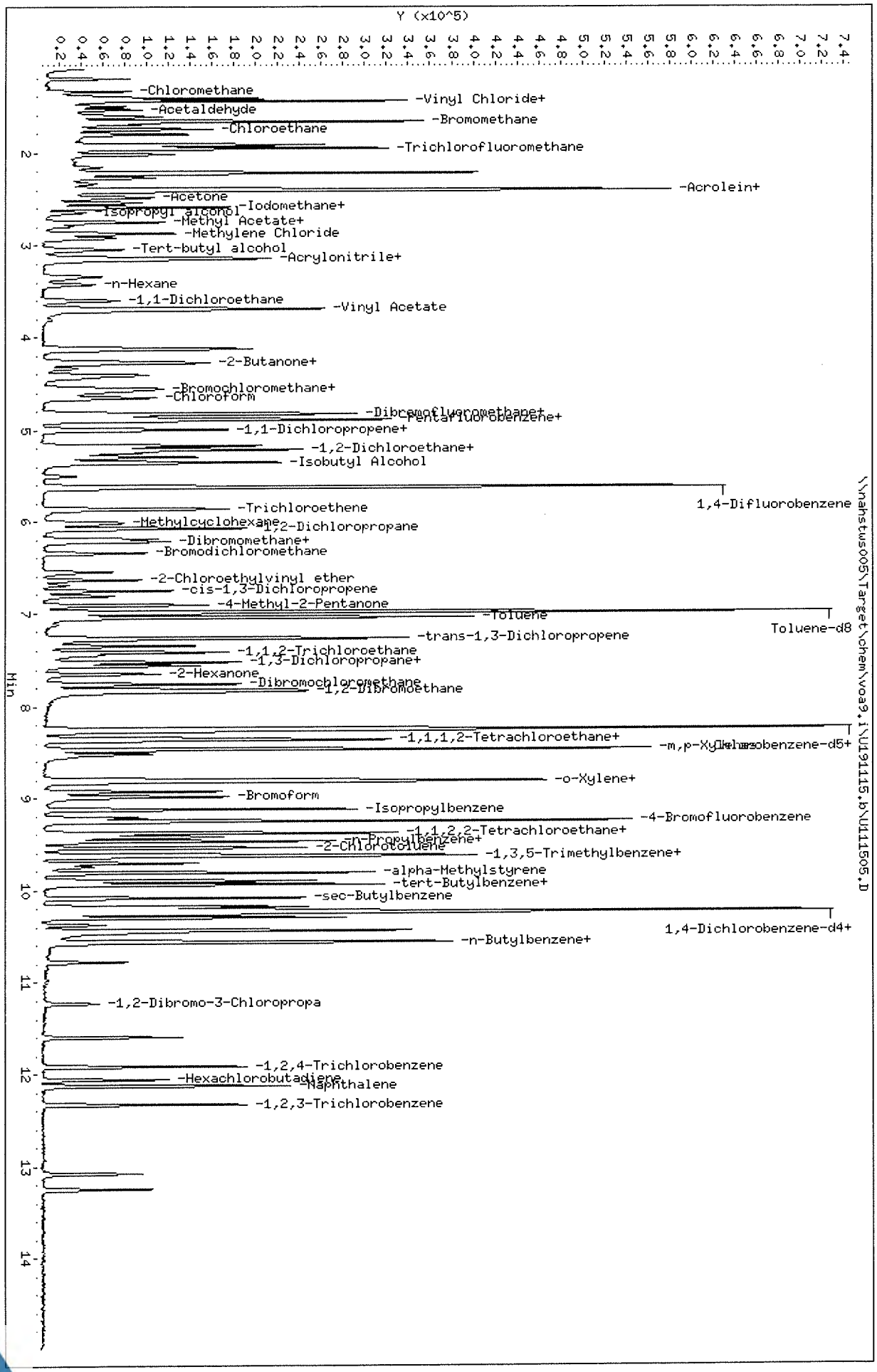
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	203635	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	349198	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	323901	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	167115	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	117291	57.7891	57.78
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	118542	47.3987	47.39
$ 30 Dibromofluoromethane	113	4.827	4.826	(0.987)	107754	53.5589	53.55
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	405923	50.4810	50.48
60 1,1,1,2-Tetrachloroethane	131	8.343	8.346	(1.012)	39967	18.3825	18.38
31 1,1,1-Trichloroethane	97	4.827	4.826	(0.987)	55798	18.4203	18.42
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	64405	21.7257	21.72
138 Freon TF	101	2.397	2.405	(0.490)	90787	19.9849	19.98
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	35472	21.0785	21.07
22 1,1-Dichloroethane	63	3.601	3.600	(0.736)	66901	23.1505	23.15
11 1,1-Dichloroethene	96	2.397	2.401	(0.490)	105493	22.1793	22.17
32 1,1-Dichloropropene	75	5.003	5.002	(0.890)	47073	20.1014	20.10
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	48814	18.5700	18.56
71 1,2,3-Trichloropropane	75	9.422	9.422	(0.921)	56866	20.0275	20.02
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	48906	16.4375	16.43
79 1,2,4-Trimethylbenzene	105	9.940	9.940	(0.971)	147931	19.0862	19.08
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.233	(1.097)	8618	15.9289	15.92
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	46683	19.1527	19.15
88 1,2-Dichlorobenzene	146	10.566	10.566	(1.033)	96907	19.2505	19.25

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111505.D Page 2
Report Date: 05-Dec-2019 16:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.934)	50665	19.4912	19.49
42	1,2-Dichloropropane	63	6.079	6.078	(1.081)	40299	24.4377	24.43
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	137865	18.9333	18.93
83	1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	85832	17.3587	17.35
54	1,3-Dichloropropane	76	7.559	7.563	(0.917)	74855	22.2426	22.24
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	93275	17.4196	17.41
26	2,2-Dichloropropane	77	4.272	4.272	(0.874)	42816	18.3341	18.33
24	2-Butanone	43	4.339	4.339	(0.887)	34425	45.4799	45.47
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	113332	20.9338	20.93
52	2-Hexanone	43	7.649	7.649	(0.928)	60381	42.6823	42.68
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	131692	19.2897	19.28
82	p-Isopropyltoluene	119	10.206	10.206	(0.997)	139260	17.8771	17.87
45	4-Methyl-2-Pentanone	43	6.911	6.914	(0.838)	84215	44.5681	44.56
10	Acetone	43	2.480	2.483	(0.507)	72768	50.3708	50.37
37	Benzene	78	5.213	5.216	(0.927)	165573	21.9369	21.93
74	Bromobenzene	156	9.377	9.377	(0.916)	54611	18.0716	18.07
29	Bromochloromethane	128	4.553	4.556	(0.931)	24920	20.7302	20.73
39	Bromodichloromethane	83	6.345	6.345	(1.129)	49263	21.1614	21.16
66	Bromoform	173	8.980	8.980	(1.089)	25810	15.8659	15.86
6	Bromomethane	94	1.666	1.666	(0.341)	141058	25.6172	25.61
19	Carbon Disulfide	76	2.585	2.588	(0.529)	207028	45.8369	45.83
34	Carbon Tetrachloride	117	4.992	4.995	(0.888)	43028	17.7274	17.72
59	Chlorobenzene	112	8.272	8.271	(1.003)	127158	19.3866	19.38
7	Chloroethane	64	1.749	1.752	(0.358)	77977	26.4934	26.49(M)
28	Chloroform	83	4.654	4.654	(0.952)	73429	21.3303	21.33
3	Chloromethane	50	1.340	1.344	(0.274)	49106	26.4903	26.49
27	cis-1,2-Dichloroethene	96	4.283	4.286	(0.876)	48665	20.9806	20.98
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	57784	22.7312	22.73
55	Dibromochloromethane	129	7.754	7.758	(0.940)	37658	16.9349	16.93
44	Dibromomethane	93	6.187	6.187	(1.101)	32041	22.6436	22.64
2	Dichlorodifluoromethane	85	1.202	1.205	(0.246)	42160	20.3578	20.35
61	Ethylbenzene	106	8.365	8.369	(1.015)	58318	17.8343	17.83
91	Hexachlorobutadiene	225	12.062	12.061	(1.179)	17462	17.3432	17.34
67	Isopropylbenzene	105	9.123	9.122	(1.106)	168219	18.1411	18.14
62	m,p-Xylenes	106	8.470	8.470	(1.027)	153610	38.3870	38.38
17	Methylene Chloride	84	2.866	2.869	(0.586)	42731	23.0102	23.01
87	n-Butylbenzene	91	10.551	10.554	(1.031)	119677	18.3464	18.34
73	n-Propylbenzene	91	9.471	9.471	(0.926)	190840	19.5359	19.53
92	Naphthalene	128	12.129	12.129	(1.185)	158688	20.0721	20.07
63	o-Xylene	106	8.808	8.807	(1.068)	76386	18.8385	18.83
81	sec-Butylbenzene	105	10.082	10.082	(0.985)	152172	18.5931	18.59
64	Styrene	104	8.823	8.822	(1.070)	137141	19.4508	19.45
78	tert-Butylbenzene	119	9.899	9.898	(0.967)	113729	18.3878	18.38
56	Tetrachloroethene	166	7.522	7.522	(0.912)	42148	17.1663	17.16
50	Toluene	91	7.046	7.046	(0.855)	189790	19.4193	19.41
20	trans-1,2-Dichloroethene	96	3.140	3.143	(0.642)	38645	20.6794	20.67
51	trans-1,3-Dichloropropene	75	7.256	7.259	(1.291)	50302	17.9709	17.97
38	Trichloroethene	130	5.857	5.861	(1.042)	43268	18.7144	18.71
8	Trichlorofluoromethane	101	1.951	1.955	(0.399)	187645	21.4749	21.47
5	Vinyl Chloride	62	1.419	1.422	(0.290)	109602	24.2022	24.20

QC Flag Legend

M - Compound response manually integrated.



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111505.D
Date : 15-NOV-2019 12:19
Client ID: VLCSW-191115
Sample Info: VLCSW-191115;VLCSW-191115;3;;LCS
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

\\nahstws005\Target\chem\voa9.i\U191115.b\U111505.D

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111507.D Page 1
Report Date: 05-Dec-2019 16:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111507.D
Lab Smp Id: VBLKW-191115 Client Smp ID: VBLKW-191115
Inj Date : 15-NOV-2019 13:07
Operator : PC Inst ID: VOA9.i
Smp Info : VBLKW-191115;VBLKW-191115;3;;BLANK
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:55 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

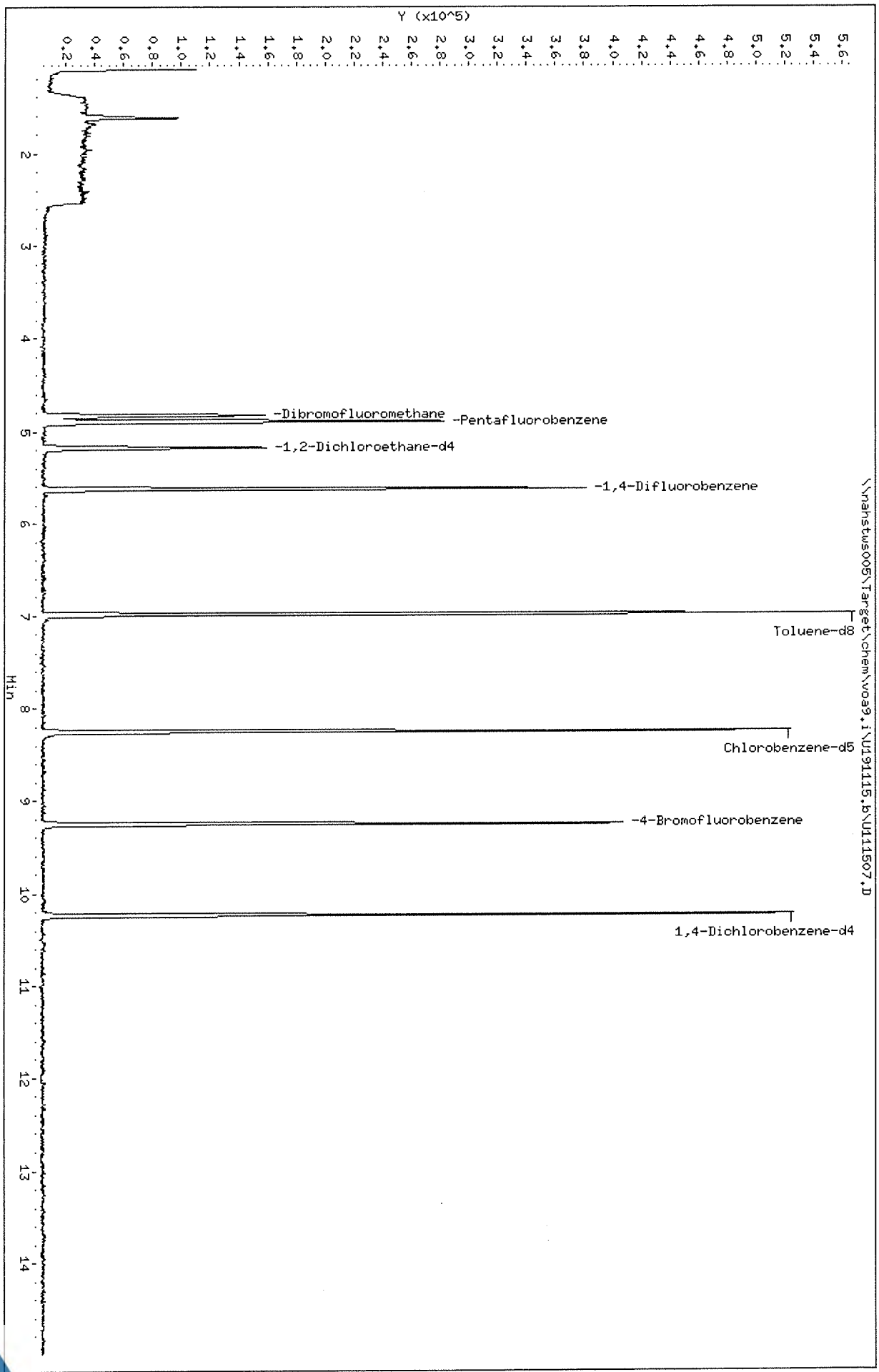
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	185581	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	280493	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	257390	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	122676	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	90890	48.9957	48.99
$ 69 4-Bromofluorobenzene	95	9.253	9.254	(1.122)	93574	47.0880	47.08
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	81470	44.5043	44.50
$ 48 Toluene-d8	98	6.985	6.986	(0.847)	333040	52.1154	52.11

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111507.D
Date : 15-NOV-2019 13:07
Client ID: VBLKW-191115
Sample Info: VBLKW-191115;VBLKW-191115;3;;BLANK
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111508.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111508.D
Lab Smp Id: HS19110644-11 Client Smp ID: HS19110644-11
Inj Date : 15-NOV-2019 13:32
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-11;HS19110644-11;;;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

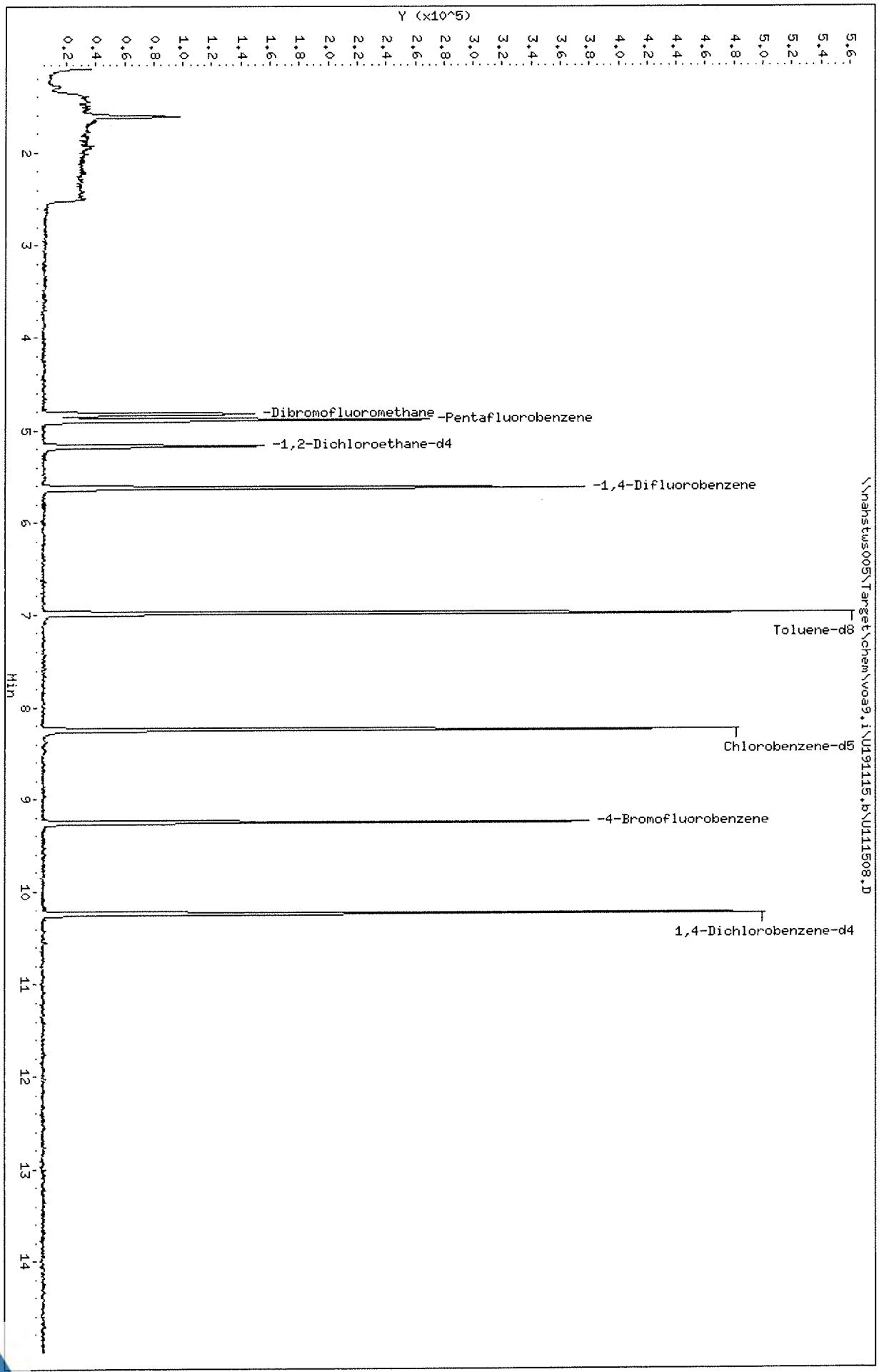
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	182572	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	282006	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	242418	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	124394	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	87979	48.1929	48.19
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	90834	48.5121	48.51
$ 30 Dibromofluoromethane	113	4.823	4.826	(0.986)	80149	44.5043	44.50
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	332410	55.2216	55.22

Data File: \\nahstws005\Target\chem\voa9,i\U191115,b\U111508.D
Date : 15-NOV-2019 13:32
Client ID: HS191110644-11
Sample Info: HS191110644-11;HS191110644-11;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111509.D Page 1
Report Date: 05-Dec-2019 16:57

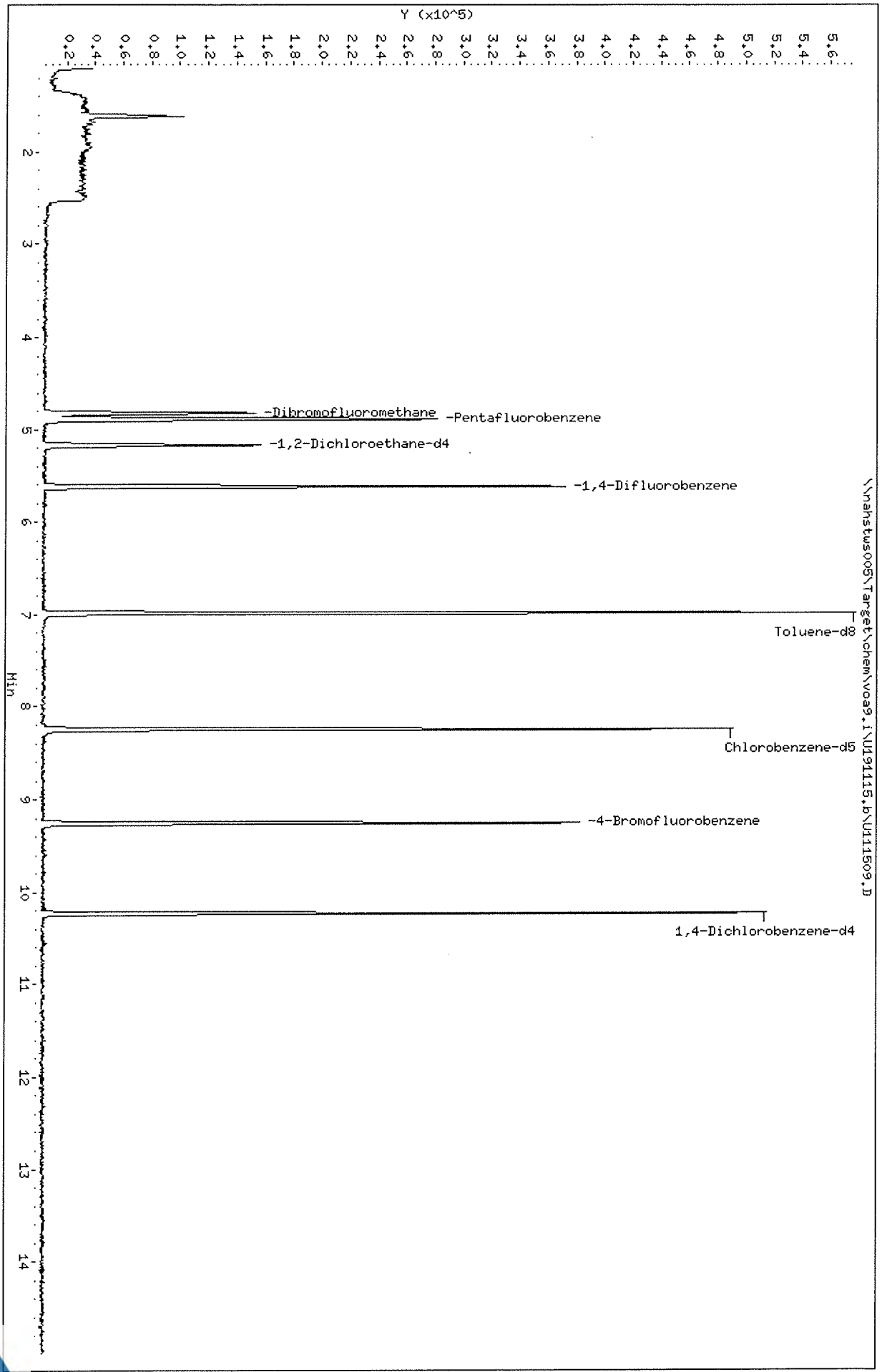
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111509.D
Lab Smp Id: HS19110644-01 Client Smp ID: HS19110644-01
Inj Date : 15-NOV-2019 13:56
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-01;HS19110644-01;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	185132	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	283544	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	244984	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	117064	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	88741	47.9331	47.93
$ 69 4-Bromofluorobenzene	95	9.253	9.254	(1.122)	91382	48.2965	48.29
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.987)	79644	43.6150	43.61
$ 48 Toluene-d8	98	6.985	6.986	(0.847)	327387	53.8209	53.82



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111509.D
Date : 15-NOV-2019 13:56
Client ID: HS19110644-01
Sample Info: HS19110644-01;HS19110644-01;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

\\nahstws005\Target\chem\voa9.i\U191115.b\U111509.D

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111510.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111510.D
Lab Smp Id: HS19110644-09 Client Smp ID: HS19110644-09
Inj Date : 15-NOV-2019 14:20
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-09;HS19110644-09;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

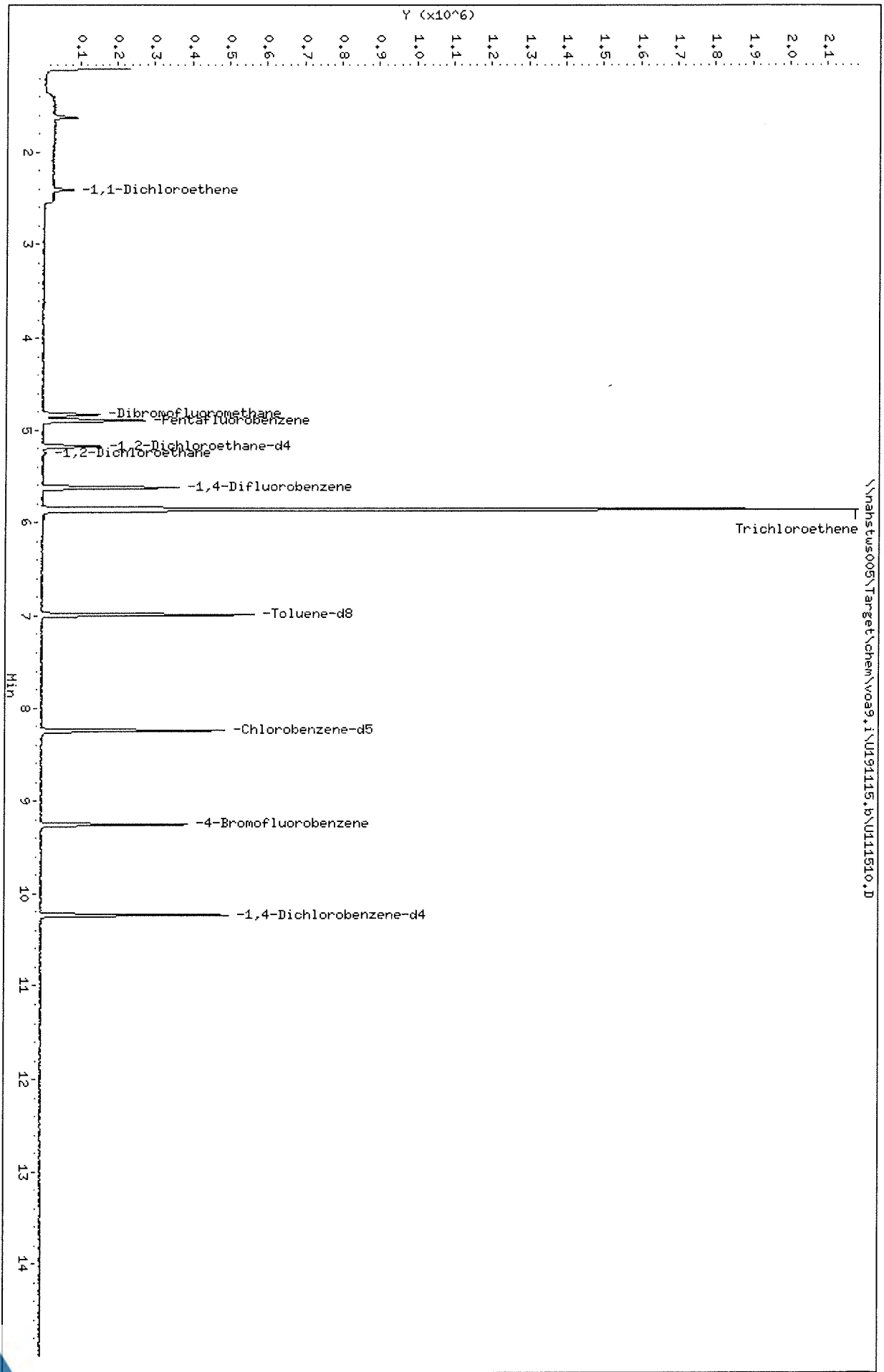
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	183765	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	276454	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	250381	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	123284	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	90244	49.1308	49.13
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	87165	45.1185	45.11
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	78480	43.2980	43.29
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	328764	52.8845	52.88
11 1,1-Dichloroethene	96	2.409	2.401	(0.492)	19668	4.58220	4.58(a)
33 1,2-Dichloroethane	62	5.254	5.250	(0.934)	5552	2.69792	2.69(a)
38 Trichloroethene	130	5.861	5.861	(1.042)	619426	338.413	338.41(A)

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\voa9,i\U191115,b\U111510,D
Date : 15-NOV-2019 14:20
Client ID: HS19110644-09
Sample Info: HS19110644-09;HS19110644-09;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111510.D

Date : 15-NOV-2019 14:20

Client ID: HS19110644-09

Instrument: VOA9.i

Sample Info: HS19110644-09;HS19110644-09;;;

Purge Volume: 5.0

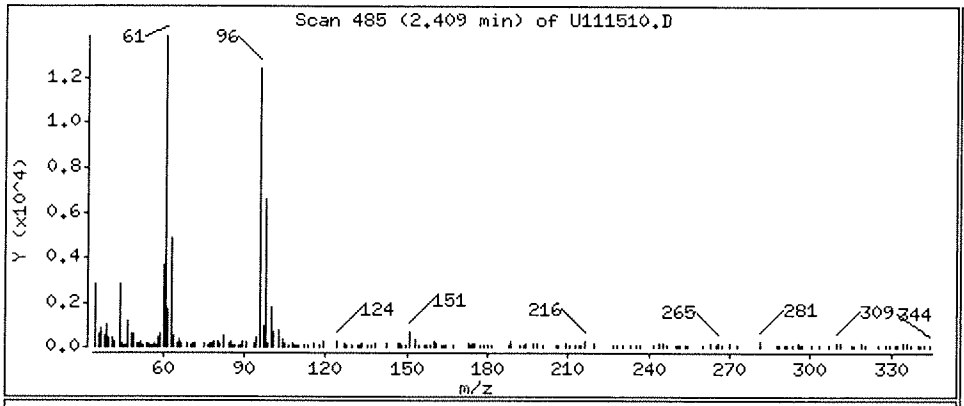
Operator: PC

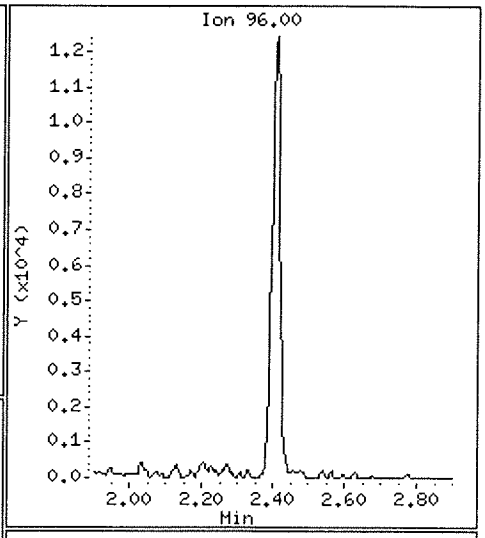
Column phase: DB624

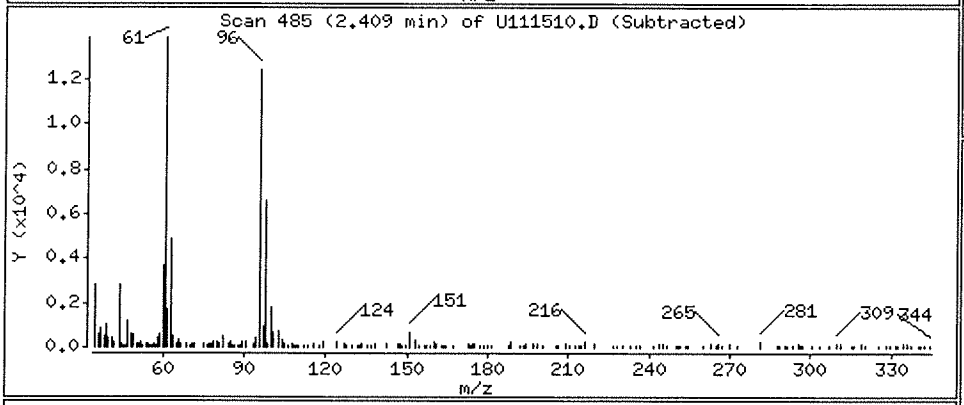
Column diameter: 0.18

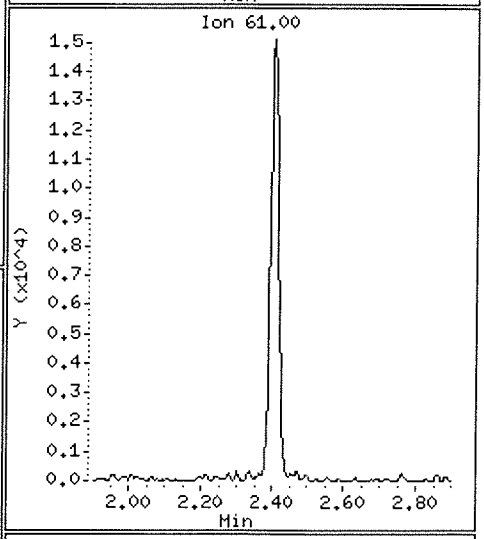
11 1,1-Dichloroethene

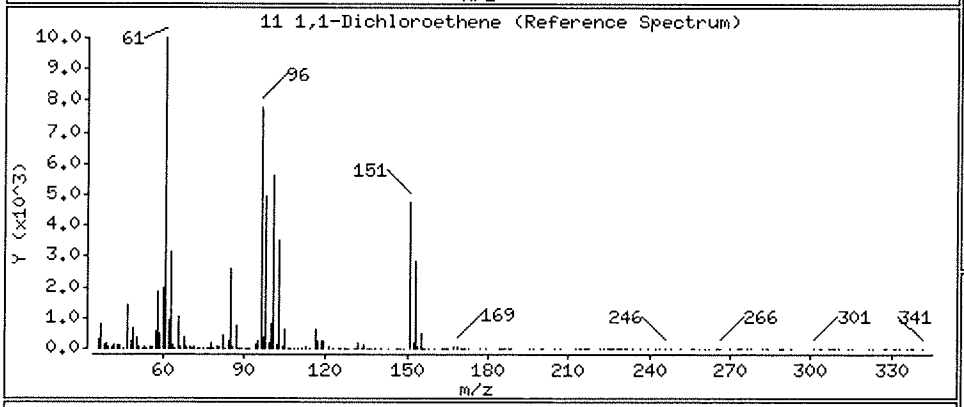
Concentration: 4.58 ug/l

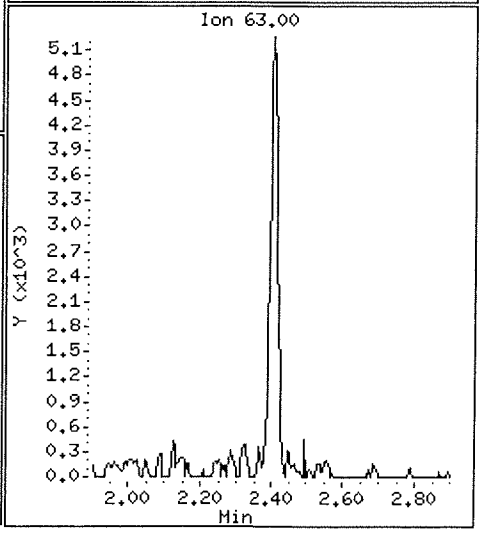


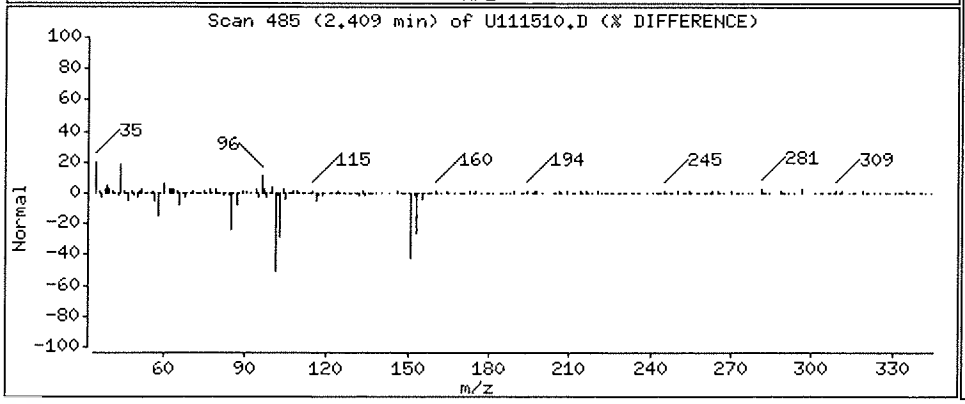












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111510.D

Date : 15-NOV-2019 14:20

Client ID: HS19110644-09

Instrument: VOA9.i

Sample Info: HS19110644-09;HS19110644-09;;;

Purge Volume: 5.0

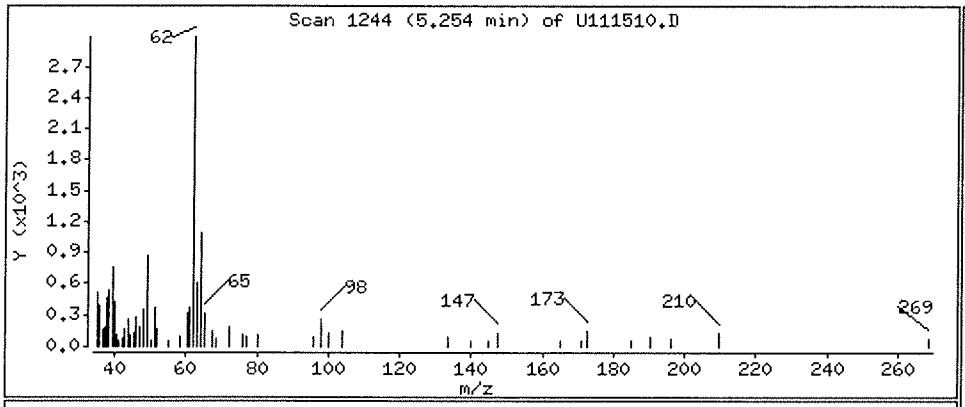
Operator: PC

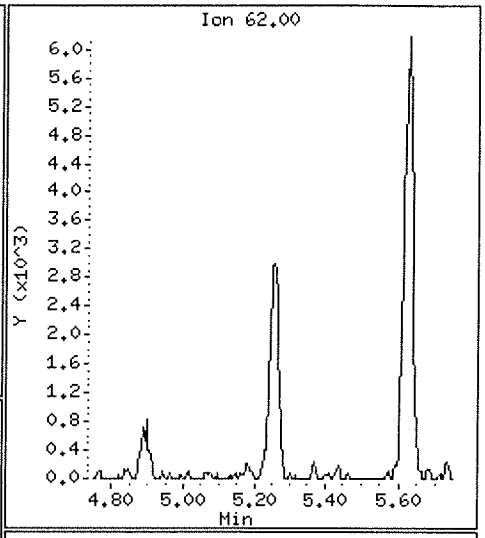
Column phase: DB624

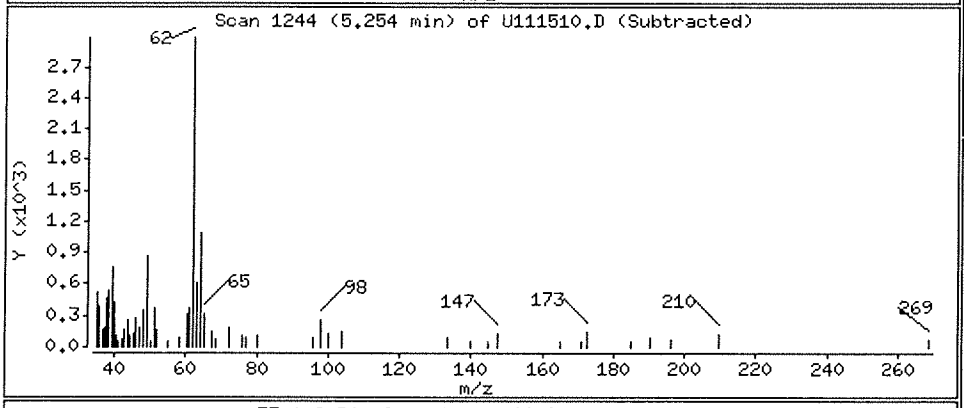
Column diameter: 0.18

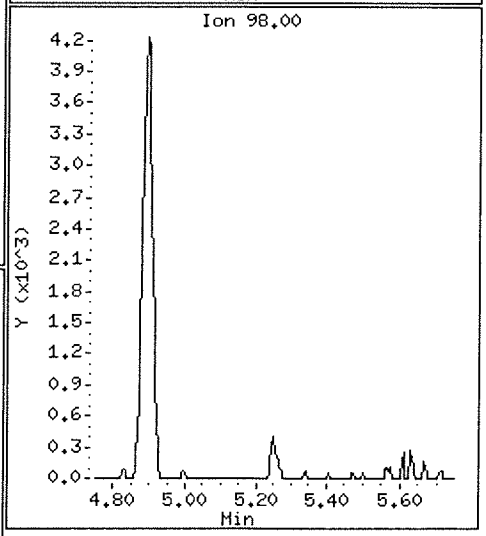
33 1,2-Dichloroethane

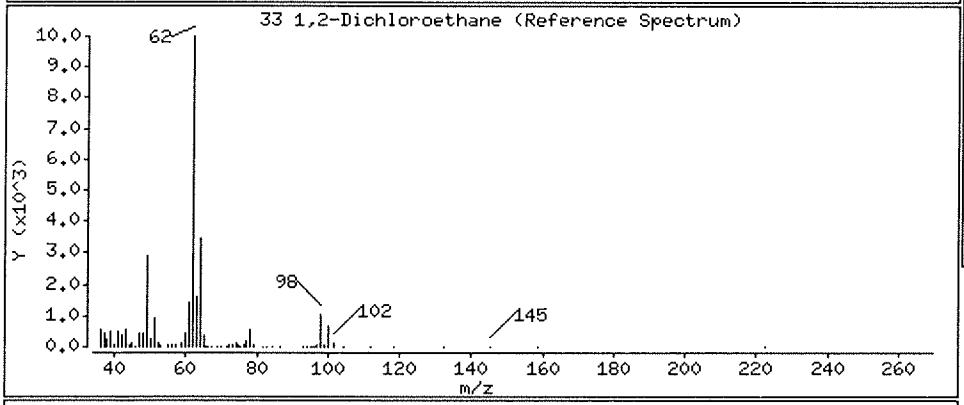
Concentration: 2.69 ug/l

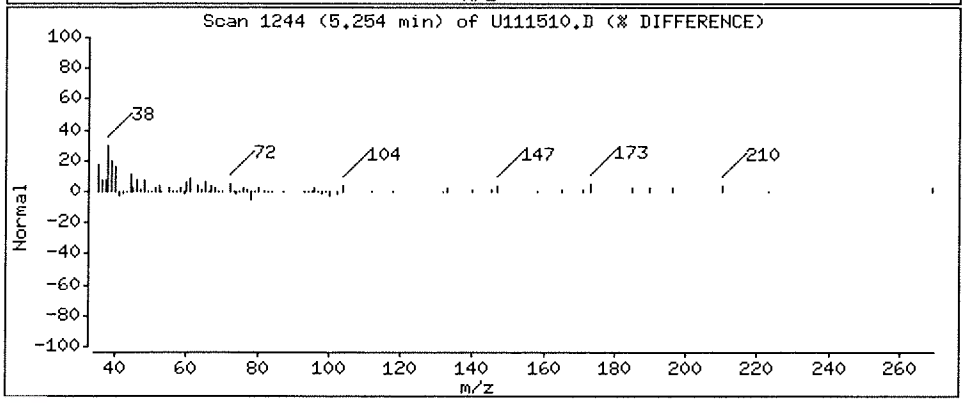












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111510.D Page 5

Date : 15-NOV-2019 14:20

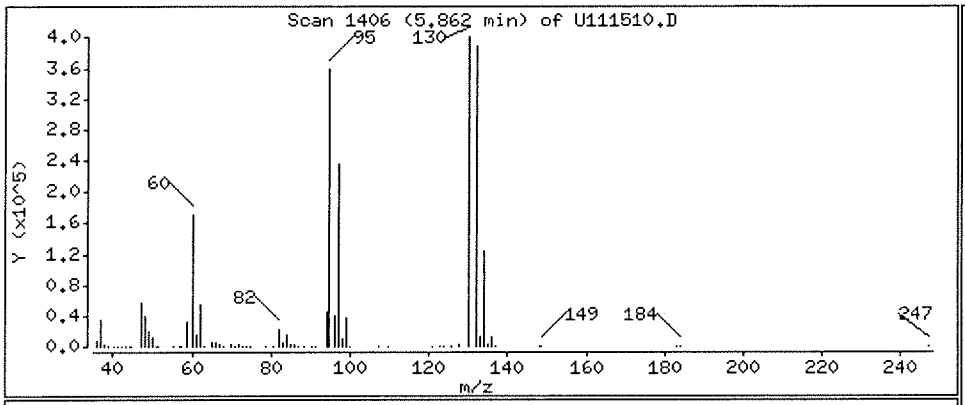
Client ID: HS19110644-09 Instrument: VOA9.i

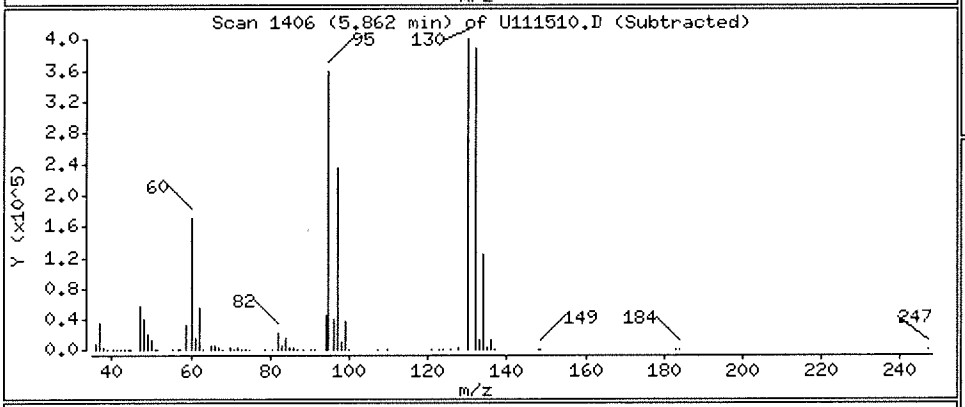
Sample Info: HS19110644-09;HS19110644-09;;;

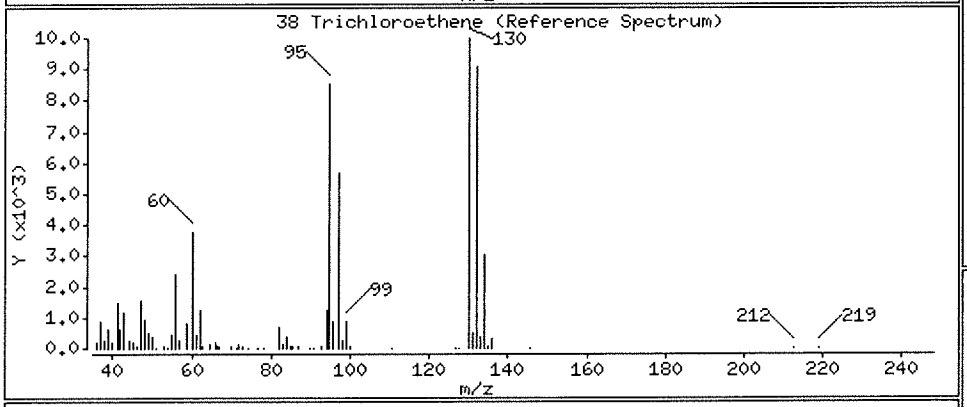
Purge Volume: 5.0 Operator: PC

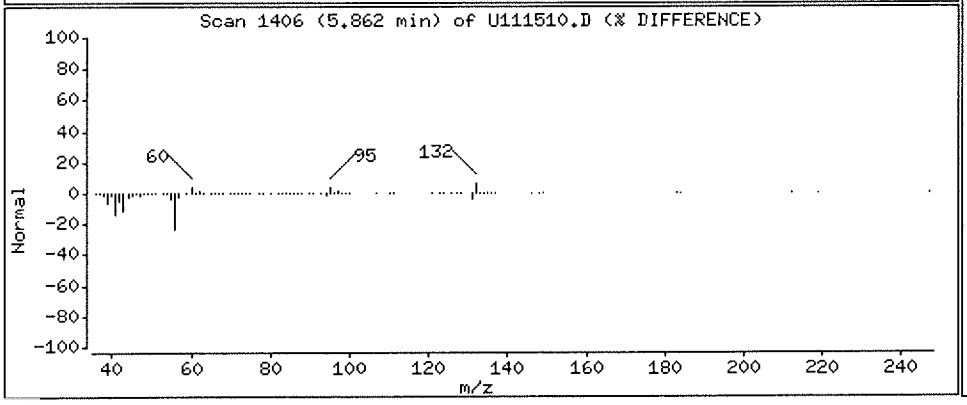
Column phase: DB624 Column diameter: 0.18

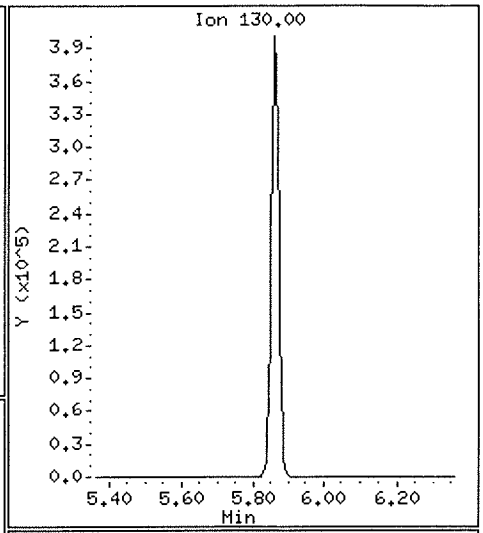
38 Trichloroethene Concentration: 338.41 ug/l

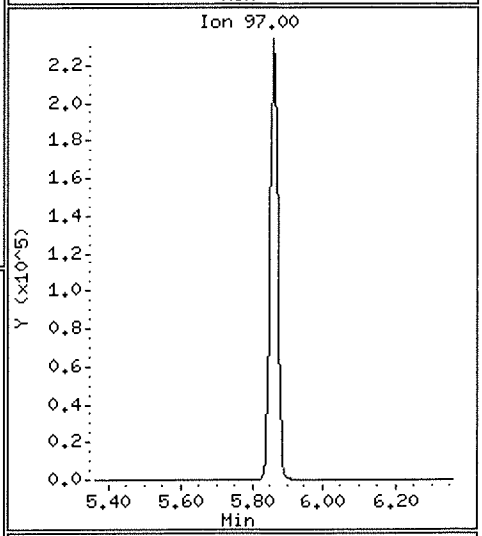


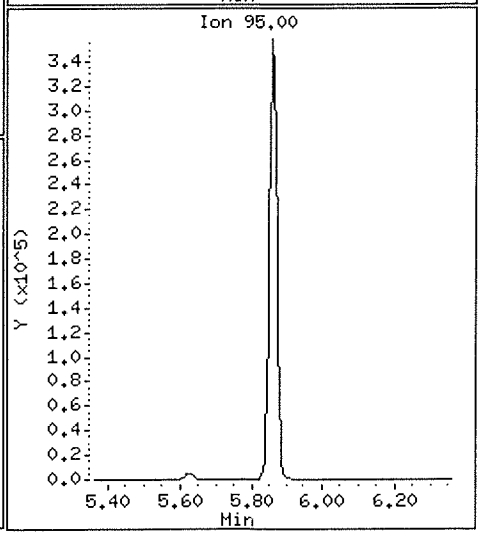












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111511.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111511.D
Lab Smp Id: HS19110644-10 Client Smp ID: HS19110644-10
Inj Date : 15-NOV-2019 14:45
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-10;HS19110644-10;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

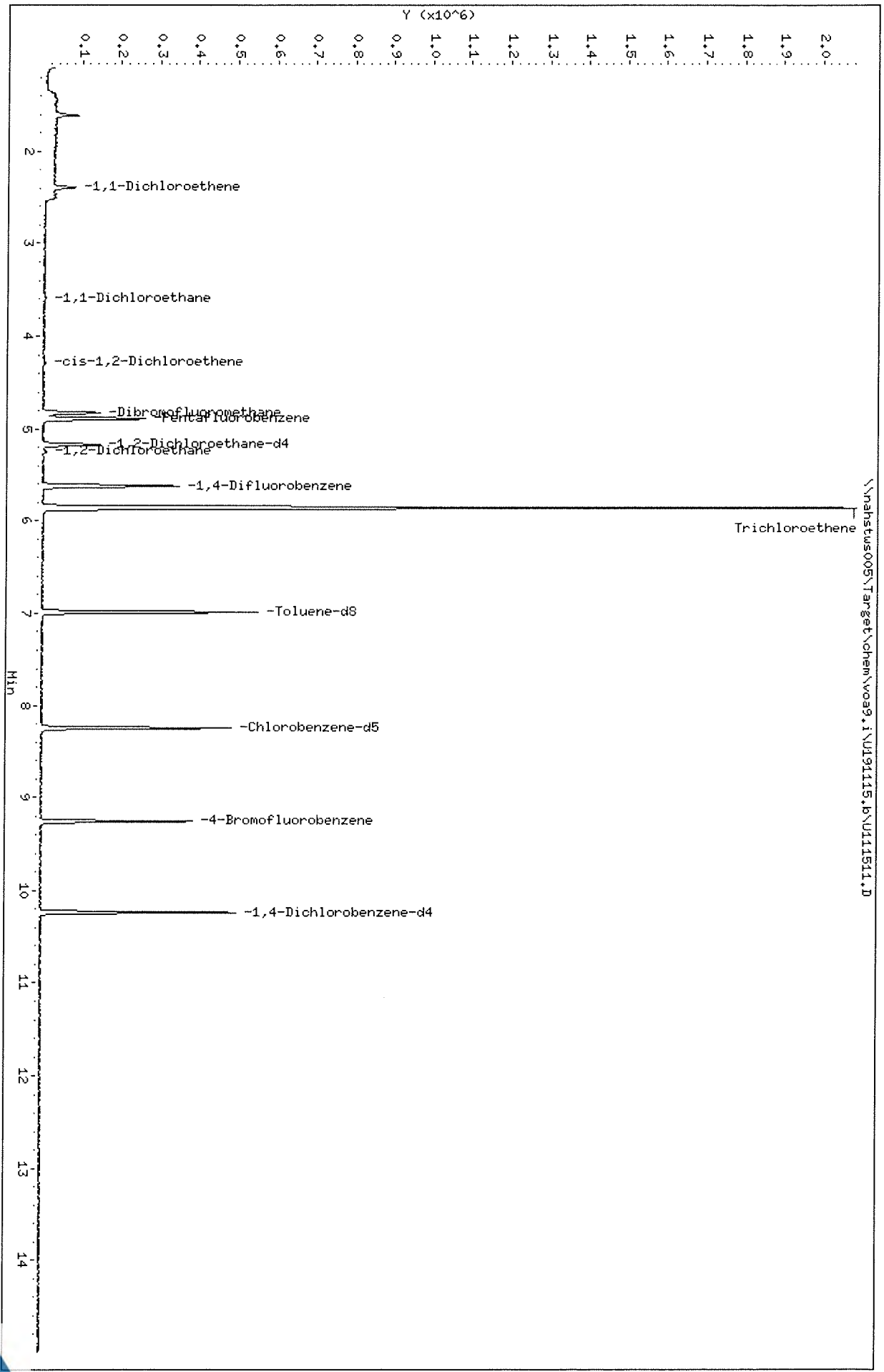
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	176131	50.0000	
* 36 1,4-Difluorobenzene	114	5.617	5.625	(1.000)	277033	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	244366	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	121979	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.168	5.171	(1.057)	88678	50.3947	50.39
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	90614	48.0156	48.01
$ 30 Dibromofluoromethane	113	4.823	4.826	(0.986)	77532	44.6251	44.62
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	322795	53.2017	53.20
22 1,1-Dichloroethane	63	3.597	3.600	(0.736)	3667	1.46708	1.46(a)
11 1,1-Dichloroethene	96	2.390	2.401	(0.489)	16891	4.10579	4.10(a)
33 1,2-Dichloroethane	62	5.246	5.250	(0.934)	5621	2.72574	2.72(a)
27 cis-1,2-Dichloroethene	96	4.283	4.286	(0.876)	1518	0.75664	0.75(a)
38 Trichloroethene	130	5.857	5.861	(1.043)	605857	330.308	330.30(A)

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\voa9.i\U191115.b\U111511.D
Date : 15-NOV-2019 14:45
Client ID: HS19110644-10
Sample Info: HS19110644-10;HS19110644-10;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111511.D

Date : 15-NOV-2019 14:45

Client ID: HS19110644-10

Instrument: VOA9.i

Sample Info: HS19110644-10;HS19110644-10;;;

Purge Volume: 5.0

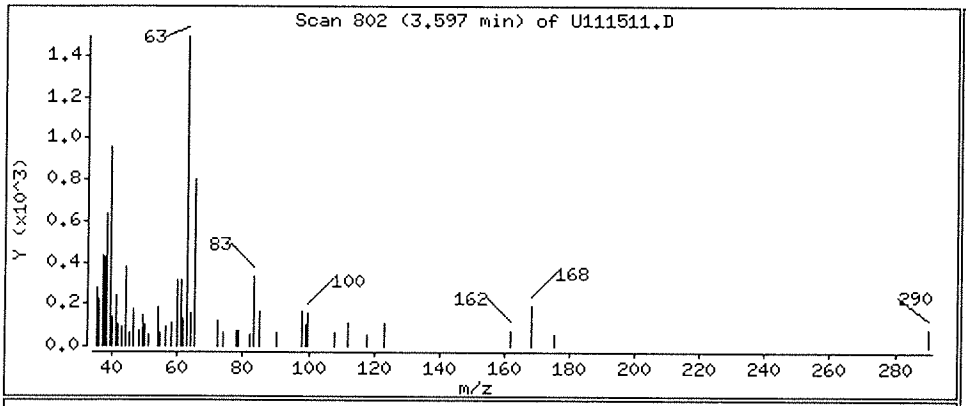
Operator: PC

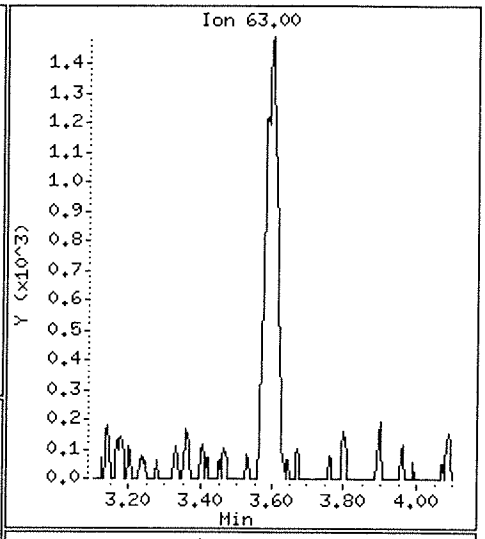
Column phase: DB624

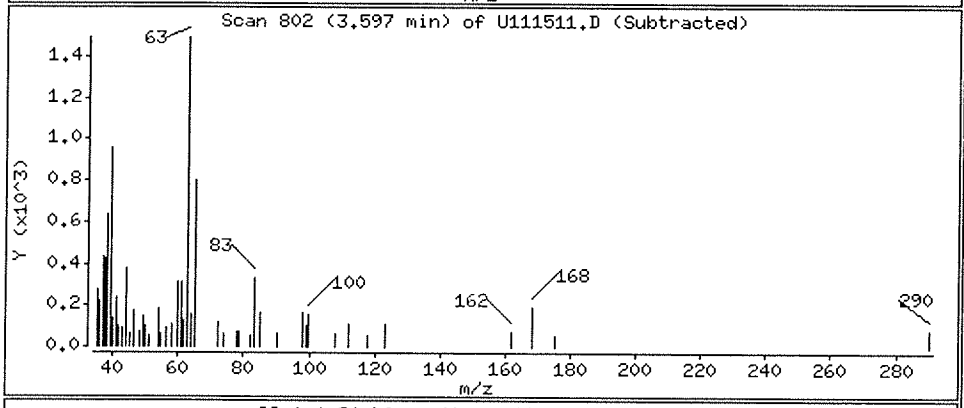
Column diameter: 0.18

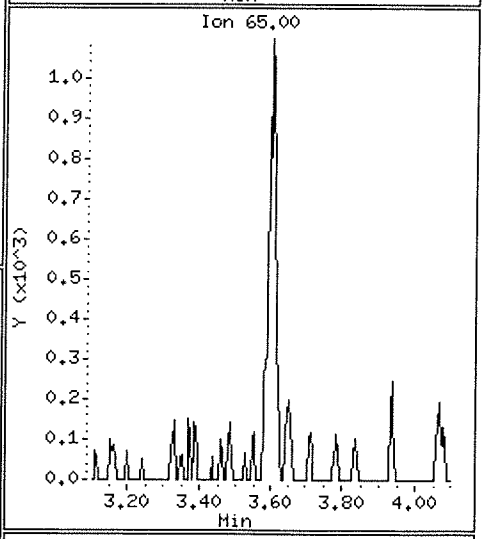
22 1,1-Dichloroethane

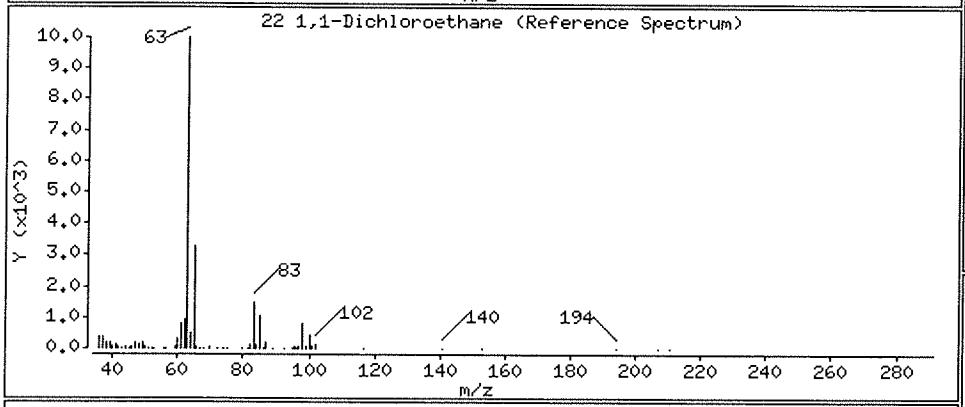
Concentration: 1.46 ug/l

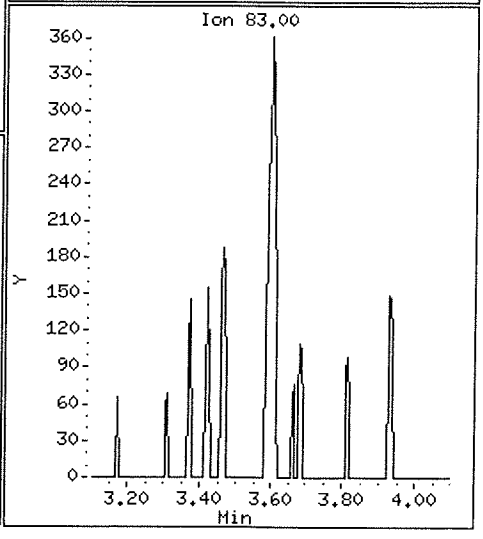


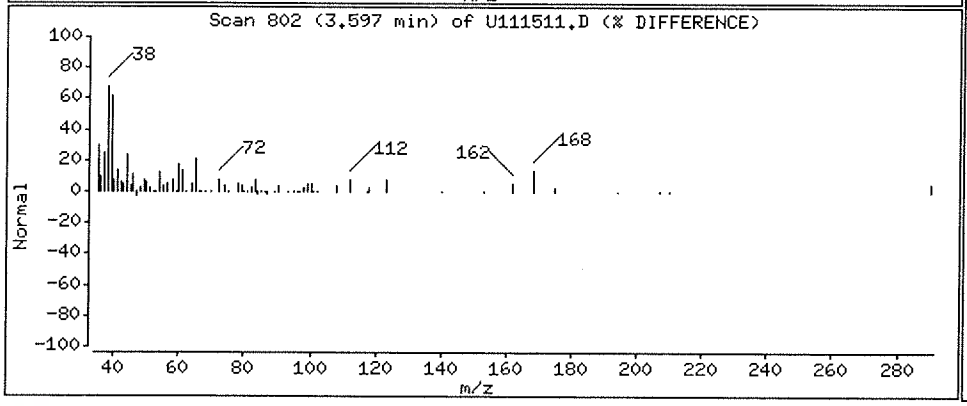












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111511.D Page 4

Date : 15-NOV-2019 14:45

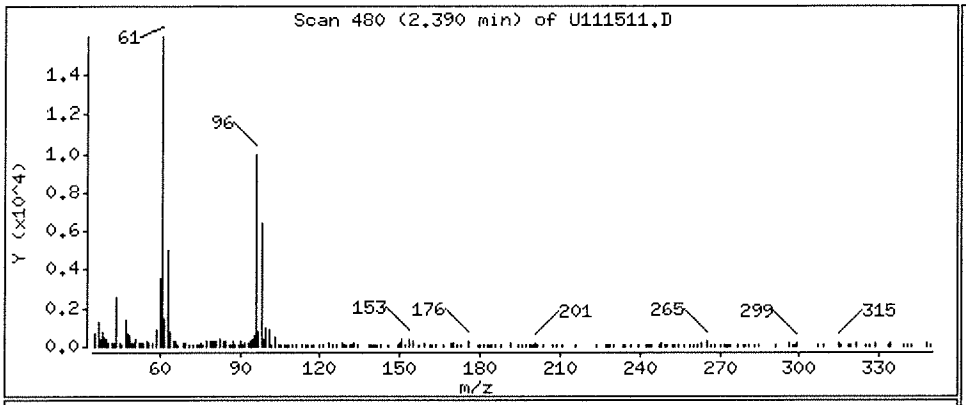
Client ID: HS19110644-10 Instrument: VOA9.i

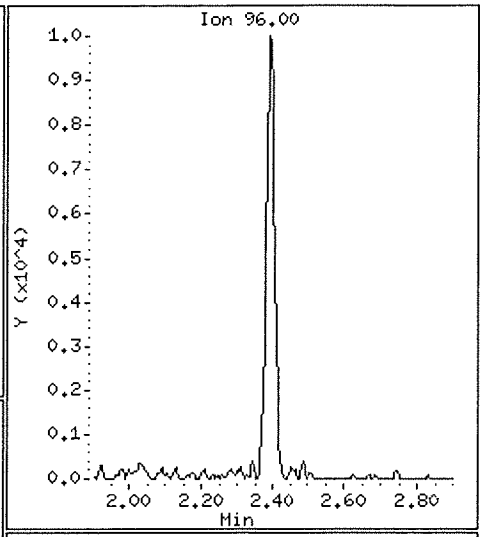
Sample Info: HS19110644-10;HS19110644-10;;;

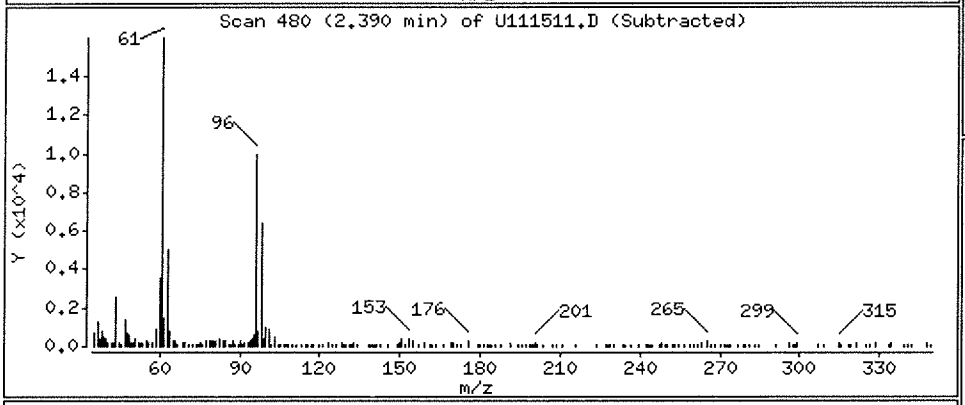
Purge Volume: 5.0 Operator: PC

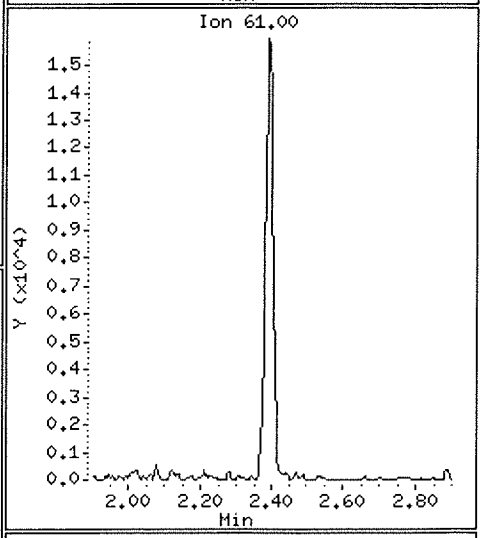
Column phase: DB624 Column diameter: 0.18

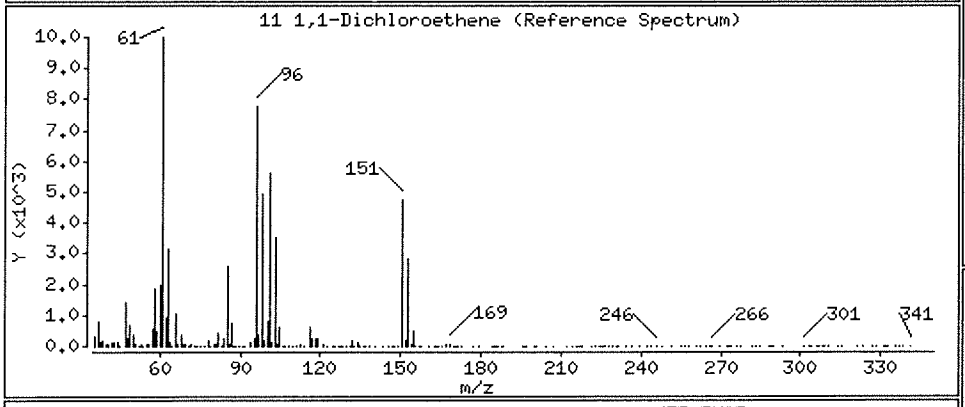
11 1,1-Dichloroethene Concentration: 4.10 ug/l

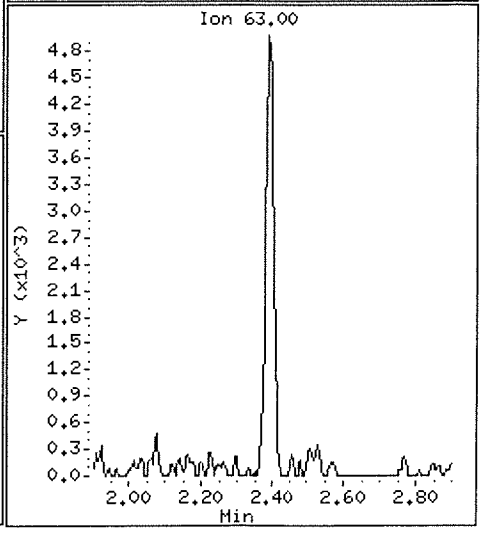


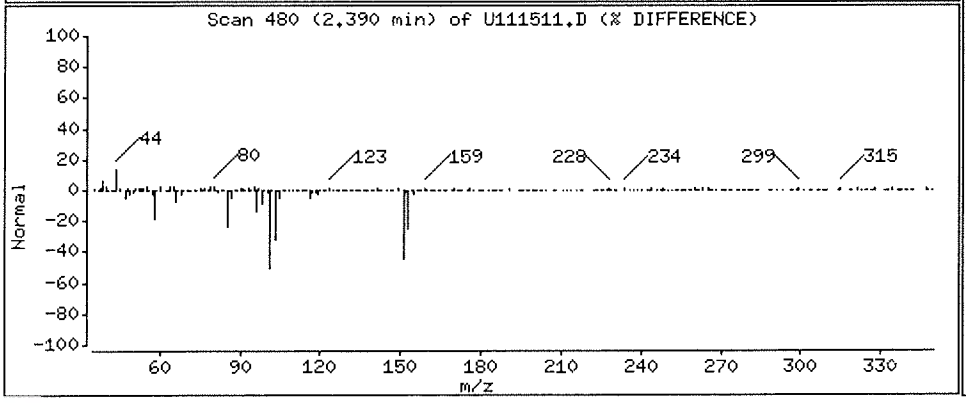












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111511.D

Date : 15-NOV-2019 14:45

Client ID: HS19110644-10

Instrument: VOA9.i

Sample Info: HS19110644-10;HS19110644-10;;;

Purge Volume: 5.0

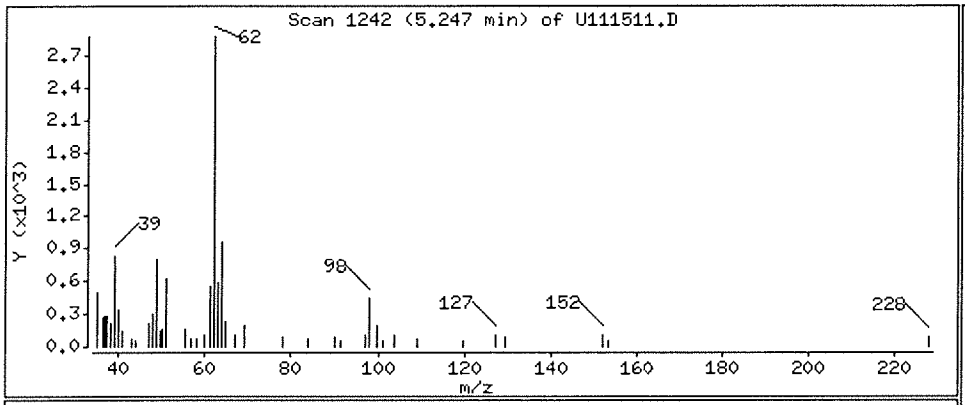
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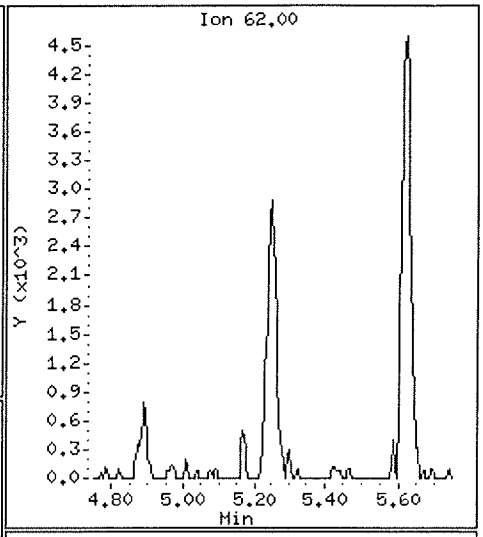
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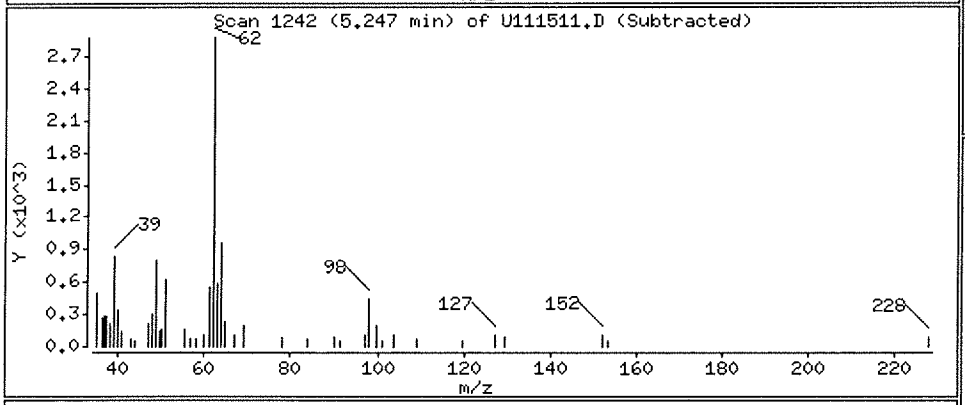
Column diameter: 0.18

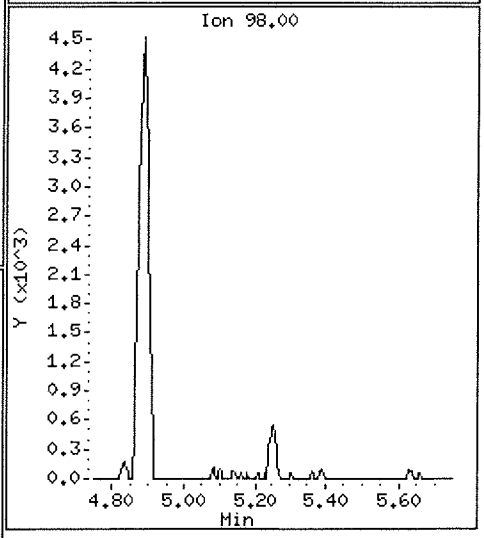
33 1,2-Dichloroethane

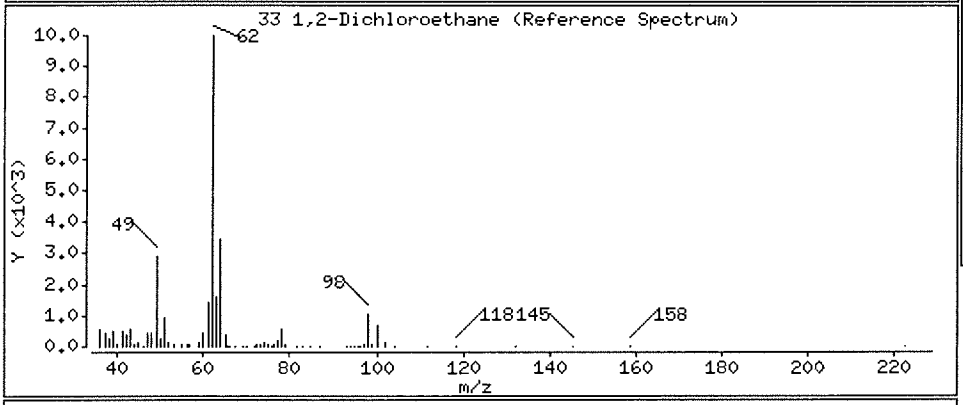
Concentration: 2.72 ug/l

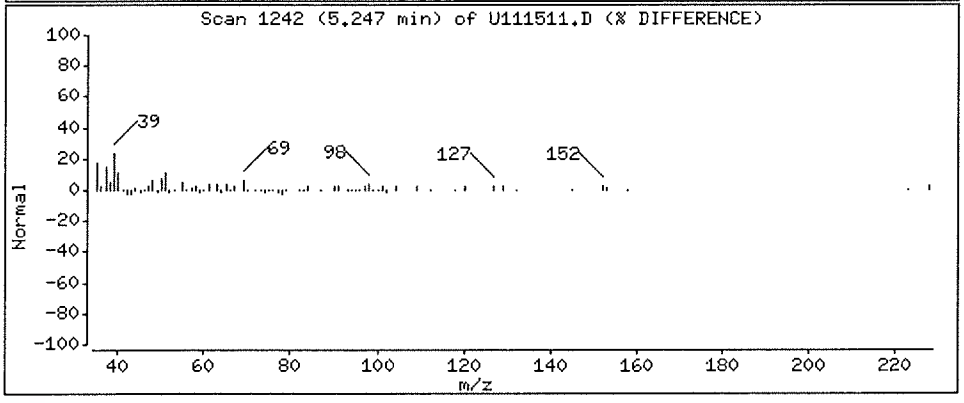












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111511.D

Date : 15-NOV-2019 14:45

Client ID: HS19110644-10

Instrument: VOA9.i

Sample Info: HS19110644-10;HS19110644-10;;;

Purge Volume: 5.0

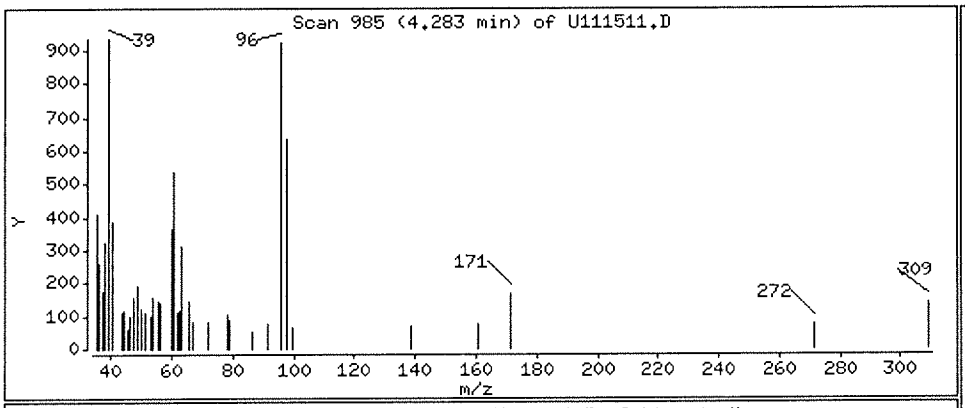
Operator: PC

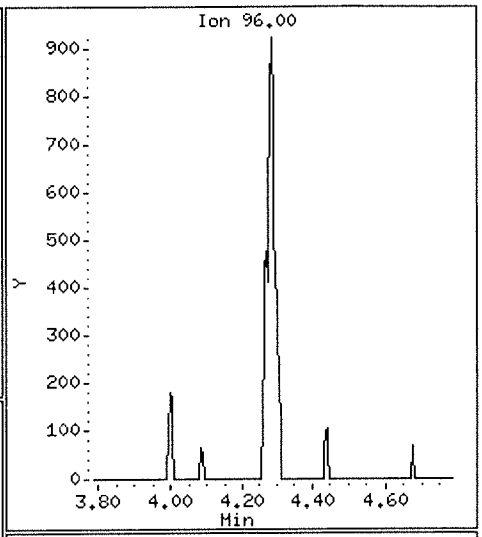
Column phase: DB624

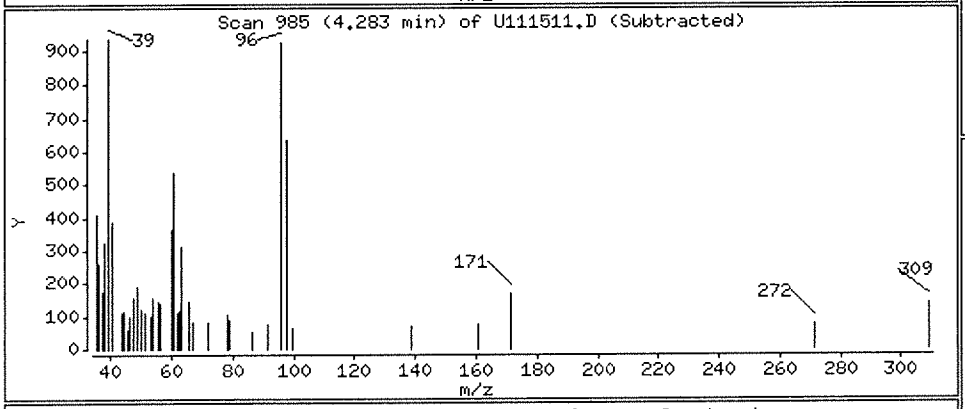
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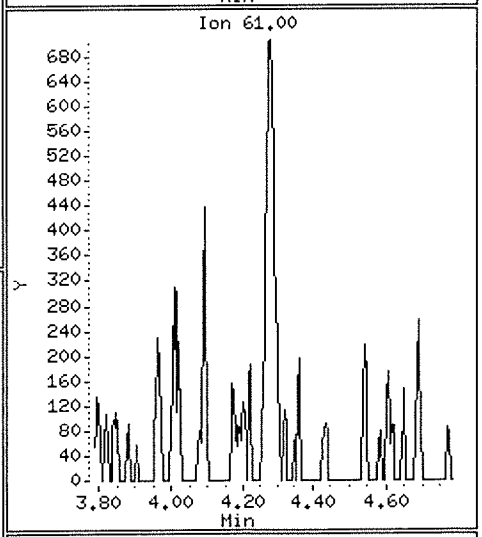
27 cis-1,2-Dichloroethene

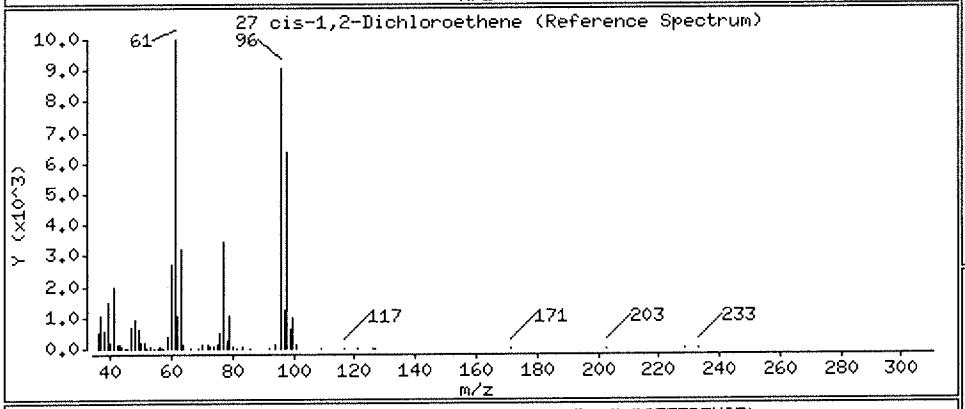
Concentration: 0.75 ug/l

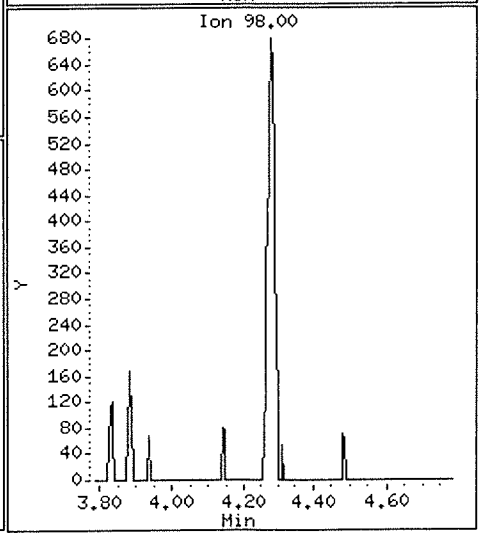


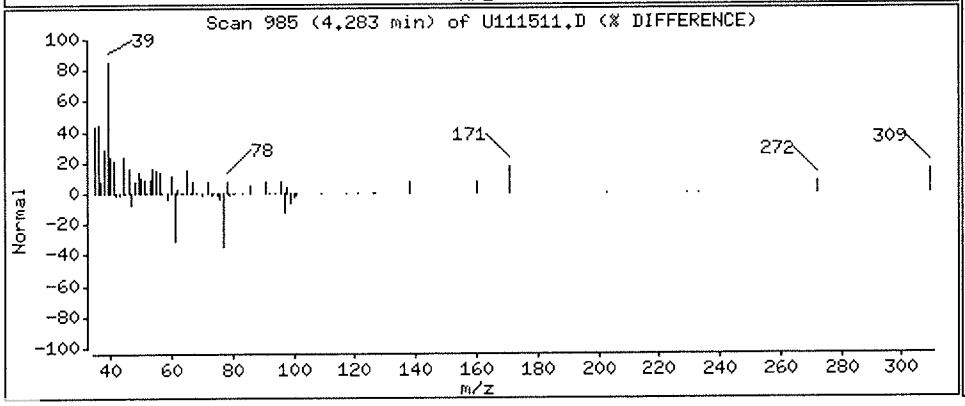












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111511.D

Date : 15-NOV-2019 14:45

Client ID: HS19110644-10

Instrument: VOA9.i

Sample Info: HS19110644-10;HS19110644-10;;;

Purge Volume: 5.0

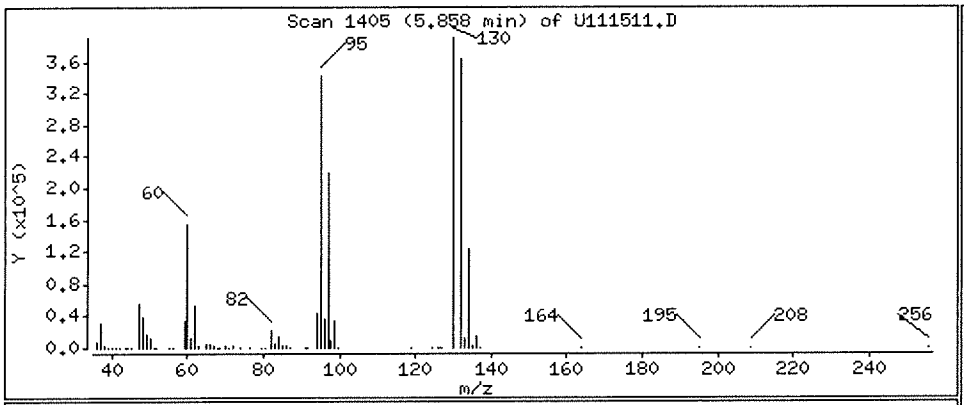
Operator: PC

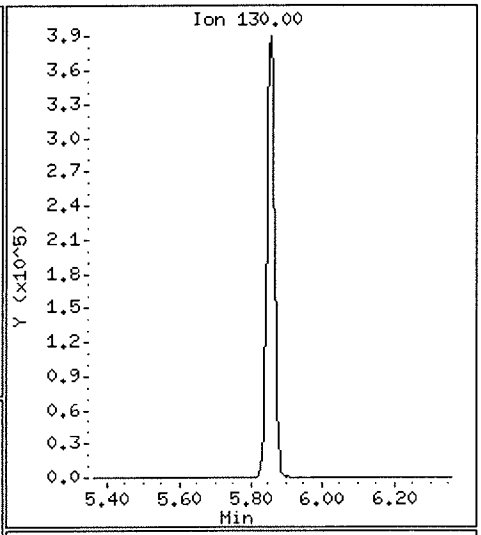
Column phase: DB624

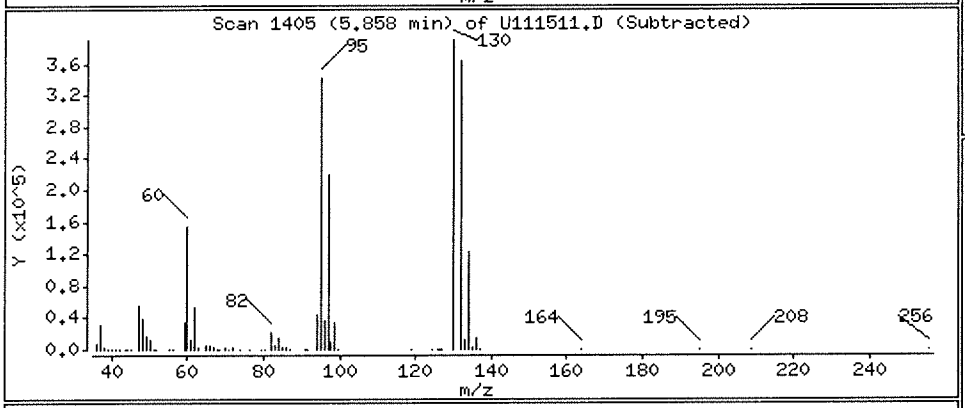
Column diameter: 0.18

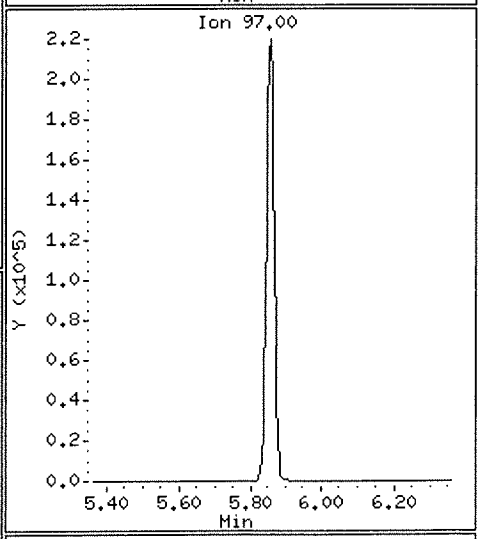
38 Trichloroethene

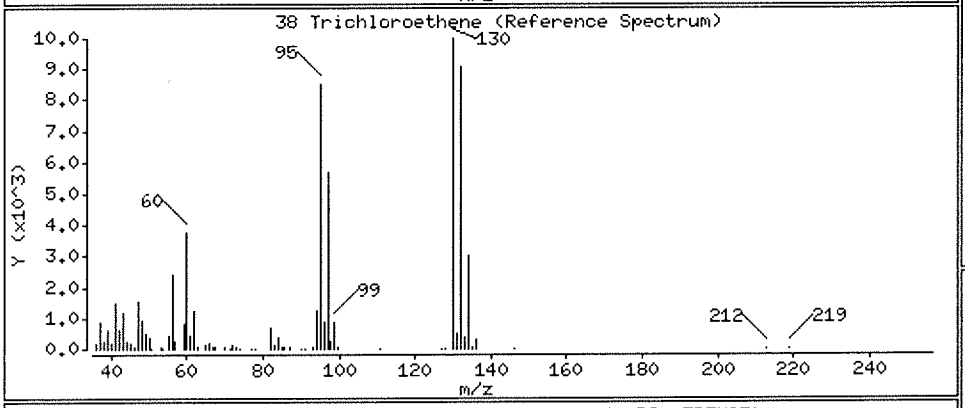
Concentration: 330.30 ug/l

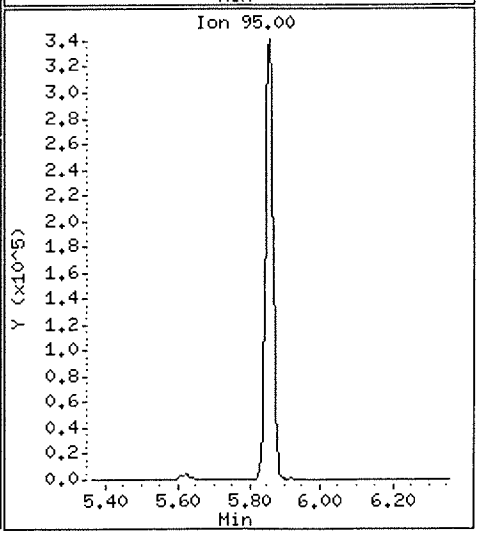


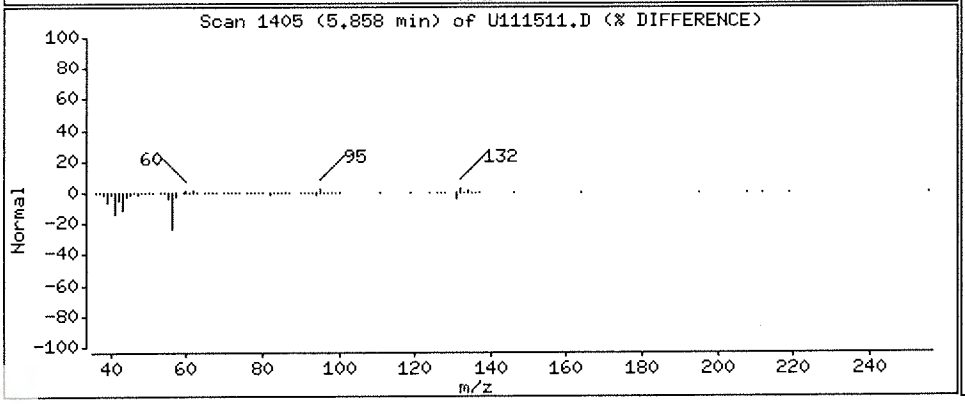












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111512.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111512.D
Lab Smp Id: HS19110644-06 Client Smp ID: HS19110644-06
Inj Date : 15-NOV-2019 15:09
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-06;HS19110644-06;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 12
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

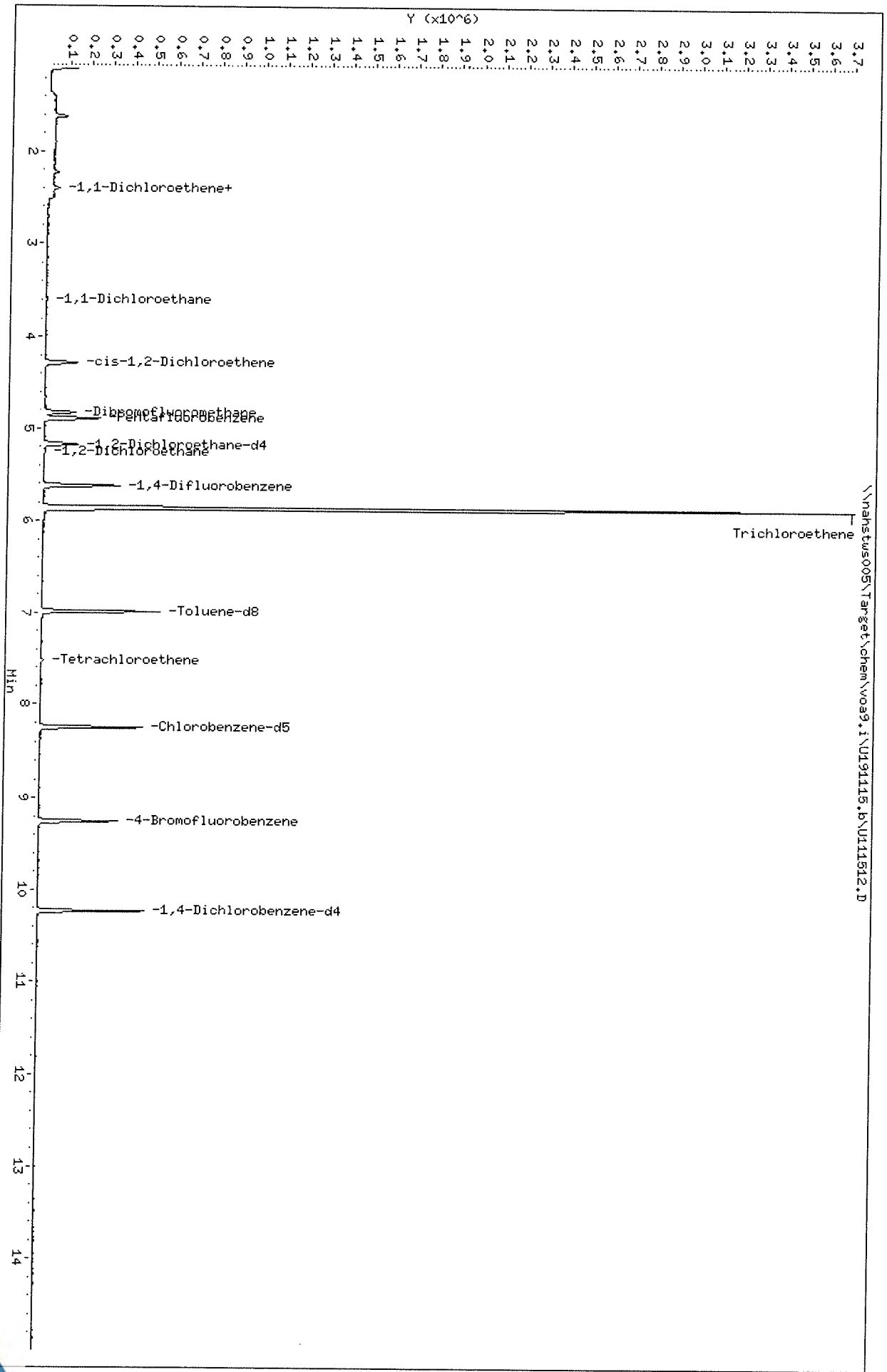
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	169031	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	266097	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	243352	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	112732	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	85147	50.4211	50.42
$ 69 4-Bromofluorobenzene	95	9.253	9.254	(1.122)	86823	46.2233	46.22
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	76010	45.5826	45.58
$ 48 Toluene-d8	98	6.985	6.986	(0.847)	317124	52.4865	52.48
138 Freon TF	101	2.401	2.405	(0.491)	6089	1.61477	1.61(a)
22 1,1-Dichloroethane	63	3.604	3.600	(0.737)	2425	1.01094	1.01(a)
11 1,1-Dichloroethene	96	2.401	2.401	(0.491)	4671	1.18310	1.18(a)
33 1,2-Dichloroethane	62	5.257	5.250	(0.935)	4433	2.23800	2.23(a)
27 cis-1,2-Dichloroethene	96	4.286	4.286	(0.876)	74995	38.9510	38.95
56 Tetrachloroethene	166	7.521	7.522	(0.912)	2311	1.25278	1.25(a)
38 Trichloroethene	130	5.861	5.861	(1.042)	1034907	587.411	587.41(A)

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\voa9,i\U191115,b\U111512.D
Date : 15-NOV-2019 15:09
Client ID: HS19110644-06
Sample Info: HS19110644-06;HS19110644-06;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111512.D Page 3

Date : 15-NOV-2019 15:09

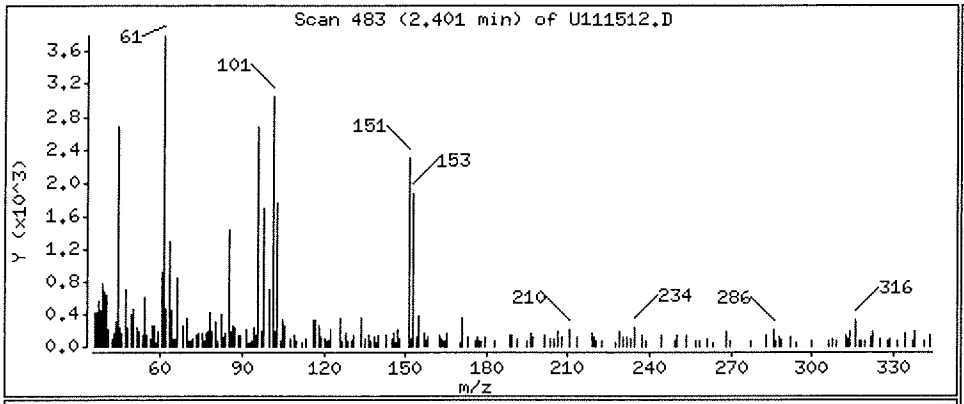
Client ID: HS19110644-06 Instrument: VOA9.i

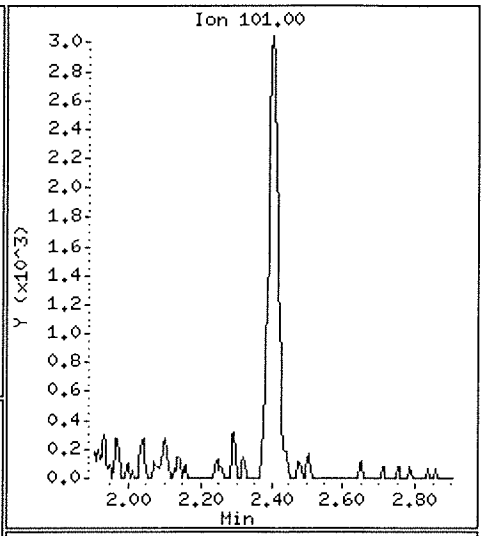
Sample Info: HS19110644-06;HS19110644-06;;;

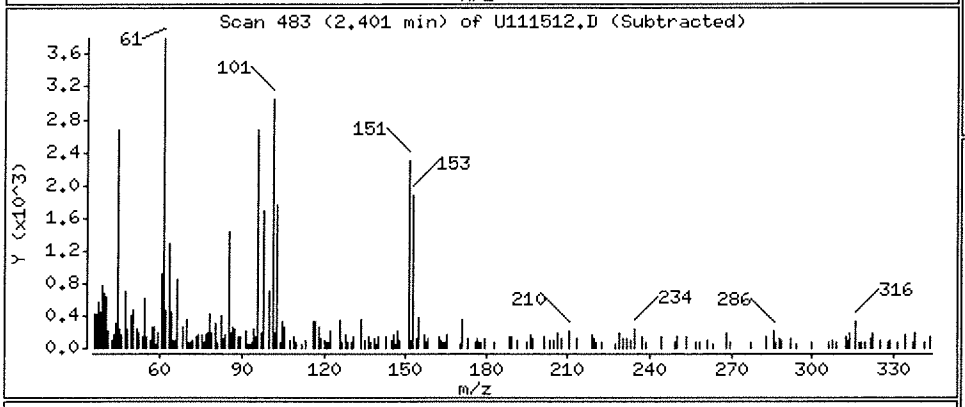
Purge Volume: 5.0 Operator: PC

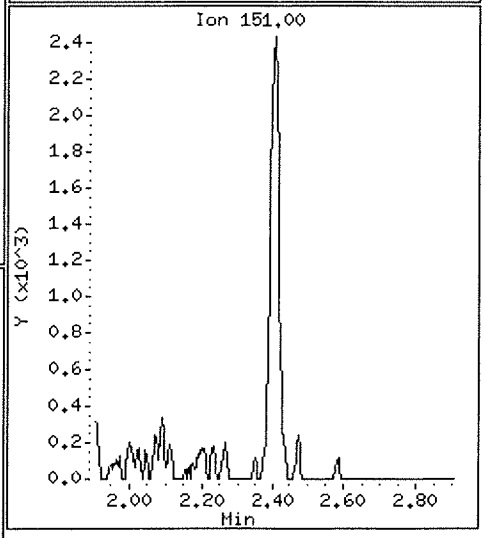
Column phase: DB624 Column diameter: 0.18

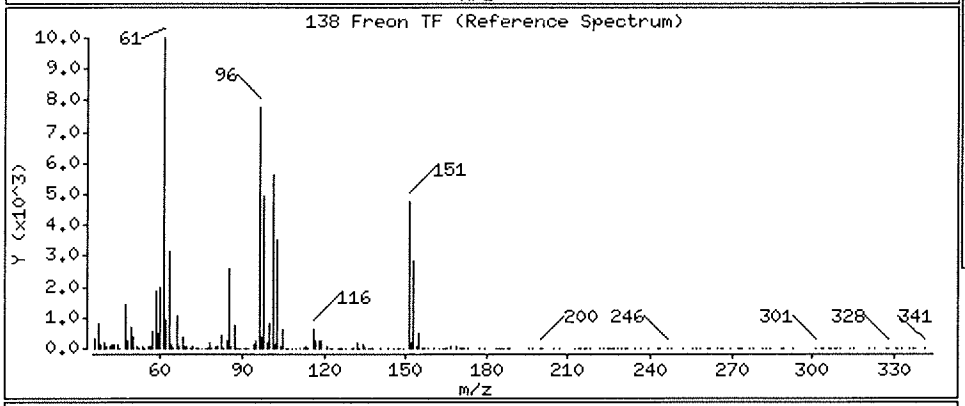
138 Freon TF Concentration: 1.61 ug/l

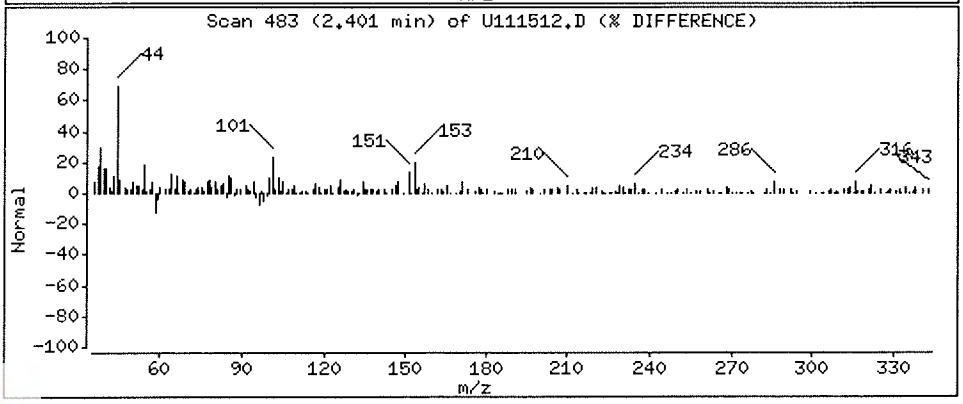












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111512.D

Date : 15-NOV-2019 15:09

Client ID: HS19110644-06

Instrument: VOA9.i

Sample Info: HS19110644-06;HS19110644-06;;;

Purge Volume: 5.0

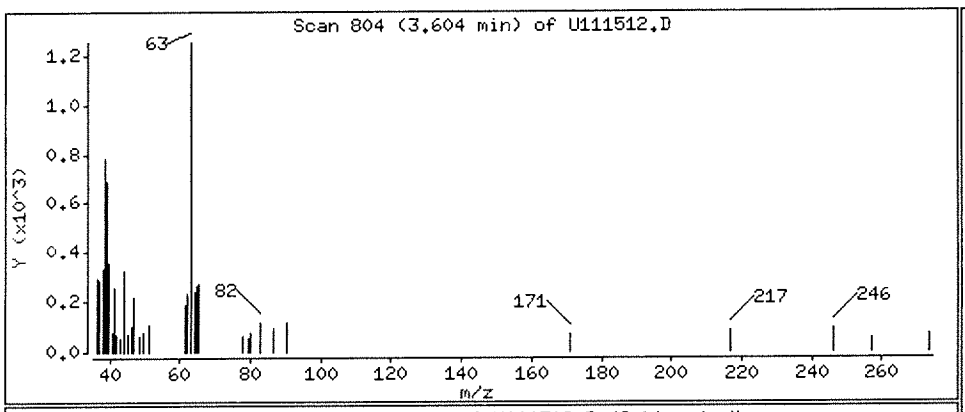
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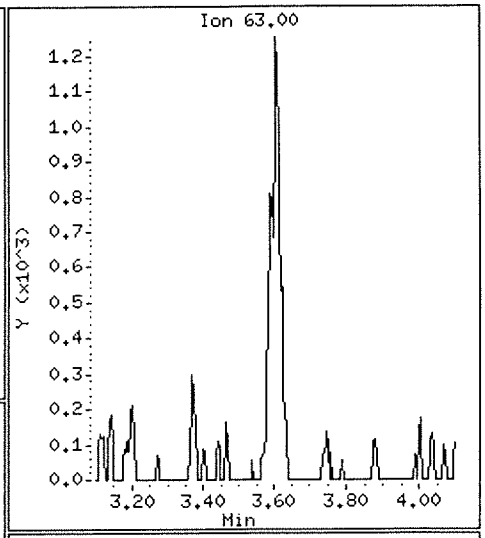
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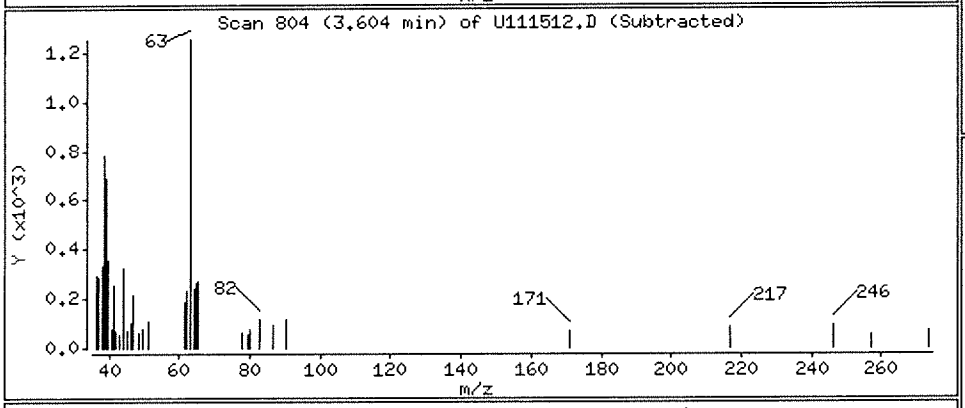
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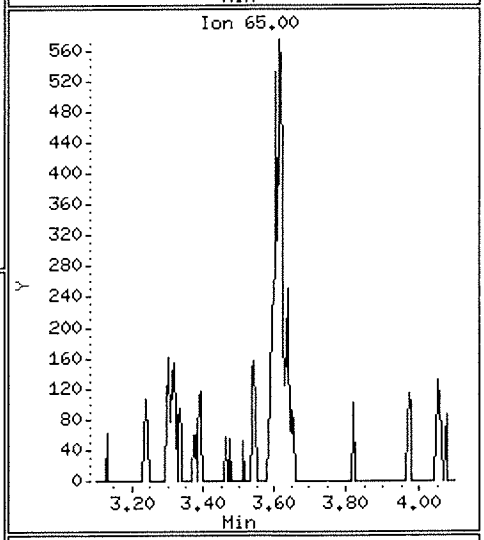
22 1,1-Dichloroethane

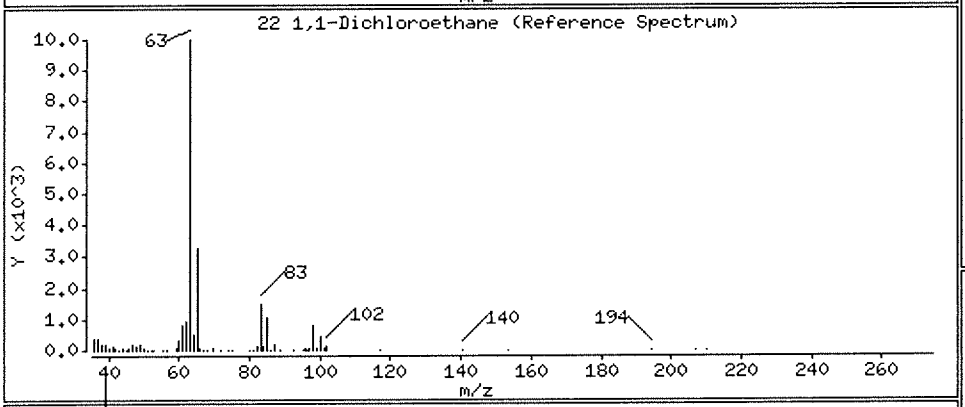
Concentration: 1.01 ug/l

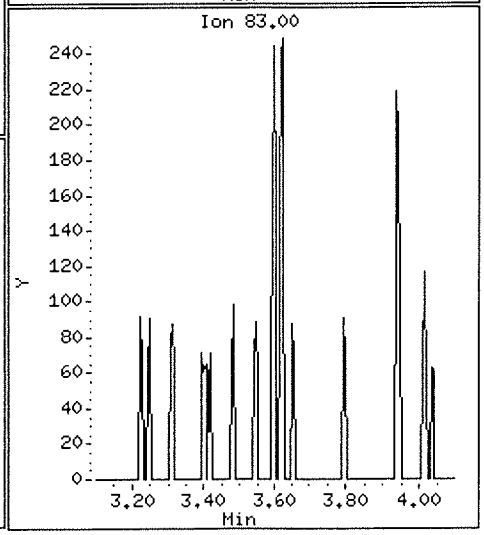


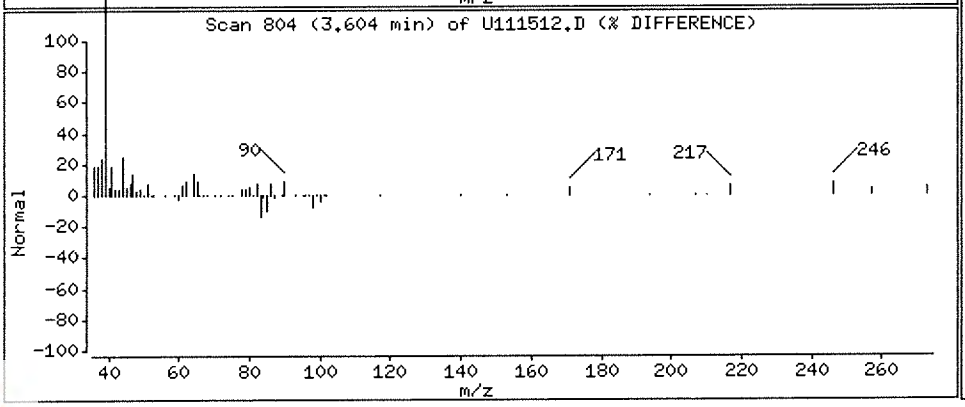












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111512.D Page 5

Date : 15-NOV-2019 15:09

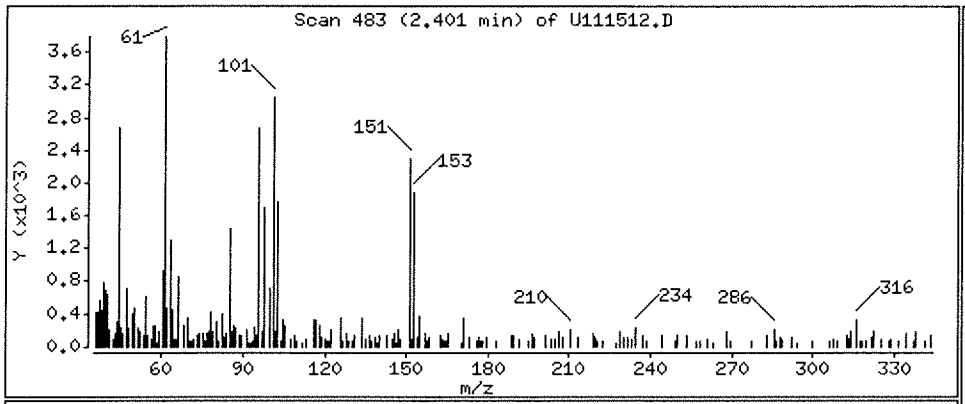
Client ID: HS19110644-06 Instrument: VOA9.i

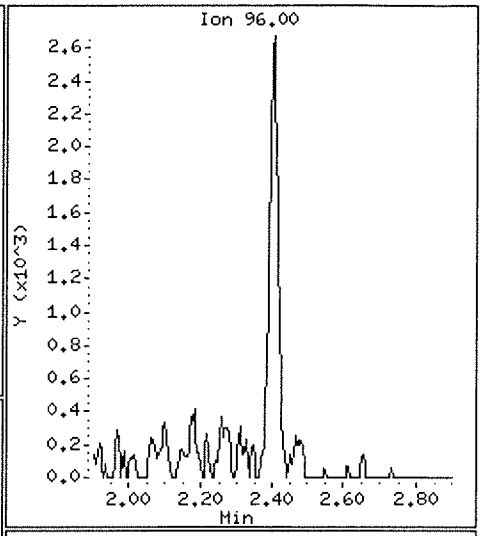
Sample Info: HS19110644-06;HS19110644-06;;;

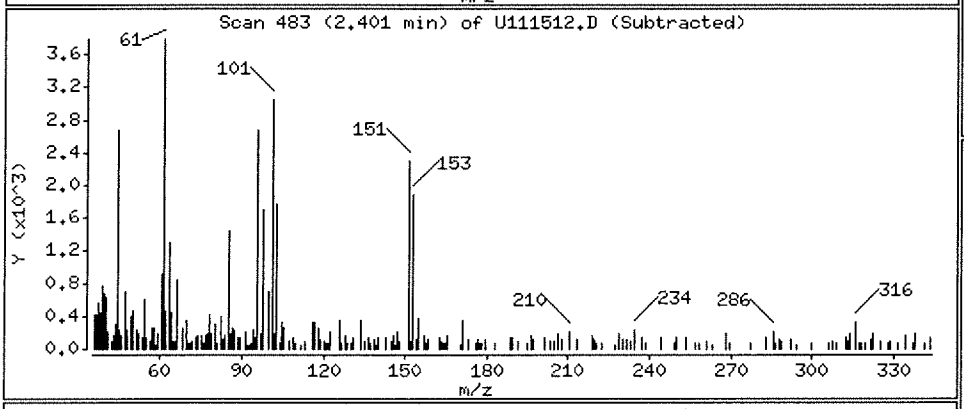
Purge Volume: 5.0 Operator: PC

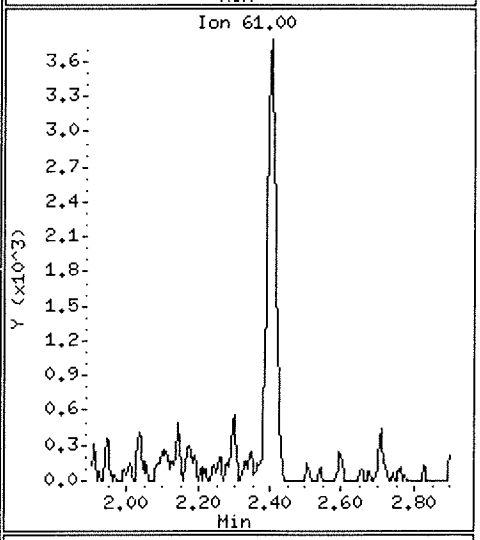
Column phase: DB624 Column diameter: 0.18

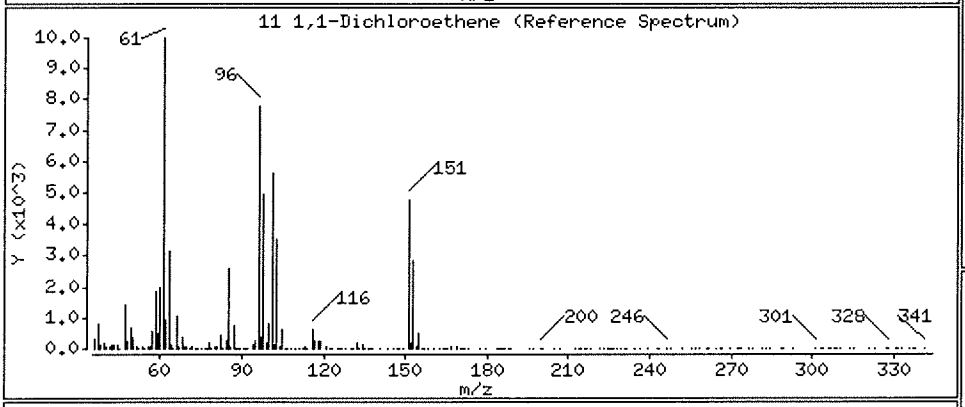
11 1,1-Dichloroethene Concentration: 1.18 ug/l

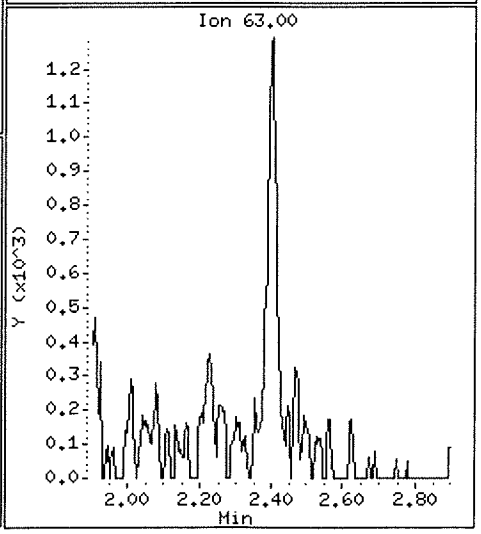


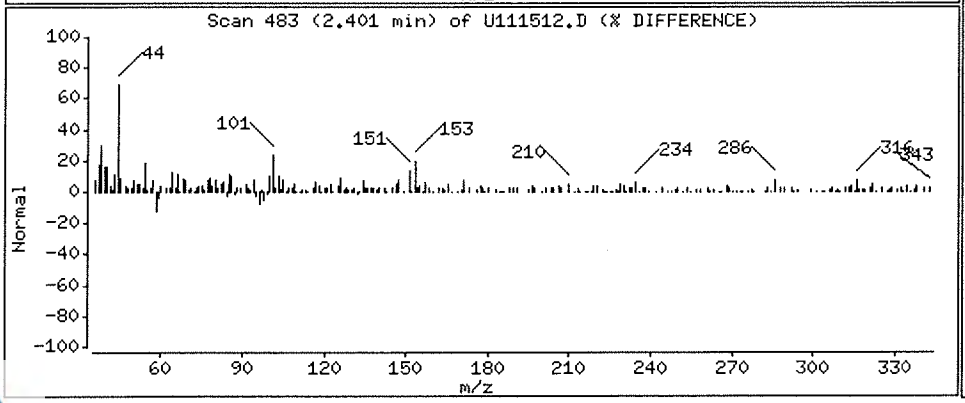












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111512.D

Date : 15-NOV-2019 15:09

Client ID: HS19110644-06

Instrument: VOA9.i

Sample Info: HS19110644-06;HS19110644-06;;;

Purge Volume: 5.0

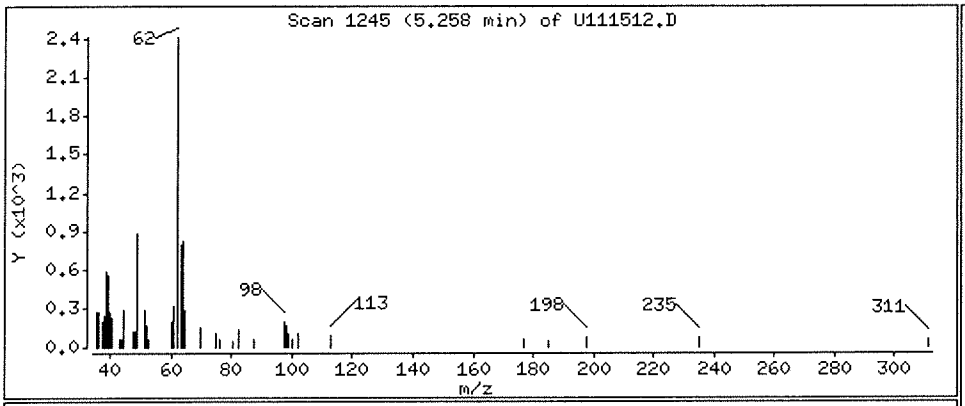
Operator: PC

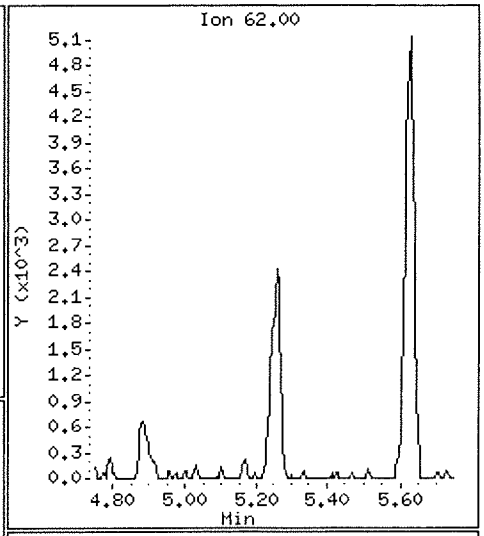
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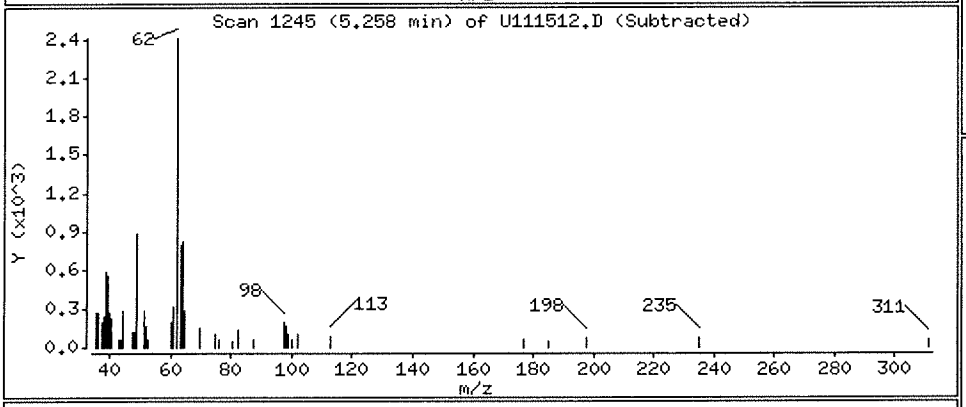
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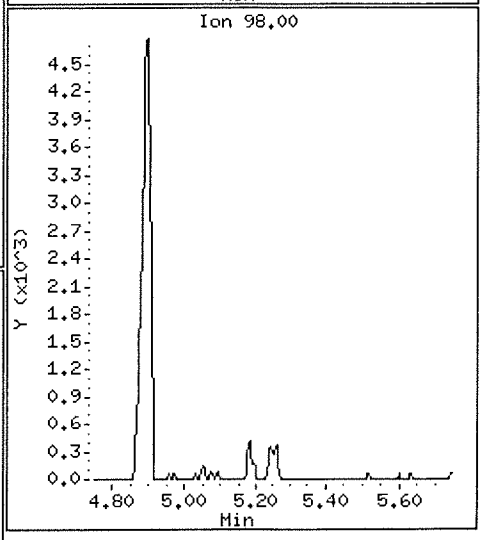
33 1,2-Dichloroethane

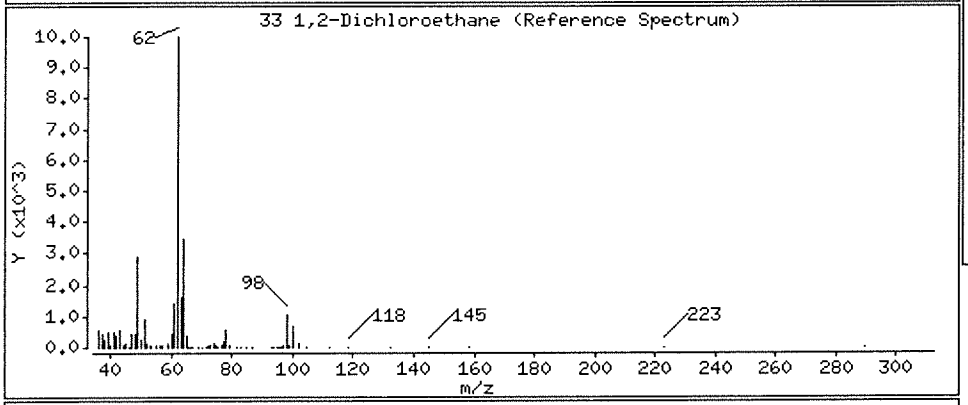
Concentration: 2.23 ug/l

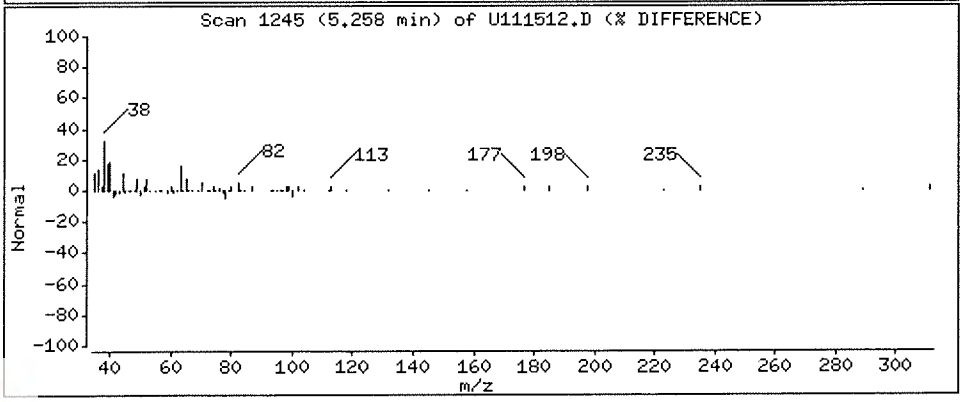












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111512.D Page 7

Date : 15-NOV-2019 15:09

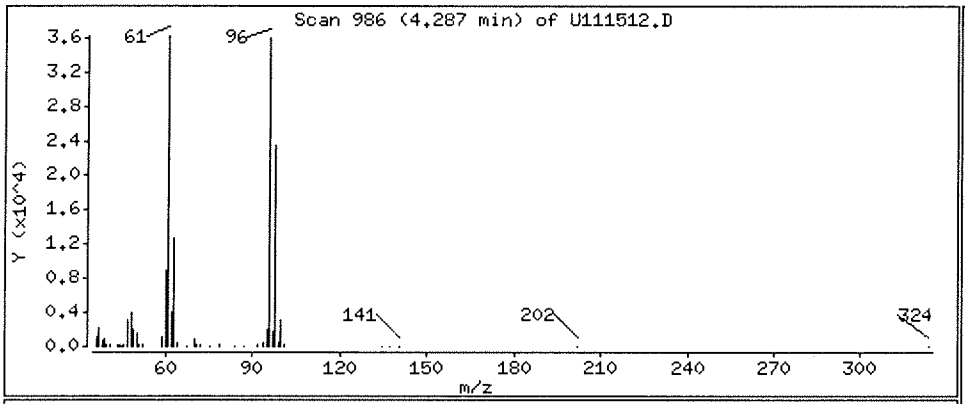
Client ID: HS19110644-06 Instrument: VOA9.i

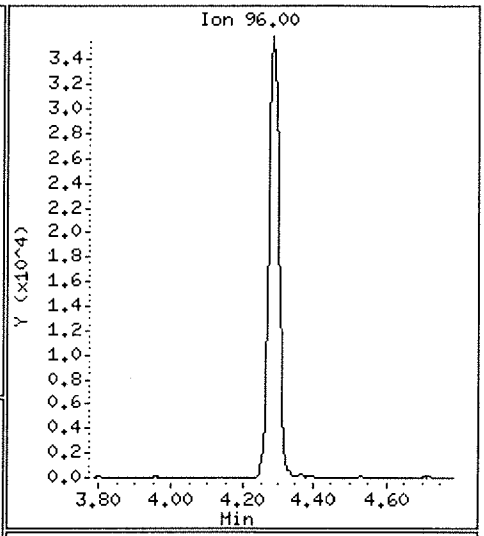
Sample Info: HS19110644-06;HS19110644-06;;;

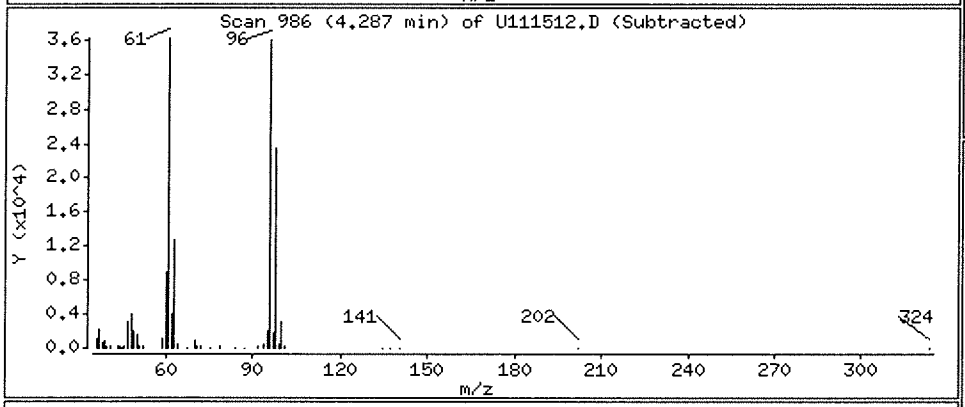
Purge Volume: 5.0 Operator: PC

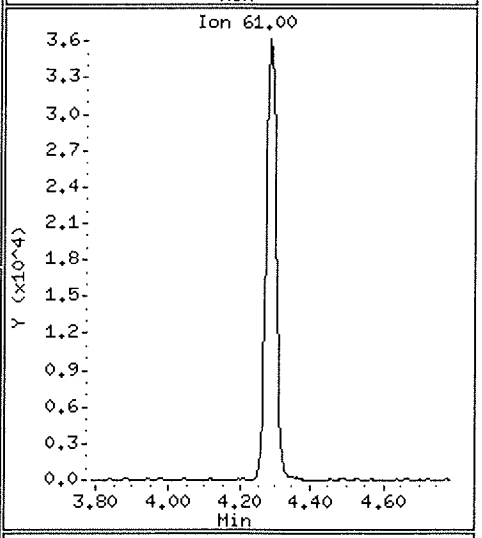
Column phase: DB624 Column diameter: 0.18

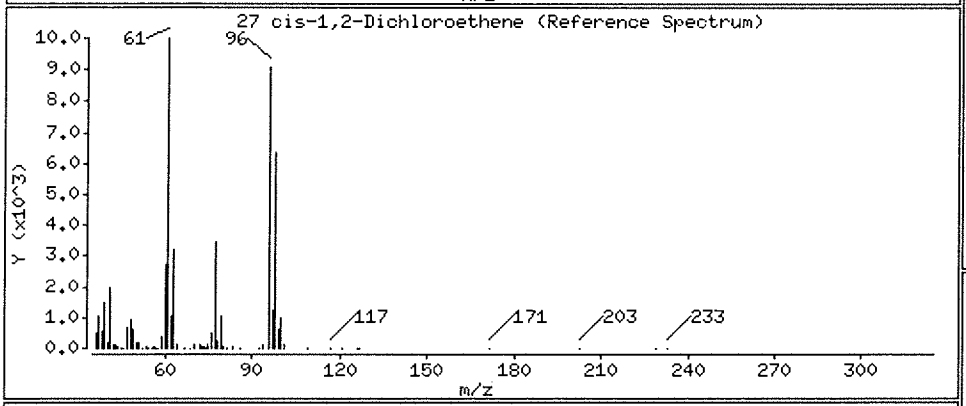
27 cis-1,2-Dichloroethene Concentration: 38.95 ug/l

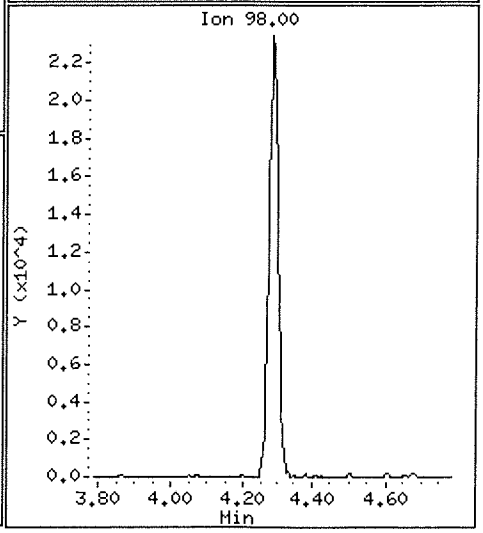


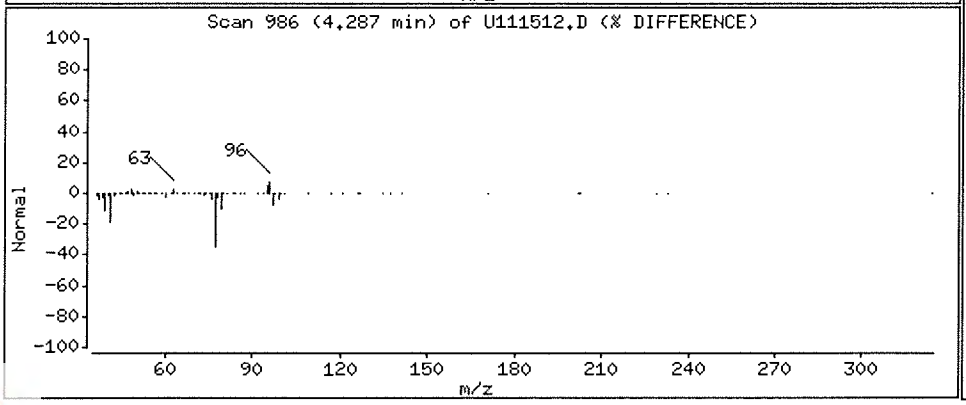












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111512.D

Date : 15-NOV-2019 15:09

Client ID: HS19110644-06

Instrument: VOA9.i

Sample Info: HS19110644-06;HS19110644-06;;;

Purge Volume: 5.0

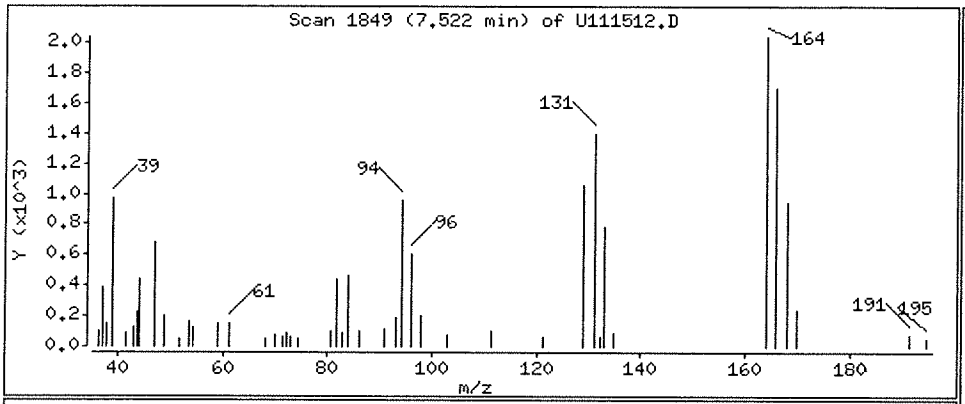
Operator: PC

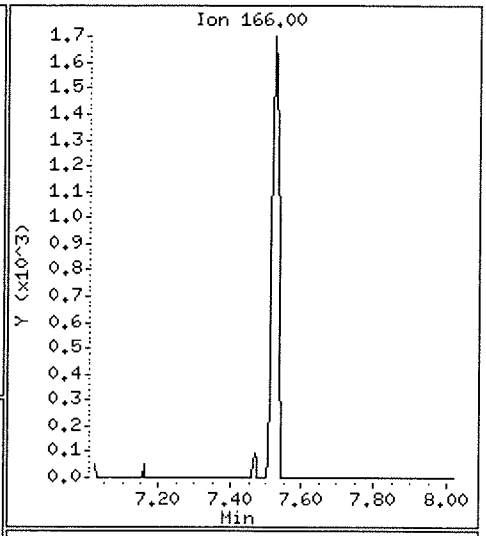
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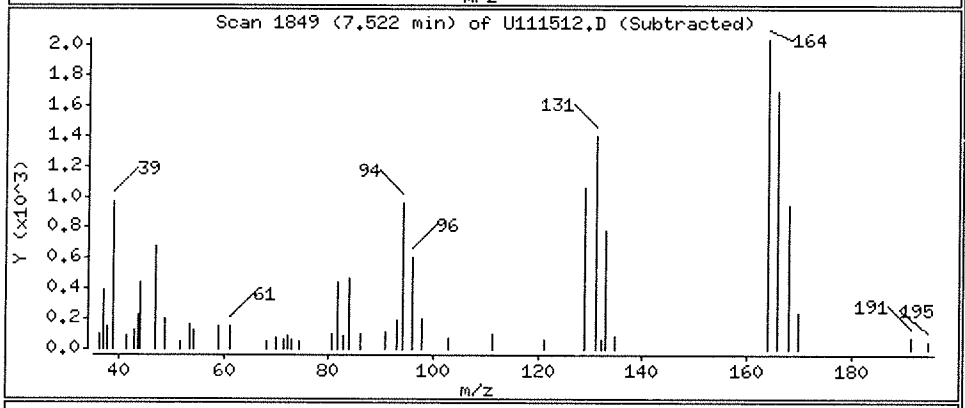
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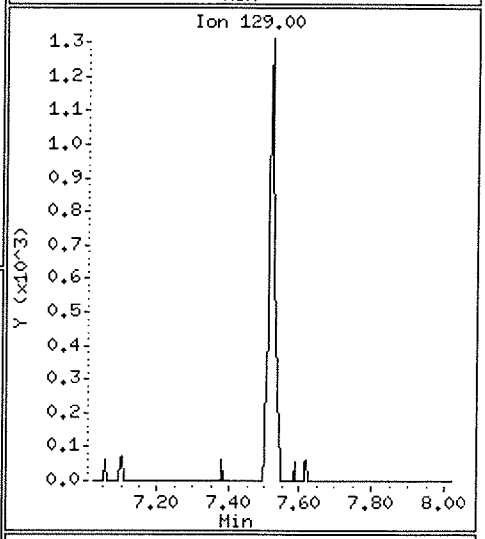
56 Tetrachloroethene

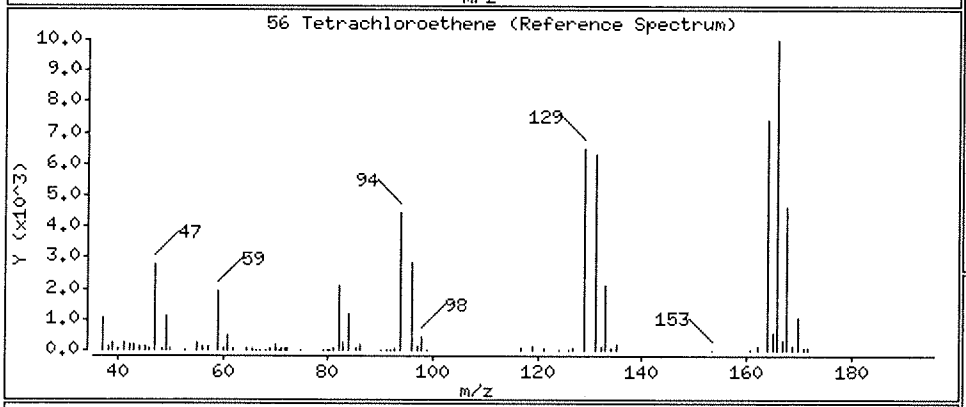
Concentration: 1.25 ug/l

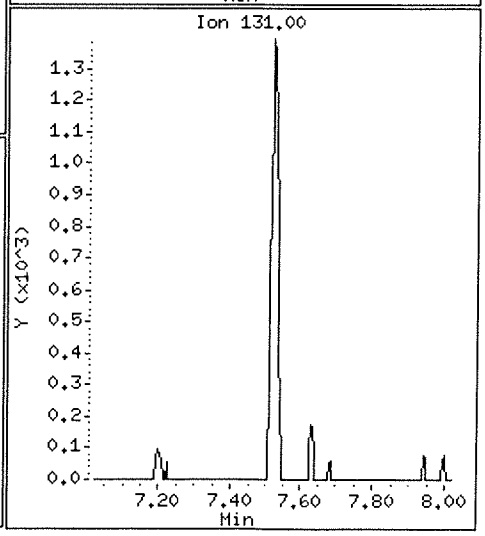


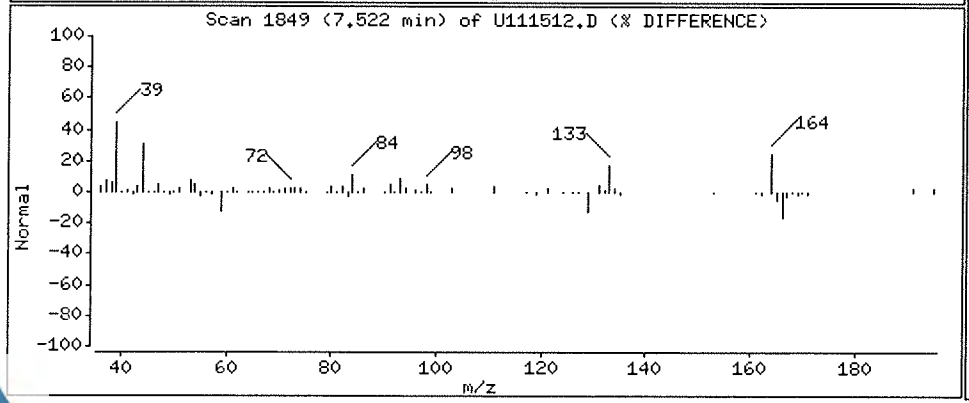












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111512.D Page 9

Date : 15-NOV-2019 15:09

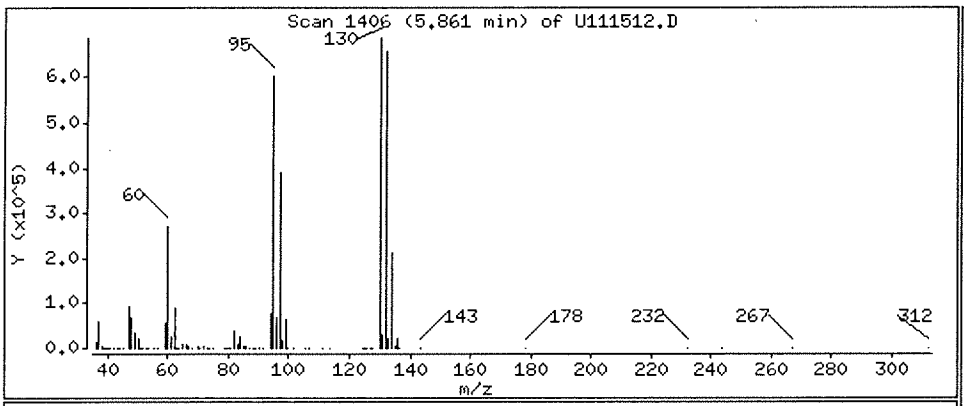
Client ID: HS19110644-06 Instrument: VOA9.i

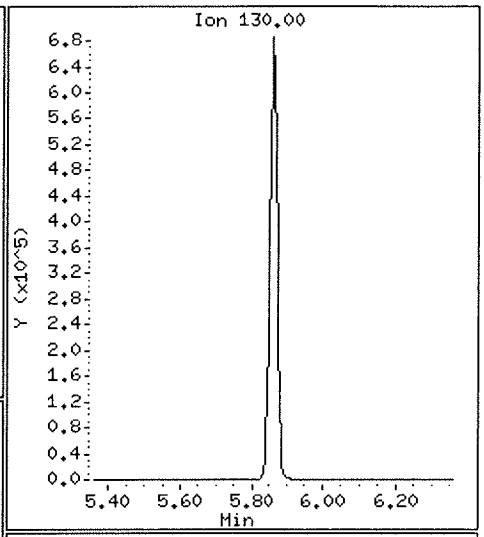
Sample Info: HS19110644-06;HS19110644-06;;;

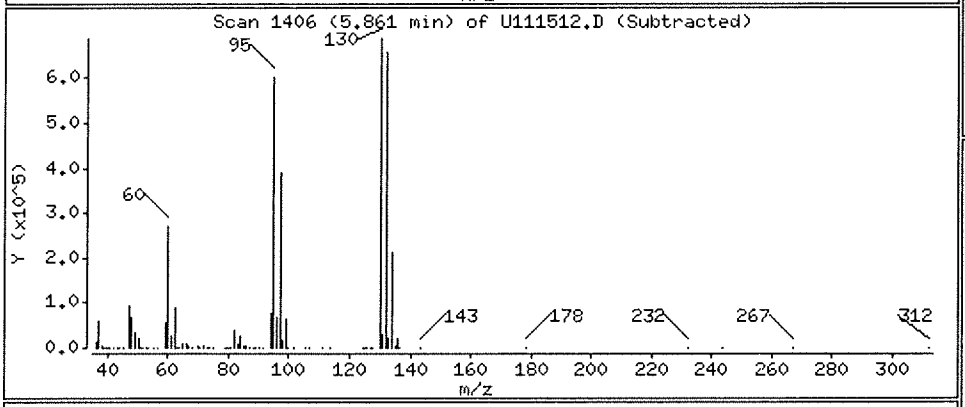
Purge Volume: 5.0 Operator: PC

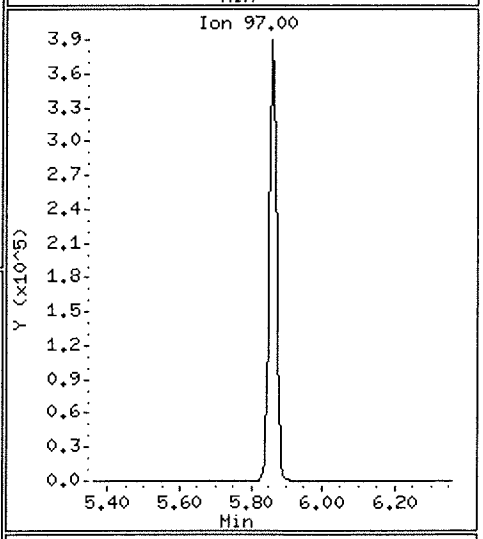
Column phase: DB624 Column diameter: 0.18

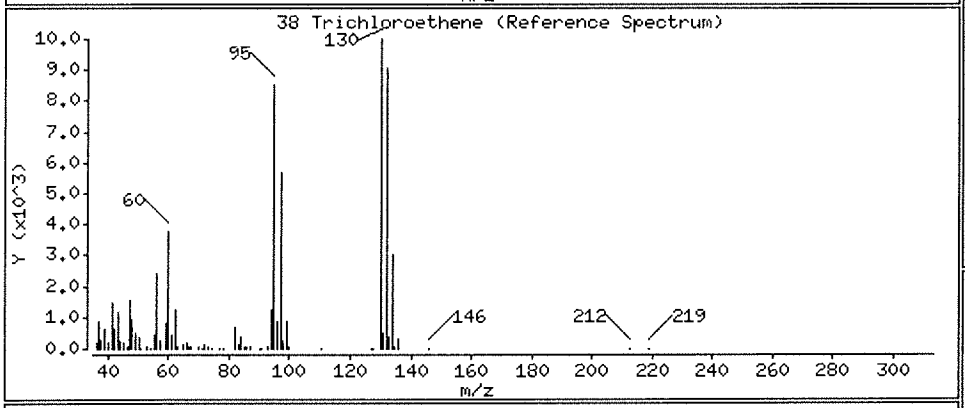
38 Trichloroethene Concentration: 587.41 ug/l

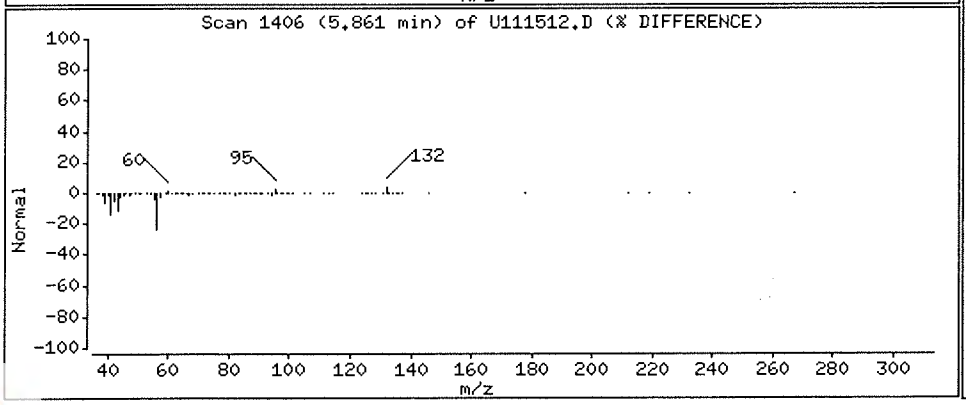


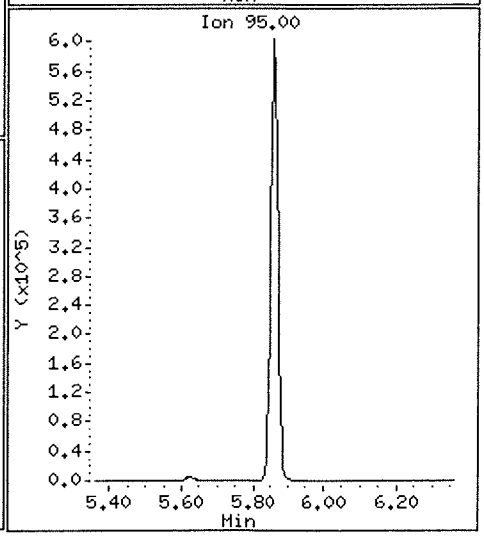












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111513.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111513.D
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Inj Date : 15-NOV-2019 15:33
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-08;HS19110644-08;;;
Misc Info : 180315V9;WATER;0;10;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 13
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

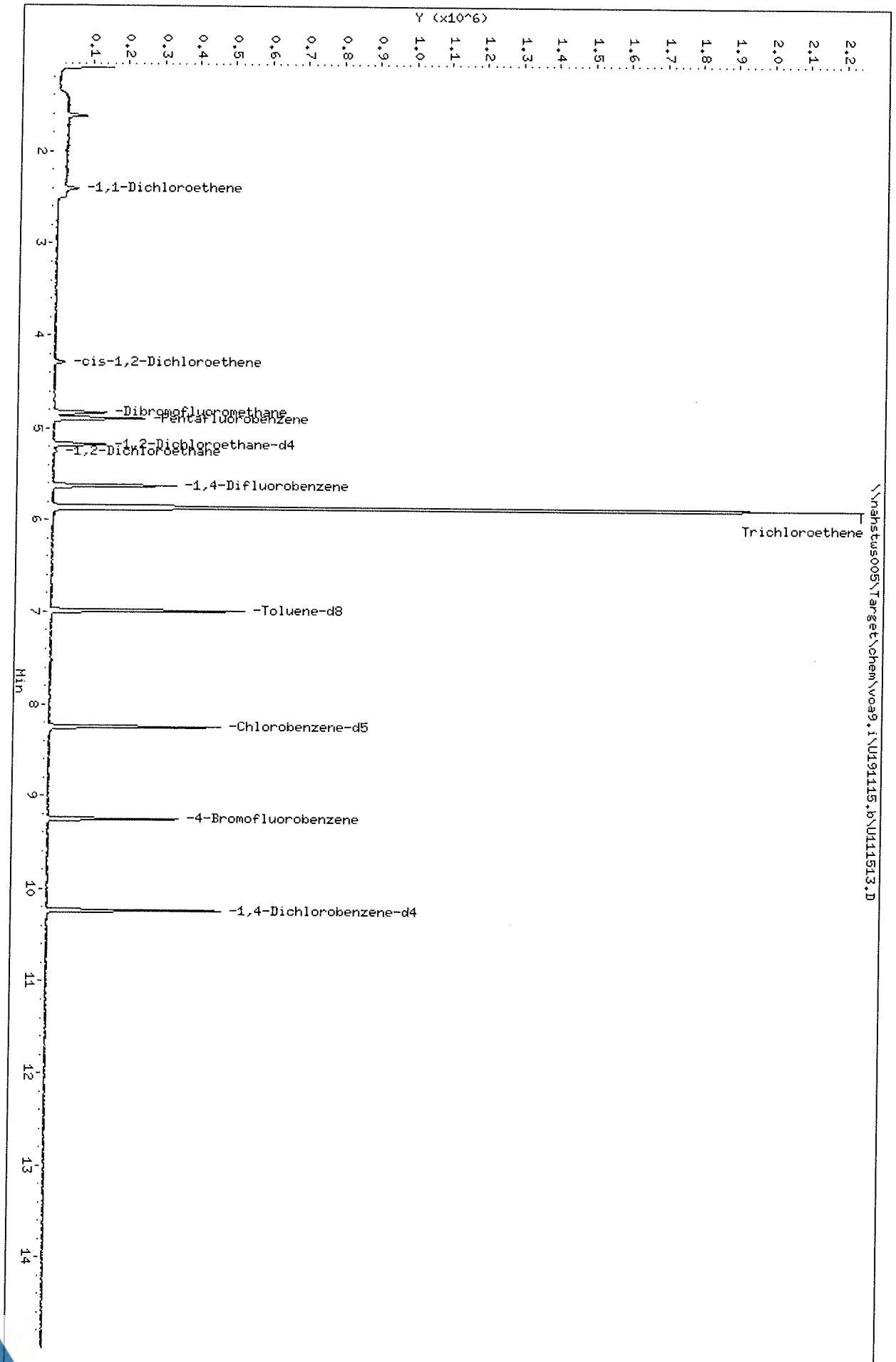
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	173627	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	270018	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	239751	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	115045	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	86969	50.1314	50.13
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	87082	47.0457	47.04
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	78945	46.0869	46.08
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	314707	52.8679	52.86
11 1,1-Dichloroethene	96	2.401	2.401	(0.491)	10611	2.61647	26.16(a)
33 1,2-Dichloroethane	62	5.254	5.250	(0.934)	5575	2.77367	27.73(a)
27 cis-1,2-Dichloroethene	96	4.291	4.286	(0.877)	11464	5.79658	57.96
38 Trichloroethene	130	5.861	5.861	(1.042)	641933	359.069	3590.68(A)

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\voa9,i\U191115,b\U111513.D
Date : 15-NOV-2019 15:33
Client ID: HS19110644-08
Sample Info: HS19110644-08;HS19110644-08;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111513.D

Date : 15-NOV-2019 15:33

Client ID: HS19110644-08

Instrument: VOA9.i

Sample Info: HS19110644-08;HS19110644-08;;;

Purge Volume: 5.0

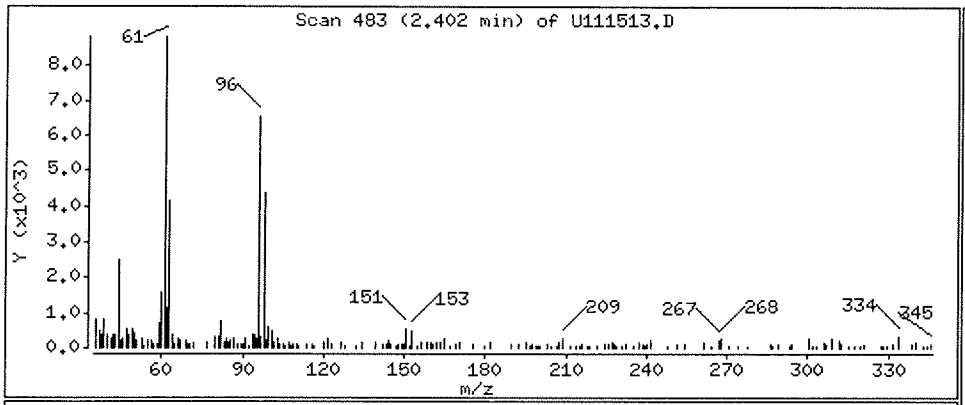
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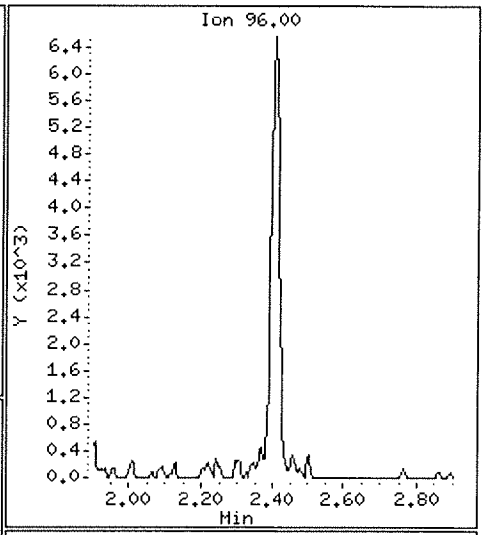
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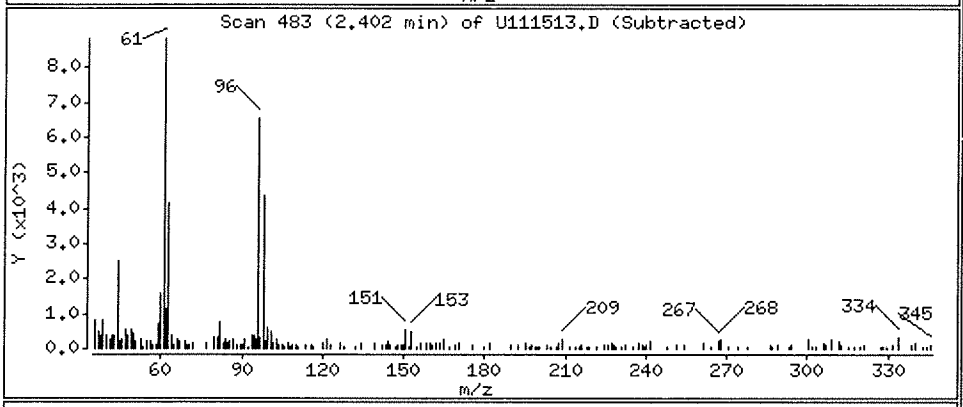
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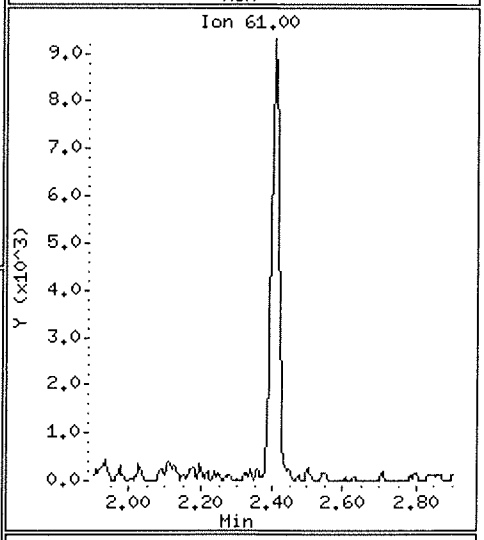
11 1,1-Dichloroethene

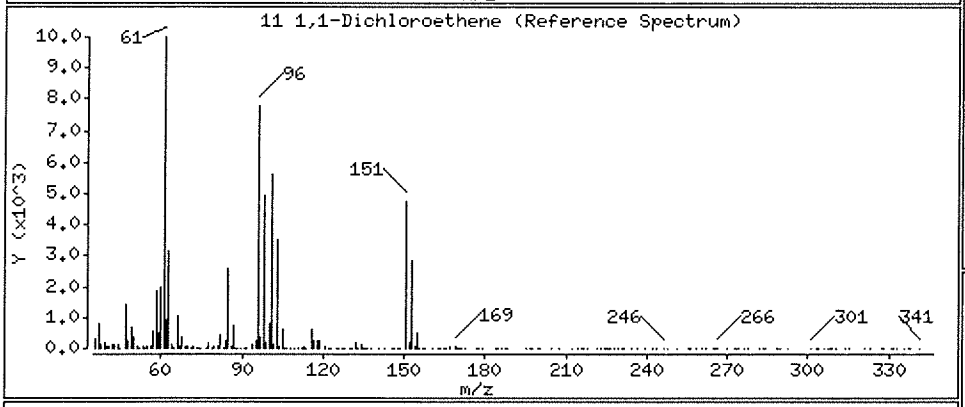
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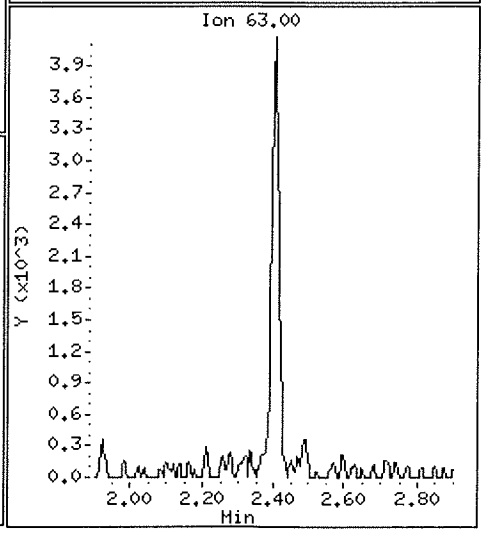


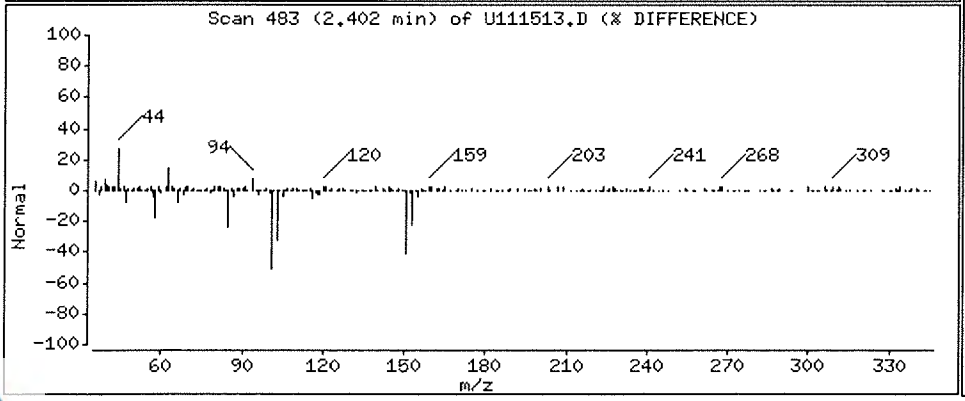












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111513.D

Date : 15-NOV-2019 15:33

Client ID: HS19110644-08

Instrument: VOA9.i

Sample Info: HS19110644-08;HS19110644-08;;;

Purge Volume: 5.0

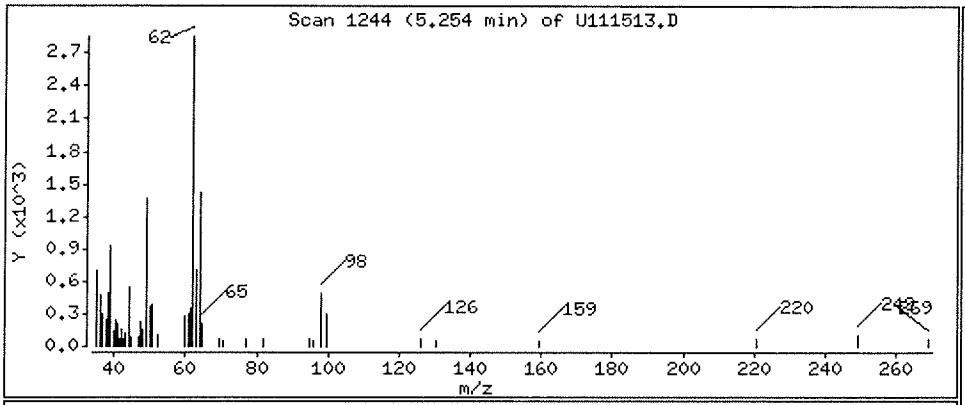
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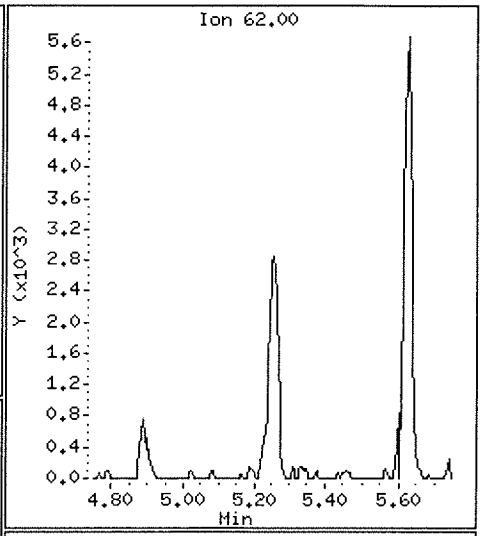
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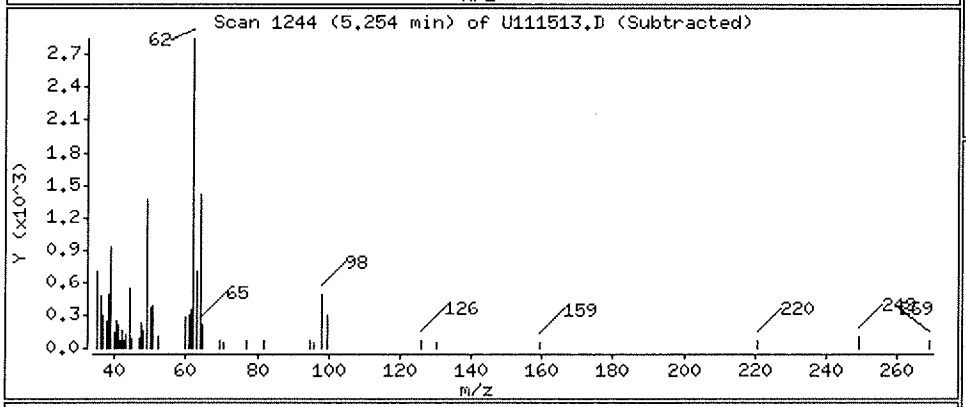
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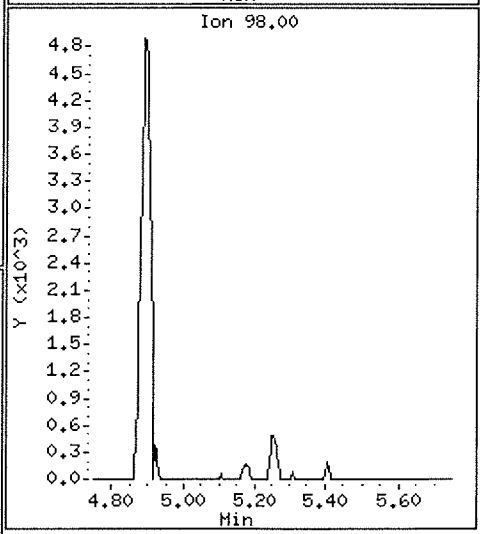
33 1,2-Dichloroethane

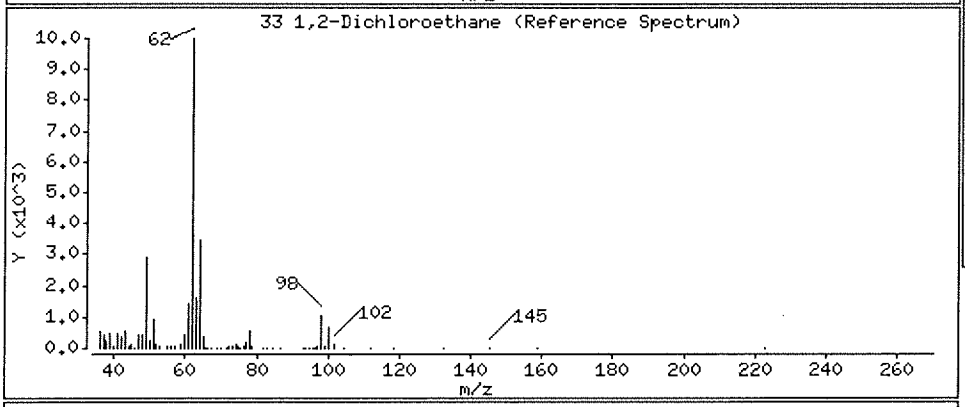
Concentration: 27.73 ug/l

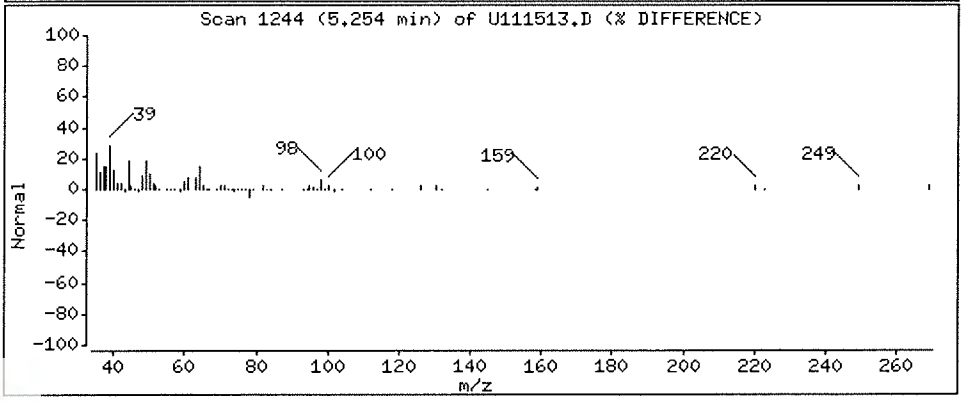












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111513.D

Date : 15-NOV-2019 15:33

Client ID: HS19110644-08

Instrument: VOA9.i

Sample Info: HS19110644-08;HS19110644-08;;;

Purge Volume: 5.0

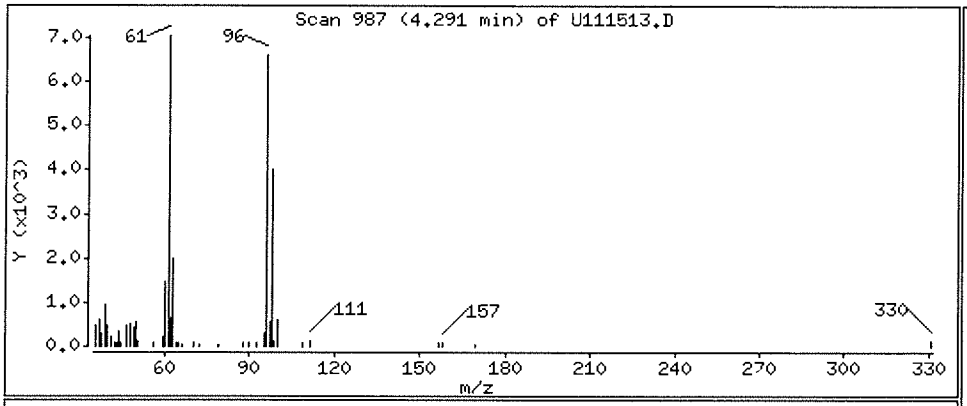
Operator: PC

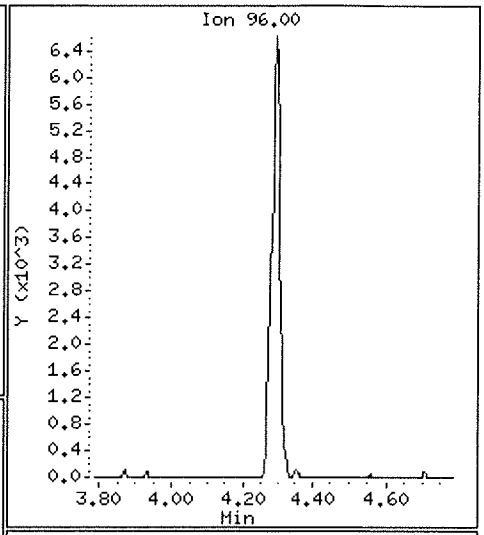
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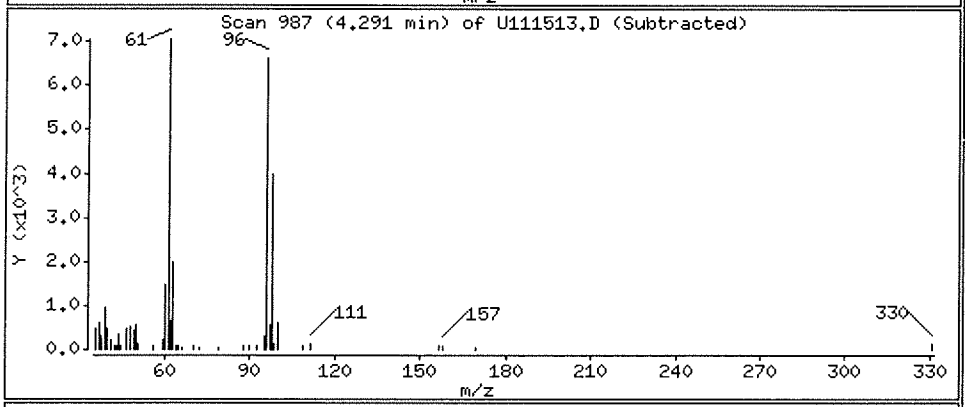
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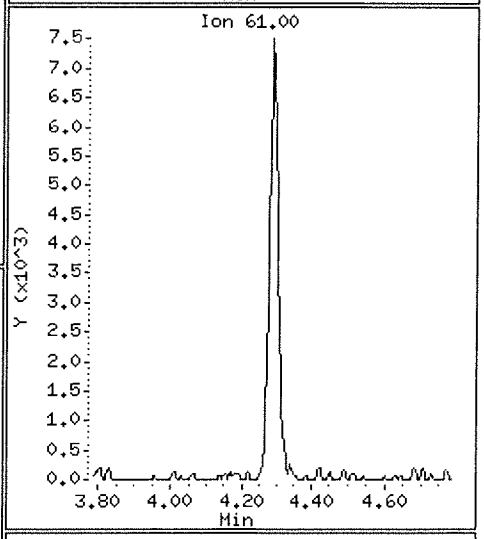
27 cis-1,2-Dichloroethene

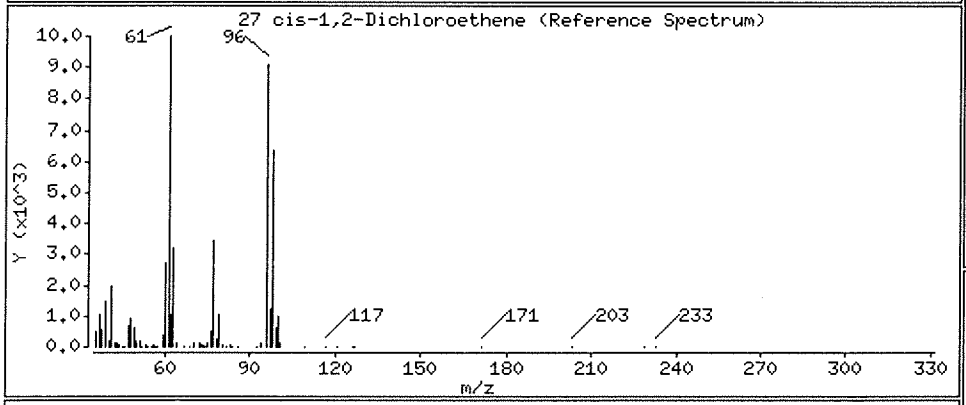
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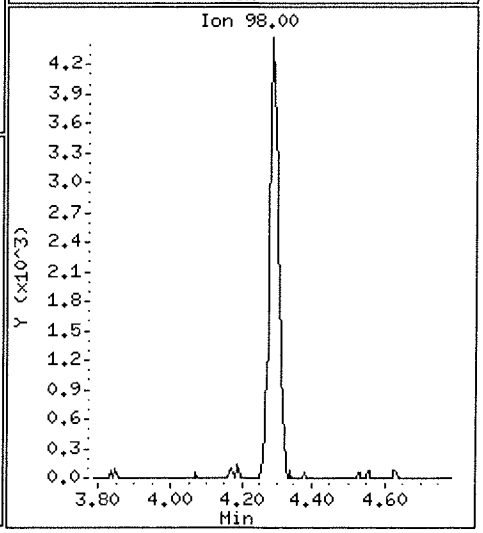


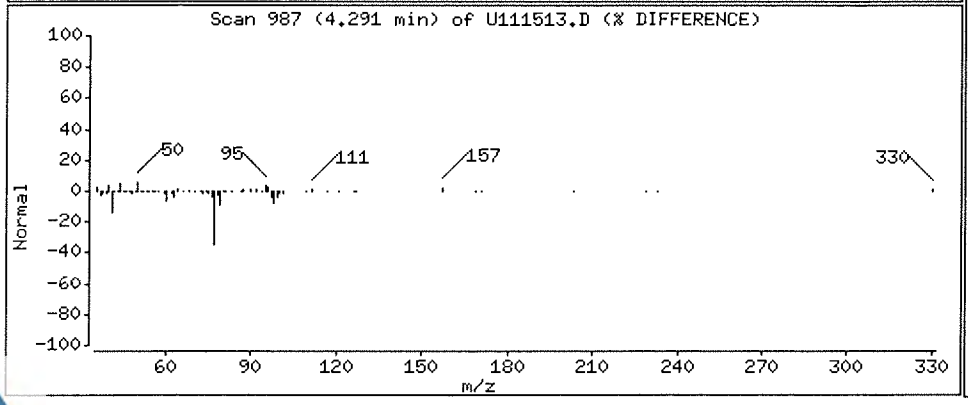












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111513.D Page 6

Date : 15-NOV-2019 15:33

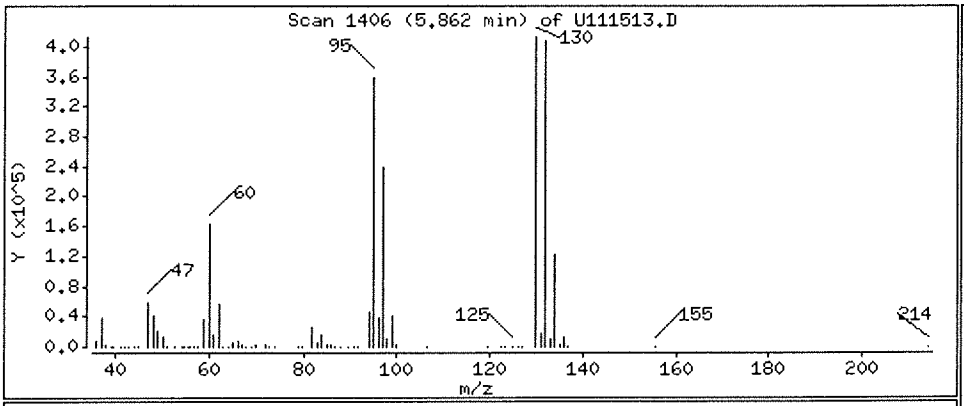
Client ID: HS19110644-08 Instrument: VOA9.i

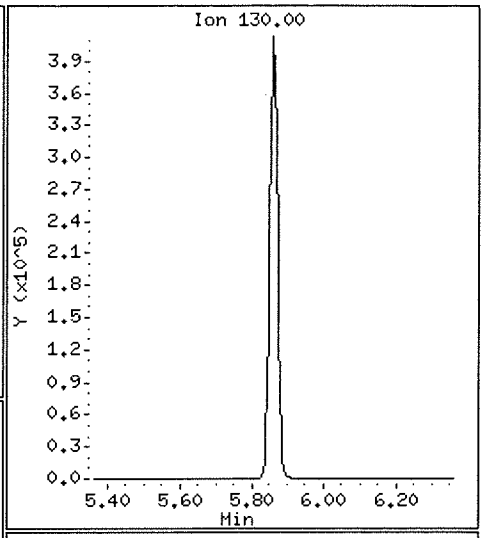
Sample Info: HS19110644-08;HS19110644-08;;;

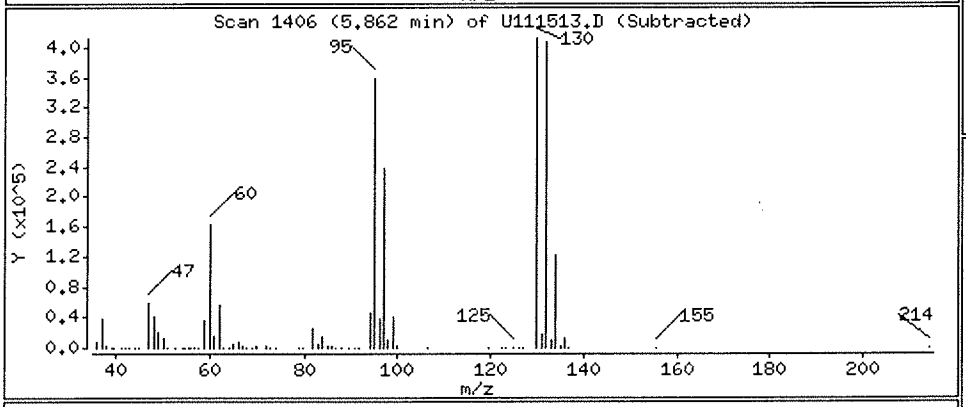
Purge Volume: 5.0 Operator: PC

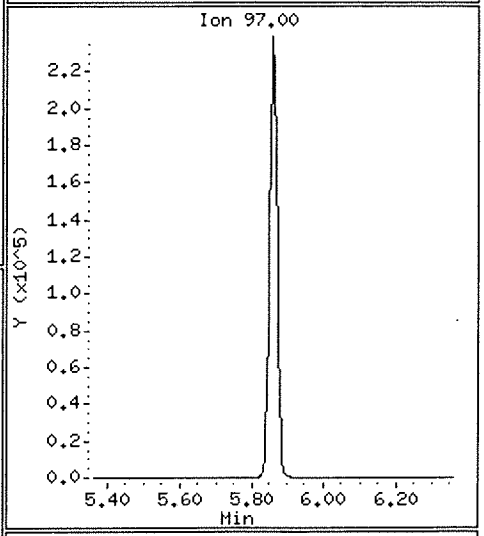
Column phase: DB624 Column diameter: 0.18

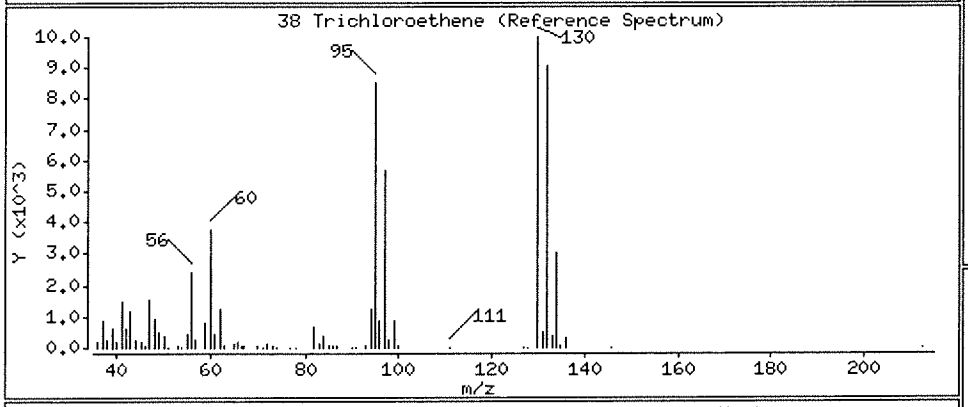
38 Trichloroethene Concentration: 3590.68 ug/l

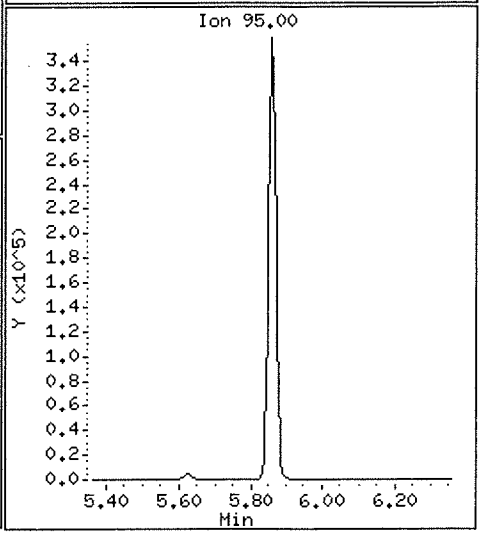


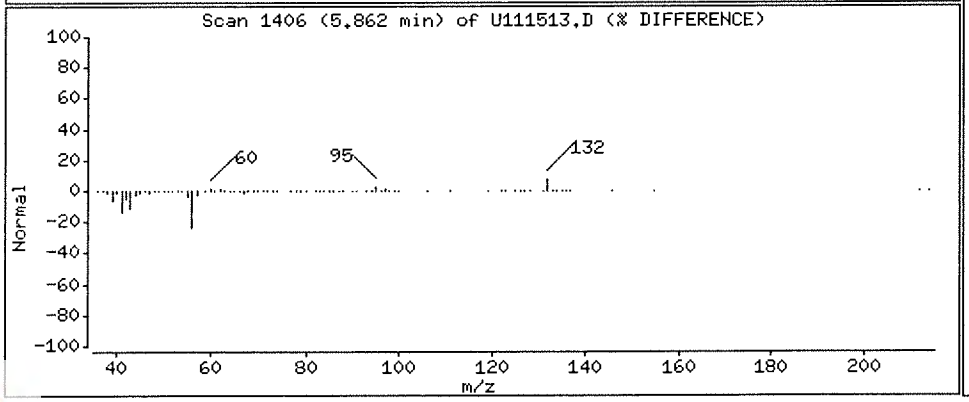












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111514.D Page 1
Report Date: 05-Dec-2019 16:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111514.D
Lab Smp Id: HS19110644-01MS Client Smp ID: HS19110644-01MS
Inj Date : 15-NOV-2019 15:58
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-01MS;HS19110644-01MS;3;;MS
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:55 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 14 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

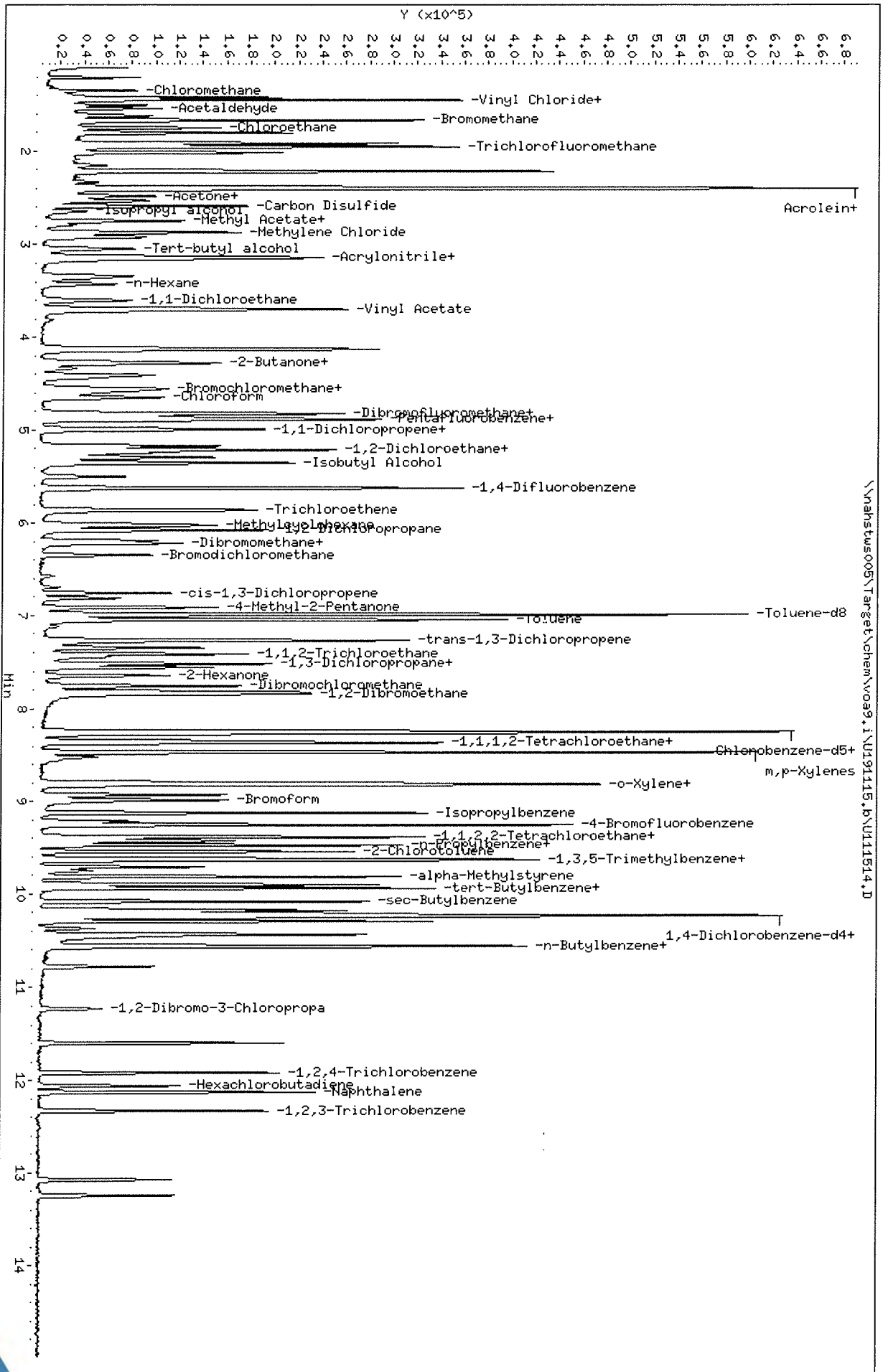
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	178169	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	282528	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	258814	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	143094	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	88399	49.6477	49.64
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	99366	49.6907	49.69
$ 30 Dibromofluoromethane	113	4.827	4.826	(0.986)	84848	48.2556	48.25
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	333586	51.9142	51.91
60 1,1,1,2-Tetrachloroethane	131	8.347	8.346	(1.012)	39009	22.0695	22.06
31 1,1,1-Trichloroethane	97	4.827	4.826	(0.986)	64657	24.3957	24.39
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	61159	24.0940	24.09
138 Freon TF	101	2.401	2.405	(0.491)	111444	28.0386	28.03
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.900)	37498	27.8860	27.88
22 1,1-Dichloroethane	63	3.601	3.600	(0.736)	67797	26.8138	26.81
11 1,1-Dichloroethene	96	2.397	2.401	(0.490)	117813	28.3099	28.30
32 1,1-Dichloropropene	75	4.999	5.002	(0.889)	54041	28.5226	28.52
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	48515	21.5545	21.55
71 1,2,3-Trichloropropane	75	9.422	9.422	(0.921)	56787	23.3570	23.35
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	53252	20.9028	20.90
79 1,2,4-Trimethylbenzene	105	9.940	9.940	(0.971)	158416	23.8700	23.86
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.233	(1.097)	9900	20.8244	20.82
57 1,2-Dibromoethane	107	7.848	7.848	(0.952)	46263	23.7536	23.75
88 1,2-Dichlorobenzene	146	10.566	10.566	(1.033)	99122	22.9960	22.99

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111514.D Page 2
Report Date: 05-Dec-2019 16:56

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33 1,2-Dichloroethane	62	5.250	5.250	(0.934)	57575	27.3763	27.37
42 1,2-Dichloropropane	63	6.079	6.078	(1.081)	39723	30.1199	30.11
75 1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	155074	24.8717	24.87
83 1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	93887	22.1752	22.17
54 1,3-Dichloropropane	76	7.559	7.563	(0.917)	73178	27.2125	27.21
84 1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	96970	21.1497	21.14
26 2,2-Dichloropropane	77	4.272	4.272	(0.873)	36989	18.1028	18.10
24 2-Butanone	43	4.339	4.339	(0.887)	32733	49.5758	49.57
76 2-Chlorotoluene	91	9.542	9.546	(0.933)	117323	25.3089	25.30
52 2-Hexanone	43	7.649	7.649	(0.928)	55656	49.2361	49.23
77 4-Chlorotoluene	91	9.636	9.636	(0.942)	139840	23.9217	23.92
82 p-Isopropyltoluene	119	10.206	10.206	(0.997)	158580	23.7745	23.77
45 4-Methyl-2-Pentanone	43	6.915	6.914	(0.839)	78322	51.8732	51.87
10 Acetone	43	2.484	2.483	(0.508)	66802	53.4098	53.40
37 Benzene	78	5.216	5.216	(0.928)	170726	27.9573	27.95
74 Bromobenzene	156	9.377	9.377	(0.916)	53969	20.8572	20.85
29 Bromochloromethane	128	4.553	4.556	(0.930)	23522	22.3640	22.36
39 Bromodichloromethane	83	6.345	6.345	(1.129)	49628	26.3488	26.34
66 Bromoform	173	8.980	8.980	(1.089)	24325	18.3258	18.32
6 Bromomethane	94	1.666	1.666	(0.341)	146412	30.2608	30.26
19 Carbon Disulfide	76	2.589	2.588	(0.529)	203208	51.4218	51.42
34 Carbon Tetrachloride	117	4.991	4.995	(0.888)	49152	25.0291	25.02
59 Chlorobenzene	112	8.272	8.271	(1.003)	128881	24.5907	24.59
7 Chloroethane	64	1.749	1.752	(0.357)	85394	33.6007	33.60
28 Chloroform	83	4.654	4.654	(0.951)	76574	25.4233	25.42
3 Chloromethane	50	1.340	1.344	(0.274)	47649	29.5111	29.51
27 cis-1,2-Dichloroethene	96	4.283	4.286	(0.875)	49728	24.5031	24.50
46 cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	53362	25.9452	25.94
55 Dibromochloromethane	129	7.754	7.758	(0.940)	38437	20.9256	20.92
44 Dibromomethane	93	6.187	6.187	(1.101)	30221	26.3973	26.39
2 Dichlorodifluoromethane	85	1.205	1.205	(0.246)	42202	23.2907	23.29
61 Ethylbenzene	106	8.369	8.369	(1.015)	67346	25.7744	25.77
91 Hexachlorobutadiene	225	12.062	12.061	(1.179)	16506	19.1456	19.14
67 Isopropylbenzene	105	9.123	9.122	(1.106)	190853	25.7581	25.75
62 m,p-Xylenes	106	8.470	8.470	(1.027)	159208	49.7913	49.79
17 Methylene Chloride	84	2.870	2.869	(0.586)	42149	25.8260	25.82
87 n-Butylbenzene	91	10.555	10.554	(1.032)	136987	24.5252	24.52
73 n-Propylbenzene	91	9.471	9.471	(0.926)	214537	25.6484	25.64
92 Naphthalene	128	12.129	12.129	(1.185)	162947	24.0708	24.07
63 o-Xylene	106	8.808	8.807	(1.068)	78762	24.3094	24.30
81 sec-Butylbenzene	105	10.082	10.082	(0.985)	177567	25.3381	25.33
64 Styrene	104	8.823	8.822	(1.070)	135248	24.0063	24.00
78 tert-Butylbenzene	119	9.899	9.898	(0.967)	130757	24.6899	24.68
56 Tetrachloroethene	166	7.522	7.522	(0.912)	47292	24.1052	24.10
50 Toluene	91	7.046	7.046	(0.855)	197267	25.2603	25.26
20 trans-1,2-Dichloroethene	96	3.140	3.143	(0.642)	39191	23.6707	23.67
51 trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	46147	20.2774	20.27
38 Trichloroethene	130	5.857	5.861	(1.042)	50131	26.7994	26.79
8 Trichlorofluoromethane	101	1.955	1.955	(0.400)	208039	27.2119	27.21
5 Vinyl Chloride	62	1.419	1.422	(0.290)	111827	28.2230	28.22



Data File: \\nahstws005\Target\chem\voa9,i\U191115,b\U111514,D
Date : 15-NOV-2019 15:58
Client ID: HS1911O644-O1MS
Sample Info: HS1911O644-O1MS;HS1911O644-O1MS;3;;MS
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111515.D Page 1
Report Date: 05-Dec-2019 16:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111515.D
Lab Smp Id: HS19110644-01MSD Client Smp ID: HS19110644-01MSD
Inj Date : 15-NOV-2019 16:22
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-01MSD;HS19110644-01MSD;3;;MSD
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:55 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 14 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

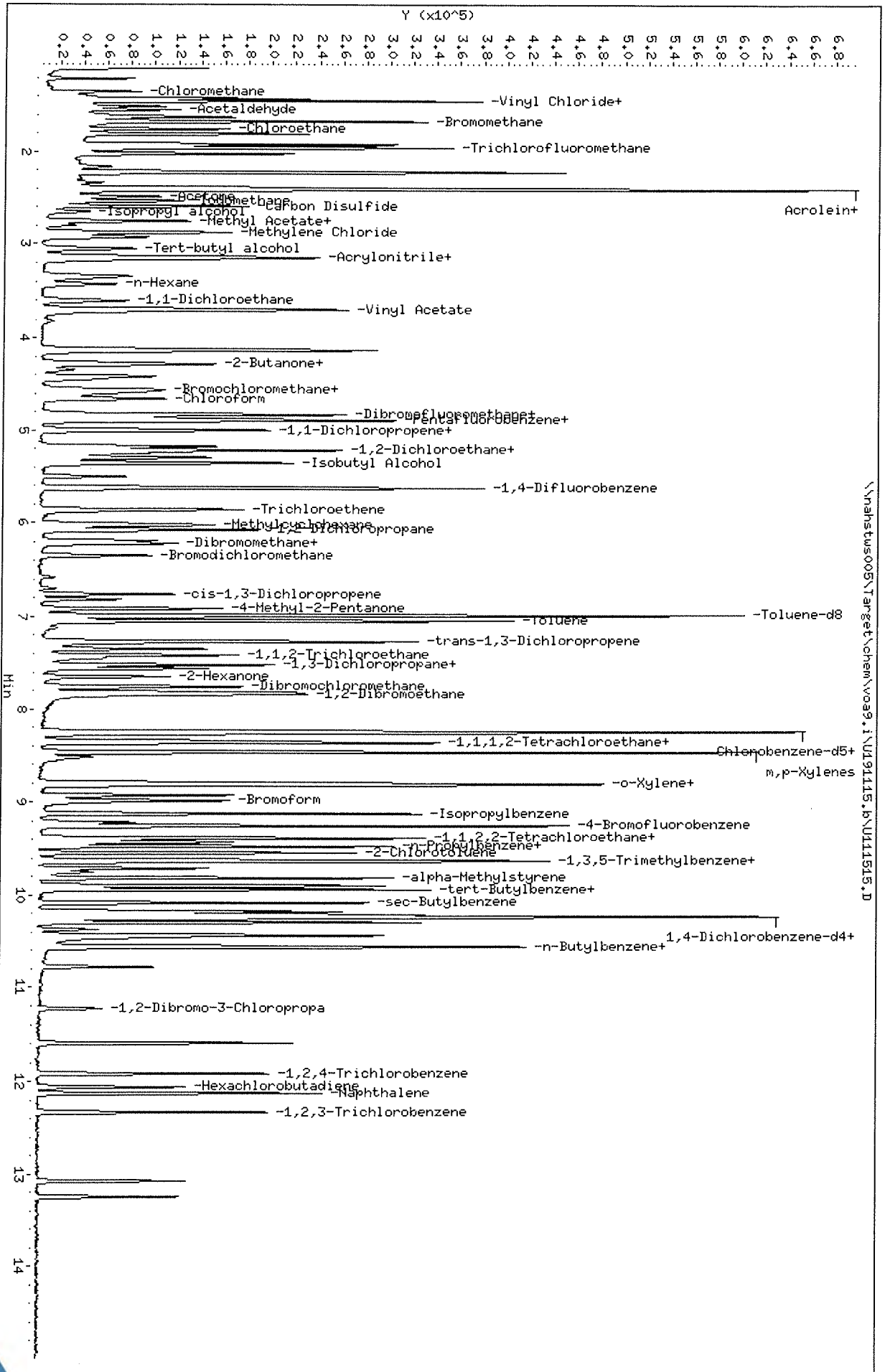
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	185145	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	282127	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	261349	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	141537	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	89509	48.3527	48.35
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	100546	49.7918	49.79
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	84577	46.3020	46.30
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	335071	51.6402	51.64
60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	38419	21.5677	21.56
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	60656	22.0238	22.02
68 1,1,2,2-Tetrachloroethane	83	9.389	9.388	(0.918)	64789	25.8048	25.80
138 Freon TF	101	2.405	2.405	(0.491)	111151	26.9112	26.91
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.899)	36584	26.9424	26.94
22 1,1-Dichloroethane	63	3.604	3.600	(0.737)	65048	24.7572	24.75
11 1,1-Dichloroethene	96	2.401	2.401	(0.491)	117707	27.2187	27.21
32 1,1-Dichloropropene	75	5.003	5.002	(0.889)	54491	28.8009	28.80
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	51292	23.0389	23.03
71 1,2,3-Trichloropropane	75	9.422	9.422	(0.921)	56515	23.5008	23.50
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	53244	21.1295	21.12
79 1,2,4-Trimethylbenzene	105	9.940	9.940	(0.971)	156891	23.9003	23.90
89 1,2-Dibromo-3-Chloropropane	155	11.229	11.233	(1.097)	10066	21.3619	21.36
57 1,2-Dibromoethane	107	7.848	7.848	(0.951)	43927	22.3354	22.33
88 1,2-Dichlorobenzene	146	10.566	10.566	(1.033)	96444	22.6208	22.62

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111515.D Page 2
Report Date: 05-Dec-2019 16:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.933)	58113	27.6714	27.67
42	1,2-Dichloropropane	63	6.079	6.078	(1.081)	39862	30.2761	30.27
75	1,3,5-Trimethylbenzene	105	9.621	9.625	(0.940)	149118	24.1795	24.17
83	1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	94788	22.6343	22.63
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	75173	27.6833	27.68
84	1,4-Dichlorobenzene	146	10.251	10.254	(1.002)	98480	21.7153	21.71
26	2,2-Dichloropropane	77	4.275	4.272	(0.874)	35930	16.9220	16.92
24	2-Butanone	43	4.343	4.339	(0.887)	32961	47.9866	47.98
76	2-Chlorotoluene	91	9.542	9.546	(0.933)	119339	26.0270	26.02
52	2-Hexanone	43	7.649	7.649	(0.927)	59177	51.8432	51.84
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	138845	24.0128	24.01
82	p-Isopropyltoluene	119	10.206	10.206	(0.997)	158073	23.9592	23.95
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	85282	55.9350	55.93
10	Acetone	43	2.484	2.483	(0.508)	71715	55.5535	55.55
37	Benzene	78	5.216	5.216	(0.927)	172726	28.3250	28.32
74	Bromobenzene	156	9.377	9.377	(0.916)	55802	21.8028	21.80
29	Bromochloromethane	128	4.553	4.556	(0.930)	24921	22.8014	22.80
39	Bromodichloromethane	83	6.345	6.345	(1.128)	50147	26.6622	26.66
66	Bromoform	173	8.980	8.980	(1.089)	26094	19.3301	19.33
6	Bromomethane	94	1.670	1.666	(0.341)	147533	29.3715	29.37
19	Carbon Disulfide	76	2.592	2.588	(0.530)	209611	51.0435	51.04
34	Carbon Tetrachloride	117	4.991	4.995	(0.887)	49915	25.4537	25.45
59	Chlorobenzene	112	8.272	8.271	(1.003)	124548	23.5335	23.53
7	Chloroethane	64	1.756	1.752	(0.359)	84740	32.0082	32.00
28	Chloroform	83	4.654	4.654	(0.951)	78329	25.0261	25.02
3	Chloromethane	50	1.344	1.344	(0.275)	50417	30.0711	30.07
27	cis-1,2-Dichloroethene	96	4.287	4.286	(0.876)	45403	21.5291	21.52
46	cis-1,3-Dichloropropene	75	6.753	6.757	(1.201)	52695	25.6574	25.65
55	Dibromochloromethane	129	7.754	7.758	(0.940)	40654	21.7971	21.79
44	Dibromomethane	93	6.187	6.187	(1.100)	30947	27.0698	27.06
2	Dichlorodifluoromethane	85	1.209	1.205	(0.247)	39358	20.9027	20.90
61	Ethylbenzene	106	8.369	8.369	(1.015)	65034	24.6482	24.64
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	18906	22.1707	22.17
67	Isopropylbenzene	105	9.122	9.122	(1.106)	192065	25.6702	25.67
62	m,p-Xylenes	106	8.470	8.470	(1.027)	162403	50.2979	50.29
17	Methylene Chloride	84	2.873	2.869	(0.587)	41242	24.3708	24.37
87	n-Butylbenzene	91	10.551	10.554	(1.031)	143138	25.9084	25.90
73	n-Propylbenzene	91	9.471	9.471	(0.926)	211345	25.5447	25.54
92	Naphthalene	128	12.129	12.129	(1.185)	164107	24.5088	24.50
63	o-Xylene	106	8.808	8.807	(1.068)	78137	23.8826	23.88
81	sec-Butylbenzene	105	10.082	10.082	(0.985)	177922	25.6680	25.66
64	Styrene	104	8.823	8.822	(1.070)	138042	24.2645	24.26
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	134028	25.5859	25.58
56	Tetrachloroethene	166	7.522	7.522	(0.912)	47277	23.8639	23.86
50	Toluene	91	7.046	7.046	(0.854)	197587	25.0559	25.05
20	trans-1,2-Dichloroethene	96	3.143	3.143	(0.642)	39448	22.9870	22.98
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	47908	21.0517	21.05
38	Trichloroethene	130	5.861	5.861	(1.042)	48618	26.0275	26.02
8	Trichlorofluoromethane	101	1.955	1.955	(0.400)	214249	26.9683	26.96
5	Vinyl Chloride	62	1.423	1.422	(0.291)	115928	28.1556	28.15



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111515.D
Date : 15-NOV-2019 16:22
Client ID: HS19110644-01MSD
Sample Info: HS19110644-01MSD;HS19110644-01MSD;3;;MSD
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111516.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111516.D
Lab Smp Id: HS19110644-08 Client Smp ID: HS19110644-08
Inj Date : 15-NOV-2019 16:46
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-08;HS19110644-08;;;
Misc Info : 180315V9;WATER;0;100;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
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Dil Factor: 100.00000
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Target Version: 4.14
Processing Host: NAHSTW7056

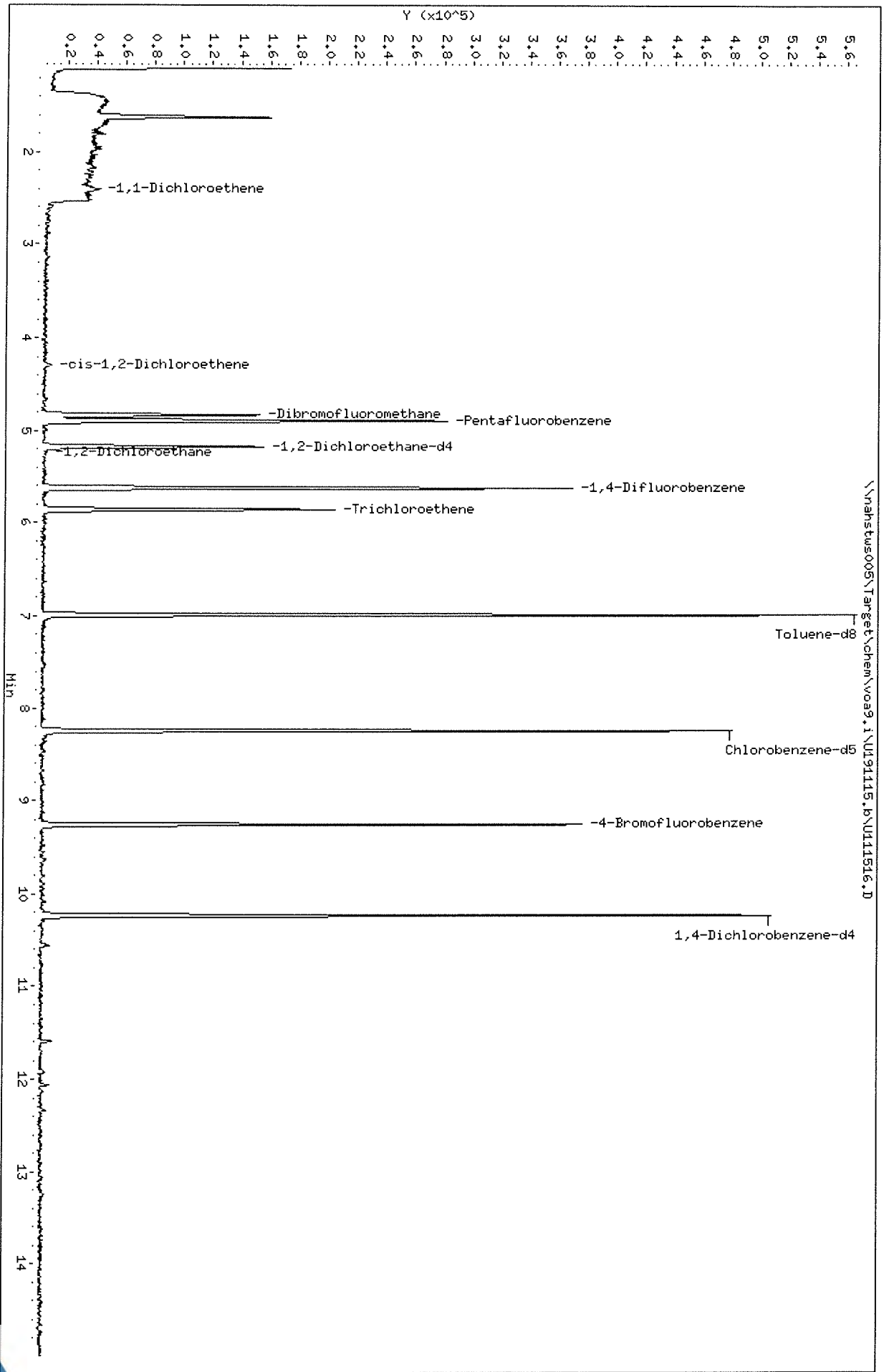
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	182341	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	276335	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	242964	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	121431	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	90741	49.7999	49.79
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	89414	47.6581	47.65
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	79839	44.3887	44.38
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	321180	53.2409	53.24
11 1,1-Dichloroethene	96	2.397	2.401	(0.490)	2537	0.59568	59.56(a)
33 1,2-Dichloroethane	62	5.254	5.250	(0.934)	1117	0.54302	54.30(a)
27 cis-1,2-Dichloroethene	96	4.290	4.286	(0.877)	1631	0.78528	78.52(a)
38 Trichloroethene	130	5.861	5.861	(1.042)	59802	32.6859	3268.58

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111516.D
Date : 15-NOV-2019 16:46
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Sample Info: HS19110644-08;HS19110644-08;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111516.D

Date : 15-NOV-2019 16:46

Client ID: HS19110644-08

Instrument: VOA9.i

Sample Info: HS19110644-08;HS19110644-08;;;

Purge Volume: 5.0

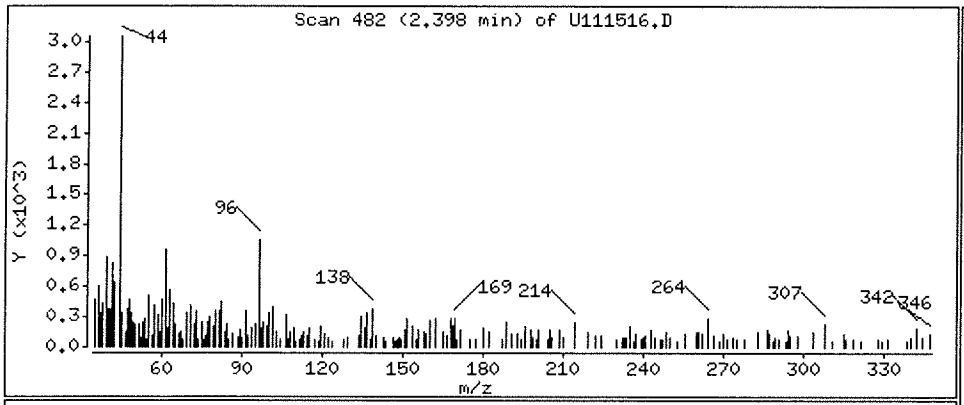
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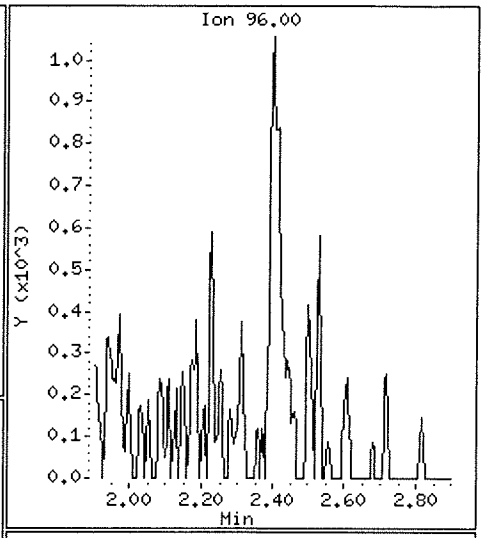
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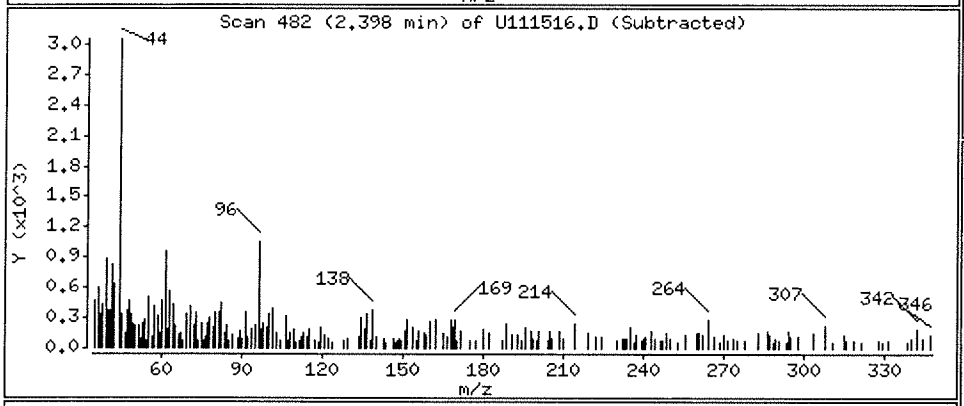
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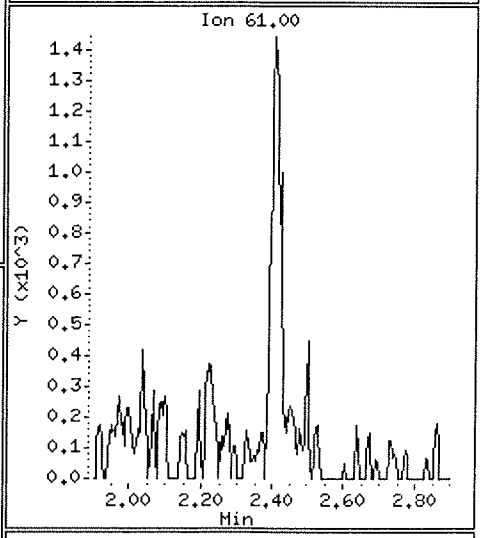
11 1,1-Dichloroethene

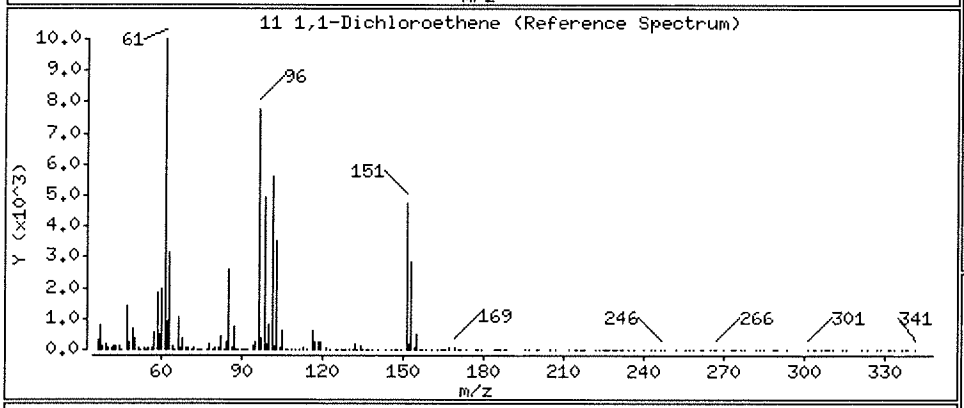
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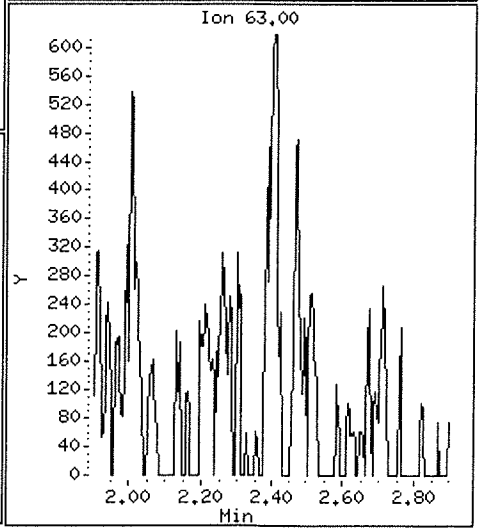


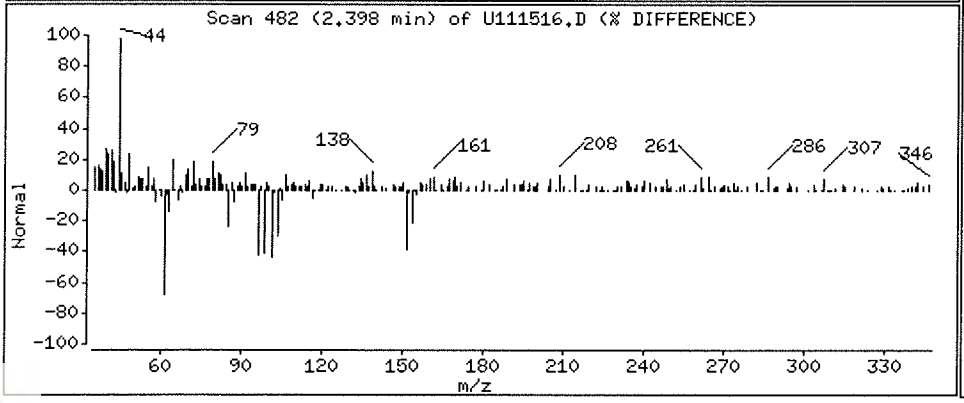












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111516.D

Date : 15-NOV-2019 16:46

Client ID: HS19110644-08

Instrument: VOA9.i

Sample Info: HS19110644-08;HS19110644-08;;;

Purge Volume: 5.0

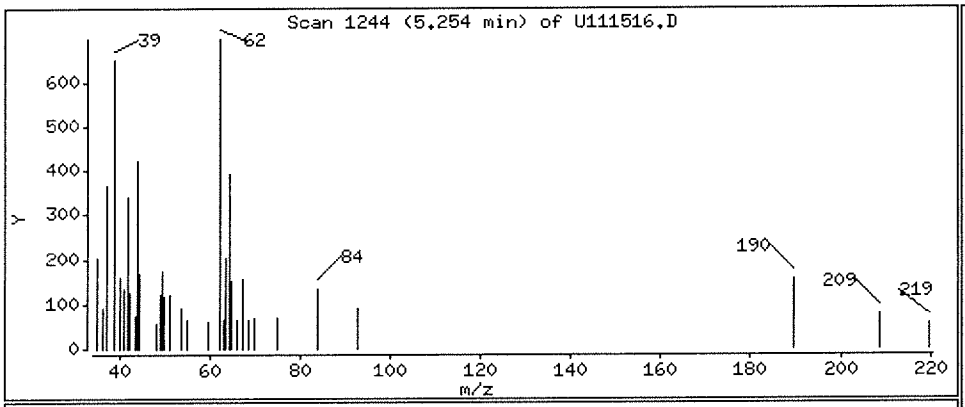
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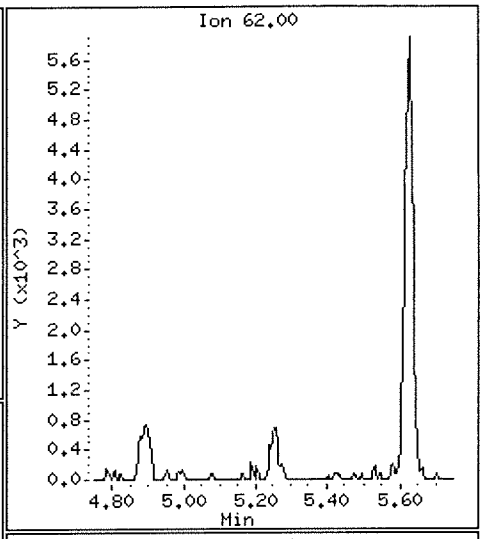
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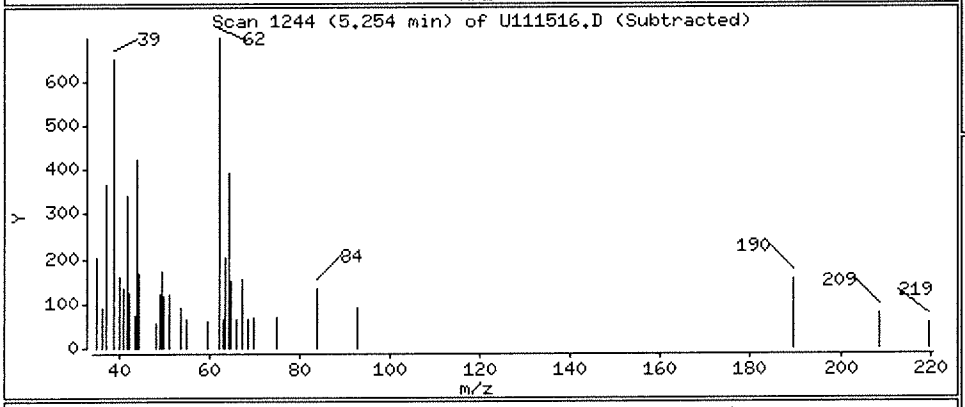
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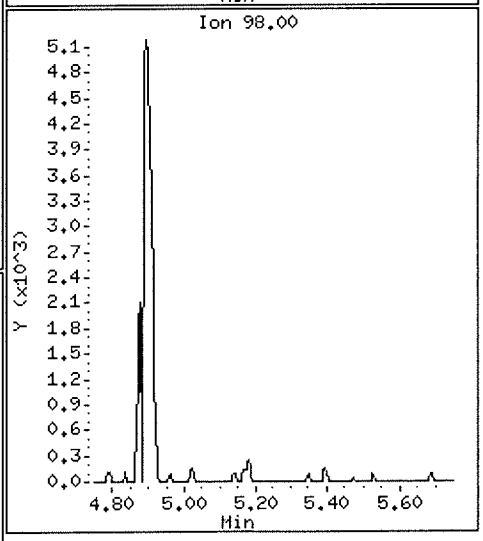
33 1,2-Dichloroethane

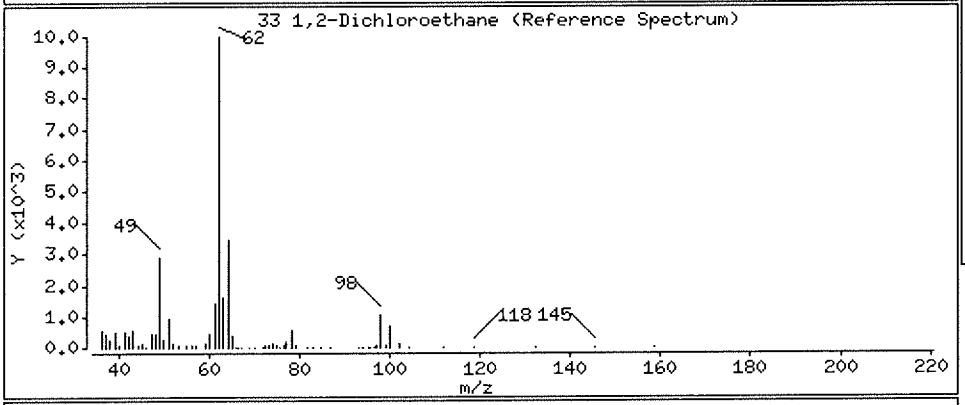
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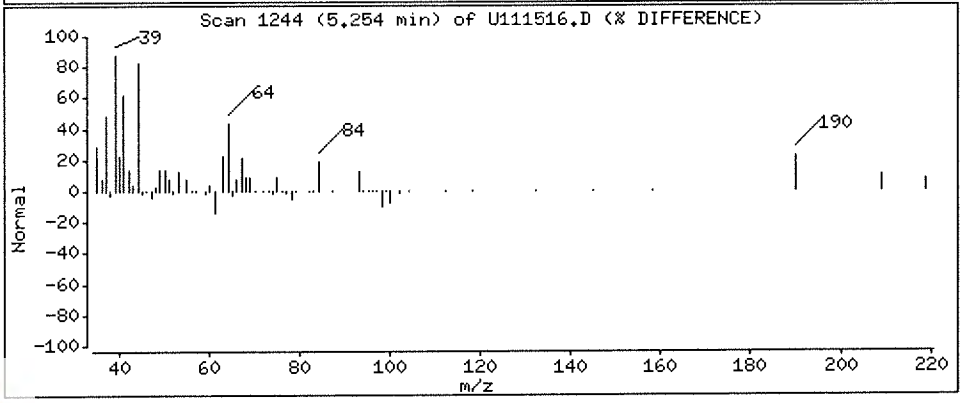












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111516.D

Date : 15-NOV-2019 16:46

Client ID: HS19110644-08

Instrument: VOA9.i

Sample Info: HS19110644-08;HS19110644-08;;;

Purge Volume: 5.0

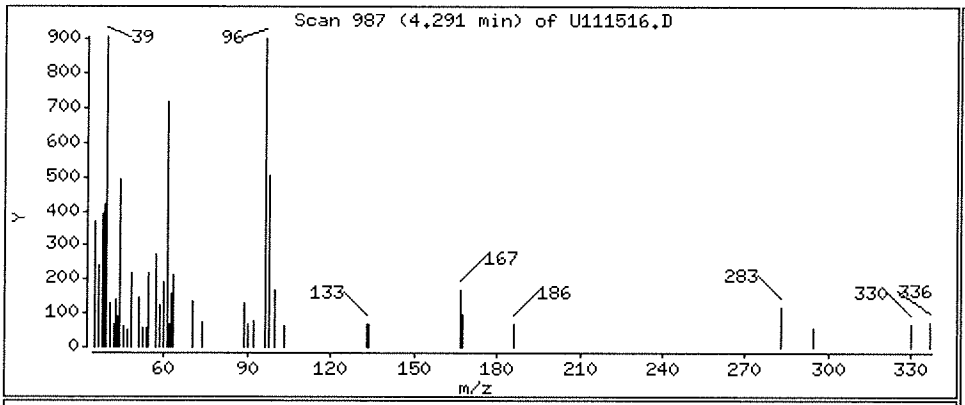
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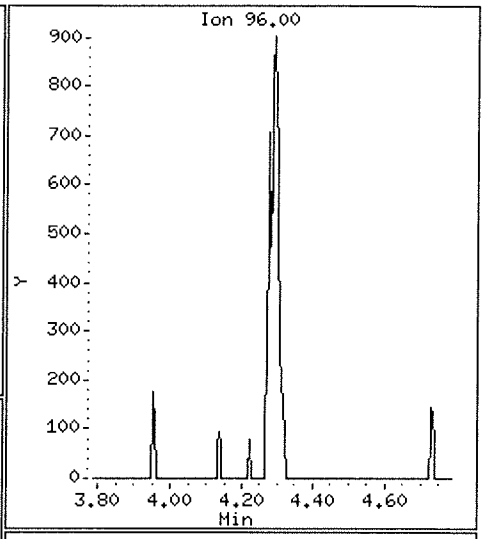
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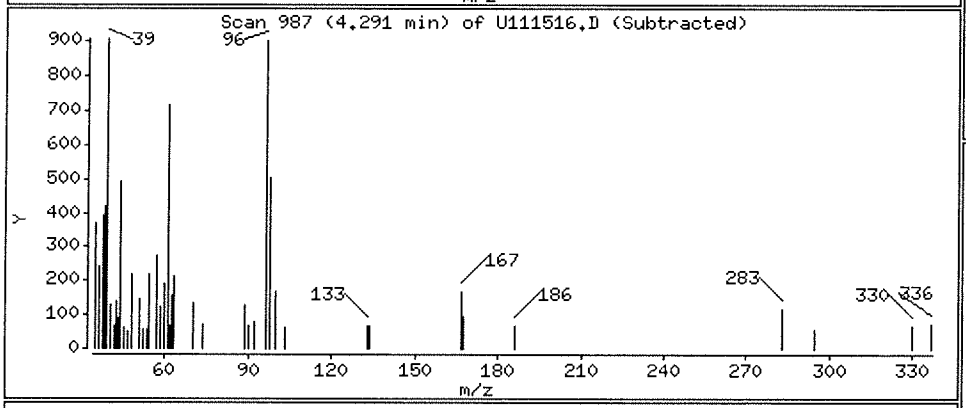
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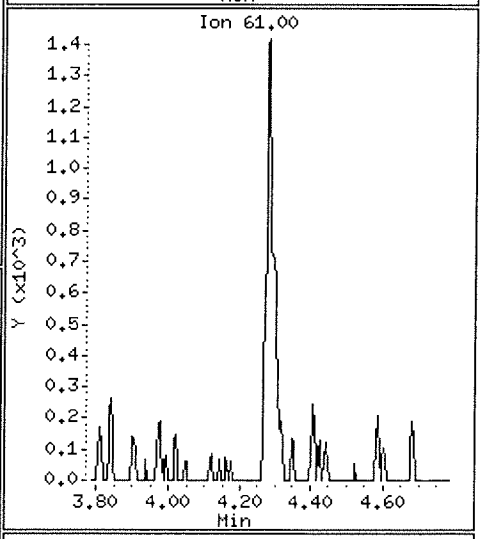
27 cis-1,2-Dichloroethene

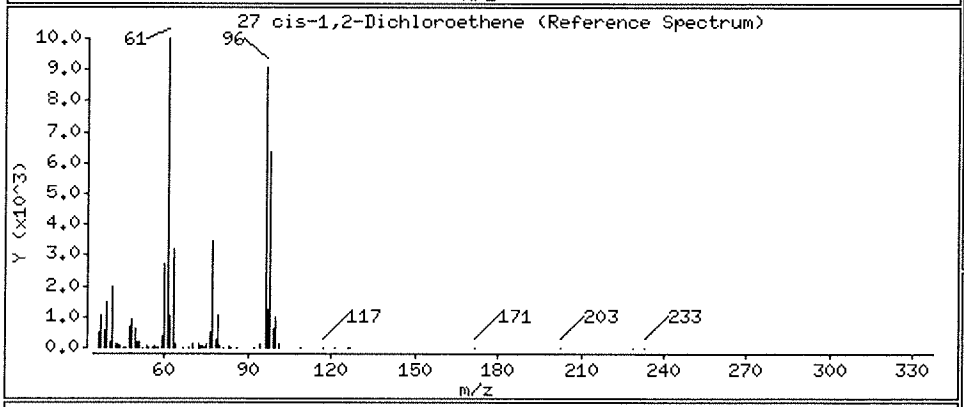
Concentration: 78.52 ug/l

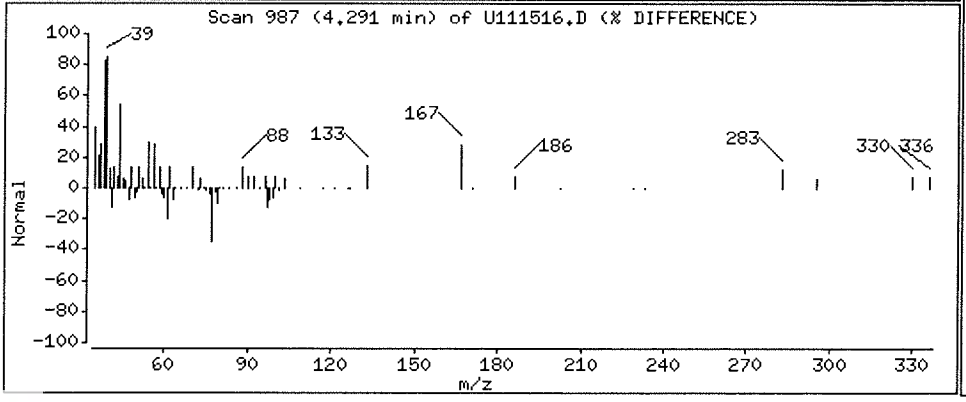


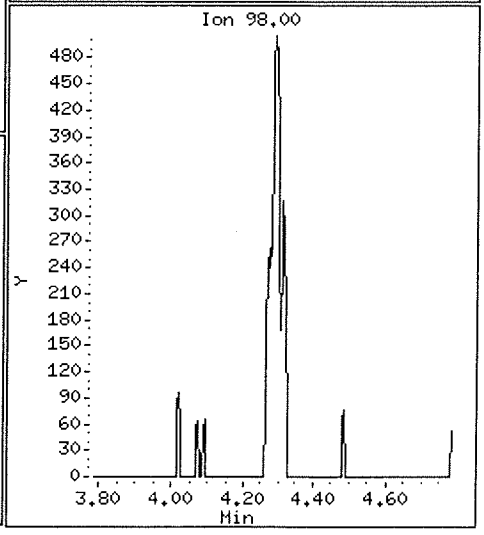












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111516.D

Date : 15-NOV-2019 16:46

Client ID: HS19110644-08

Instrument: VOA9.i

Sample Info: HS19110644-08;HS19110644-08;;;

Purge Volume: 5.0

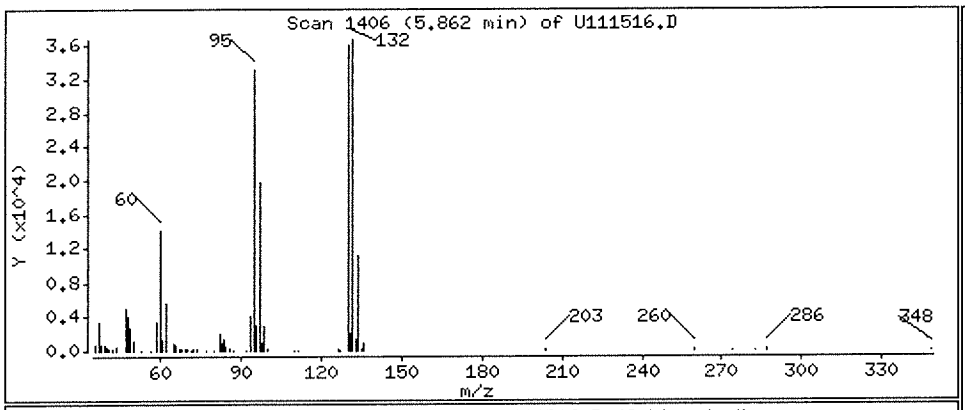
Operator: PC

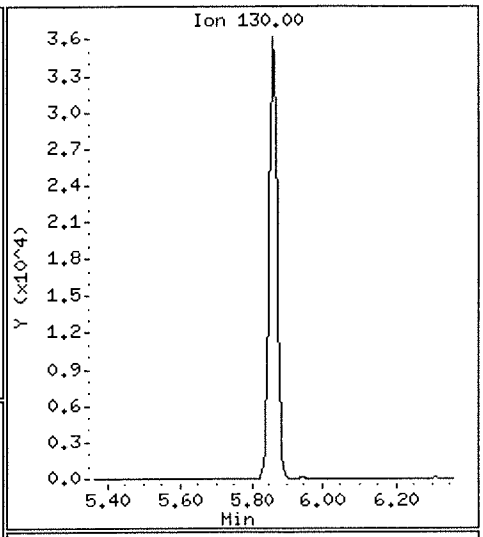
Column phase: DB624

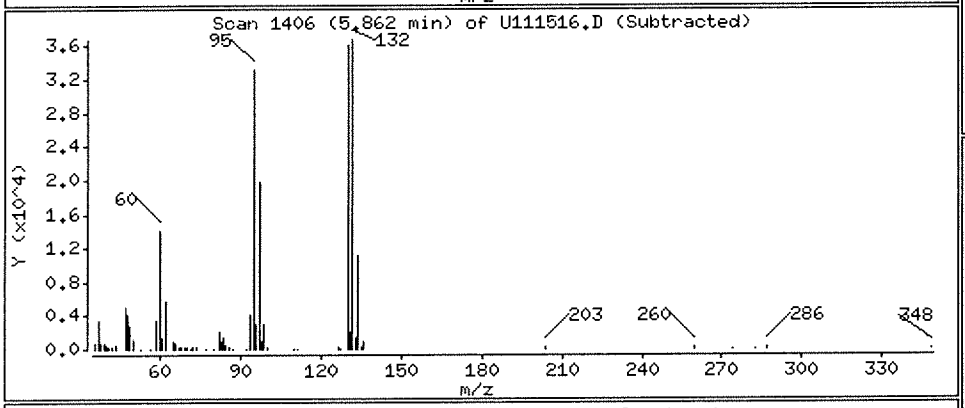
Column diameter: 0.18

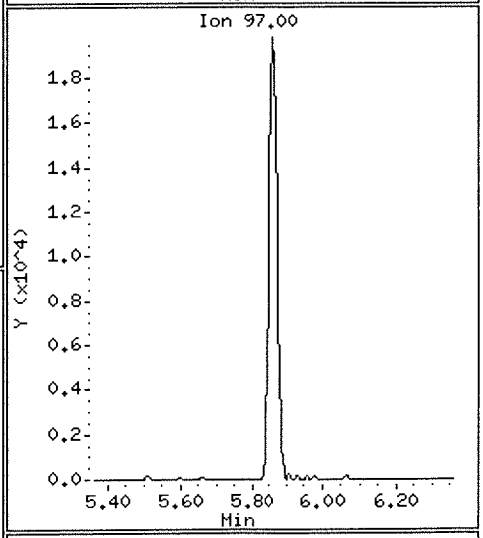
38 Trichloroethene

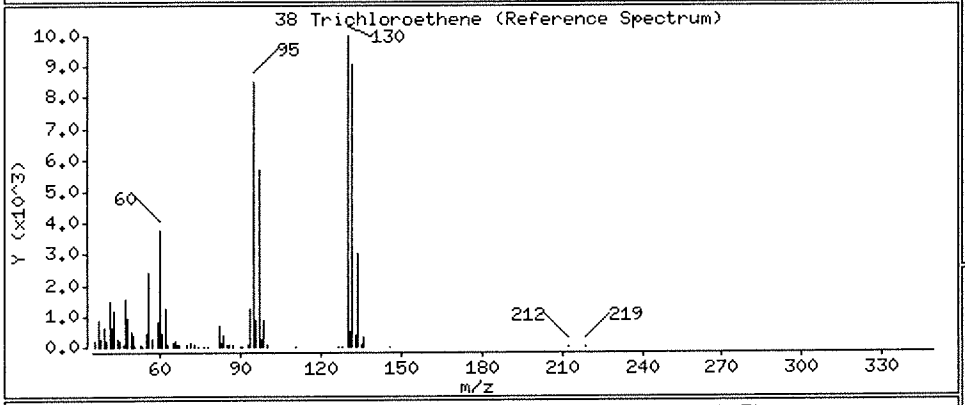
Concentration: 3268.58 ug/l

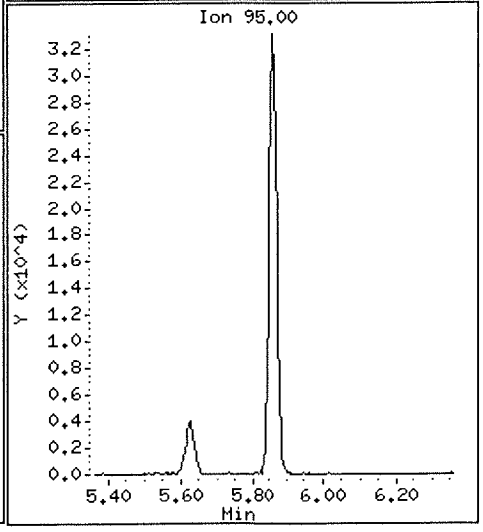


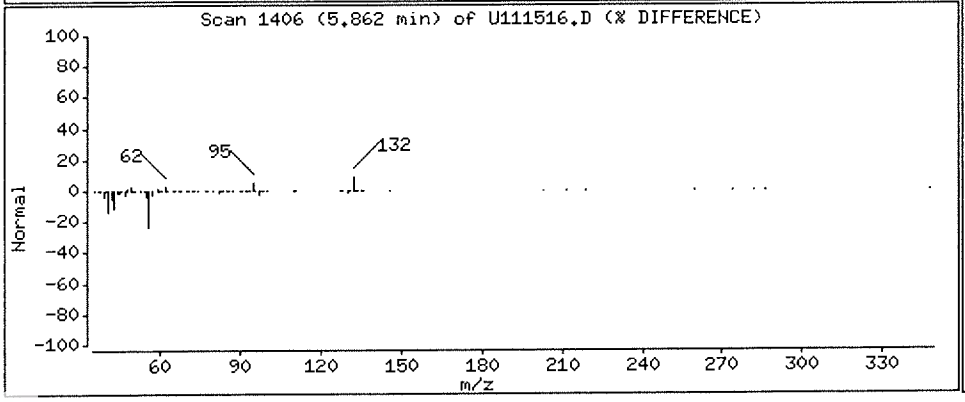












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111517.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111517.D
Lab Smp Id: HS19110644-06 Client Smp ID: HS19110644-06
Inj Date : 15-NOV-2019 17:10
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-06;HS19110644-06;;;
Misc Info : 180315V9;WATER;0;10;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 16
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

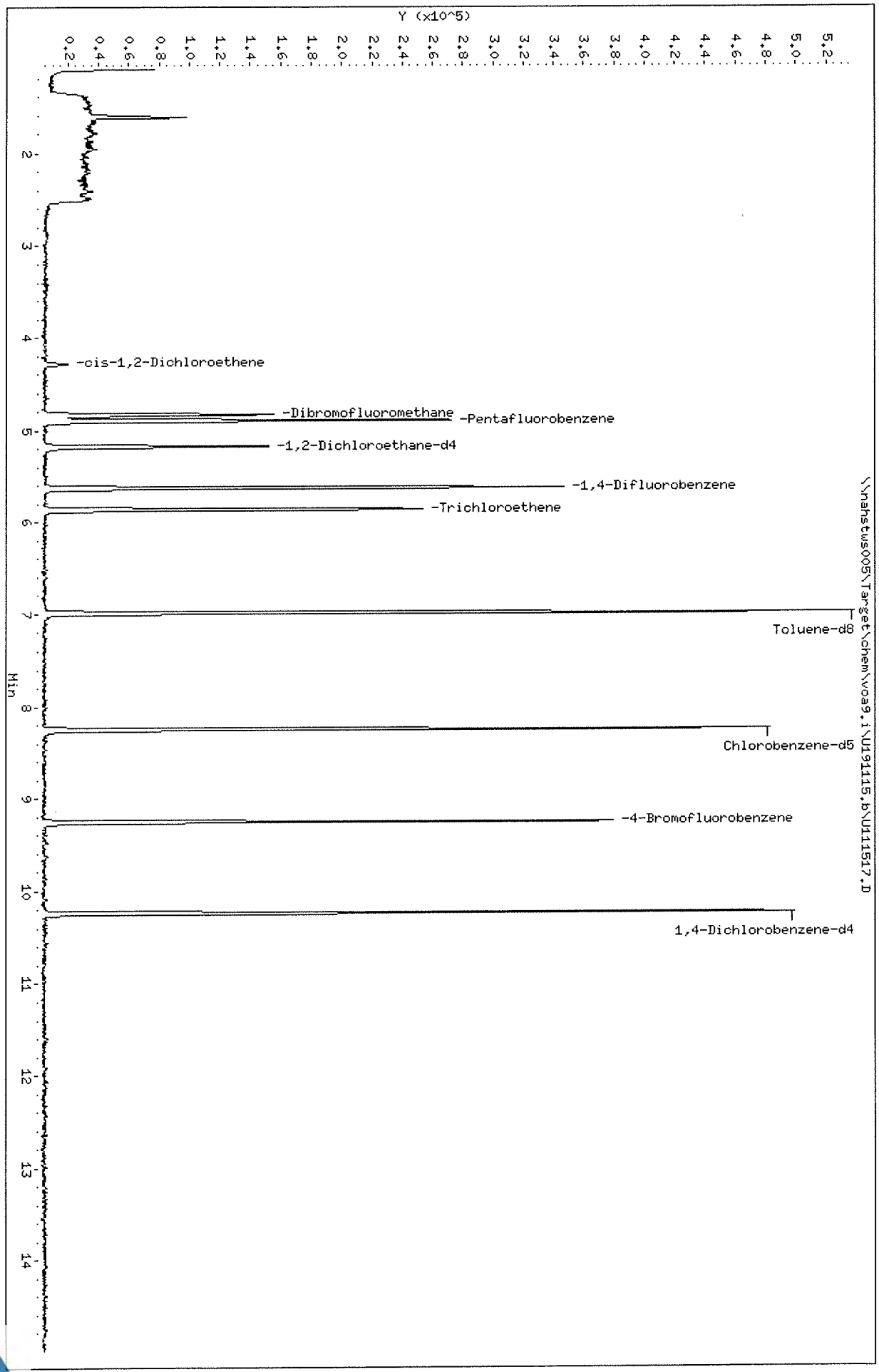
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	172534	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	272418	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	243389	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	116688	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	87106	50.5360	50.53
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	92609	49.2526	49.25
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	78560	46.1524	46.15
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	315953	52.2853	52.28
27 cis-1,2-Dichloroethene	96	4.287	4.286	(0.876)	7531	3.83205	38.32(a)
38 Trichloroethene	130	5.861	5.861	(1.043)	75379	41.7922	417.92

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111517.D
Date : 15-NOV-2019 17:10
Client ID: HS19110644-06
Sample Info: HS19110644-06;HS19110644-06;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

\\nahstws005\Target\chem\voa9.i\U191115.b\U111517.D

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111517.D

Date : 15-NOV-2019 17:10

Client ID: HS19110644-06

Instrument: VOA9.i

Sample Info: HS19110644-06;HS19110644-06;;;

Purge Volume: 5.0

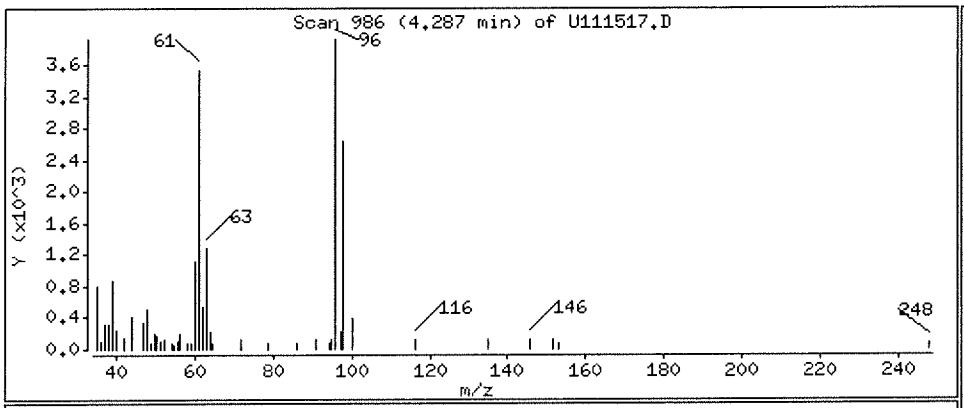
Operator: PC

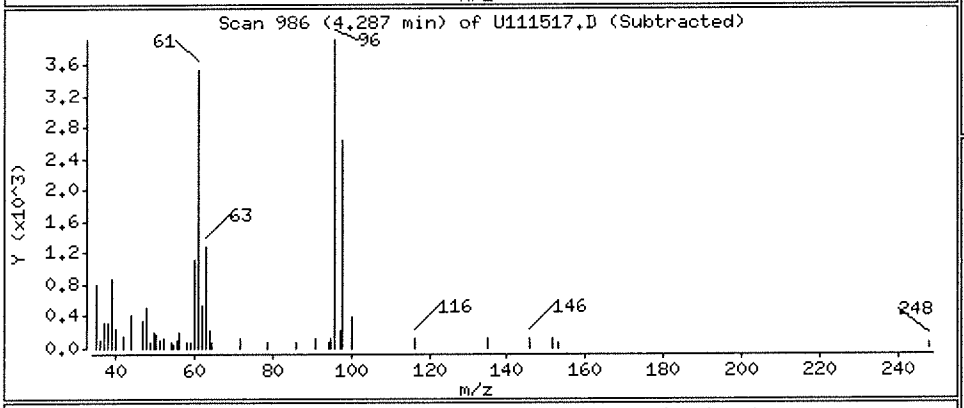
Column phase: DB624

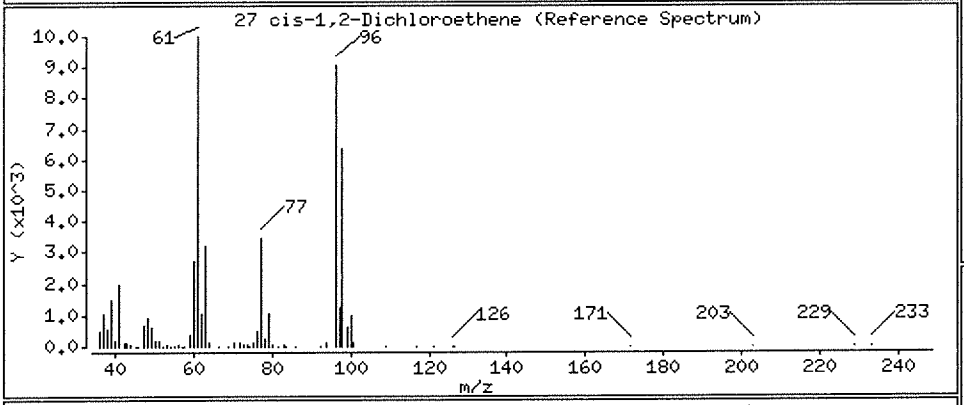
Column diameter: 0.18

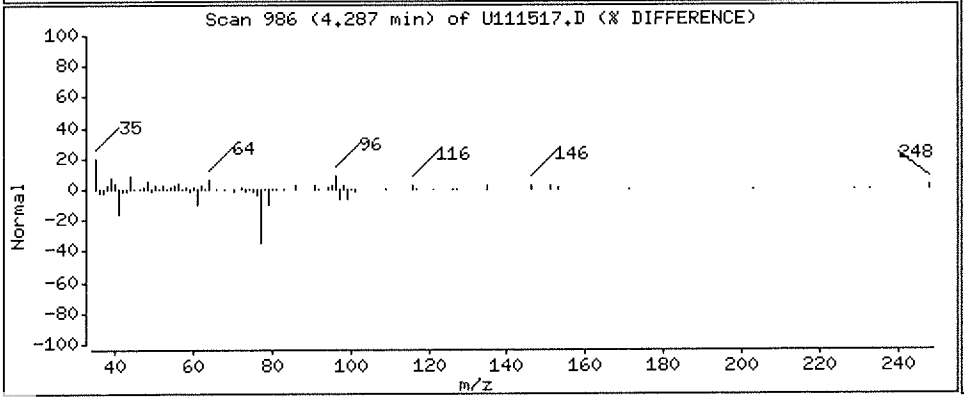
27 cis-1,2-Dichloroethene

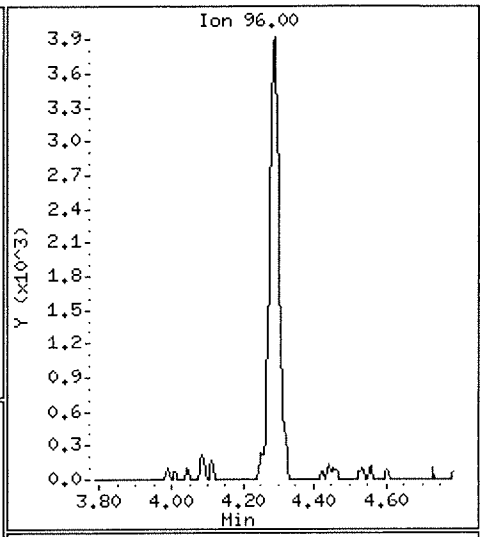
Concentration: 38.32 ug/l

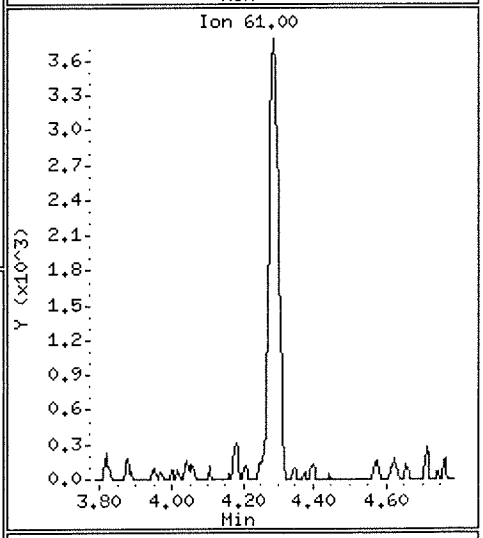


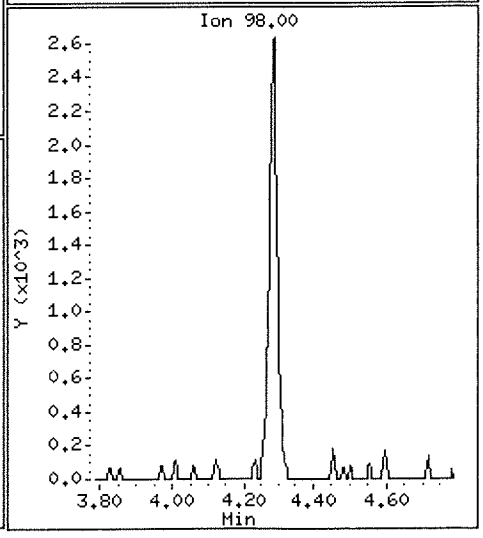












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111517.D

Date : 15-NOV-2019 17:10

Client ID: HS19110644-06

Instrument: VOA9.i

Sample Info: HS19110644-06;HS19110644-06;;;

Purge Volume: 5.0

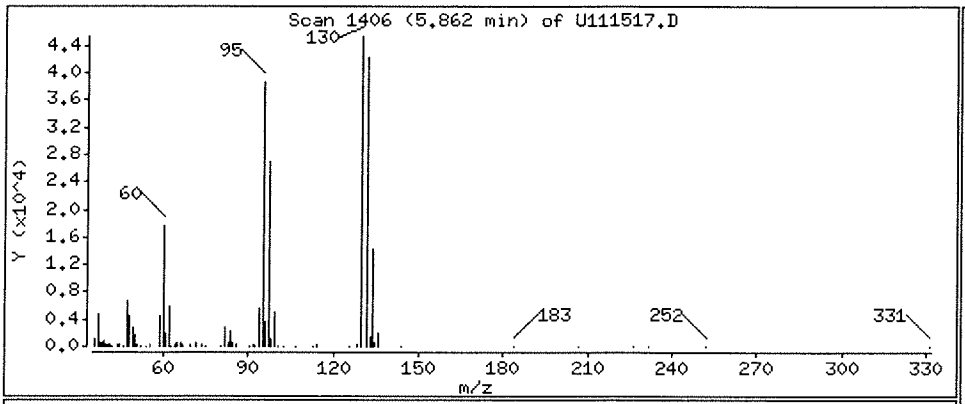
Operator: PC

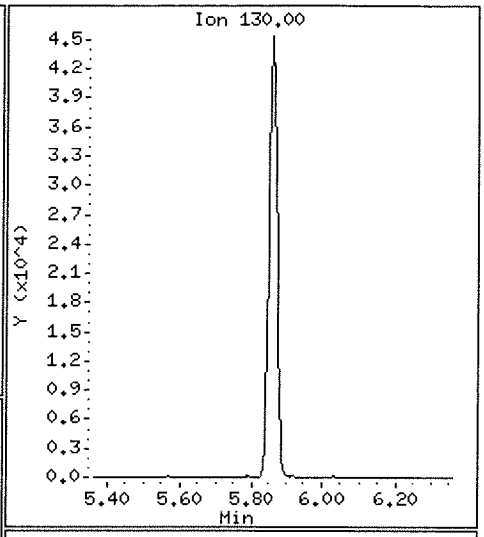
Column phase: DB624

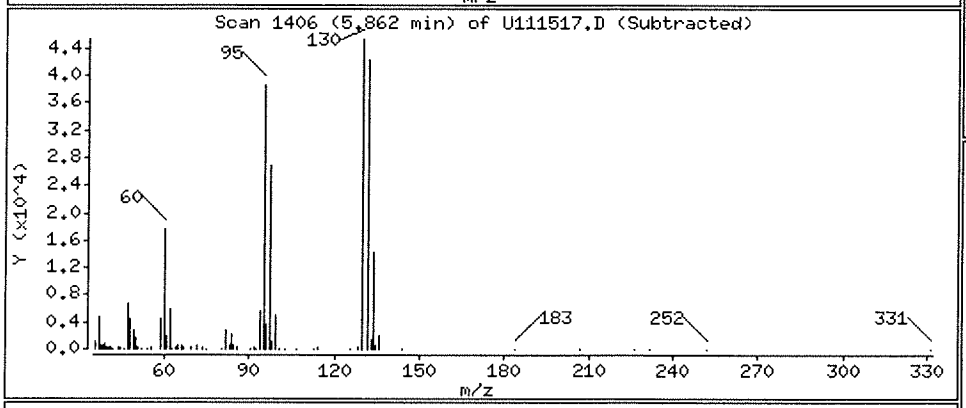
Column diameter: 0.18

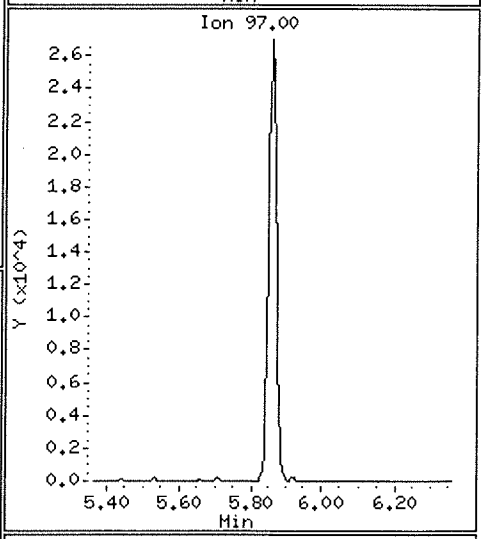
38 Trichloroethene

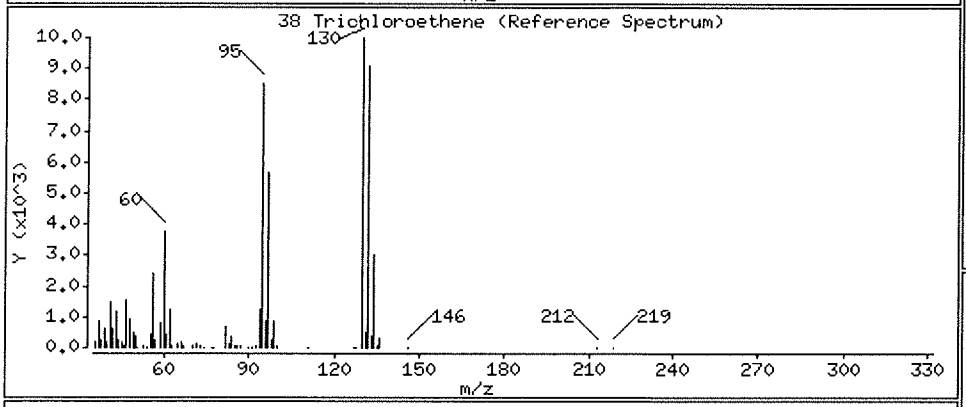
Concentration: 417.92 ug/l

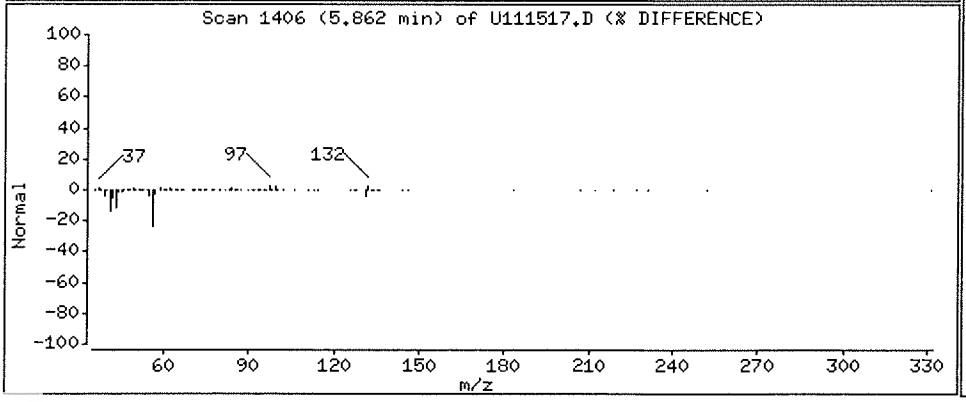


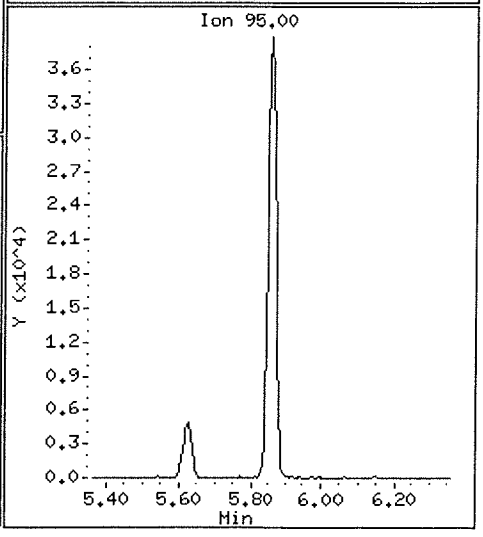












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111518.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111518.D
Lab Smp Id: HS19110644-09 Client Smp ID: HS19110644-09
Inj Date : 15-NOV-2019 17:35
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-09;HS19110644-09;;;
Misc Info : 180315V9;WATER;0;5;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 17
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

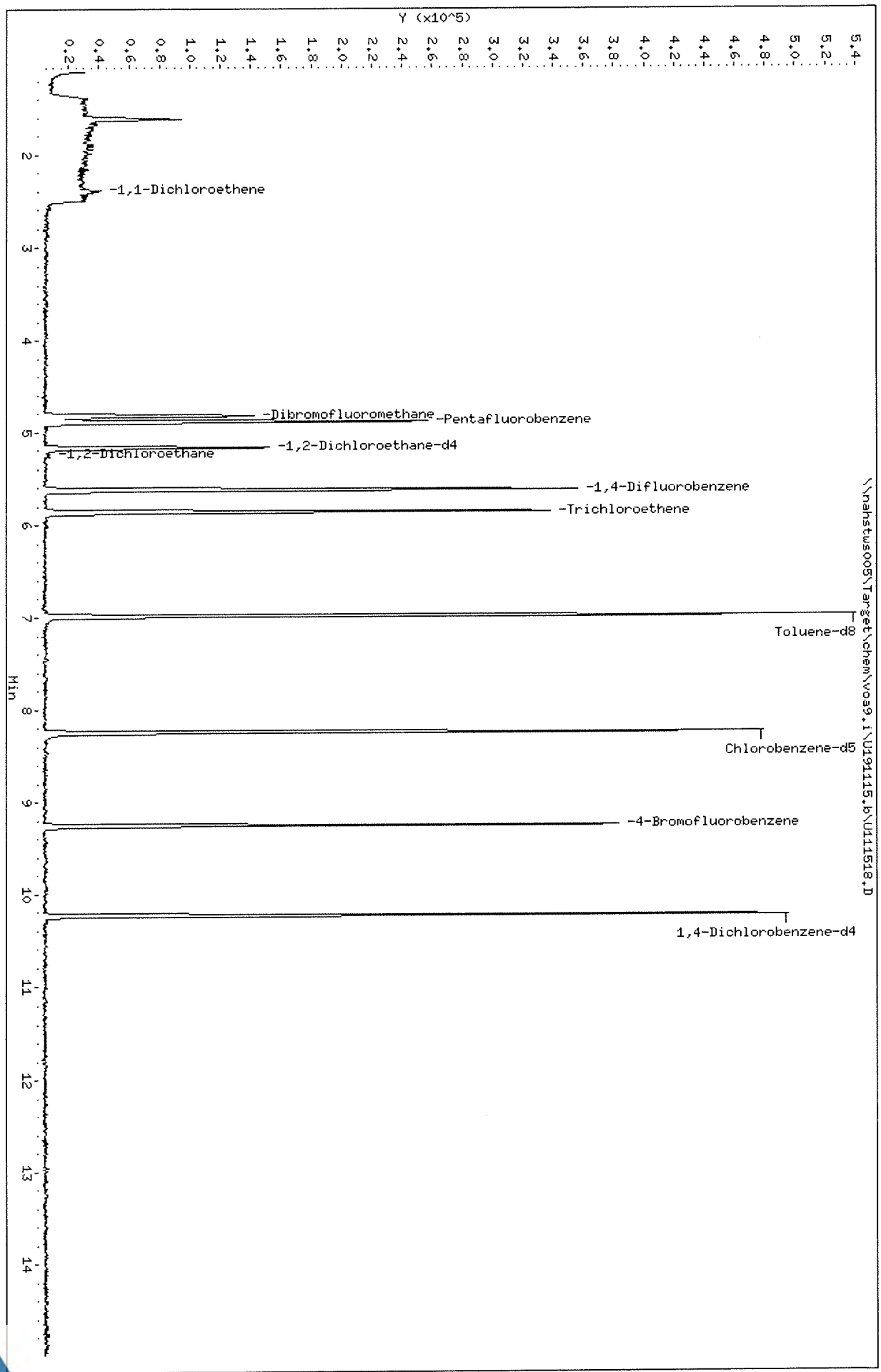
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	164529	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	264555	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	242034	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	120499	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	89254	54.3724	54.37
$ 69 4-Bromofluorobenzene	95	9.253	9.254	(1.122)	87459	46.8071	46.80
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.987)	77042	47.4545	47.45
$ 48 Toluene-d8	98	6.985	6.986	(0.847)	314769	52.3807	52.38
11 1,1-Dichloroethene	96	2.393	2.401	(0.489)	4749	1.23577	6.17(a)
33 1,2-Dichloroethane	62	5.242	5.250	(0.933)	1192	0.60529	3.02(a)
38 Trichloroethene	130	5.857	5.861	(1.042)	98816	56.4146	282.07

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9,i\U191115,b\U111518.D
Date : 15-NOV-2019 17:35
Client ID: HS191110644-09
Sample Info: HS191110644-09;HS191110644-09;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

\\nahstws005\Target\chem\voa9,i\U191115,b\U111518.D

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111518.D

Date : 15-NOV-2019 17:35

Client ID: HS19110644-09

Instrument: VOA9.i

Sample Info: HS19110644-09;HS19110644-09;;;

Purge Volume: 5.0

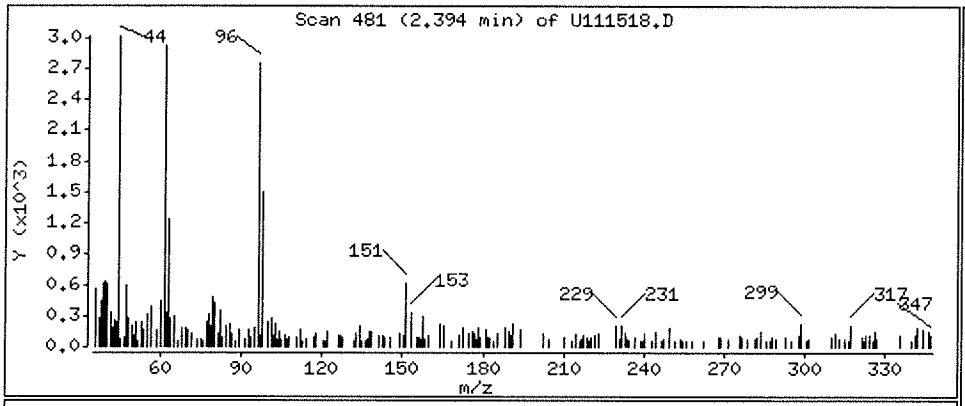
Operator: PC

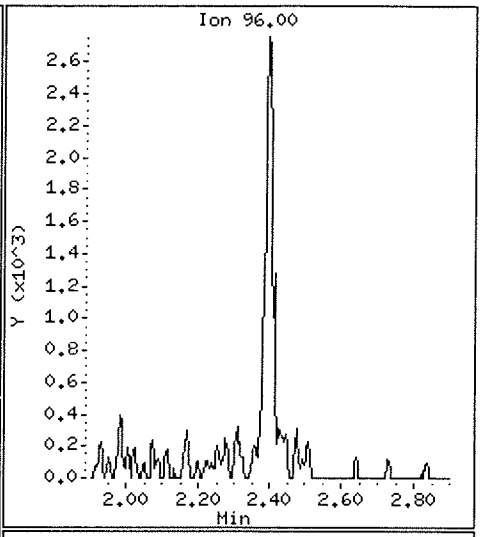
Column phase: DB624

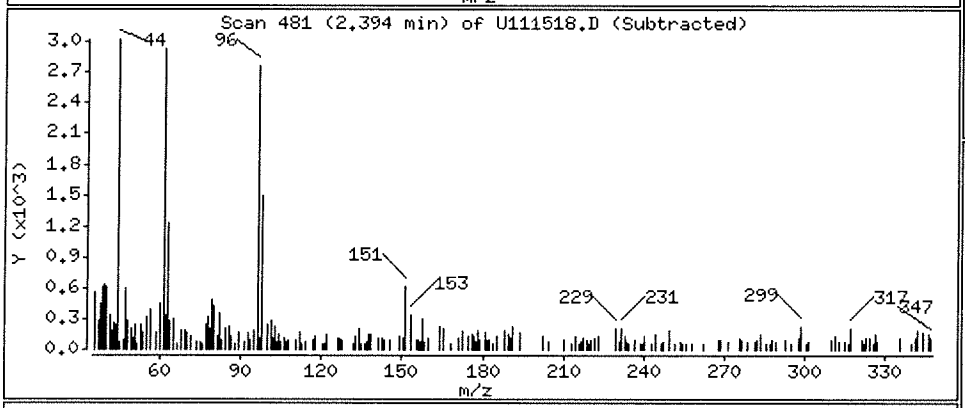
Column diameter: 0.18

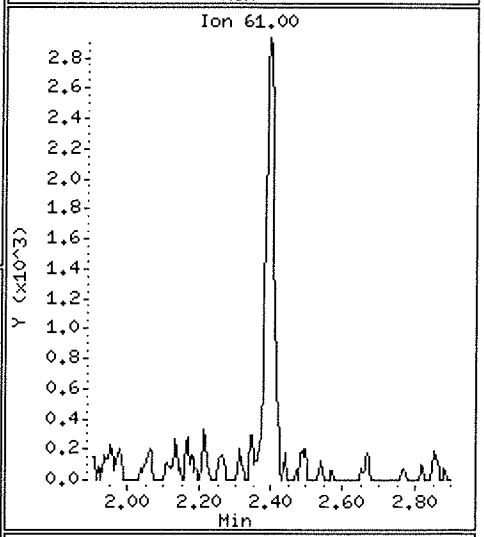
11 1,1-Dichloroethene

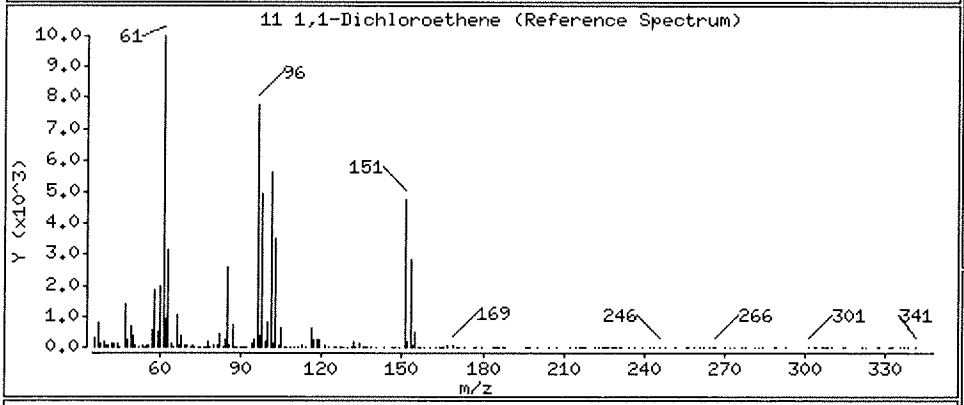
Concentration: 6.17 ug/l

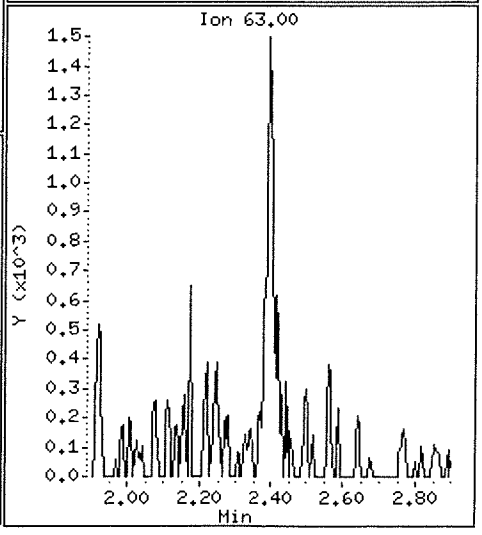


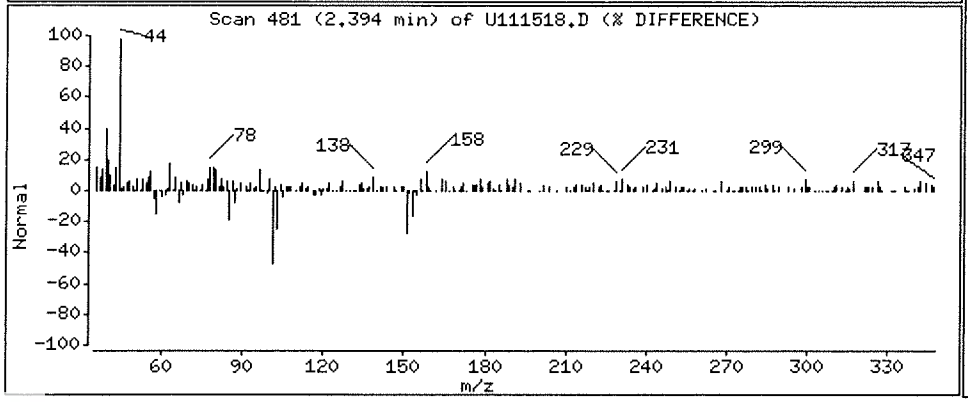












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111518.D

Date : 15-NOV-2019 17:35

Client ID: HS19110644-09

Instrument: VOA9.i

Sample Info: HS19110644-09;HS19110644-09;;;

Purge Volume: 5.0

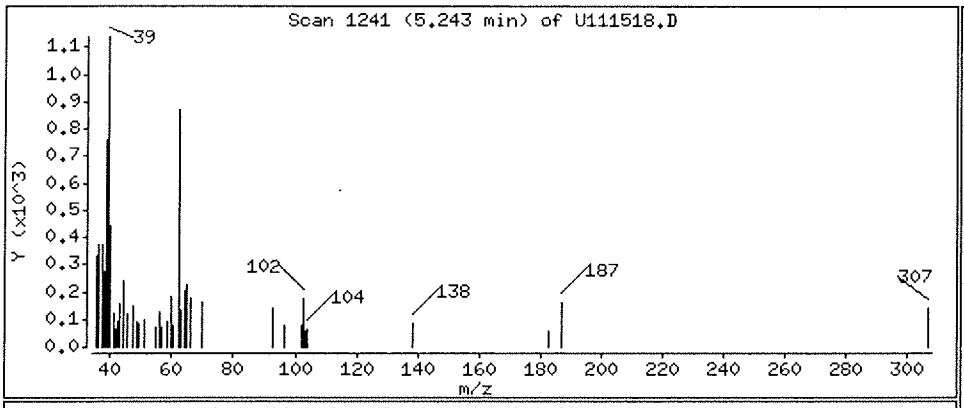
Operator: PC

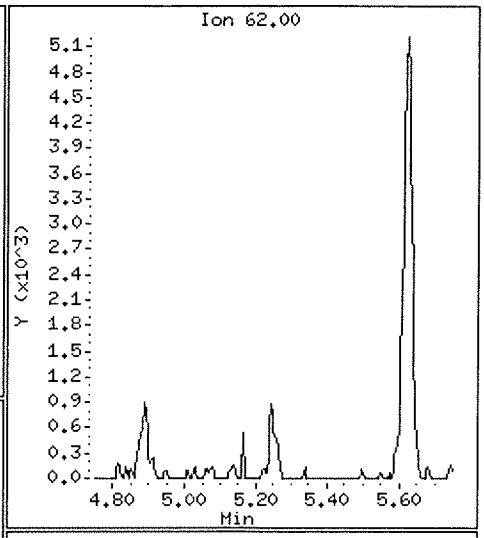
Column phase: DB624

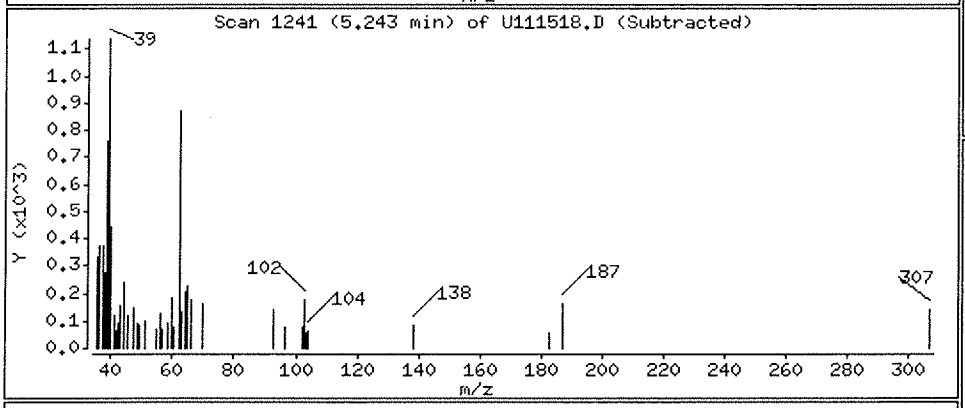
Column diameter: 0.18

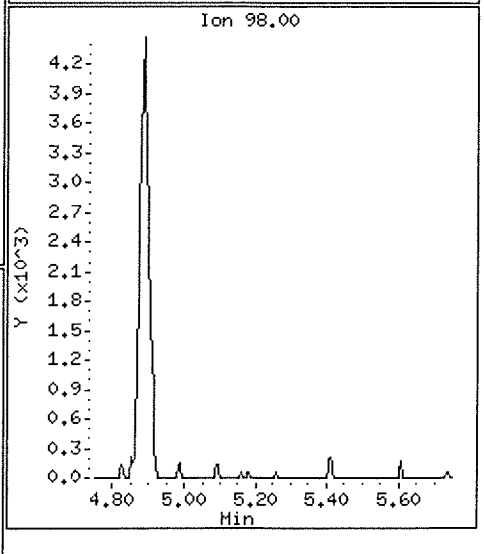
33 1,2-Dichloroethane

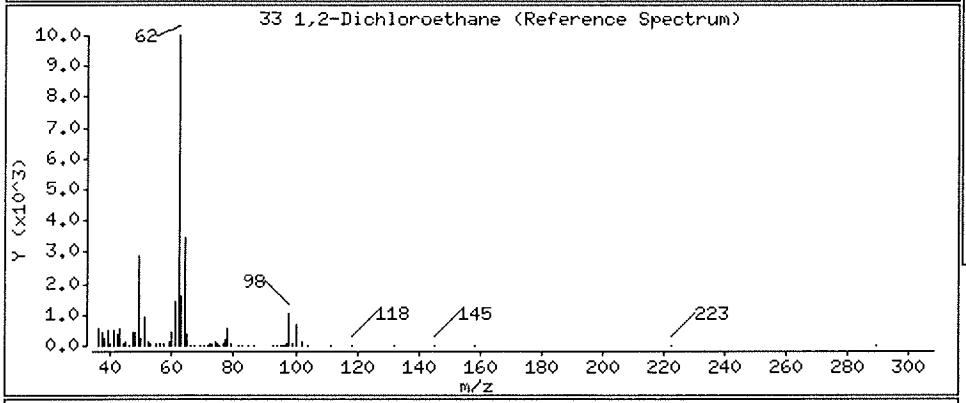
Concentration: 3.02 ug/l

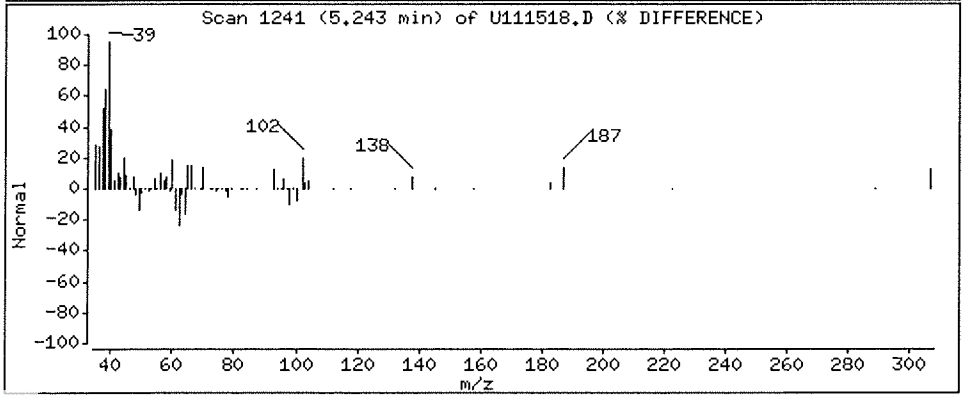












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111518.D

Date : 15-NOV-2019 17:35

Client ID: HS19110644-09

Instrument: VOA9.i

Sample Info: HS19110644-09;HS19110644-09;;;

Purge Volume: 5.0

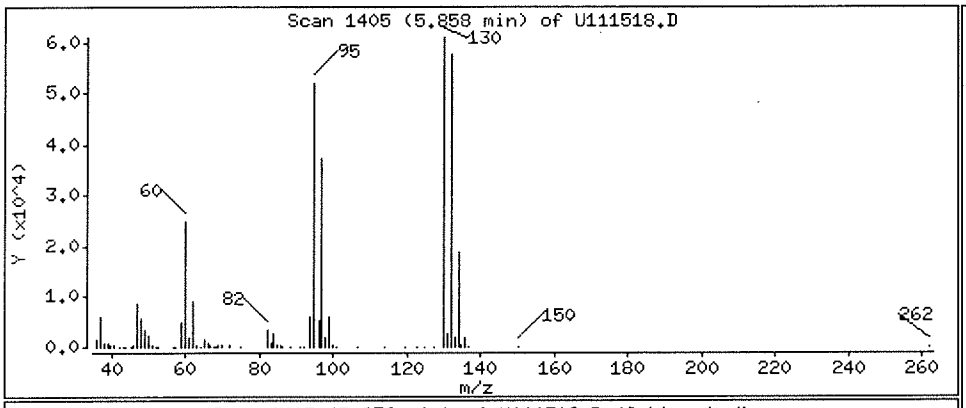
Operator: PC

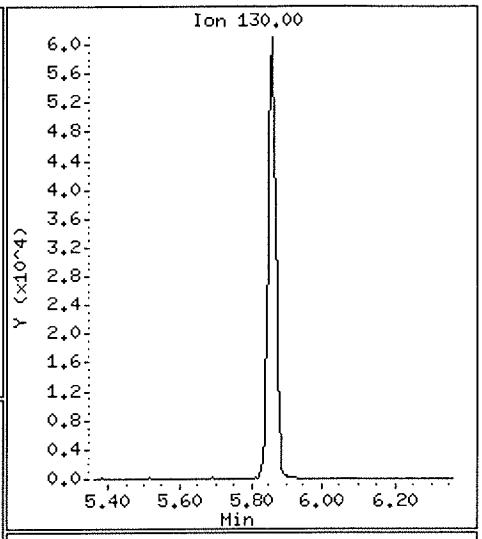
Column phase: DB624

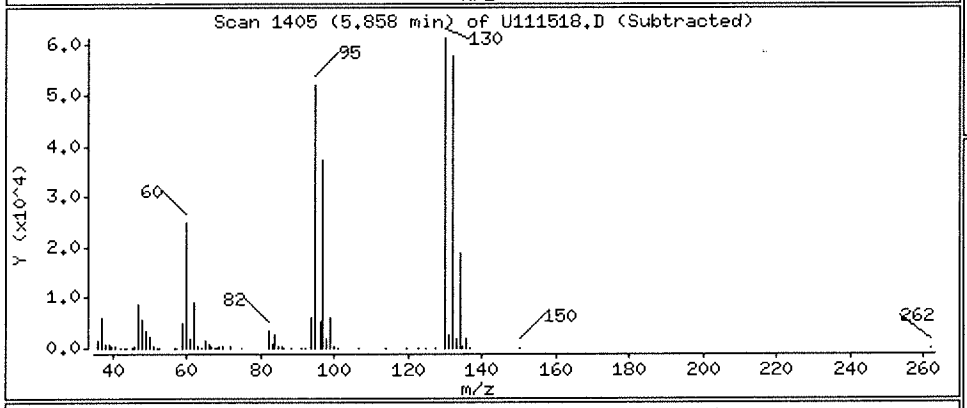
Column diameter: 0.18

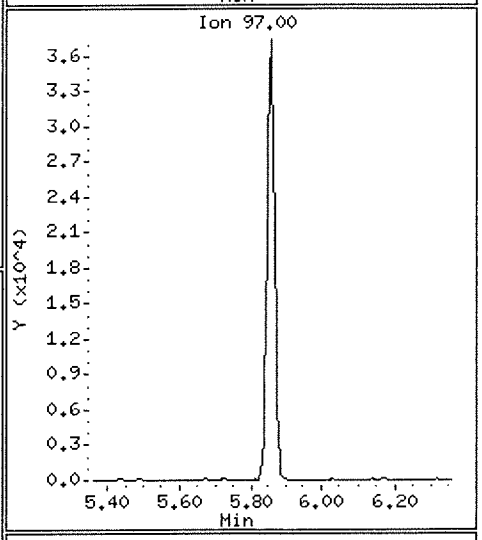
38 Trichloroethene

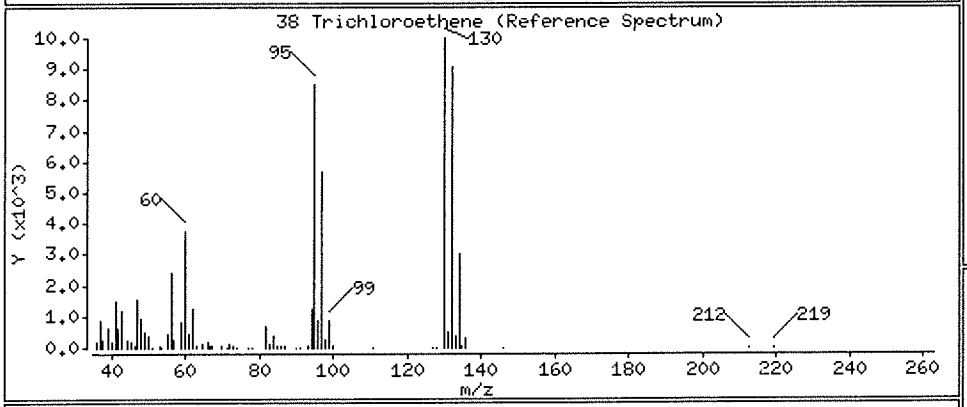
Concentration: 282.07 ug/l

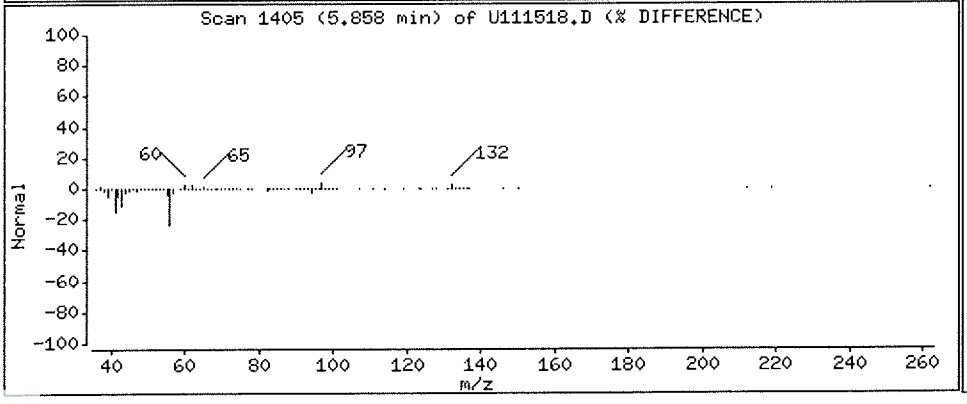


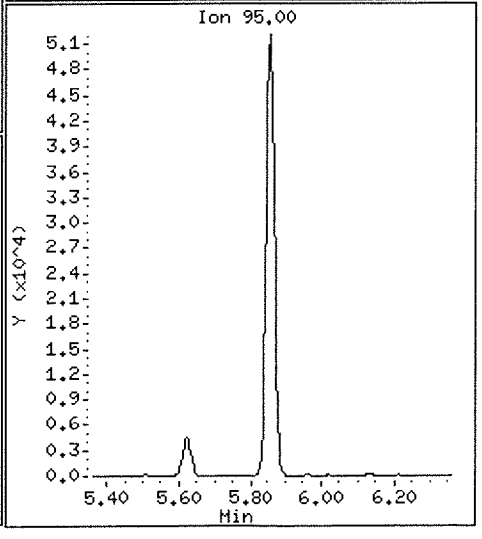












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111519.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111519.D
Lab Smp Id: HS19110644-10 Client Smp ID: HS19110644-10
Inj Date : 15-NOV-2019 17:59
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-10;HS19110644-10;;;
Misc Info : 180315V9;WATER;0;5;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 18
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

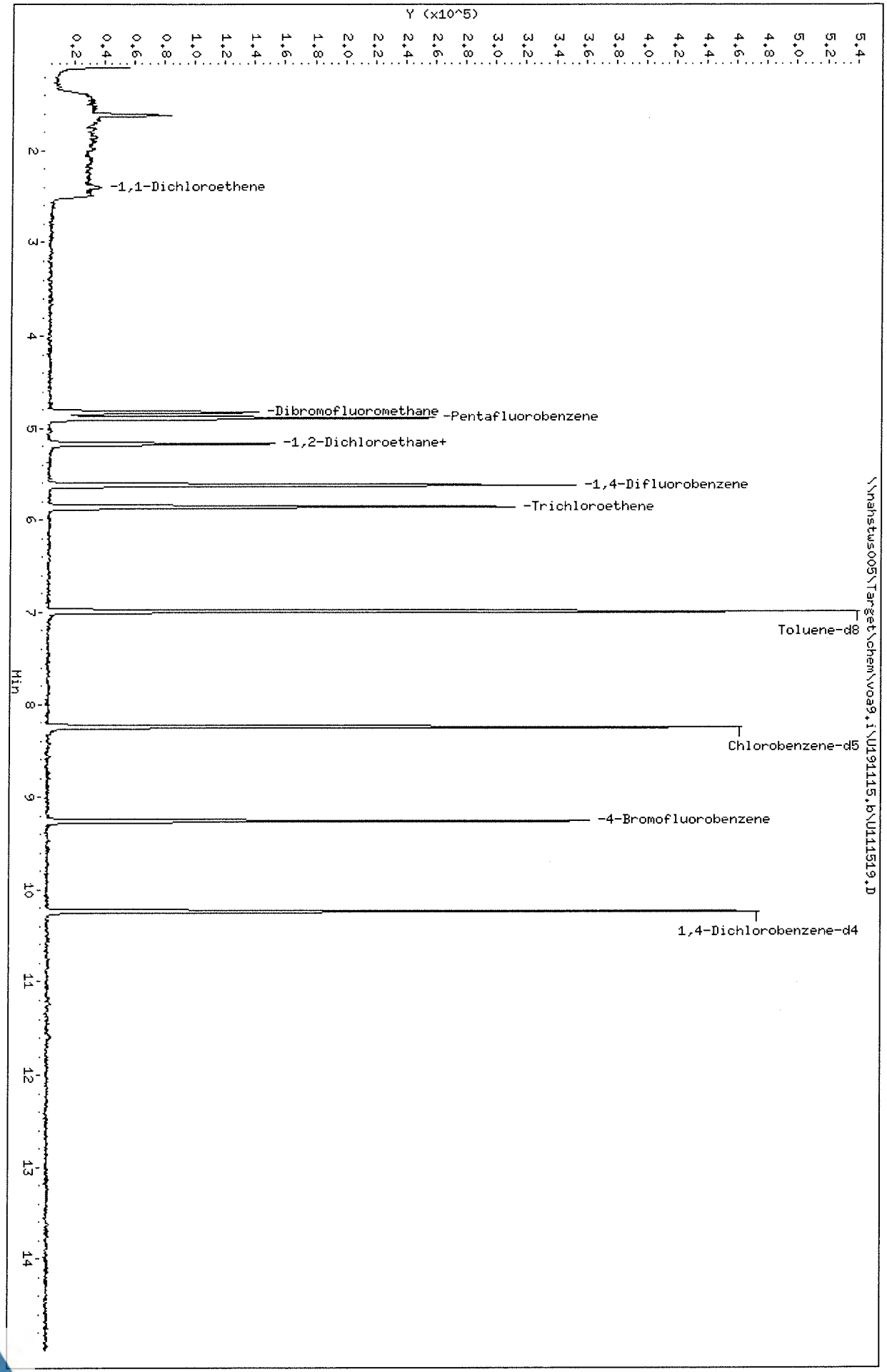
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	173424	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	260124	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	230422	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	111480	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	86643	49.9995	49.99
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	90378	50.7508	50.75
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.987)	71824	41.9902	41.99
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	311503	54.4444	54.44
11 1,1-Dichloroethene	96	2.401	2.401	(0.491)	3788	0.93514	4.67(a)
33 1,2-Dichloroethane	62	5.261	5.250	(0.936)	1145	0.59133	2.95(a)
38 Trichloroethene	130	5.857	5.861	(1.042)	88949	51.6465	258.23

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9,i\U191115,b\U111519,D
Date : 15-NOV-2019 17:59
Client ID: HS19110644-10
Sample Info: HS19110644-10;HS19110644-10;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111519.D

Date : 15-NOV-2019 17:59

Client ID: HS19110644-10

Instrument: VOA9.i

Sample Info: HS19110644-10;HS19110644-10;;;

Purge Volume: 5.0

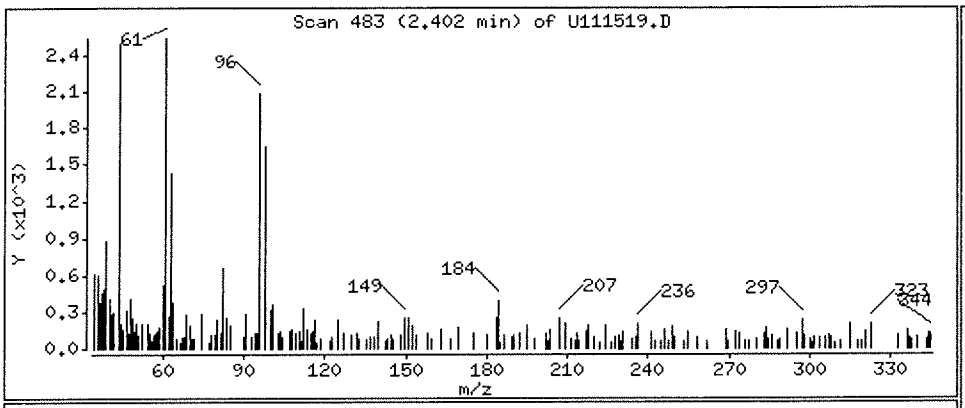
Operator: PC

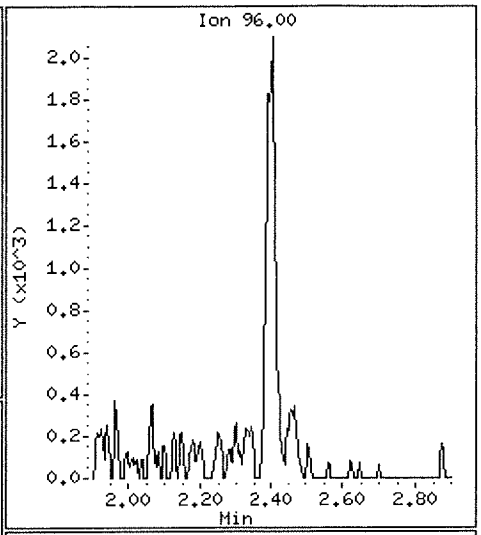
Column phase: DB624

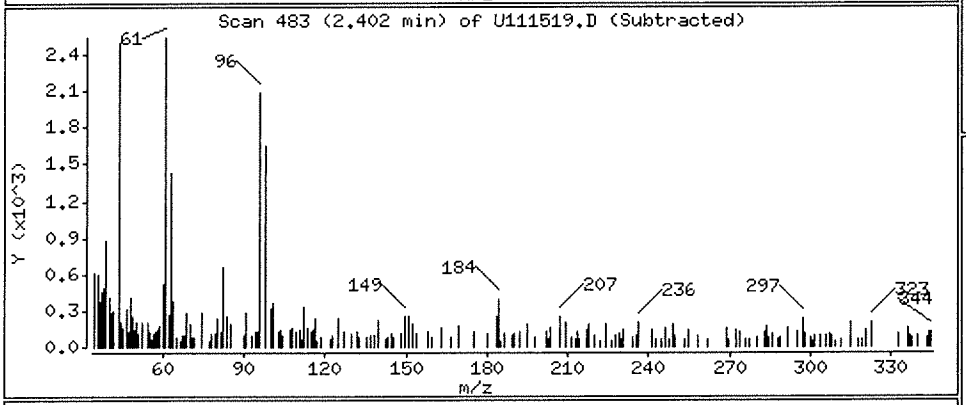
Column diameter: 0.18

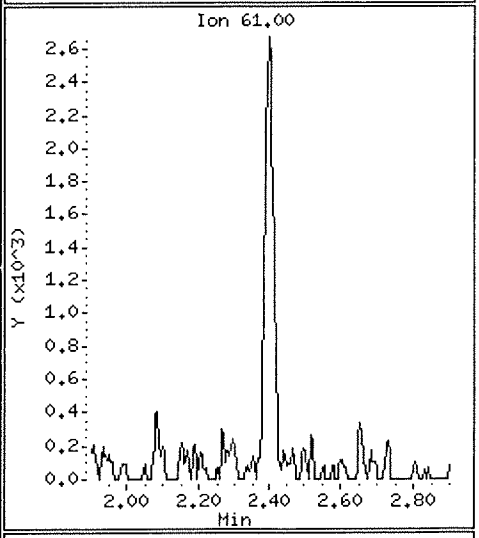
11 1,1-Dichloroethene

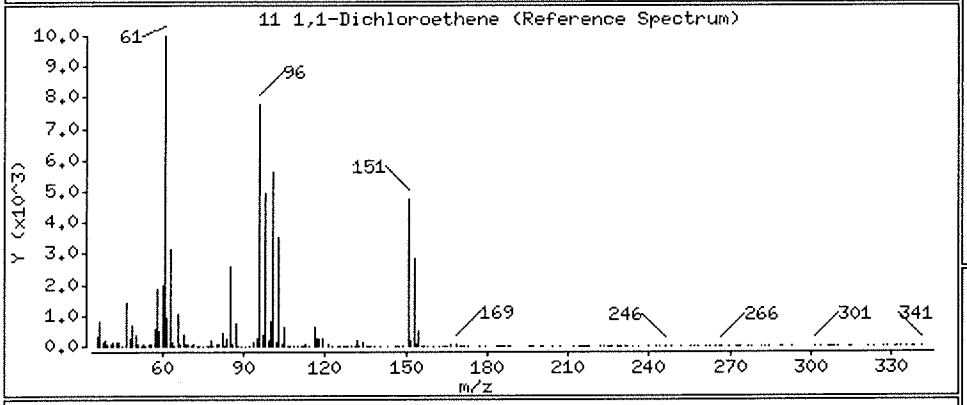
Concentration: 4.67 ug/l

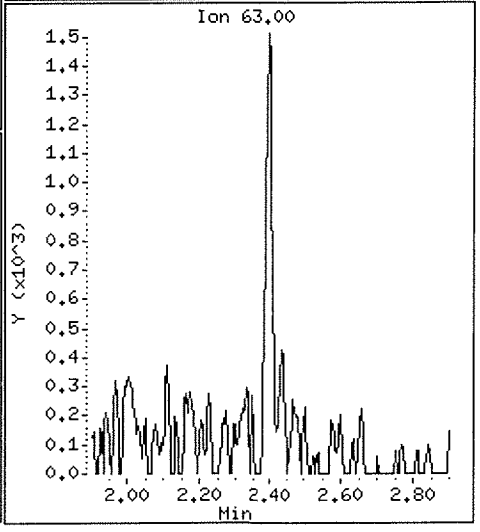


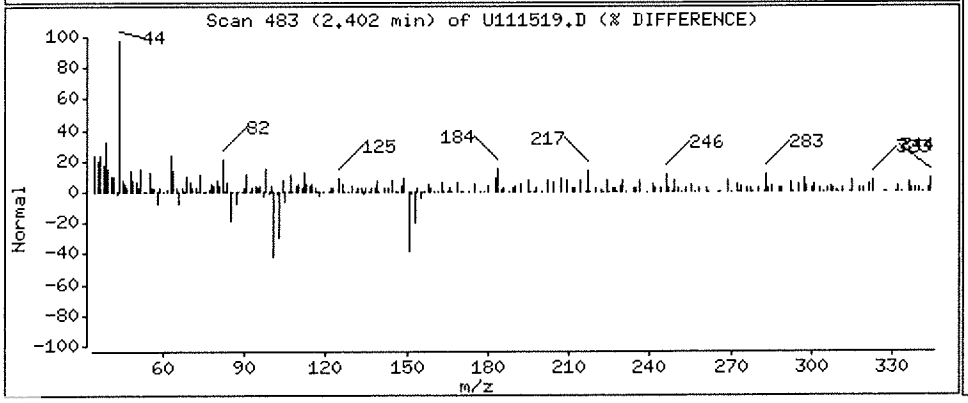












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111519.D

Date : 15-NOV-2019 17:59

Client ID: HS19110644-10

Instrument: VOA9.i

Sample Info: HS19110644-10;HS19110644-10;;;

Purge Volume: 5.0

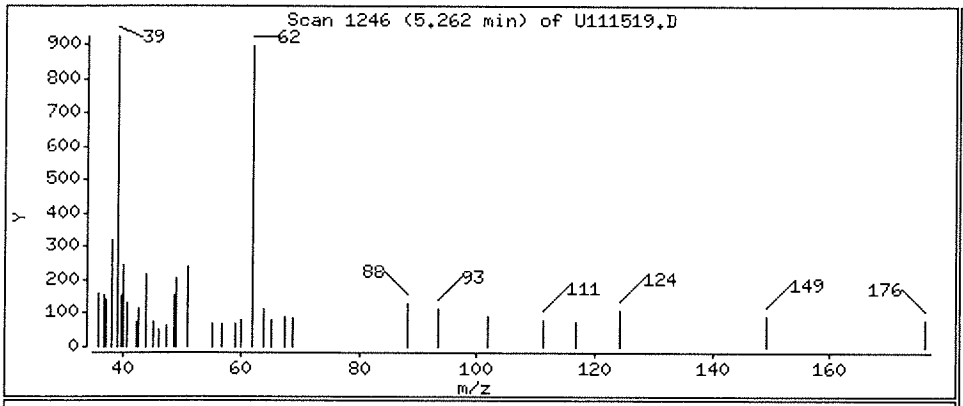
Operator: PC

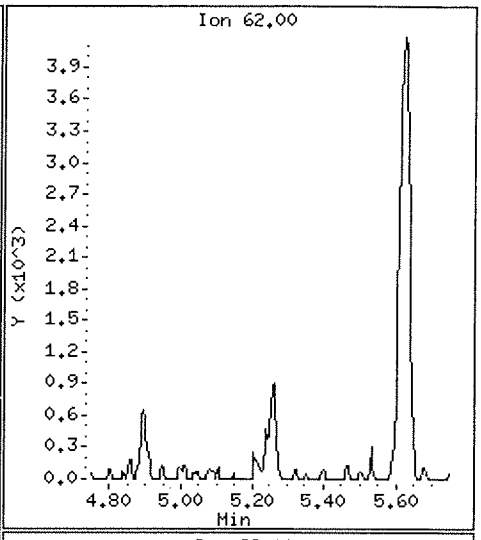
Column phase: DB624

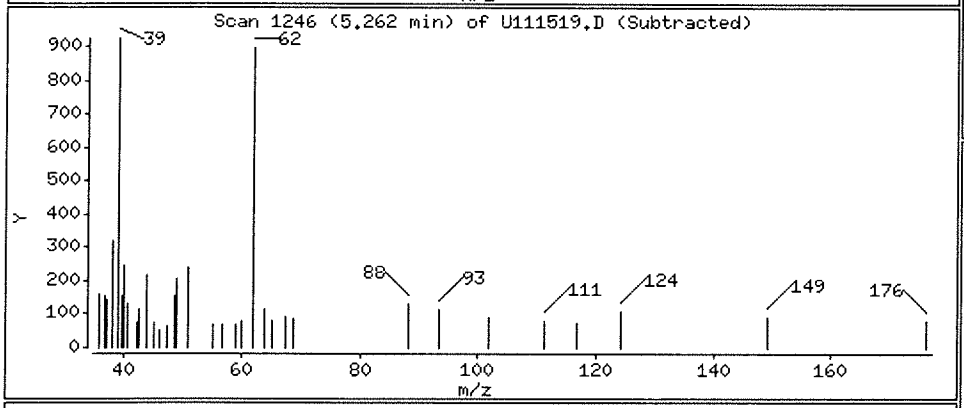
Column diameter: 0.18

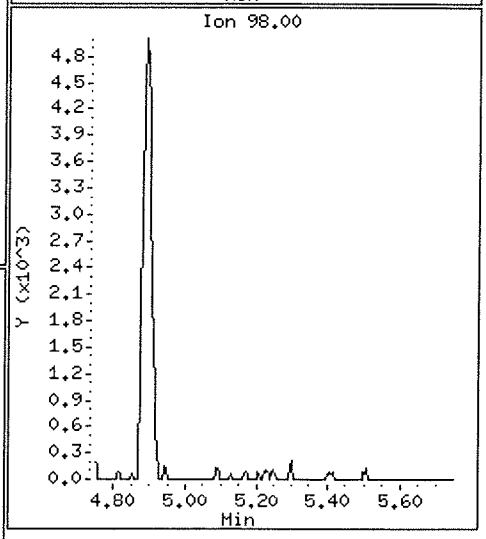
33 1,2-Dichloroethane

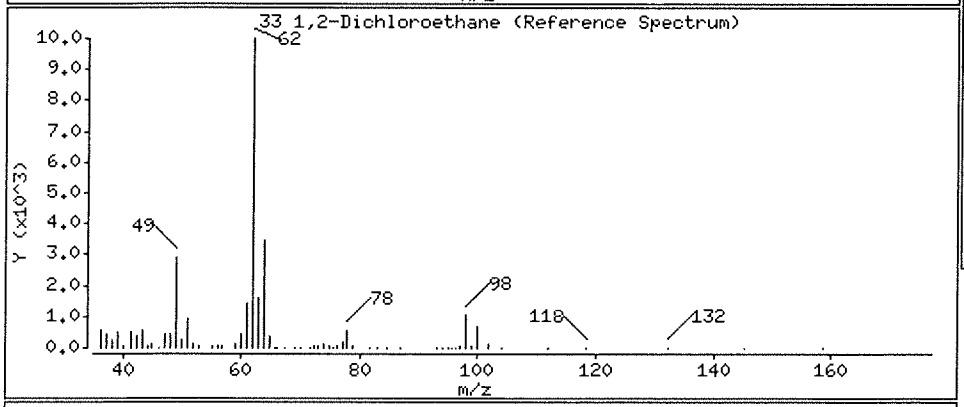
Concentration: 2.95 ug/l

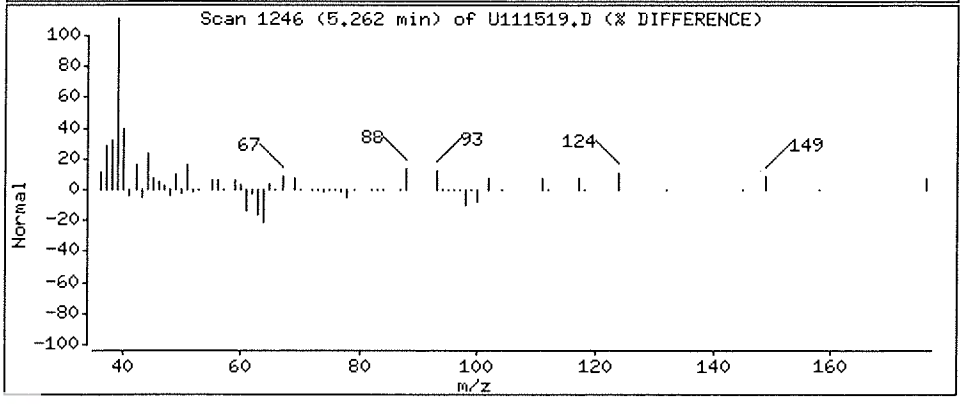












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111519.D

Date : 15-NOV-2019 17:59

Client ID: HS19110644-10

Instrument: VOA9.i

Sample Info: HS19110644-10;HS19110644-10;;;

Purge Volume: 5.0

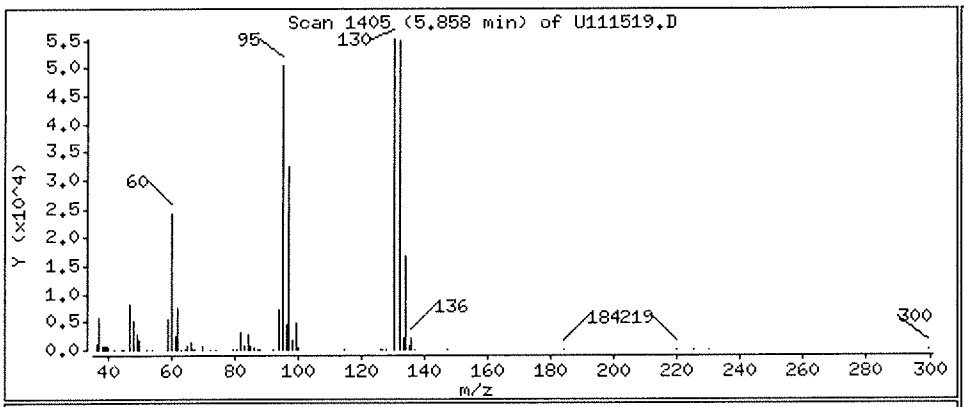
Operator: PC

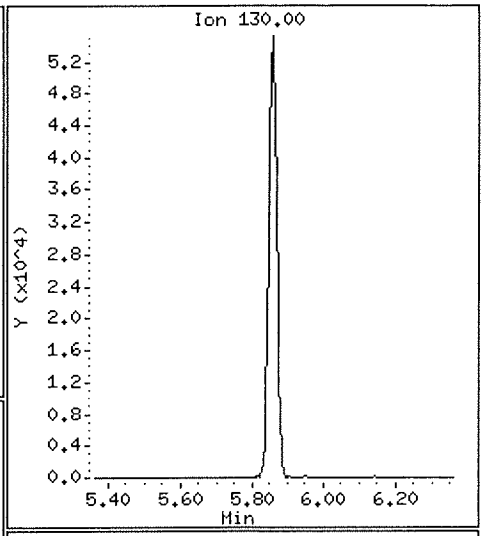
Column phase: DB624

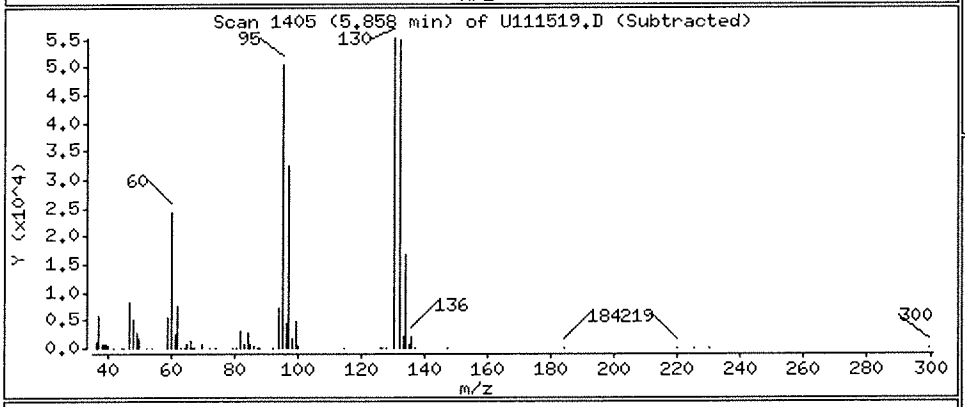
Column diameter: 0.18

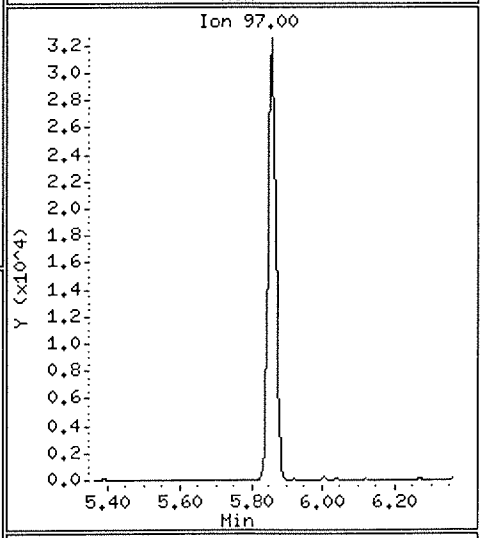
38 Trichloroethene

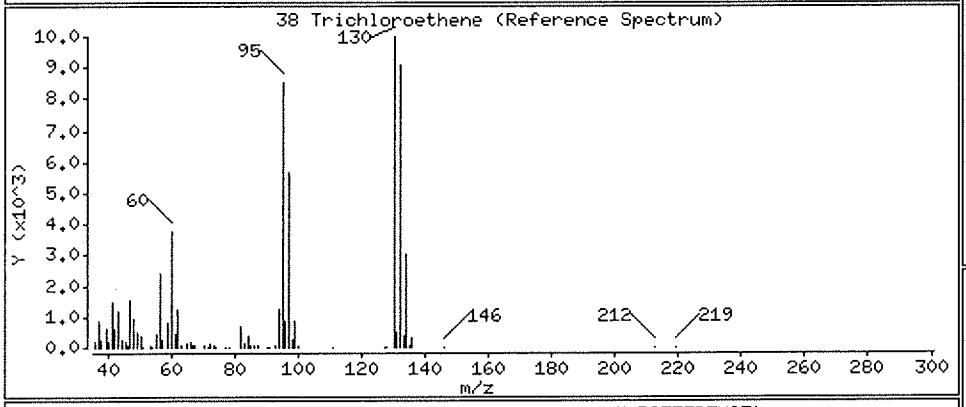
Concentration: 258.23 ug/l

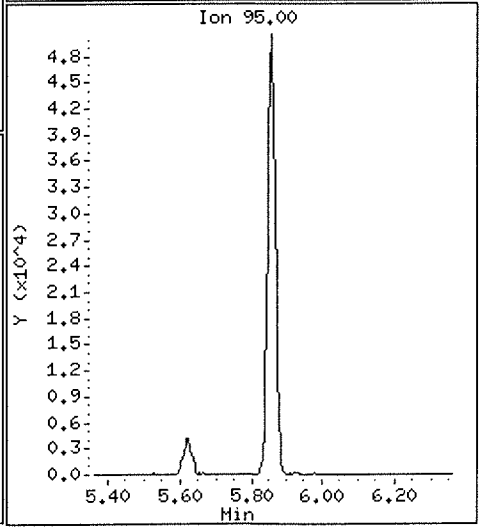


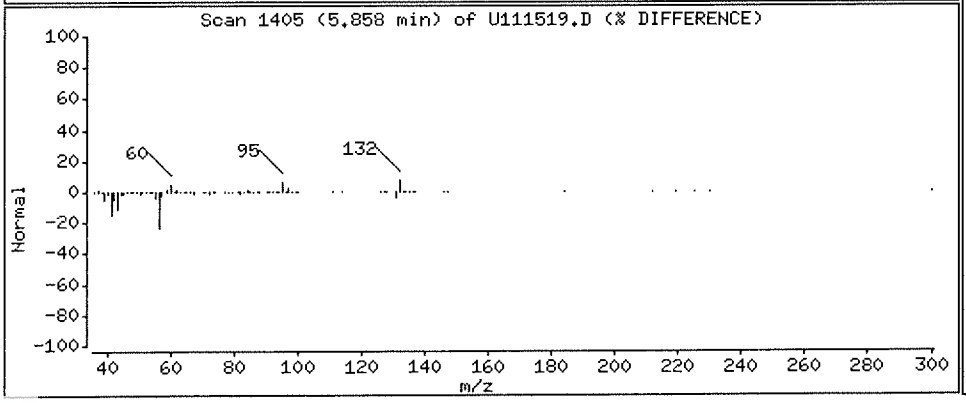












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111520.D Page 1
Report Date: 05-Dec-2019 16:57

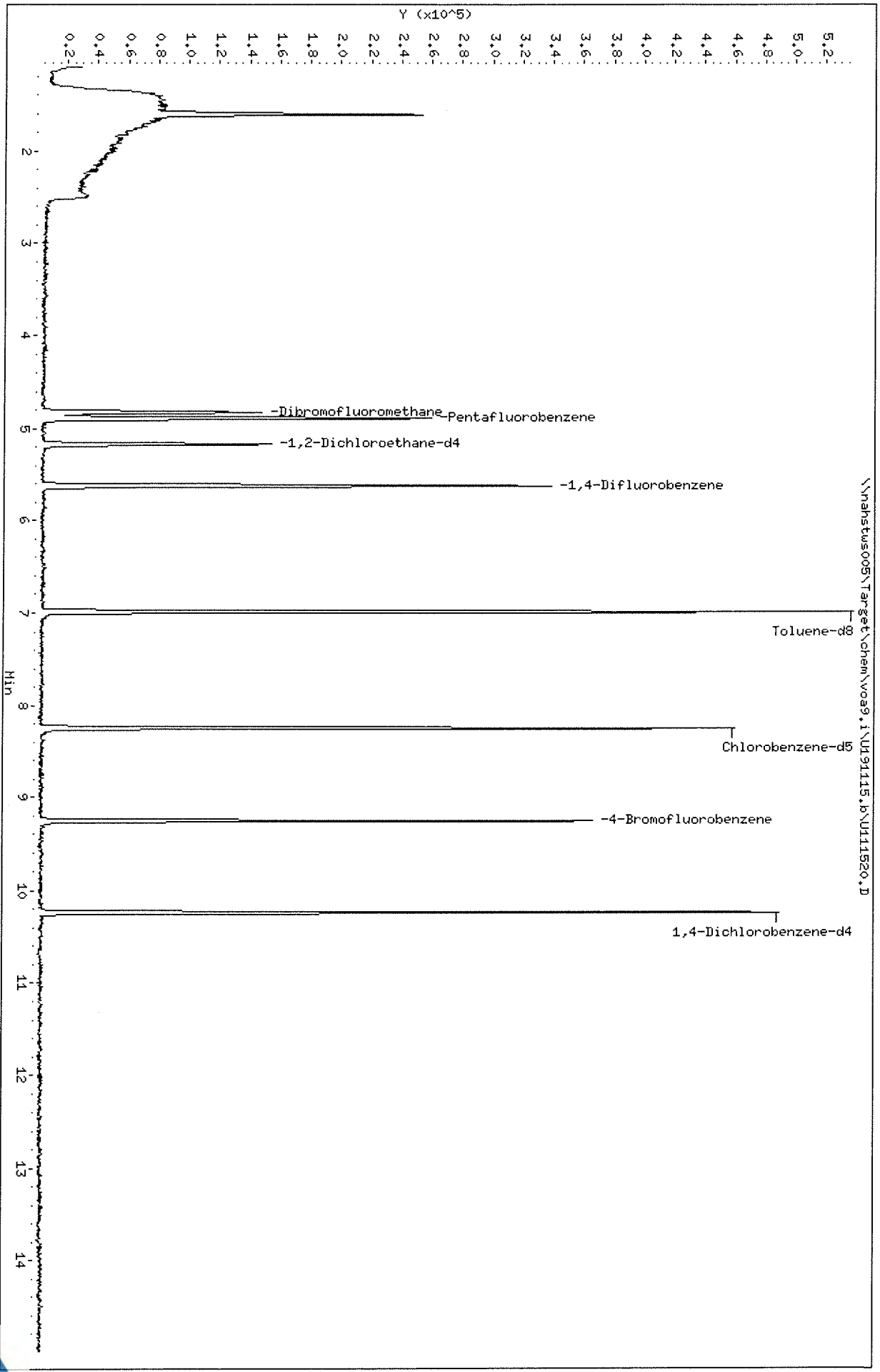
ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111520.D
Lab Smp Id: HS19110644-02 Client Smp ID: HS19110644-02
Inj Date : 15-NOV-2019 18:23
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-02;HS19110644-02;;;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 19
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	176311	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	259641	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	234865	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	116005	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	84832	48.1178	48.11
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	86689	47.7971	47.79
$ 30 Dibromofluoromethane	113	4.823	4.826	(0.986)	77861	44.7681	44.76
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	308608	52.9217	52.92



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111520.D
Date : 15-NOV-2019 18:23
Client ID: HS19110644-02
Sample Info: HS19110644-02;HS19110644-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

\\nahstws005\Target\chem\voa9.i\U191115.b\U111520.D

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111521.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111521.D
Lab Smp Id: HS19110644-03 Client Smp ID: HS19110644-03
Inj Date : 15-NOV-2019 18:48
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-03;HS19110644-03;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 20
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

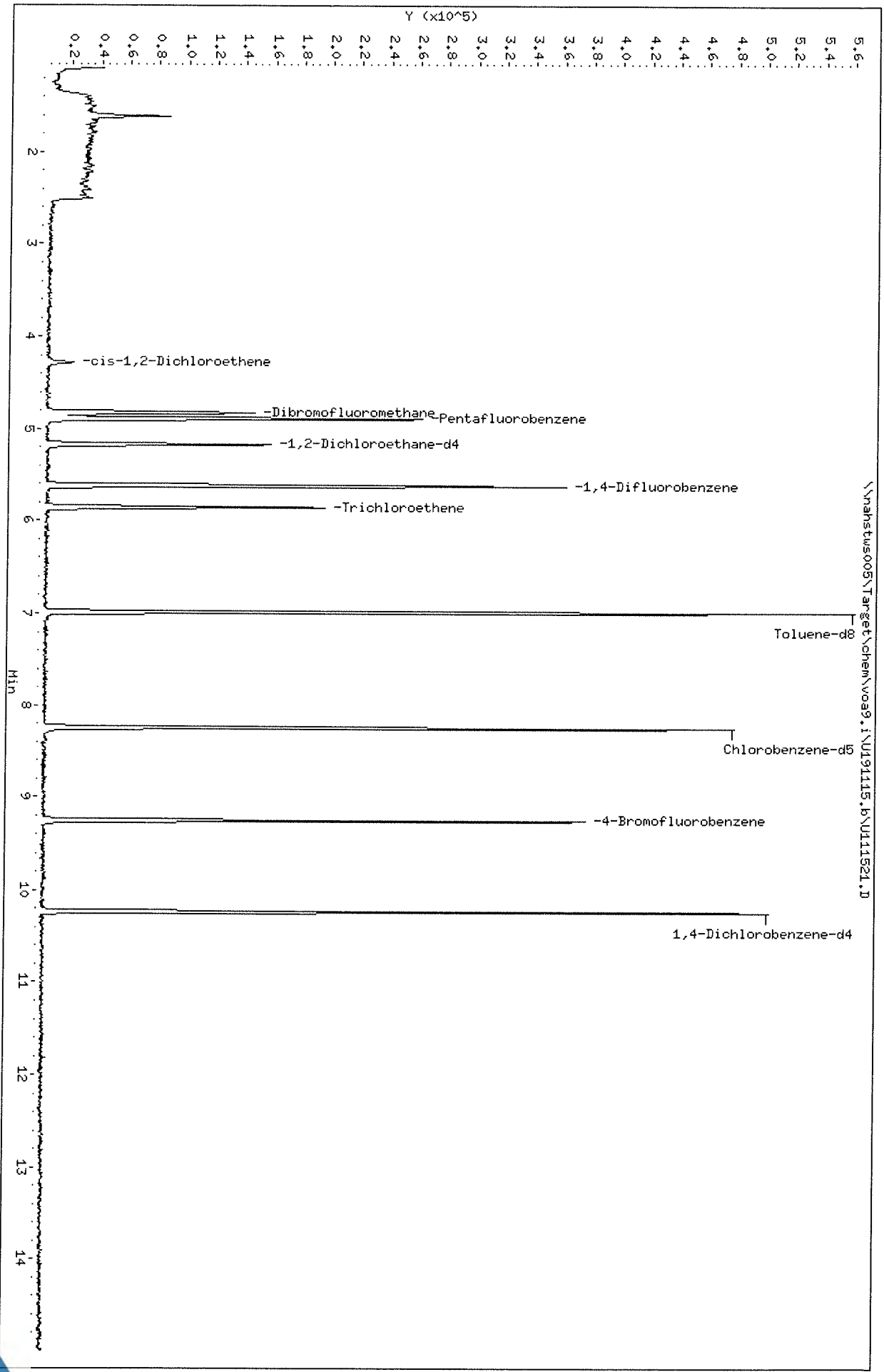
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	179689	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	276444	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	243592	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	116479	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	90398	50.3542	50.35
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	84575	44.9998	44.99
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.987)	77975	43.9934	43.99
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	322462	53.3154	53.31
27 cis-1,2-Dichloroethene	96	4.279	4.286	(0.875)	8345	4.07716	4.07(a)
38 Trichloroethene	130	5.857	5.861	(1.042)	54742	29.9085	29.90

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\nahstus005\Target\chem\voa9,i\U191115,b\U111521.D
Date : 15-NOV-2019 18:48
Client ID: HS19110644-03
Sample Info: HS19110644-03;HS19110644-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111521.D

Date : 15-NOV-2019 18:48

Client ID: HS19110644-03

Instrument: VOA9.i

Sample Info: HS19110644-03;HS19110644-03;;;

Purge Volume: 5.0

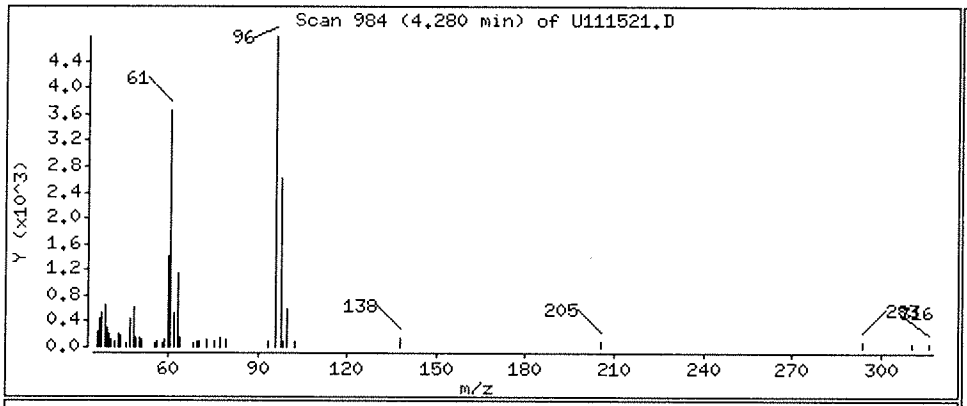
Operator: PC

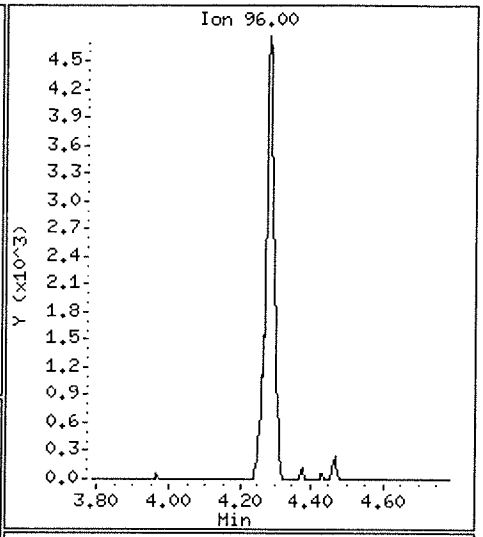
Column phase: DB624

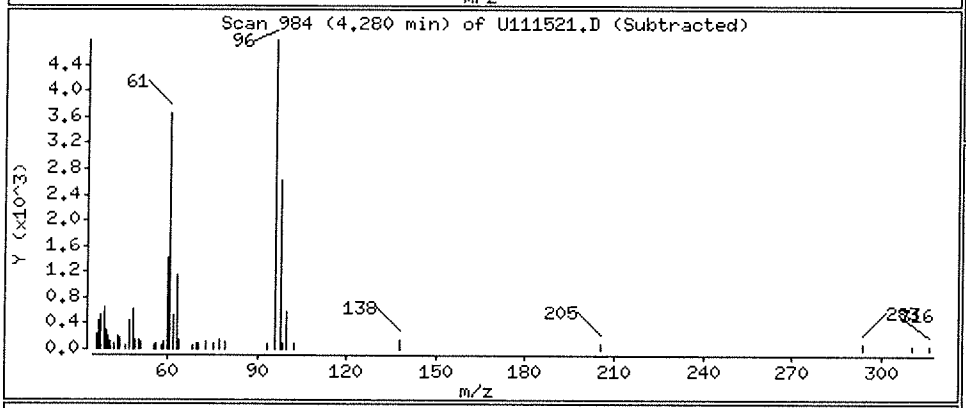
Column diameter: 0.18

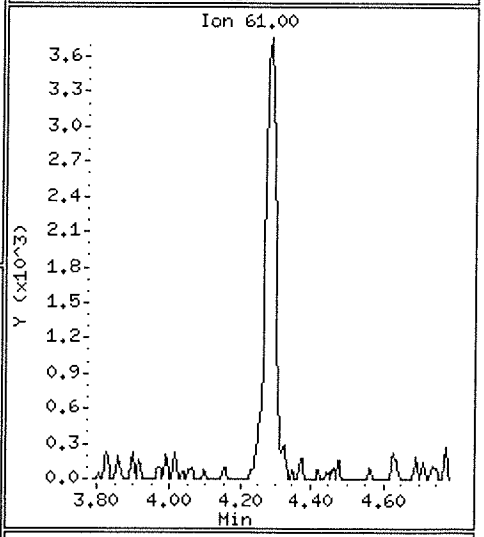
27 cis-1,2-Dichloroethene

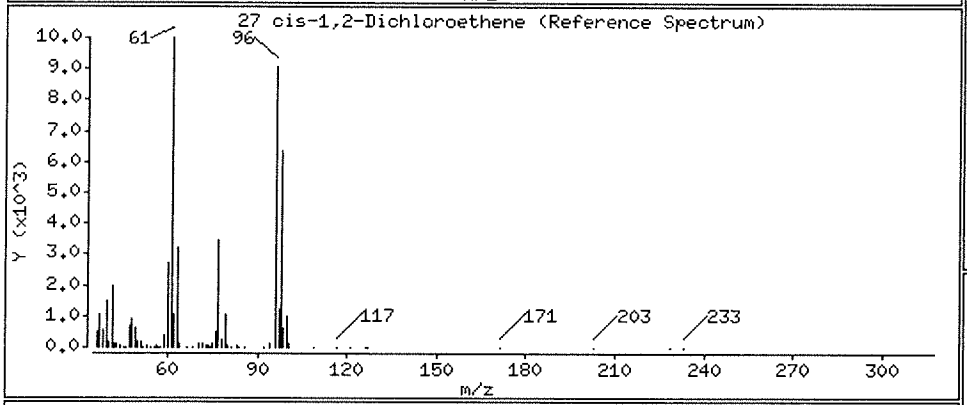
Concentration: 4.07 ug/l

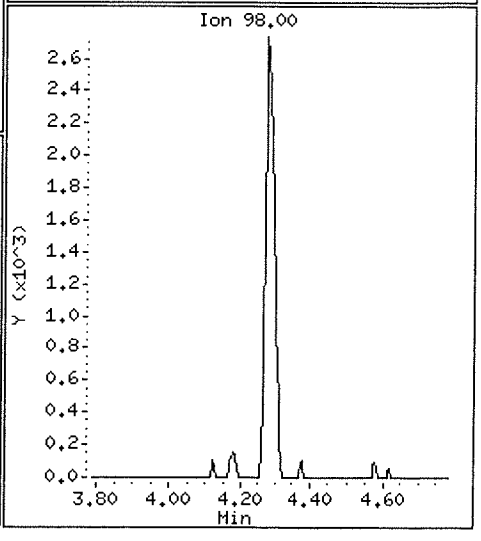


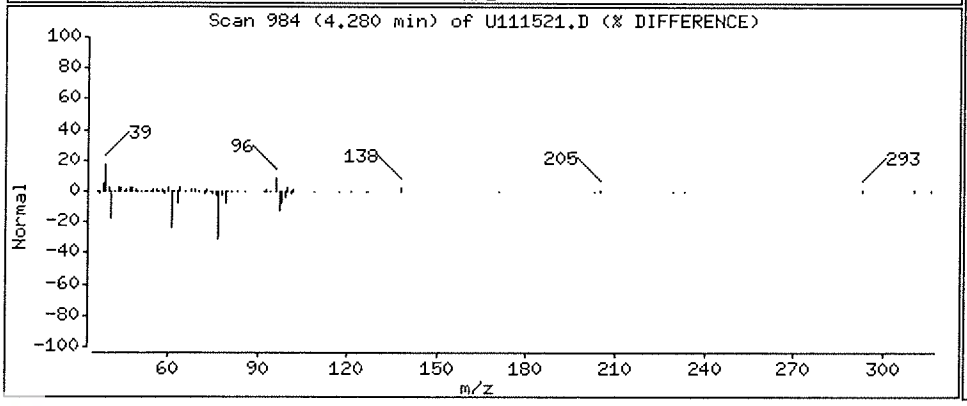












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111521.D

Date : 15-NOV-2019 18:48

Client ID: HS19110644-03

Instrument: VOA9.i

Sample Info: HS19110644-03;HS19110644-03;;;

Purge Volume: 5.0

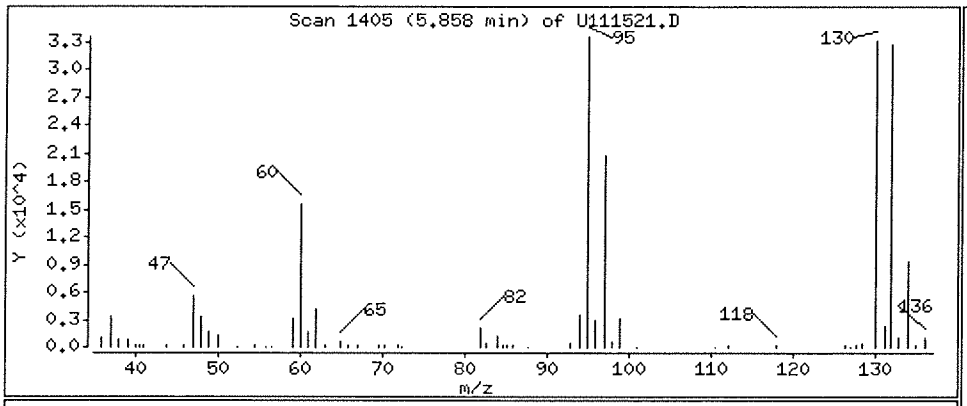
Operator: PC

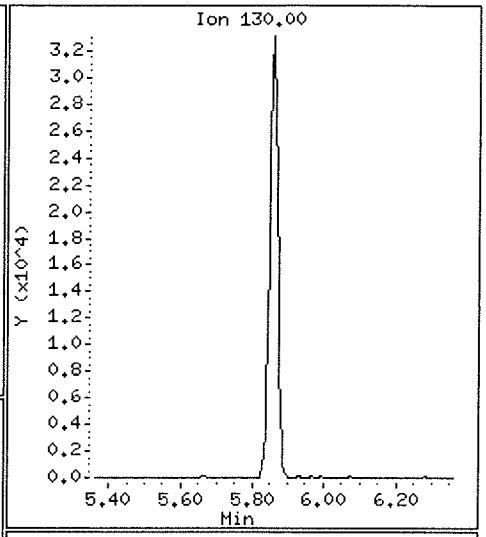
Column phase: DB624

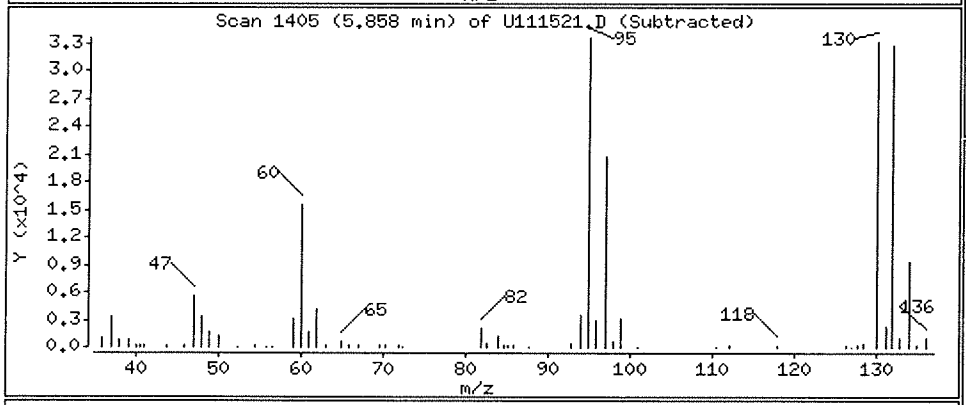
Column diameter: 0.18

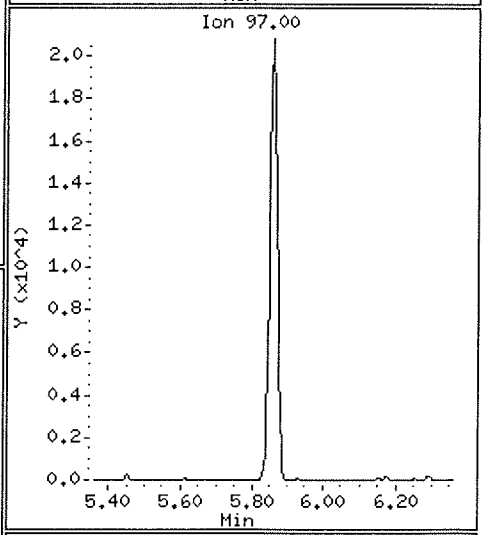
38 Trichloroethene

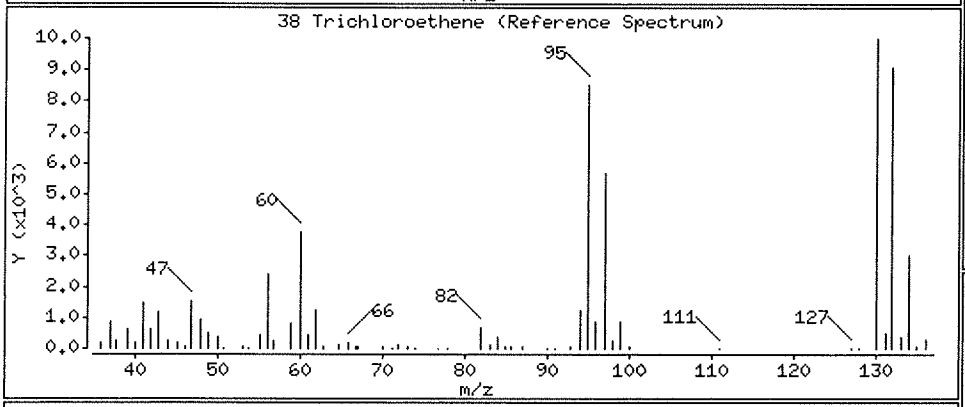
Concentration: 29.90 ug/l

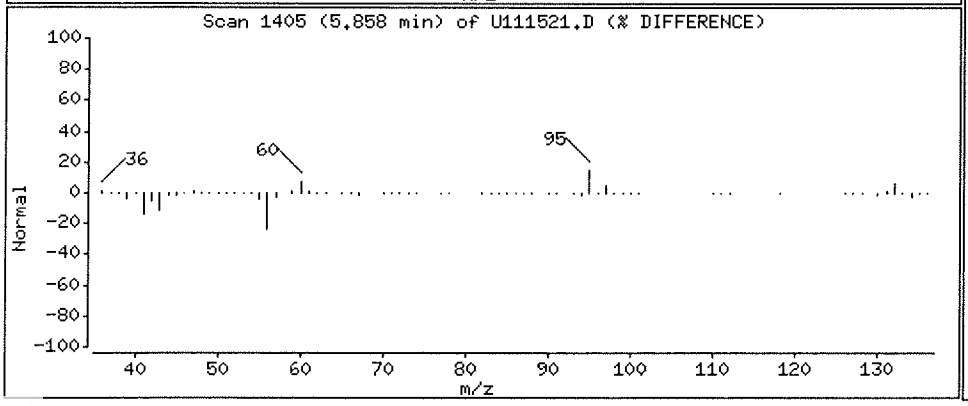


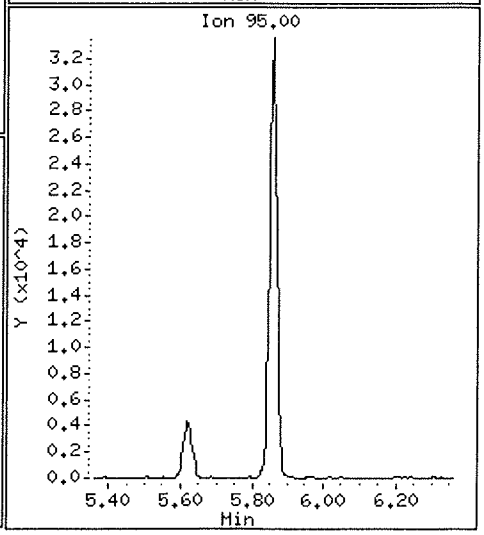












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111522.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111522.D
Lab Smp Id: HS19110644-04 Client Smp ID: HS19110644-04
Inj Date : 15-NOV-2019 19:12
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-04;HS19110644-04;;;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 21
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

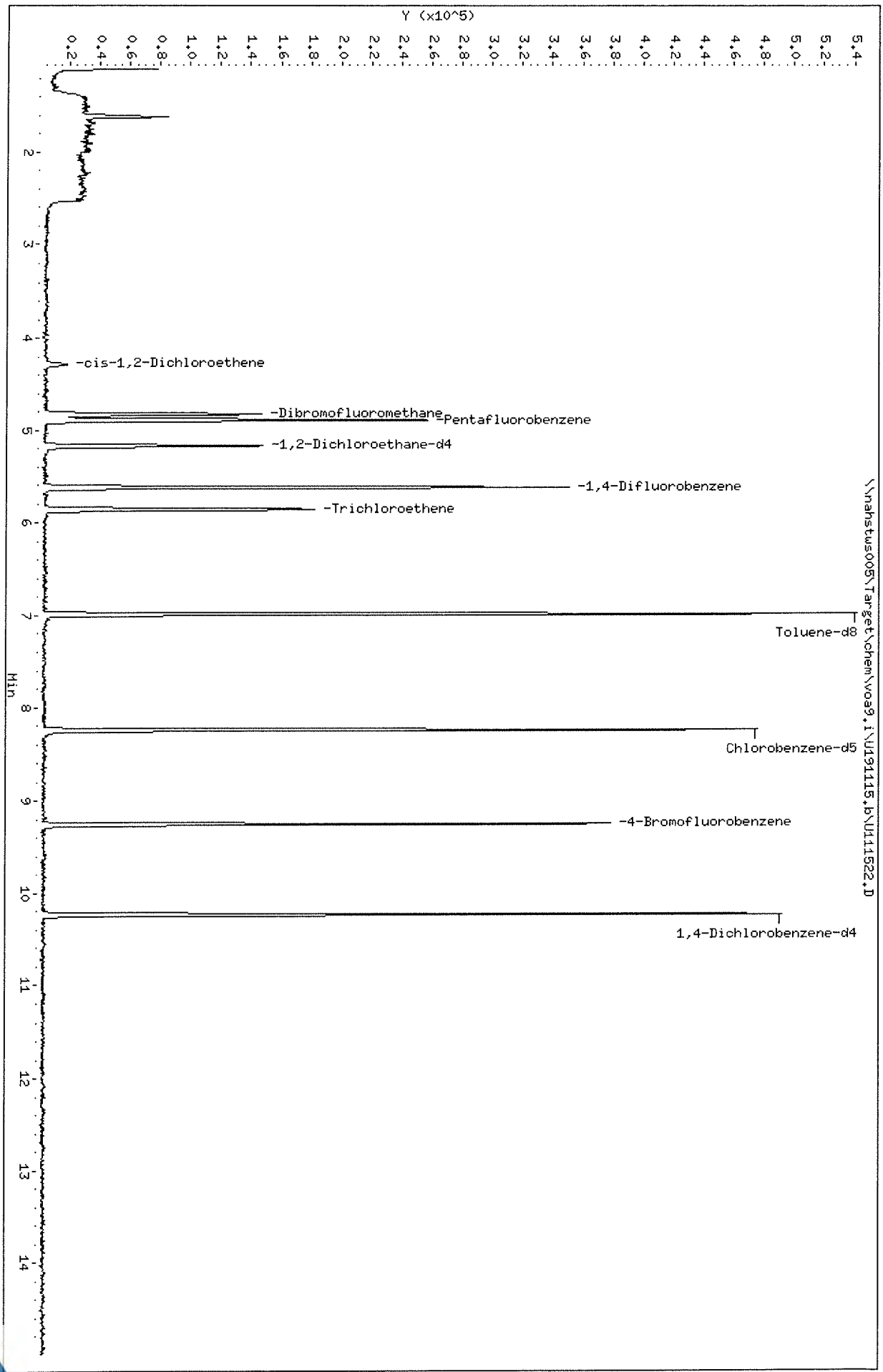
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	172951	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	273946	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	237894	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	116102	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	85253	49.3193	49.31
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	86551	47.1227	47.12
$ 30 Dibromofluoromethane	113	4.827	4.826	(0.986)	77548	45.4515	45.45
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	318848	53.9789	53.97
27 cis-1,2-Dichloroethene	96	4.283	4.286	(0.875)	7941	4.03093	4.03(a)
38 Trichloroethene	130	5.861	5.861	(1.043)	53516	29.5052	29.50

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111522.D
Date : 15-NOV-2019 19:12
Client ID: HS19110644-04
Sample Info: HS19110644-04;HS19110644-04;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111522.D

Date : 15-NOV-2019 19:12

Client ID: HS19110644-04

Instrument: VOA9.i

Sample Info: HS19110644-04;HS19110644-04;;;

Purge Volume: 5.0

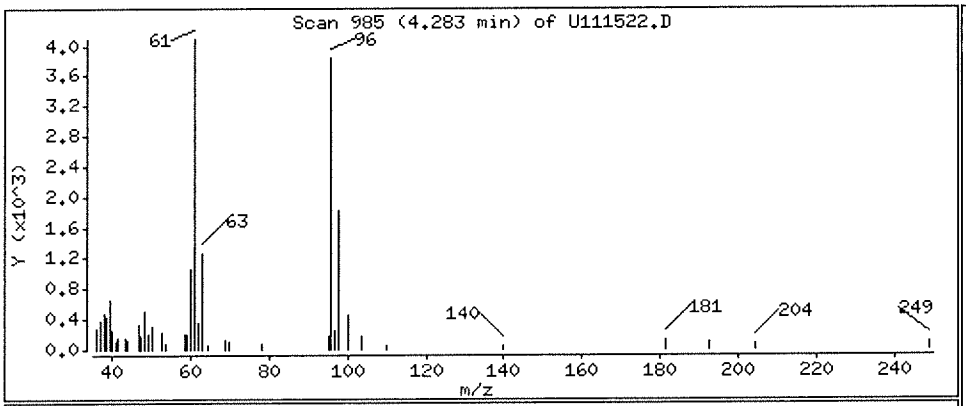
Operator: PC

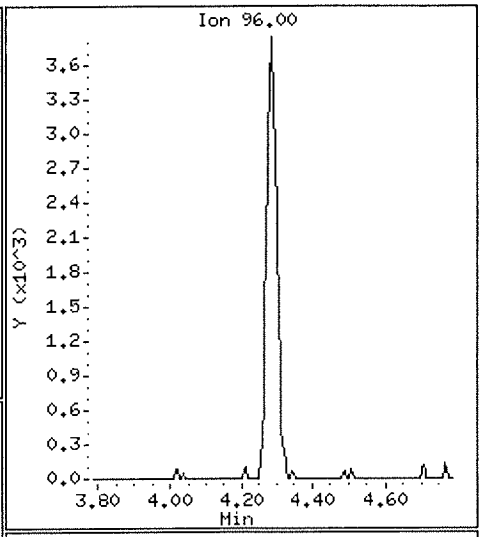
Column phase: DB624

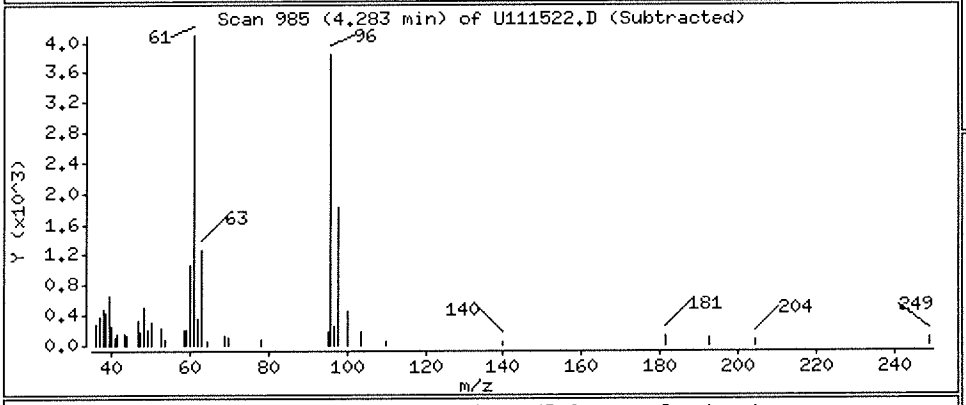
Column diameter: 0.18

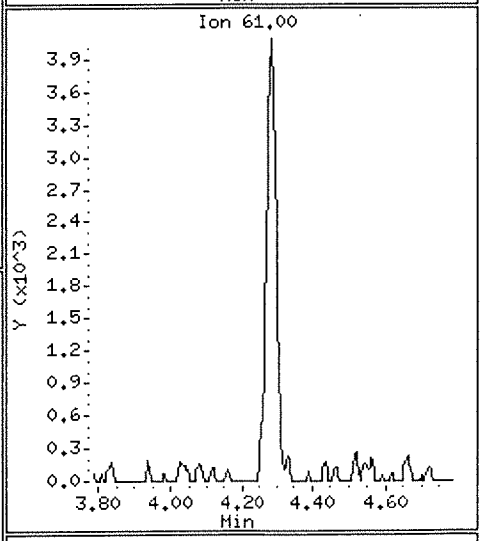
27 cis-1,2-Dichloroethene

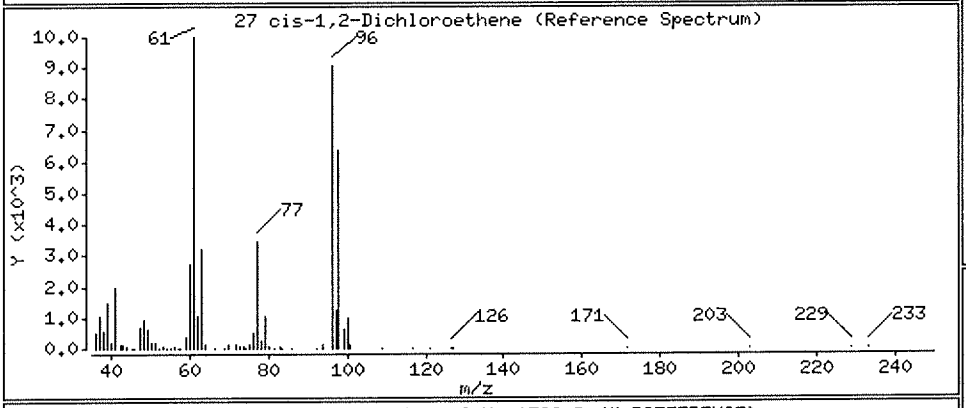
Concentration: 4.03 ug/l

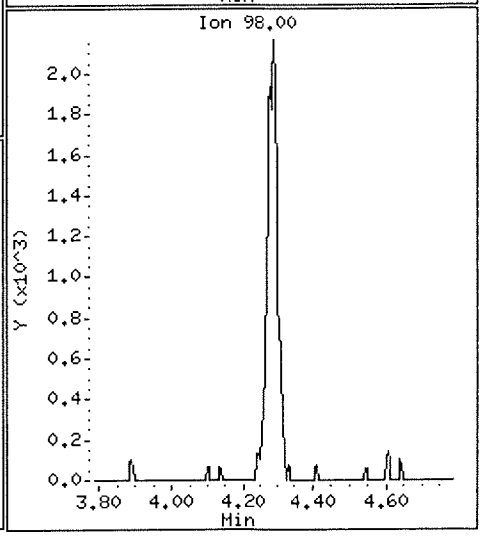


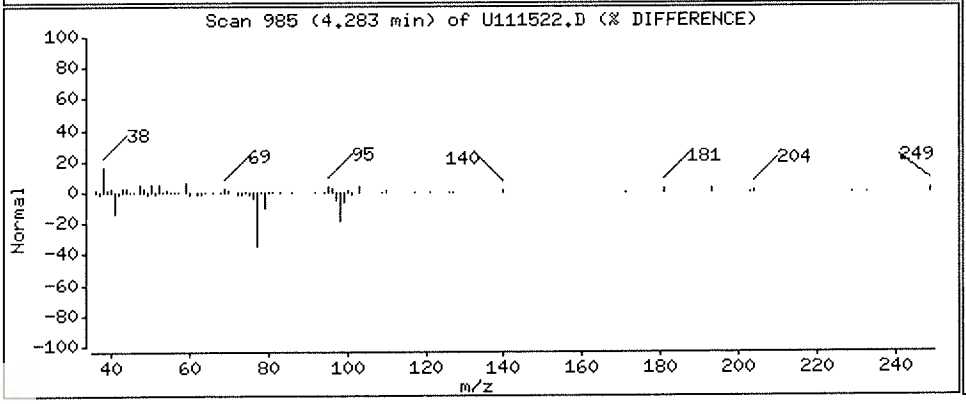












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111522.D

Date : 15-NOV-2019 19:12

Client ID: HS19110644-04

Instrument: VOA9.i

Sample Info: HS19110644-04;HS19110644-04;;;

Purge Volume: 5.0

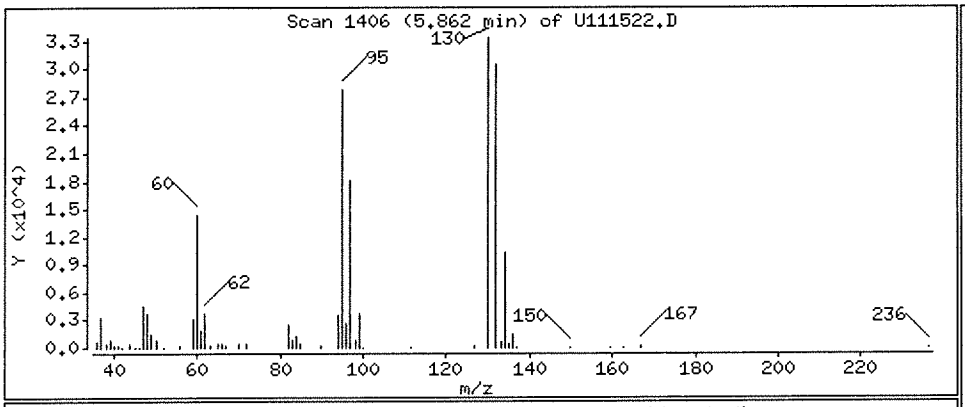
Operator: PC

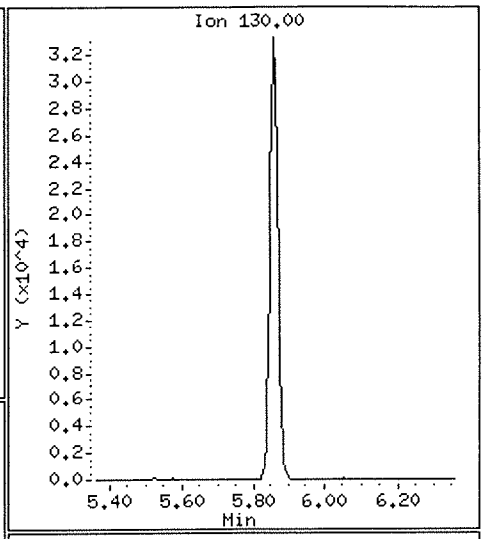
Column phase: DB624

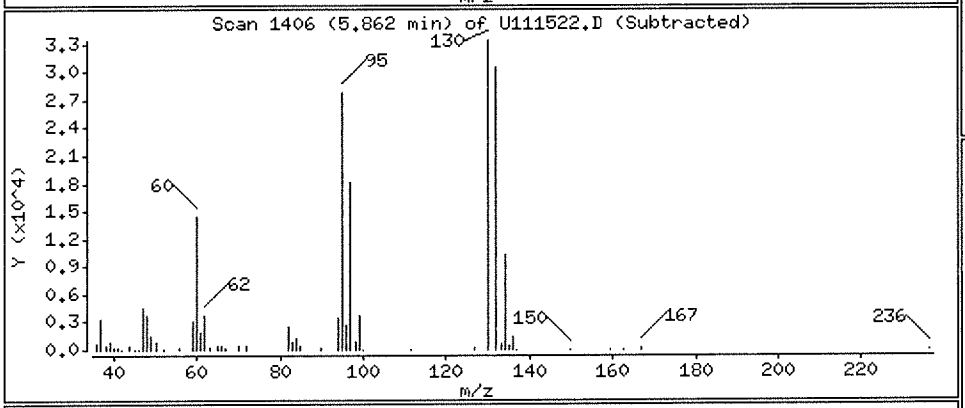
Column diameter: 0.18

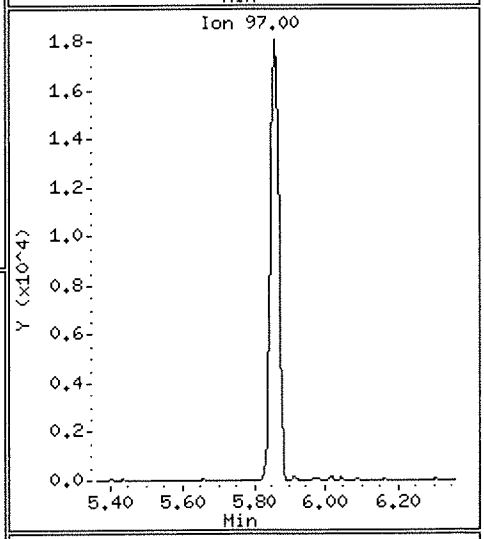
38 Trichloroethene

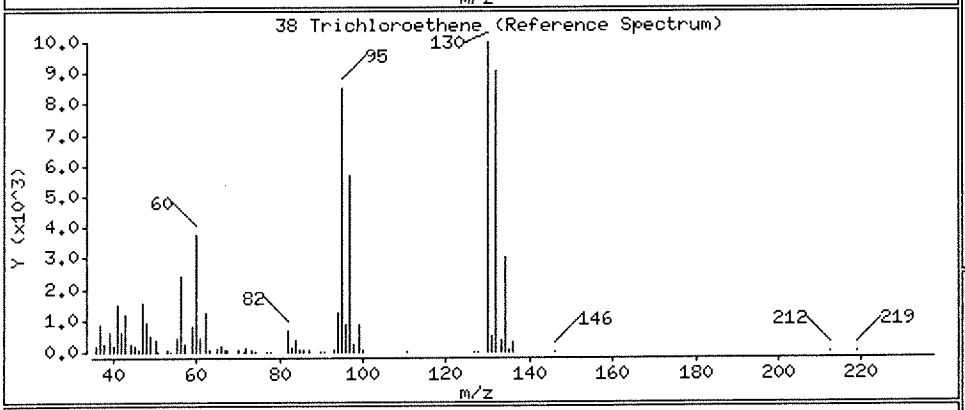
Concentration: 29.50 ug/l

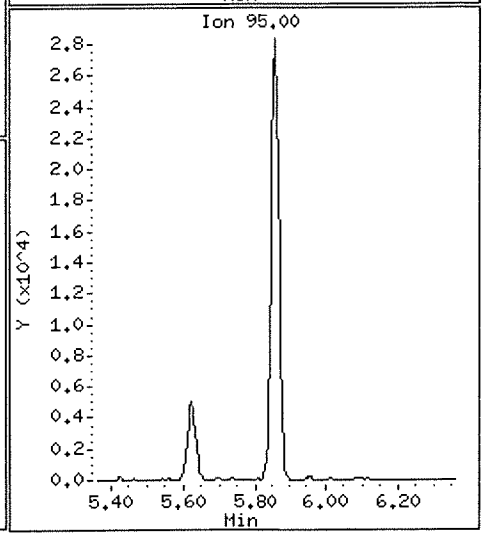


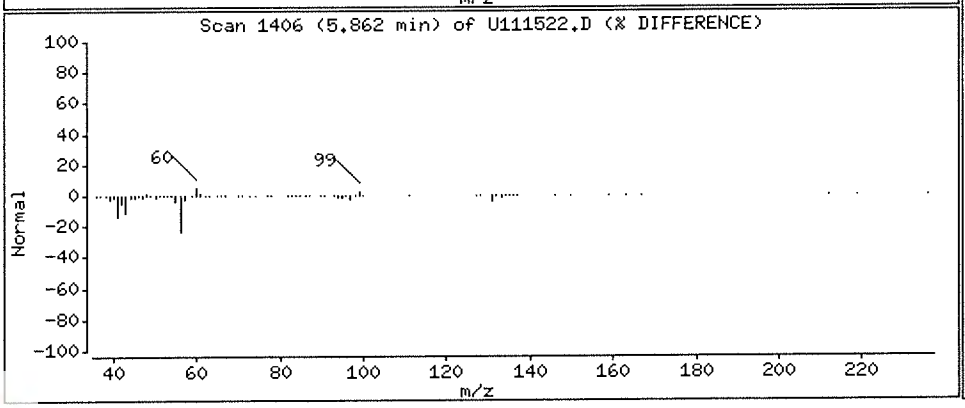












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111523.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111523.D
Lab Smp Id: HS19110644-05 Client Smp ID: HS19110644-05
Inj Date : 15-NOV-2019 19:36
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-05;HS19110644-05;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 22
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

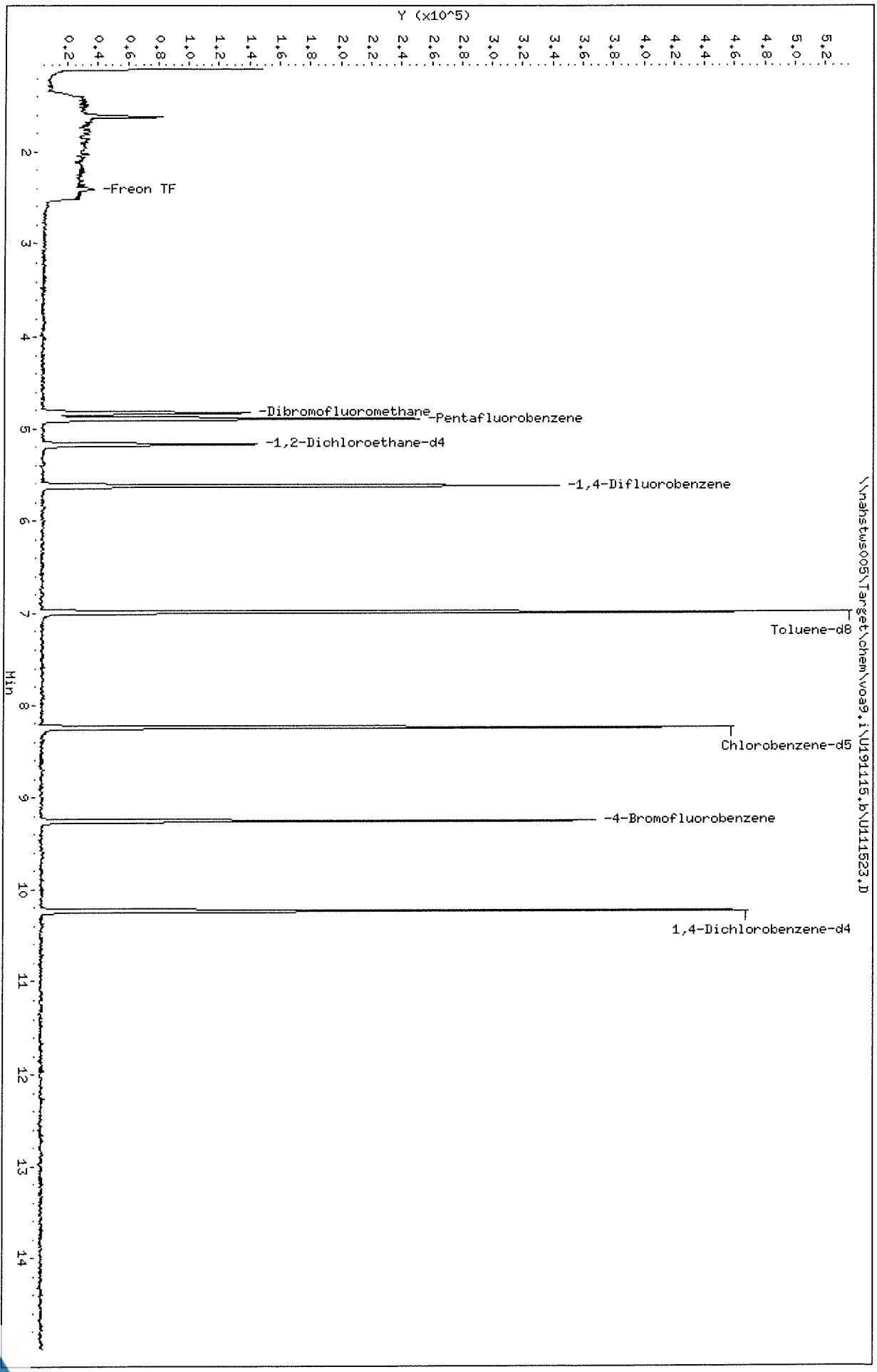
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	169439	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	252069	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	228414	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	111779	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.175	5.171	(1.057)	86740	51.2562	51.25
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	85783	48.6219	48.62
$ 30 Dibromofluoromethane	113	4.830	4.826	(0.987)	72538	43.4031	43.40
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	300287	52.9490	52.94
138 Freon TF	101	2.409	2.405	(0.492)	3880	1.02648	1.02(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9,i\U191115,b\U111523.D
Date : 15-NOV-2019 19:36
Client ID: HS19110644-05
Sample Info: HS19110644-05;HS19110644-05;;;
Purge Volume: 5.0
Column phase: DB624

\\nahstws005\Target\chem\voa9,i\U191115,b\U111523.D

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111523.D

Date : 15-NOV-2019 19:36

Client ID: HS19110644-05

Instrument: VOA9.i

Sample Info: HS19110644-05;HS19110644-05;;;

Purge Volume: 5.0

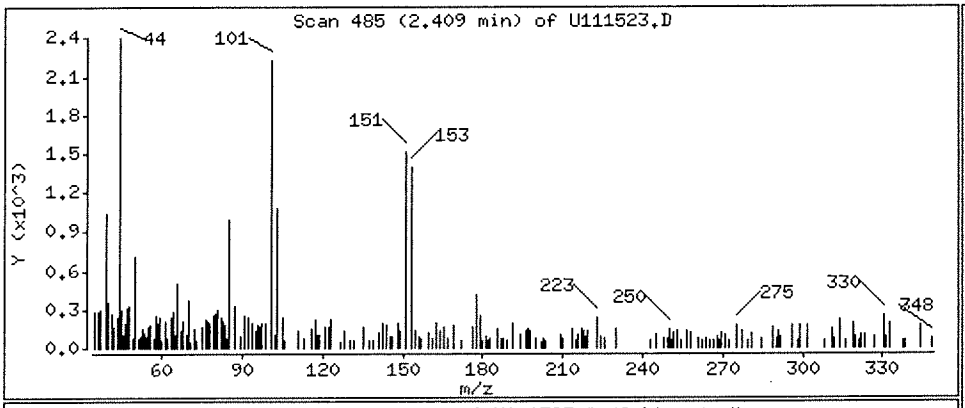
Operator: PC

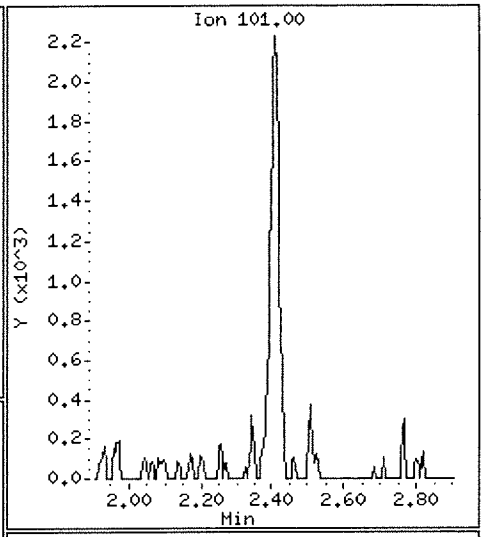
Column phase: DB624

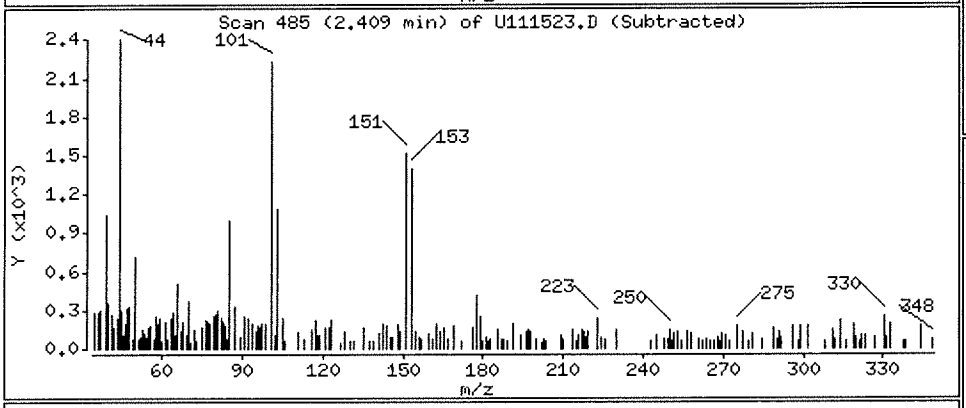
Column diameter: 0.18

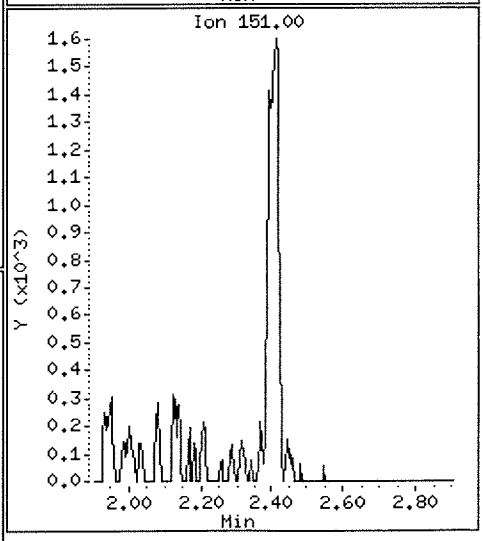
138 Freon TF

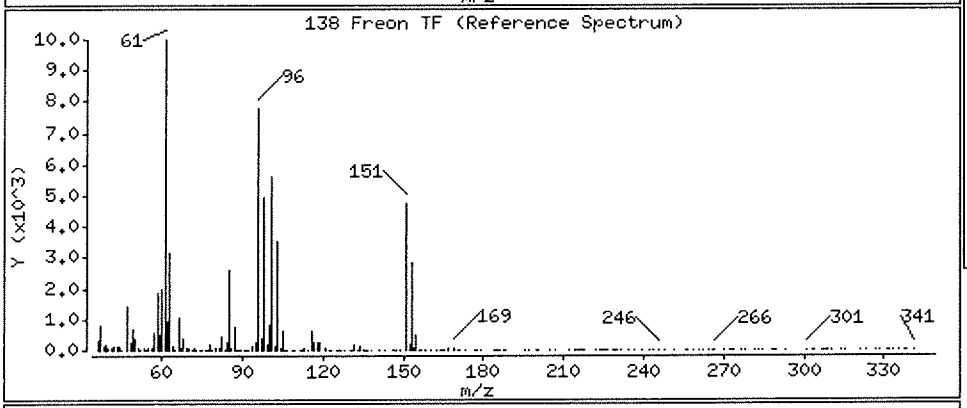
Concentration: 1.02 ug/l

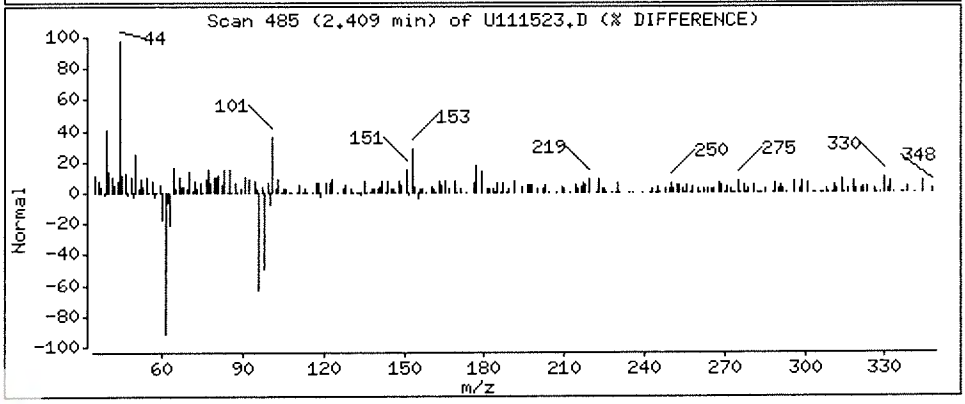












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111524.D Page 1
Report Date: 05-Dec-2019 16:57

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111524.D
Lab Smp Id: HS19110644-07 Client Smp ID: HS19110644-07
Inj Date : 15-NOV-2019 20:01
Operator : PC Inst ID: VOA9.i
Smp Info : HS19110644-07;HS19110644-07;;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:56 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 23
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

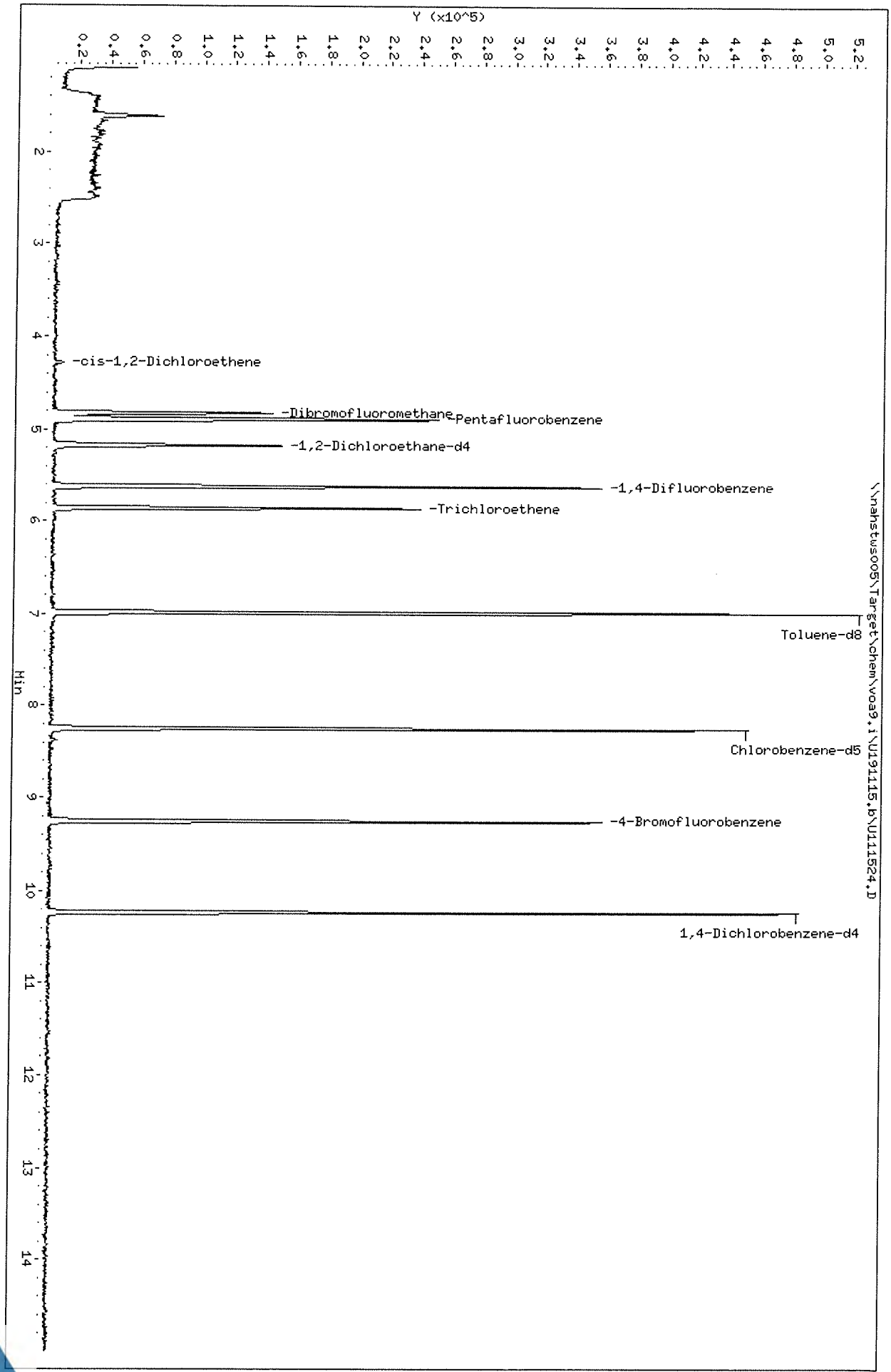
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.890	4.894	(1.000)	164948	50.0000	
* 36 1,4-Difluorobenzene	114	5.621	5.625	(1.000)	260689	50.0000	
* 47 Chlorobenzene-d5	117	8.245	8.249	(1.000)	226011	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	116714	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	83620	50.7486	50.74
$ 69 4-Bromofluorobenzene	95	9.253	9.254	(1.122)	82645	47.3586	47.35
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.987)	74768	45.9458	45.94
$ 48 Toluene-d8	98	6.985	6.986	(0.847)	298454	53.1848	53.18
27 cis-1,2-Dichloroethene	96	4.279	4.286	(0.875)	2346	1.24863	1.24(a)
38 Trichloroethene	130	5.857	5.861	(1.042)	70783	41.0097	41.00

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa9,i\U191115,b\U111524.D
Date : 15-NOV-2019 20:01
Client ID: HS19110644-07
Sample Info: HS19110644-07;HS19110644-07;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111524.D

Date : 15-NOV-2019 20:01

Client ID: HS19110644-07

Instrument: VOA9.i

Sample Info: HS19110644-07;HS19110644-07;;;

Purge Volume: 5.0

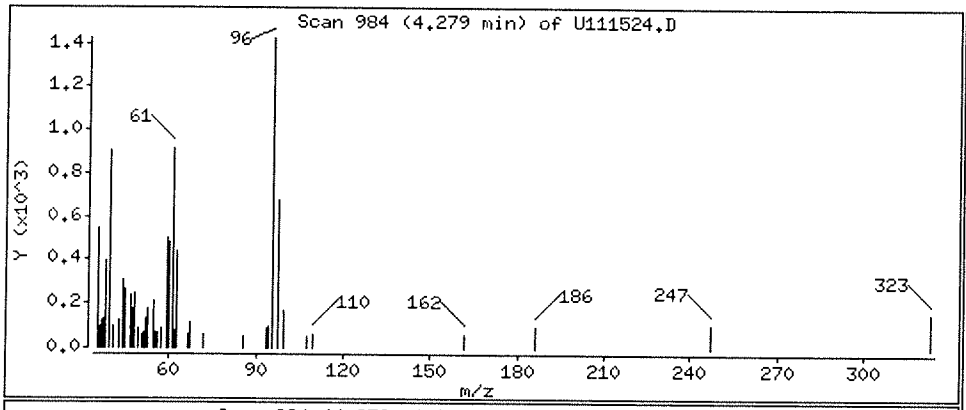
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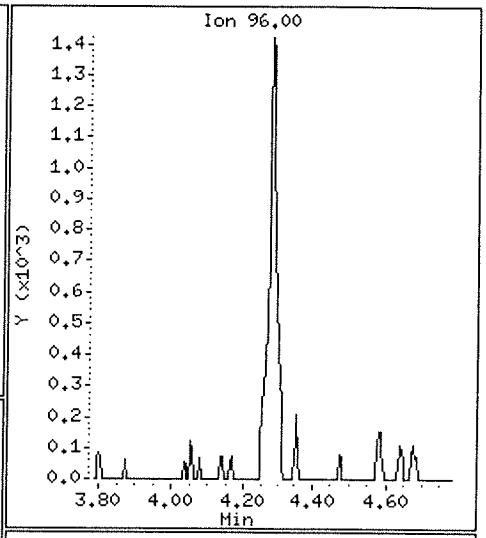
Column phase: DB624

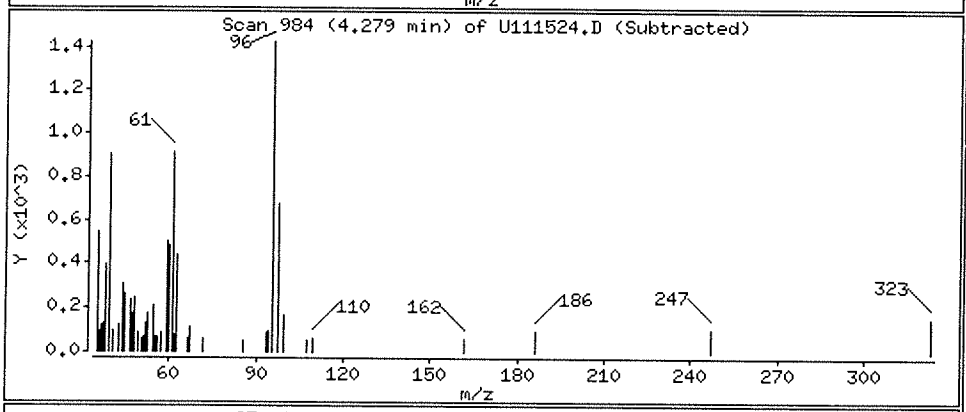
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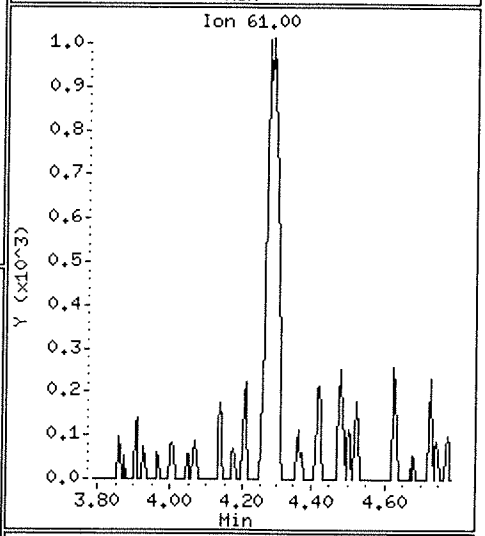
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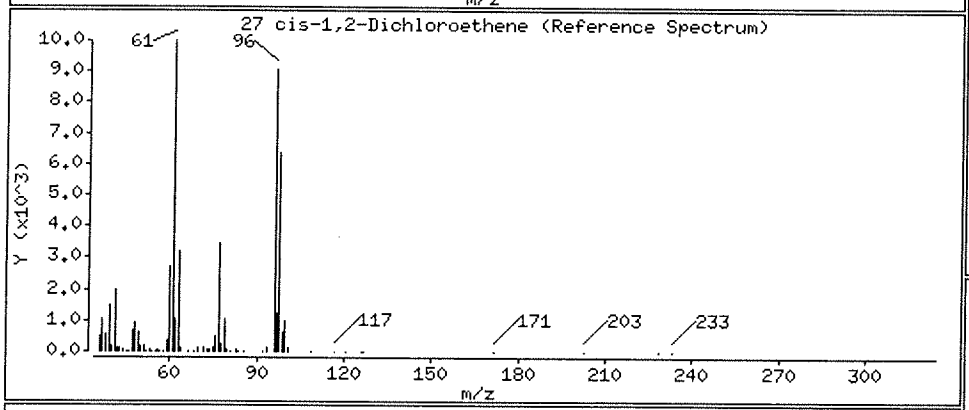
Concentration: 1.24 ug/l

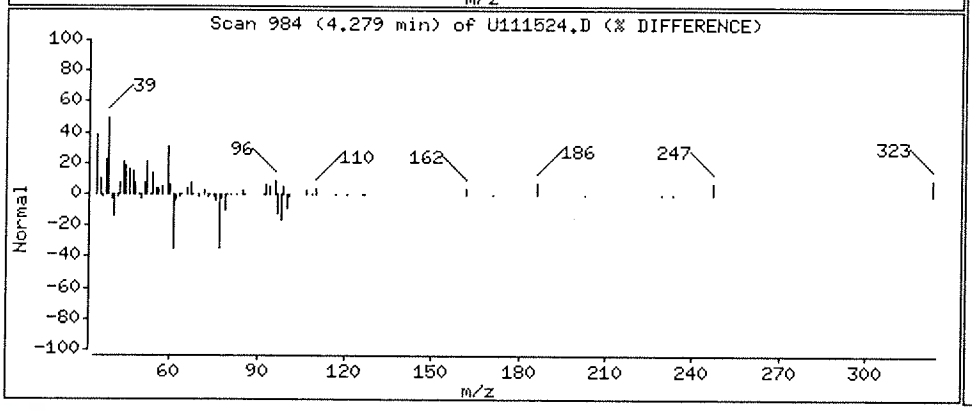


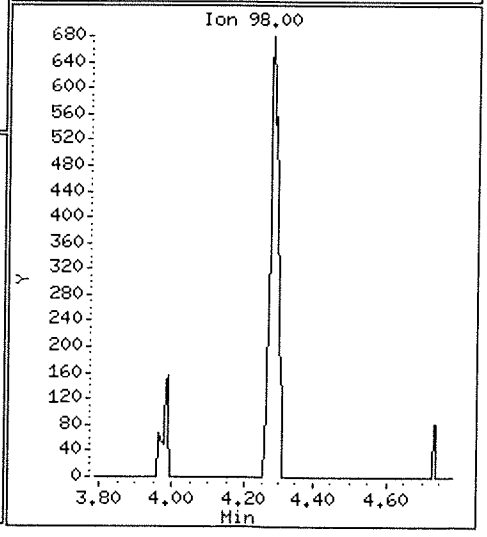












Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111524.D

Date : 15-NOV-2019 20:01

Client ID: HS19110644-07

Instrument: VOA9.i

Sample Info: HS19110644-07;HS19110644-07;;;

Purge Volume: 5.0

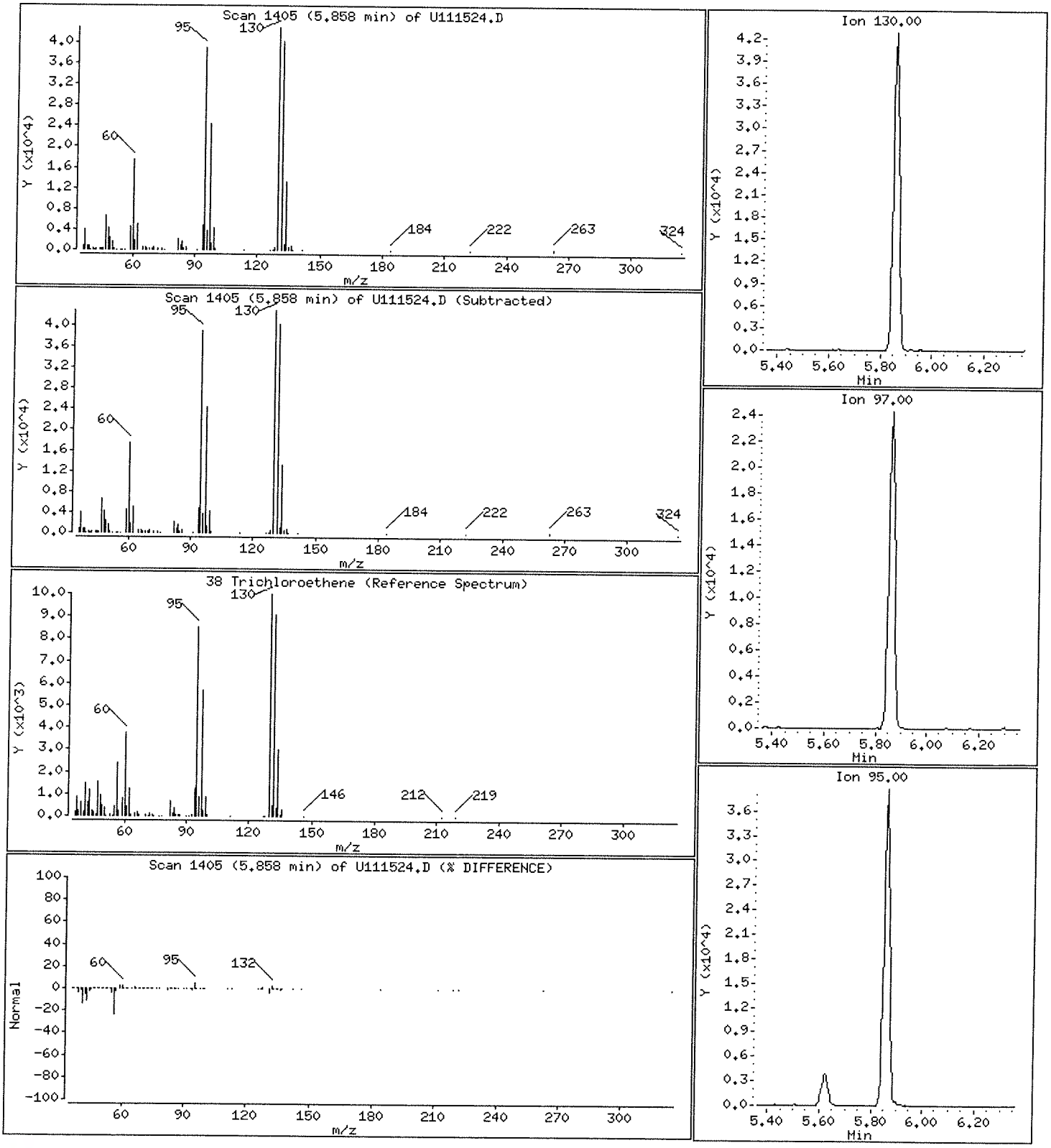
Operator: PC

Column phase: DB624

Column diameter: 0.18

38 Trichloroethene

Concentration: 41.00 ug/l



Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111525.D Page 1
Report Date: 05-Dec-2019 16:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa9.i\U191115.b\U111525.D
Lab Smp Id: CCV-END Client Smp ID: CCV-END
Inj Date : 15-NOV-2019 20:25
Operator : PC Inst ID: VOA9.i
Smp Info : CCV-END;CCV-END;2;;
Misc Info : 180315V9;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa9.i\U191115.b\8260C.m
Meth Date : 05-Dec-2019 16:55 DevakG Quant Type: ISTD
Cal Date : 12-NOV-2019 14:05 Cal File: U111208.D
Als bottle: 24 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

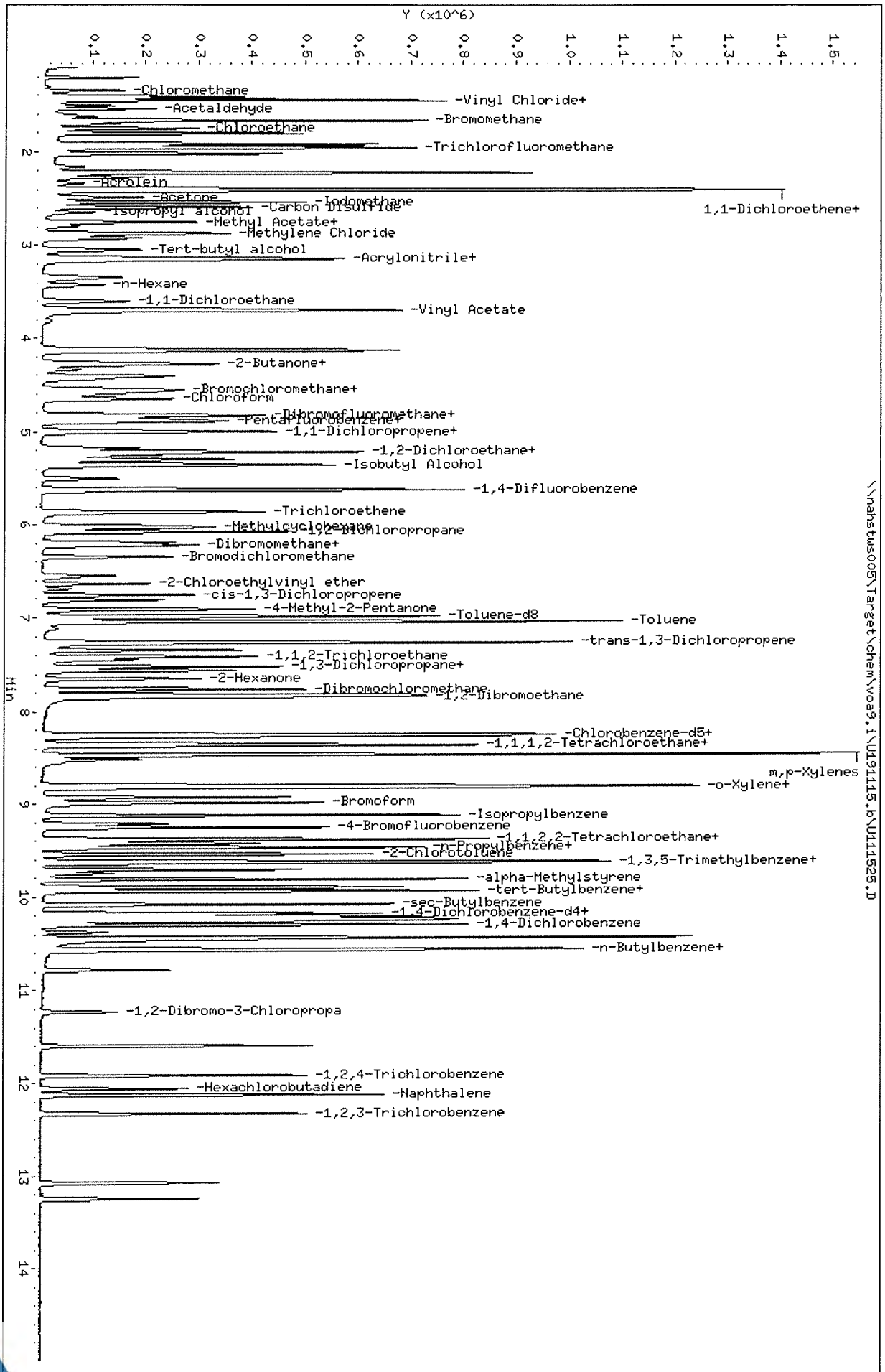
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.894	4.894	(1.000)	183416	50.0000	
* 36 1,4-Difluorobenzene	114	5.625	5.625	(1.000)	343755	50.0000	
* 47 Chlorobenzene-d5	117	8.249	8.249	(1.000)	310938	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	10.232	10.232	(1.000)	164481	50.0000	
$ 35 1,2-Dichloroethane-d4	65	5.171	5.171	(1.057)	108337	50.0000	59.28
$ 69 4-Bromofluorobenzene	95	9.254	9.254	(1.122)	121437	50.0000	50.53
$ 30 Dibromofluoromethane	113	4.826	4.826	(0.986)	104930	50.0000	57.83
$ 48 Toluene-d8	98	6.986	6.986	(0.847)	400566	50.0000	51.88
60 1,1,1,2-Tetrachloroethane	131	8.346	8.346	(1.012)	98555	50.0000	44.49
31 1,1,1-Trichloroethane	97	4.826	4.826	(0.986)	142830	50.0000	52.34
68 1,1,2,2-Tetrachloroethane	83	9.388	9.388	(0.918)	166739	50.0000	57.14
138 Freon TF	101	2.405	2.405	(0.491)	232136	50.0000	56.73
53 1,1,2-Trichloroethane	83	7.417	7.417	(0.899)	90257	50.0000	55.86
22 1,1-Dichloroethane	63	3.600	3.600	(0.736)	152472	50.0000	58.57
11 1,1-Dichloroethene	96	2.401	2.401	(0.491)	249580	50.0000	58.25
32 1,1-Dichloropropene	75	5.002	5.002	(0.889)	121650	50.0000	52.77
93 1,2,3-Trichlorobenzene	180	12.331	12.331	(1.205)	130244	50.0000	50.34
71 1,2,3-Trichloropropane	75	9.422	9.422	(0.921)	152766	50.0000	54.66
90 1,2,4-Trichlorobenzene	180	11.919	11.919	(1.165)	139099	50.0000	47.50
79 1,2,4-Trimethylbenzene	105	9.940	9.940	(0.971)	405407	50.0000	53.14
89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.098)	27550	50.0000	48.14
57 1,2-Dibromoethane	107	7.848	7.848	(0.951)	117932	50.0000	50.40
88 1,2-Dichlorobenzene	146	10.566	10.566	(1.033)	257071	50.0000	51.88

Data File: \\nahstws005\Target\chem\voa9.i\U191115.b\U111525.D Page 2
Report Date: 05-Dec-2019 16:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	5.250	5.250	(0.933)	131880	50.0000	51.53
42	1,2-Dichloropropane	63	6.078	6.078	(1.081)	97431	50.0000	62.33
75	1,3,5-Trimethylbenzene	105	9.625	9.625	(0.941)	371828	50.0000	51.88
83	1,3-Dichlorobenzene	146	10.176	10.176	(0.995)	229544	50.0000	47.16
54	1,3-Dichloropropane	76	7.563	7.563	(0.917)	182104	50.0000	56.36
84	1,4-Dichlorobenzene	146	10.254	10.254	(1.002)	249718	50.0000	47.38
26	2,2-Dichloropropane	77	4.272	4.272	(0.873)	76762	50.0000	36.49
24	2-Butanone	43	4.339	4.339	(0.887)	85160	100.000	127.93
76	2-Chlorotoluene	91	9.546	9.546	(0.933)	290041	50.0000	54.43
52	2-Hexanone	43	7.649	7.649	(0.927)	150507	100.000	110.82
77	4-Chlorotoluene	91	9.636	9.636	(0.942)	351436	50.0000	52.30
82	p-Isopropyltoluene	119	10.206	10.206	(0.997)	381058	50.0000	49.70
45	4-Methyl-2-Pentanone	43	6.914	6.914	(0.838)	209581	100.000	115.53
10	Acetone	43	2.483	2.483	(0.508)	158336	100.000	137.77
37	Benzene	78	5.216	5.216	(0.927)	415410	50.0000	55.90
74	Bromobenzene	156	9.377	9.377	(0.916)	140714	50.0000	47.31
29	Bromochloromethane	128	4.556	4.556	(0.931)	58375	50.0000	53.91
39	Bromodichloromethane	83	6.345	6.345	(1.128)	127321	50.0000	55.55
66	Bromoform	173	8.980	8.980	(1.089)	75335	50.0000	43.19
6	Bromomethane	94	1.666	1.666	(0.341)	300522	50.0000	57.59
19	Carbon Disulfide	76	2.588	2.588	(0.529)	472467	100.000	116.13
34	Carbon Tetrachloride	117	4.995	4.995	(0.888)	116366	50.0000	48.70
59	Chlorobenzene	112	8.271	8.271	(1.003)	306604	50.0000	48.69
7	Chloroethane	64	1.752	1.752	(0.358)	176968	50.0000	69.41
28	Chloroform	83	4.654	4.654	(0.951)	179195	50.0000	57.79
3	Chloromethane	50	1.344	1.344	(0.275)	100870	50.0000	61.97
27	cis-1,2-Dichloroethene	96	4.286	4.286	(0.876)	109697	50.0000	52.50
46	cis-1,3-Dichloropropene	75	6.757	6.757	(1.201)	137002	50.0000	54.74
55	Dibromochloromethane	129	7.758	7.758	(0.940)	105739	50.0000	44.63
44	Dibromomethane	93	6.187	6.187	(1.100)	76761	50.0000	55.10
2	Dichlorodifluoromethane	85	1.205	1.205	(0.246)	94456	50.0000	50.63
61	Ethylbenzene	106	8.369	8.369	(1.015)	156620	50.0000	49.89
91	Hexachlorobutadiene	225	12.061	12.061	(1.179)	40257	50.0000	40.62
67	Isopropylbenzene	105	9.122	9.122	(1.106)	460901	50.0000	51.77
62	m,p-Xylenes	106	8.470	8.470	(1.027)	403039	100.000	104.91
17	Methylene Chloride	84	2.869	2.869	(0.586)	97590	50.0000	56.95
87	n-Butylbenzene	91	10.554	10.554	(1.032)	326346	50.0000	50.82
73	n-Propylbenzene	91	9.471	9.471	(0.926)	524301	50.0000	54.53
92	Naphthalene	128	12.129	12.129	(1.185)	441623	50.0000	56.75
63	o-Xylene	106	8.807	8.807	(1.068)	196353	50.0000	50.44
81	sec-Butylbenzene	105	10.082	10.082	(0.985)	419781	50.0000	52.11
64	Styrene	104	8.822	8.822	(1.070)	361433	50.0000	53.39
78	tert-Butylbenzene	119	9.898	9.898	(0.967)	319057	50.0000	52.41
56	Tetrachloroethene	166	7.522	7.522	(0.912)	111866	50.0000	47.46
50	Toluene	91	7.046	7.046	(0.854)	485252	50.0000	51.72
20	trans-1,2-Dichloroethene	96	3.143	3.143	(0.642)	94880	50.0000	53.13
51	trans-1,3-Dichloropropene	75	7.259	7.259	(1.291)	133301	50.0000	47.12
38	Trichloroethene	130	5.861	5.861	(1.042)	109491	50.0000	48.10
8	Trichlorofluoromethane	101	1.955	1.955	(0.400)	437649	50.0000	55.60
5	Vinyl Chloride	62	1.422	1.422	(0.291)	252415	50.0000	61.88



Data File: \\nahstws005\Target\chem\voa9,i\U191115,b\U111525.D
Date : 15-NOV-2019 20:25
Client ID: CCV-END
Sample Info: CCV-END;CCV-END;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

HS19110644 Wet Chem Raw Data

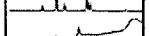
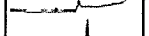
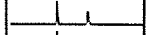
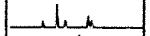
ALS WO# HS19110644

Sequence: 111319
Last Update Operator: alshs.nouser

HS1911 0644

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	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
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	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/13/2019 1:45:21 PM -06:00
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Sequence: 111319
Last Update Operator: alshs.nouser

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	me	Status	Inject Time
	HS19110644-09		Unknown	GC4	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/13/2019 10:03:57 PM -06:00
	HS19110644-09DF20		Unknown	GC5	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/13/2019 10:20:32 PM -06:00
	HS19110644-10		Unknown	GC6	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/13/2019 10:37:07 PM -06:00
	HS19110644-10DF20		Unknown	GC7	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/13/2019 10:53:43 PM -06:00
	HS19110377-01	9056_W	Unknown	GA4	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/13/2019 11:10:19 PM -06:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/13/2019 11:26:57 PM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/13/2019 11:43:31 PM -06:00
	HS19110377-02DF20	9056_W	Unknown	GA5	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 12:00:10 AM -06:00
	HS19110377-03DF20		Unknown	GA6	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 12:16:45 AM -06:00
	HS19110377-04		Unknown	GA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 12:33:21 AM -06:00
	HS19110377-10		Unknown	GA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 12:49:57 AM -06:00
	HS19110377-11		Unknown	GB1	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 1:06:33 AM -06:00
	HS19110446-01DF10		Unknown	GC8	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 1:23:08 AM -06:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 1:39:45 AM -06:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 1:56:21 AM -06:00

Sequence: 111319
Injection #6: STD6

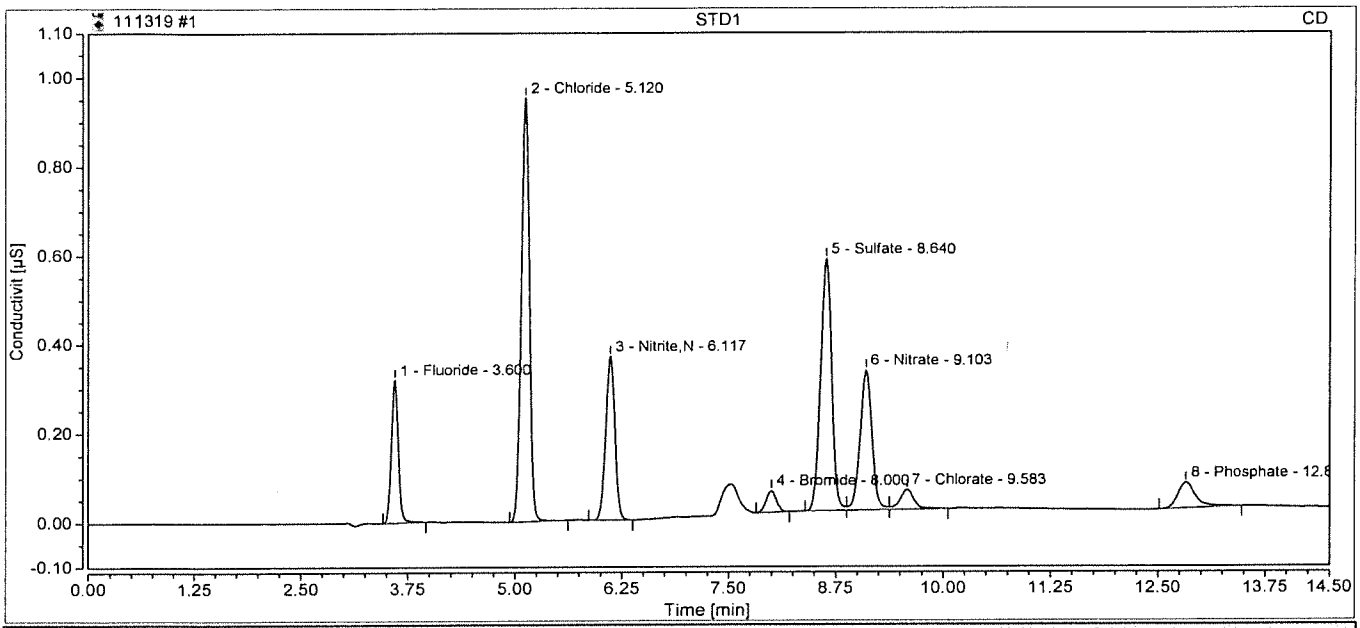
Calibration

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:



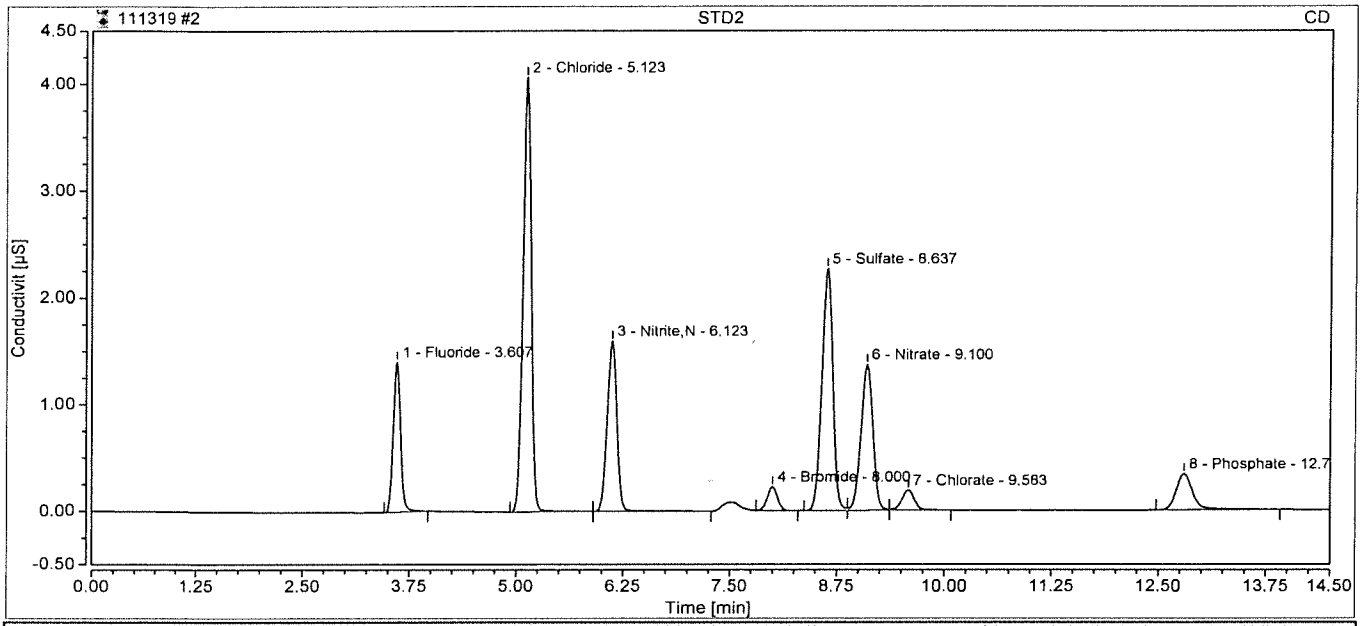
Integration Results

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:



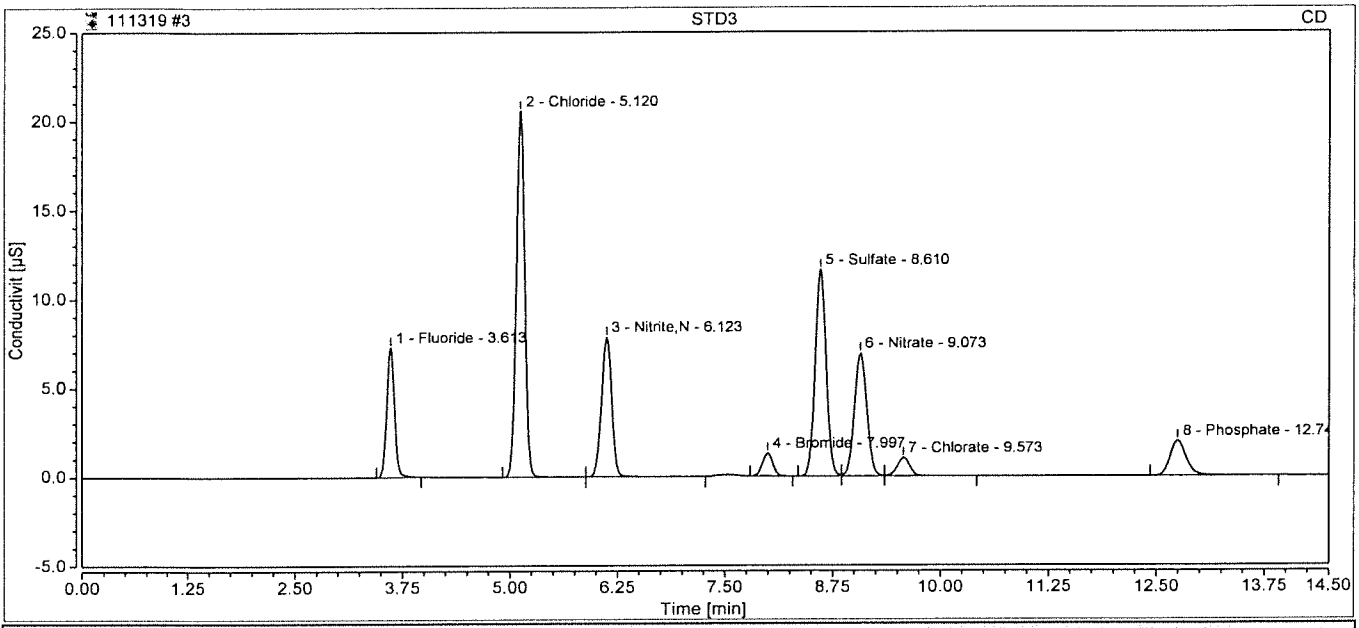
Integration Results

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:



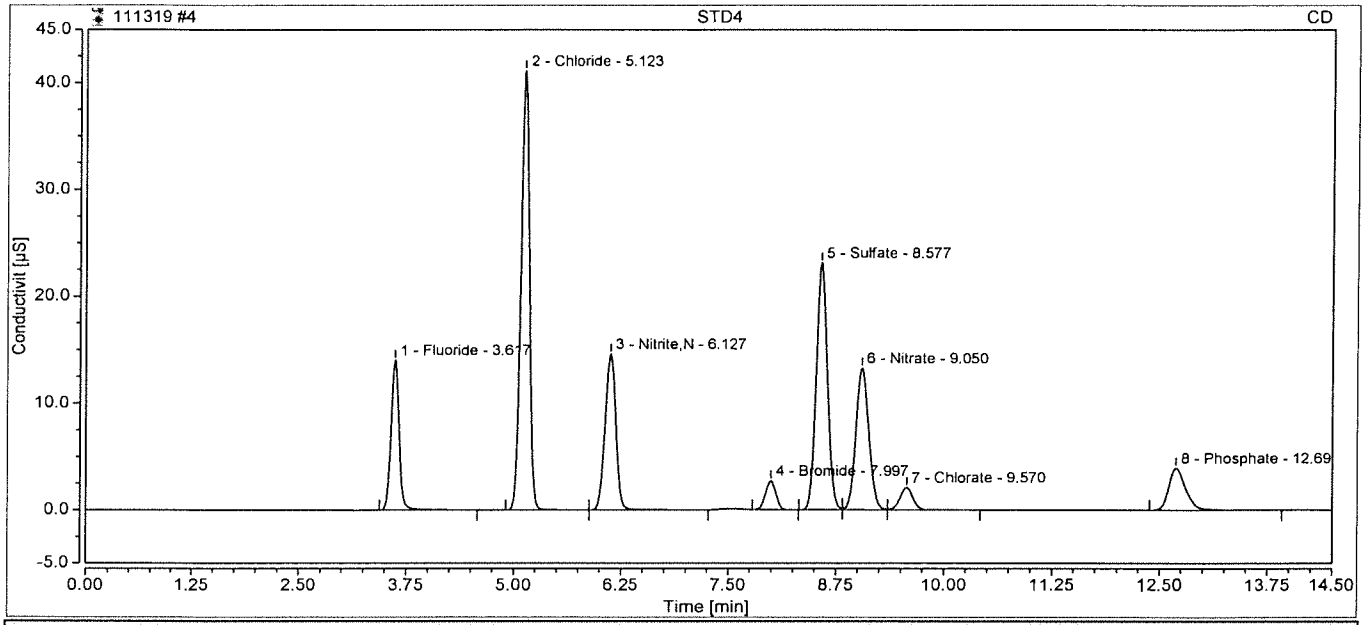
Integration Results

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:



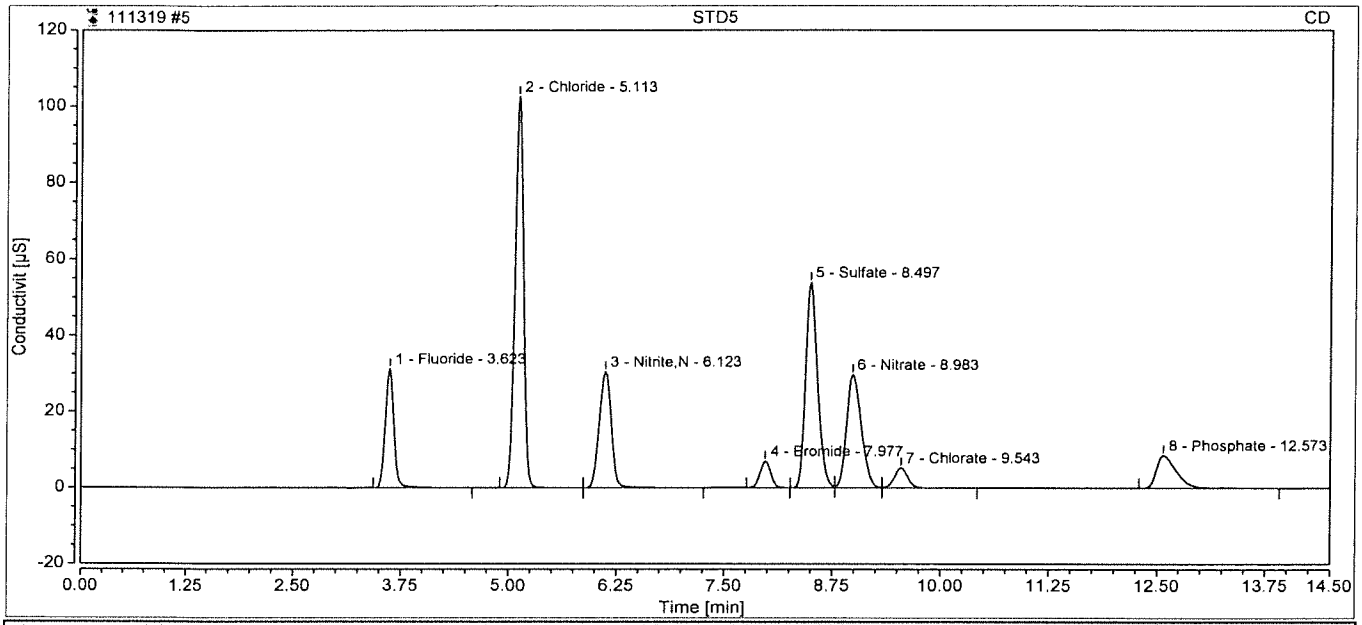
Integration Results

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:



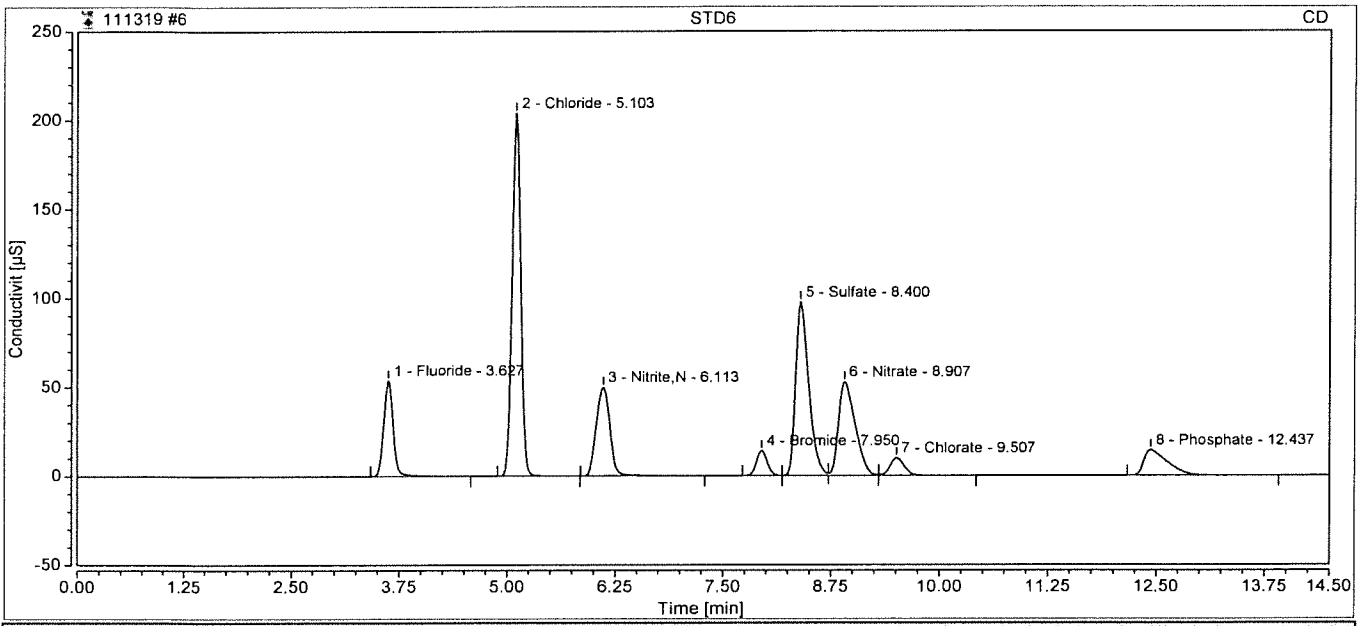
Integration Results

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:



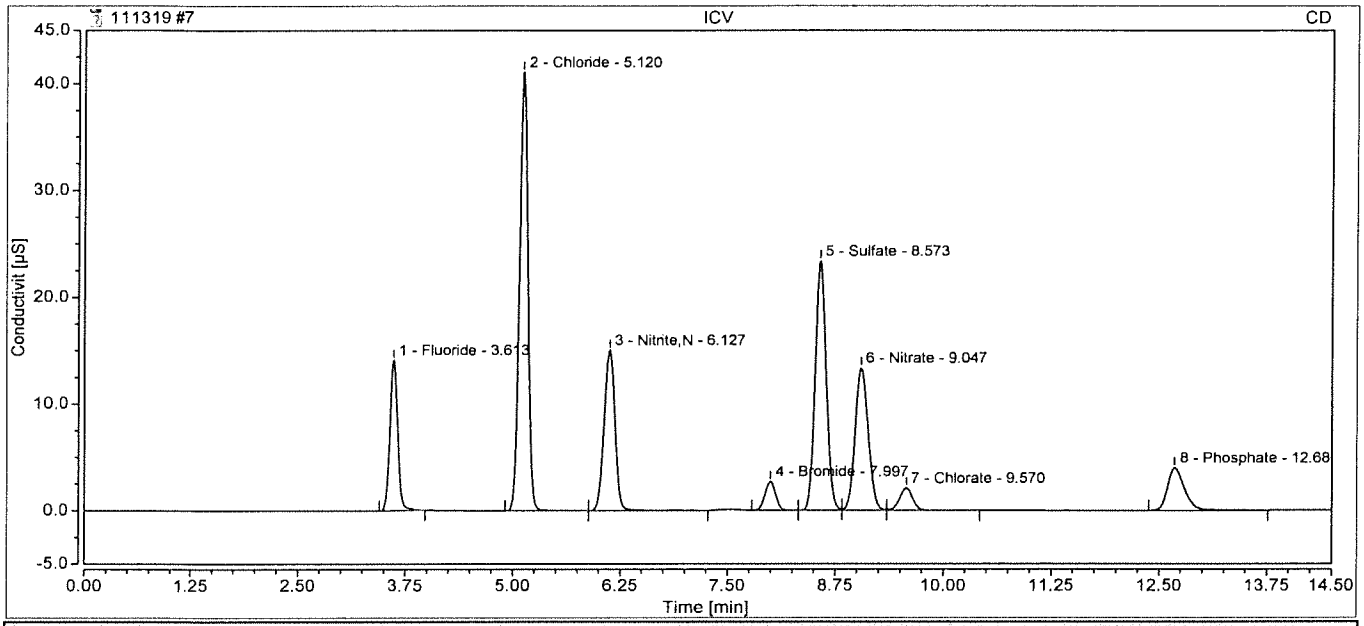
Integration Results

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:



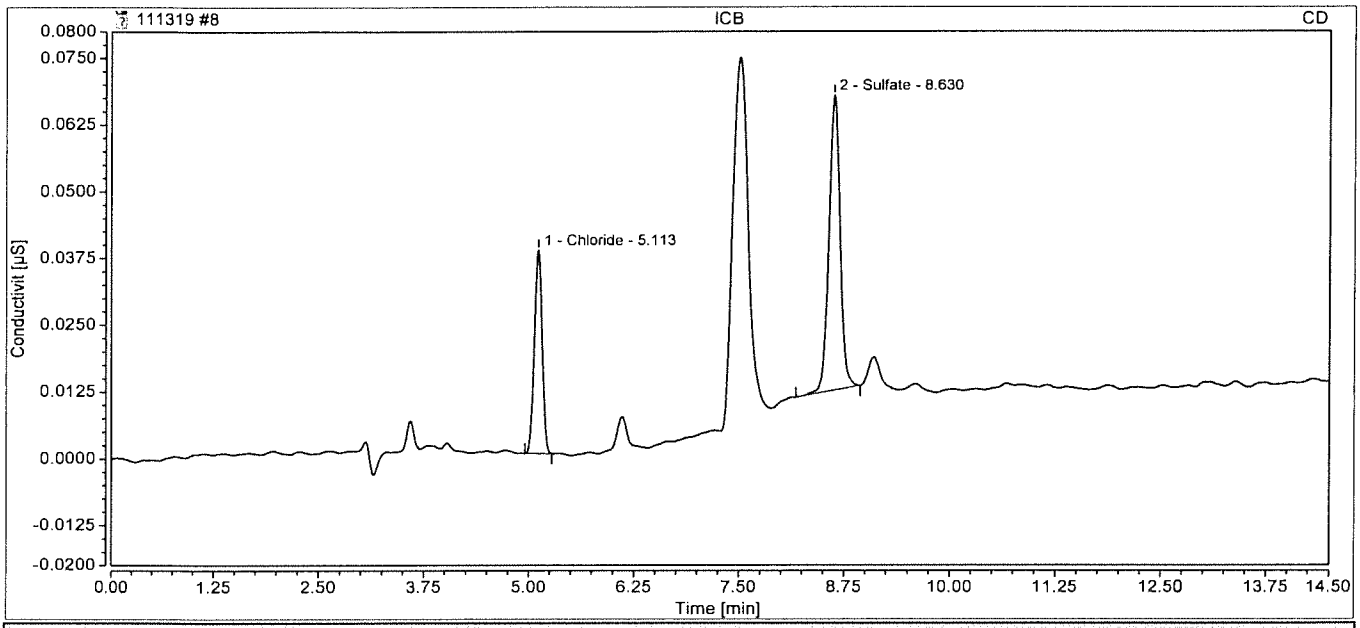
Integration Results

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:



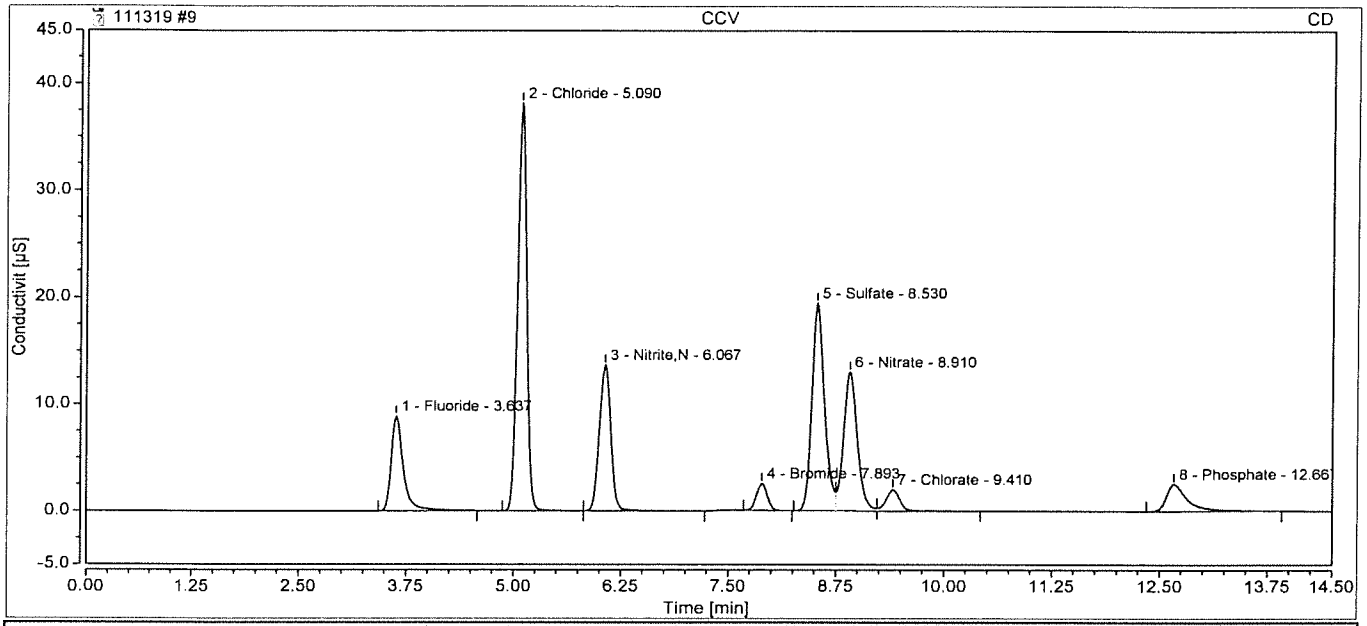
Integration Results

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**	

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:	**11/13/2019 13:28**	*Sample Weight:*	**1.0000**

Run Time:

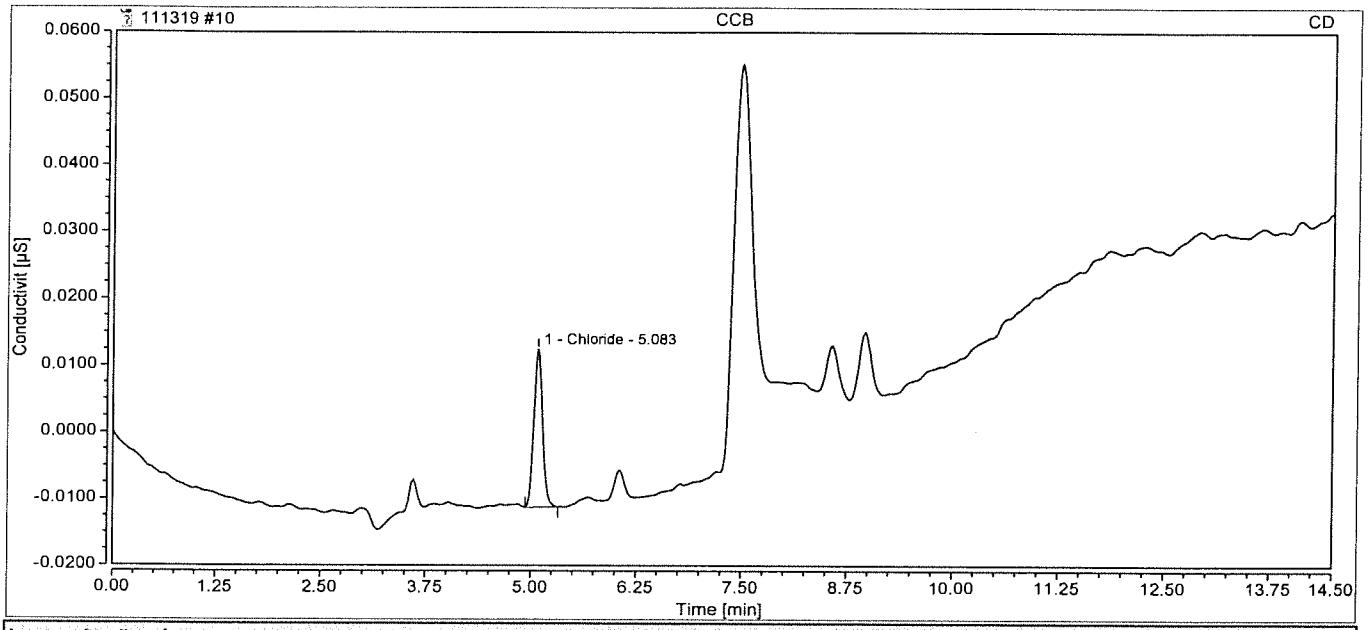


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.64	Fluoride	BMB	1.441	3.8943	3.8943	1.0000
2	5.09	Chloride	BMB	4.686	19.9540	19.9540	1.0000
3	6.07	Nitrite,N	BMB	2.118	4.1352	4.1352	1.0000
4	7.89	Bromide	BMB	0.371	3.7340	3.7340	1.0000
5	8.53	Sulfate	BM	3.288	19.1596	19.1596	1.0000
6	8.91	Nitrate	M	2.413	4.1247	4.1247	1.0000
7	9.41	Chlorate	MB	0.380	4.0516	4.0516	1.0000
8	12.67	Phosphate	BMB	0.746	3.2633	3.2633	1.0000
Total:			**0.000**	**15.444**		**62.32**	

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:	**11/13/2019 13:45**	*Sample Weight:*	**1.0000**
Run Time:			



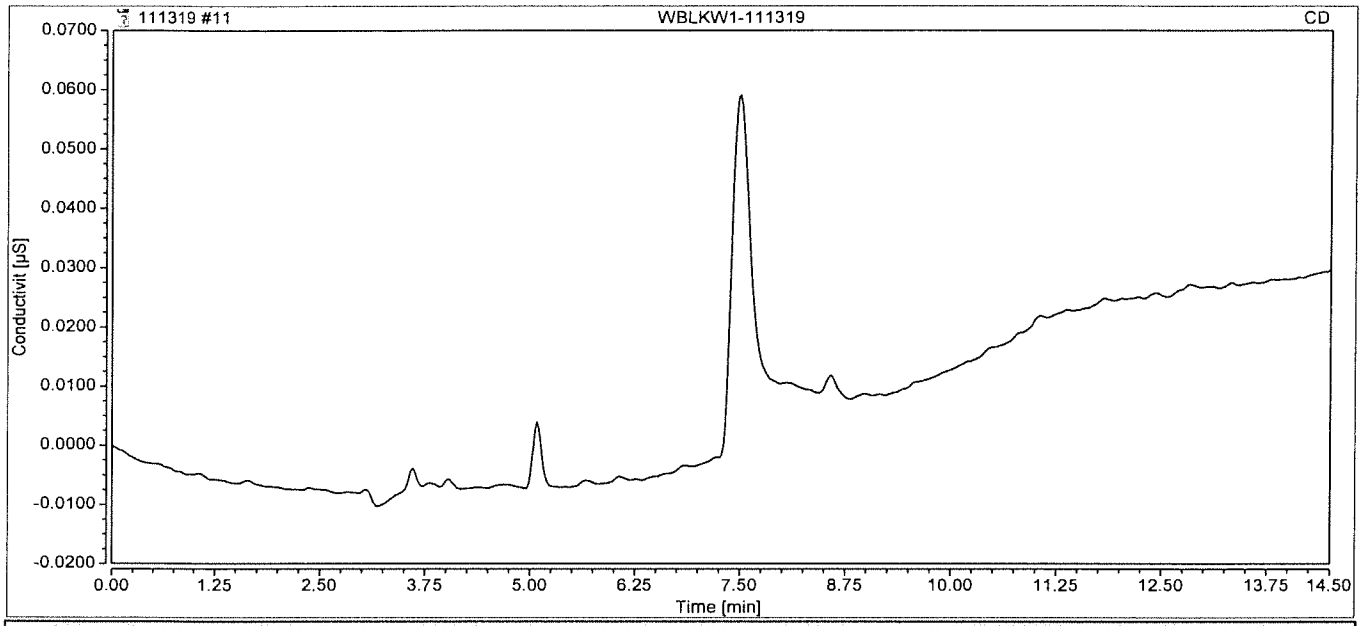
Integration Results

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	5.08	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**	

11 WBLKW1-111319

Sample Name:	**WBLKW1-111319**	*Injection Volume:*	**5.00**
Vial Number:	**RD5**	*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:	**11/13/2019 14:02**	*Sample Weight:*	**1.0000**

Run Time:



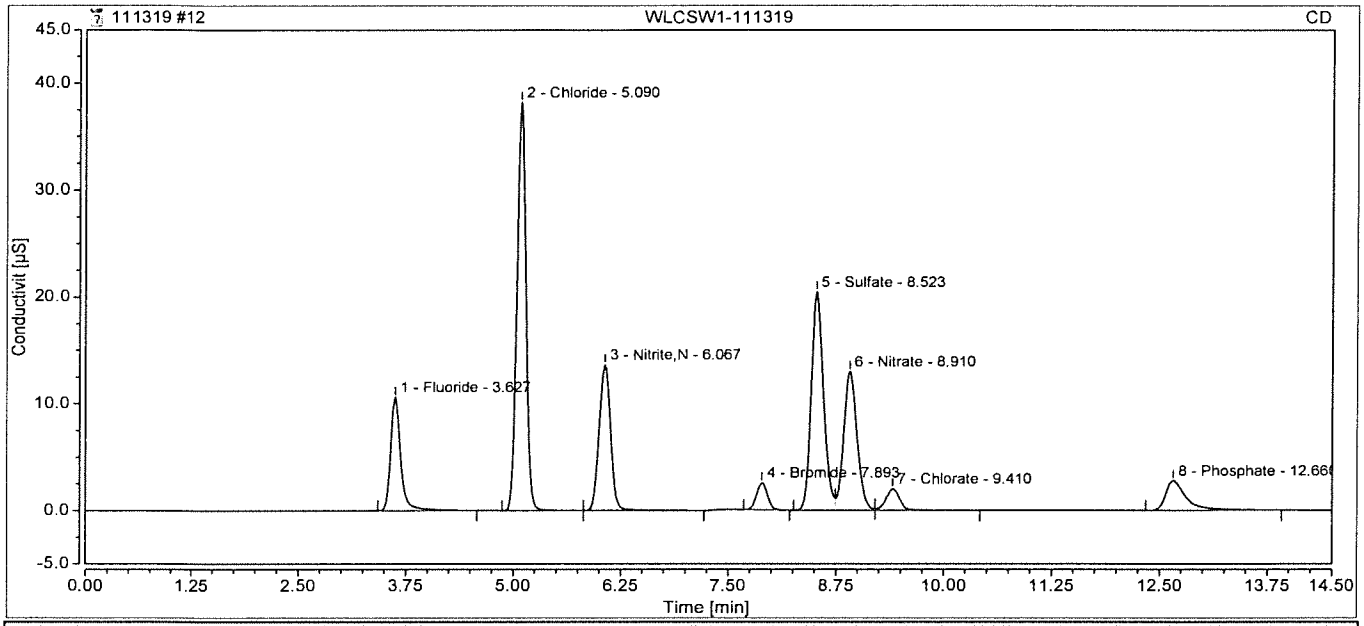
Integration Results

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
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 *WLCSW1-111319*

Sample Name:	**WLCSW1-111319**	*Injection Volume:*	**5.00**
Vial Number:	**RD6**	*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:	**11/13/2019 14:18**	*Sample Weight:*	**1.0000**

Run Time:



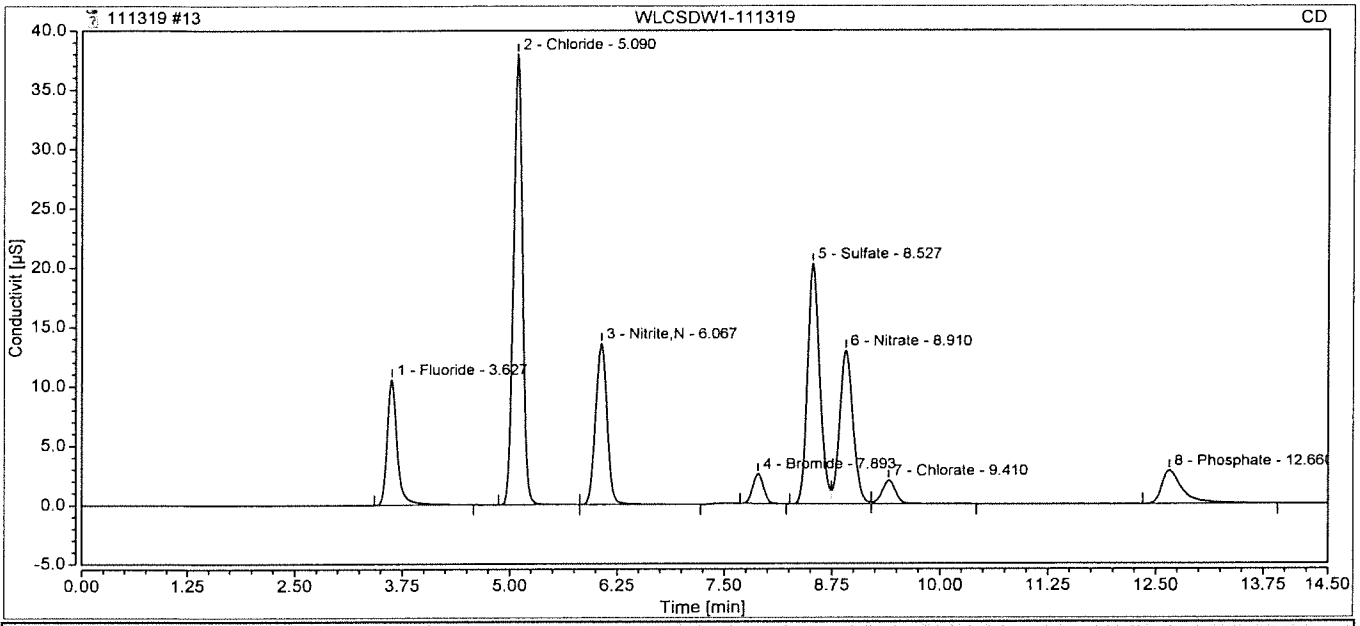
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.468	3.9646	3.9646	1.0000
2	5.09	Chloride	BMB	4.674	19.9023	19.9023	1.0000
3	6.07	Nitrite,N	BMB	2.112	4.1248	4.1248	1.0000
4	7.89	Bromide	BMB	0.373	3.7541	3.7541	1.0000
5	8.52	Sulfate	BM	3.364	19.5979	19.5979	1.0000
6	8.91	Nitrate	M	2.352	4.0210	4.0210	1.0000
7	9.41	Chlorate	MB	0.375	3.9958	3.9958	1.0000
8	12.66	Phosphate	BMB	0.786	3.4340	3.4340	1.0000
Total:			**0.000**	**15.504**		**62.79**	

13 WLCSDW1-111319

Sample Name:	**WLCSDW1-111319**	*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:	**11/13/2019 14:35**	*Sample Weight:*	**1.0000**

Run Time:

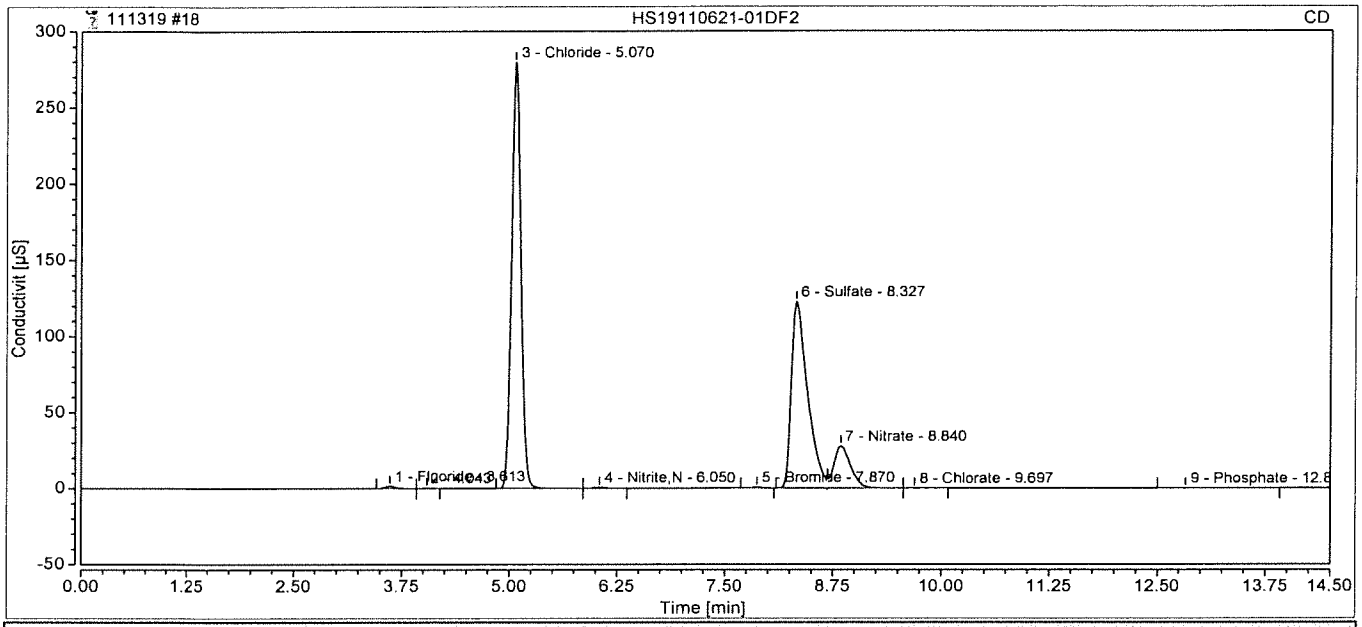


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.449	3.9154	3.9154	1.0000
2	5.09	Chloride	BMB	4.639	19.7555	19.7555	1.0000
3	6.07	Nitrite,N	BMB	2.098	4.0967	4.0967	1.0000
4	7.89	Bromide	BMB	0.370	3.7201	3.7201	1.0000
5	8.53	Sulfate	BM	3.328	19.3888	19.3888	1.0000
6	8.91	Nitrate	M	2.335	3.9913	3.9913	1.0000
7	9.41	Chlorate	MB	0.371	3.9592	3.9592	1.0000
8	12.66	Phosphate	BMB	0.791	3.4563	3.4563	1.0000
Total:			**0.000**	**15.381**		**62.28**	

18 HS19110621-01DF2

Sample Name:	**HS19110621-01DF2**	*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:*	**2.0000**
Recording Time:	**11/13/2019 15:58**	*Sample Weight:*	**1.0000**
Run Time:			



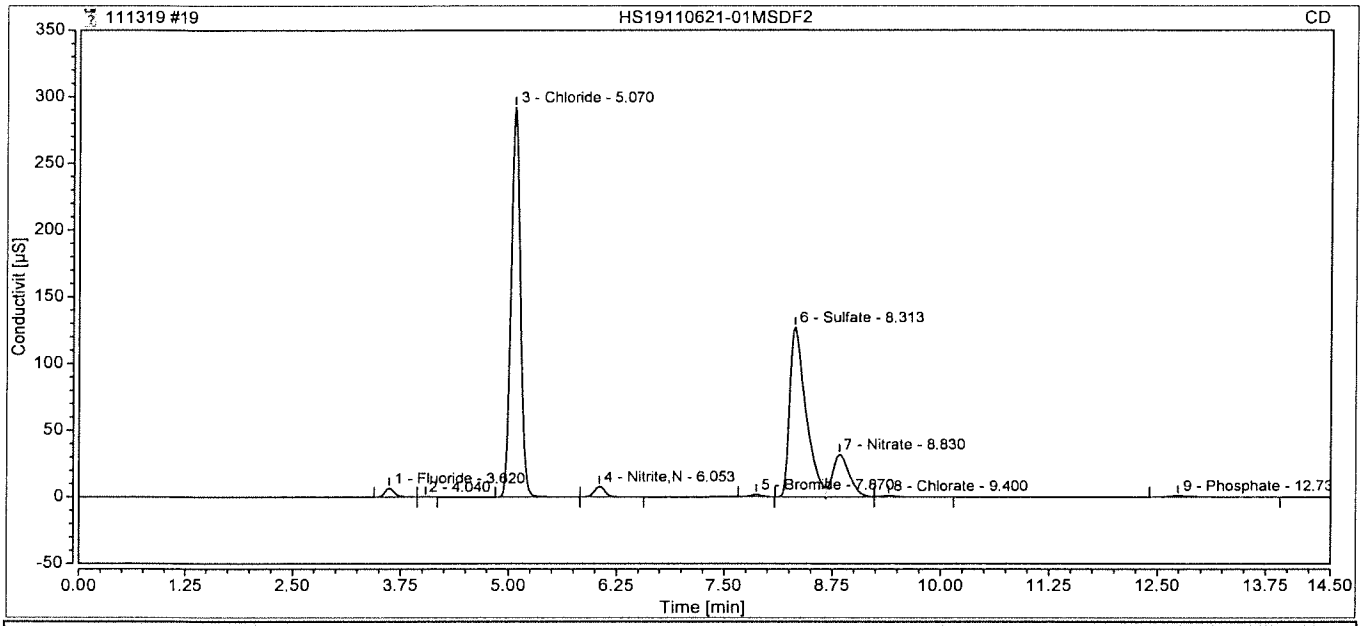
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.201	0.5562	1.1124	2.0000
3	5.07	Chloride	BMB	34.964	148.5218	297.0436	2.0000
4	6.05	Nitrite,N	BMB	0.102	0.1978	0.3955	2.0000
5	7.87	Bromide	BMB	0.069	0.7400	1.4799	2.0000
6	8.33	Sulfate	BM	26.660	155.2438	310.4877	2.0000
7	8.84	Nitrate	M	6.161	10.5025	21.0051	2.0000
8	9.70	Chlorate	MB	0.005	0.0738	0.1476	2.0000
9	12.83	Phosphate	BMB	0.040	0.2217	0.4434	2.0000
Total:			**0.000**	**68.202**		**632.12**	

19 HS19110621-01MSDF2

Sample Name:	**HS19110621-01MSDF2**	*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:*	**2.0000**
Recording Time:	**11/13/2019 16:14**	*Sample Weight:*	**1.0000**

Run Time:



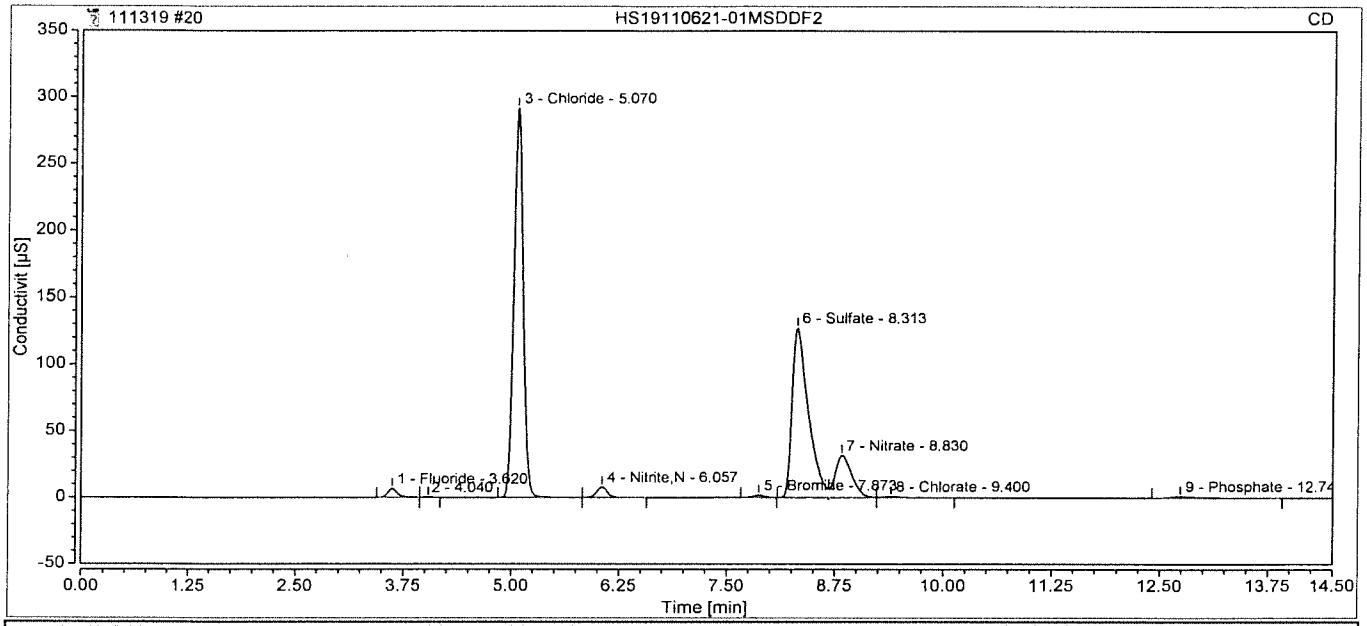
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.887	2.4015	4.8030	2.0000
3	5.07	Chloride	BMB	36.619	155.5521	311.1042	2.0000
4	6.05	Nitrite,N	BMB	1.162	2.2698	4.5395	2.0000
5	7.87	Bromide	BMB	0.252	2.5470	5.0939	2.0000
6	8.31	Sulfate	BM	27.692	161.2513	322.5026	2.0000
7	8.83	Nitrate	M	7.195	12.2635	24.5270	2.0000
8	9.40	Chlorate	MB	0.194	2.0805	4.1611	2.0000
9	12.74	Phosphate	BMB	0.389	1.7241	3.4481	2.0000
Total:			**0.000**	**74.391**		**680.18**	

20 HS19110621-01MSDDF2

Sample Name:	**HS19110621-01MSDDF2**	*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:*	**2.0000**
Recording Time:	**11/13/2019 16:31**	*Sample Weight:*	**1.0000**

Run Time:



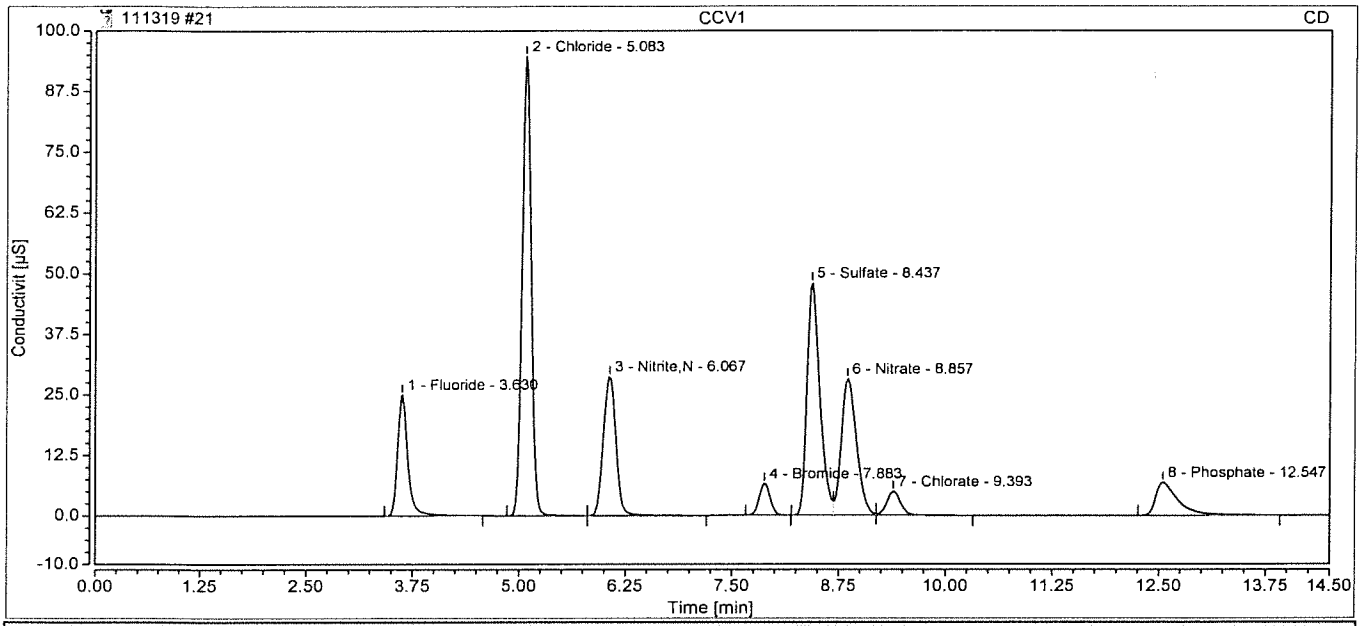
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.882	2.3895	4.7790	2.0000
3	5.07	Chloride	BMB	36.531	155.1752	310.3504	2.0000
4	6.06	Nitrite,N	BMB	1.155	2.2552	4.5105	2.0000
5	7.87	Bromide	BMB	0.250	2.5257	5.0515	2.0000
6	8.31	Sulfate	BM	27.677	161.1644	322.3287	2.0000
7	8.83	Nitrate	M	7.169	12.2196	24.4391	2.0000
8	9.40	Chlorate	MB	0.193	2.0683	4.1365	2.0000
9	12.74	Phosphate	BMB	0.395	1.7515	3.5029	2.0000
Total:			**0.000**	**74.252**		**679.10**	

21 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:	**11/13/2019 16:48**	*Sample Weight:*	**1.0000**

Run Time:



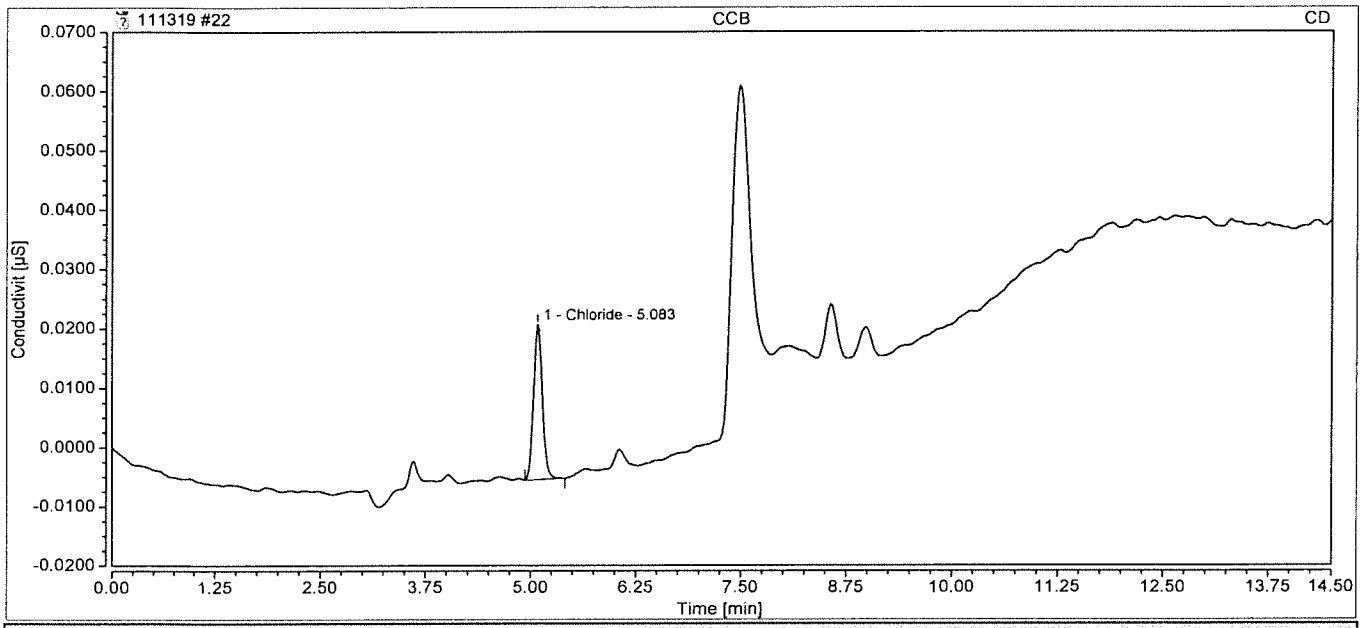
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	3.546	9.5573	9.5573	1.0000
2	5.08	Chloride	BMB	11.663	49.5823	49.5823	1.0000
3	6.07	Nitrite,N	BMB	4.923	9.6142	9.6142	1.0000
4	7.88	Bromide	BMB	0.978	9.7501	9.7501	1.0000
5	8.44	Sulfate	BM	8.373	48.7627	48.7627	1.0000
6	8.86	Nitrate	M	5.894	10.0479	10.0479	1.0000
7	9.39	Chlorate	MB	0.945	10.0383	10.0383	1.0000
8	12.55	Phosphate	BMB	2.116	9.1637	9.1637	1.0000
Total:			**0.000**	**38.437**		**156.52**	

22 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:	**11/13/2019 17:04**	*Sample Weight:*	**1.0000**

Run Time:



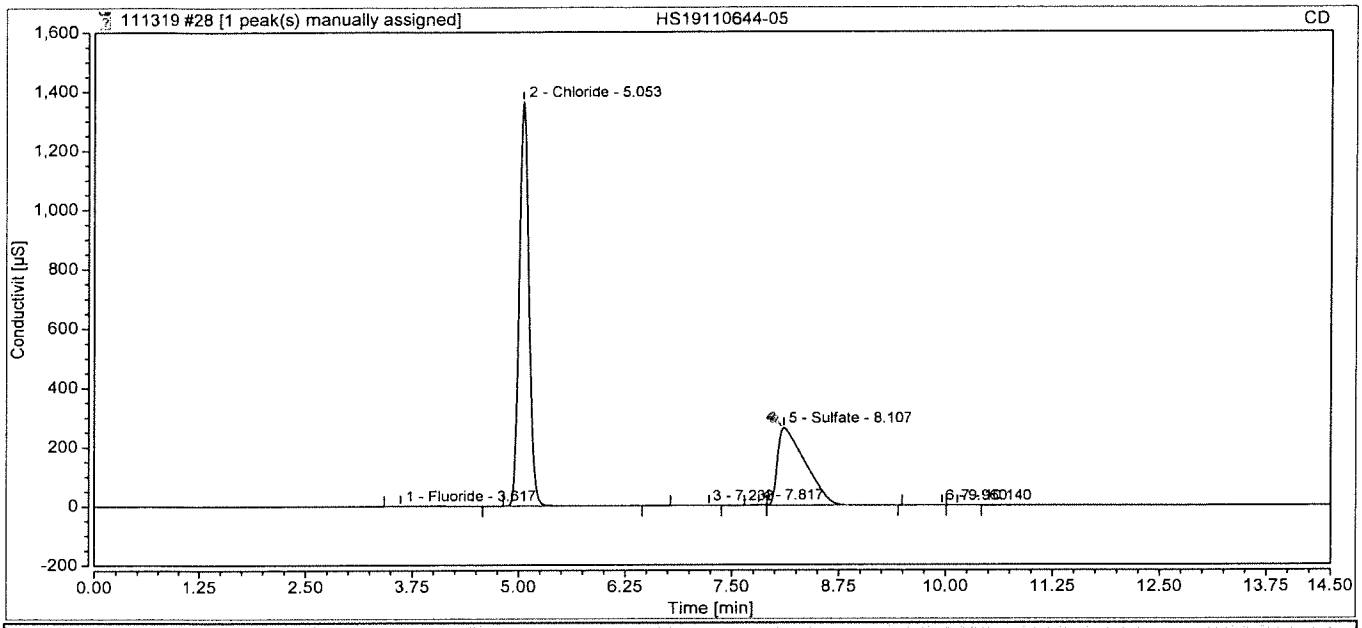
Integration Results

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	5.08	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**	

28 HS19110644-05

Sample Name:	**HS19110644-05**	*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:	**11/13/2019 18:44**	*Sample Weight:*	**1.0000**

Run Time:



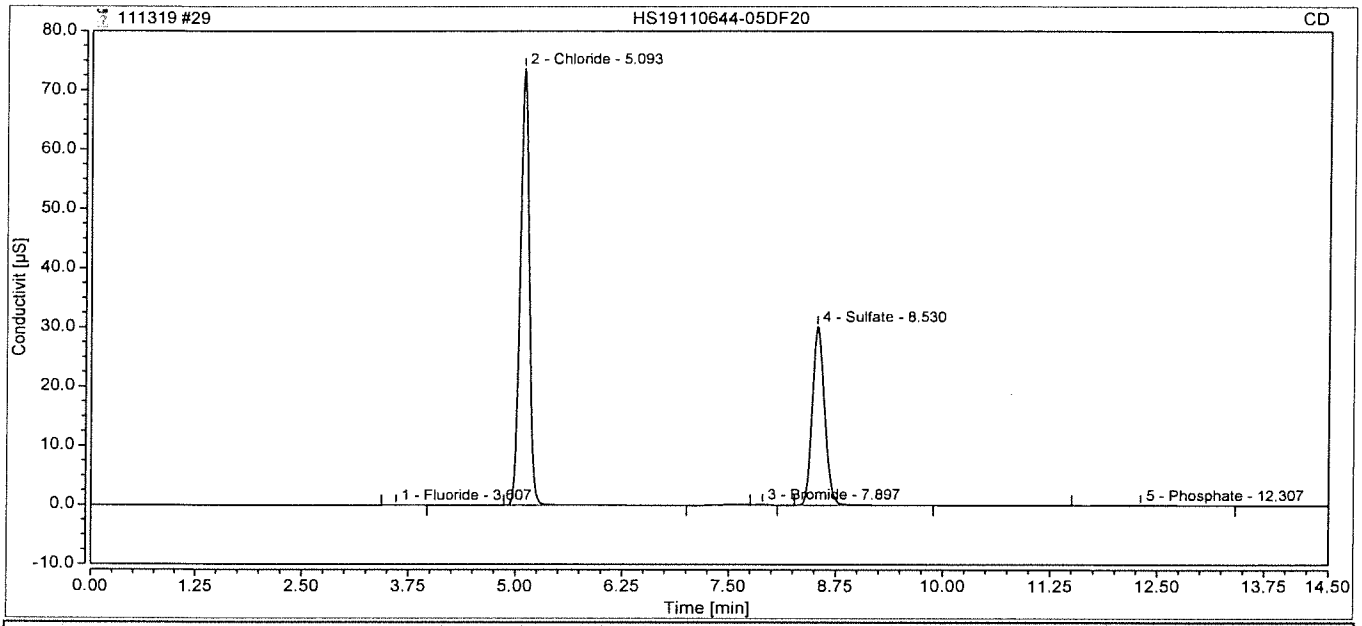
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.138	0.3871	0.3871	1.0000
2	5.05	Chloride	BMB	179.107	760.5899	760.5899	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
5	8.11	Sulfate	MB^	97.651	568.5953	568.5953	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**	**276.896**		**1329.57**	

29 *HS19110644-05DF20*

Sample Name:	**HS19110644-05DF20**	*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:*	**20.0000**
Recording Time:	**11/13/2019 19:01**	*Sample Weight:*	**1.0000**

Run Time:



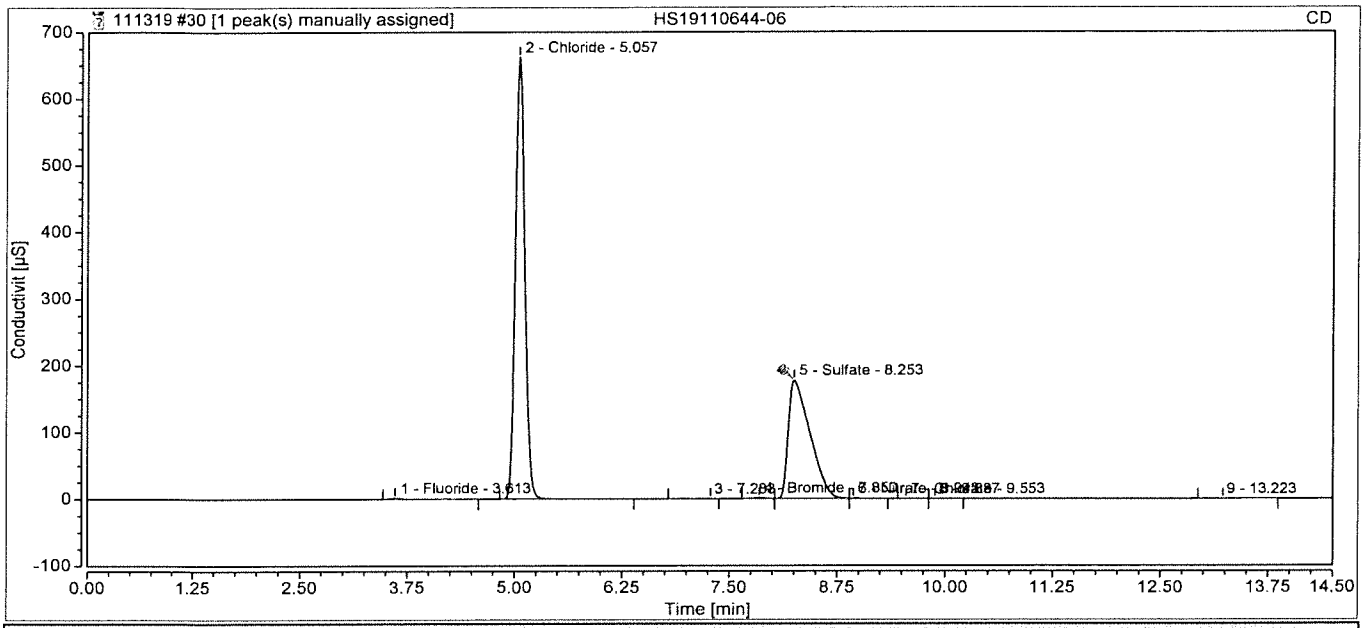
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.007	0.0330	0.6598	20.0000
2	5.09	Chloride	BMB	9.090	38.6573	773.1464	20.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	20.0000
3	7.90	Bromide	BMB	0.012	0.1690	3.3794	20.0000
4	8.53	Sulfate	BMB	5.036	29.3376	586.7519	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
5	12.31	Phosphate	BMB	0.033	0.1893	3.7853	20.0000
Total:			**0.000**	**14.178**		**1367.72**	

30 HS19110644-06

Sample Name:	**HS19110644-06**	*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:	**11/13/2019 19:17**	*Sample Weight:*	**1.0000**

Run Time:



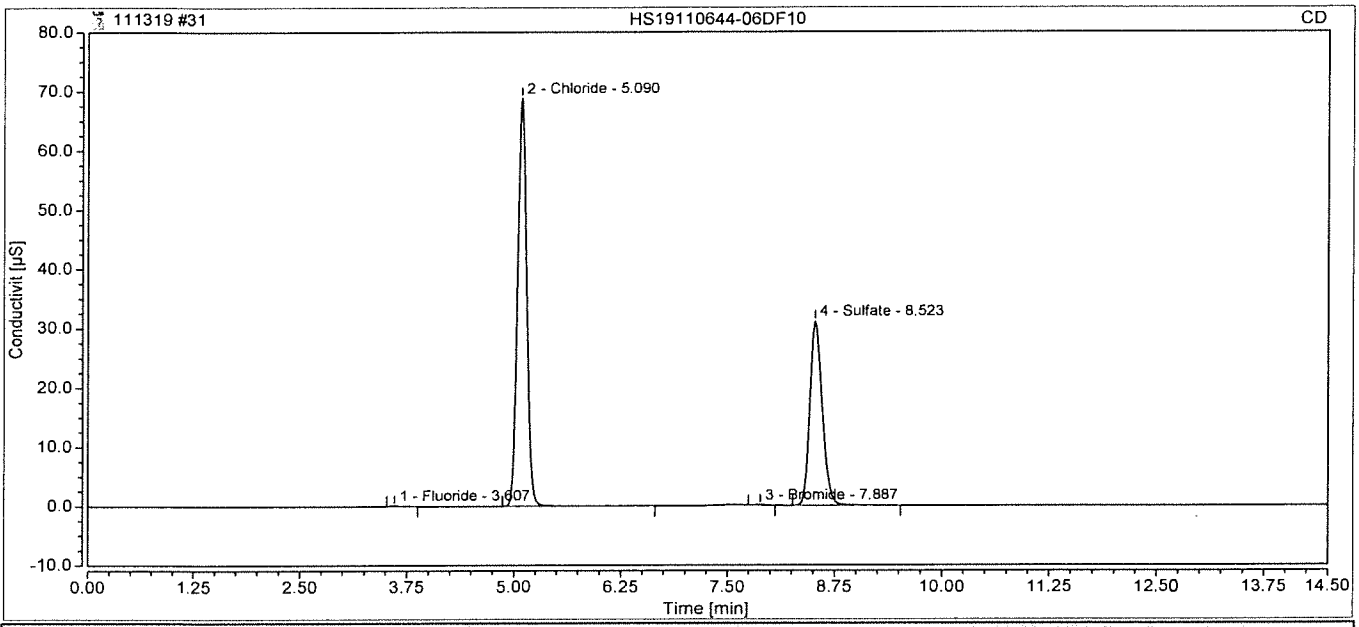
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.204	0.5628	0.5628	1.0000
2	5.06	Chloride	BMB	84.713	359.7696	359.7696	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
4	7.85	Bromide	BMB	0.174	1.7736	1.7736	1.0000
5	8.25	Sulfate	BM ^	51.679	300.9172	300.9172	1.0000
6	8.94	Nitrate	MB	0.059	0.1182	0.1182	1.0000
7	9.55	Chlorate	BM	0.003	0.0586	0.0586	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**136.831**		**663.20**	

31 HS19110644-06DF10

Sample Name:	**HS19110644-06DF10**	*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:*	**10.0000**
Recording Time:	**11/13/2019 19:34**	*Sample Weight:*	**1.0000**

Run Time:



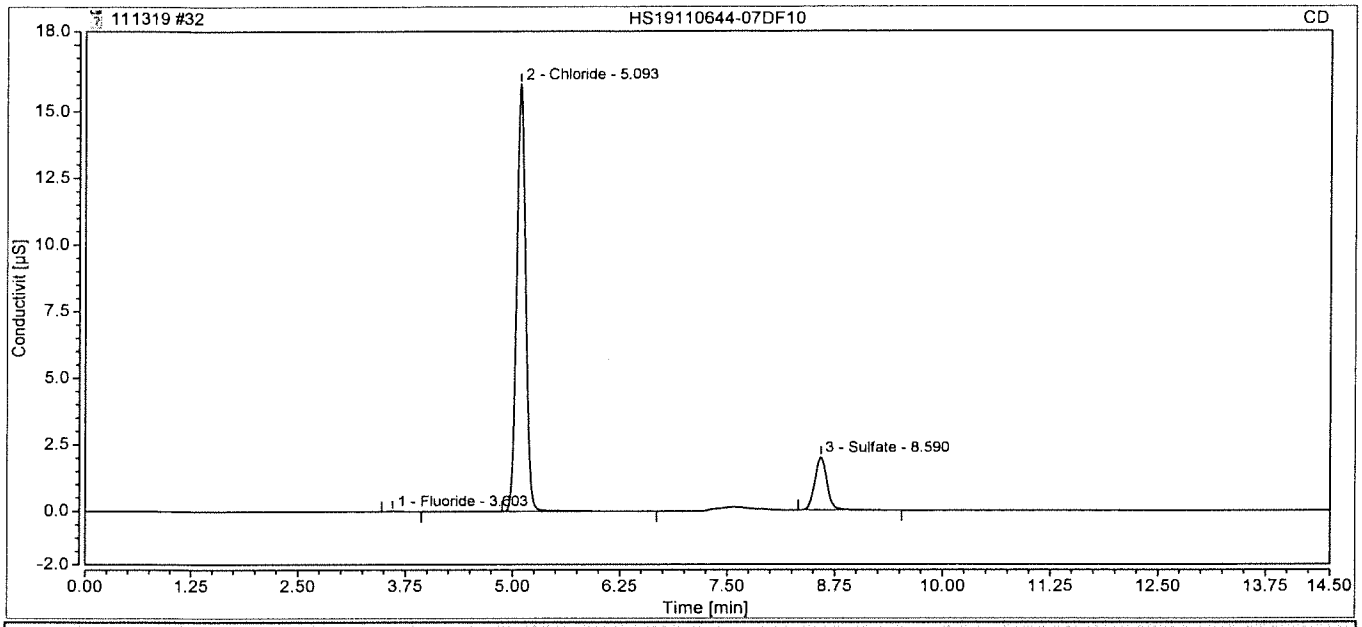
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.012	0.0468	0.4680	10.0000
2	5.09	Chloride	BMB	8.491	36.1108	361.1081	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
3	7.89	Bromide	BMB	0.011	0.1588	1.5876	10.0000
4	8.52	Sulfate	BMB	5.227	30.4456	304.4557	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**	**13.740**		**667.62**	

32 HS19110644-07DF10

Sample Name:	**HS19110644-07DF10**	*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:*	**10.0000**
Recording Time:	**11/13/2019 19:51**	*Sample Weight:*	**1.0000**

Run Time:



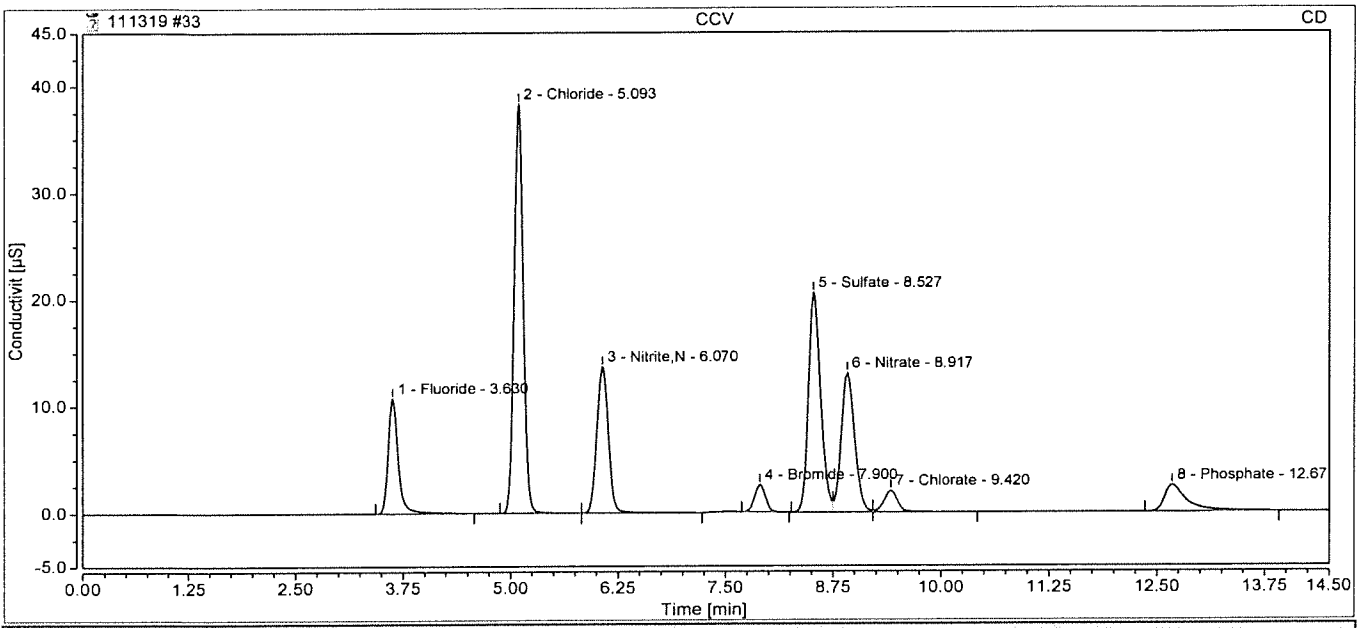
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.002	0.0212	0.2120	10.0000
2	5.09	Chloride	BMB	1.958	8.3731	83.7306	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	10.0000
3	8.59	Sulfate	BMB	0.330	1.9325	19.3253	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**	**2.290**		**103.27**	

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:	**11/13/2019 20:07**	*Sample Weight:*	**1.0000**

Run Time:



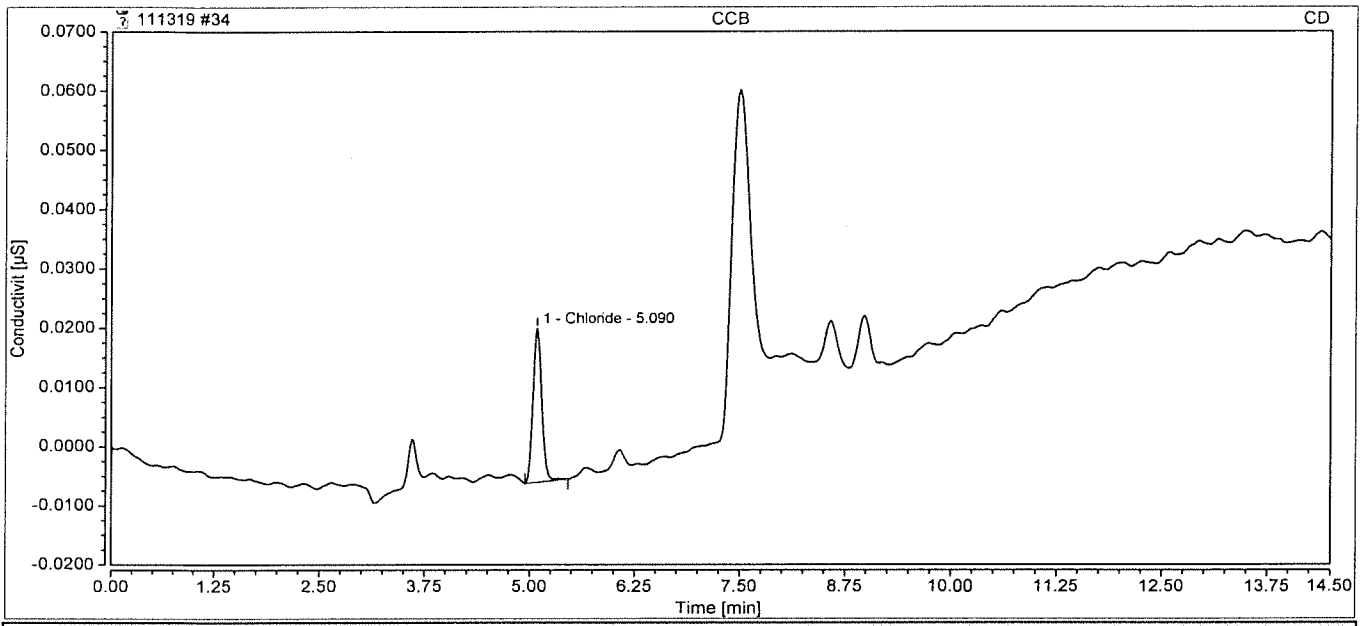
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.472	3.9770	3.9770	1.0000
2	5.09	Chloride	BMB	4.699	20.0083	20.0083	1.0000
3	6.07	Nitrite,N	BMB	2.121	4.1422	4.1422	1.0000
4	7.90	Bromide	BMB	0.375	3.7695	3.7695	1.0000
5	8.53	Sulfate	BM	3.381	19.6990	19.6990	1.0000
6	8.92	Nitrate	M	2.361	4.0360	4.0360	1.0000
7	9.42	Chlorate	MB	0.377	4.0168	4.0168	1.0000
8	12.68	Phosphate	BMB	0.774	3.3820	3.3820	1.0000
Total:			**0.000**	**15.560**		**63.03**	

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:	**11/13/2019 20:24**	*Sample Weight:*	**1.0000**

Run Time:



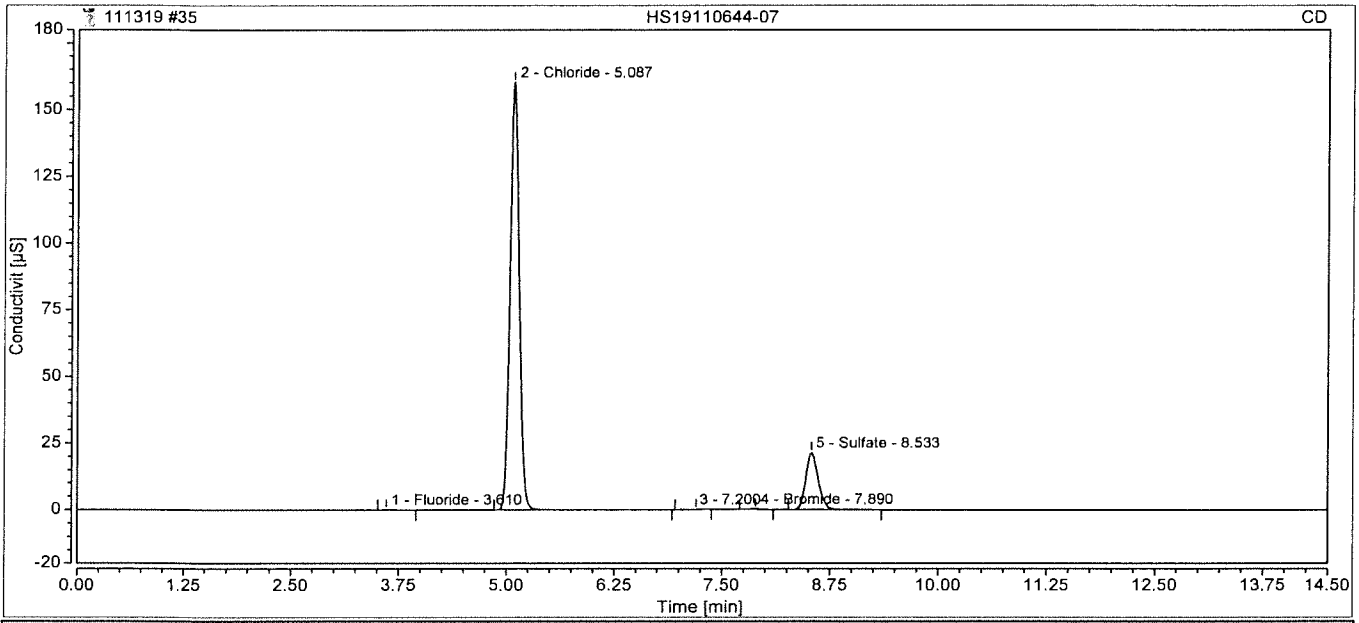
Integration Results

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	0.0706	0.0706	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**	

35 HS19110644-07

Sample Name:	**HS19110644-07**	*Injection Volume:*	**5.00**
Vial Number:	**GB6**	*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:	**11/13/2019 20:40**	*Sample Weight:*	**1.0000**

Run Time:



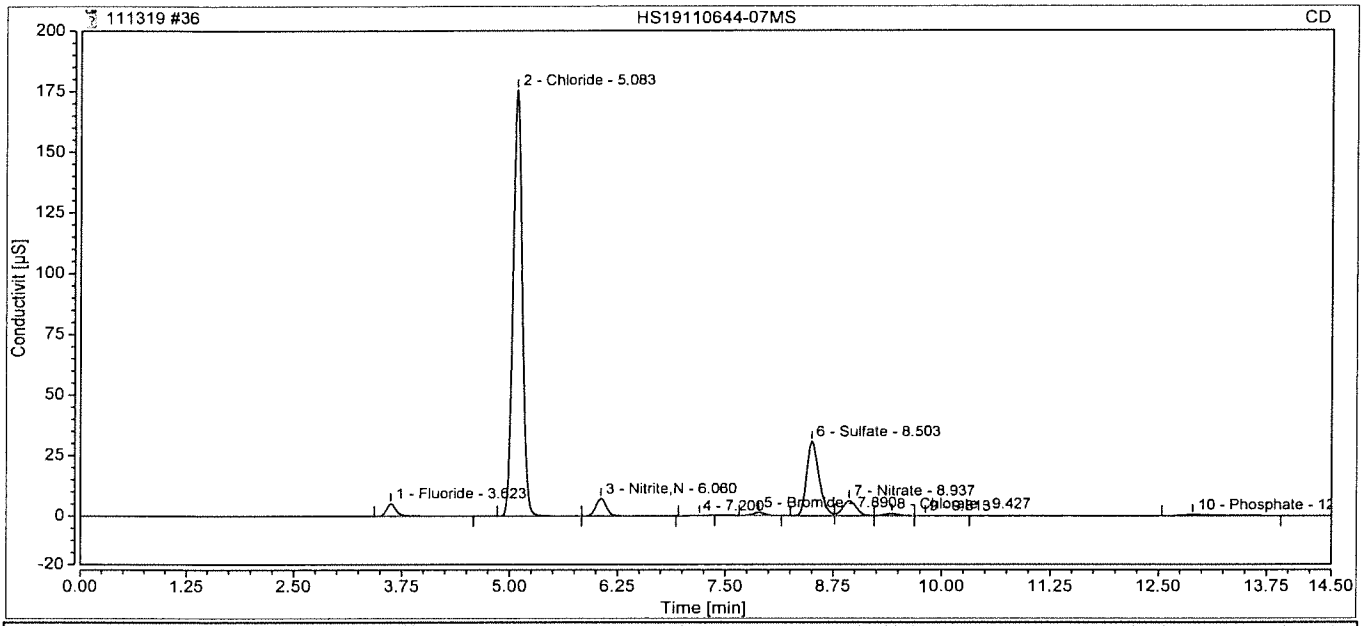
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.018	0.0640	0.0640	1.0000
2	5.09	Chloride	BMB	19.793	84.1018	84.1018	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
4	7.89	Bromide	BMB	0.029	0.3430	0.3430	1.0000
5	8.53	Sulfate	BMB	3.564	20.7631	20.7631	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**	**23.404**		**105.27**	

36 HS19110644-07MS

Sample Name:	**HS19110644-07MS**	*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:*	**1.0000**
Recording Time:	**11/13/2019 20:57**	*Sample Weight:*	**1.0000**

Run Time:



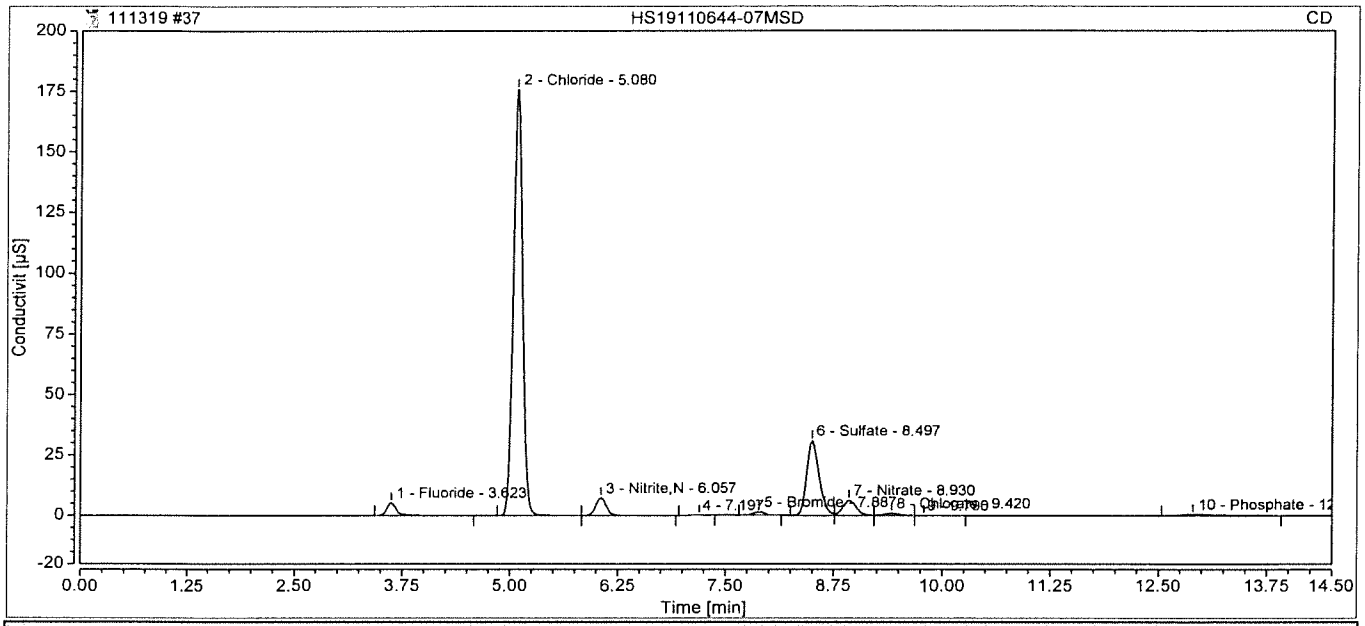
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.720	1.9531	1.9531	1.0000
2	5.08	Chloride	BMB	21.689	92.1523	92.1523	1.0000
3	6.06	Nitrite,N	BMB	1.044	2.0378	2.0378	1.0000
5	7.89	Bromide	BMB	0.200	2.0297	2.0297	1.0000
6	8.50	Sulfate	BM	5.124	29.8502	29.8502	1.0000
7	8.94	Nitrate	M	1.123	1.9288	1.9288	1.0000
8	9.43	Chlorate	M	0.165	1.7684	1.7684	1.0000
10	12.90	Phosphate	BMB	0.241	1.0875	1.0875	1.0000
Total:			**0.000**	**30.305**		**132.81**	

37 *HS19110644-07MSD*

Sample Name:	**HS19110644-07MSD**	*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:	**11/13/2019 21:14**	*Sample Weight:*	**1.0000**

Run Time:



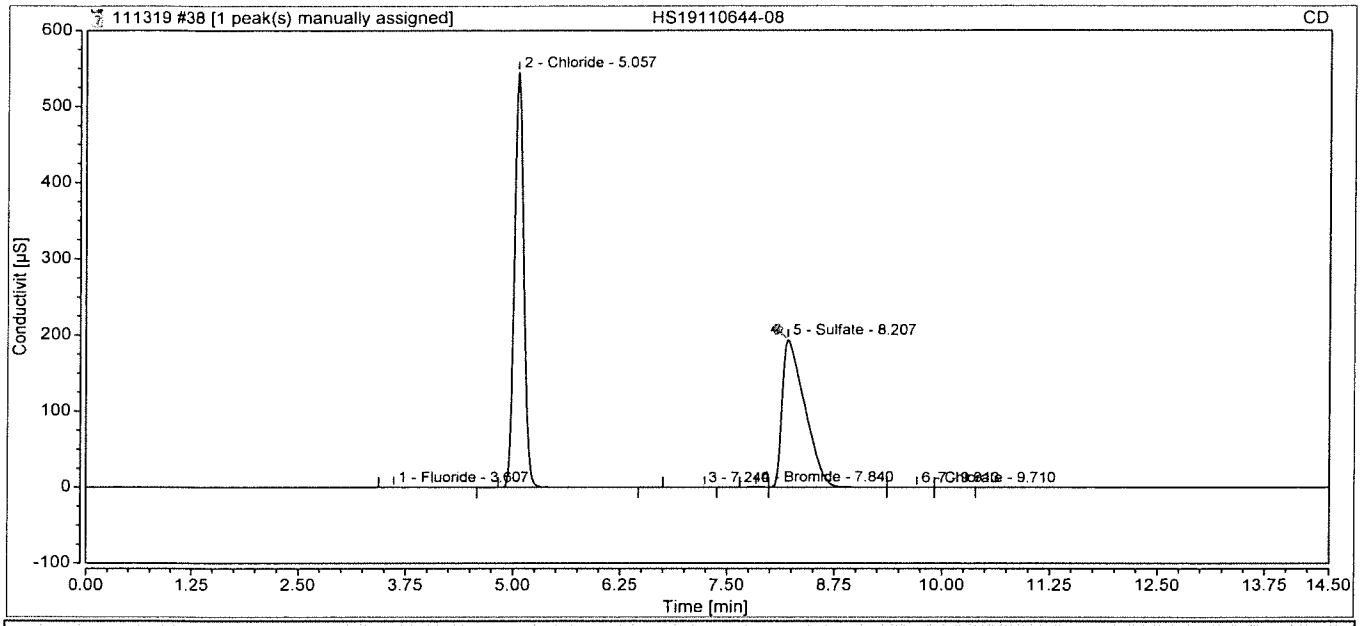
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.724	1.9645	1.9645	1.0000
2	5.08	Chloride	BMB	21.692	92.1678	92.1678	1.0000
3	6.06	Nitrite,N	BMB	1.046	2.0428	2.0428	1.0000
5	7.89	Bromide	BMB	0.200	2.0318	2.0318	1.0000
6	8.50	Sulfate	BM	5.130	29.8801	29.8801	1.0000
7	8.93	Nitrate	M	1.126	1.9335	1.9335	1.0000
8	9.42	Chlorate	M	0.165	1.7781	1.7781	1.0000
10	12.90	Phosphate	BMB	0.247	1.1135	1.1135	1.0000
Total:			**0.000**	**30.331**		**132.91**	

38 HS19110644-08

Sample Name:	**HS19110644-08**	*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:	**11/13/2019 21:30**	*Sample Weight:*	**1.0000**

Run Time:



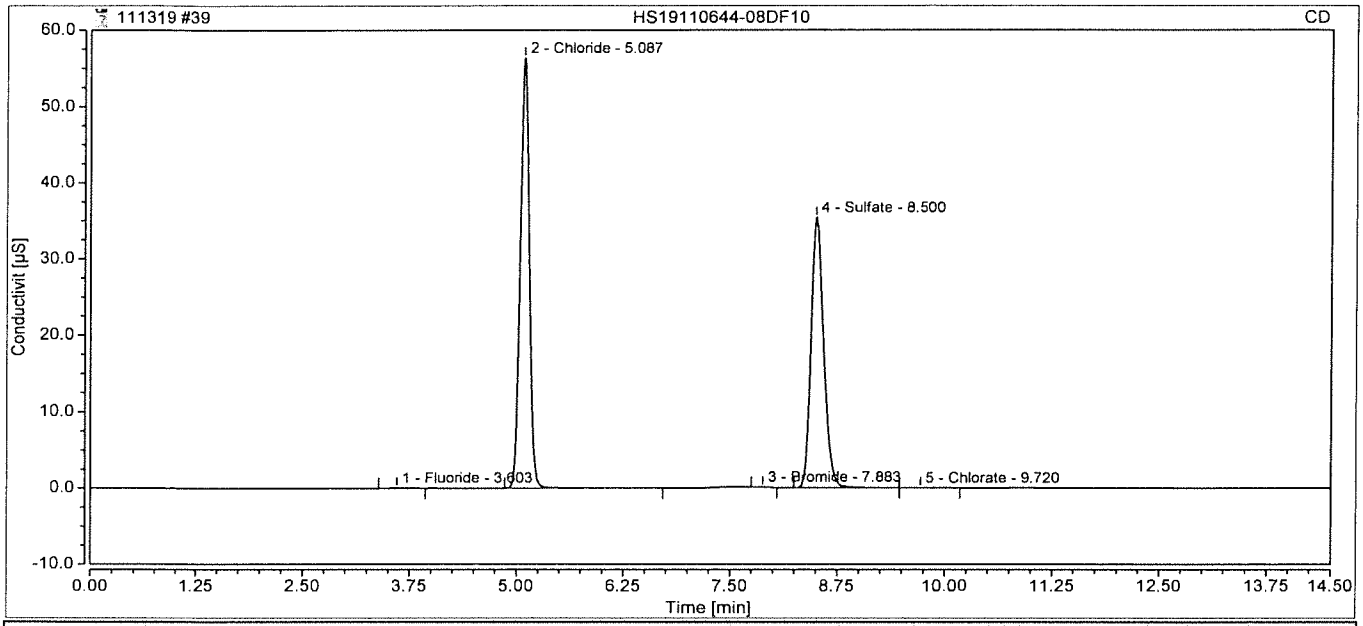
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.089	0.2541	0.2541	1.0000
2	5.06	Chloride	BMB	69.104	293.4894	293.4894	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
4	7.84	Bromide	BM	0.120	1.2435	1.2435	1.0000
5	8.21	Sulfate	M ^	59.318	345.3934	345.3934	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
6	9.71	Chlorate	M	0.011	0.1414	0.1414	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**128.641**		**640.52**	

39 HS19110644-08DF10

Sample Name:	**HS19110644-08DF10**	*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:*	**10.0000**
Recording Time:	**11/13/2019 21:47**	*Sample Weight:*	**1.0000**

Run Time:



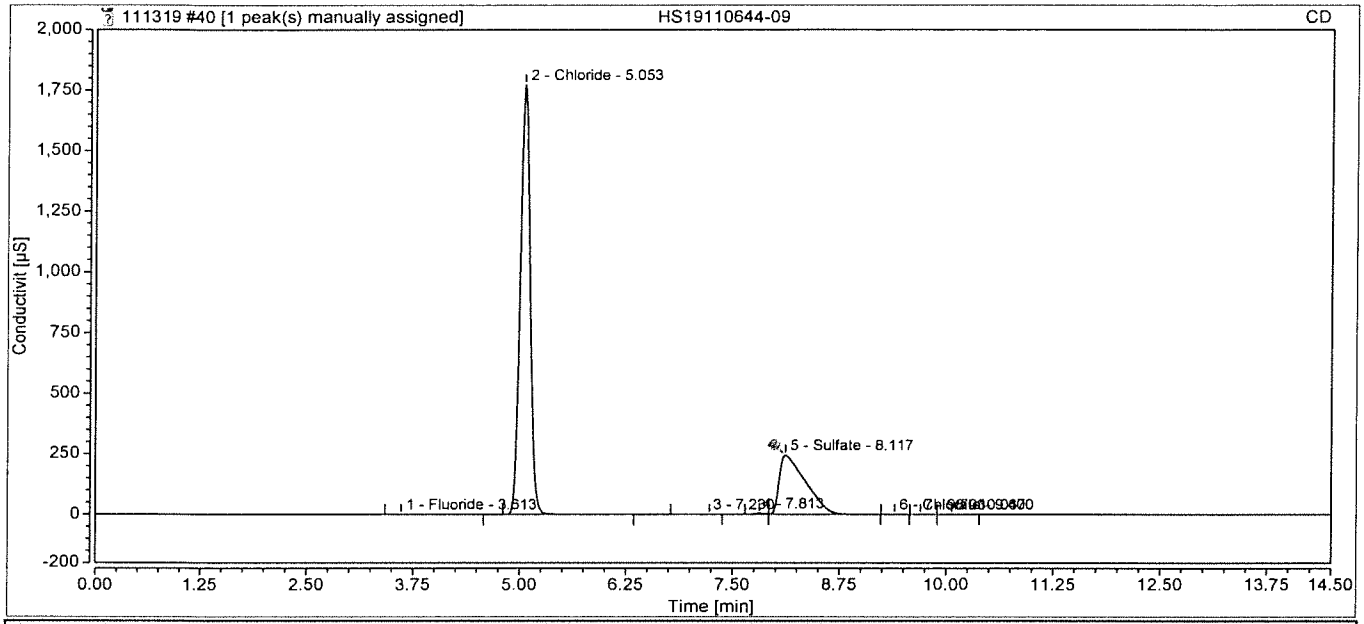
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.006	0.0321	0.3210	10.0000
2	5.09	Chloride	BMB	6.917	29.4306	294.3064	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
3	7.88	Bromide	BMB	0.008	0.1282	1.2820	10.0000
4	8.50	Sulfate	BM	6.021	35.0683	350.6834	10.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	10.0000
5	9.72	Chlorate	MB	0.007	0.1027	1.0269	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**12.959**		**647.62**	

40 HS19110644-09

Sample Name:	**HS19110644-09**	*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:*	**1.0000**
Recording Time:	**11/13/2019 22:03**	*Sample Weight:*	**1.0000**

Run Time:



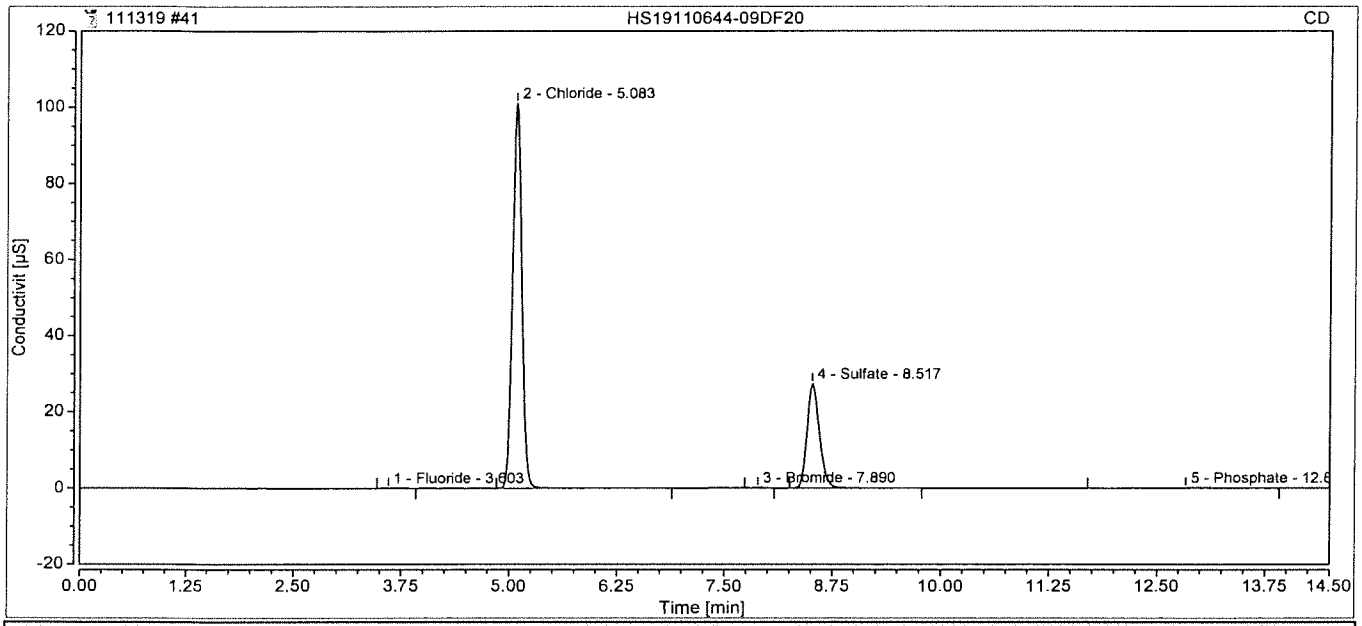
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.059	0.1727	0.1727	1.0000
2	5.05	Chloride	BMB	238.157	1011.3312	1011.3312	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
5	8.12	Sulfate	MB^	86.204	501.9401	501.9401	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
6	9.40	Chlorate	BMB	0.009	0.1249	0.1249	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**324.428**		**1513.57**	

41 HS19110644-09DF20

Sample Name:	**HS19110644-09DF20**	*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:*	**20.0000**
Recording Time:	**11/13/2019 22:20**	*Sample Weight:*	**1.0000**

Run Time:



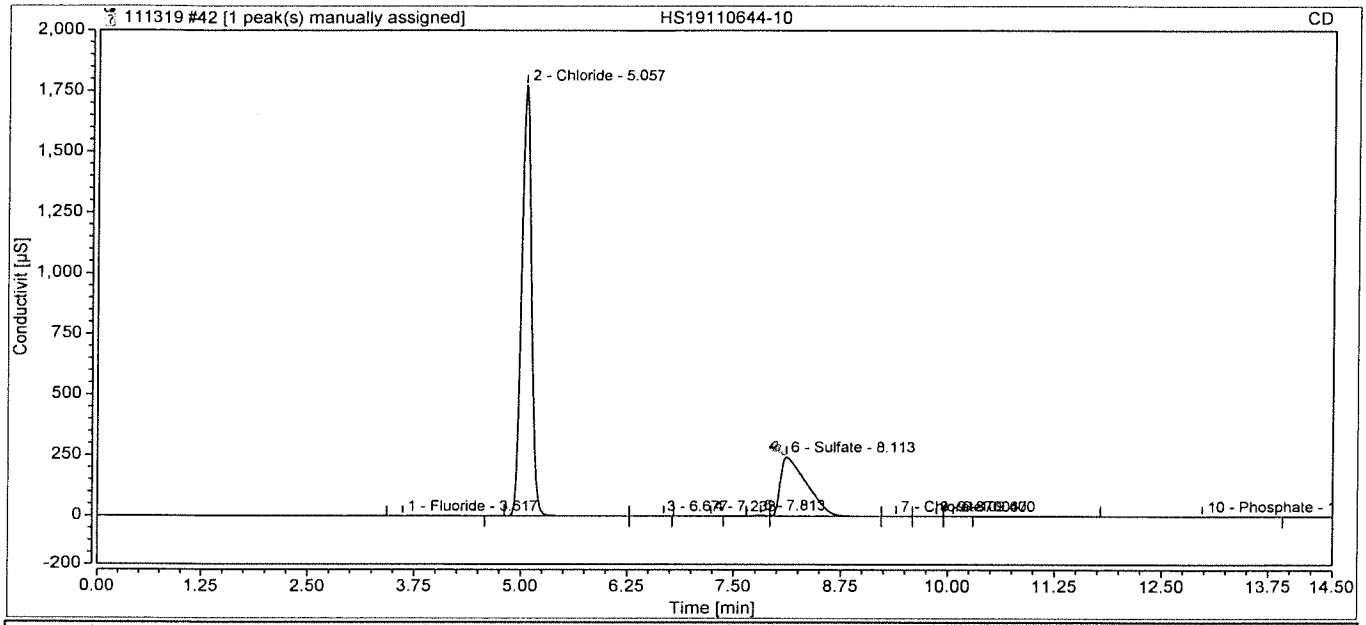
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.003	0.0219	0.4374	20.0000
2	5.08	Chloride	BMB	12.530	53.2628	1065.2557	20.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	20.0000
3	7.89	Bromide	BMB	0.017	0.2195	4.3893	20.0000
4	8.52	Sulfate	BMB	4.556	26.5414	530.8271	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
5	12.84	Phosphate	BMB	0.095	0.4567	9.1335	20.0000
Total:			**0.000**	**17.201**		**1610.04**	

42 HS19110644-10

Sample Name:	**HS19110644-10**	*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:*	**1.0000**
Recording Time:	**11/13/2019 22:37**	*Sample Weight:*	**1.0000**

Run Time:



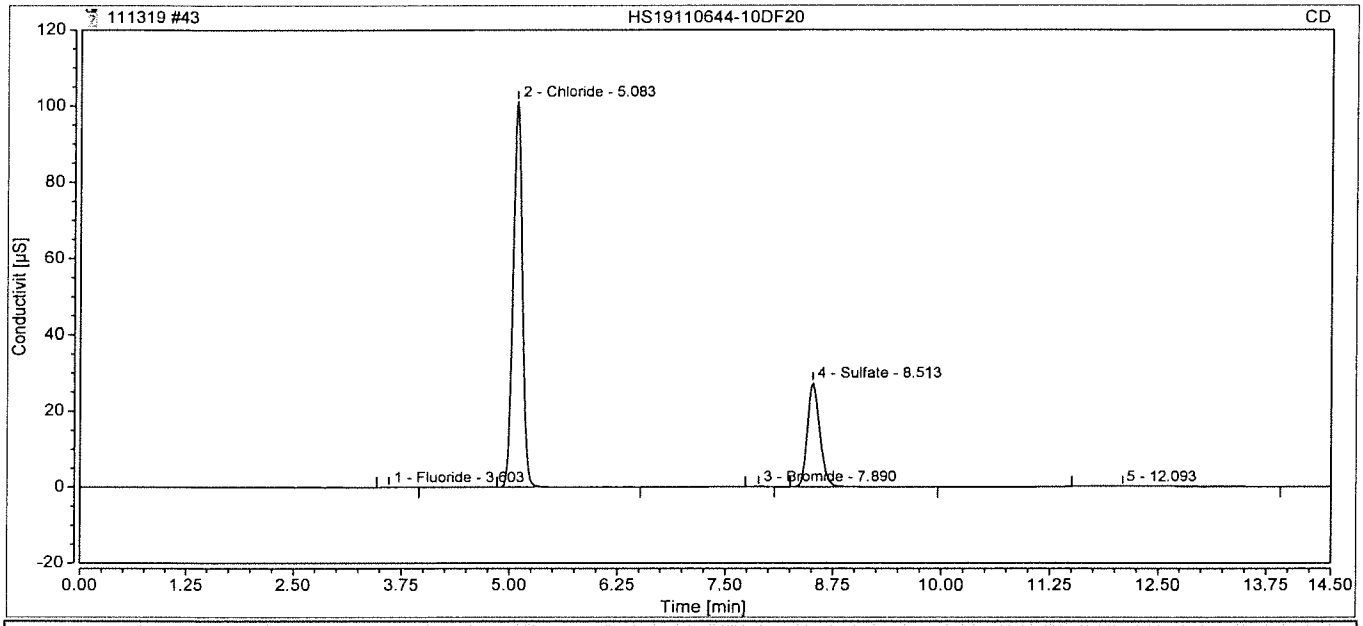
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.058	0.1699	0.1699	1.0000
2	5.06	Chloride	BMB	238.647	1013.4129	1013.4129	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
6	8.11	Sulfate	MB^	86.363	502.8676	502.8676	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
7	9.40	Chlorate	BMB	0.010	0.1355	0.1355	1.0000
10	12.98	Phosphate	BMB	0.088	0.4272	0.4272	1.0000
Total:			**0.000**	**325.166**		**1517.01**	

43 HS19110644-10DF20

Sample Name:	**HS19110644-10DF20**	*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:*	**20.0000**
Recording Time:	**11/13/2019 22:53**	*Sample Weight:*	**1.0000**

Run Time:



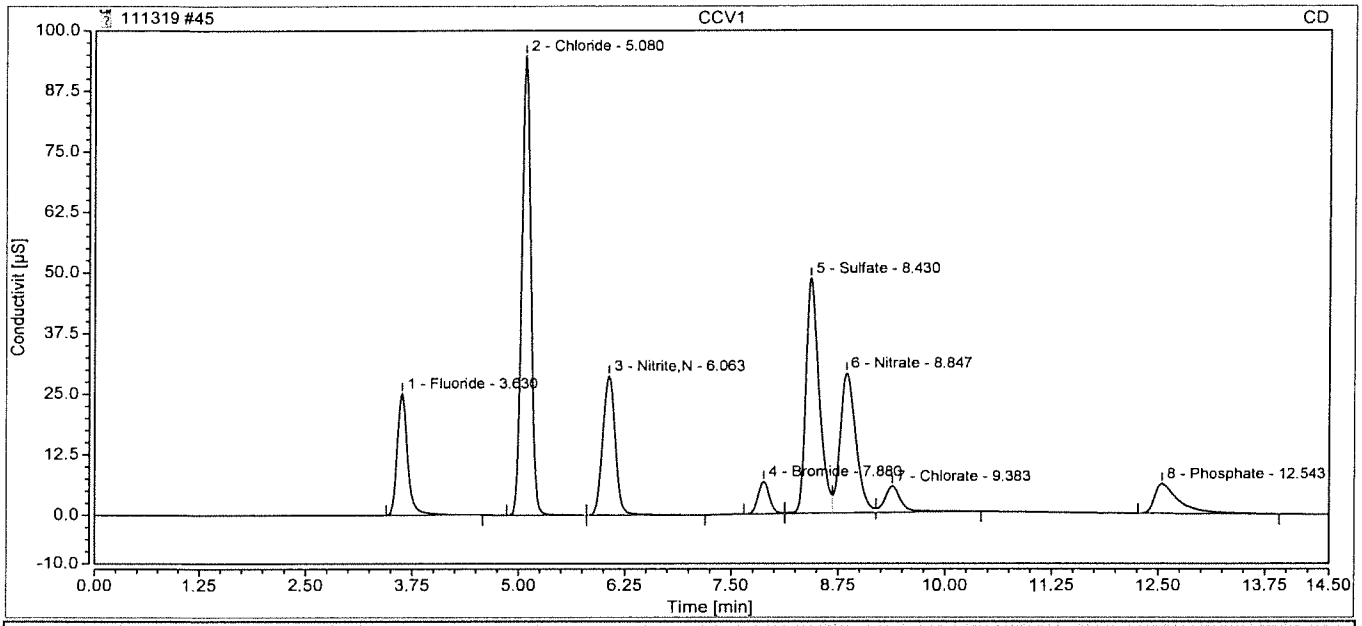
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.60	Fluoride	BMB	0.002	0.0217	0.4333	20.0000
2	5.08	Chloride	BMB	12.512	53.1879	1063.7584	20.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	20.0000
3	7.89	Bromide	BMB	0.017	0.2219	4.4385	20.0000
4	8.51	Sulfate	BMB	4.572	26.6330	532.6600	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**	**17.104**		**1601.29**	

45 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:	**11/13/2019 23:26**	*Sample Weight:*	**1.0000**

Run Time:



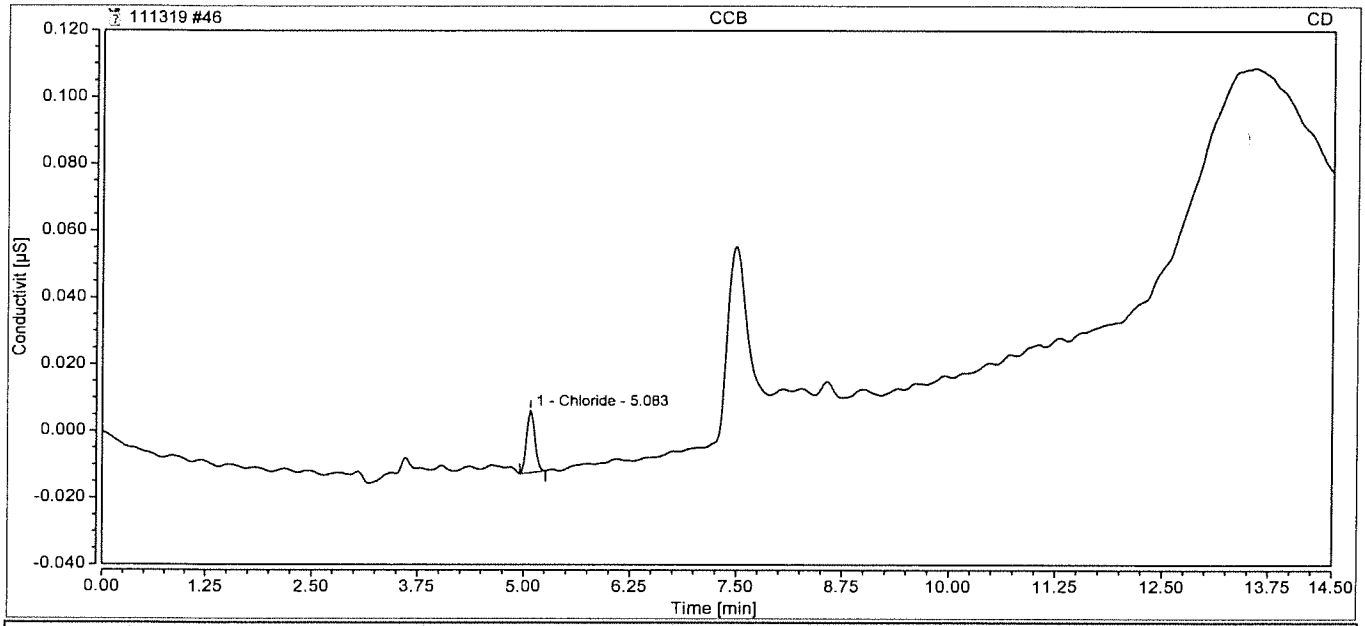
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	3.572	9.6281	9.6281	1.0000
2	5.08	Chloride	BMB	11.709	49.7753	49.7753	1.0000
3	6.06	Nitrite,N	BMB	4.946	9.6604	9.6604	1.0000
4	7.88	Bromide	BM	1.033	10.2883	10.2883	1.0000
5	8.43	Sulfate	M	8.660	50.4378	50.4378	1.0000
6	8.85	Nitrate	M	6.219	10.6023	10.6023	1.0000
7	9.38	Chlorate	MB	1.230	13.0501	13.0501	1.0000
8	12.54	Phosphate	BMB	2.065	8.9444	8.9444	1.0000
Total:			**0.000**	**39.434**		**162.39**	

46 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:	**11/13/2019 23:43**	*Sample Weight:*	**1.0000**

Run Time:



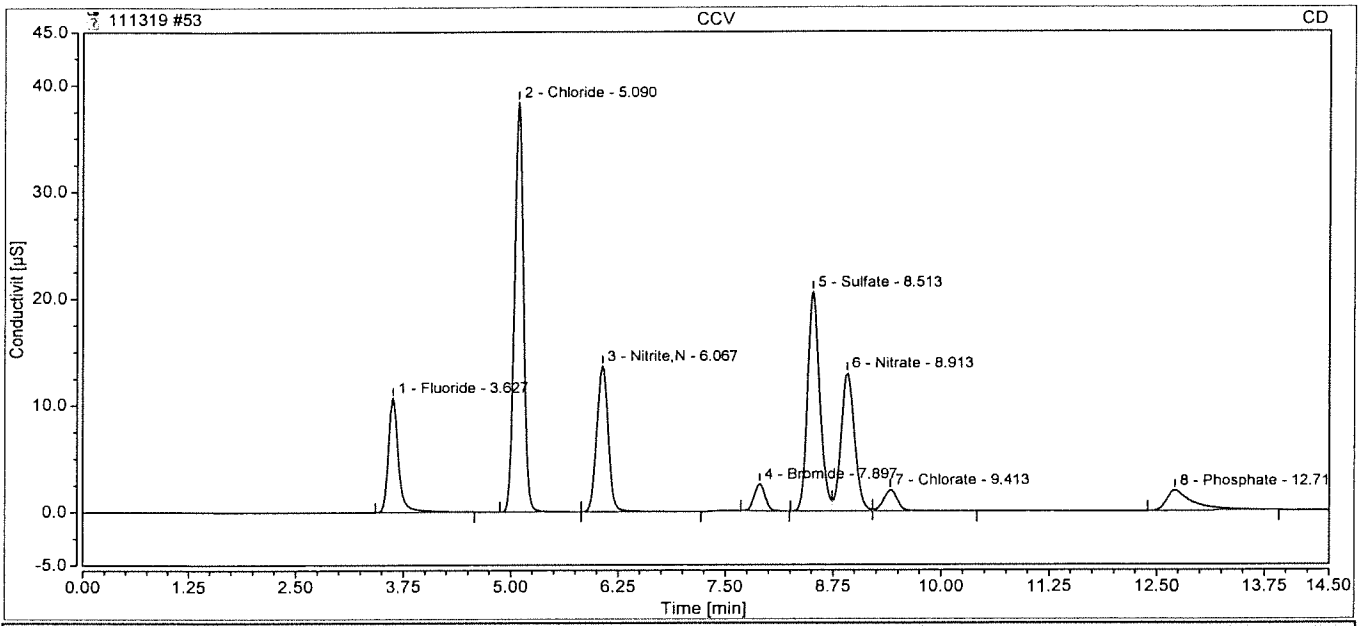
Integration Results

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.	1.0000
1	5.08	Chloride	BMB	0.002	0.0663	0.0663	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**	

53 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:	**11/14/2019 01:39**	*Sample Weight:*	**1.0000**

Run Time:



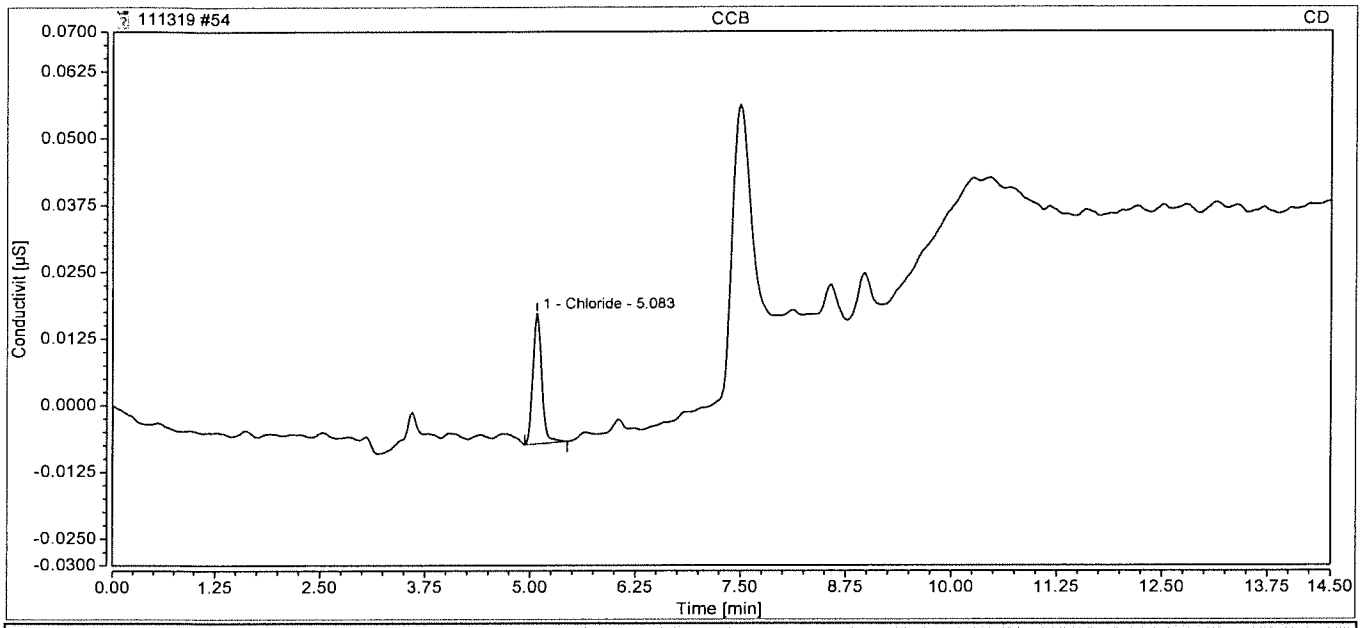
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.472	3.9766	3.9766	1.0000
2	5.09	Chloride	BMB	4.695	19.9939	19.9939	1.0000
3	6.07	Nitrite,N	BMB	2.121	4.1424	4.1424	1.0000
4	7.90	Bromide	BMB	0.374	3.7628	3.7628	1.0000
5	8.51	Sulfate	BM	3.371	19.6380	19.6380	1.0000
6	8.91	Nitrate	M	2.362	4.0382	4.0382	1.0000
7	9.41	Chlorate	MB	0.376	4.0030	4.0030	1.0000
8	12.71	Phosphate	BMB	0.699	3.0581	3.0581	1.0000
Total:			**0.000**	**15.470**		**62.61**	

54 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:	**11/14/2019 01:56**	*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
1	5.08	Chloride	BMB	0.003	0.0700	0.0700	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**	

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

WorkOrder: HS19110684

LHAAP-50 501032

Aptim Environmental & Infrastucture, Inc.

Susan Huang
2500 City West Blvd., Suite 1700
Houston TX 77042

09-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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HS19110684 Wet Chem Raw Data

HS19110684 LHAAP50 501032 Final

ALS WO# HS19110684

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

December 05, 2019

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

Work Order: **HS19110684**

Laboratory Results for: **LHAAP-50 501032**

Dear Susan,

ALS Environmental received 5 sample(s) on Nov 14, 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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Work Order: HS19110684

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110684-01	50WW16-191113	Groundwater		13-Nov-2019 08:35	14-Nov-2019 09:05	☐
HS19110684-02	50WW14-191113	Groundwater		13-Nov-2019 09:45	14-Nov-2019 09:05	☐
HS19110684-03	50WW13-191113	Groundwater		13-Nov-2019 10:35	14-Nov-2019 09:05	☐
HS19110684-04	50WW23-191113	Groundwater		13-Nov-2019 11:40	14-Nov-2019 09:05	☐
HS19110684-05	Trip Blank	Water	CG 101419 -03	13-Nov-2019 00:00	14-Nov-2019 09:05	☐

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP-50 501032
Work Order: HS19110684

Work Order Comments

- 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 Environmental in Kelso, WA. Final Report attached.

GCMS Volatiles by Method SW8260

Batch ID: R350853

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

WetChemistry by Method SW9056

Batch ID: R350580

Sample ID: 50WW23-191113 (HS19110684-04MS)

- 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)

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW16-191113
Collection Date: 13-Nov-2019 08:35

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Nov-2019 12:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Nov-2019 12:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Nov-2019 12:49
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Nov-2019 12:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Nov-2019 12:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW16-191113
Collection Date: 13-Nov-2019 08:35

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Nov-2019 12:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Nov-2019 12:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Trichloroethene	**1.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Nov-2019 12:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:49
Surr: 1,2-Dichloroethane-d4	*87.7*			**0**	*81-118*	*%REC*	*1*	*19-Nov-2019 12:49*
Surr: 4-Bromofluorobenzene	*91.7*			**0**	*85-114*	*%REC*	*1*	*19-Nov-2019 12:49*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*1*	*19-Nov-2019 12:49*
Surr: Toluene-d8	*96.2*			**0**	*89-112*	*%REC*	*1*	*19-Nov-2019 12:49*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**6.07**		**0.200**	**0.500**	**0.500**	**mg/L**	1	14-Nov-2019 19:07
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	14-Nov-2019 19:07
Sulfate	**28.7**		**0.200**	**0.500**	**0.500**	**mg/L**	1	14-Nov-2019 19:07
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Dec-2019 09:28

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW16-191113
Collection Date: 13-Nov-2019 08:35

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
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.

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW14-191113
Collection Date: 13-Nov-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Nov-2019 13:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Nov-2019 13:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Nov-2019 13:37
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Nov-2019 13:37
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Nov-2019 13:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW14-191113
Collection Date: 13-Nov-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
cis-1,2-Dichloroethene	**1.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Nov-2019 13:37
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Nov-2019 13:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Nov-2019 13:37
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:37
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Trichloroethene	**37**		**0.20**	**0.50**	**1.0**	**UG/L**	1	19-Nov-2019 13:37
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:37
Surr: 1,2-Dichloroethane-d4	*89.6*			**0**	*81-118*	*%REC*	*1*	*19-Nov-2019 13:37*
Surr: 4-Bromofluorobenzene	*93.1*			**0**	*85-114*	*%REC*	*1*	*19-Nov-2019 13:37*
Surr: Dibromofluoromethane	*95.3*			**0**	*80-119*	*%REC*	*1*	*19-Nov-2019 13:37*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*1*	*19-Nov-2019 13:37*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**395**		**2.00**	**5.00**	**5.00**	**mg/L**	10	14-Nov-2019 20:13
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	14-Nov-2019 19:57
Sulfate	**357**		**2.00**	**5.00**	**5.00**	**mg/L**	10	14-Nov-2019 20:13
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Dec-2019 09:28

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW14-191113
Collection Date: 13-Nov-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
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.

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP-50 501032 WorkOrder:HS19110684
Sample ID: 50WW13-191113 Lab ID:HS19110684-03
Collection Date: 13-Nov-2019 10:35 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
1,1,1-Trichloroethane	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
1,1,2,2-Tetrachloroethane	12	U	12	12	25	UG/L	25	19-Nov-2019 14:01
1,1,2-Trichlor-1,2,2-trifluoroethane	12	U	12	12	25	UG/L	25	19-Nov-2019 14:01
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
1,1-Dichloroethane	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
1,1-Dichloroethene	**17**	J	**5.0**	**12**	**25**	**UG/L**	25	19-Nov-2019 14:01
1,1-Dichloropropene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
1,2,3-Trichlorobenzene	12	U	10	12	25	UG/L	25	19-Nov-2019 14:01
1,2,3-Trichloropropane	12	U	12	12	25	UG/L	25	19-Nov-2019 14:01
1,2,4-Trichlorobenzene	12	U	12	12	25	UG/L	25	19-Nov-2019 14:01
1,2,4-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
1,2-Dibromo-3-chloropropane	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
1,2-Dibromoethane	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
1,2-Dichlorobenzene	12	U	12	12	25	UG/L	25	19-Nov-2019 14:01
1,2-Dichloroethane	**39**		**5.0**	**12**	**25**	**UG/L**	25	19-Nov-2019 14:01
1,2-Dichloropropane	12	U	12	12	25	UG/L	25	19-Nov-2019 14:01
1,3,5-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
1,3-Dichlorobenzene	12	U	10	12	25	UG/L	25	19-Nov-2019 14:01
1,3-Dichloropropane	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
1,4-Dichlorobenzene	12	U	10	12	25	UG/L	25	19-Nov-2019 14:01
2,2-Dichloropropane	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
2-Butanone	25	U	12	25	50	UG/L	25	19-Nov-2019 14:01
2-Chlorotoluene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
2-Hexanone	25	U	25	25	50	UG/L	25	19-Nov-2019 14:01
4-Chlorotoluene	12	U	10	12	25	UG/L	25	19-Nov-2019 14:01
4-Isopropyltoluene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
4-Methyl-2-pentanone	25	U	18	25	50	UG/L	25	19-Nov-2019 14:01
Acetone	25	U	10	25	50	UG/L	25	19-Nov-2019 14:01
Benzene	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
Bromobenzene	12	U	10	12	25	UG/L	25	19-Nov-2019 14:01
Bromochloromethane	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
Bromodichloromethane	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
Bromoform	12	U	10	12	25	UG/L	25	19-Nov-2019 14:01
Bromomethane	12	U	10	12	25	UG/L	25	19-Nov-2019 14:01
Carbon disulfide	25	U	15	25	50	UG/L	25	19-Nov-2019 14:01
Carbon tetrachloride	12	U	12	12	25	UG/L	25	19-Nov-2019 14:01
Chlorobenzene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
Chloroethane	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP-50 501032 WorkOrder:HS19110684
Sample ID: 50WW13-191113 Lab ID:HS19110684-03
Collection Date: 13-Nov-2019 10:35 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
Chloromethane	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
cis-1,2-Dichloroethene	**230**		**5.0**	**12**	**25**	**UG/L**	25	19-Nov-2019 14:01
cis-1,3-Dichloropropene	12	U	2.5	12	25	UG/L	25	19-Nov-2019 14:01
Dibromochloromethane	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
Dibromomethane	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
Dichlorodifluoromethane	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
Ethylbenzene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
Hexachlorobutadiene	12	U	25	12	25	UG/L	25	19-Nov-2019 14:01
Isopropylbenzene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
m,p-Xylene	25	U	12	25	50	UG/L	25	19-Nov-2019 14:01
Methylene chloride	25	U	10	25	50	UG/L	25	19-Nov-2019 14:01
n-Butylbenzene	12	U	10	12	25	UG/L	25	19-Nov-2019 14:01
n-Propylbenzene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
Naphthalene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
o-Xylene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
sec-Butylbenzene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
Styrene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
tert-Butylbenzene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
Tetrachloroethene	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
Toluene	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
trans-1,2-Dichloroethene	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
trans-1,3-Dichloropropene	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
Trichloroethene	**7,300**		**50**	**120**	**250**	**UG/L**	250	19-Nov-2019 15:13
Trichlorofluoromethane	12	U	7.5	12	25	UG/L	25	19-Nov-2019 14:01
Vinyl chloride	12	U	5.0	12	25	UG/L	25	19-Nov-2019 14:01
Surr: 1,2-Dichloroethane-d4	*88.2*			**0**	*81-118*	*%REC*	*250*	*19-Nov-2019 15:13*
Surr: 1,2-Dichloroethane-d4	*87.8*			**0**	*81-118*	*%REC*	*25*	*19-Nov-2019 14:01*
Surr: 4-Bromofluorobenzene	*91.9*			**0**	*85-114*	*%REC*	*25*	*19-Nov-2019 14:01*
Surr: 4-Bromofluorobenzene	*93.0*			**0**	*85-114*	*%REC*	*250*	*19-Nov-2019 15:13*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*250*	*19-Nov-2019 15:13*
Surr: Dibromofluoromethane	*94.3*			**0**	*80-119*	*%REC*	*25*	*19-Nov-2019 14:01*
Surr: Toluene-d8	*96.3*			**0**	*89-112*	*%REC*	*25*	*19-Nov-2019 14:01*
Surr: Toluene-d8	*95.1*			**0**	*89-112*	*%REC*	*250*	*19-Nov-2019 15:13*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**308**		**2.00**	**5.00**	**5.00**	**mg/L**	10	14-Nov-2019 20:47
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	14-Nov-2019 20:30
Sulfate	**316**		**2.00**	**5.00**	**5.00**	**mg/L**	10	14-Nov-2019 20:47

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW13-191113
Collection Date: 13-Nov-2019 10:35

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Dec-2019 09:28
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.

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW23-191113
Collection Date: 13-Nov-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:13
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Nov-2019 13:13
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Nov-2019 13:13
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:13
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Nov-2019 13:13
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Nov-2019 13:13
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Nov-2019 13:13
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW23-191113
Collection Date: 13-Nov-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Nov-2019 13:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Nov-2019 13:13
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 13:13
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 13:13
Surr: 1,2-Dichloroethane-d4	*88.6*			**0**	*81-118*	*%REC*	*1*	*19-Nov-2019 13:13*
Surr: 4-Bromofluorobenzene	*93.9*			**0**	*85-114*	*%REC*	*1*	*19-Nov-2019 13:13*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*1*	*19-Nov-2019 13:13*
Surr: Toluene-d8	*95.1*			**0**	*89-112*	*%REC*	*1*	*19-Nov-2019 13:13*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**1,290**		**4.00**	**10.0**	**10.0**	**mg/L**	20	14-Nov-2019 21:53
Nitrogen, Nitrate (As N)	**0.104**		**0.0300**	**0.100**	**0.100**	**mg/L**	1	14-Nov-2019 21:03
Sulfate	**181**		**4.00**	**10.0**	**10.0**	**mg/L**	20	14-Nov-2019 21:53
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Nov-2019 17:54
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Dec-2019 09:28

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: 50WW23-191113
Collection Date: 13-Nov-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
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.

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: Trip Blank
Collection Date: 13-Nov-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Nov-2019 12:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Nov-2019 12:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Nov-2019 12:25
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Nov-2019 12:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Nov-2019 12:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Sample ID: Trip Blank
Collection Date: 13-Nov-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19110684
Lab ID:HS19110684-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Nov-2019 12:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Nov-2019 12:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Nov-2019 12:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Nov-2019 12:25
Surr: 1,2-Dichloroethane-d4	*88.5*			**0**	*81-118*	*%REC*	*1*	*19-Nov-2019 12:25*
Surr: 4-Bromofluorobenzene	*90.8*			**0**	*85-114*	*%REC*	*1*	*19-Nov-2019 12:25*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*1*	*19-Nov-2019 12:25*
Surr: Toluene-d8	*96.5*			**0**	*89-112*	*%REC*	*1*	*19-Nov-2019 12:25*

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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R350580 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS19110684-01	50WW16-191113	13 Nov 2019 08:35			14 Nov 2019 19:07	1
HS19110684-02	50WW14-191113	13 Nov 2019 09:45			14 Nov 2019 20:13	10
HS19110684-02	50WW14-191113	13 Nov 2019 09:45			14 Nov 2019 19:57	1
HS19110684-03	50WW13-191113	13 Nov 2019 10:35			14 Nov 2019 20:47	10
HS19110684-03	50WW13-191113	13 Nov 2019 10:35			14 Nov 2019 20:30	1
HS19110684-04	50WW23-191113	13 Nov 2019 11:40			14 Nov 2019 21:53	20
HS19110684-04	50WW23-191113	13 Nov 2019 11:40			14 Nov 2019 21:03	1
Batch ID: R350853 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19110684-05	Trip Blank	13 Nov 2019 00:00			19 Nov 2019 12:25	1
Batch ID: R350853 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19110684-01	50WW16-191113	13 Nov 2019 08:35			19 Nov 2019 12:49	1
HS19110684-02	50WW14-191113	13 Nov 2019 09:45			19 Nov 2019 13:37	1
HS19110684-03	50WW13-191113	13 Nov 2019 10:35			19 Nov 2019 15:13	250
HS19110684-03	50WW13-191113	13 Nov 2019 10:35			19 Nov 2019 14:01	25
HS19110684-04	50WW23-191113	13 Nov 2019 11:40			19 Nov 2019 13:13	1
Batch ID: R351402 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Groundwater	
HS19110684-01	50WW16-191113	13 Nov 2019 08:35			27 Nov 2019 09:14	1
HS19110684-02	50WW14-191113	13 Nov 2019 09:45			27 Nov 2019 09:14	1
HS19110684-03	50WW13-191113	13 Nov 2019 10:35			27 Nov 2019 09:14	1
HS19110684-04	50WW23-191113	13 Nov 2019 11:40			27 Nov 2019 09:14	1
Batch ID: R351504 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19110684-01	50WW16-191113	13 Nov 2019 08:35			27 Nov 2019 17:54	1
HS19110684-02	50WW14-191113	13 Nov 2019 09:45			27 Nov 2019 17:54	1
HS19110684-03	50WW13-191113	13 Nov 2019 10:35			27 Nov 2019 17:54	1
HS19110684-04	50WW23-191113	13 Nov 2019 11:40			27 Nov 2019 17:54	1
Batch ID: R351815 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS19110684-01	50WW16-191113	13 Nov 2019 08:35			05 Dec 2019 09:28	1
HS19110684-02	50WW14-191113	13 Nov 2019 09:45			05 Dec 2019 09:28	1
HS19110684-03	50WW13-191113	13 Nov 2019 10:35			05 Dec 2019 09:28	1
HS19110684-04	50WW23-191113	13 Nov 2019 11:40			05 Dec 2019 09:28	1

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-191119** Units: **UG/L** Analysis Date: **19-Nov-2019 12:01**
Client ID: Run ID: **VOA6_350853** SeqNo: **5351465** 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	0.50	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	1.0	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

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-191119** Units: **UG/L** Analysis Date: **19-Nov-2019 12:01**
Client ID: Run ID: **VOA6_350853** SeqNo: **5351465** 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	0.50	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	*44.04*	*1.0*	*50*	*0*	*88.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.89*	*1.0*	*50*	*0*	*91.8*	*85 - 114*				
Surr: Dibromofluoromethane	*46.85*	*1.0*	*50*	*0*	*93.7*	*80 - 119*				

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-191119** Units: **UG/L** Analysis Date: **19-Nov-2019 12:01**
Client ID: Run ID: **VOA6_350853** SeqNo: **5351465** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*47.73*	*1.0*	*50*	*0*	*95.5*	*89 - 112*				

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-191119** Units: **UG/L** Analysis Date: **19-Nov-2019 11:13**
Client ID: Run ID: **VOA6_350853** SeqNo: **5351464** 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	19.92	1.0	20	0	99.6	78 - 124				
1,1,1-Trichloroethane	19.09	1.0	20	0	95.4	74 - 131				
1,1,2,2-Tetrachloroethane	18.89	1.0	20	0	94.5	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	18.75	1.0	20	0	93.7	70 - 136				
1,1,2-Trichloroethane	19.59	1.0	20	0	97.9	80 - 119				
1,1-Dichloroethane	18.69	1.0	20	0	93.4	77 - 125				
1,1-Dichloroethene	19.41	1.0	20	0	97.1	71 - 131				
1,1-Dichloropropene	18.75	1.0	20	0	93.8	78 - 125				
1,2,3-Trichlorobenzene	25.58	1.0	20	0	128	69 - 129				
1,2,3-Trichloropropane	18.93	1.0	20	0	94.6	73 - 122				
1,2,4-Trichlorobenzene	23.15	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	18.02	1.0	20	0	90.1	76 - 124				
1,2-Dibromo-3-chloropropane	21.26	1.0	20	0	106	62 - 128				
1,2-Dibromoethane	19.79	1.0	20	0	98.9	77 - 121				
1,2-Dichlorobenzene	19.05	1.0	20	0	95.3	80 - 119				
1,2-Dichloroethane	19.34	1.0	20	0	96.7	73 - 128				
1,2-Dichloropropane	19.06	1.0	20	0	95.3	78 - 122				
1,3,5-Trimethylbenzene	18.26	1.0	20	0	91.3	75 - 124				
1,3-Dichlorobenzene	19.14	1.0	20	0	95.7	80 - 119				
1,3-Dichloropropane	19.12	1.0	20	0	95.6	80 - 119				
1,4-Dichlorobenzene	19.16	1.0	20	0	95.8	79 - 118				
2,2-Dichloropropane	18.78	1.0	20	0	93.9	60 - 139				
2-Butanone	37.95	2.0	40	0	94.9	56 - 143				
2-Chlorotoluene	18.77	1.0	20	0	93.9	79 - 122				
2-Hexanone	38.68	2.0	40	0	96.7	57 - 139				
4-Chlorotoluene	18.19	1.0	20	0	91.0	78 - 122				
4-Isopropyltoluene	17.83	1.0	20	0	89.2	77 - 127				
4-Methyl-2-pentanone	37.45	2.0	40	0	93.6	67 - 130				
Acetone	44.32	2.0	40	0	111	39 - 160				
Benzene	19.82	1.0	20	0	99.1	79 - 120				
Bromobenzene	19.81	1.0	20	0	99.1	80 - 120				
Bromochloromethane	19.98	1.0	20	0	99.9	78 - 123				
Bromodichloromethane	19.49	1.0	20	0	97.4	79 - 125				
Bromoform	20.66	1.0	20	0	103	66 - 130				

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-191119** Units: **UG/L** Analysis Date: **19-Nov-2019 11:13**
Client ID: Run ID: **VOA6_350853** SeqNo: **5351464** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	20.64	1.0	20	0	103	53 - 141				
Carbon disulfide	39.04	2.0	40	0	97.6	64 - 133				
Carbon tetrachloride	19.26	1.0	20	0	96.3	72 - 136				
Chlorobenzene	19.07	1.0	20	0	95.4	82 - 118				
Chloroethane	18.65	1.0	20	0	93.2	60 - 138				
Chloroform	18.5	1.0	20	0	92.5	79 - 124				
Chloromethane	18.02	1.0	20	0	90.1	50 - 139				
cis-1,2-Dichloroethene	19.82	1.0	20	0	99.1	78 - 123				
cis-1,3-Dichloropropene	19.88	1.0	20	0	99.4	75 - 124				
Dibromochloromethane	19.94	1.0	20	0	99.7	74 - 126				
Dibromomethane	20.13	1.0	20	0	101	79 - 123				
Dichlorodifluoromethane	18.2	1.0	20	0	91.0	32 - 152				
Ethylbenzene	18.46	1.0	20	0	92.3	79 - 121				
Hexachlorobutadiene	20.08	1.0	20	0	100	66 - 134				
Isopropylbenzene	18.18	1.0	20	0	90.9	72 - 131				
m,p-Xylene	37.55	2.0	40	0	93.9	80 - 121				
Methylene chloride	18.48	2.0	20	0	92.4	74 - 124				
Naphthalene	21.27	1.0	20	0	106	61 - 128				
n-Butylbenzene	17.77	1.0	20	0	88.8	75 - 128				
n-Propylbenzene	18.12	1.0	20	0	90.6	76 - 126				
o-Xylene	18.7	1.0	20	0	93.5	78 - 122				
sec-Butylbenzene	17.7	1.0	20	0	88.5	77 - 126				
Styrene	18.98	1.0	20	0	94.9	78 - 123				
tert-Butylbenzene	18.1	1.0	20	0	90.5	78 - 124				
Tetrachloroethene	19.06	1.0	20	0	95.3	74 - 129				
Toluene	19	1.0	20	0	95.0	80 - 121				
trans-1,2-Dichloroethene	19.23	1.0	20	0	96.2	75 - 124				
trans-1,3-Dichloropropene	19.55	1.0	20	0	97.8	73 - 127				
Trichloroethene	20.12	1.0	20	0	101	79 - 123				
Trichlorofluoromethane	19.58	1.0	20	0	97.9	65 - 141				
Vinyl chloride	18.38	1.0	20	0	91.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.44*	*1.0*	*50*	*0*	*98.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.61*	*1.0*	*50*	*0*	*95.2*	*85 - 114*				
Surr: Dibromofluoromethane	*50.9*	*1.0*	*50*	*0*	*102*	*80 - 119*				

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-191119** Units: **UG/L** Analysis Date: **19-Nov-2019 11:13**
Client ID: Run ID: **VOA6_350853** SeqNo: **5351464** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*46.86*	*1.0*	*50*	*0*	*93.7*	*89 - 112*				

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19110684-04MS** Units: **UG/L** Analysis Date: **19-Nov-2019 14:25**
Client ID: **50WW23-191113** Run ID: **VOA6_350853** SeqNo: **5351471** 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	19.81	1.0	20	0	99.1	78 - 124				
1,1,1-Trichloroethane	18.6	1.0	20	0	93.0	74 - 131				
1,1,2,2-Tetrachloroethane	18.11	1.0	20	0	90.5	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	18.73	1.0	20	0	93.6	70 - 136				
1,1,2-Trichloroethane	18.96	1.0	20	0	94.8	80 - 119				
1,1-Dichloroethane	17.54	1.0	20	0	87.7	77 - 125				
1,1-Dichloroethene	18.9	1.0	20	0	94.5	71 - 131				
1,1-Dichloropropene	19.23	1.0	20	0	96.2	78 - 125				
1,2,3-Trichlorobenzene	19.94	1.0	20	0	99.7	69 - 129				
1,2,3-Trichloropropane	17.88	1.0	20	0	89.4	73 - 122				
1,2,4-Trichlorobenzene	19.72	1.0	20	0	98.6	69 - 130				
1,2,4-Trimethylbenzene	19.29	1.0	20	0	96.4	76 - 124				
1,2-Dibromo-3-chloropropane	18.08	1.0	20	0	90.4	62 - 128				
1,2-Dibromoethane	18.79	1.0	20	0	93.9	77 - 121				
1,2-Dichlorobenzene	19.56	1.0	20	0	97.8	80 - 119				
1,2-Dichloroethane	18.14	1.0	20	0	90.7	73 - 128				
1,2-Dichloropropane	18.07	1.0	20	0	90.3	78 - 122				
1,3,5-Trimethylbenzene	19.83	1.0	20	0	99.1	75 - 124				
1,3-Dichlorobenzene	19.91	1.0	20	0	99.6	80 - 119				
1,3-Dichloropropane	18.28	1.0	20	0	91.4	80 - 119				
1,4-Dichlorobenzene	19.5	1.0	20	0	97.5	79 - 118				
2,2-Dichloropropane	17.64	1.0	20	0	88.2	60 - 139				
2-Butanone	28.68	2.0	40	0	71.7	56 - 143				
2-Chlorotoluene	20.15	1.0	20	0	101	79 - 122				
2-Hexanone	33.48	2.0	40	0	83.7	57 - 139				
4-Chlorotoluene	19.15	1.0	20	0	95.8	78 - 122				
4-Isopropyltoluene	19.55	1.0	20	0	97.7	77 - 127				
4-Methyl-2-pentanone	34.17	2.0	40	0	85.4	67 - 130				
Acetone	26.63	2.0	40	0	66.6	39 - 160				
Benzene	19.15	1.0	20	0	95.7	79 - 120				
Bromobenzene	20.35	1.0	20	0	102	80 - 120				
Bromochloromethane	17.61	1.0	20	0	88.0	78 - 123				
Bromodichloromethane	18.48	1.0	20	0	92.4	79 - 125				
Bromoform	19.3	1.0	20	0	96.5	66 - 130				

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19110684-04MS** Units: **UG/L** Analysis Date: **19-Nov-2019 14:25**
Client ID: **50WW23-191113** Run ID: **VOA6_350853** SeqNo: **5351471** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	20.03	1.0	20	0	100	53 - 141				
Carbon disulfide	37.43	2.0	40	0	93.6	64 - 133				
Carbon tetrachloride	20.23	1.0	20	0	101	72 - 136				
Chlorobenzene	19.02	1.0	20	0	95.1	82 - 118				
Chloroethane	17.72	1.0	20	0	88.6	60 - 138				
Chloroform	16.83	1.0	20	0	84.2	79 - 124				
Chloromethane	17.12	1.0	20	0	85.6	50 - 139				
cis-1,2-Dichloroethene	18.29	1.0	20	0	91.5	78 - 123				
cis-1,3-Dichloropropene	18.73	1.0	20	0	93.6	75 - 124				
Dibromochloromethane	19.48	1.0	20	0	97.4	74 - 126				
Dibromomethane	18.6	1.0	20	0	93.0	79 - 123				
Dichlorodifluoromethane	18.24	1.0	20	0	91.2	32 - 152				
Ethylbenzene	19.77	1.0	20	0	98.9	79 - 121				
Hexachlorobutadiene	17.54	1.0	20	0	87.7	66 - 134				
Isopropylbenzene	19.78	1.0	20	0	98.9	72 - 131				
m,p-Xylene	39.22	2.0	40	0	98.0	80 - 121				
Methylene chloride	16.66	2.0	20	0	83.3	74 - 124				
Naphthalene	16.9	1.0	20	0	84.5	61 - 128				
n-Butylbenzene	19.12	1.0	20	0	95.6	75 - 128				
n-Propylbenzene	20.33	1.0	20	0	102	76 - 126				
o-Xylene	19.21	1.0	20	0	96.1	78 - 122				
sec-Butylbenzene	19.9	1.0	20	0	99.5	77 - 126				
Styrene	18.96	1.0	20	0	94.8	78 - 123				
tert-Butylbenzene	20.39	1.0	20	0	102	78 - 124				
Tetrachloroethene	20.5	1.0	20	0	103	74 - 129				
Toluene	19.44	1.0	20	0	97.2	80 - 121				
trans-1,2-Dichloroethene	18.28	1.0	20	0	91.4	75 - 124				
trans-1,3-Dichloropropene	17.95	1.0	20	0	89.8	73 - 127				
Trichloroethene	21.07	1.0	20	0	105	79 - 123				
Trichlorofluoromethane	19.69	1.0	20	0	98.4	65 - 141				
Vinyl chloride	17.94	1.0	20	0	89.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.75*	*1.0*	*50*	*0*	*87.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*46.39*	*1.0*	*50*	*0*	*92.8*	*85 - 114*				
Surr: Dibromofluoromethane	*46.61*	*1.0*	*50*	*0*	*93.2*	*80 - 119*				

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19110684-04MS** Units: **UG/L** Analysis Date: **19-Nov-2019 14:25**
Client ID: **50WW23-191113** Run ID: **VOA6_350853** SeqNo: **5351471** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*47.97*	*1.0*	*50*	*0*	*95.9*	*89 - 112*				

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19110684-04MSD** Units: **UG/L** Analysis Date: **19-Nov-2019 14:49**
Client ID: **50WW23-191113** Run ID: **VOA6_350853** SeqNo: **5351472** 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	19.6	1.0	20	0	98.0	78 - 124	19.81	1.08	20	
1,1,1-Trichloroethane	18.12	1.0	20	0	90.6	74 - 131	18.6	2.63	20	
1,1,2,2-Tetrachloroethane	18.46	1.0	20	0	92.3	71 - 121	18.11	1.93	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	18.04	1.0	20	0	90.2	70 - 136	18.73	3.72	20	
1,1,2-Trichloroethane	18.85	1.0	20	0	94.3	80 - 119	18.96	0.555	20	
1,1-Dichloroethane	17.12	1.0	20	0	85.6	77 - 125	17.54	2.42	20	
1,1-Dichloroethene	18.15	1.0	20	0	90.7	71 - 131	18.9	4.05	20	
1,1-Dichloropropene	18.51	1.0	20	0	92.5	78 - 125	19.23	3.87	20	
1,2,3-Trichlorobenzene	23.4	1.0	20	0	117	69 - 129	19.94	16	20	
1,2,3-Trichloropropane	18.4	1.0	20	0	92.0	73 - 122	17.88	2.84	20	
1,2,4-Trichlorobenzene	21.65	1.0	20	0	108	69 - 130	19.72	9.33	20	
1,2,4-Trimethylbenzene	19.16	1.0	20	0	95.8	76 - 124	19.29	0.664	20	
1,2-Dibromo-3-chloropropane	20.12	1.0	20	0	101	62 - 128	18.08	10.7	20	
1,2-Dibromoethane	19.01	1.0	20	0	95.1	77 - 121	18.79	1.19	20	
1,2-Dichlorobenzene	19.39	1.0	20	0	96.9	80 - 119	19.56	0.903	20	
1,2-Dichloroethane	18.11	1.0	20	0	90.5	73 - 128	18.14	0.189	20	
1,2-Dichloropropane	17.85	1.0	20	0	89.3	78 - 122	18.07	1.21	20	
1,3,5-Trimethylbenzene	19.47	1.0	20	0	97.3	75 - 124	19.83	1.82	20	
1,3-Dichlorobenzene	19.81	1.0	20	0	99.0	80 - 119	19.91	0.54	20	
1,3-Dichloropropane	18.36	1.0	20	0	91.8	80 - 119	18.28	0.406	20	
1,4-Dichlorobenzene	19.54	1.0	20	0	97.7	79 - 118	19.5	0.193	20	
2,2-Dichloropropane	16.84	1.0	20	0	84.2	60 - 139	17.64	4.59	20	
2-Butanone	30.32	2.0	40	0	75.8	56 - 143	28.68	5.54	20	
2-Chlorotoluene	19.56	1.0	20	0	97.8	79 - 122	20.15	2.97	20	
2-Hexanone	33.58	2.0	40	0	84.0	57 - 139	33.48	0.3	20	
4-Chlorotoluene	18.73	1.0	20	0	93.7	78 - 122	19.15	2.2	20	
4-Isopropyltoluene	19.22	1.0	20	0	96.1	77 - 127	19.55	1.71	20	
4-Methyl-2-pentanone	34.54	2.0	40	0	86.3	67 - 130	34.17	1.06	20	
Acetone	28.33	2.0	40	0	70.8	39 - 160	26.63	6.2	20	
Benzene	18.59	1.0	20	0	92.9	79 - 120	19.15	2.96	20	
Bromobenzene	20.17	1.0	20	0	101	80 - 120	20.35	0.887	20	
Bromochloromethane	17.91	1.0	20	0	89.6	78 - 123	17.61	1.73	20	
Bromodichloromethane	18.7	1.0	20	0	93.5	79 - 125	18.48	1.16	20	
Bromoform	19.71	1.0	20	0	98.5	66 - 130	19.3	2.09	20	

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19110684-04MSD** Units: **UG/L** Analysis Date: **19-Nov-2019 14:49**
Client ID: **50WW23-191113** Run ID: **VOA6_350853** SeqNo: **5351472** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	19.44	1.0	20	0	97.2	53 - 141	20.03	2.97	20	
Carbon disulfide	35.96	2.0	40	0	89.9	64 - 133	37.43	4.02	20	
Carbon tetrachloride	19.37	1.0	20	0	96.9	72 - 136	20.23	4.31	20	
Chlorobenzene	18.71	1.0	20	0	93.6	82 - 118	19.02	1.63	20	
Chloroethane	17.34	1.0	20	0	86.7	60 - 138	17.72	2.2	20	
Chloroform	16.6	1.0	20	0	83.0	79 - 124	16.83	1.41	20	
Chloromethane	16.62	1.0	20	0	83.1	50 - 139	17.12	2.94	20	
cis-1,2-Dichloroethene	17.69	1.0	20	0	88.5	78 - 123	18.29	3.33	20	
cis-1,3-Dichloropropene	18.32	1.0	20	0	91.6	75 - 124	18.73	2.21	20	
Dibromochloromethane	19.22	1.0	20	0	96.1	74 - 126	19.48	1.36	20	
Dibromomethane	18.85	1.0	20	0	94.2	79 - 123	18.6	1.32	20	
Dichlorodifluoromethane	17.46	1.0	20	0	87.3	32 - 152	18.24	4.34	20	
Ethylbenzene	19.28	1.0	20	0	96.4	79 - 121	19.77	2.55	20	
Hexachlorobutadiene	18.32	1.0	20	0	91.6	66 - 134	17.54	4.32	20	
Isopropylbenzene	19.09	1.0	20	0	95.5	72 - 131	19.78	3.52	20	
m,p-Xylene	38.44	2.0	40	0	96.1	80 - 121	39.22	1.99	20	
Methylene chloride	16.67	2.0	20	0	83.4	74 - 124	16.66	0.0776	20	
Naphthalene	19.65	1.0	20	0	98.3	61 - 128	16.9	15.1	20	
n-Butylbenzene	18.79	1.0	20	0	94.0	75 - 128	19.12	1.73	20	
n-Propylbenzene	19.52	1.0	20	0	97.6	76 - 126	20.33	4.05	20	
o-Xylene	18.85	1.0	20	0	94.2	78 - 122	19.21	1.93	20	
sec-Butylbenzene	19.38	1.0	20	0	96.9	77 - 126	19.9	2.66	20	
Styrene	18.76	1.0	20	0	93.8	78 - 123	18.96	1.08	20	
tert-Butylbenzene	19.77	1.0	20	0	98.8	78 - 124	20.39	3.12	20	
Tetrachloroethene	19.74	1.0	20	0	98.7	74 - 129	20.5	3.79	20	
Toluene	18.94	1.0	20	0	94.7	80 - 121	19.44	2.58	20	
trans-1,2-Dichloroethene	17.8	1.0	20	0	89.0	75 - 124	18.28	2.66	20	
trans-1,3-Dichloropropene	18.18	1.0	20	0	90.9	73 - 127	17.95	1.29	20	
Trichloroethene	20.24	1.0	20	0	101	79 - 123	21.07	4.02	20	
Trichlorofluoromethane	18.72	1.0	20	0	93.6	65 - 141	19.69	5.04	20	
Vinyl chloride	16.92	1.0	20	0	84.6	58 - 137	17.94	5.86	20	
Surr: 1,2-Dichloroethane-d4	*43.66*	*1.0*	*50*	*0*	*87.3*	*81 - 118*	*43.75*	*0.193*	*20*	
Surr: 4-Bromofluorobenzene	*46.75*	*1.0*	*50*	*0*	*93.5*	*85 - 114*	*46.39*	*0.767*	*20*	
Surr: Dibromofluoromethane	*46.68*	*1.0*	*50*	*0*	*93.4*	*80 - 119*	*46.61*	*0.147*	*20*	

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350853 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19110684-04MSD** Units: **UG/L** Analysis Date: **19-Nov-2019 14:49**
Client ID: **50WW23-191113** Run ID: **VOA6_350853** SeqNo: **5351472** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*47.96*	*1.0*	*50*	*0*	*95.9*	*89 - 112*	*47.97*	*0.0235*	*20*	

The following samples were analyzed in this batch: HS19110684-01 HS19110684-02 HS19110684-03 HS19110684-04 HS19110684-05

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350580 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-111419** Units: **mg/L** Analysis Date: **14-Nov-2019 15:22**
Client ID: Run ID: **ICS-Integrion_350580** SeqNo: **5346117** PrepDate: DF: **1**

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

LCS Sample ID: **WLCSW1-111419** Units: **mg/L** Analysis Date: **14-Nov-2019 15:39**
Client ID: Run ID: **ICS-Integrion_350580** SeqNo: **5346118** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.14	0.500	20	0	101	80 - 120				
Nitrogen, Nitrate (As N)	4.066	0.100	4	0	102	80 - 120				
Sulfate	19.78	0.500	20	0	98.9	80 - 120				

LCSD Sample ID: **WLCSDW1-111419** Units: **mg/L** Analysis Date: **14-Nov-2019 15:56**
Client ID: Run ID: **ICS-Integrion_350580** SeqNo: **5346119** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.1	0.500	20	0	100	80 - 120	20.14	0.204	20	
Nitrogen, Nitrate (As N)	4.065	0.100	4	0	102	80 - 120	4.066	0.0221	20	
Sulfate	19.79	0.500	20	0	98.9	80 - 120	19.78	0.0263	20	

MS Sample ID: **HS19110684-04MS** Units: **mg/L** Analysis Date: **14-Nov-2019 21:20**
Client ID: **50WW23-191113** Run ID: **ICS-Integrion_350580** SeqNo: **5346128** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1245	0.500	10	1262	-164	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.158	0.100	2	0.1042	103	80 - 120				
Sulfate	186.3	0.500	10	180.5	57.4	80 - 120				SEO

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: HS19110684

QC BATCH REPORT

Batch ID: R350580 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MS Sample ID: **HS19110684-04MS** Units: **mg/L** Analysis Date: **14-Nov-2019 22:10**
Client ID: **50WW23-191113** Run ID: **ICS-Integrion_350580** SeqNo: **5346131** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1453	10.0	200	1288	82.4	80 - 120				O
Nitrogen, Nitrate (As N)	39.1	2.00	40	0	97.7	80 - 120				
Sulfate	367.5	10.0	200	181.5	93.0	80 - 120				

MSD Sample ID: **HS19110684-04MSD** Units: **mg/L** Analysis Date: **14-Nov-2019 21:36**
Client ID: **50WW23-191113** Run ID: **ICS-Integrion_350580** SeqNo: **5346129** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1246	0.500	10	1262	-159	80 - 120	1245	0.0444	20	SEO
Nitrogen, Nitrate (As N)	2.117	0.100	2	0.1042	101	80 - 120	2.158	1.92	20	
Sulfate	186.3	0.500	10	180.5	58.2	80 - 120	186.3	0.0432	20	SEO

MSD Sample ID: **HS19110684-04MSD** Units: **mg/L** Analysis Date: **14-Nov-2019 22:26**
Client ID: **50WW23-191113** Run ID: **ICS-Integrion_350580** SeqNo: **5346132** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1452	10.0	200	1288	81.6	80 - 120	1453	0.109	20	O
Nitrogen, Nitrate (As N)	39.2	2.00	40	0	98.0	80 - 120	39.1	0.271	20	
Sulfate	367.6	10.0	200	181.5	93.1	80 - 120	367.5	0.0397	20	

The following samples were analyzed in this batch: HS19110684-01 HS19110684-02 HS19110684-03 HS19110684-04

ALS Houston, US Date: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
WorkOrder: **HS19110684**

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: 05-Dec-19

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP-50 501032
Work Order: HS19110684

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19110684-01	50WW16-191113	Login	11/14/2019 10:12:04 AM	JRM	Sub
HS19110684-01	50WW16-191113	Login	11/14/2019 10:12:04 AM	JRM	WET118
HS19110684-01	50WW16-191113	Login	11/14/2019 10:12:04 AM	JRM	VOA135
HS19110684-01	50WW16-191113	Login	11/14/2019 10:12:04 AM	JRM	Sub
HS19110684-01	50WW16-191113	Login	11/14/2019 10:12:04 AM	JRM	Sub
HS19110684-01	50WW16-191113	Login	11/14/2019 10:12:04 AM	JRM	Sub

ALS Houston, US Date: 05-Dec-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19110684
Date/Time Received: **14-Nov-2019 09:05**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Nov-2019 Date
Reviewed by: *RJ Modashia* eSignature 14-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: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):	1.3°C / 1.3°C UC/C	IR11	
Cooler(s)/Kit(s):	24602		
Date/Time sample(s) sent to storage:	11/14/2019 10:20		
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: 50NOV2019-1911 -ALS

TURNAROUND TIME:

Page 1 of

RUSH:

PROJECT/CLIENT INFO

Facility Name	Longhorn AAP
Project Number	501032
	LHAAP-50
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.	Sample Container and Preservatives	3-40 ml VOA/HCL	3-40 ml VOA/HCL	3-40 ml VOA/Cool to 6 deg C	2-40ml Amber/H2SO4	1-250ml /Cool to 6 deg C	1-125ml /Cool to 6 deg C
ANALYSIS										Vocs by 8260B	MEE by RSK175	CO2 by RSK175	TOC by Sm5310C	Anions (chloride/sulfate/nitrate) by 9056	Perchlorate by 6850
SDWW16-191113	LHAAP 50				WG	11/13/19	0835	13		X	X	X	X	X	X
SD WW14-191113	LHAAP50				WG	11/13/19	0945	13		X	X	X	X	X	X
SDWW13-191113	LHAAP50				WG	11/13/19	1035	13		X	X	X	X	X	X
SDWW23-191113	LHAAP50				WG	11/13/19	1140	13		X	X	X	X	X	X
SDWW23-191113-MS	LHAAP50				WG	11/13/19	1140	13		X	X	X	X	X	X
SDWW23 191113-MSD	LHAAP50				WG	11/13/19	1140	13		X	X	X	X	X	X
TRIP BLANK	LHAAP50				WQ	11/13/19		2		X					

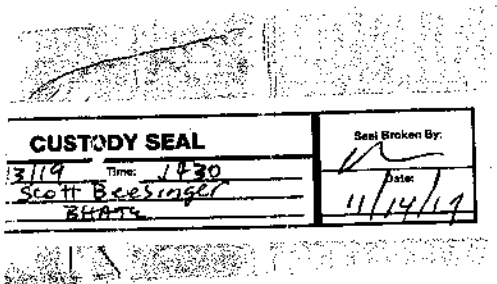
HS19110684

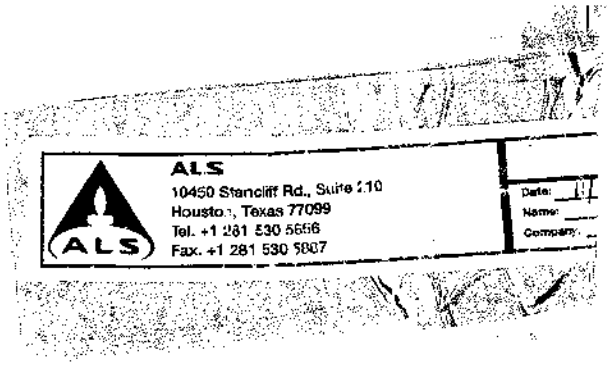
Aptim Environmental & Infrastucture, Inc.

LHAAP-50 501032

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
Cooler - 24602 Temp 1.3 1N2S cf 0.0	BHATT	11/13/19 1430	J. Mmumm	11/14/19 09:05


FedEx
TRK# 0221 1251 0291 2397
THU – 14 NOV 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US IAH


CUSTODY SEAL
Time: 1430
Scott Beesinger
Seal Broken By:
Date: 11/14/19


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

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 26, 2019 **Analytical Report for Service Request No:** K1910796

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

RE: HS19110684

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory November 15, 2019
For your reference, these analyses have been assigned our service request number **K1910796.**

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
F : +1 360 636 1068
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

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

ALS Environmental

Client: ALS Environmental - US
Project: HS19110684
Sample Matrix: Ground Water

Service Request: K1910796
Date Received: 11/15/2019

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:

Four ground water samples were received for analysis at ALS Environmental on 11/15/2019. 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, 11/23/2019: The Relative Percent Difference (RPD) criterion for the replicate analysis of Total Organic Carbon in sample 50WW14-191113 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 11/26/2019

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

K1910796

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:** **12632**

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:	HS19110684
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19110684-01**	**50WW16-191113**	**Groundwater**	**13 Nov 2019 08:35**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			02 Dec 2019
2.	**HS19110684-02**	**50WW14-191113**	**Groundwater**	**13 Nov 2019 09:45**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			02 Dec 2019
3.	**HS19110684-03**	**50WW13-191113**	**Groundwater**	**13 Nov 2019 10:35**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			02 Dec 2019
4.	**HS19110684-04**	**50WW23-191113**	**Groundwater**	**13 Nov 2019 11:40**
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD			02 Dec 2019

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

HS19110684-04 MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 11/14/19 1800.

Received By: _____ Date/Time: 11/15/19 0950

Cooler ID(s): _____ Temperature(s): _____

PC KL

Cooler Receipt and Preservation Form

Client ACS Houston Service Request K19 10791

Received: 11/15/2019 Opened: 11/15/19 By: MM Unloaded: 11/15/19 By: MM

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
-0.3	-0.4	1.7	1.6	-0.1	381	12632	1251 0291 8270	

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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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1910796
Project:	HS19110684	**Date Collected:**	11/13/19
Sample Matrix:	Ground Water	**Date Received:**	11/15/19
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
50WW16-191113	K1910796-001	**1.05**	0.50	0.20	0.07	1	11/23/19 21:30	
50WW14-191113	K1910796-002	**0.88**	0.50	0.20	0.07	1	11/23/19 21:59	
50WW13-191113	K1910796-003	**1.78**	0.50	0.20	0.07	1	11/23/19 22:27	
50WW23-191113	K1910796-004	**0.20 J**	0.50	0.20	0.07	1	11/23/19 20:18	
Method Blank	K1910796-MB	ND U	0.50	0.20	0.07	1	11/23/19 17:14	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1910796
Project	HS19110684	**Date Collected:**	11/13/19
Sample Matrix:	Ground Water	**Date Received:**	11/15/19
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
50WW16-191113	K1910796-001DUP	0.50	0.20	0.07	1.05	1.14	1.09	8	10	11/23/19
50WW14-191113	K1910796-002DUP	0.50	0.20	0.07	0.88	0.77	0.823	14 *	10	11/23/19
50WW13-191113	K1910796-003DUP	0.50	0.20	0.07	1.78	1.75	1.77	1	10	11/23/19
50WW23-191113	K1910796-004DUP	0.50	0.20	0.07	0.20 J	0.21 J	0.204	6	10	11/23/19

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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1910796
Project:	HS19110684	**Date Collected:**	11/13/19
Sample Matrix:	Ground Water	**Date Received:**	11/15/19
		Date Analyzed:	11/23/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	50WW23-191113	**Units:**	mg/L
Lab Code:	K1910796-004	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1910796-004MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	0.20 J	22.5	25.0	89	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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1910796
Project:	HS19110684	**Date Analyzed:**	11/23/19
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:	661076

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1910796-LCS	24.7	25.0	99	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1910796
Project: HS19110684

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	661076	KQ1917446-01	11/23/19 16:45	25.0	24.5	98	90-110
CCV2	661076	KQ1917446-02	11/23/19 21:01	25.0	24.6	98	90-110
CCV3	661076	KQ1917446-03	11/24/19 02:11	25.0	24.6	98	90-110
CCV4	661076	KQ1917446-04	11/24/19 06:54	25.0	24.2	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1910796
Project: HS19110684

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	661076	KQ1917446-05	11/23/19 16:59	0.50	0.20	0.07	ND	U
CCB2	661076	KQ1917446-06	11/23/19 21:15	0.50	0.20	0.07	ND	U
CCB3	661076	KQ1917446-07	11/24/19 02:26	0.50	0.20	0.07	ND	U
CCB4	661076	KQ1917446-08	11/24/19 07:09	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, 86, 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: BCV

Analysis: TOC/DOC

TOC: 661076, 661077, 661078

Run # 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: K190847-4/4d, K190903-2/2d, 803-4/4d sent for CA due to being above calibration curve.
K190803-3/3d, 803-5/5d sent for CA due to sample carry over.
K191043-2 sent for CA due to being overdiluted.
K190680-2/2d, 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.
K191033-6/6d, 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

# 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.

Printed 11/26/19 13:39

Results Summary

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

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	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	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

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	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	

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	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

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

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

Instrument Name: Fusion1

Report Version: 1 of 1

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)

Engine Version: 1.1.5.1

Firmware Version: 1.2.0696

Connection: RS232 COM1

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
SystemFlow	500 ml/min

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	2019/11/25 06:49

ALS Environmental

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: BCP	Date Analyzed: 11/26/19
Reviewed By:	Date Reviewed: 11/26/19

23 BCP 11/27/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1932283; 1932284; 1932352

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2320 (252432)

General Set Information: There were seventeen 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 1932284006 was analyzed and reported from a 1:10 dilution. Field sample 1932284007 was analyzed and reported from a 1:100 dilution. Field samples 1932284008/09/10 and 1932352003 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 685442) was less than 1/2 the CRDL. The recovery for the LCS (685439) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1932352005/06 (Client ID: 50WW23-191113). 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 – 685440) is reported from the analysis of the Laboratory Control Sample (LCS – 685439) 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 datafile 22NOV19D07.

Thomas Bosch — Analyst
November 25, 2019 — Date

ANALYTICAL REPORT

Report Date: November 26, 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: 34-1932352
Project ID: HS19110684
Purchase Order: HS19110684
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
50WW16-191113	1932352001	11/13/19	11/15/19	HS19110684-01
50WW14-191113	1932352002	11/13/19	11/15/19	HS19110684-01
50WW13-191113	1932352003	11/13/19	11/15/19	HS19110684-01
50WW23-191113	1932352004	11/13/19	11/15/19	HS19110684-01

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
50WW23-191113 MS	1932352005	11/13/19	11/15/19	HS19110684-01
50WW23-191113 MSD	1932352006	11/13/19	11/15/19	HS19110684-01

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

ANALYTICAL REPORT

Workorder: 34-1932352
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 50WW16-191113 | Sampling Site: HS19110684-01 | Collected: 11/13/2019
Lab ID: 1932352001 | Media: 125 mL Nalgene | Received: 11/15/2019
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/2320 (HBN: 252432) | %Solids: NA
Analyzed: 11/22/2019 12:13 | Report Basis: Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.6	1.0	2.0	4.0	1	J

Sample ID: 50WW14-191113 | Sampling Site: HS19110684-01 | Collected: 11/13/2019
Lab ID: 1932352002 | Media: 125 mL Nalgene | Received: 11/15/2019
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/2320 (HBN: 252432) | %Solids: NA
Analyzed: 11/22/2019 12:27 | 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: 50WW13-191113 | Sampling Site: HS19110684-01 | Collected: 11/13/2019
Lab ID: 1932352003 | Media: 125 mL Nalgene | Received: 11/15/2019
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/2320 (HBN: 252432) | %Solids: NA
Analyzed: 11/22/2019 12:41 | Report Basis: Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	4900	1000	2000	4000	1000	

Sample ID: 50WW23-191113 | Sampling Site: HS19110684-01 | Collected: 11/13/2019
Lab ID: 1932352004 | Media: 125 mL Nalgene | Received: 11/15/2019
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/2320 (HBN: 252432) | %Solids: NA
Analyzed: 11/22/2019 12:55 | 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: 34-1932352
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 252432)

Field sample 1932284006 was analyzed and reported from a 1:10 dilution. Field sample 1932284007 was analyzed and reported from a 1:100 dilution. Field samples 1932284008/09/10 and 1932352003 were analyzed and reported from 1:1,000 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 11/25/2019 12:25	/S/ Stephen Brose 11/26/2019 07:45

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 (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

ANALYTICAL REPORT

Workorder: 34-1932352
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.
< 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: 1932352

Limits:	Client SOW/Contract Specified	Preparation:	NA	Analysis:	EPA 6850, DoD QSM
Basis:	DoD QSM	Batch:	NA	Batch:	ELMS/2320 (HBN: 252432)
		Prepared By:	NA	Analyzed By:	Thomas Bosch

Blank

LMB: 685442
Analyzed: 11/22/2019 08:51
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 685439
Analyzed: 11/22/2019 08:23
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	2.92	3.00	97.3	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample: 1932352004	MS: 1932352005	MSD: 1932352006
	Analyzed: 11/22/2019 12:55	Analyzed: 11/22/2019 13:09	Analyzed: 11/22/2019 13:23
	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	3.29	3	110	78.8	123.8	3.05	102	7.54	0.0	20.0

Comments

Field sample 1932284006 was analyzed and reported from a 1:10 dilution. Field sample 1932284007 was analyzed and reported from a 1:100 dilution. Field samples 1932284008/09/10 and 1932352003 were analyzed and reported from 1:1,000 dilutions. The reporting limits have 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
11/25/2019 12:27	11/26/2019 07:45

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

1932352

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

18698 / # 2

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **12631**

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:	HS19110684
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19110684-01**	**50WW16-191113**	**Groundwater**	**13 Nov 2019 08:35**
	SUB_Perch-6850			02 Dec 2019
2.	**HS19110684-02**	**50WW14-191113**	**Groundwater**	**13 Nov 2019 09:45**
	SUB_Perch-6850			02 Dec 2019
3.	**HS19110684-03**	**50WW13-191113**	**Groundwater**	**13 Nov 2019 10:35**
	SUB_Perch-6850			02 Dec 2019
4.	**HS19110684-04**	**50WW23-191113**	**Groundwater**	**13 Nov 2019 11:40**
	SUB_Perch-6850			02 Dec 2019

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

HS19110684-04 MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 11/14/19 1800.

Received By: Jamie Russell Date/Time: 11-15-19 9:04

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19110684-01	***Split:***	**Workorder ID:** 1932352	**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	EPA 6850, DoD QSM
1	11/13/2019 08:35	50WW16-191113	1932352001		Water	A	1	A
2	11/13/2019 09:45	50WW14-191113	1932352002		Water	A	1	A
3	11/13/2019 10:35	50WW13-191113	1932352003		Water	A	1	A
4	11/13/2019 11:40	50WW23-191113	1932352004		Water	A	1	A
5	11/13/2019 11:40	50WW23-191113 MS	1932352005	MS	Water	A	1	A
6	11/13/2019 11:40	50WW23-191113 MSD	1932352006	MSD	Water	A	1	A
7								
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	11/15/2019 09:04	ALS Sample Receiving	Sample Login
Jennifer Russell	11-15-19 11:20	6C	Storage
R.33.	11/2019/14:00	T. Burch	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

Fri, 11/15/19 11:18 AM

ALSCOCV3.1

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

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: HS19110684-01

Date/Time of Receipt: 11-5-19 9:04

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	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: [signature] (Signature) T. Vartassell (Printed Name) 11-5-19 (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: _____

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: 14NOV19
ACTWGT: 11.35 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19110684 - RJ

FedEx Express

FRI - 15 NOV 3:00P
STANDARD OVERNIGHT

TRK# 0201 1251 0291 8281

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2320
Rule: EPA 6850, DoD QSM Water

Created: 11/22/2019 07:40
Analyst: T. Bosch

Instrument:
Status: WP

HBN: 252432

Workorder: 1932283 [ENV_LVL4]
Workorder: 1932284 [ENV_LVL4]
Workorder: 1932352 [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	685438	CCV for HBN 252432 [ELMS/2320]				CCV	3		E685041C3Q	5311		11/27/2019	
2	685439	LCS for HBN 252432 [ELMS/2320]				LCS	3		E6850Q413Q	5311		11/27/2019	
3	685440	RLVS for HBN 252432 [ELMS/2320				RLVS	3		E685041C3Q	5311		11/27/2019	
4	685441	ICS for HBN 252432 [ELMS/2320]				ICS	3		E6850..D3Q	5311		11/27/2019	
5	685442	LMB for HBN 252432 [ELMS/2320]				LMB	3		E6850Q413Q	5311		11/27/2019	
6	1932283001	LH18/24-SP650_111219_AIX				SAMPLE	3	1932283001-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
7	1932284001	50WW29-191111				SAMPLE	3	1932284001-A	E6850Q41.3	5480	12/9/2019	11/27/2019	
8	1932284002	50WW10-191111				SAMPLE	3	1932284002-A	E6850Q41.3	5480	12/9/2019	11/27/2019	
9	1932284003	50WW09-191111				SAMPLE	3	1932284003-A	E6850Q41.3	5480	12/9/2019	11/27/2019	
10	1932284004	50WW09-191111-FD				SAMPLE	3	1932284004-A	E6850Q41.3	5480	12/9/2019	11/27/2019	
11	1932284005	50WW22-191112				SAMPLE	3	1932284005-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
12	1932284006	50WW08-191112				SAMPLE	3	1932284006-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
13	1932284007	50WW06-191112				SAMPLE	3	1932284007-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
14	1932284008	50WW11-191112				SAMPLE	3	1932284008-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
15	1932284009	50WW12-191112				SAMPLE	3	1932284009-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
16	685443	CCV for HBN 252432 [ELMS/2320]				CCV	3		E685041C3Q	5311		11/27/2019	
17	1932284010	50WW12-191112-FD				SAMPLE	3	1932284010-A	E6850Q41.3	5480	12/10/2019	11/27/2019	
18	1932352001	50WW16-191113				SAMPLE	3	1932352001-A	E6850Q41.3	5480	12/11/2019	12/2/2019	
19	1932352002	50WW14-191113				SAMPLE	3	1932352002-A	E6850Q41.3	5480	12/11/2019	12/2/2019	
20	1932352003	50WW13-191113				SAMPLE	3	1932352003-A	E6850Q41.3	5480	12/11/2019	12/2/2019	
21	1932352004	50WW23-191113				SAMPLE	3	1932352004-A	E6850Q41.3	5480	12/11/2019	12/2/2019	
22	1932352005	50WW23-191113 MS				MS	3	1932352005-A	E6850Q413Q	5480		11/27/2019	
23	1932352006	50WW23-191113 MSD				MSD	3	1932352006-A	E6850Q413Q	5480		11/27/2019	
24	685444	CCV for HBN 252432 [ELMS/2320]				CCV	3		E685041C3Q	5311		11/27/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 1932283 (001); 1932284 (001-10); 1932352 (001-06)
ELMS Batch/HBN ID: 2320 (252432)
Prep Date: 11/20/2019 Analysis Date: 11/22/2019 Analyst: Tom Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\NOV\22NOV19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom 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: 35µL
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 685439; Target = 3.0µg/L. ASTM type II water was used for LMB 685442.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1932352005/06 (Client ID's: 50WW23-191113. 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 1932284006 was analyzed and reported from a 1:10 dilution. Field sample 1932284007 was analyzed and reported from a 1:100 dilution. Field samples 1932284008/09/10 and 1932352003 were analyzed and reported from 1:1,000 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\2019\NOV\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\252432-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 685440) is reported from the analysis of the Laboratory Control Sample (LCS – 685439) 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 datafile 22NOV19D07.

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 2320 HBN: 252432 **Sample Set IDs if Applicable:** 1932283/1932284/1932352	**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	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/20/2019 03:09PM	**Expires:** 07/25/2020
MFG Lot: TNB: 09/20/2019		**Usable:** Yes
Pipette ID: Not Provided		**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	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** Yes
Part ID: IC-PER-10X-1		**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	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/23/2019 03:09PM	**Expires:** 07/25/2020
MFG Lot: TNB: 09/20/2019		**Usable:** Yes
Pipette ID: Not Provided		**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	**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	**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®

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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*

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

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

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

250 SMITH STREET • NORTH KINGSTOWN, RHODE ISLAND 02852 • WWW.ULTRASCI.COM

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ISO 9001 ISO GUIDE 34 ISO/IEC 17025 ULTRA

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/IEC 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
(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*: ** For isotopically labeled compounds, MW listed is for the fully enriched product.*	130.44
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.

$NaCl^{18}O_4$

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\22NOV19D\22NOV19S.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
*	685438 CCV@25	Vial 71	1	Control	1	1.18387e6	7.449	24.67940
*	685439 QC@3.0	Vial 72	1	Control	2	1.54064e5	7.386	2.91840
*	685441 ICS@3.0	Vial 73	1	Control	3	8.60264e4	7.254	2.21034
*	685442 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1932283001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1932284001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1932284002	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1932284003	Vial 78	1	Sample	8	3.39907e5	7.111	6.60218
*	1932284004	Vial 79	1	Sample	9	3.51318e5	7.127	7.40859
*	1932284005	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1932284006 10X	Vial 81	1	Sample	11	3.45930e5	7.327	83.07076
*	1932284008 1K	Vial 83	1	Sample	13	3.33136e5	7.511	7986.47256
*	1932284009 1K	Vial 84	1	Sample	14	2.24426e6	7.566	4.73695e4
*	685443 CCV@25	Vial 71	1	Control	15	1.08713e6	7.452	23.36377
*	1932284010 1K	Vial 85	1	Sample	16	2.57913e6	7.503	4.25987e4
*	1932352001	Vial 86	1	Sample	17	8.45132e4	7.334	1.64039
*	1932352002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1932352003 1K	Vial 88	1	Sample	19	2.46586e5	7.620	4887.02652
*	1932352004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1932352005 MS	Vial 90	1	Sample	21	1.31208e5	7.056	3.28992
*	1932352006 MSD	Vial 91	1	Sample	22	1.21739e5	6.973	3.05088
*	1932284007 100	Vial 92	1	Sample	23	2.00097e6	7.508	4344.98594
*	685444 CCV@25	Vial 71	1	Control	24	1.01321e6	7.528	23.41845

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	685438 CCV@25	Vial 71	1	Control	1	1.64125e5	7.468	5.00000
*	685439 QC@3.0	Vial 72	1	Control	2	1.94166e5	7.409	5.00000
*	685441 ICS@3.0	Vial 73	1	Control	3	1.42348e5	7.286	5.00000
*	685442 LMB	Vial 74	1	Control	4	1.76890e5	7.423	5.00000
*	1932283001	Vial 75	1	Sample	5	1.50033e5	7.238	5.00000
*	1932284001	Vial 76	1	Sample	6	1.75095e5	7.088	5.00000
*	1932284002	Vial 77	1	Sample	7	1.69527e5	7.355	5.00000
*	1932284003	Vial 78	1	Sample	8	1.89098e5	7.138	5.00000
*	1932284004	Vial 79	1	Sample	9	1.73764e5	7.145	5.00000
*	1932284005	Vial 80	1	Sample	10	1.68474e5	7.001	5.00000
*	1932284006 10X	Vial 81	1	Sample	11	1.52150e5	7.348	50.00000
*	1932284008 1K	Vial 83	1	Sample	13	1.52567e5	7.535	5000.00000
*	1932284009 1K	Vial 84	1	Sample	14	1.48043e5	7.591	5000.00000
*	685443 CCV@25	Vial 71	1	Control	15	1.60069e5	7.476	5.00000
*	1932284010 1K	Vial 85	1	Sample	16	1.92723e5	7.534	5000.00000
*	1932352001	Vial 86	1	Sample	17	1.86562e5	7.360	5.00000
*	1932352002	Vial 87	1	Sample	18	1.64477e5	7.141	5.00000
*	1932352003 1K	Vial 88	1	Sample	19	1.85984e5	7.653	5000.00000
*	1932352004	Vial 89	1	Sample	20	1.67521e5	7.041	5.00000
*	1932352005 MS	Vial 90	1	Sample	21	1.46896e5	7.077	5.00000
*	1932352006 MSD	Vial 91	1	Sample	22	1.46852e5	6.990	5.00000
*	1932284007 100	Vial 92	1	Sample	23	1.46105e5	7.536	500.00000
*	685444 CCV@25	Vial 71	1	Control	24	1.48803e5	7.553	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	685438 CCV@25	Vial 71	1	Control	1	3.62557e5	7.464	24.77392
*	685439 QC@3.0	Vial 72	1	Control	2	4.98007e4	7.424	3.00461

Batch Report: C:\HPCHEM\1\DATA\22NOV19D\22NOV19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	685441 ICS@3.0	Vial 73	1	Control	3	3.55197e4	7.263	2.91970
*	685442 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1932283001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1932284001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1932284002	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1932284003	Vial 78	1	Sample	8	1.13127e5	7.120	7.10077
*	1932284004	Vial 79	1	Sample	9	1.17024e5	7.135	7.98367
*	1932284005	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1932284006 10X	Vial 81	1	Sample	11	1.11676e5	7.348	86.89341
*	1932284008 1K	Vial 83	1	Sample	13	1.02889e5	7.529	7994.43215
*	1932284009 1K	Vial 84	1	Sample	14	6.95779e5	7.584	4.83298e4
*	685443 CCV@25	Vial 71	1	Control	15	3.40343e5	7.472	23.92121
*	1932284010 1K	Vial 85	1	Sample	16	7.87731e5	7.521	4.28684e4
*	1932352001	Vial 86	1	Sample	17	2.73332e4	7.346	1.65533
*	1932352002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1932352003 1K	Vial 88	1	Sample	19	7.88807e4	7.651	5031.65245
*	1932352004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1932352005 MS	Vial 90	1	Sample	21	4.82831e4	7.074	3.88198
*	1932352006 MSD	Vial 91	1	Sample	22	4.25685e4	6.990	3.41115
*	1932284007 100	Vial 92	1	Sample	23	6.21132e5	7.526	4434.86232
*	685444 CCV@25	Vial 71	1	Control	24	3.26599e5	7.551	24.62821

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\NOV\22NOV19D.S

Sequence Table:

Method and Injection Info Part:

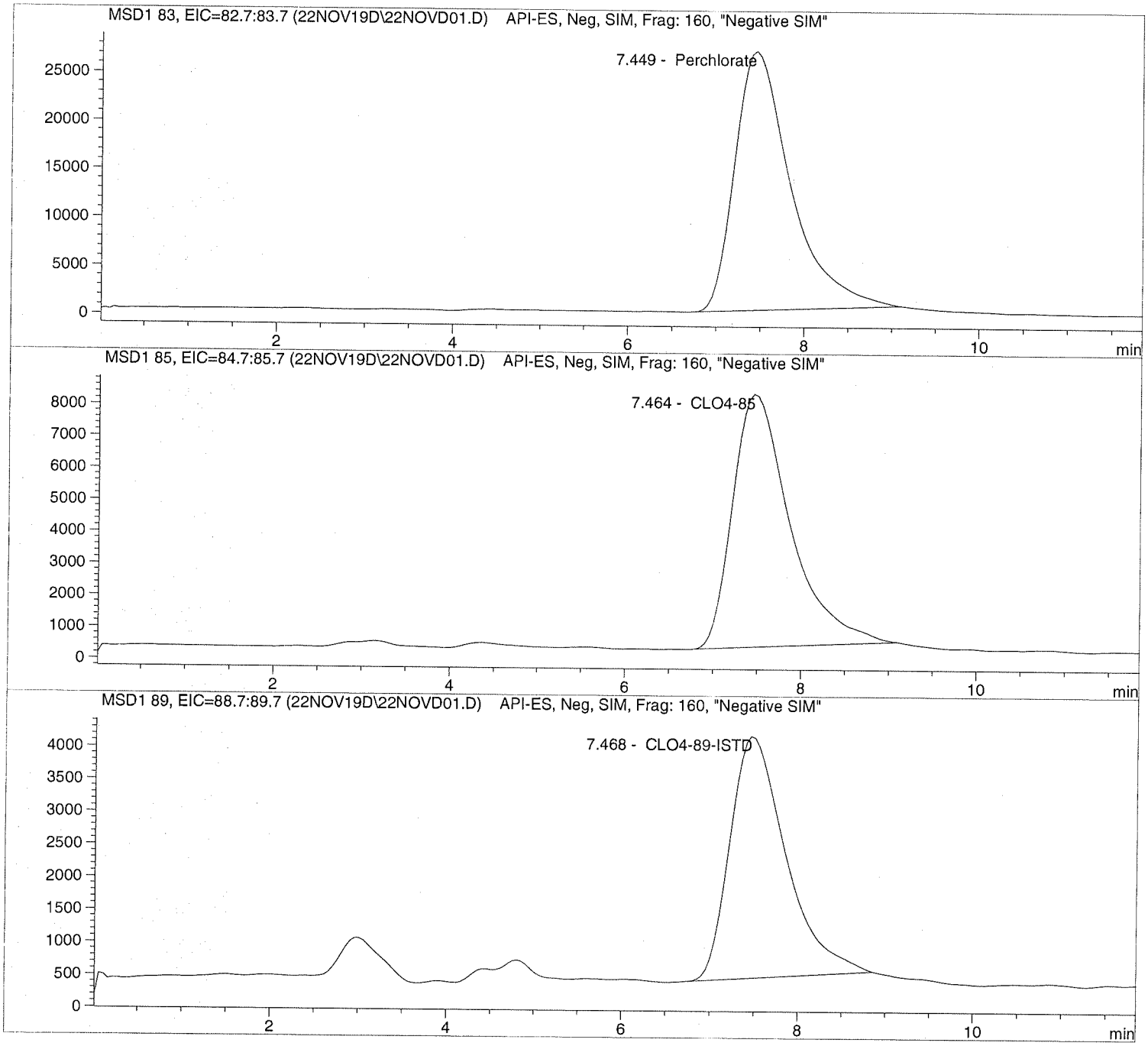
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	685438	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	685439	QC@3.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	685441	ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	685442	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1932283001		CLO4-AQN	1	Sample		
6	Vial 76	1932284001		CLO4-AQN	1	Sample		
7	Vial 77	1932284002		CLO4-AQN	1	Sample		
8	Vial 78	1932284003		CLO4-AQN	1	Sample		
9	Vial 79	1932284004		CLO4-AQN	1	Sample		
10	Vial 80	1932284005		CLO4-AQN	1	Sample		
11	Vial 81	1932284006	10X	CLO4-AQN	1	Sample		
12	Vial 82	1932284007	1K	CLO4-AQN	1	Sample		
13	Vial 83	1932284008	1K	CLO4-AQN	1	Sample		
14	Vial 84	1932284009	1K	CLO4-AQN	1	Sample		
15	Vial 71	685443	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1932284010	1K	CLO4-AQN	1	Sample		
17	Vial 86	1932352001		CLO4-AQN	1	Sample		
18	Vial 87	1932352002		CLO4-AQN	1	Sample		
19	Vial 88	1932352003	1K	CLO4-AQN	1	Sample		
20	Vial 89	1932352004		CLO4-AQN	1	Sample		
21	Vial 90	1932352005	MS	CLO4-AQN	1	Sample		
22	Vial 91	1932352006	MSD	CLO4-AQN	1	Sample		
23	Vial 92	1932284007	100	CLO4-AQN	1	Sample		
24	Vial 71	685444	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD01.D Sample Name: 685438 CCV@25

Injection Date:	11/22/2019 08:07:39	Seq Line:	1
Sample Name:	685438 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\22NOV19D\22NOVD01.D Sample Name: 685438 CCV@25

Injection Date:	11/22/2019 08:07:39	Seq Line:	1
Sample Name:	685438 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
7.449	PBA	1183865.7	24.6794	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.464	PBA	362557.4	24.7739	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.468	PBA	164125.4	5.0000	CLO4-89-ISTD

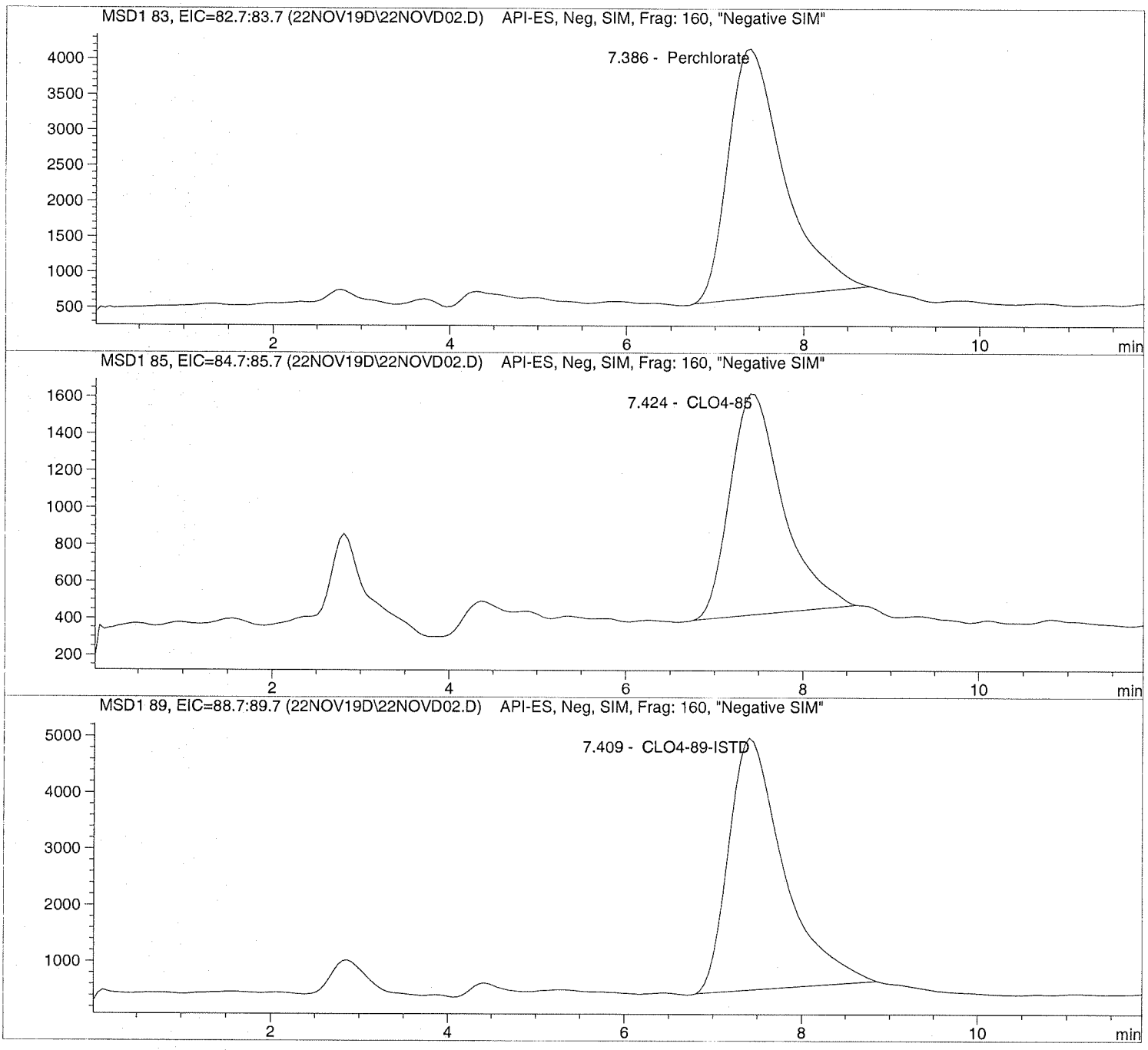
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD02.D Sample Name: 685439 QC@3.0

Injection Date:	11/22/2019 08:23:13	Seq Line:	2
Sample Name:	685439 QC@3.0	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\22NOV19D\22NOVD02.D Sample Name: 685439 QC@3.0

Injection Date:	11/22/2019 08:23:13	Seq Line:	2
Sample Name:	685439 QC@3.0	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:	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
7.386	PBA	154063.9	2.9184	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.424	PBA	49800.7	3.0046	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.409	PBA	194166.2	5.0000	CLO4-89-ISTD

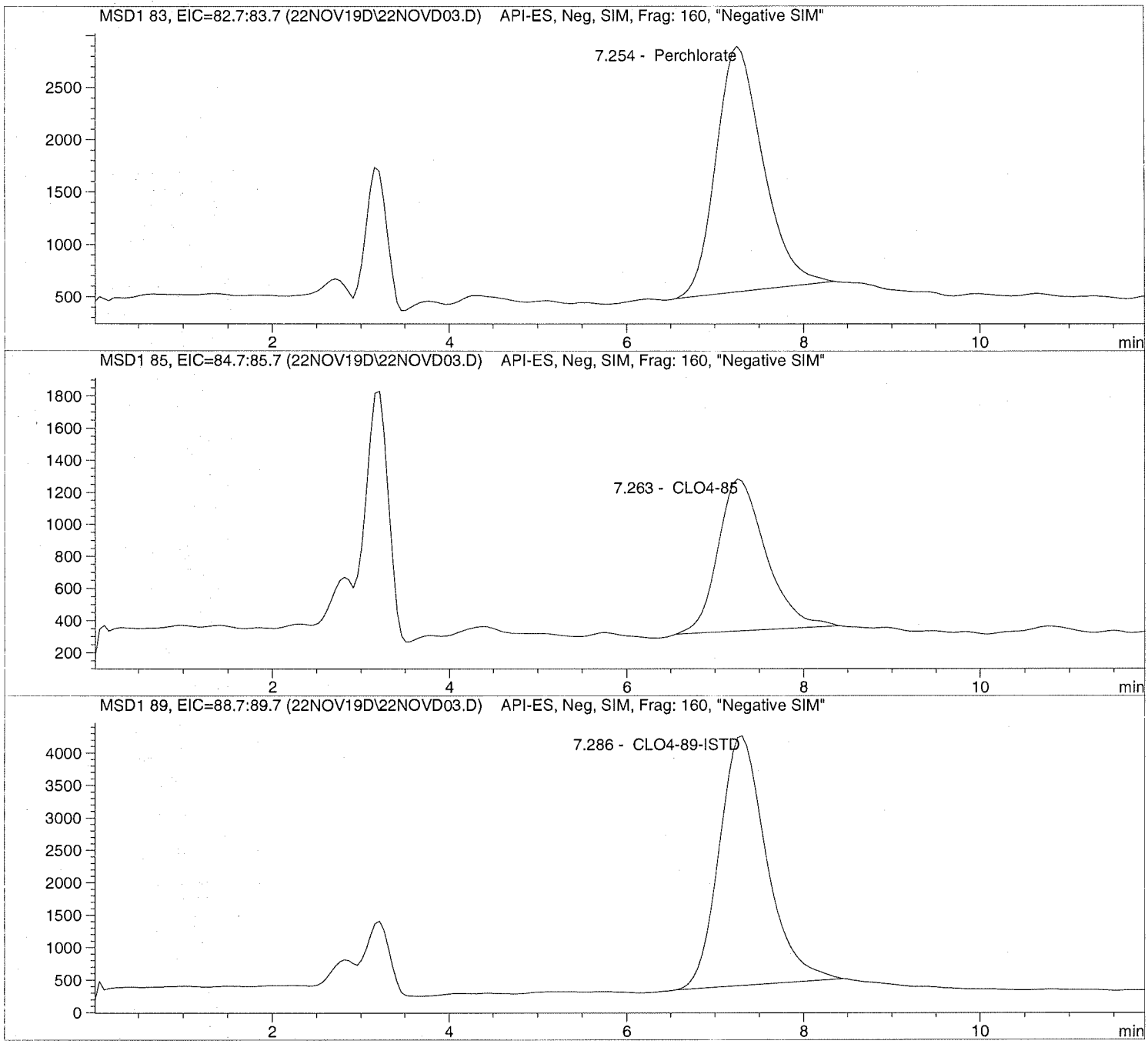
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD03.D Sample Name: 685441 ICS@3.0

Injection Date:	11/22/2019 08:37:06	Seq Line:	3
Sample Name:	685441 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\22NOV19D\22NOVD03.D Sample Name: 685441 ICS@3.0

Injection Date:	11/22/2019 08:37:06	Seq Line:	3
Sample Name:	685441 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
7.254	PBA	86026.4	2.2103	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.263	BBA	35519.7	2.9197	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.286	PBA	142348.3	5.0000	CLO4-89-ISTD

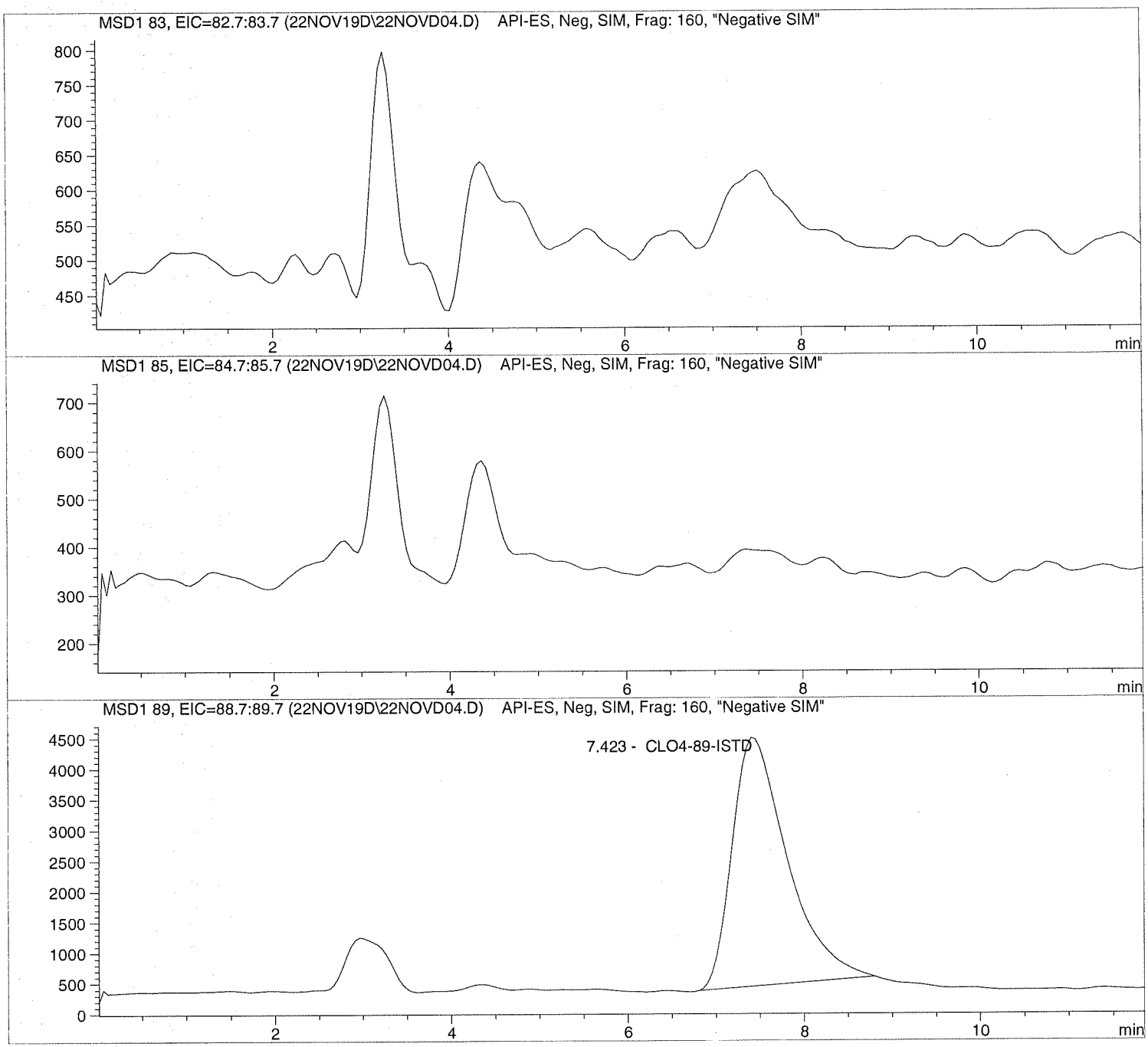
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD04.D Sample Name: 685442 LMB

Injection Date:	11/22/2019 08:51:01	Seq Line:	4
Sample Name:	685442 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\22NOV19D\22NOVD04.D Sample Name: 685442 LMB

Injection Date:	11/22/2019 08:51:01	Seq Line:	4
Sample Name:	685442 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:	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
7.423	PBA	176890.3	5.0000	CLO4-89-ISTD

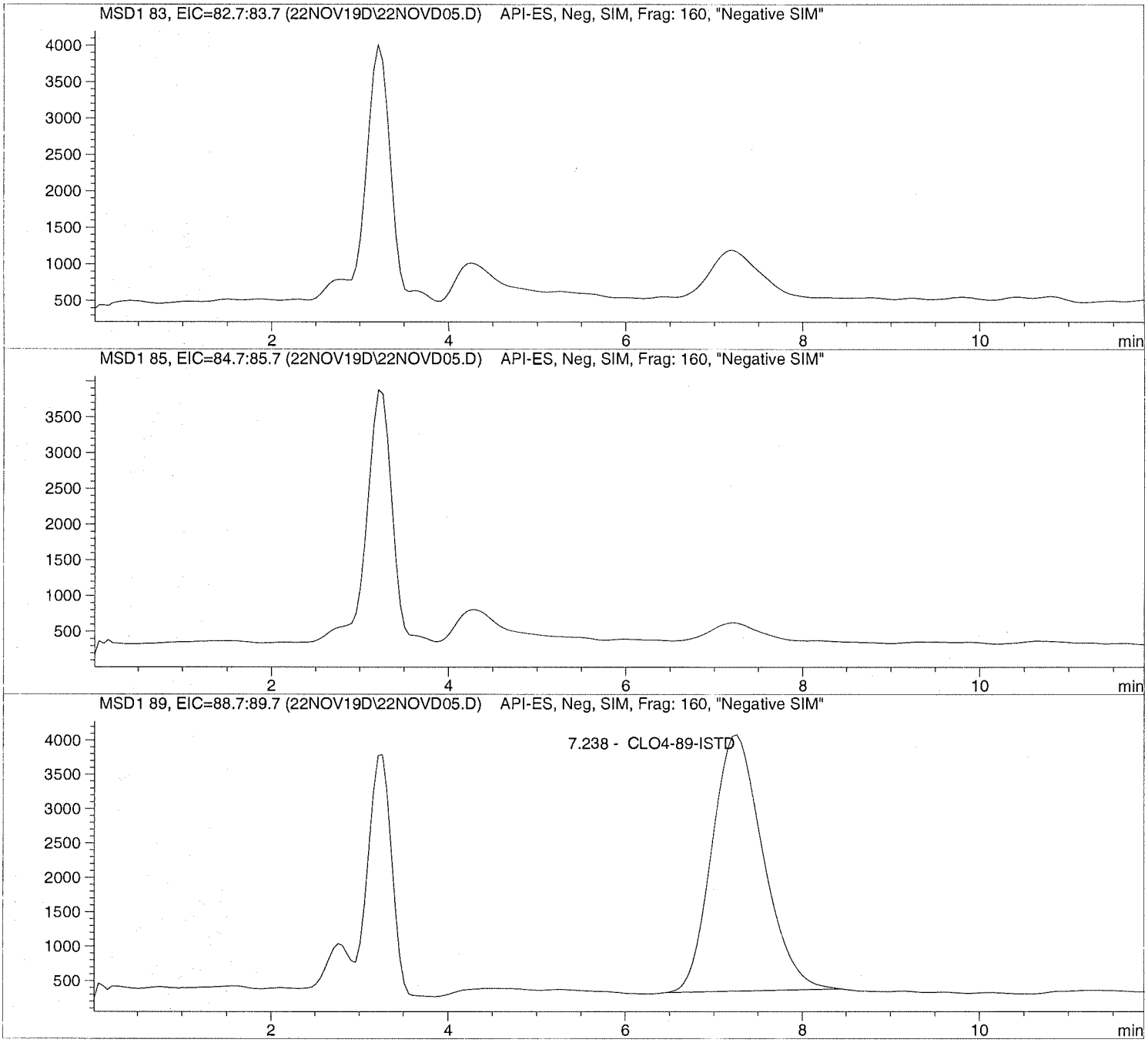
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD05.D Sample Name: 1932283001

Injection Date:	11/22/2019 09:12:41	Seq Line:	5
Sample Name:	1932283001	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\22NOV19D\22NOVD05.D Sample Name: 1932283001

Injection Date:	11/22/2019 09:12:41	Seq Line:	5
Sample Name:	1932283001	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:	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
7.238	PBA	150033.3	5.0000	CLO4-89-ISTD

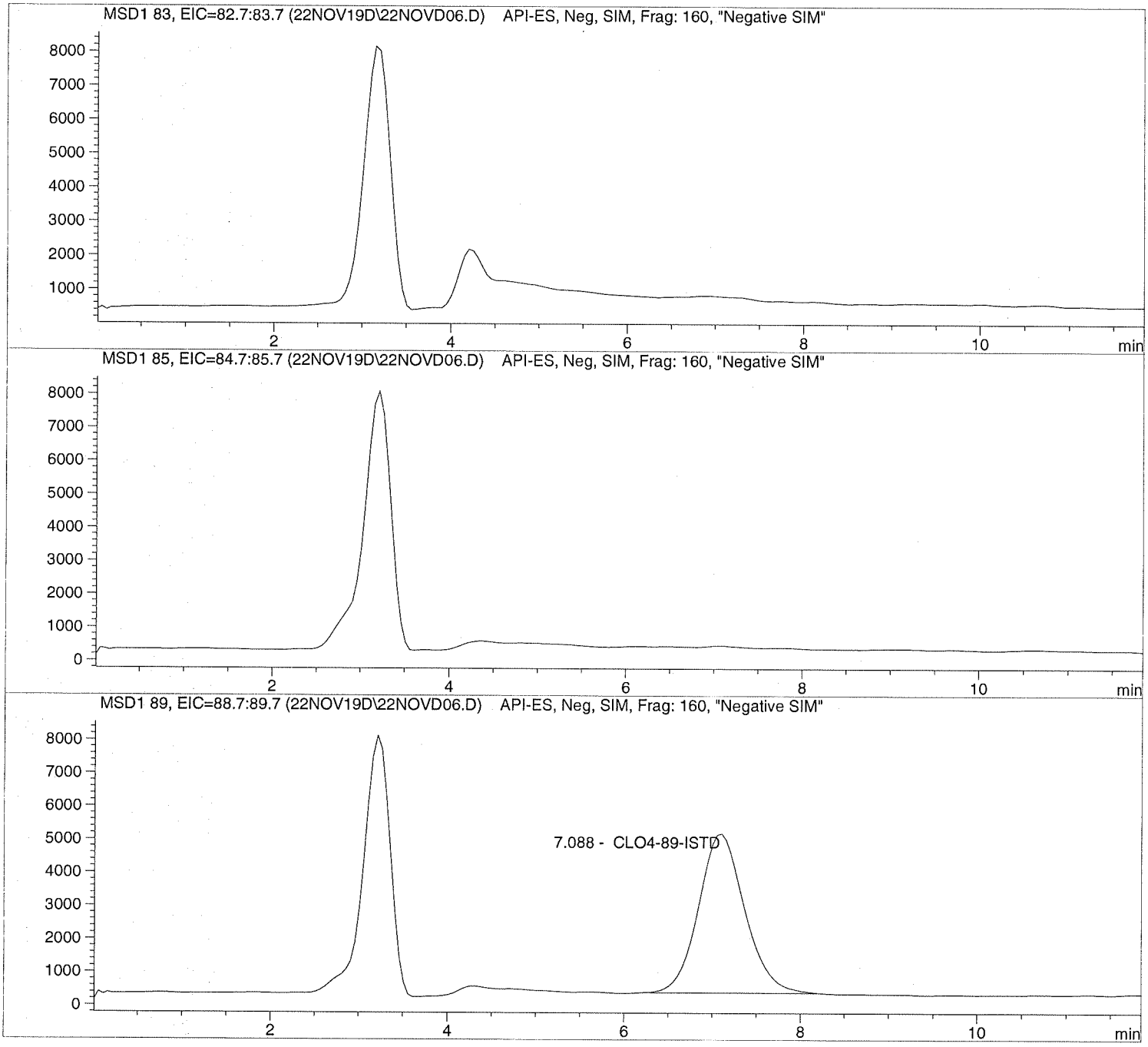
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD06.D Sample Name: 1932284001

Injection Date:	11/22/2019 09:26:34	Seq Line:	6
Sample Name:	1932284001	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\22NOV19D\22NOVD06.D Sample Name: 1932284001

Injection Date:	11/22/2019 09:26:34	Seq Line:	6
Sample Name:	1932284001	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:	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
7.088	BBA	175095.0	5.0000	CLO4-89-ISTD

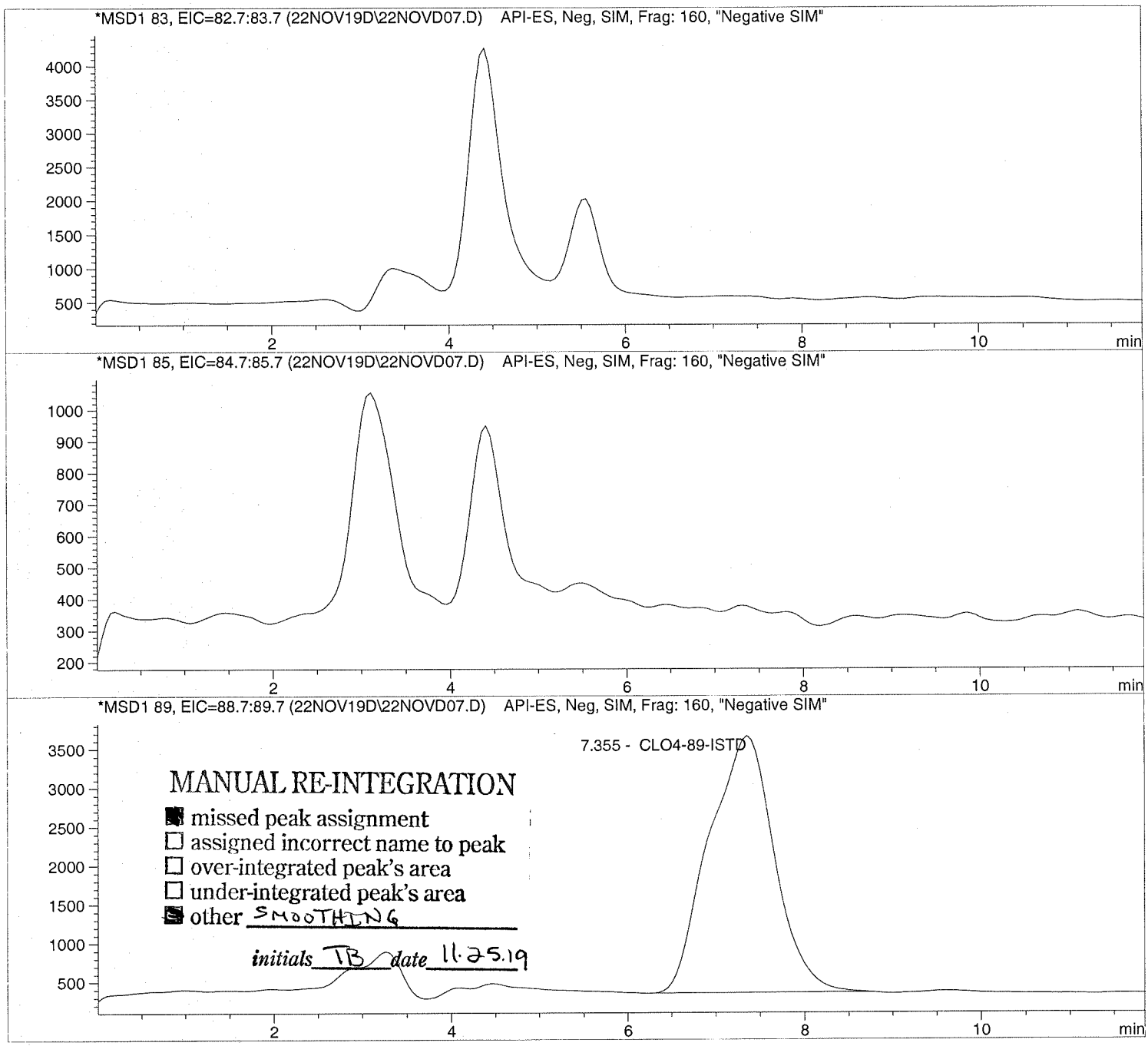
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD07.D Sample Name: 1932284002

Injection Date:	11/22/2019 09:55:02	Seq Line:	7
Sample Name:	1932284002	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\22NOV19D\22NOVD07.D Sample Name: 1932284002

Injection Date:	11/22/2019 09:55:02	Seq Line:	7
Sample Name:	1932284002	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:	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
7.355	PBA	169526.6	5.0000	CLO4-89-ISTD

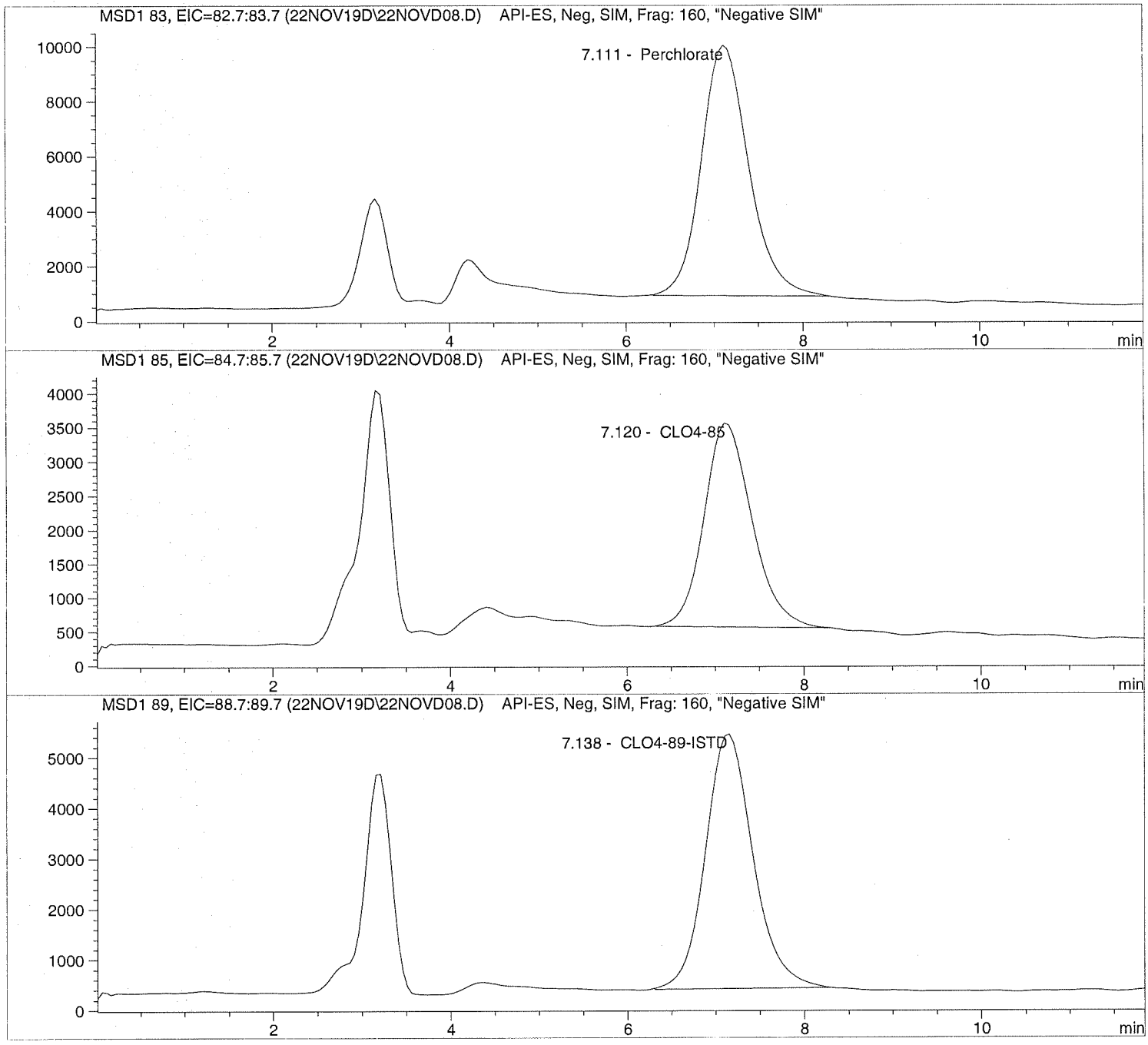
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD08.D Sample Name: 1932284003

Injection Date:	11/22/2019 10:08:56	Seq Line:	8
Sample Name:	1932284003	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\22NOV19D\22NOVD08.D Sample Name: 1932284003

Injection Date:	11/22/2019 10:08:56	Seq Line:	8
Sample Name:	1932284003	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:	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
7.111	BBA	339906.7	6.6022	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.120	PBA	113127.0	7.1008	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.138	PBA	189097.7	5.0000	CLO4-89-ISTD

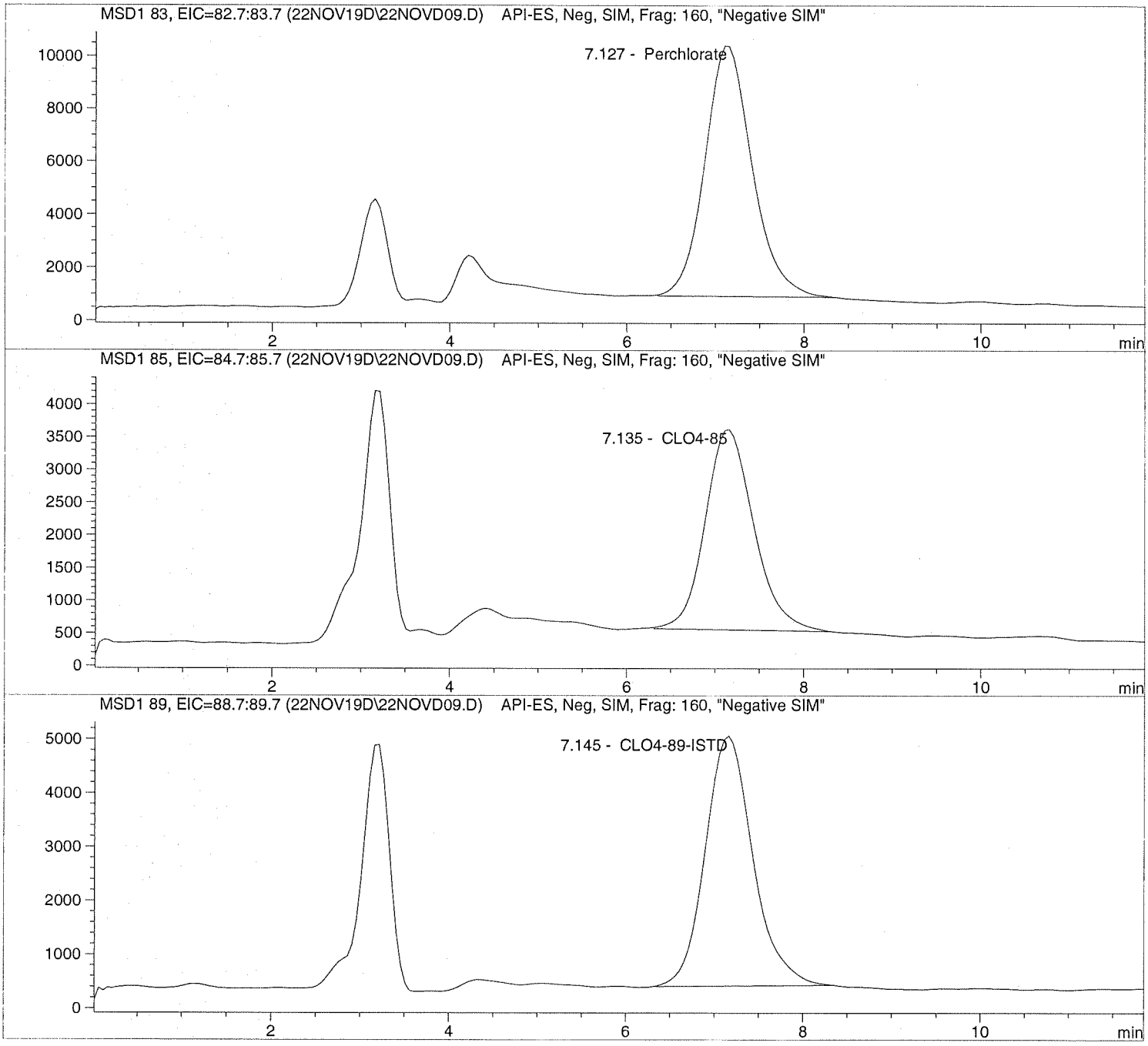
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD09.D Sample Name: 1932284004

Injection Date:	11/22/2019 10:22:49	Seq Line:	9
Sample Name:	1932284004	Location:	Vial 79
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\22NOV19D\22NOVD09.D Sample Name: 1932284004

Injection Date:	11/22/2019 10:22:49	Seq Line:	9
Sample Name:	1932284004	Location:	Vial 79
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:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.127	BBA	351317.6	7.4086	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.135	BBA	117024.3	7.9837	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.145	PBA	173763.9	5.0000	CLO4-89-ISTD

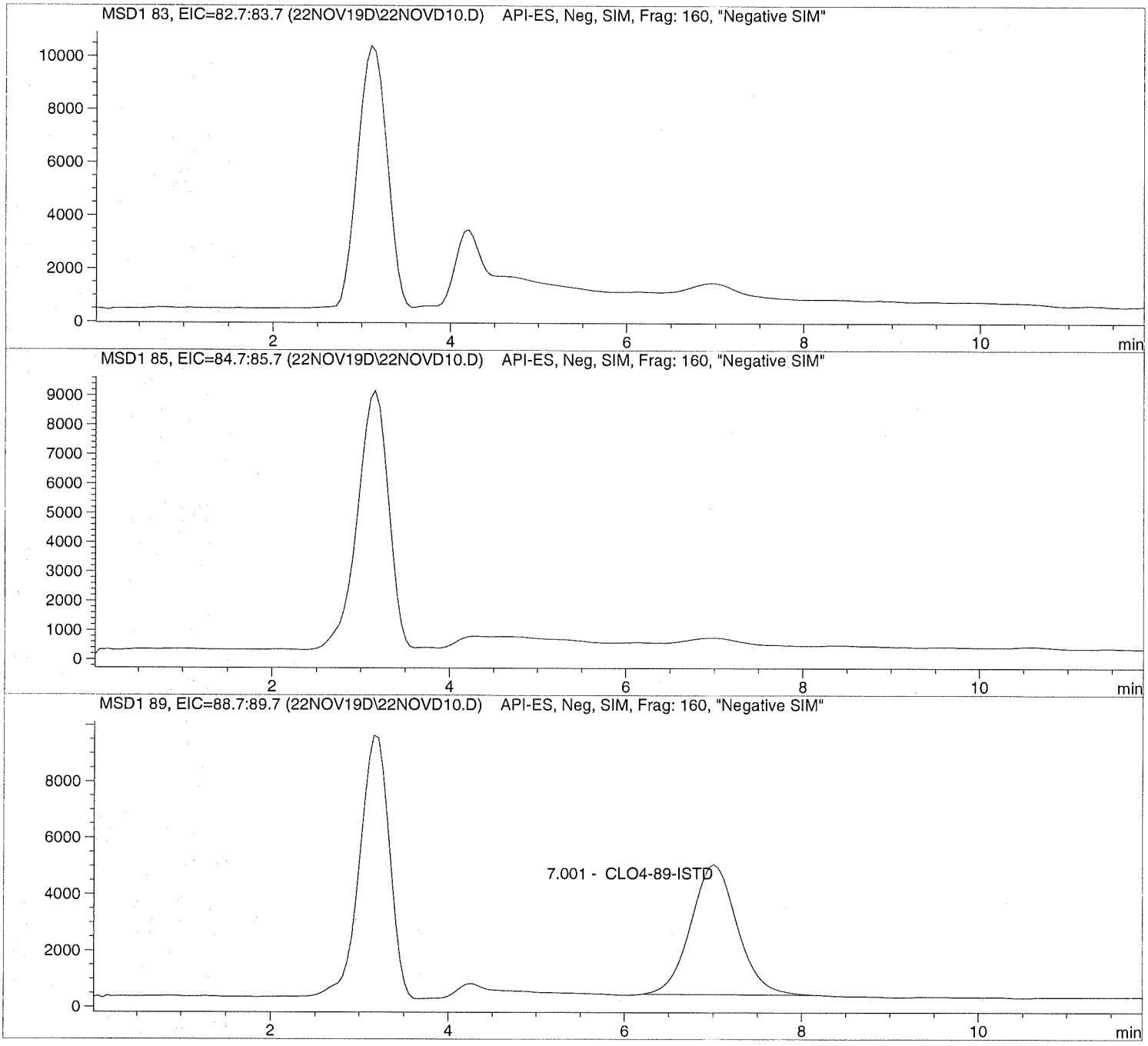
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD10.D Sample Name: 1932284005

Injection Date:	11/22/2019 10:36:43	Seq Line:	10
Sample Name:	1932284005	Location:	Vial 80
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\22NOV19D\22NOVD10.D Sample Name: 1932284005

Injection Date:	11/22/2019 10:36:43	Seq Line:	10
Sample Name:	1932284005	Location:	Vial 80
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:	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
7.001	BBA	168474.5	5.0000	CLO4-89-ISTD

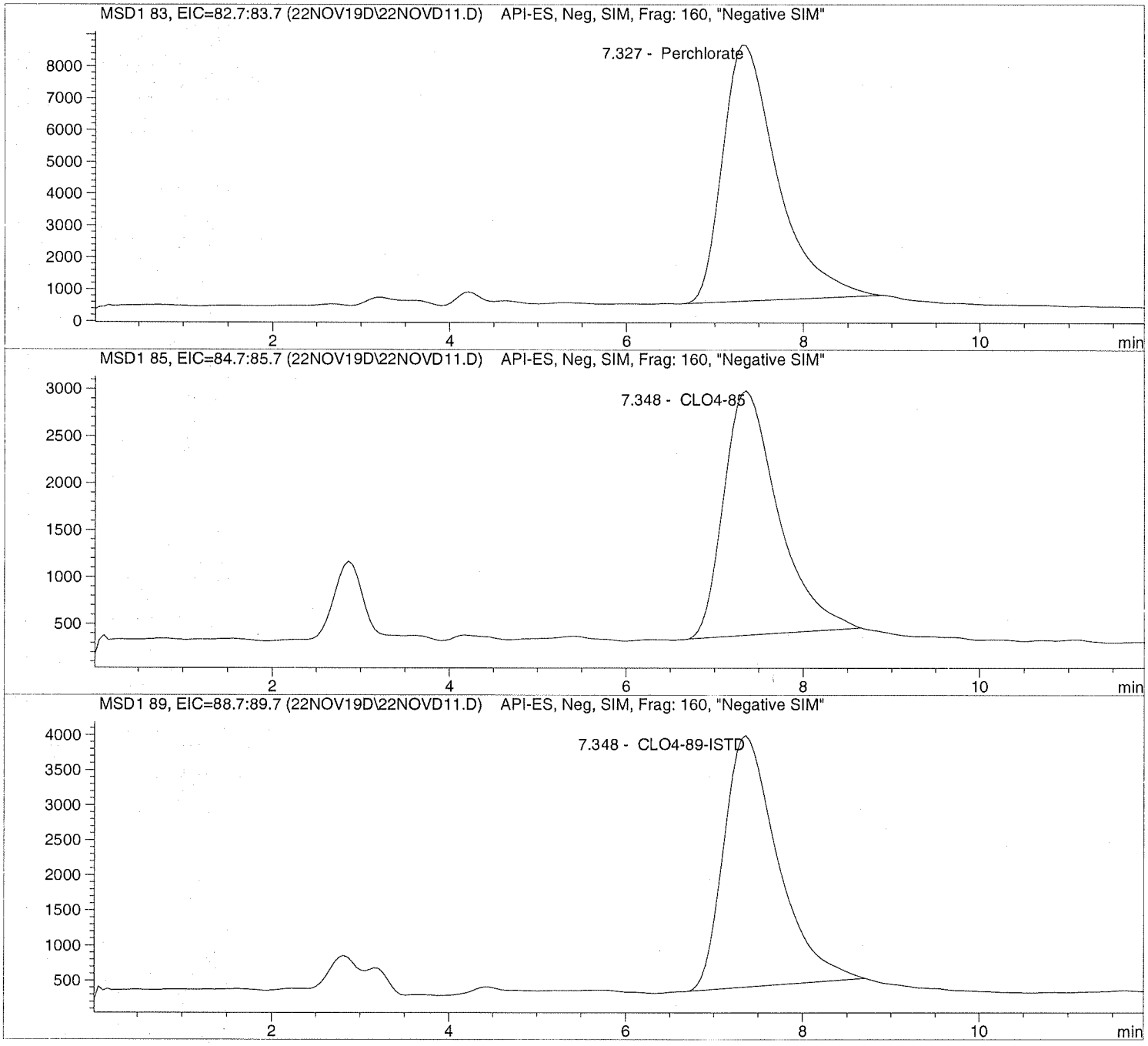
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD11.D Sample Name: 1932284006 10X

Injection Date:	11/22/2019 10:50:36	Seq Line:	11
Sample Name:	1932284006 10X	Location:	Vial 81
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\22NOV19D\22NOVD11.D Sample Name: 1932284006 10X

Injection Date:	11/22/2019 10:50:36	Seq Line:	11
Sample Name:	1932284006 10X	Location:	Vial 81
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:	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
7.327	PBA	345930.0	83.0708	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.348	PBA	111675.8	86.8934	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.348	PBA	152149.8	50.0000	CLO4-89-ISTD

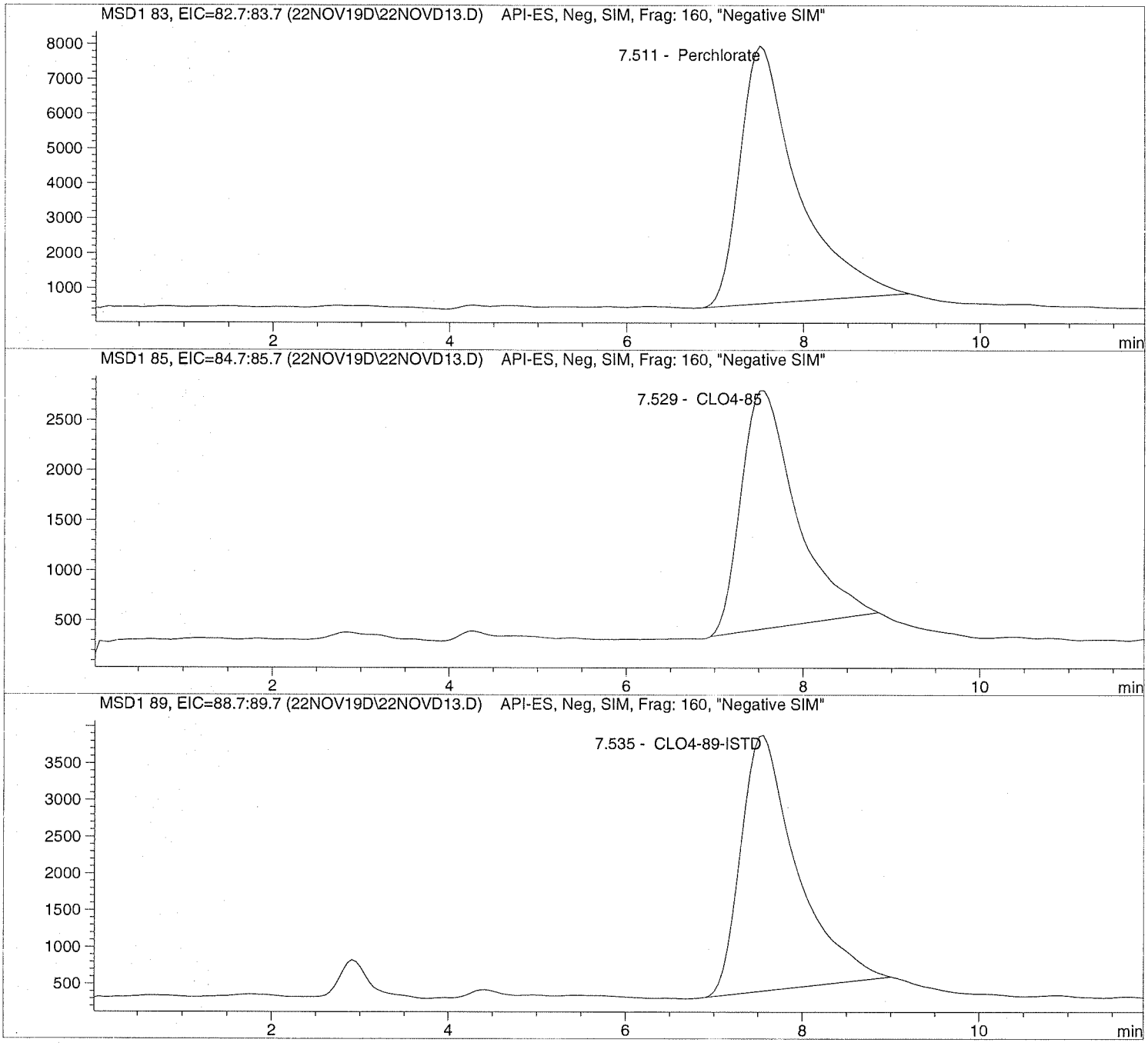
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD13.D Sample Name: 1932284008 1K

Injection Date:	11/22/2019 11:18:19	Seq Line:	13
Sample Name:	1932284008 1K	Location:	Vial 83
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\22NOV19D\22NOVD13.D Sample Name: 1932284008 1K

Injection Date:	11/22/2019 11:18:19	Seq Line:	13
Sample Name:	1932284008 1K	Location:	Vial 83
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:	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
7.511	PBA	333135.6	7986.4726	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.529	PBA	102889.4	7994.4321	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.535	PBA	152567.1	5000.0000	CLO4-89-ISTD

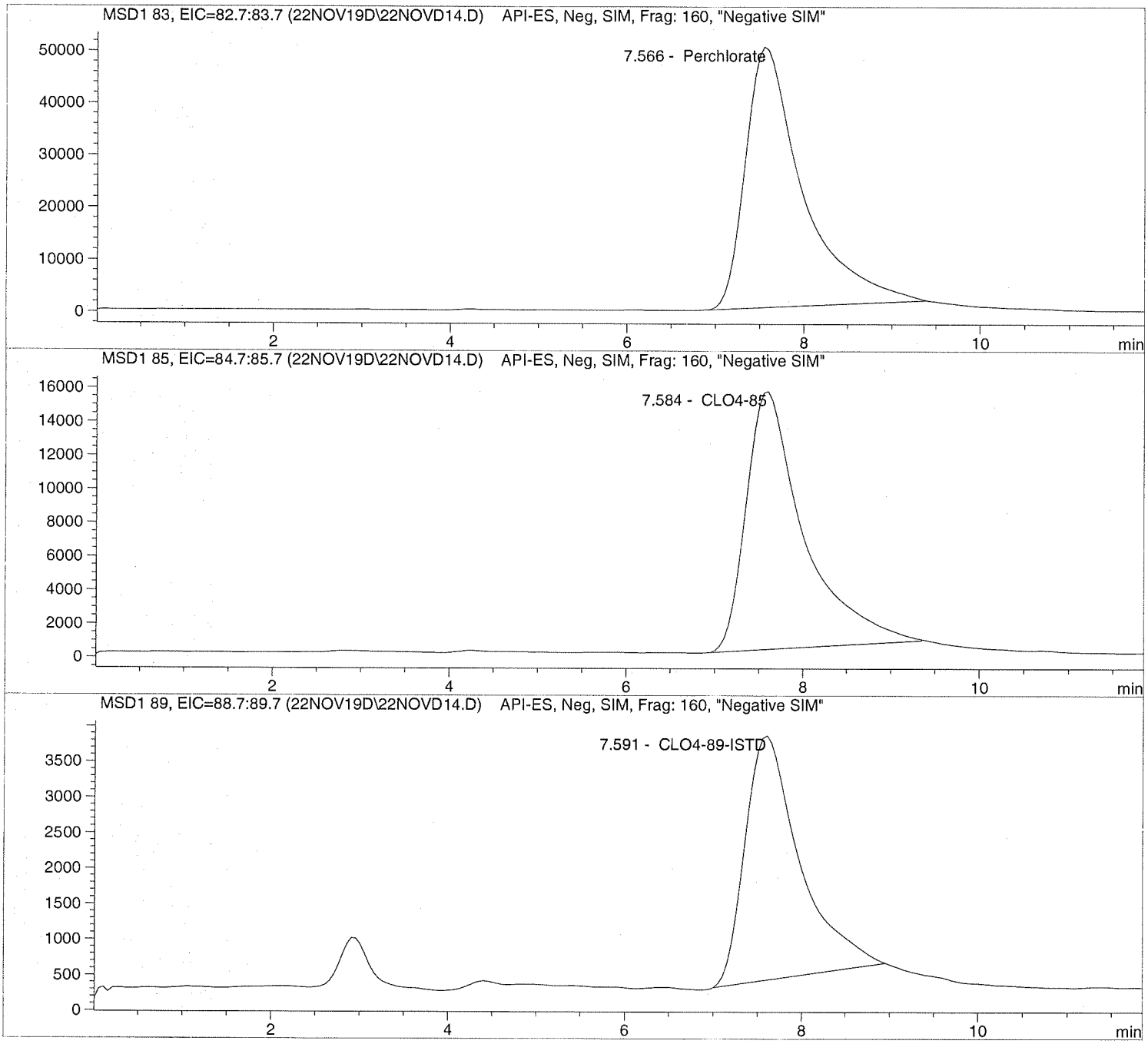
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD14.D Sample Name: 1932284009 1K

Injection Date:	11/22/2019 11:32:09	Seq Line:	14
Sample Name:	1932284009 1K	Location:	Vial 84
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\22NOV19D\22NOVD14.D Sample Name: 1932284009 1K

Injection Date:	11/22/2019 11:32:09	Seq Line:	14
Sample Name:	1932284009 1K	Location:	Vial 84
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:	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
7.566	PBA	2244256.0	47369.5432	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.584	PBA	695778.6	48329.8011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.591	PBA	148042.5	5000.0000	CLO4-89-ISTD

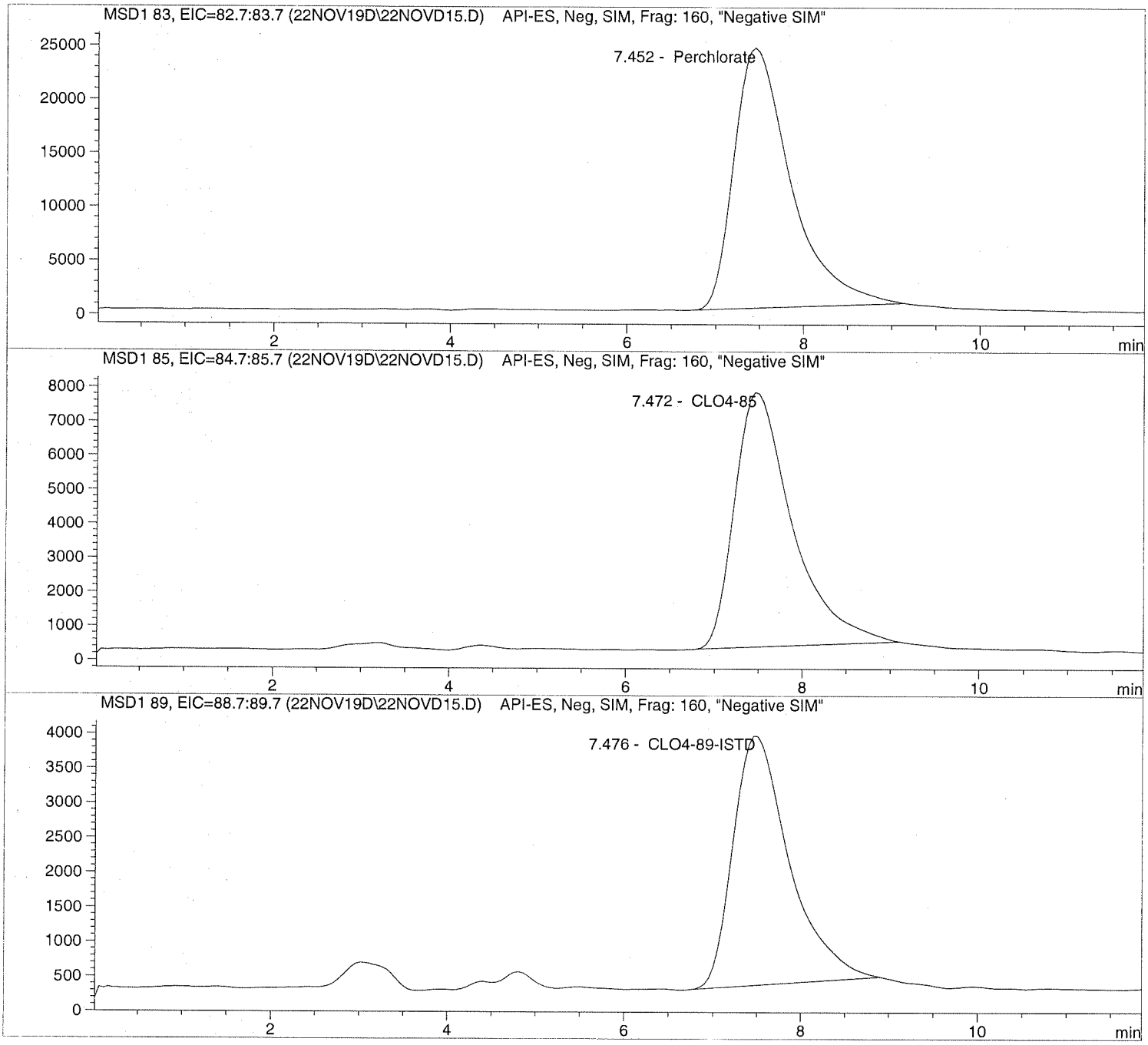
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD15.D Sample Name: 685443 CCV@25

Injection Date:	11/22/2019 11:46:00	Seq Line:	15
Sample Name:	685443 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\22NOV19D\22NOVD15.D Sample Name: 685443 CCV@25

Injection Date:	11/22/2019 11:46:00	Seq Line:	15
Sample Name:	685443 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
7.452	PBA	1087130.5	23.3638	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.472	PBA	340342.8	23.9212	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.476	PBA	160068.6	5.0000	CLO4-89-ISTD

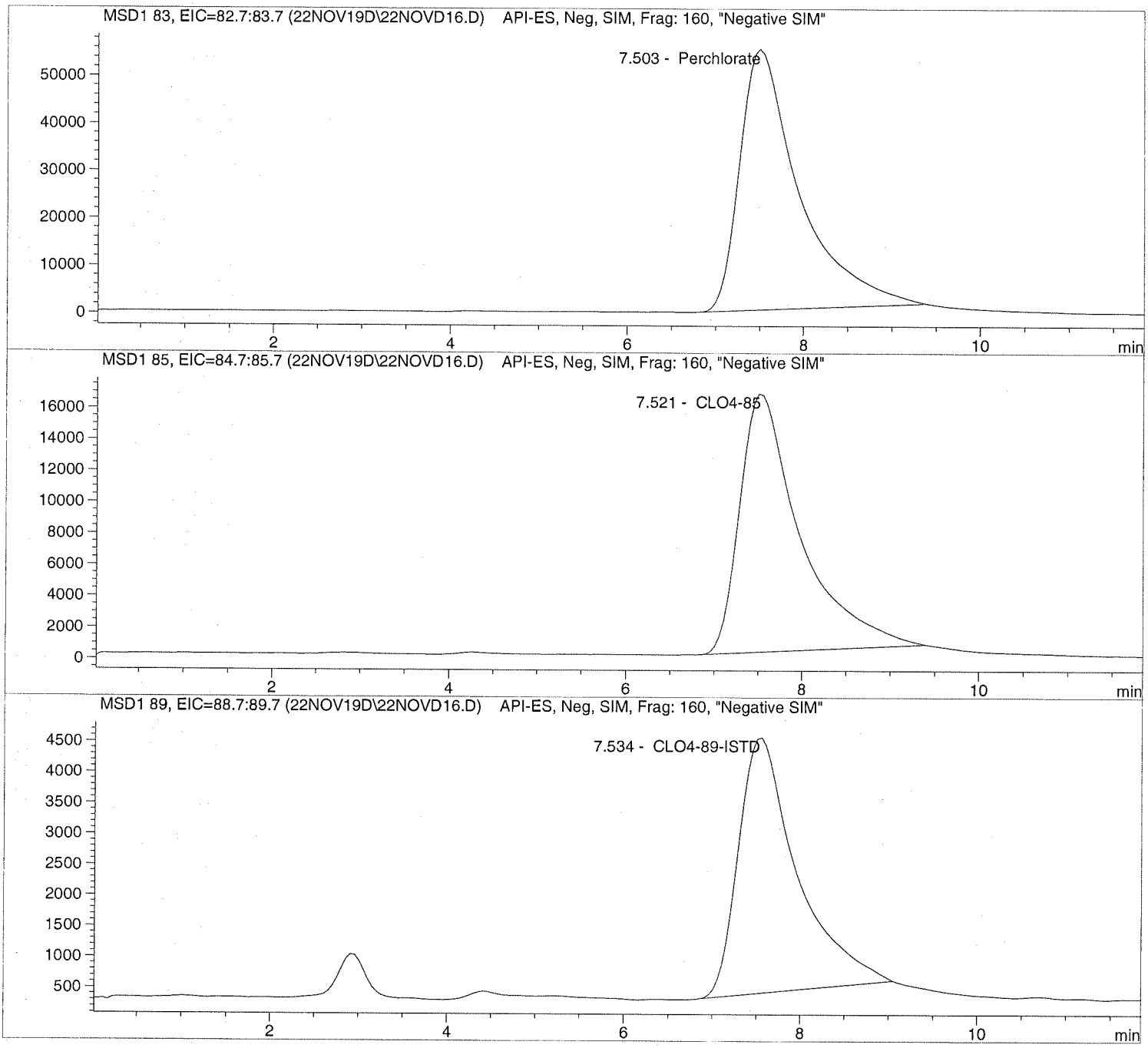
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD16.D Sample Name: 1932284010 1K

Injection Date:	11/22/2019 11:59:50	Seq Line:	16
Sample Name:	1932284010 1K	Location:	Vial 85
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\22NOV19D\22NOVD16.D Sample Name: 1932284010 1K

Injection Date:	11/22/2019 11:59:50	Seq Line:	16
Sample Name:	1932284010 1K	Location:	Vial 85
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:	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
7.503	PBA	2579132.0	42598.6907	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.521	PBA	787731.0	42868.3703	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.534	PBA	192723.4	5000.0000	CLO4-89-ISTD

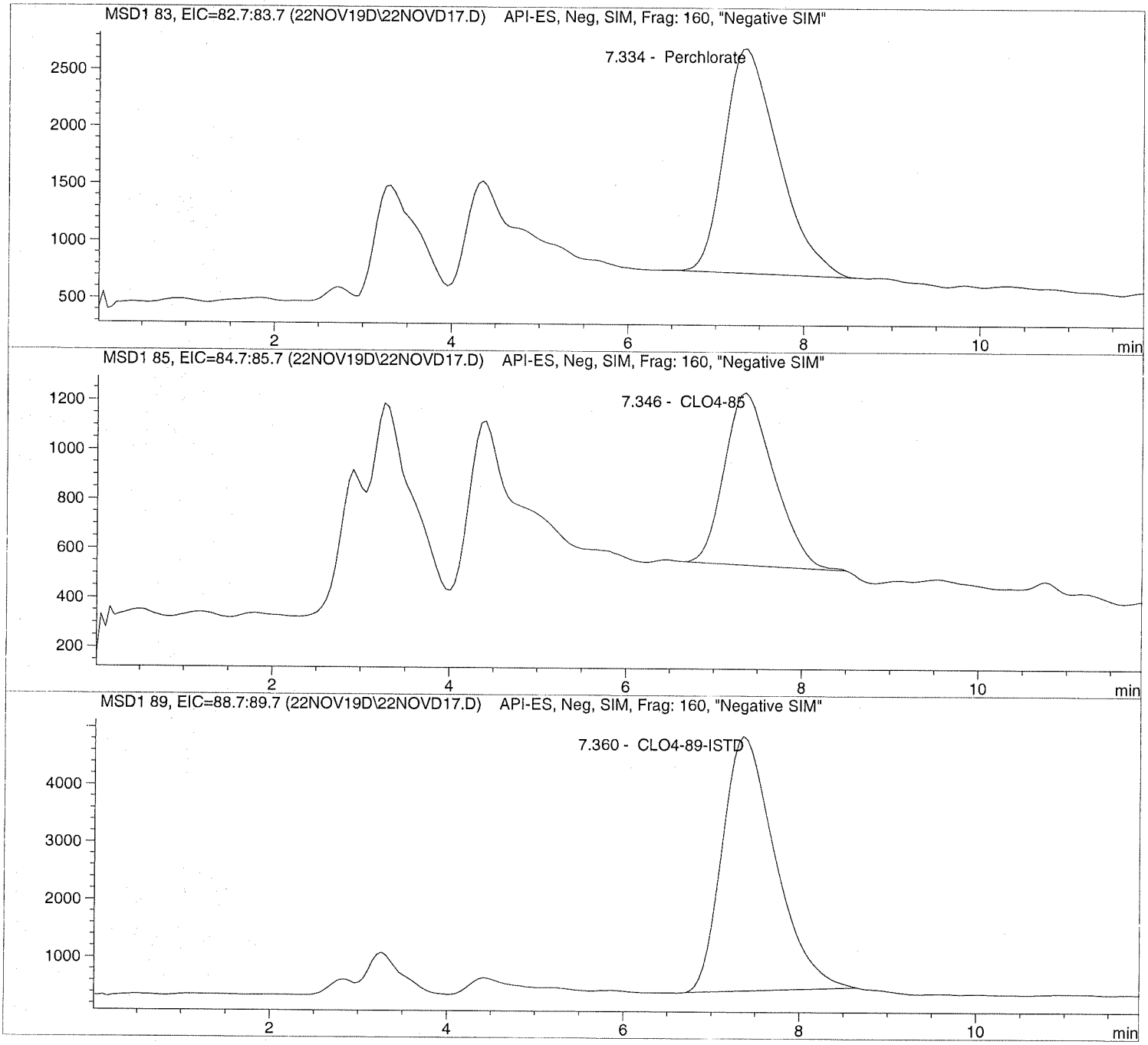
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD17.D Sample Name: 1932352001

Injection Date:	11/22/2019 12:13:41	Seq Line:	17
Sample Name:	1932352001	Location:	Vial 86
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\22NOV19D\22NOVD17.D Sample Name: 1932352001

Injection Date:	11/22/2019 12:13:41	Seq Line:	17
Sample Name:	1932352001	Location:	Vial 86
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:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.334	PBA	84513.2	1.6404	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.346	PBA	27333.2	1.6553	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.360	PBA	186562.4	5.0000	CLO4-89-ISTD

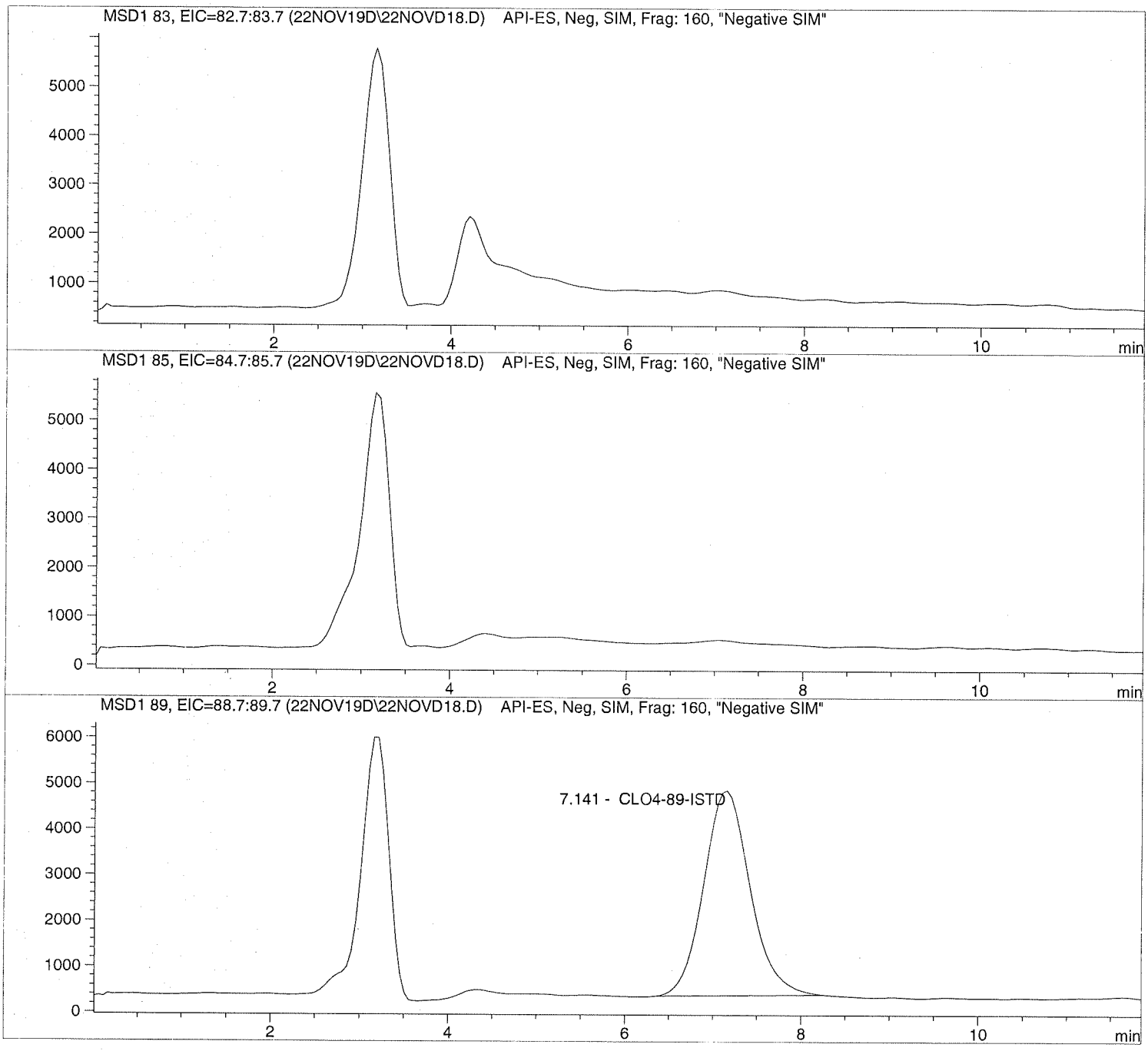
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD18.D Sample Name: 1932352002

Injection Date:	11/22/2019 12:27:35	Seq Line:	18
Sample Name:	1932352002	Location:	Vial 87
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\22NOV19D\22NOVD18.D Sample Name: 1932352002

Injection Date:	11/22/2019 12:27:35	Seq Line:	18
Sample Name:	1932352002	Location:	Vial 87
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: 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	PBA	164476.7	5.0000	CLO4-89-ISTD

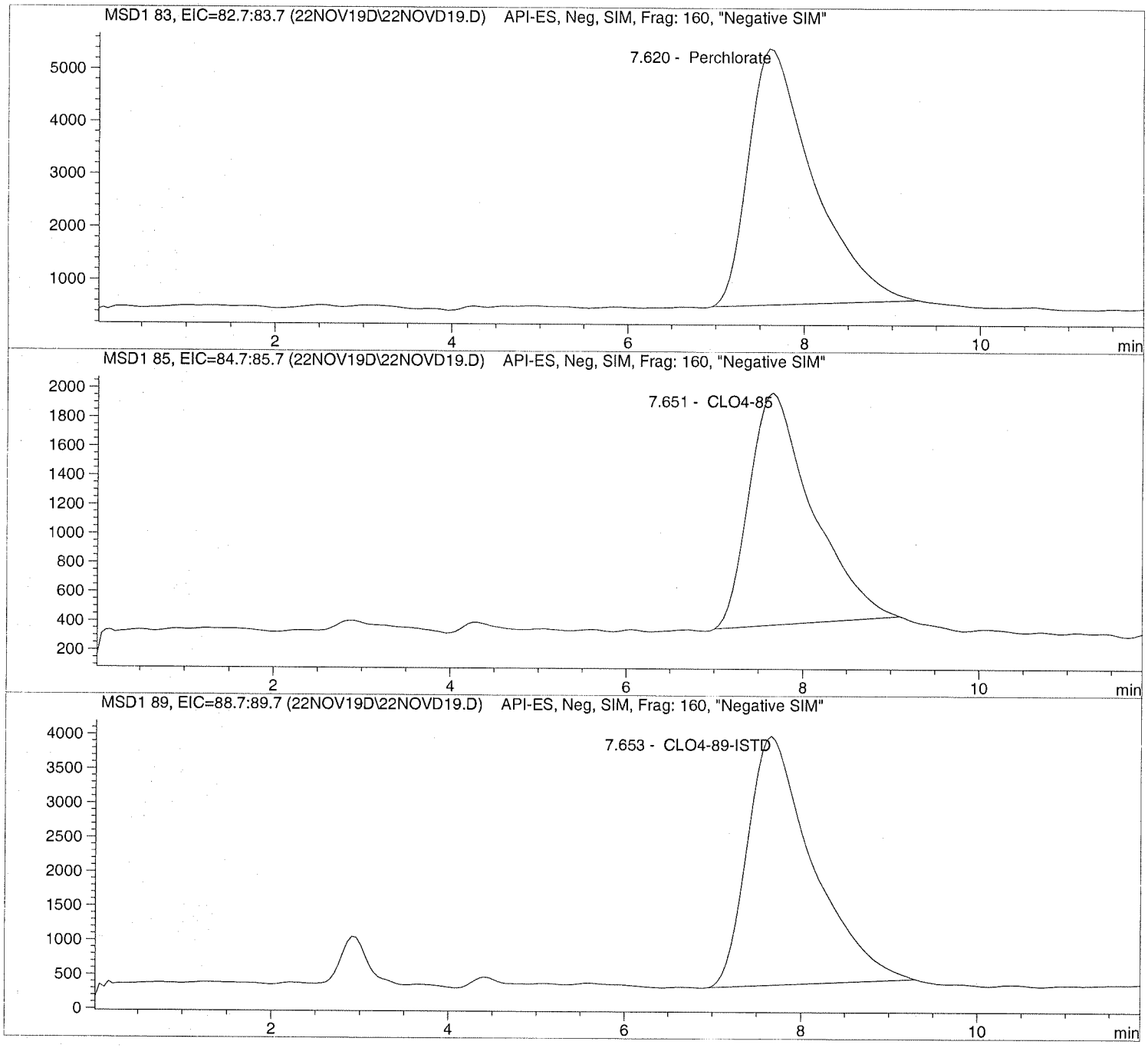
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD19.D Sample Name: 1932352003 1K

Injection Date:	11/22/2019 12:41:26	Seq Line:	19
Sample Name:	1932352003 1K	Location:	Vial 88
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\22NOV19D\22NOVD19.D Sample Name: 1932352003 1K

Injection Date:	11/22/2019 12:41:26	Seq Line:	19
Sample Name:	1932352003 1K	Location:	Vial 88
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:	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
7.620	PBA	246585.9	4887.0265	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.651	PBA	78880.7	5031.6524	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.653	PBA	185984.5	5000.0000	CLO4-89-ISTD

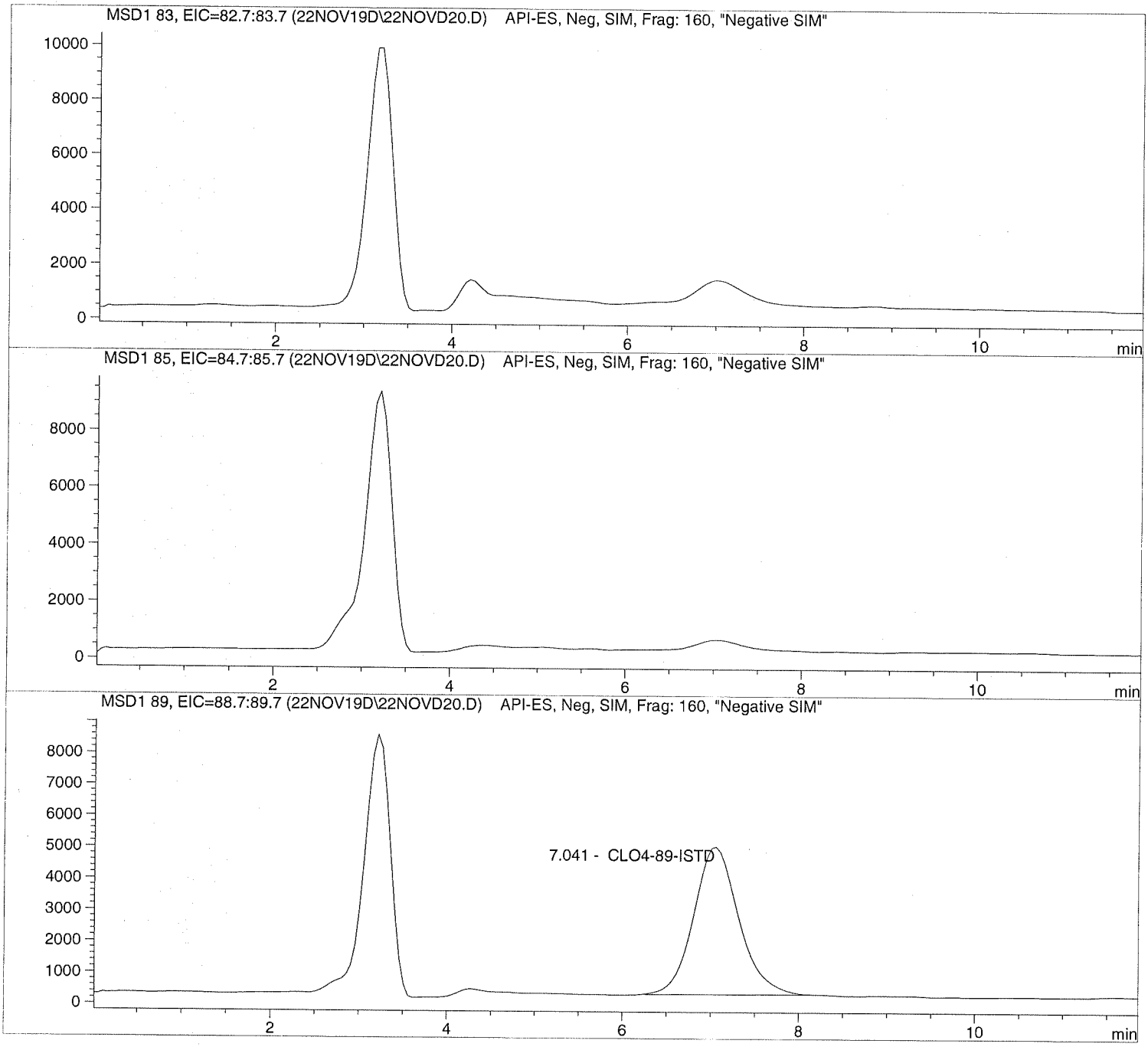
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD20.D Sample Name: 1932352004

Injection Date:	11/22/2019 12:55:21	Seq Line:	20
Sample Name:	1932352004	Location:	Vial 89
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\22NOV19D\22NOVD20.D Sample Name: 1932352004

Injection Date:	11/22/2019 12:55:21	Seq Line:	20
Sample Name:	1932352004	Location:	Vial 89
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:	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
7.041	BBA	167521.2	5.0000	CLO4-89-ISTD

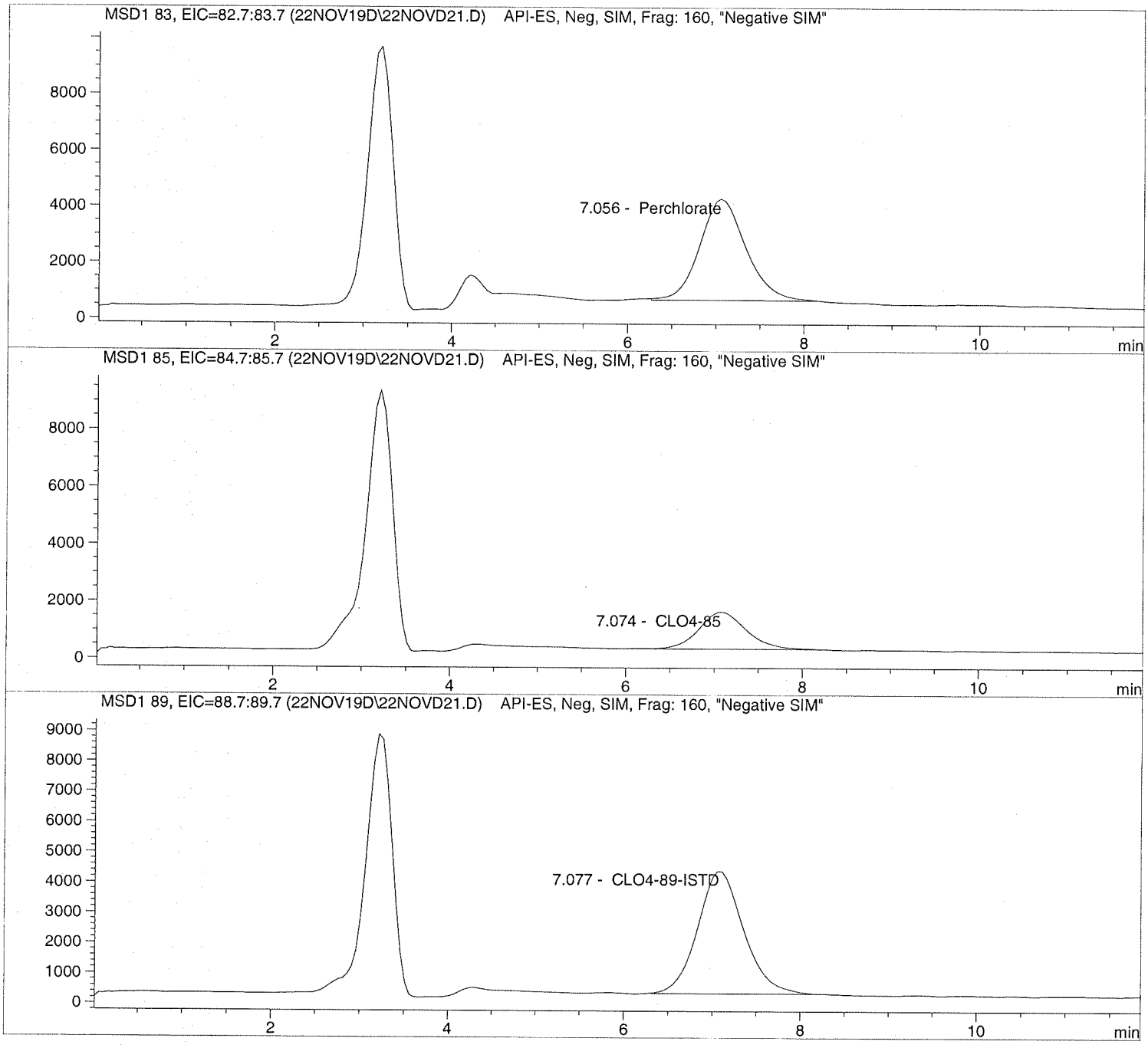
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD21.D Sample Name: 1932352005 MS

Injection Date:	11/22/2019 13:09:17	Seq Line:	21
Sample Name:	1932352005 MS	Location:	Vial 90
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\22NOV19D\22NOVD21.D Sample Name: 1932352005 MS

Injection Date:	11/22/2019 13:09:17	Seq Line:	21
Sample Name:	1932352005 MS	Location:	Vial 90
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:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.056	BBA	131207.6	3.2899	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.074	BBA	48283.1	3.8820	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.077	PBA	146896.4	5.0000	CLO4-89-ISTD

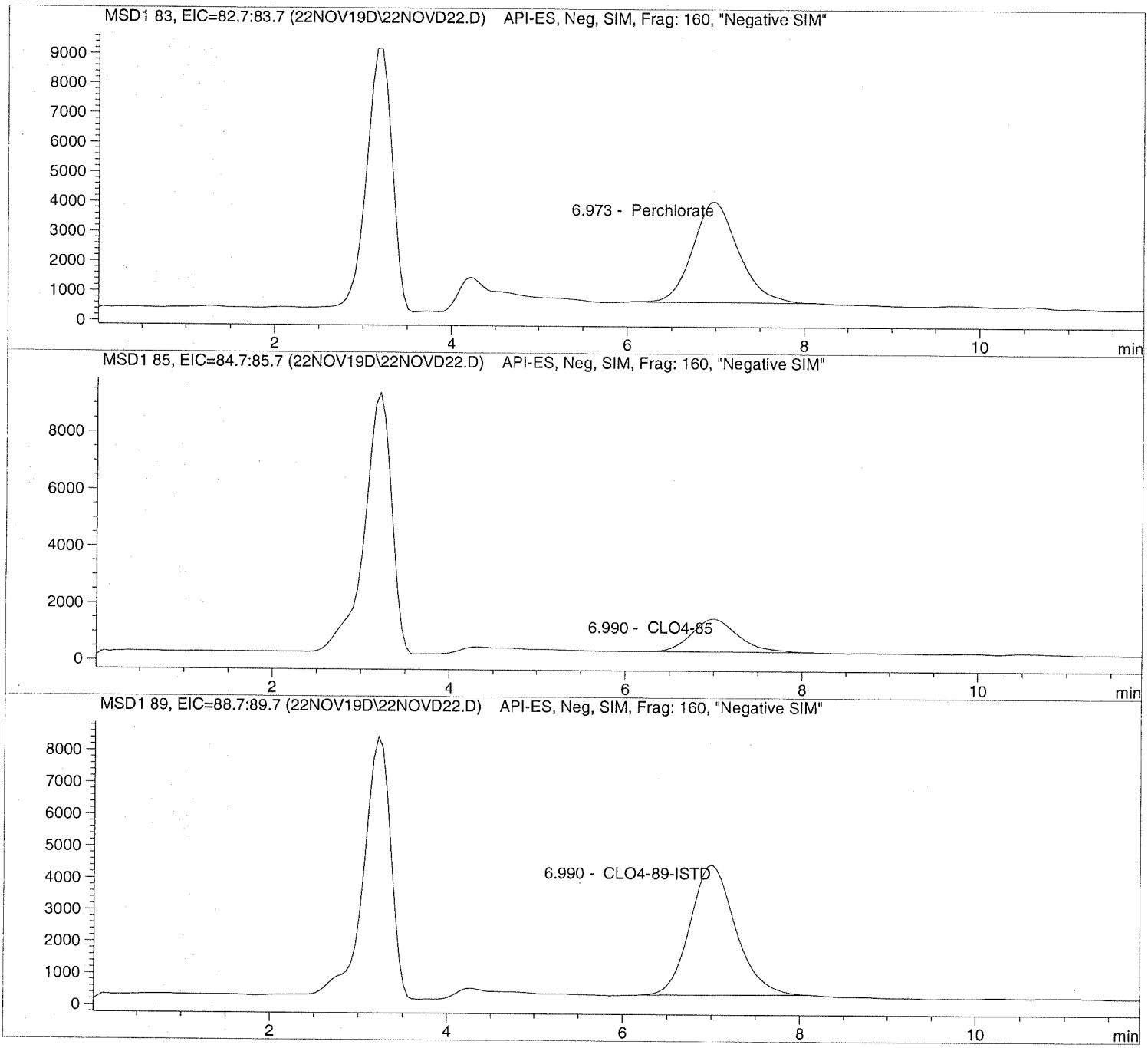
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD22.D Sample Name: 1932352006 MSD

Injection Date:	11/22/2019 13:23:12	Seq Line:	22
Sample Name:	1932352006 MSD	Location:	Vial 91
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\22NOV19D\22NOVD22.D Sample Name: 1932352006 MSD

Injection Date:	11/22/2019 13:23:12	Seq Line:	22
Sample Name:	1932352006 MSD	Location:	Vial 91
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:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.973	BBA	121738.6	3.0509	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.990	BBA	42568.5	3.4112	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.990	BBA	146852.0	5.0000	CLO4-89-ISTD

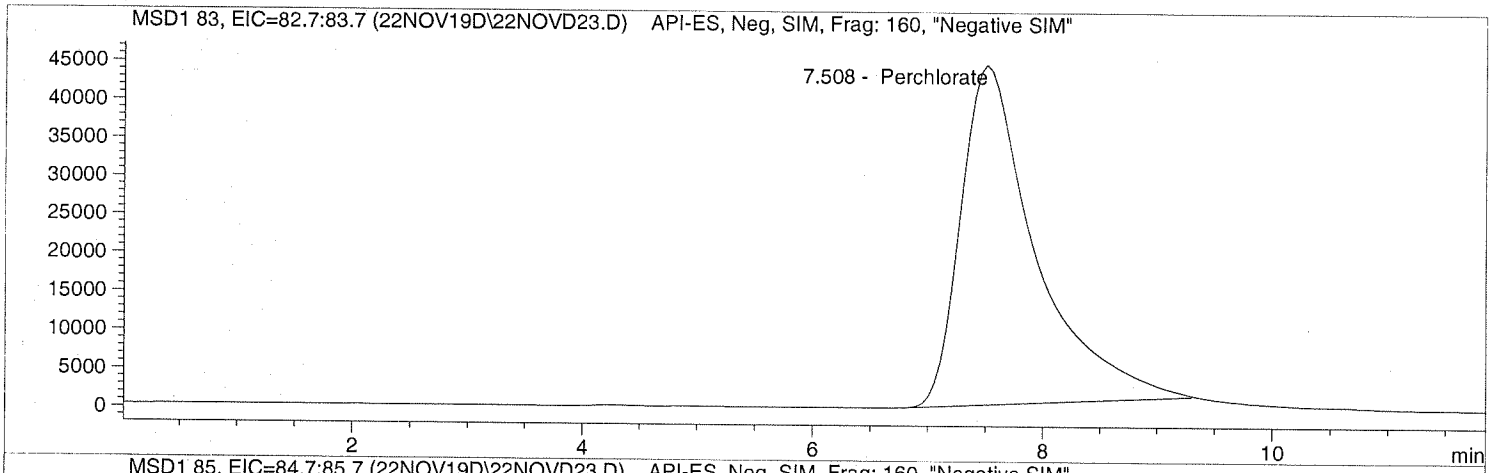
*** End of Report ***

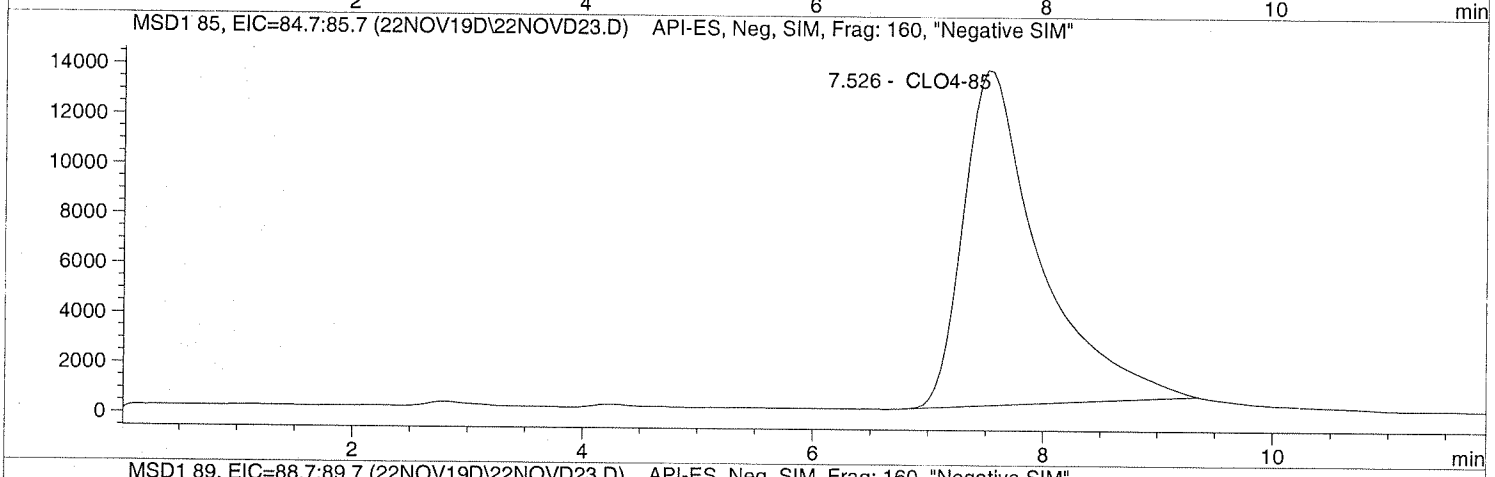
Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD23.D Sample Name: 1932284007 100

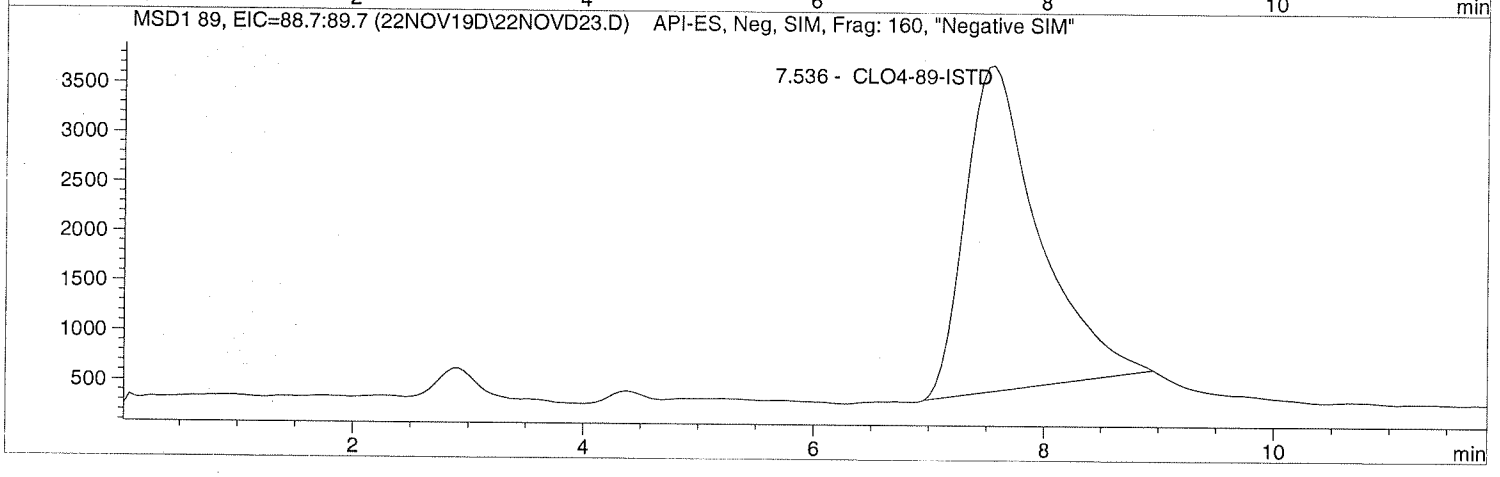
Injection Date:	11/22/2019 13:39:02	Seq Line:	23
Sample Name:	1932284007 100	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

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\22NOV19D\22NOVD23.D Sample Name: 1932284007 100

Injection Date:	11/22/2019 13:39:02	Seq Line:	23
Sample Name:	1932284007 100	Location:	Vial 92
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:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.508	PBA	2000966.8	4344.9859	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.526	PBA	621132.3	4434.8623	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.536	PBA	146104.5	500.0000	CLO4-89-ISTD

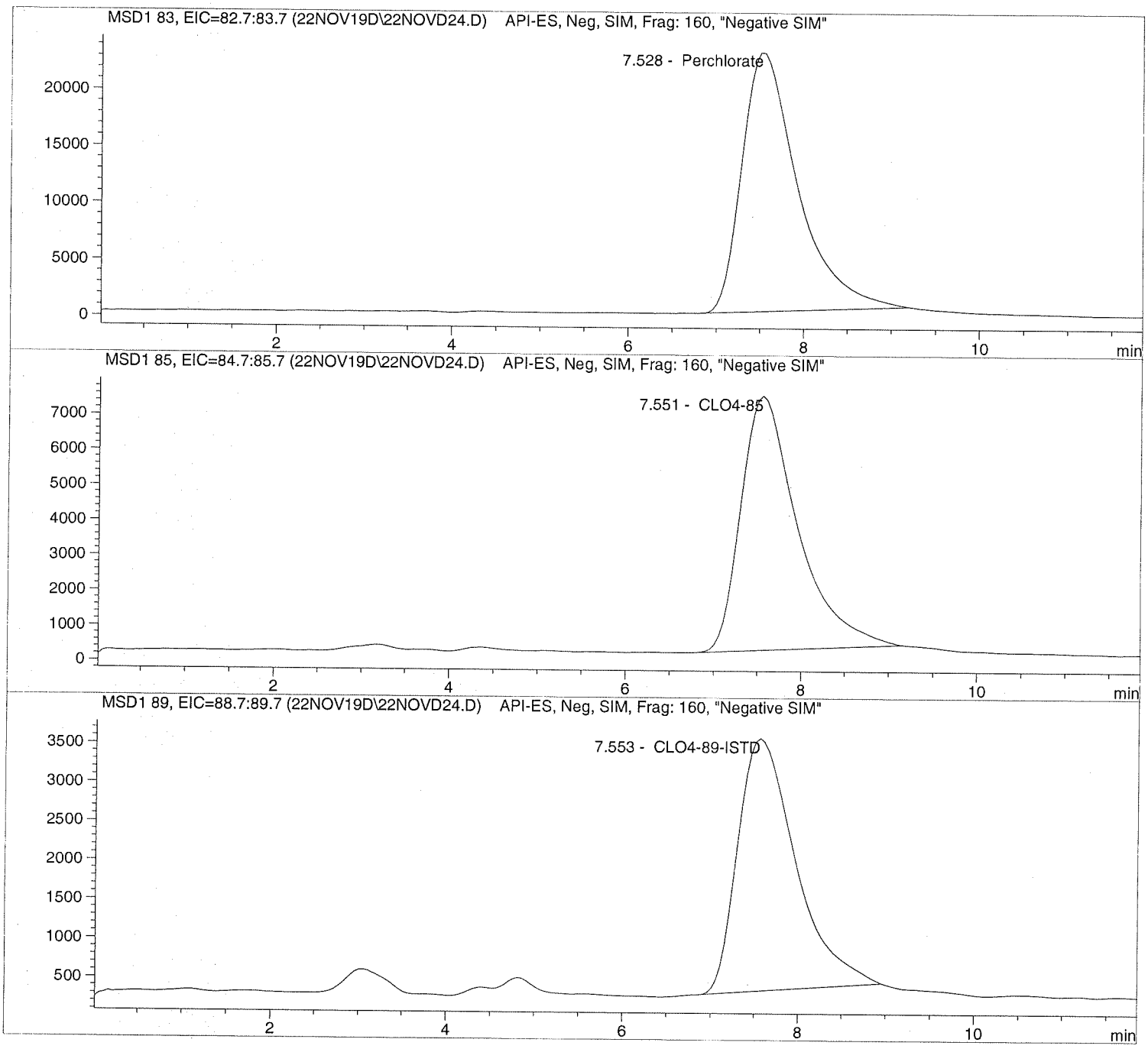
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD24.D Sample Name: 685444 CCV@25

Injection Date:	11/22/2019 13:54:23	Seq Line:	24
Sample Name:	685444 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\22NOV19D\22NOVD24.D Sample Name: 685444 CCV@25

Injection Date:	11/22/2019 13:54:23	Seq Line:	24
Sample Name:	685444 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
7.528	PBA	1013210.4	23.4184	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.551	PBA	326598.5	24.6282	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.553	PBA	148802.7	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

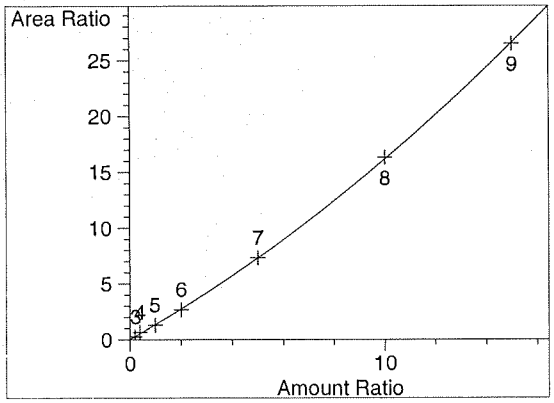
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

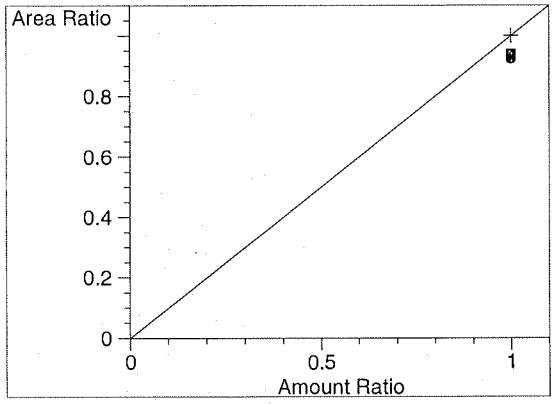
Peak Sum Table

No Entries in table

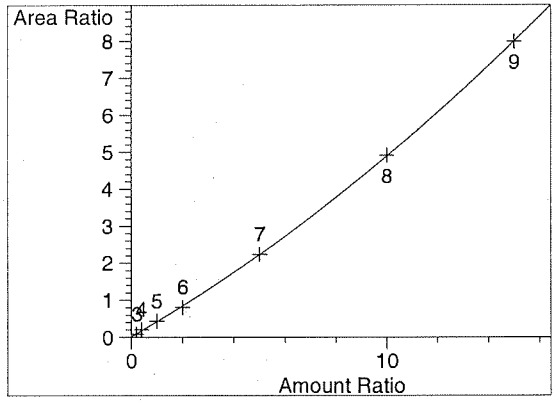
Calibration Curves



Perchlorate at exp. RT: 7.750
MSD1 83, EIC=82.7:83.7
Correlation: 0.99975
Residual Std. Dev.: 0.10284
Formula: y = ax² + 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 = ax² + 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:

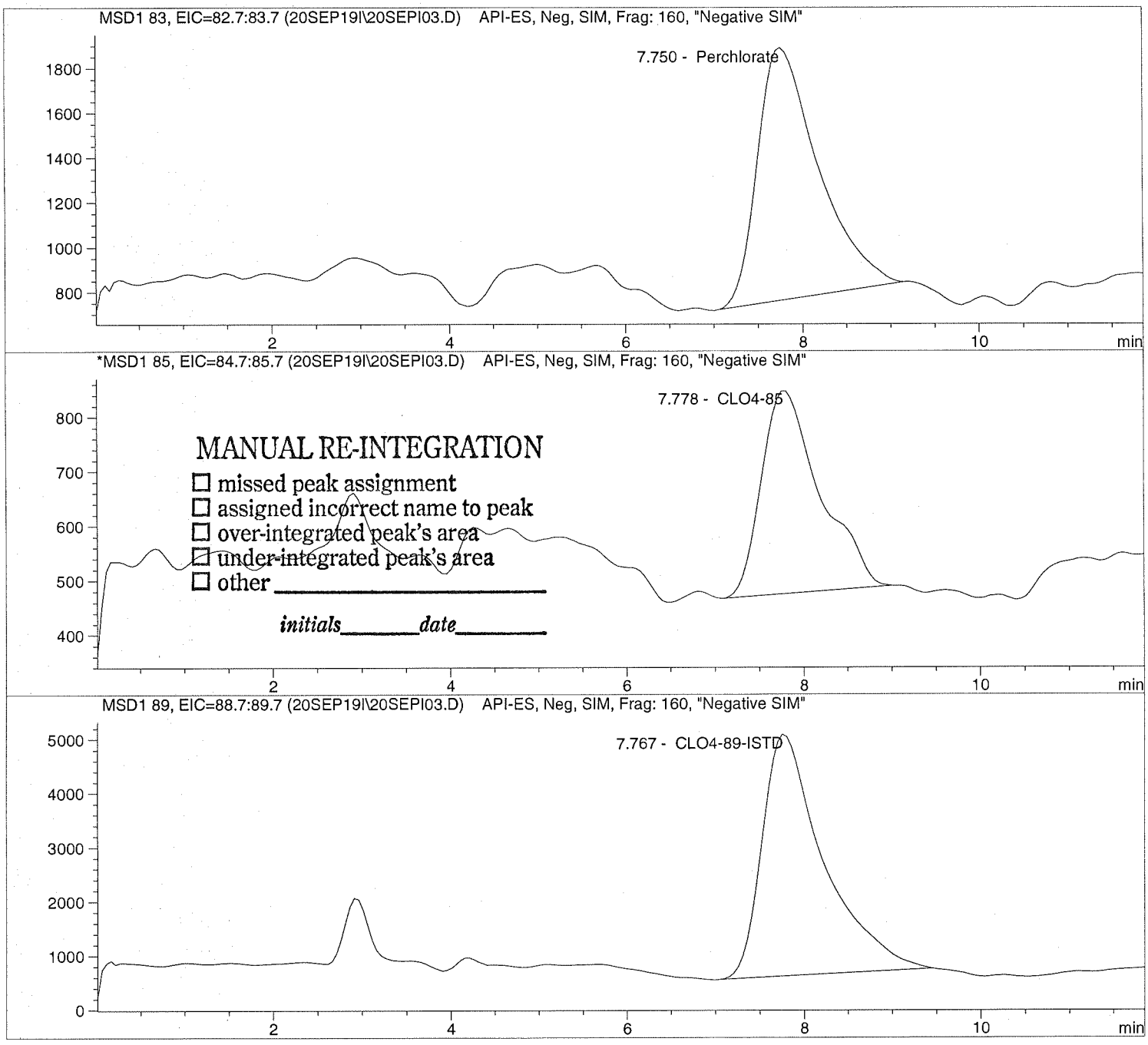
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

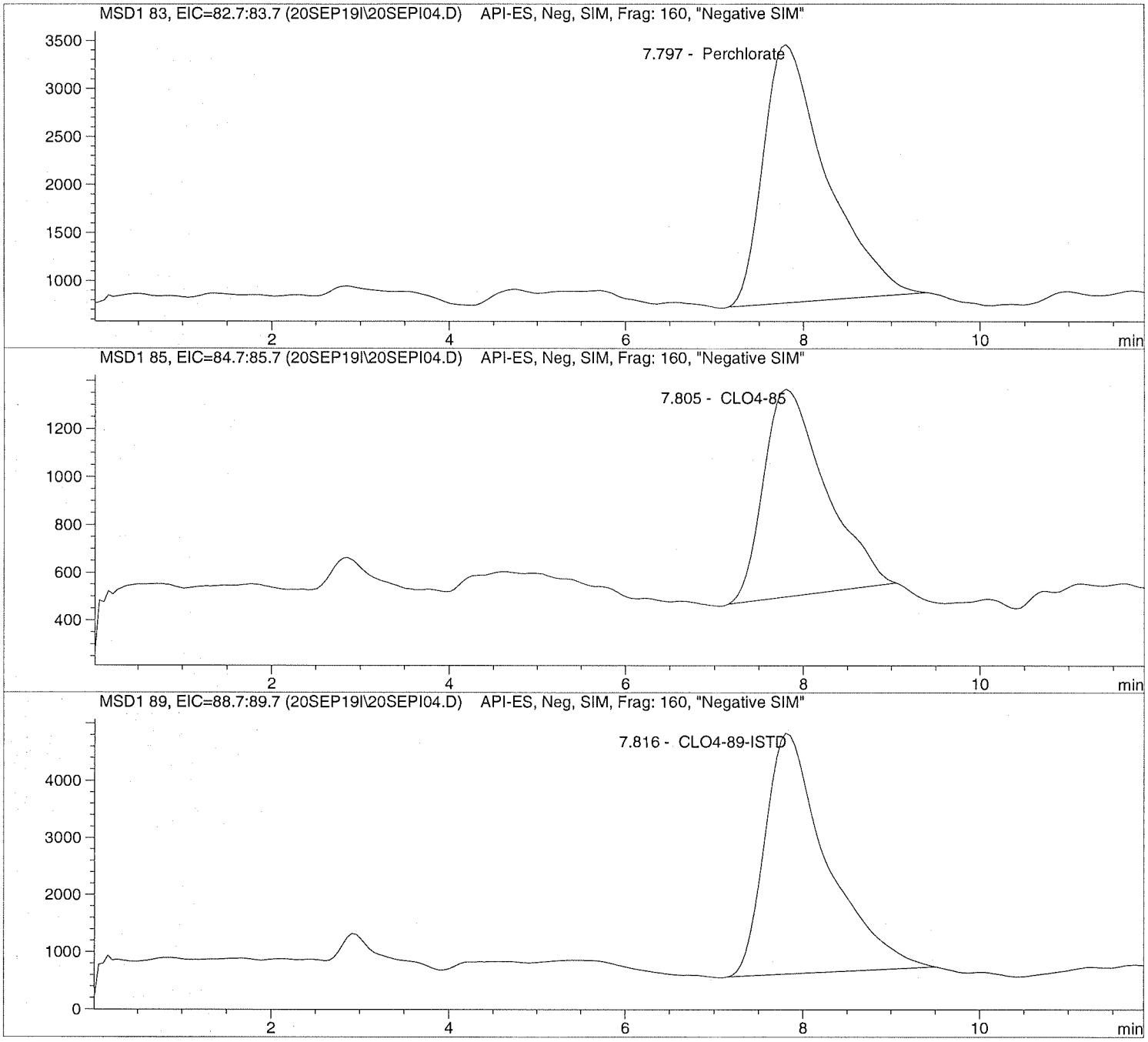
*** End of Report ***

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

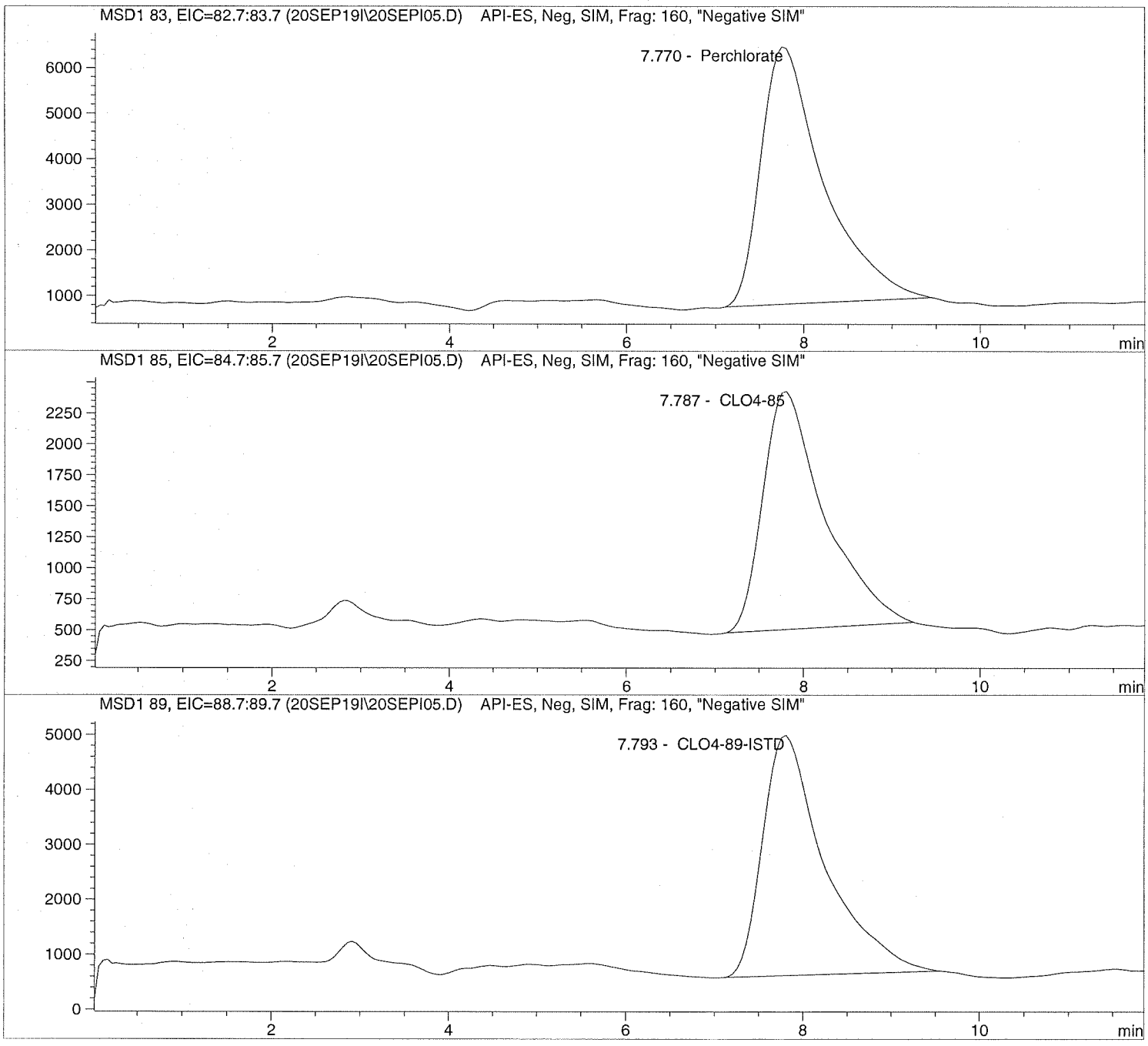
*** End of Report ***

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

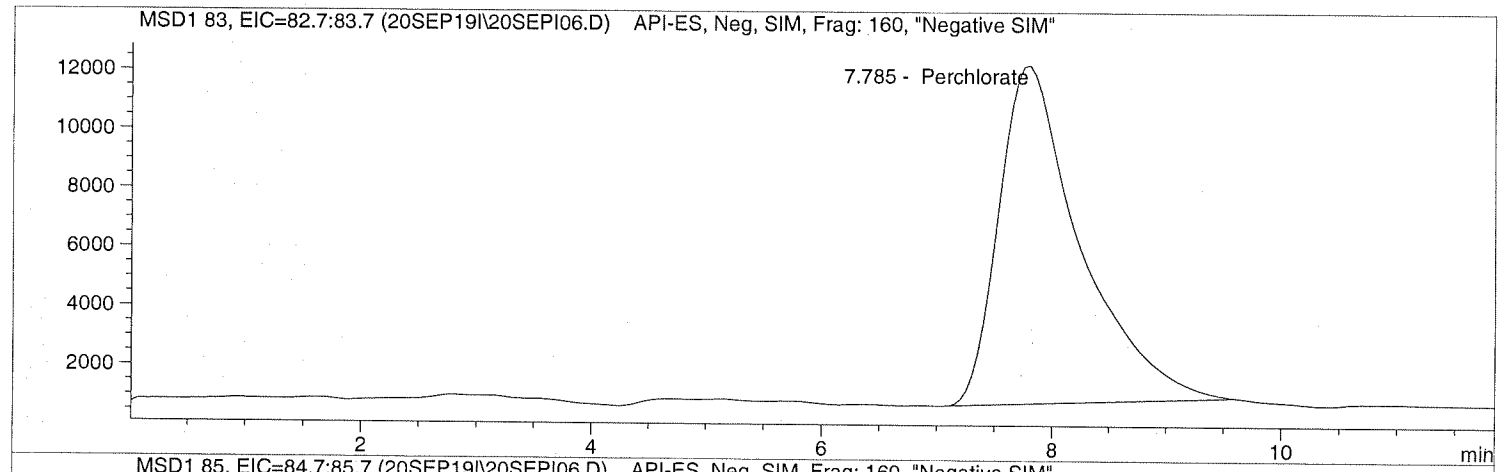
*** End of Report ***

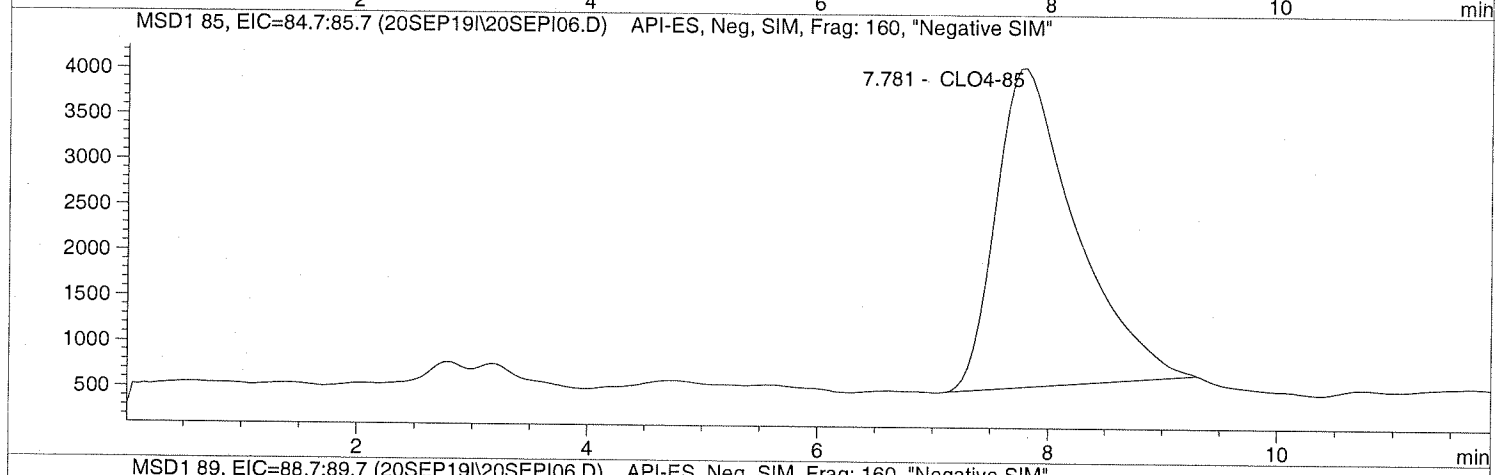
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

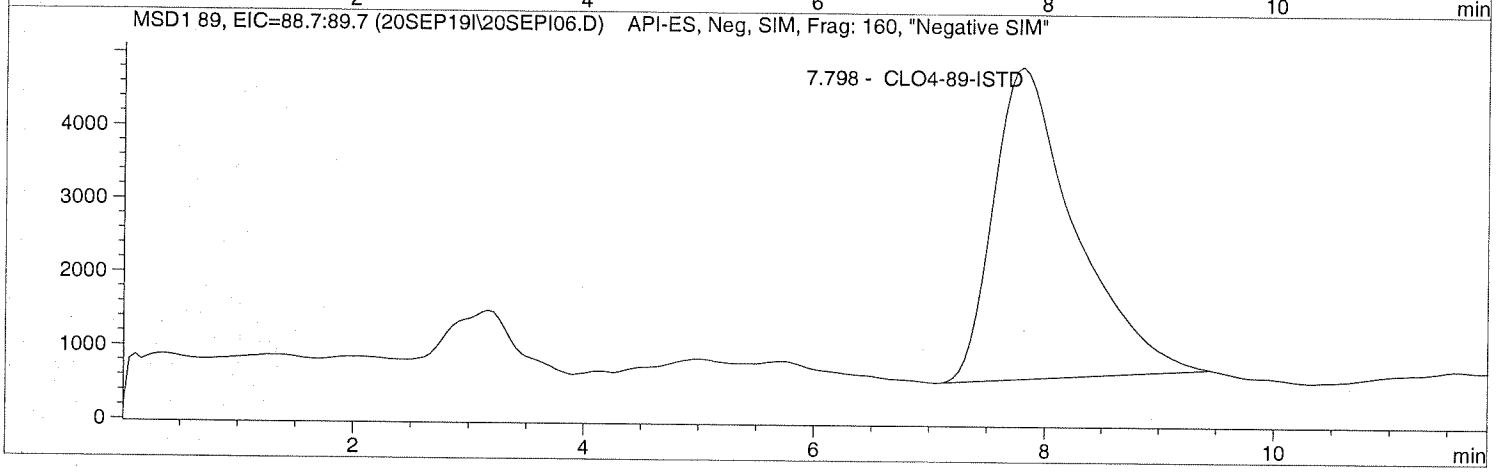
Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

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

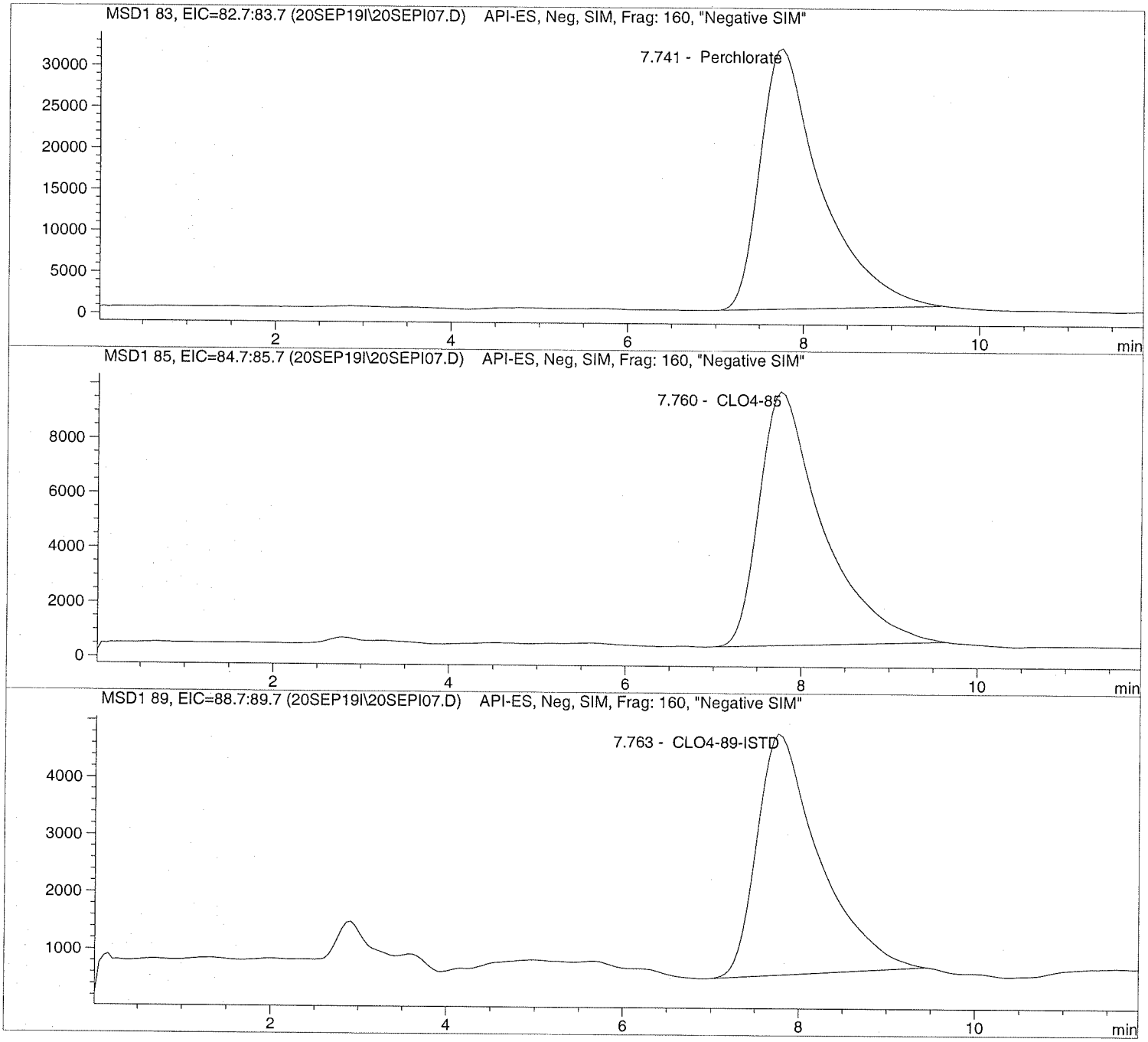
*** End of Report ***

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

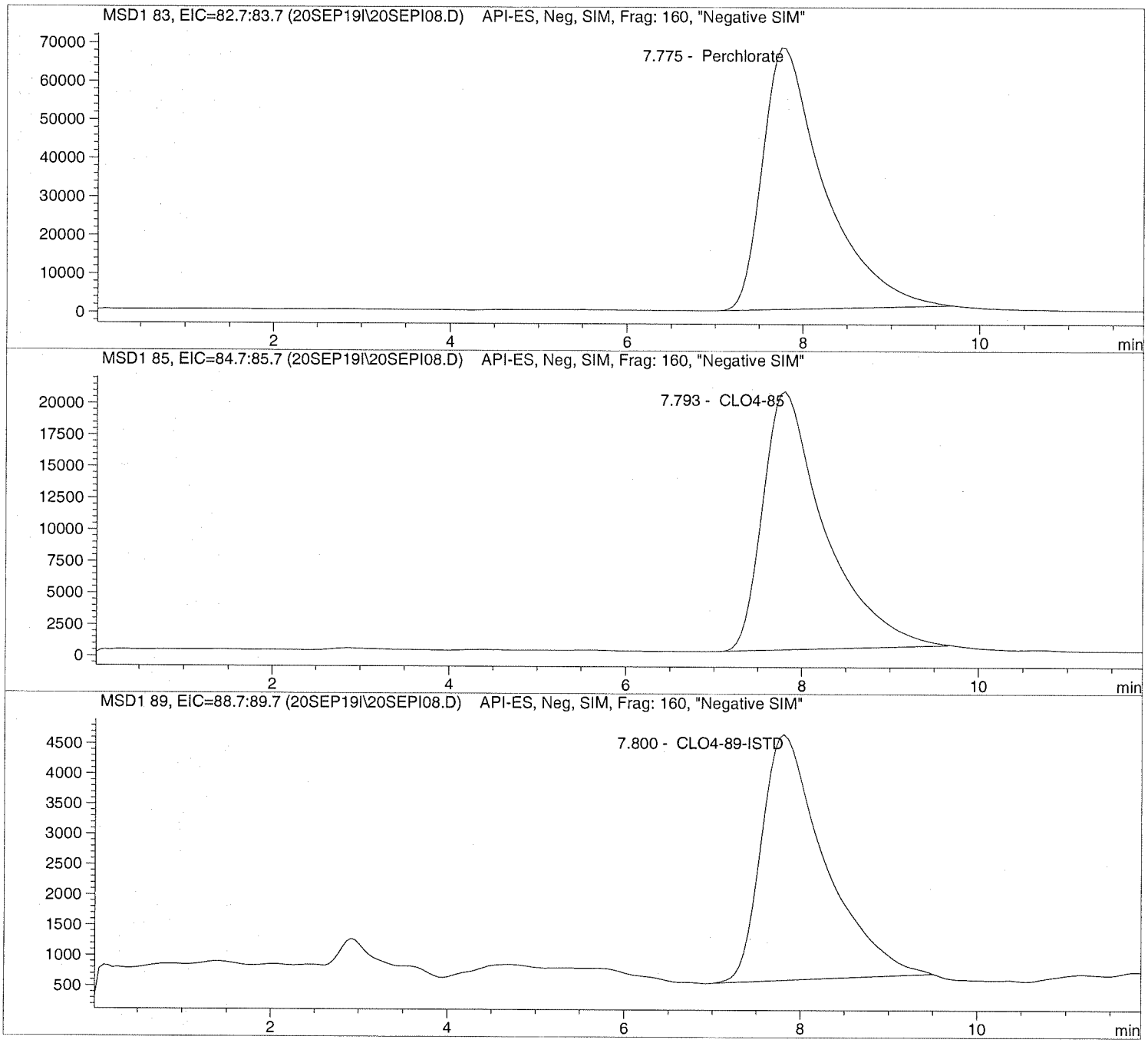
*** End of Report ***

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

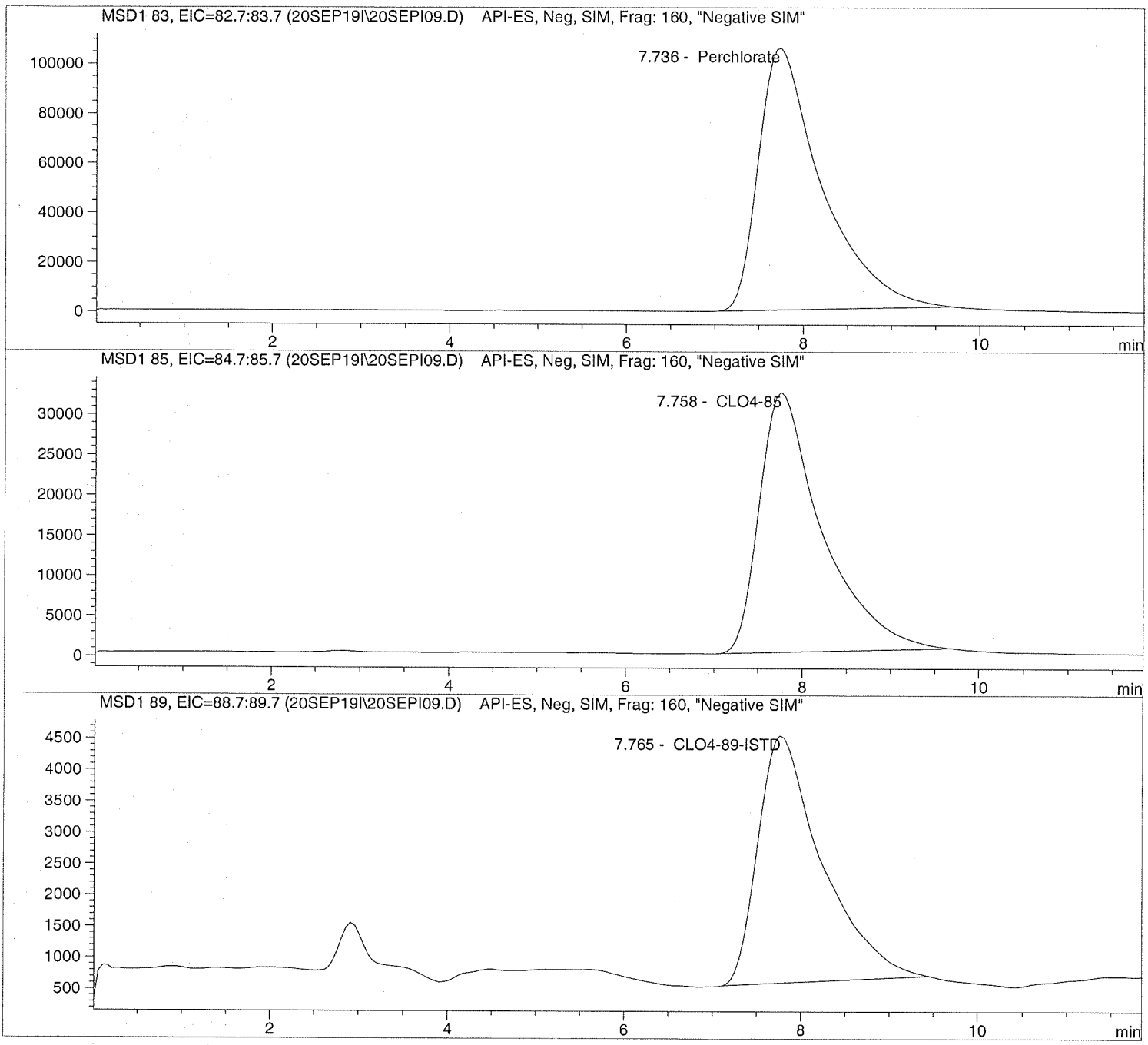
*** End of Report ***

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

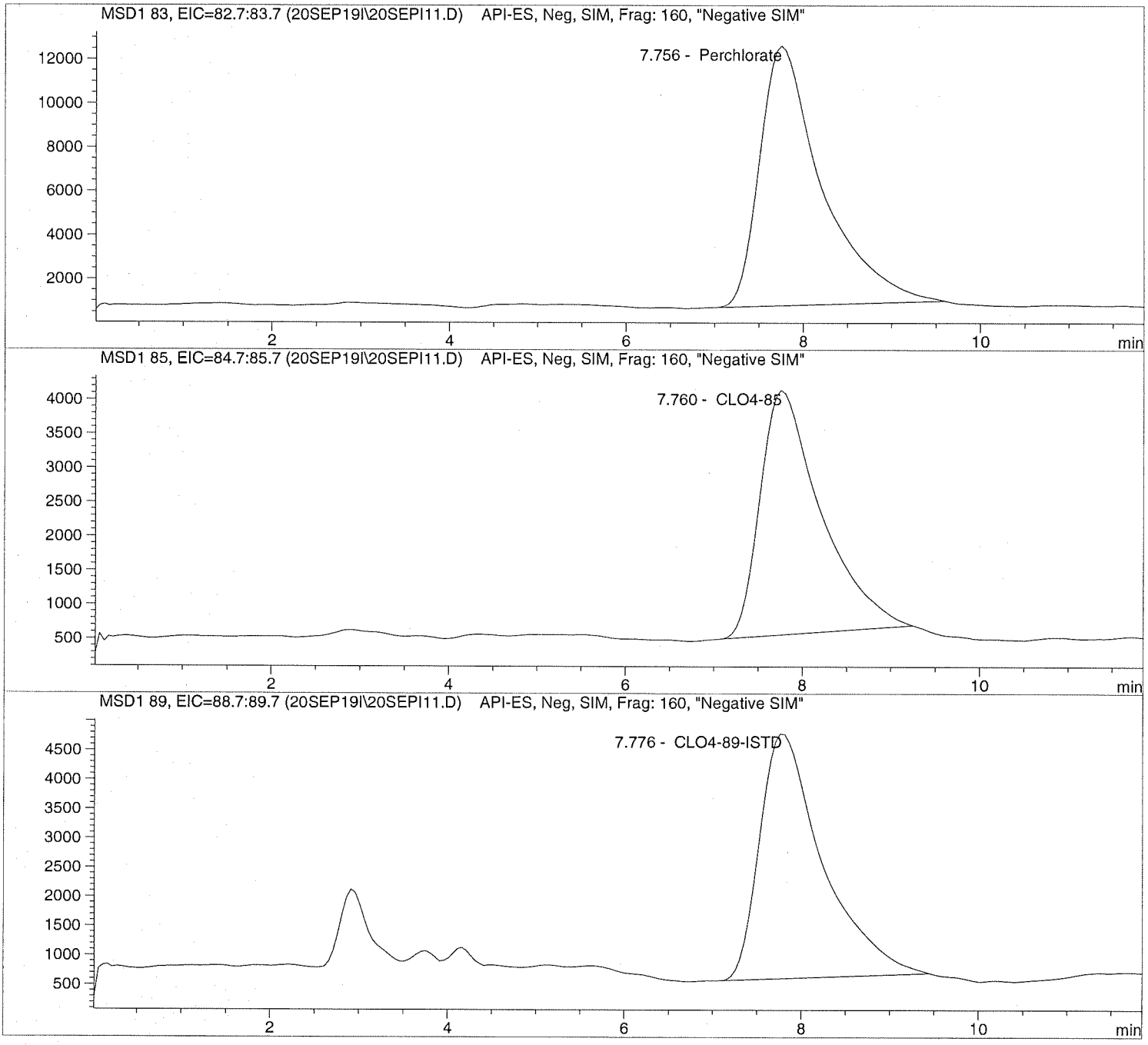
*** End of Report ***

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

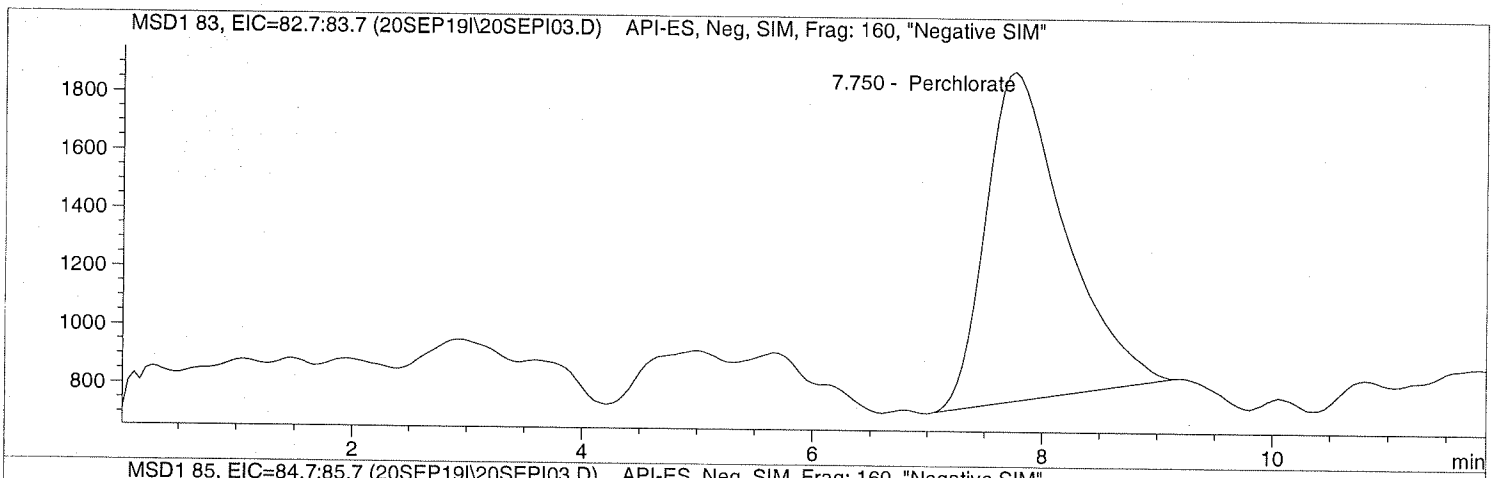
Unmodified

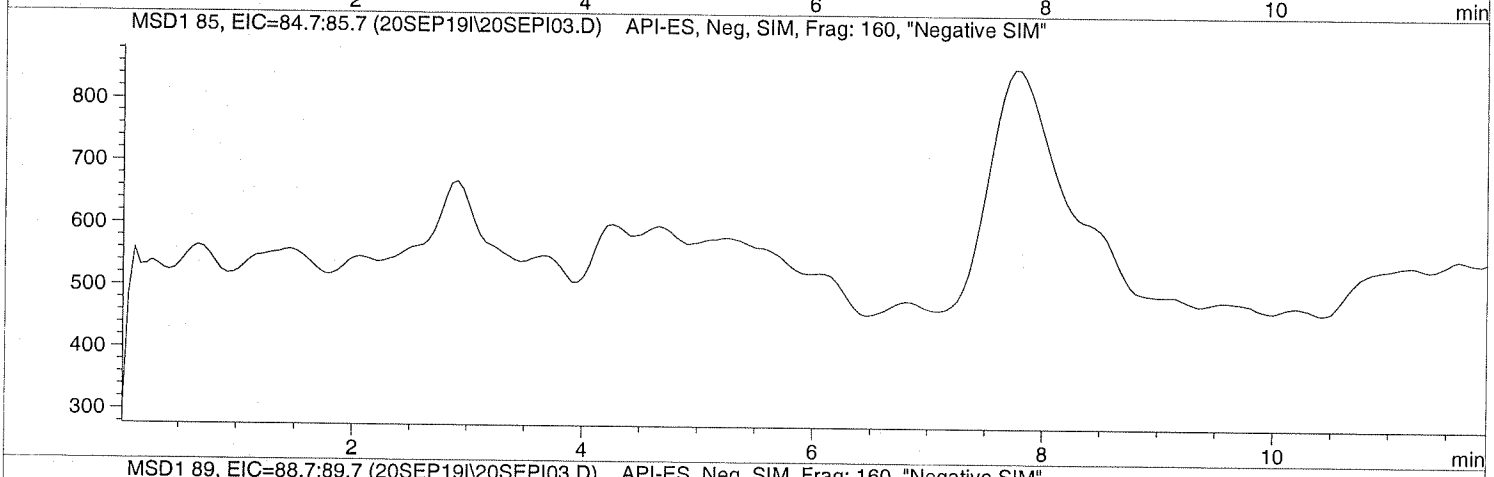
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

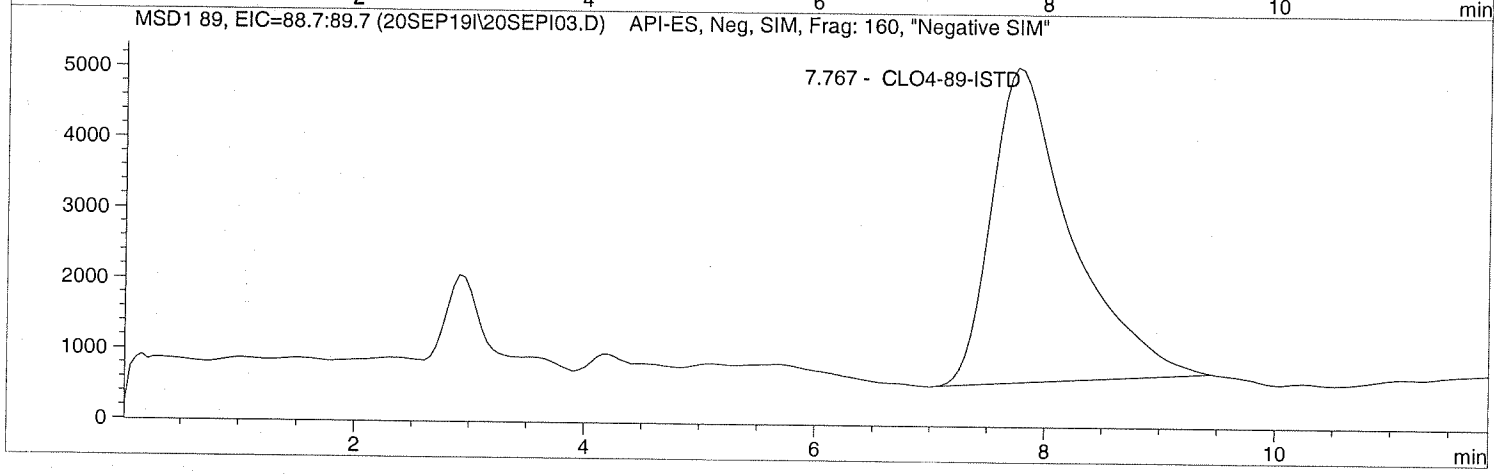
Injection Date:	9/20/2019 09:24:05	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

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

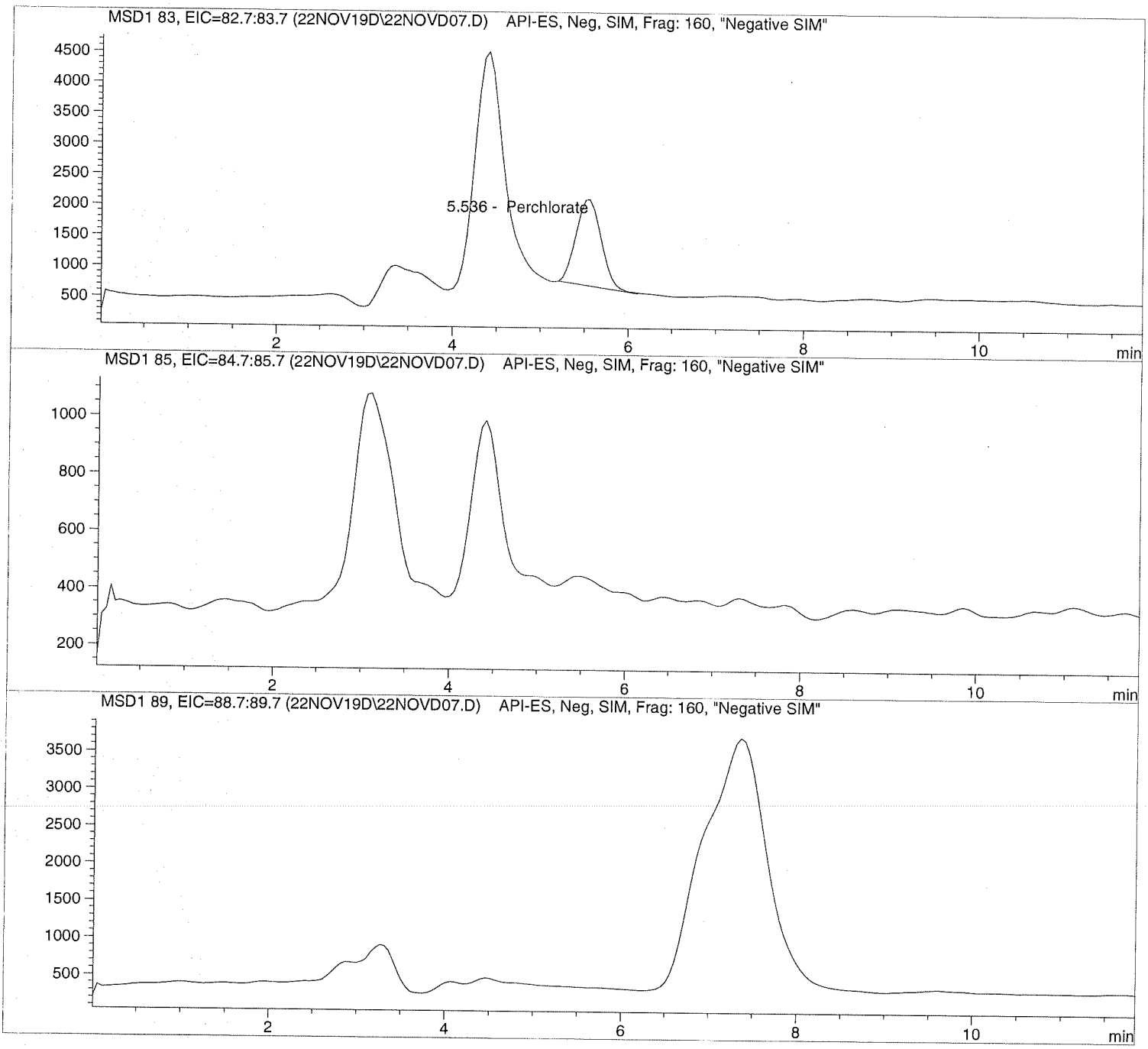
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\22NOV19D\22NOVD07.D Sample Name: 1932284002

Injection Date:	11/22/2019 09:55:02	Seq Line:	7
Sample Name:	1932284002	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\22NOV19D\22NOVD07.D Sample Name: 1932284002

Injection Date:	11/22/2019 09:55:02	Seq Line:	7
Sample Name:	1932284002	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:	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
5.536	PBA	27611.0	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
0.000		0.0	0.0000	CLO4-89-ISTD

*** End of Report ***

LABORATORY REPORT

December 3, 2019

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

RE: HS19110684-01

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on November 15, 2019. For your reference, these analyses have been assigned our service request number P1907040.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Hayden Akers at 10:55 am, Dec 03, 2019

Hayden Akers
Project Manager

Client: ALS Laboratory Group
Project: HS19110684-01

Service Request No: P1907040

CASE NARRATIVE

The samples were received intact under chain of custody on November 15, 2019 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Methane, Ethene and Ethane & Carbon Dioxide Analysis

The samples were analyzed for methane, ethene, ethane and carbon dioxide using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

The recovery and relative percent difference were outside the DOD control limits for carbon dioxide for the matrix spike and its duplicate. However all quality control parameters were met for the laboratory control sample and its duplicate.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Service Request: P1907040
Project ID: HS19110684-01

Date Received: 11/15/2019
Time Received: 09:15

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
50WW16-191113	P1907040-001	Water	11/13/2019	08:35	X	X
50WW14-191113	P1907040-002	Water	11/13/2019	09:45	X	X
50WW13-191113	P1907040-003	Water	11/13/2019	10:35	X	X
50WW23-191113	P1907040-004	Water	11/13/2019	11:40	X	X

01010430

P1907040

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:** **12633**

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065 **Phone:** +1 805 526 7161

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:	HS19110684
TSR:	Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19110684-01**	**50WW16-191113**	**Groundwater**	**13 Nov 2019 08:35**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			02 Dec 2019
2.	**HS19110684-02**	**50WW14-191113**	**Groundwater**	**13 Nov 2019 09:45**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			02 Dec 2019
3.	**HS19110684-03**	**50WW13-191113**	**Groundwater**	**13 Nov 2019 10:35**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			02 Dec 2019
4.	**HS19110684-04**	**50WW23-191113**	**Groundwater**	**13 Nov 2019 11:40**
	MEE + CO2. DOD IV. Equis EDD. EQuIS 5.0 - Longhorn			02 Dec 2019

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

HS19110684-04 MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 11/14/19 1800.

Received By: _____ Date/Time: 11-15-19 0915

Cooler ID(s): _____ Temperature(s): 2° cor 1C15

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1907040

Project: HS19110684-01

Sample(s) received on: 11/15/19 Date opened: 11/15/19 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: ° C Blank Temperature: 2° C Thermometer ID T-111 Wet Ice			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1907040-001.01	40mL VOA NP		6		A	11/22/2019 WH/LD
P1907040-001.02	40mL VOA NP				A	
P1907040-001.03	40mL VOA NP				A	
P1907040-001.04	40ml VOA HCL		1		A	11/25/2019 WH/LD
P1907040-001.05	40ml VOA HCL				A	
P1907040-001.06	40ml VOA HCL				A	
P1907040-002.01	40mL VOA NP		6		A	11/22/2019 WH/LD
P1907040-002.02	40mL VOA NP				A	
P1907040-002.03	40mL VOA NP				A	
P1907040-002.04	40ml VOA HCL		1		A	11/25/2019 WH/LD
P1907040-002.05	40ml VOA HCL				A	
P1907040-002.06	40ml VOA HCL				A	
P1907040-003.01	40mL VOA NP		6		A	11/22/2019 WH/LD
P1907040-003.02	40mL VOA NP				A	
P1907040-003.03	40mL VOA NP				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1907040

Project: HS19110684-01

Sample(s) received on: 11/15/19 Date opened: 11/15/19 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1907040-003.04	40ml VOA HCL		1		A	11/25/2019 WH/LD
P1907040-003.05	40ml VOA HCL				A	
P1907040-003.06	40ml VOA HCL				A	
P1907040-004.01	40mL VOA NP		6		A	11/22/2019 WH/LD
P1907040-004.02	40mL VOA NP		6		A	11/22/2019 WH/LD
P1907040-004.03	40mL VOA NP		6		A	11/22/2019 WH/LD
P1907040-004.04	40ml VOA HCL		1		A	11/25/2019 WH/LD
P1907040-004.05	40ml VOA HCL		1		A	11/25/2019 WH/LD
P1907040-004.06	40ml VOA HCL		1		A	11/25/2019 WH/LD
P1907040-004.07	40mL VOA NP				A	
P1907040-004.08	40mL VOA NP				A	
P1907040-004.09	40mL VOA NP				A	
P1907040-004.10	40mL VOA NP				A	
P1907040-004.11	40mL VOA NP				A	
P1907040-004.12	40mL VOA NP				A	
P1907040-004.13	40ml VOA HCL				A	
P1907040-004.14	40ml VOA HCL				A	
P1907040-004.15	40ml VOA HCL				A	
P1907040-004.16	40ml VOA HCL				A	
P1907040-004.17	40ml VOA HCL				A	
P1907040-004.18	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS19110684-01** ALS Project ID: P1907040

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date(s) Collected: 11/13/19
Date Received: 11/15/19
Date Analyzed: 11/22/19

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
50WW16-191113	P1907040-001	0.10	**26,000**	1,000	860	370	
50WW14-191113	P1907040-002	0.10	**97,000**	1,000	860	370	
50WW13-191113	P1907040-003	0.10	**86,000**	1,000	860	370	
50WW23-191113	P1907040-004	0.10	**190,000**	1,000	860	370	
Method Control Sample	P191122-MB	0.10	860	1,000	860	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **50WW23-191113**
Client Project ID: **HS19110684-01**

ALS Project ID: P1907040
ALS Sample ID: P1907040-004MS
P1907040-004DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/13/19
Date Received: 11/15/19
Date Analyzed: 11/22/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount MS / DMS ug/L	Sample Amount ug/L	Result MS ug/L	Result DMS ug/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	185,000	195,000	213,000	**44**	**122**	80-122	94	30	**N, R**

N = The matrix spike sample recovery is not within control limits. See case narrative.
R = Duplicate precision not met.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P1907040
Client Project ID: **HS19110684-01** ALS Sample ID: P191122-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Li Donghao/Wade Henton Date Analyzed: 11/22/19
Matrix: Water Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result$_1$ LCS ug/L	Result$_1$ DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	18,900	19,400	**83**	**85**	80-122	2	12	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW16-191113**
Client Project ID: **HS19110684-01**

ALS Project ID: P1907040
ALS Sample ID: P1907040-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/13/19
Date Received: 11/15/19
Date Analyzed: 11/25/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**3.0**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW14-191113**
Client Project ID: **HS19110684-01**

ALS Project ID: P1907040
ALS Sample ID: P1907040-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/13/19
Date Received: 11/15/19
Date Analyzed: 11/25/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**1.8**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW13-191113**
Client Project ID: **HS19110684-01**

ALS Project ID: P1907040
ALS Sample ID: P1907040-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/13/19
Date Received: 11/15/19
Date Analyzed: 11/25/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**4.7**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **50WW23-191113**
Client Project ID: **HS19110684-01**

ALS Project ID: P1907040
ALS Sample ID: P1907040-004

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/13/19
Date Received: 11/15/19
Date Analyzed: 11/25/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample** ALS Project ID: P1907040
Client Project ID: **HS19110684-01** ALS Sample ID: P191125-MB

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/FID Date Received: NA
Analyst: Li Donghao/Wade Henton Date Analyzed: 11/25/19
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

MATRIX SPIKE / DUPLICATE MATRIX SPIKE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **50WW23-191113**
Client Project ID: **HS19110684-01**

ALS Project ID: P1907040
ALS Sample ID: P1907040-004MS
P1907040-004DMS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: 11/13/19
Date Received: 11/15/19
Date Analyzed: 11/25/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount MS / DMS µg/L	Sample Amount µg/L	Result MS µg/L	Result DMS µg/L	% Recovery MS	% Recovery DMS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	ND	2.38	2.35	**94**	**93**	73-125	1	30	
74-85-1	Ethene	4.40	ND	4.05	4.24	**92**	**96**	72-133	4	30	
74-84-0	Ethane	4.72	ND	4.23	4.38	**90**	**93**	74-131	3	30	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS19110684-01**

ALS Project ID: P1907040
ALS Sample ID: P191125-LCS
P191125-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Li Donghao/Wade Henton
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 11/25/19
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result$_1$ LCS µg/L	Result$_1$ DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.52	2.49	2.53	**99**	**100**	73-125	1	26	
74-85-1	Ethene	4.40	4.44	4.47	**101**	**102**	72-133	1	11	
74-84-0	Ethane	4.72	4.61	4.61	**98**	**98**	74-131	0	10	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:36:14
Operator : WH/LD
Sample : P1907040-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 13:46:57 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

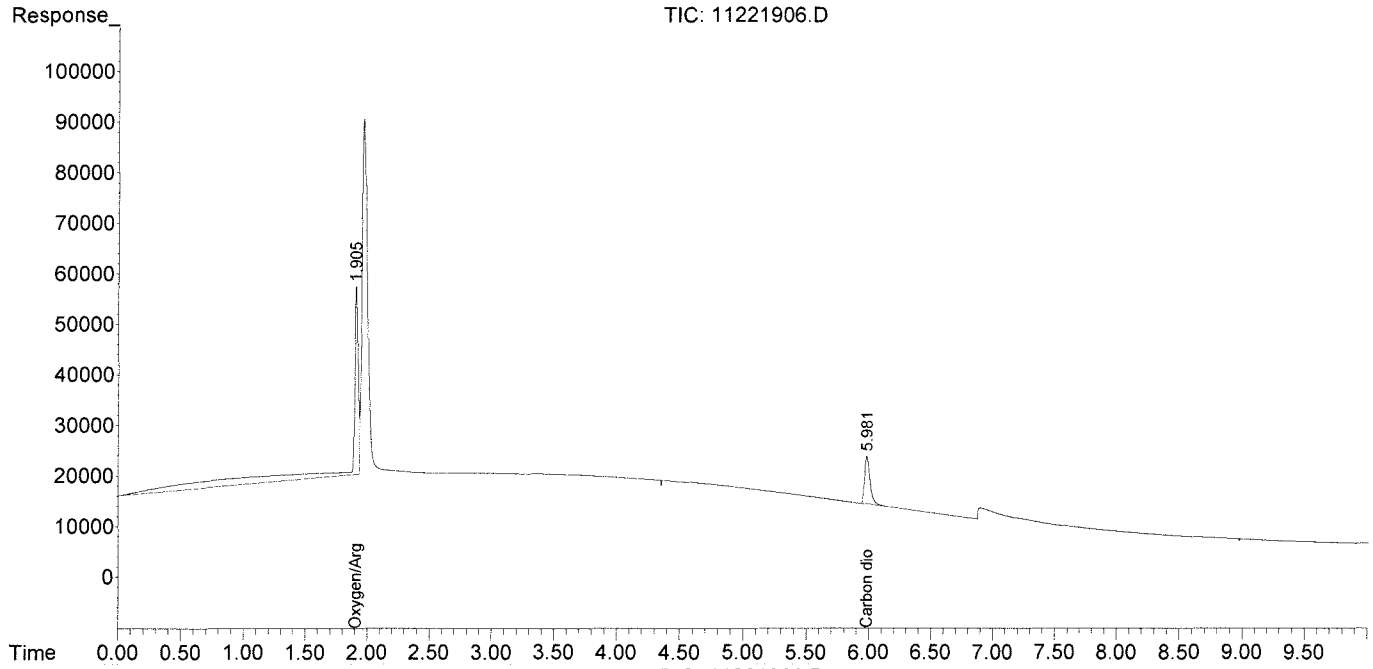
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.906f	1762438	0.370	ppm
2)	Carbon monoxide	1.906f	1762438	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.982	284121	1210.421	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

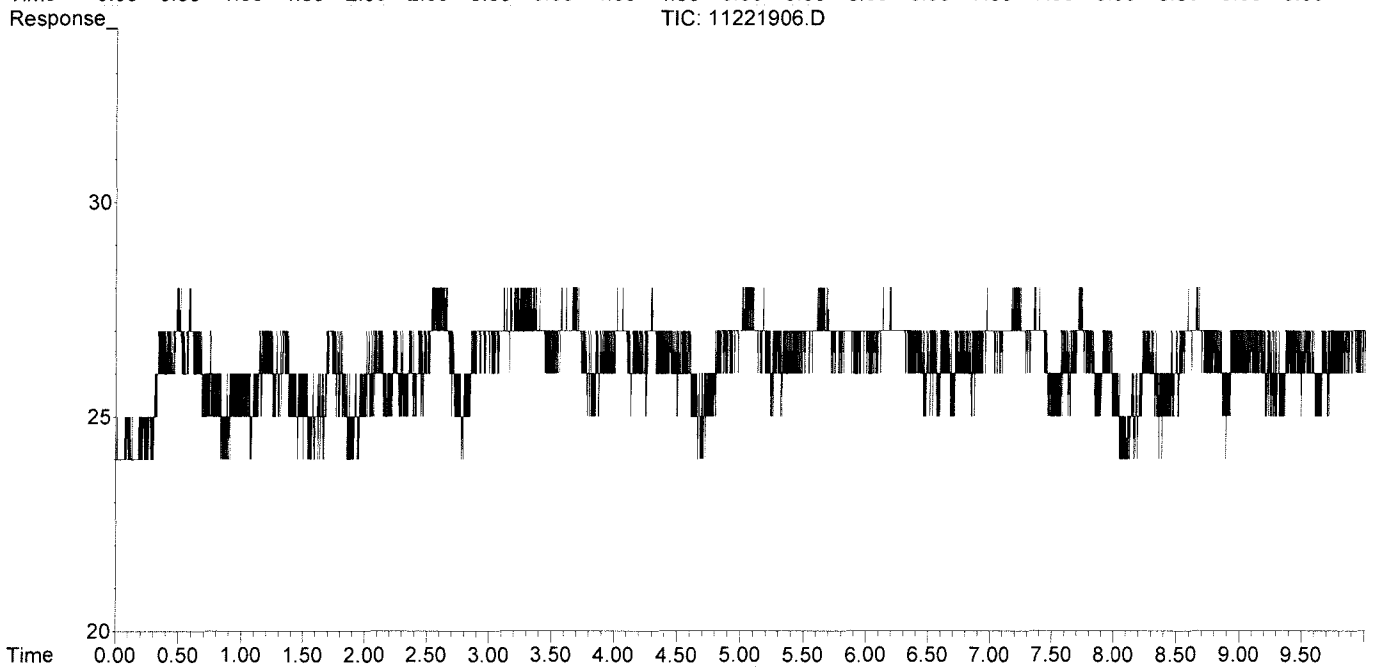
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:36:14
Operator : WH/LD
Sample : P1907040-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 13:46:57 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221907.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:49:08
Operator : WH/LD
Sample : P1907040-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 13:47:14 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

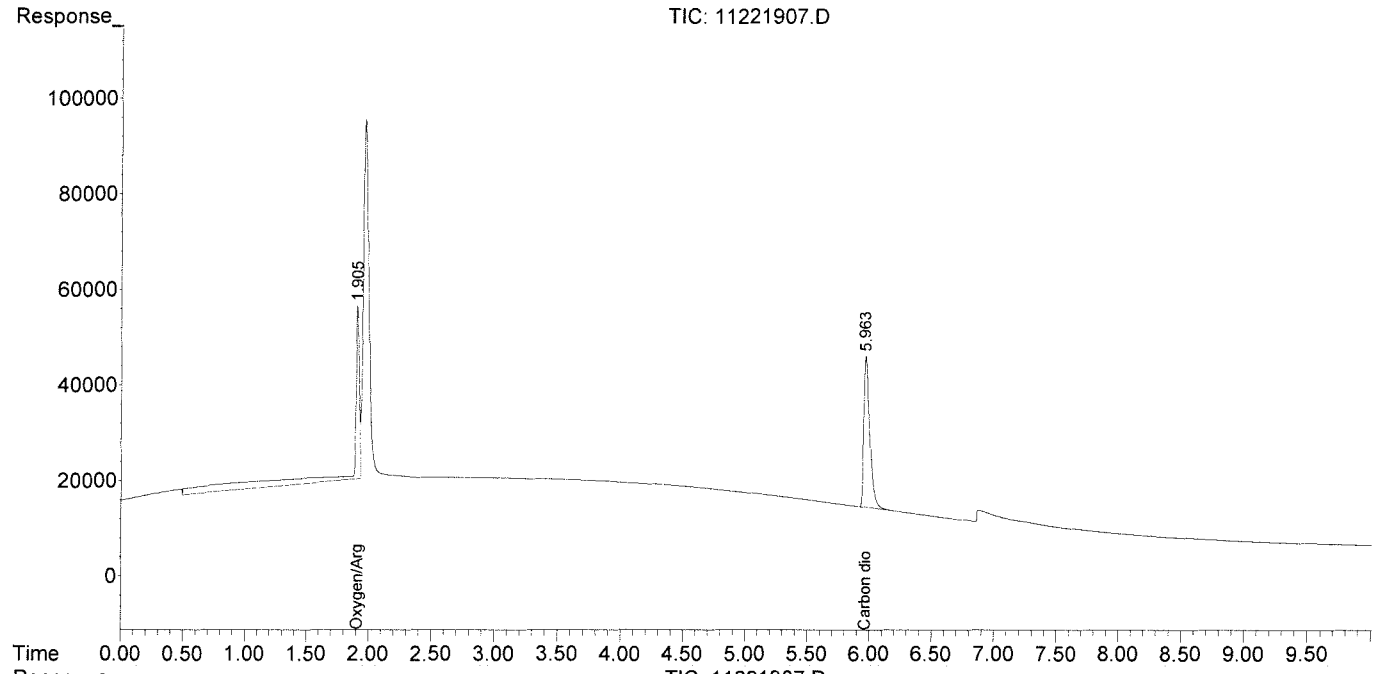
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.906f	1610984	0.338	ppm
2)	Carbon monoxide	1.906f	1610984	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.964	1047117	4460.958	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

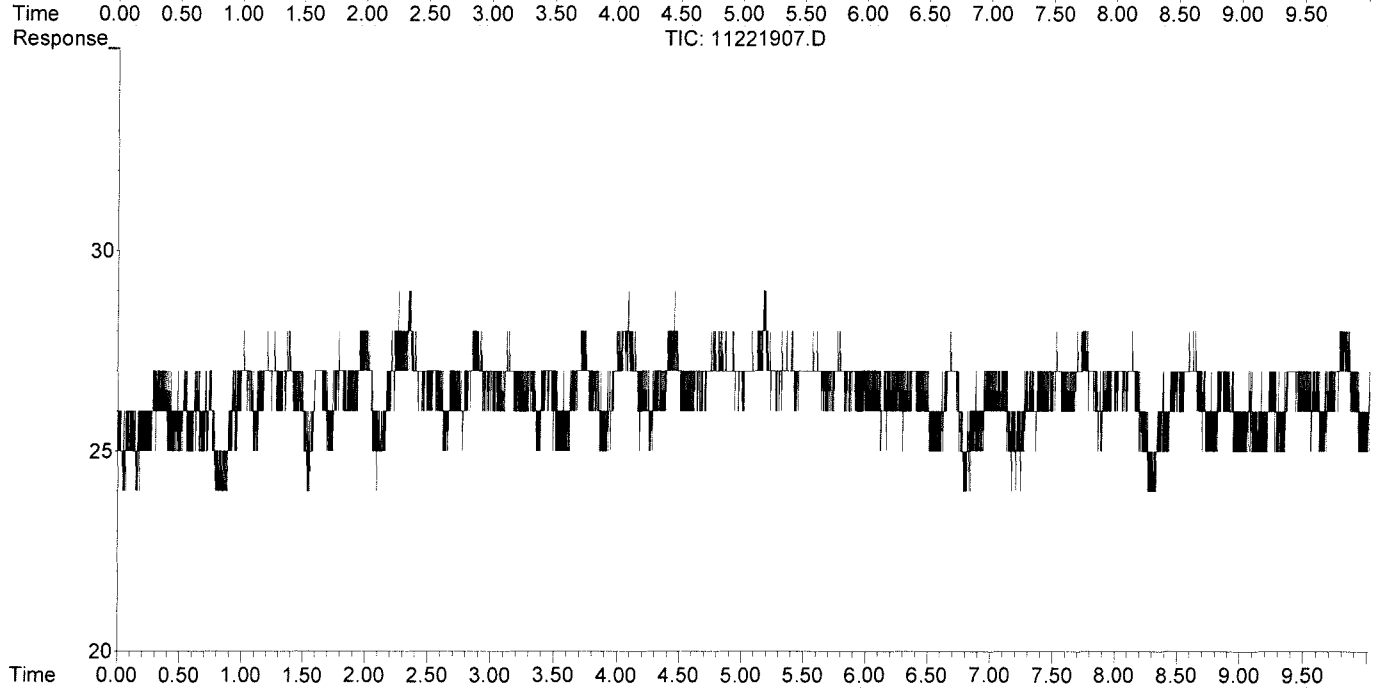
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221907.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:49:08
Operator : WH/LD
Sample : P1907040-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 13:47:14 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 14:23:57
Operator : WH/LD
Sample : P1907040-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 13:47:29 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

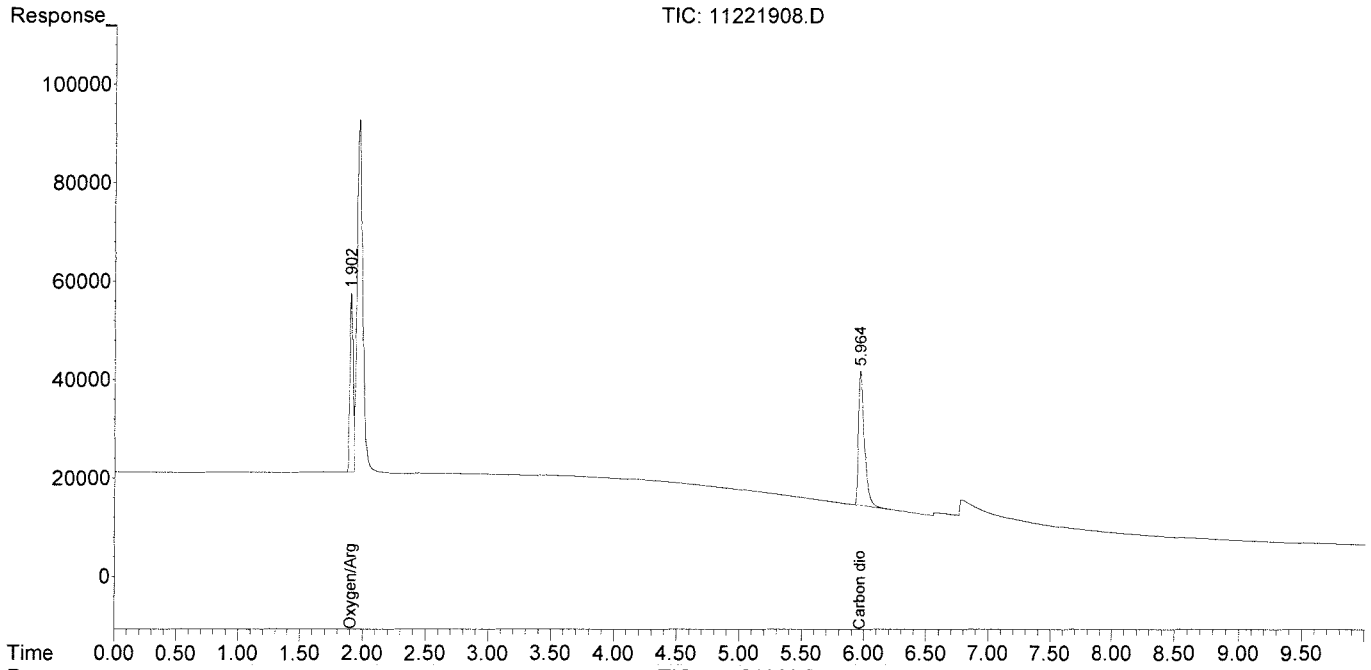
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.903	619369	0.130	ppm
2)	Carbon monoxide	1.903	619369	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.964	923180	3932.958	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

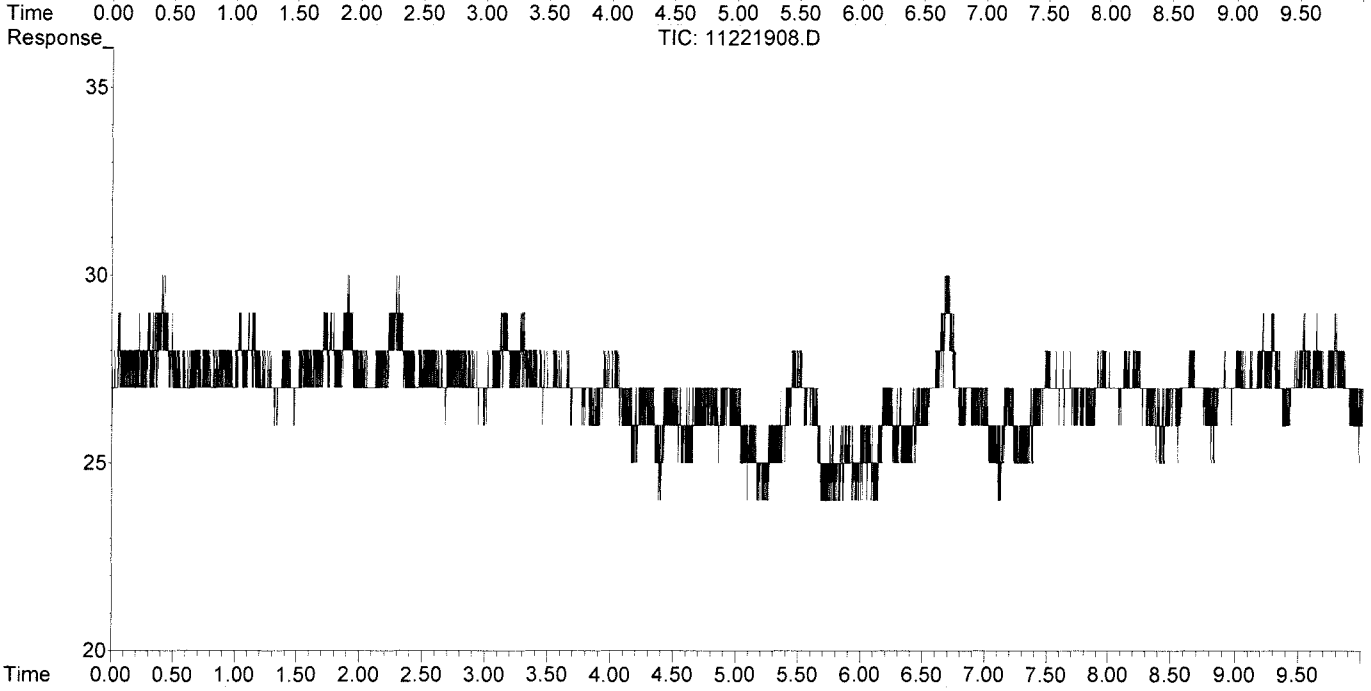
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 14:23:57
Operator : WH/LD
Sample : P1907040-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 13:47:29 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 14:44:44
Operator : WH/LD
Sample : P1907040-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 14:01:00 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

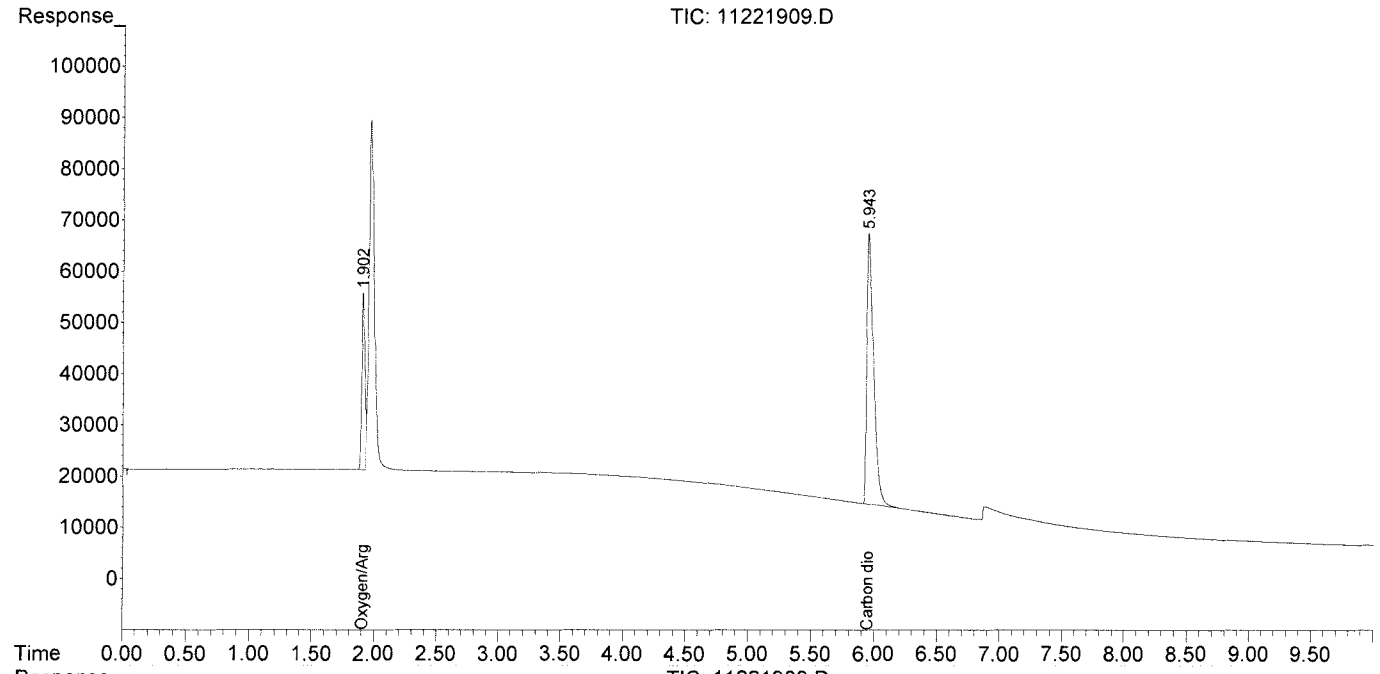
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.903	588229	0.124	ppm
2)	Carbon monoxide	1.903	588229	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	5.944	1993576	8493.089	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

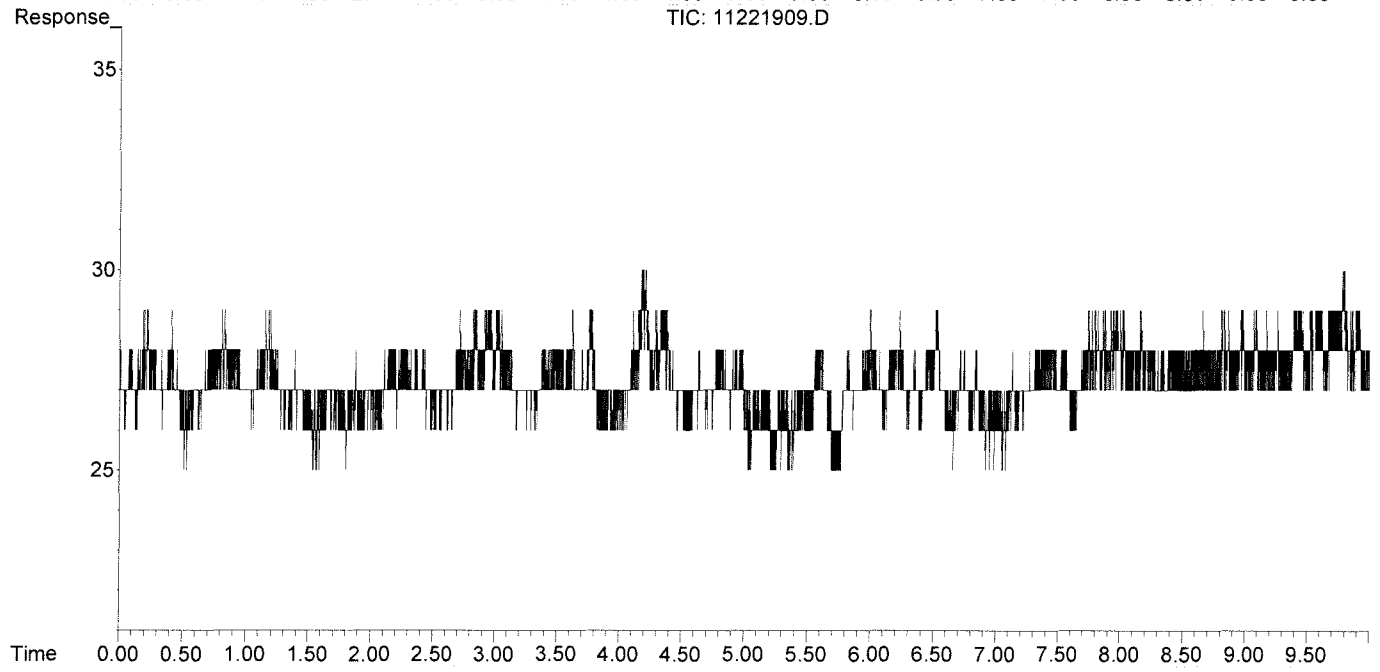
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 14:44:44
Operator : WH/LD
Sample : P1907040-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 14:01:00 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 12:56:11
Operator : WH/LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:06:57 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

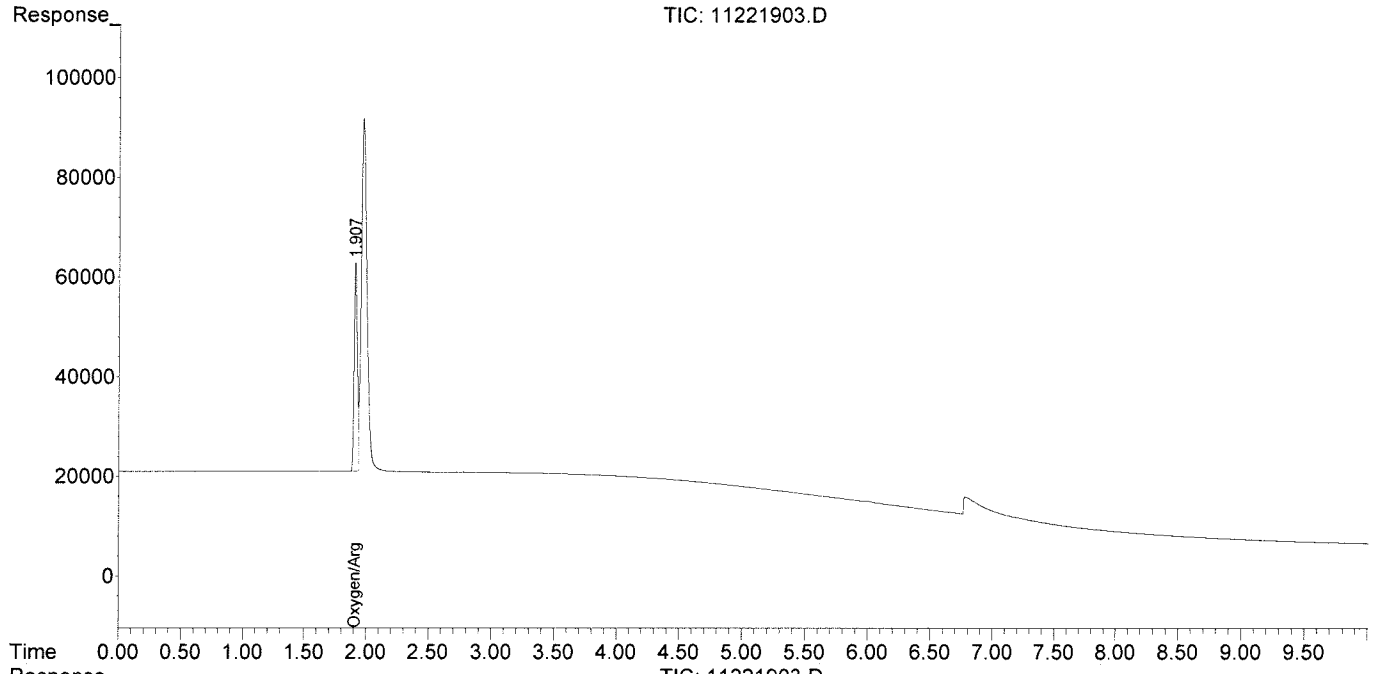
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.907f	727601	0.153	ppm
2)	Carbon monoxide	1.907f	727601	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

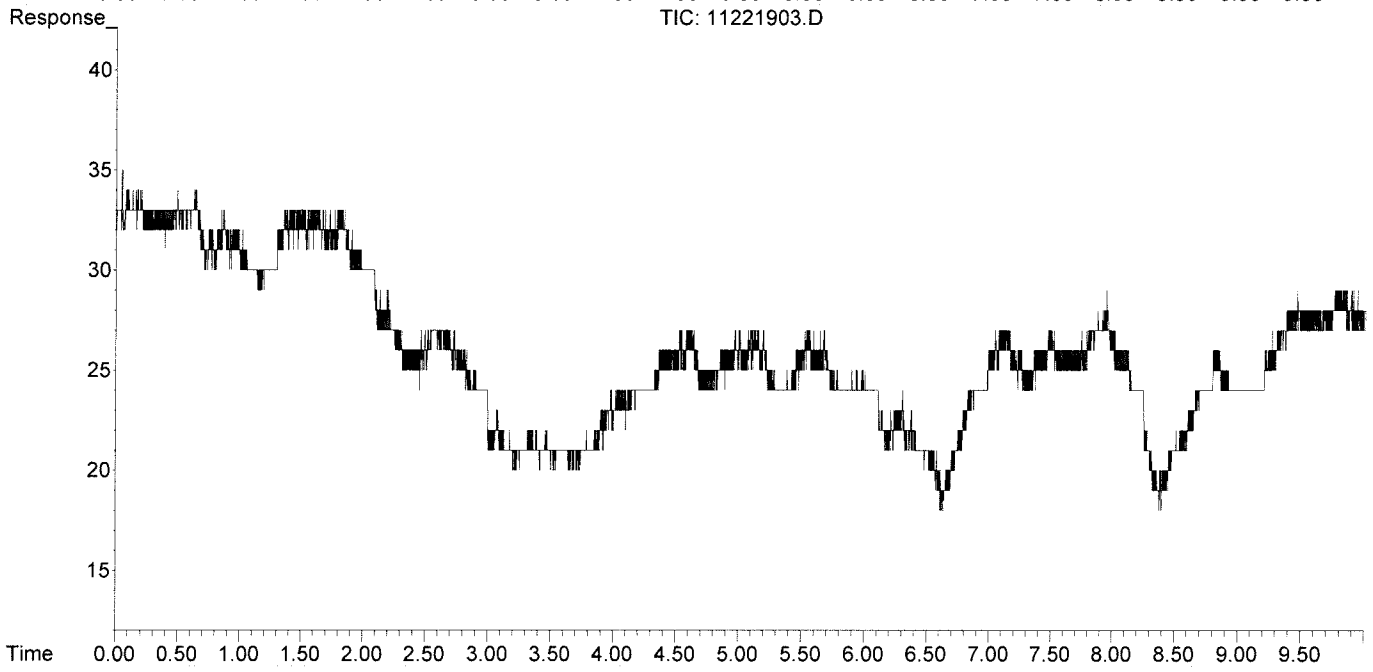
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 12:56:11
Operator : WH/LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:06:57 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 18:11:33
Operator : WH/LD
Sample : P1907040-004ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 09:55:26 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

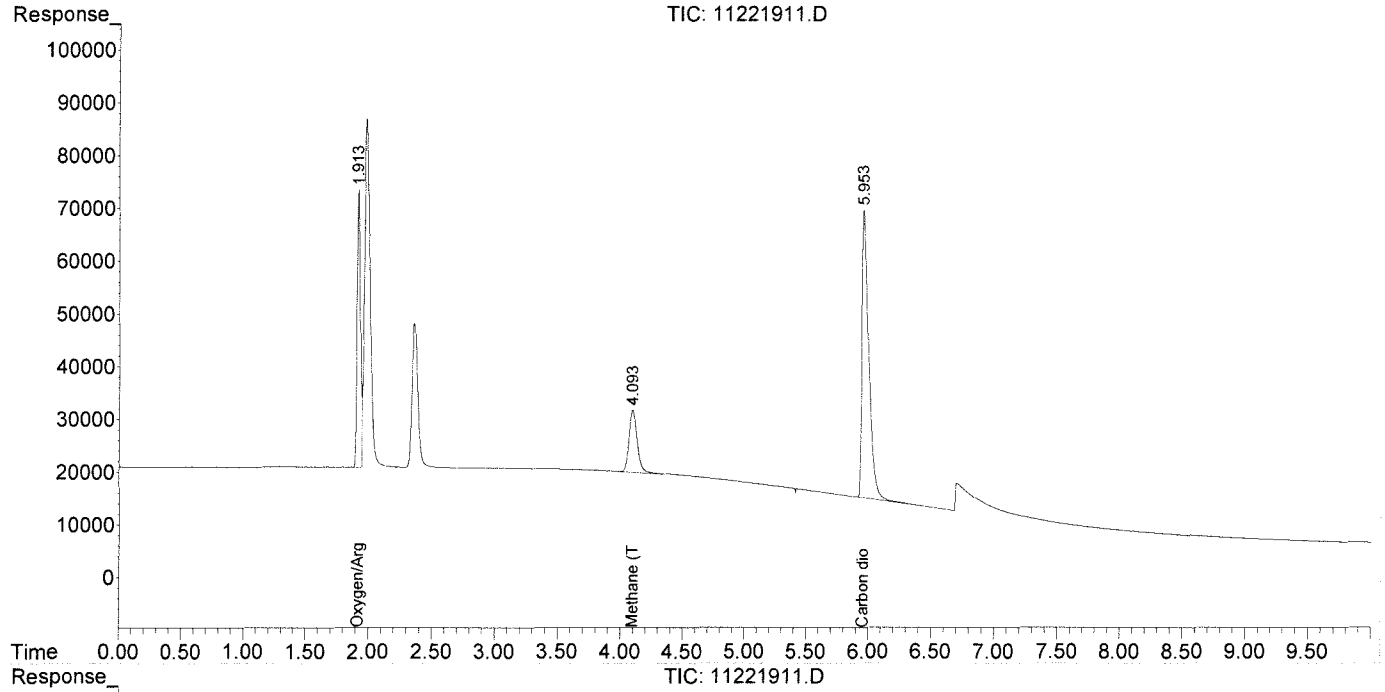
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.914f	931313	0.196	ppm
2)	Carbon monoxide	1.914f	931313	N.D.	ppm
3)	Methane (TCD)	4.094f	538764	56967.771	ppm
4)	Carbon dioxide	5.955	2096703	8932.435	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

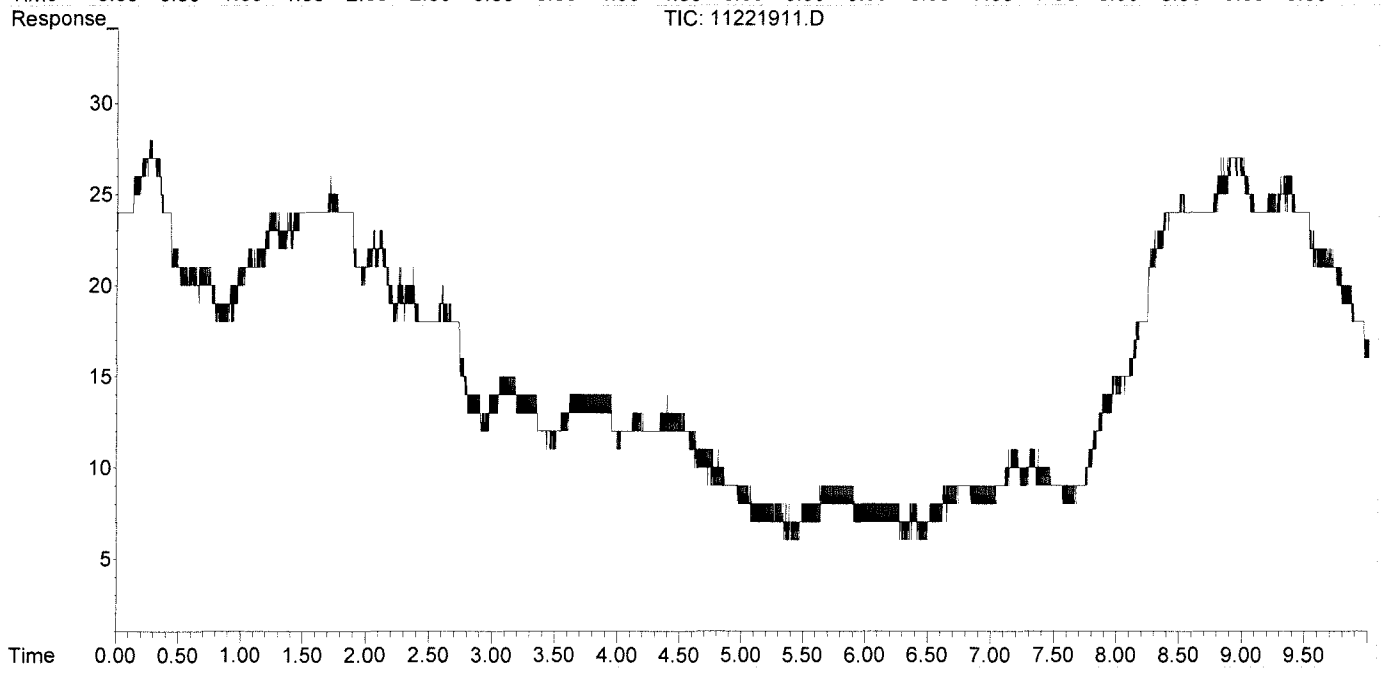
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 18:11:33
Operator : WH/LD
Sample : P1907040-004ms 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 09:55:26 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 18:31:18
Operator : WH/LD
Sample : P1907070-004msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 17:43:02 2019
Quant Method : J:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

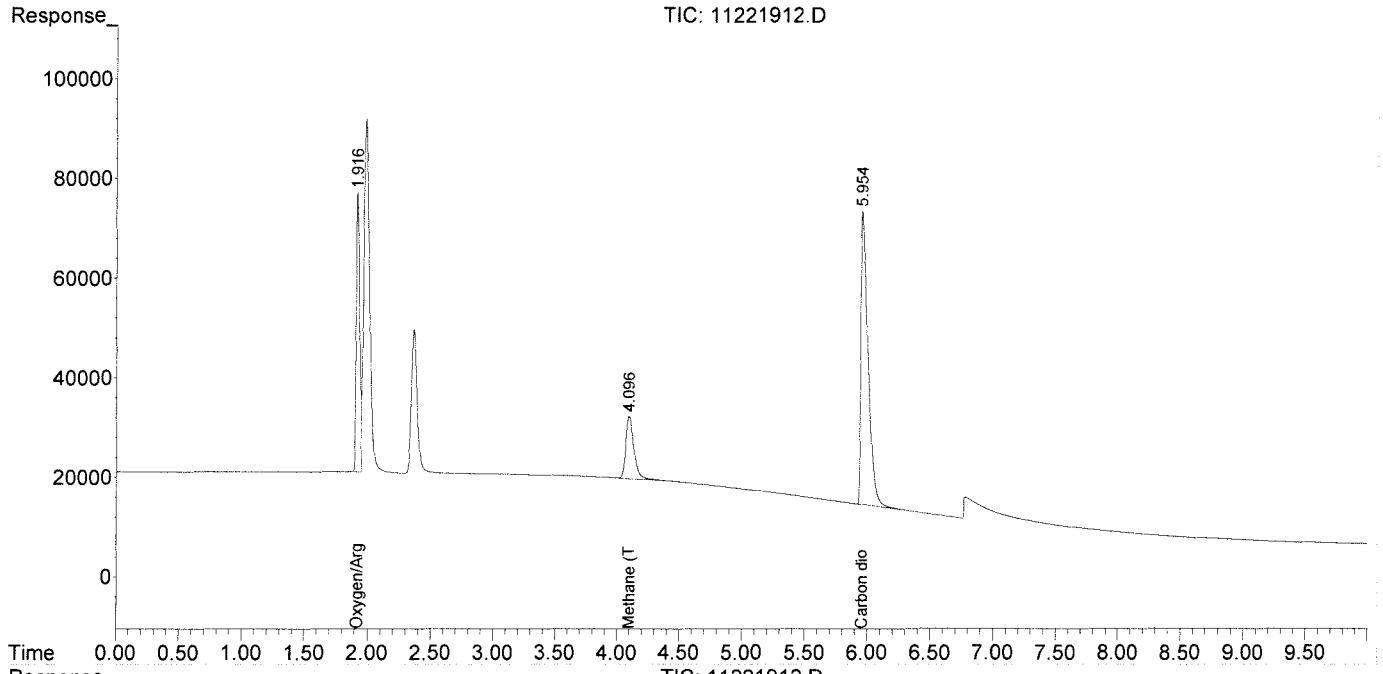
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.916f	1007402	0.212	ppm
2)	Carbon monoxide	1.916f	1007402	N.D.	ppm
3)	Methane (TCD)	4.097f	578385	61157.149	ppm
4)	Carbon dioxide	5.955	2287950	9747.190	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

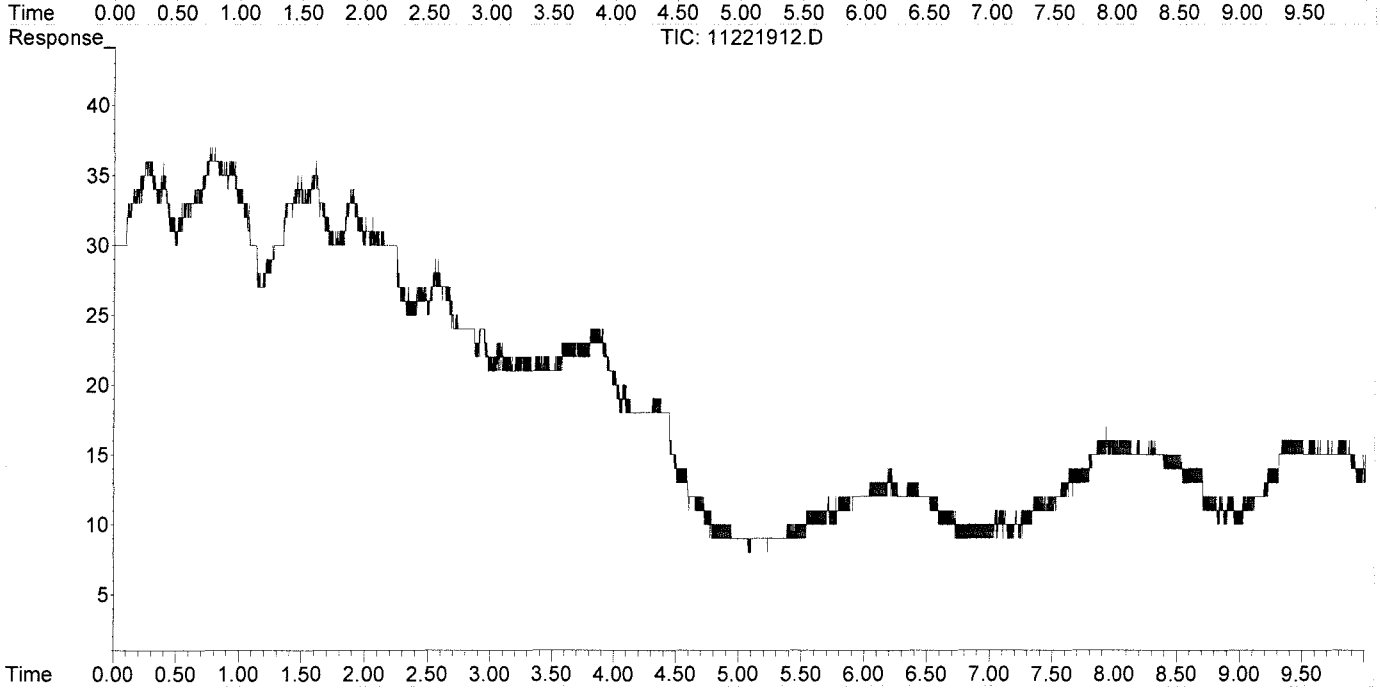
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 18:31:18
Operator : WH/LD
Sample : P1907070-004msd 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 17:43:02 2019
Quant Method : J:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221904.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:10:20
Operator : WH/LD
Sample : LCS S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:23:17 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

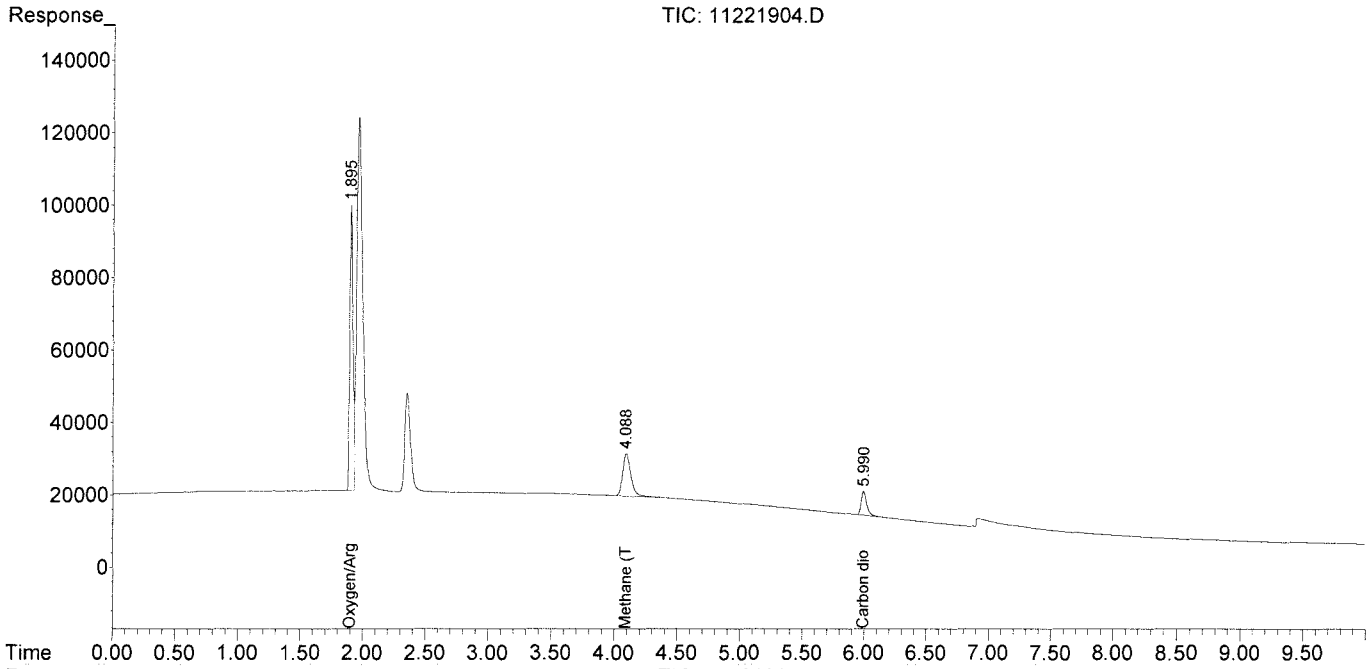
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.895	1404792	0.295	ppm	
2)	Carbon monoxide	1.895	1404792	N.D.	ppm	
3)	Methane (TCD)	4.089f	541798	57288.555	ppm	
4)	Carbon dioxide	5.990	203565	867.235	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

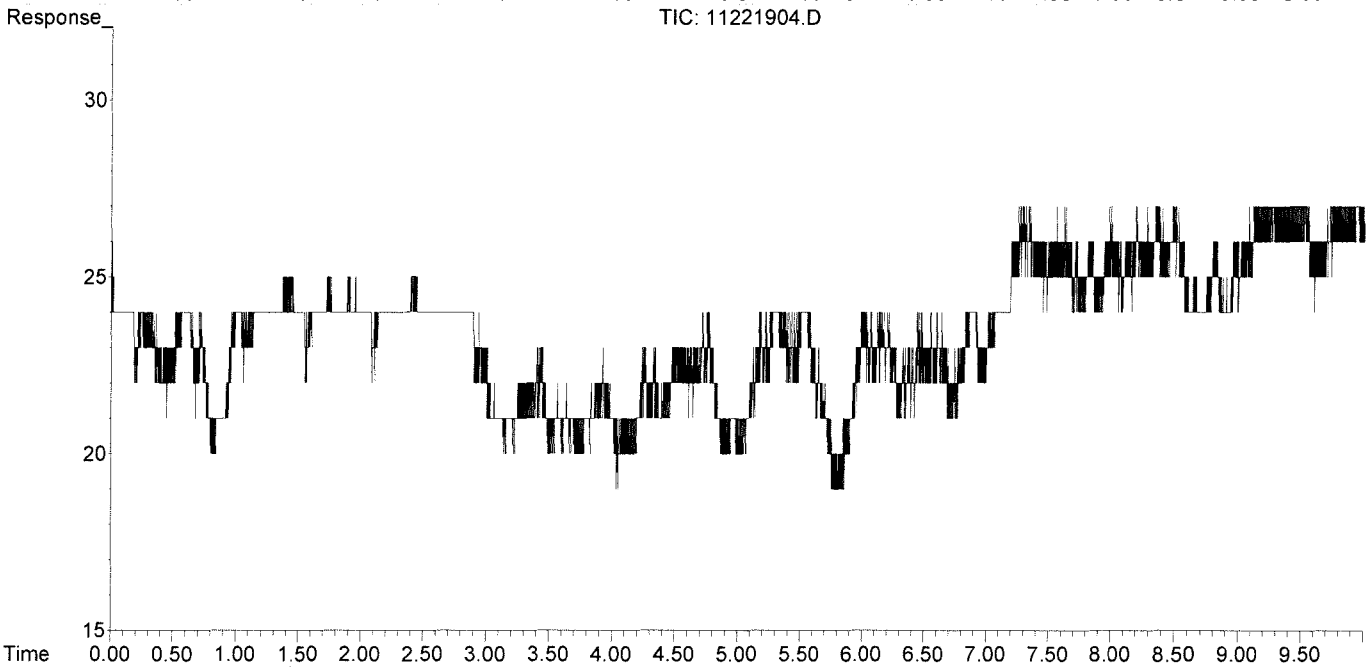
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221904.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:10:20
Operator : WH/LD
Sample : LCS S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:23:17 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

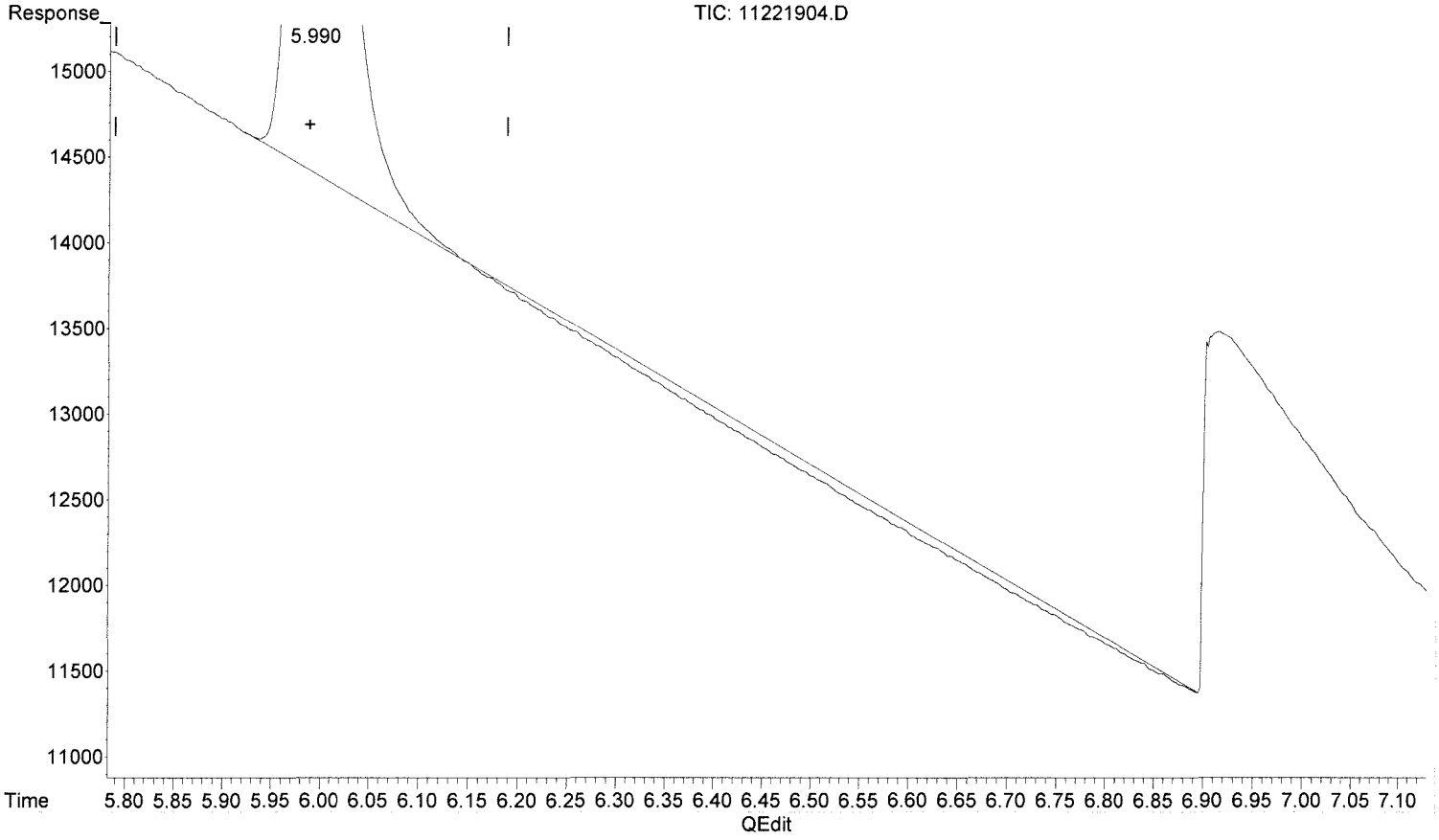




Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221904.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:10:20
Operator : WH/LD
Sample : LCS S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:23:17 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.991min 786.662 ppm

response 184653

(+) = Expected Retention Time

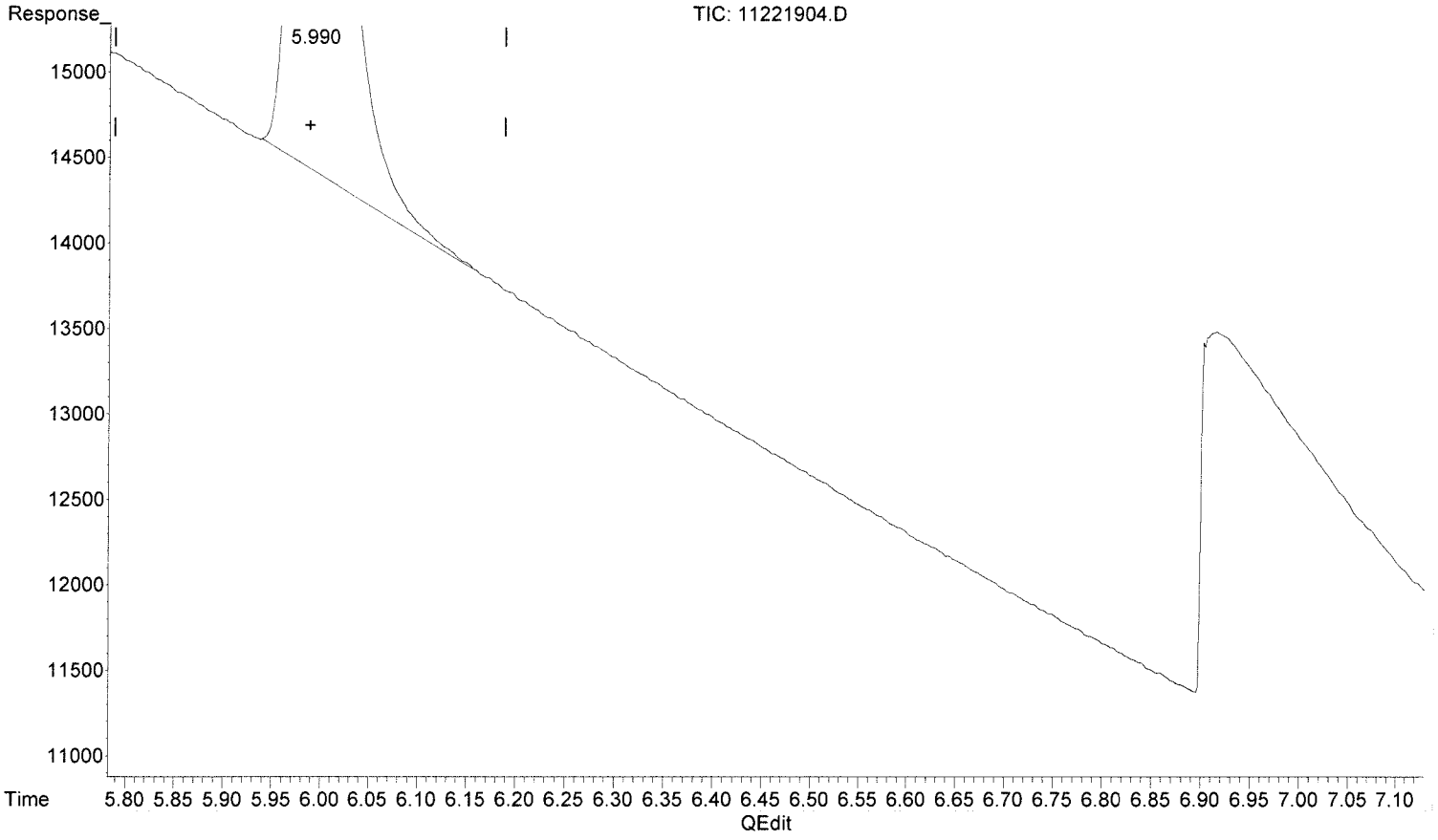
01010460

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221904.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:10:20
Operator : WH/LD
Sample : LCS S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:23:17 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

CP
BLC
11/22

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.990min 867.235 ppm m

response 203565

11/22/19 MLC 11/25/19

(+) = Expected Retention Time
RS082817_CO2.M Fri Nov 22 12:34:25 2019 Page: 1

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:23:19
Operator : WH/LD
Sample : LCSD S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:33:18 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

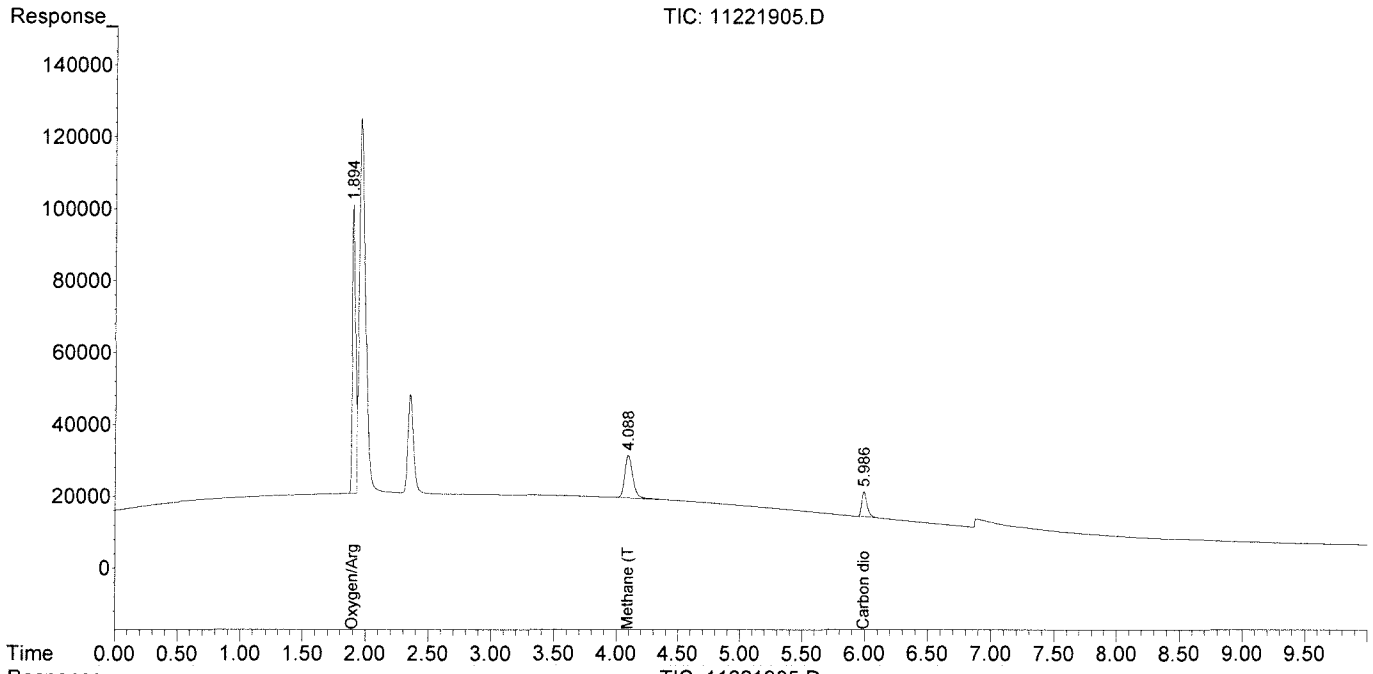
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.895	1431820	0.301	ppm	
2)	Carbon monoxide	1.895	1431820	N.D.	ppm	
3)	Methane (TCD)	4.089f	545387	57668.031	ppm	
4)	Carbon dioxide	5.986	209057	890.632	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

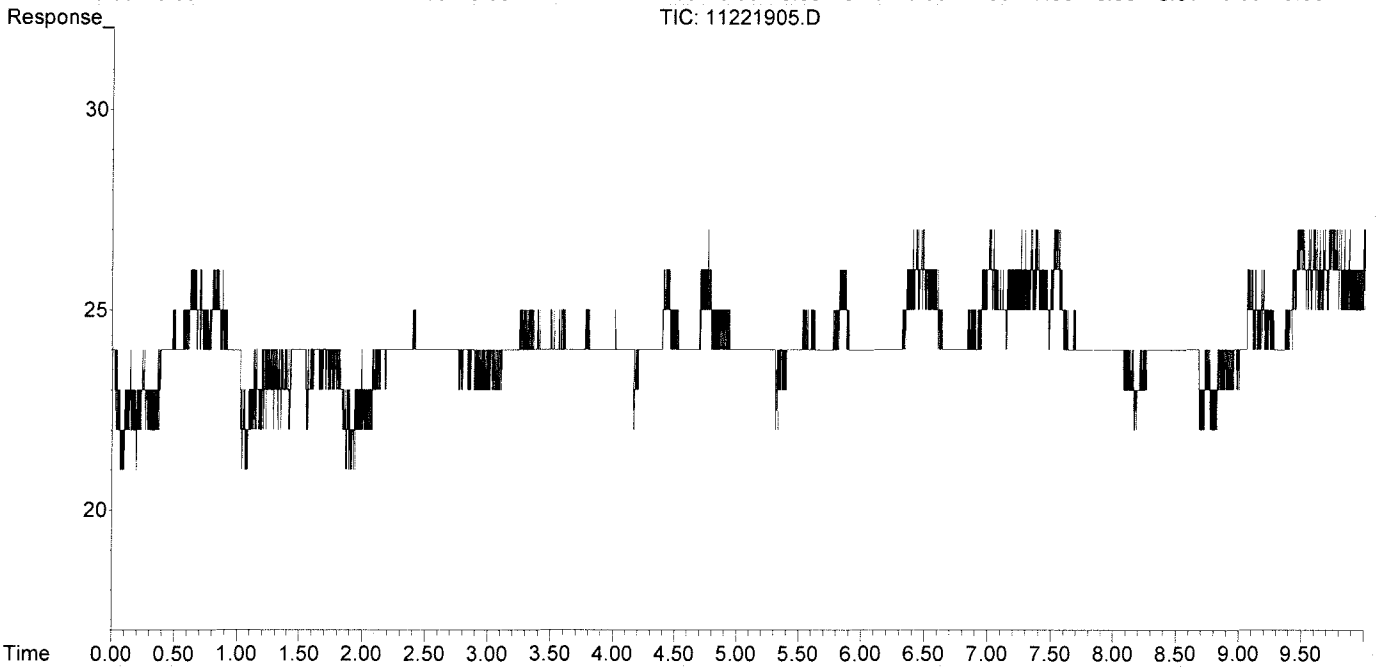
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:23:19
Operator : WH/LD
Sample : LCSD S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:33:18 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

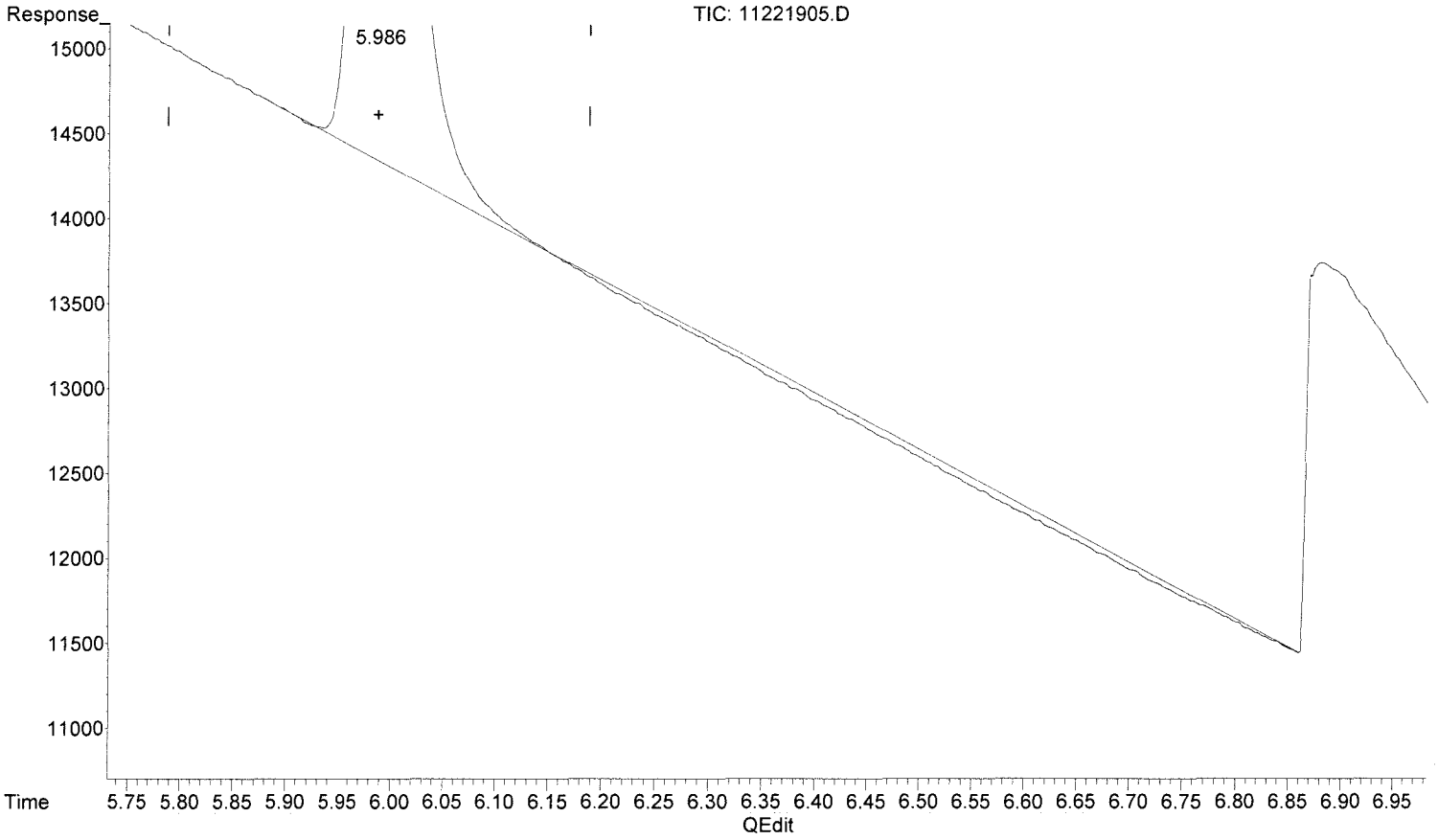




Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:23:19
Operator : WH/LD
Sample : LCSD S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:33:18 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.987min 834.764 ppm

response 195944

(+) = Expected Retention Time

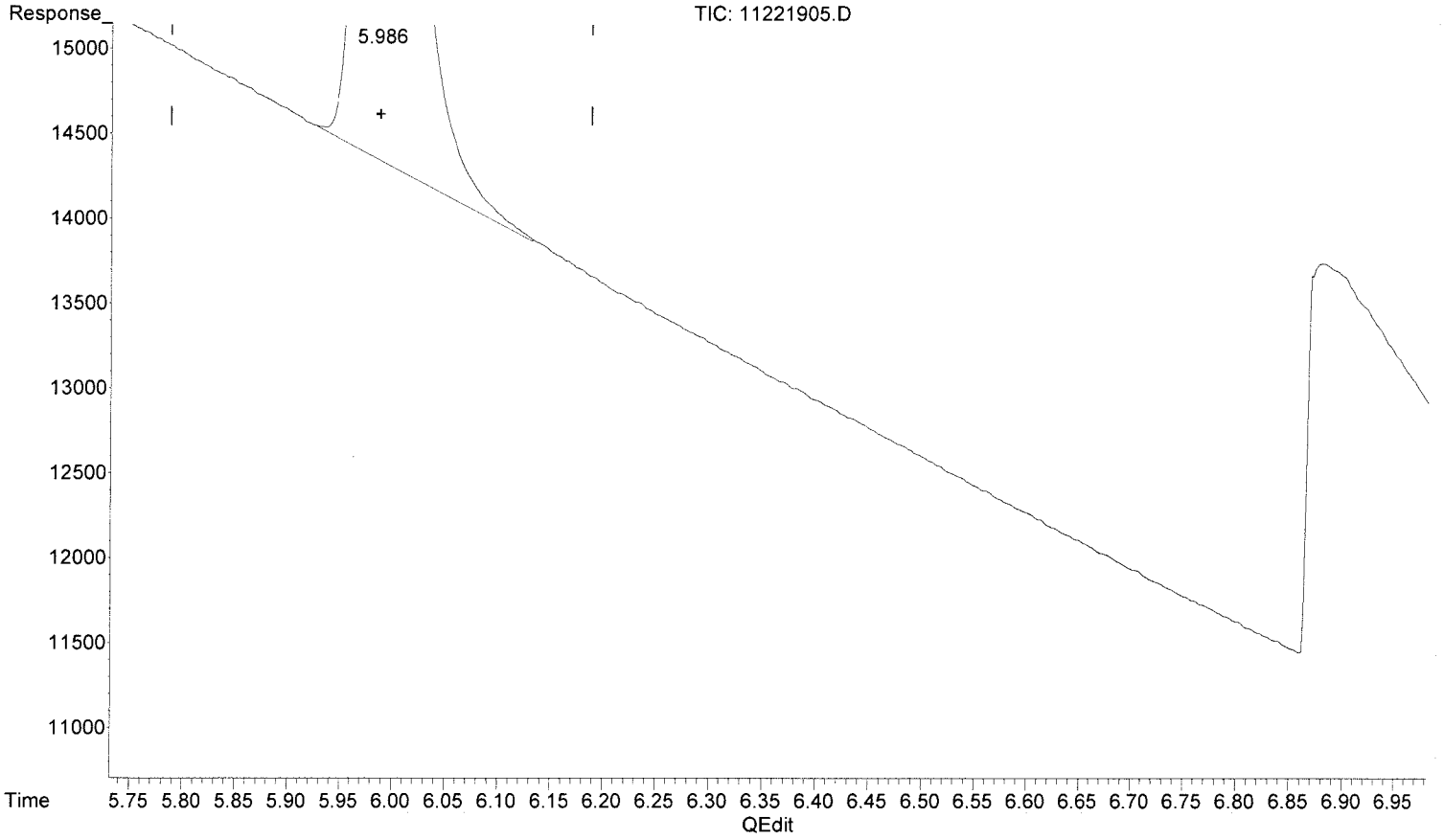
01010464

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 13:23:19
Operator : WH/LD
Sample : LCSD S32-08141901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 12:33:18 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

LD
BLC
11/22

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.986min 890.632 ppm m

response 209057

11/22/19

MR 11/25/19

(+) = Expected Retention Time

RS082817_CO2.M Fri Nov 22 12:34:47 2019

Response Factor Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	4.760						4.760	E6	0.00
2)	Carbon monoxide	2.775		1.066	0.043	0.033	0.027	0.657	E6	170.12
3)	Methane (TCD)							9.457		0.00
4)	Carbon dioxide	2.717	2.193	2.338	2.272	2.265	2.298	2.347	E2	7.99

Signal #2 Calibration Files
1 =08291715.D 2 =08291716.D 3 =08291717.D
4 =08291719.D 5 =08291720.D 6 =08291721.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)	1.253	1.160	1.005	0.927	0.848	0.848	0.945	E4	15.85
7)	Ethylene	1.677	1.605	1.900	1.749	1.597	1.579	1.684	E4	7.30
8)	Ethane	1.769	1.631	1.866	1.767	1.639	1.667	1.723	E4	5.40
9)	Propylene	2.402	2.309	2.767	2.551	2.331	2.333	2.449	E4	7.32
10)	Propane	2.906	2.737	2.817	2.639	2.410	2.420	2.655	E4	7.75
11)	Isobutylene							0.000		-1.00
12)	Isobutane							0.000		-1.00
13)	n-Butane							0.000		-1.00

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS082817_CO2.M Wed Aug 30 13:24:19 2017

dit Compounds -- Compound #4 -- Carbon dioxide

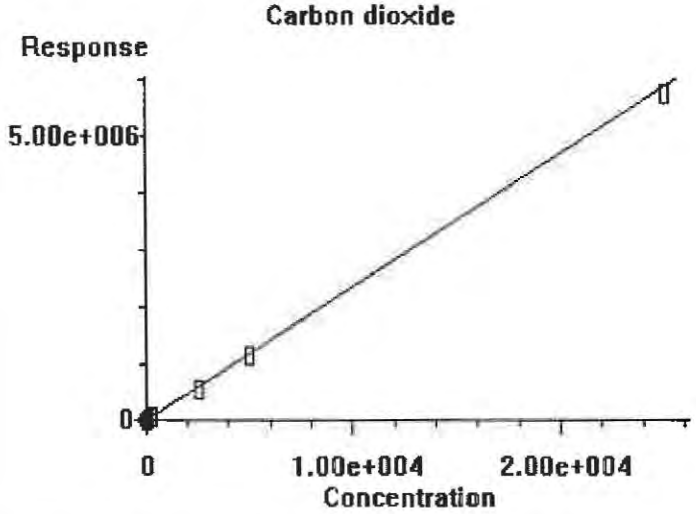
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	25.000000	6793.665186
2	100.000000	21932.418000
3	250.000000	58460.642510
4	2500.000000	568043.388750
5	5000.000000	1132363.215937
6	25000.000000	5744294.891563
7	25000.000000	
8	25000.000000	
9	2000.000000	
10	30000.000000	

Lvl ID	Concentration	Response



0.000e+000	Quadratic term
2.347e+002	Linear term
0.000e+000	Constant term
7.987%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Calibration Status Report HP5890

Method Path : I:\GC10\METHODS\
Method File : RS082817_CO2.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Tue Aug 29 16:13:13 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291715.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291716.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291717.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291719.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291720.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291721.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241711.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Aug 29 14:21 2017	Aug 29 14:20 2017	29-Aug-2017, 14:07
2	2	Aug 29 14:52 2017	Aug 29 14:51 2017	29-Aug-2017, 14:22
3	3	Aug 29 15:04 2017	Aug 29 15:04 2017	29-Aug-2017, 14:53
4	4	Aug 29 15:36 2017	Aug 29 15:36 2017	29-Aug-2017, 15:23
5	5	Aug 29 15:57 2017	Aug 29 15:57 2017	29-Aug-2017, 15:44
6	6	Aug 29 16:13 2017	Aug 29 16:13 2017	29-Aug-2017, 16:00
7	7	Aug 25 09:05 2017	Aug 24 16:00 2017	24-Aug-2017, 15:44
8	8	Aug 25 09:06 2017	Aug 24 16:13 2017	24-Aug-2017, 16:02
9	9	Aug 25 09:06 2017	Aug 24 16:31 2017	24-Aug-2017, 16:16
10	10	Aug 25 09:07 2017	Aug 24 16:42 2017	24-Aug-2017, 16:33

RS082817_CO2.M Wed Aug 30 13:24:30 2017

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

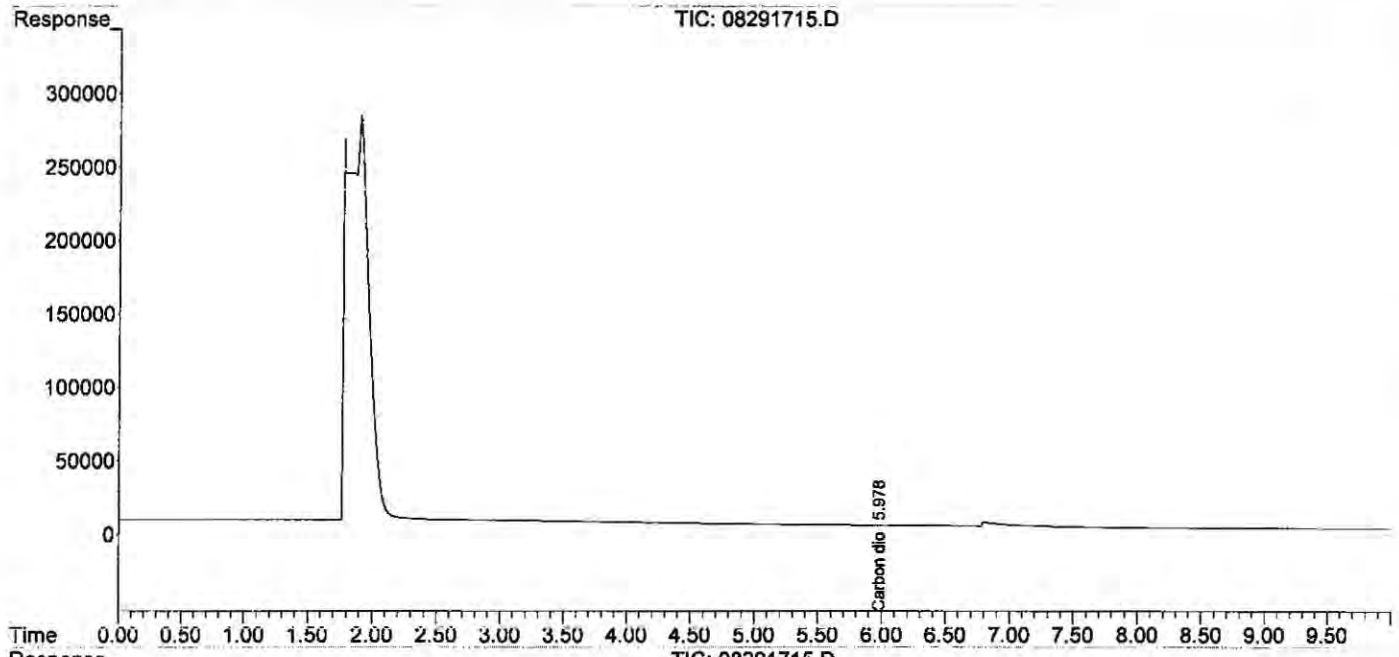
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.776	277465	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	6794	27.870	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

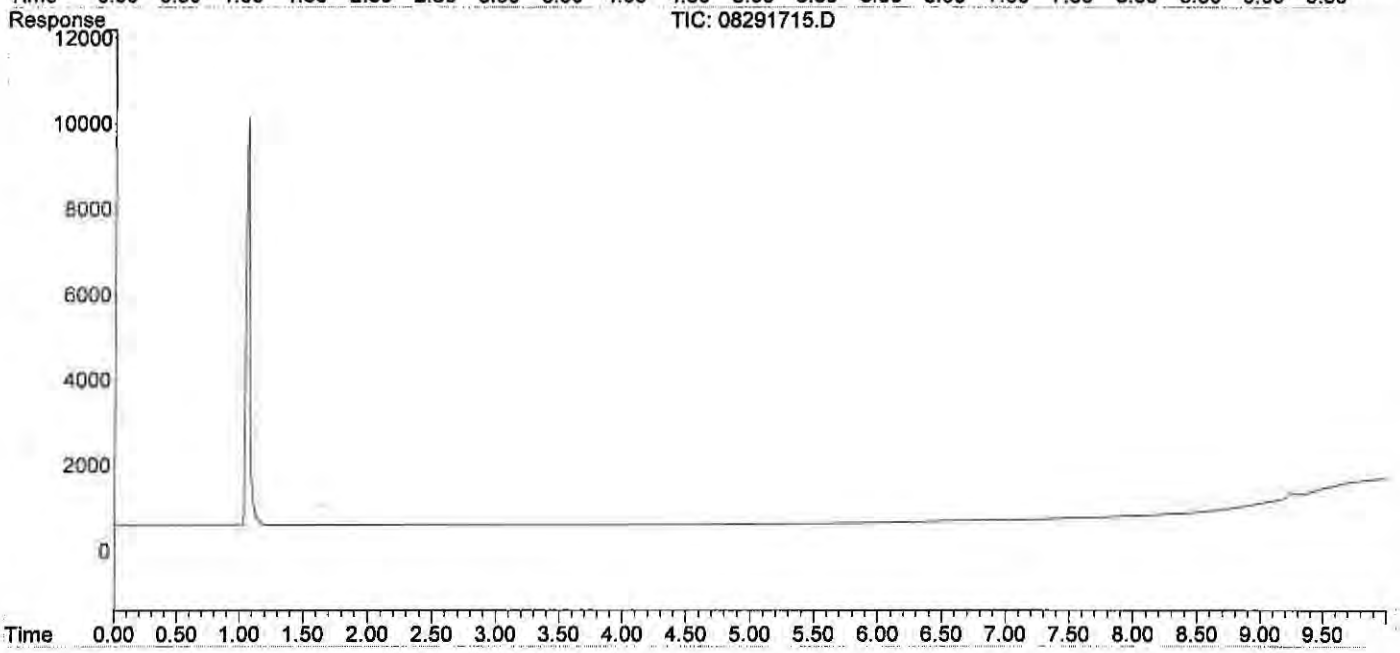
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



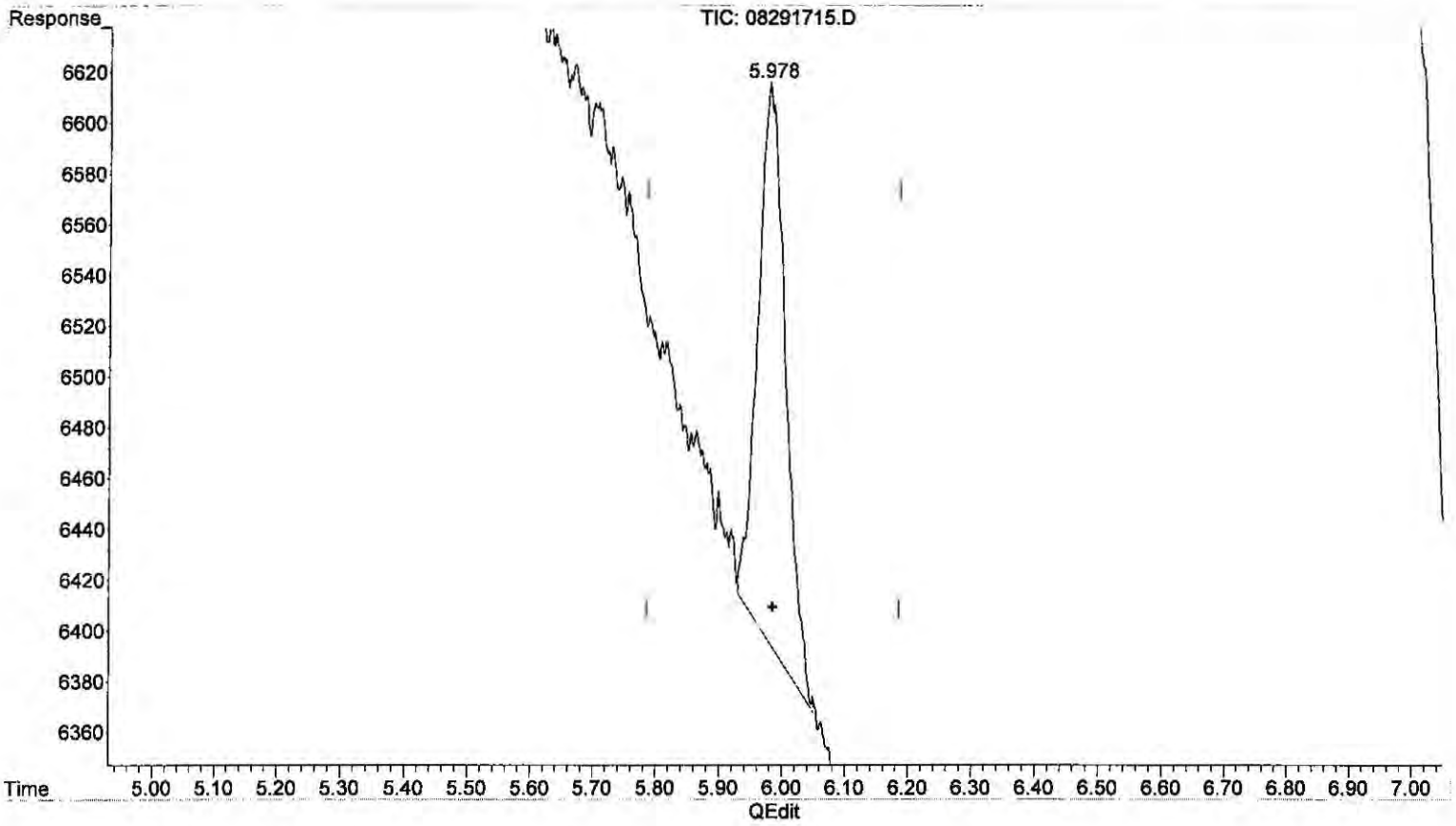


01010470

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:07
Operator : MC
Sample : 25ppm s32-08291701 0.25ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:20:06 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.978min 27.870 ppm m

response 6794

8/30/17
BW
M.
prelim

8/4/17

(+) = Expected Retention Time

RS082817_CO2.M Wed Aug 30 13:17:47 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

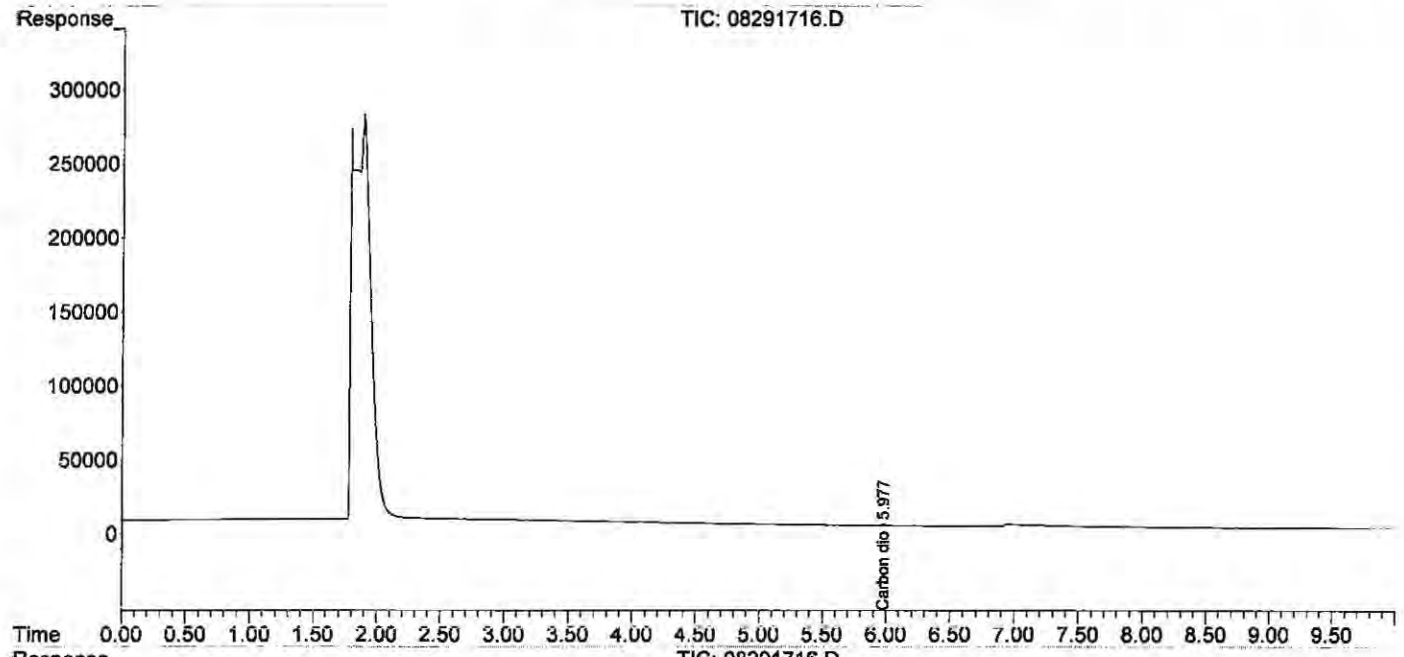
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.790	-598962	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	5.978	21932	87.858	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

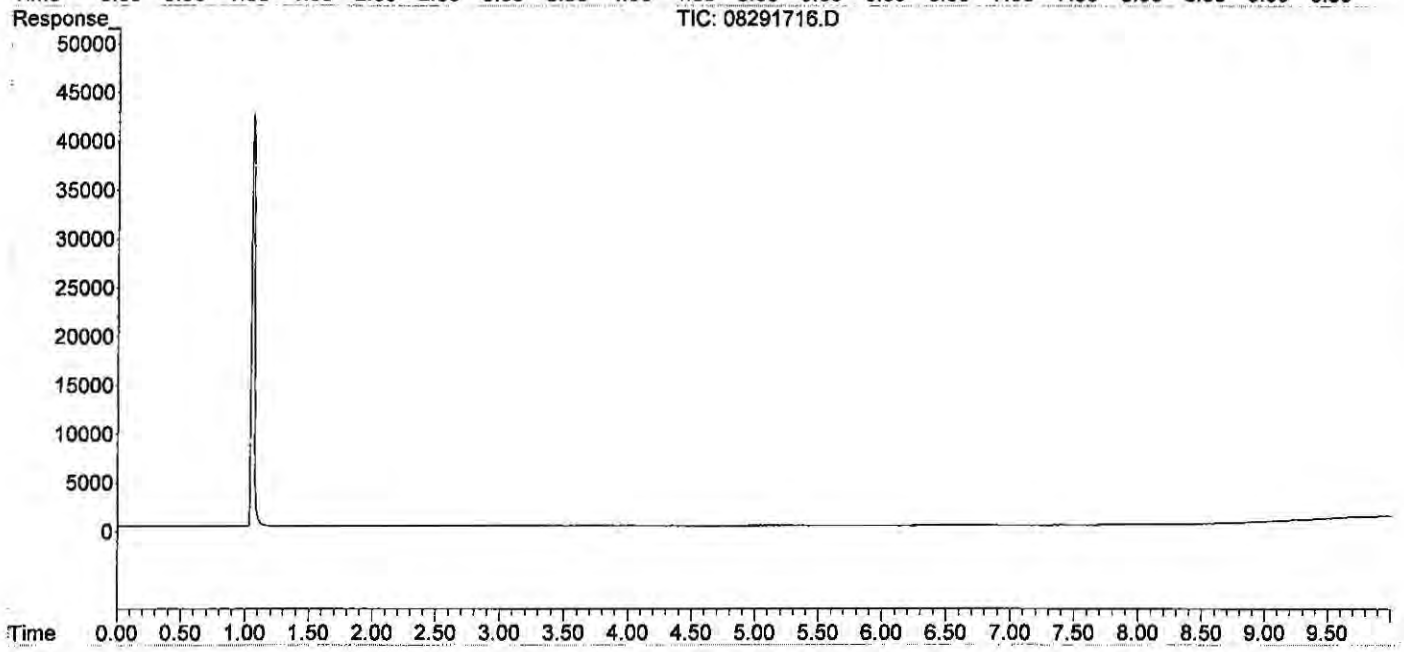
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291716.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:22
Operator : MC
Sample : 100ppm s32-08291702 0.2ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 14:51:38 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:21:08 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

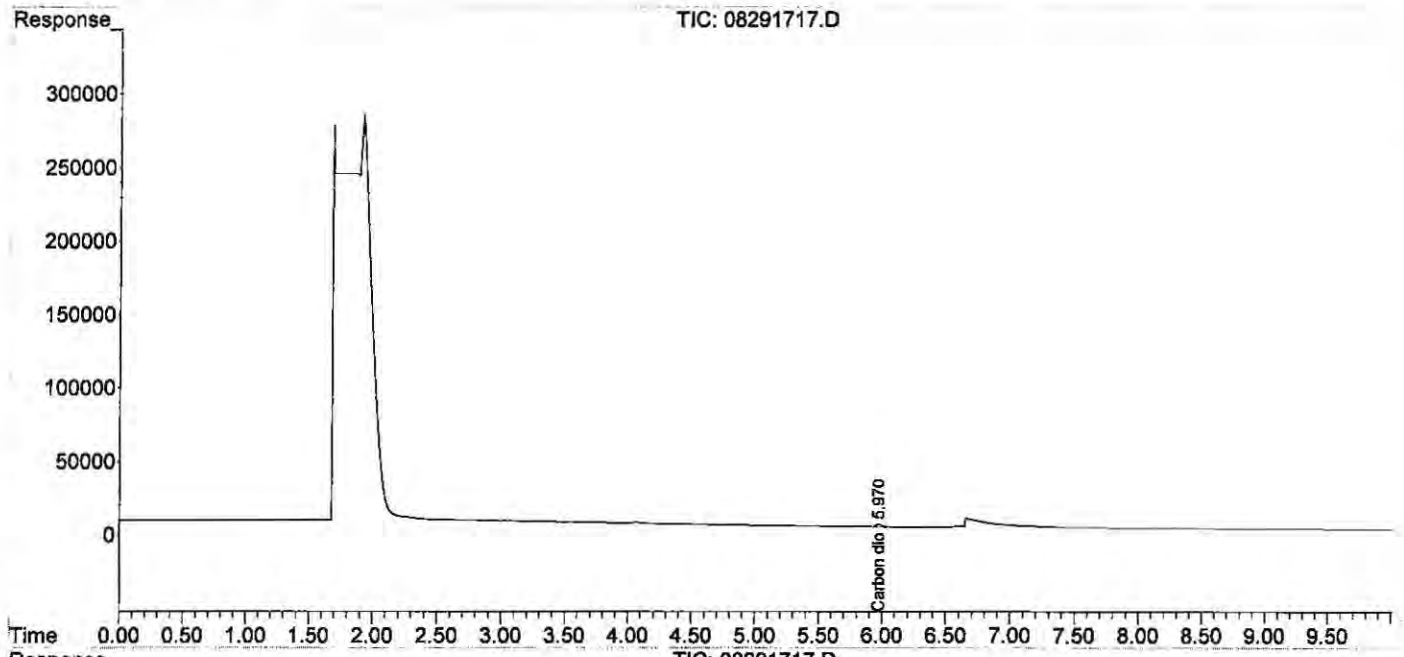
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.920f	-30716454	N.D.	ppm	
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.970	58461	240.204	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

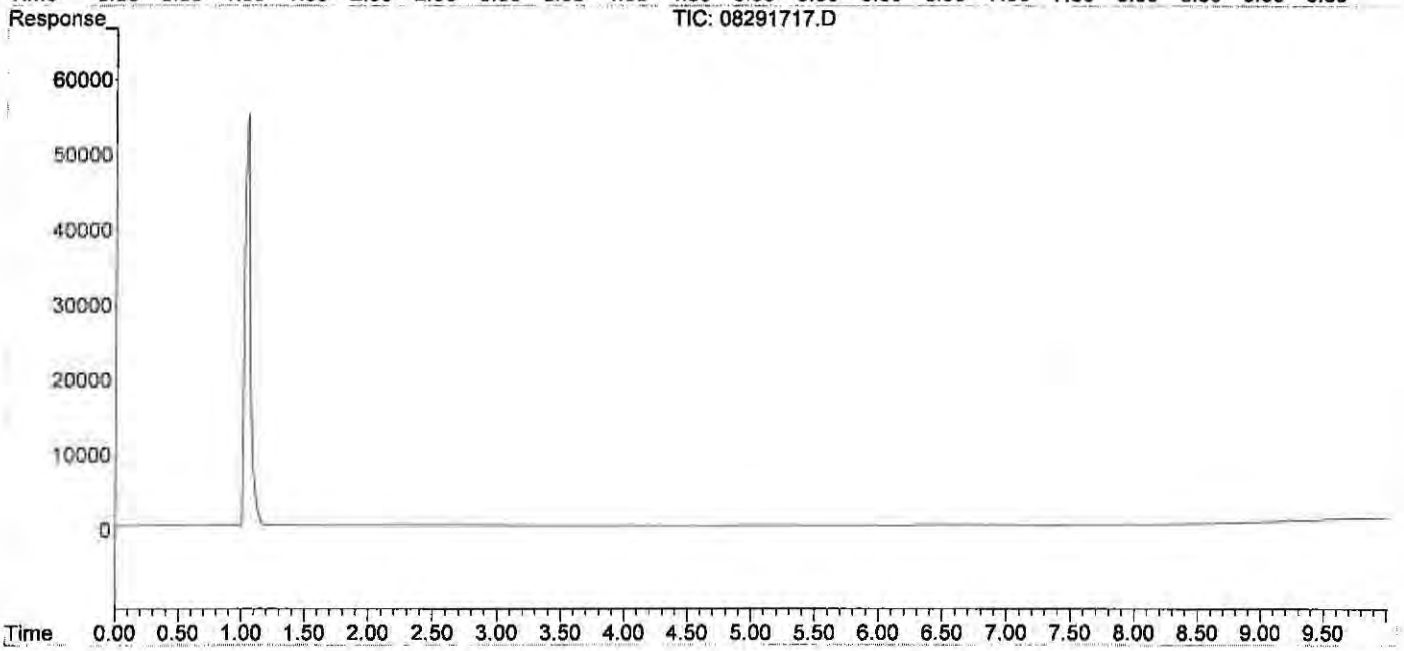
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



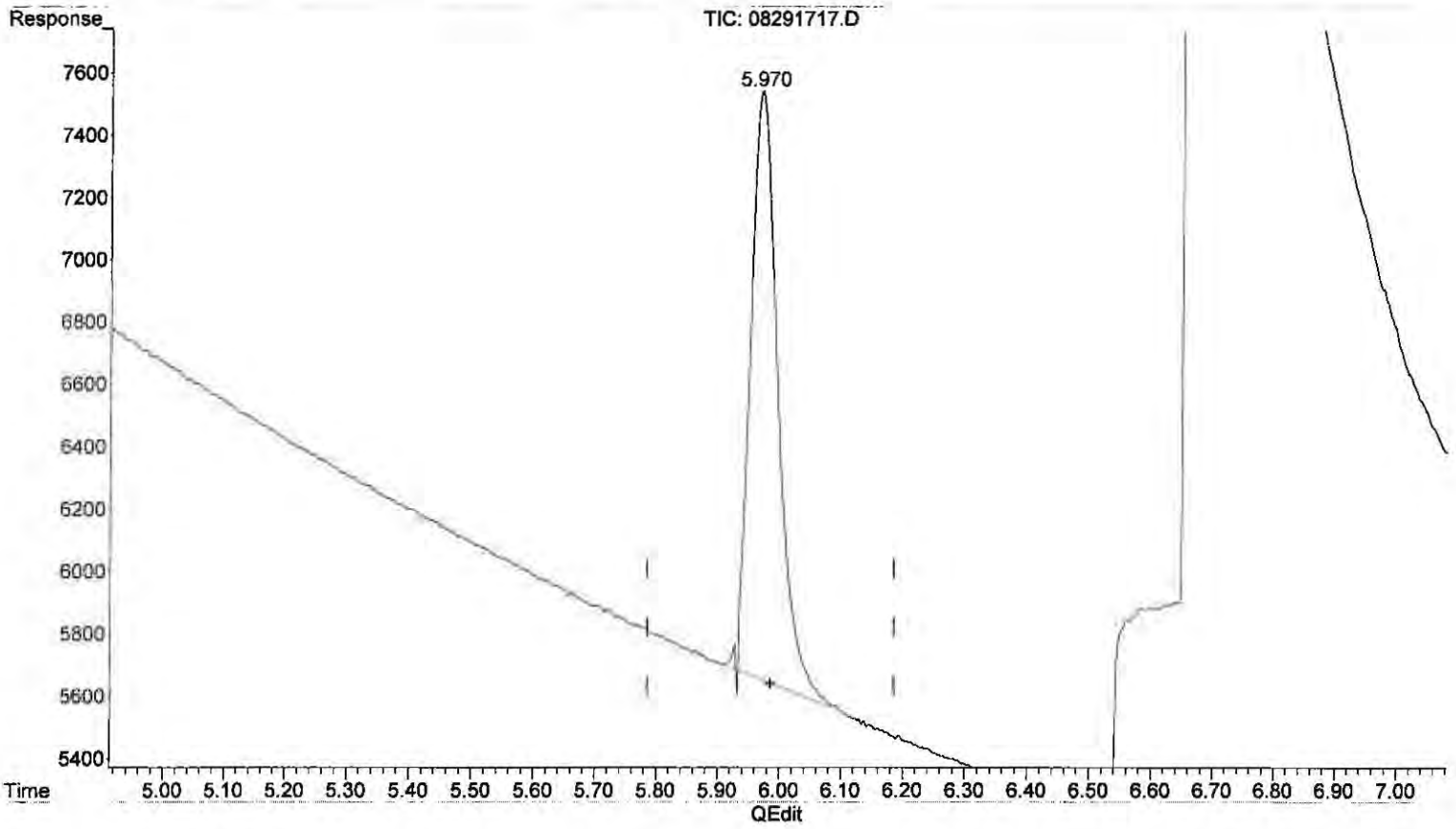


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.970min 240.204 ppm m

response 58461

(+) = Expected Retention Time

RS082817_CO2.M Wed Aug 30 13:19:20 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

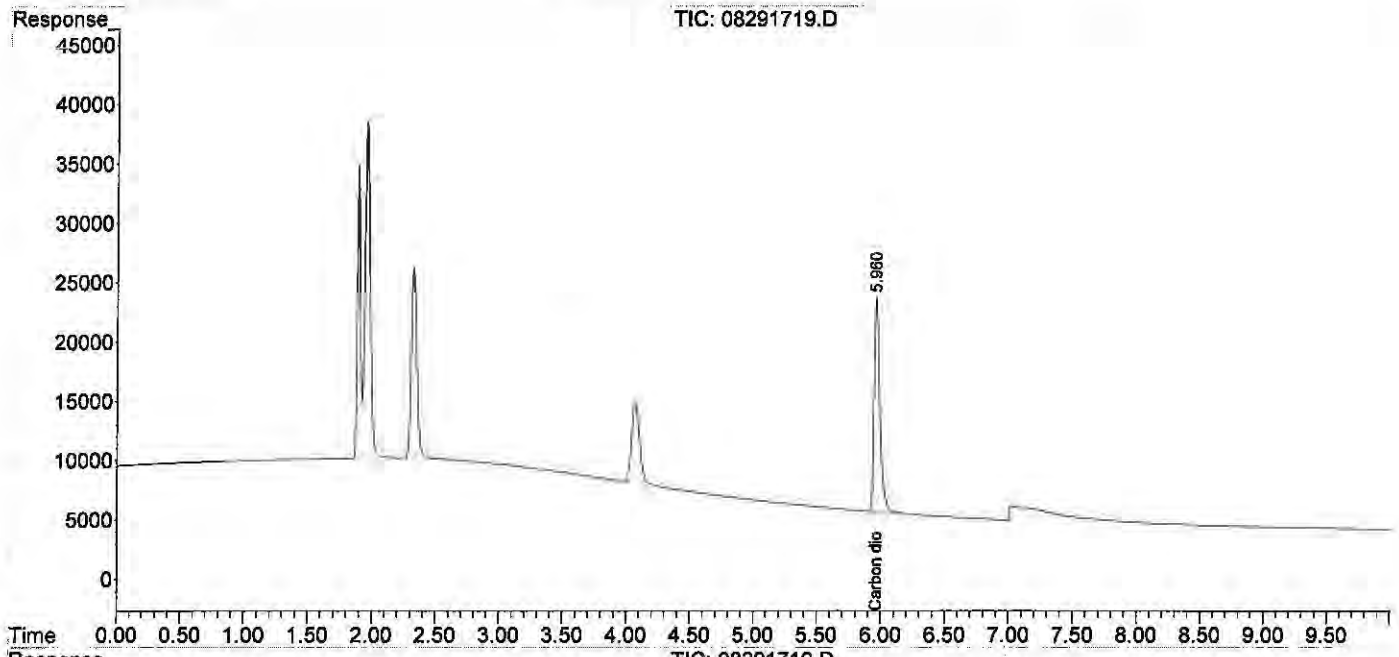
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.891	425113	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.962	568043	2369.673	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

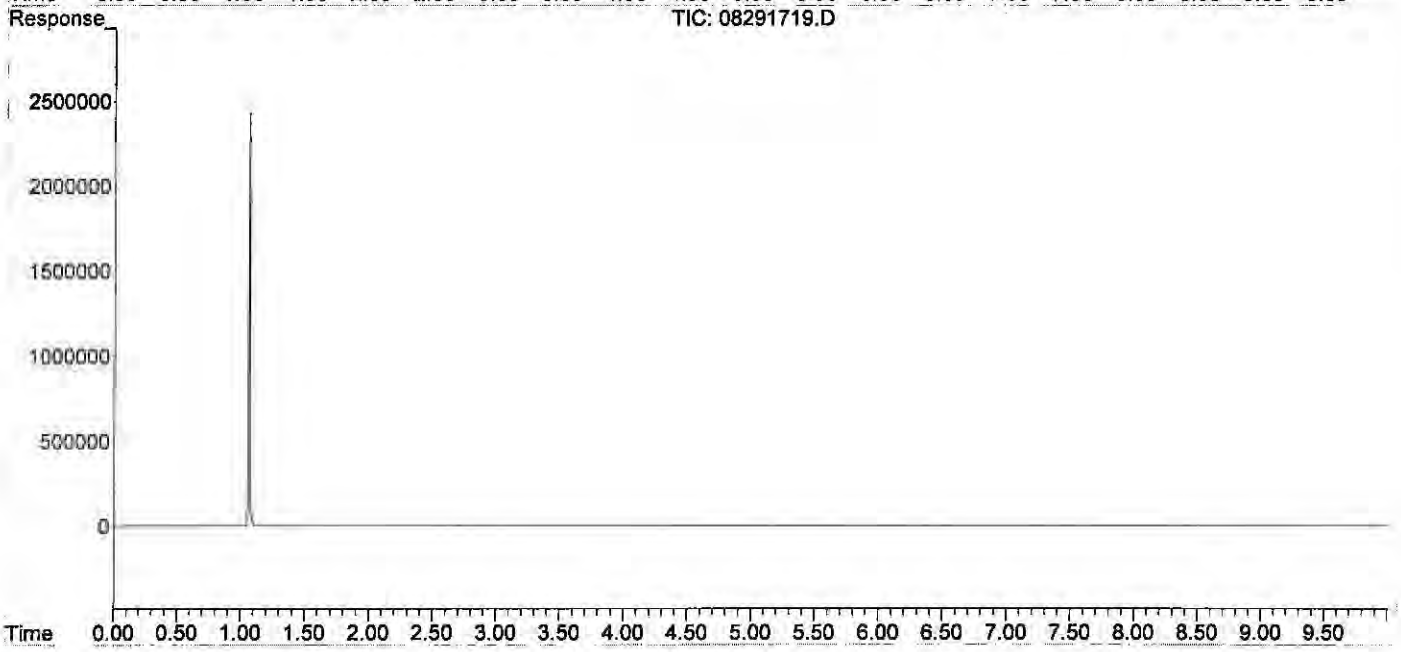
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291719.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:23
Operator : MC
Sample : 2500ppm s32-08231701 50ul
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:35:50 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:04:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

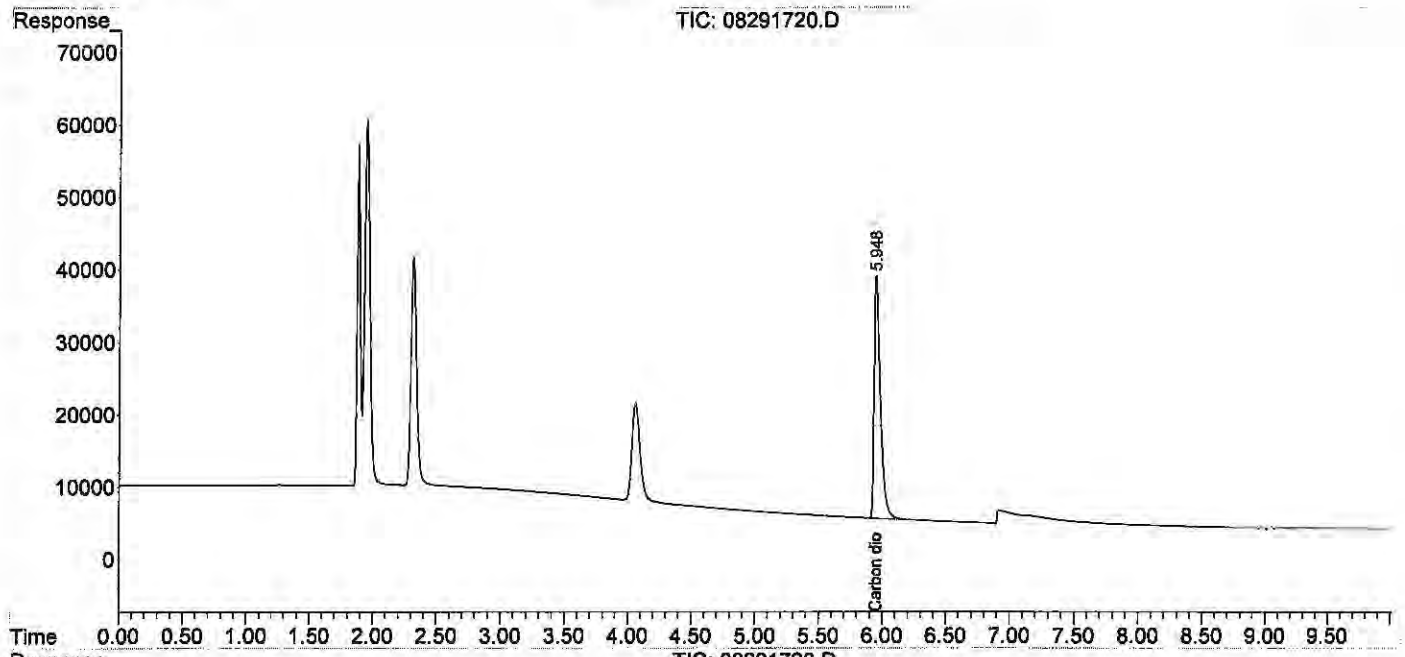
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.880	819221	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.948	1132363	4753.126	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

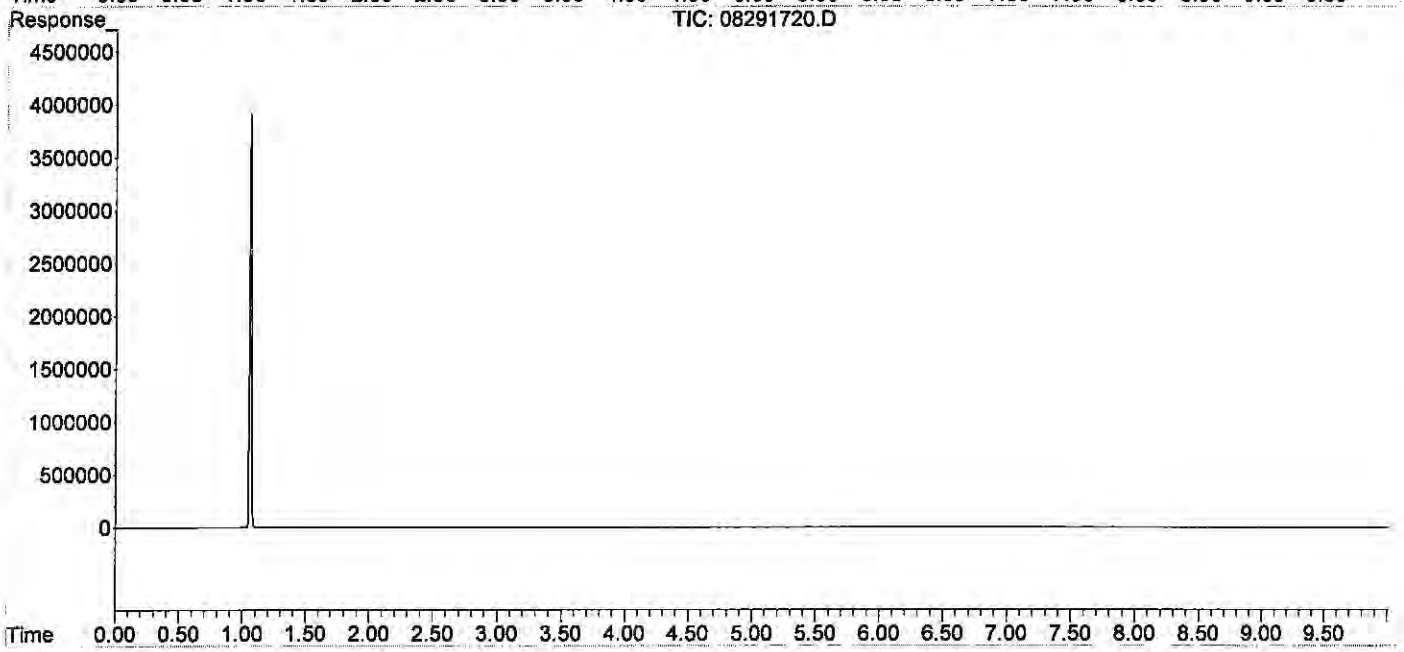
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291720.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 15:44
Operator : MC
Sample : 5000ppm s32-08231701 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:57:17 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:36:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

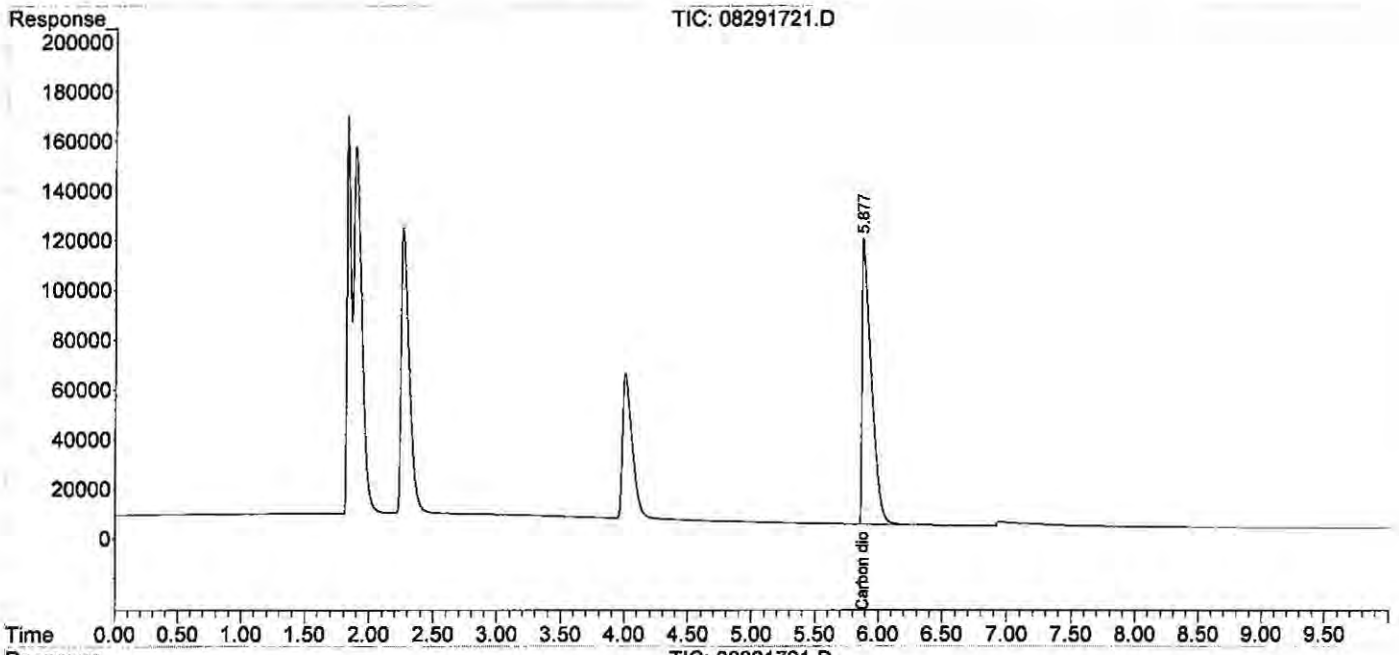
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.827	3325463	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	5.879f	5744295	24443.288	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

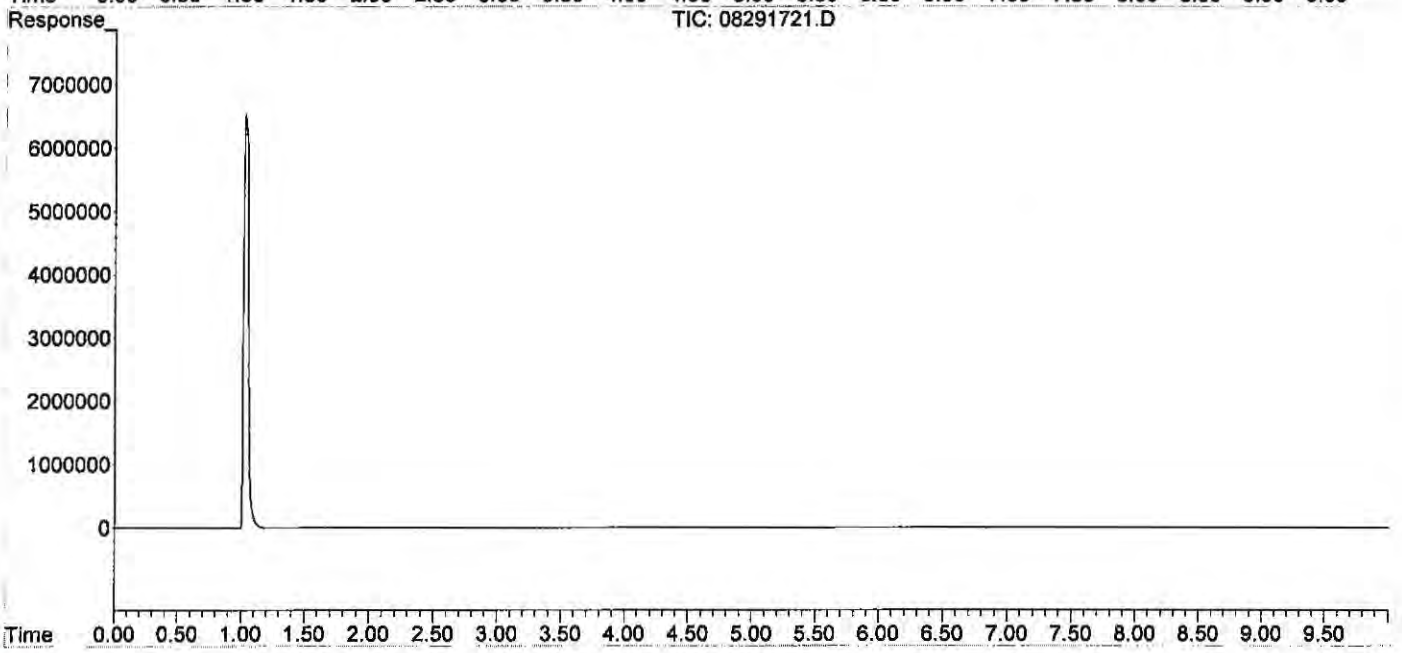
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291721.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:00
Operator : MC
Sample : 25000ppm s32-08231701 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:12:53 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 15:57:37 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.886	536422	0.113	ppm
2)	Carbon monoxide	1.886	536422	N.D.	ppm
3)	Methane (TCD)	4.059f	626500	66244.710	ppm
4)	Carbon dioxide	5.947	1163775	4957.948	ppm
6)	Methane (FID)	1.062	37290742	3947.023	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

Actual %D
5000 99.16

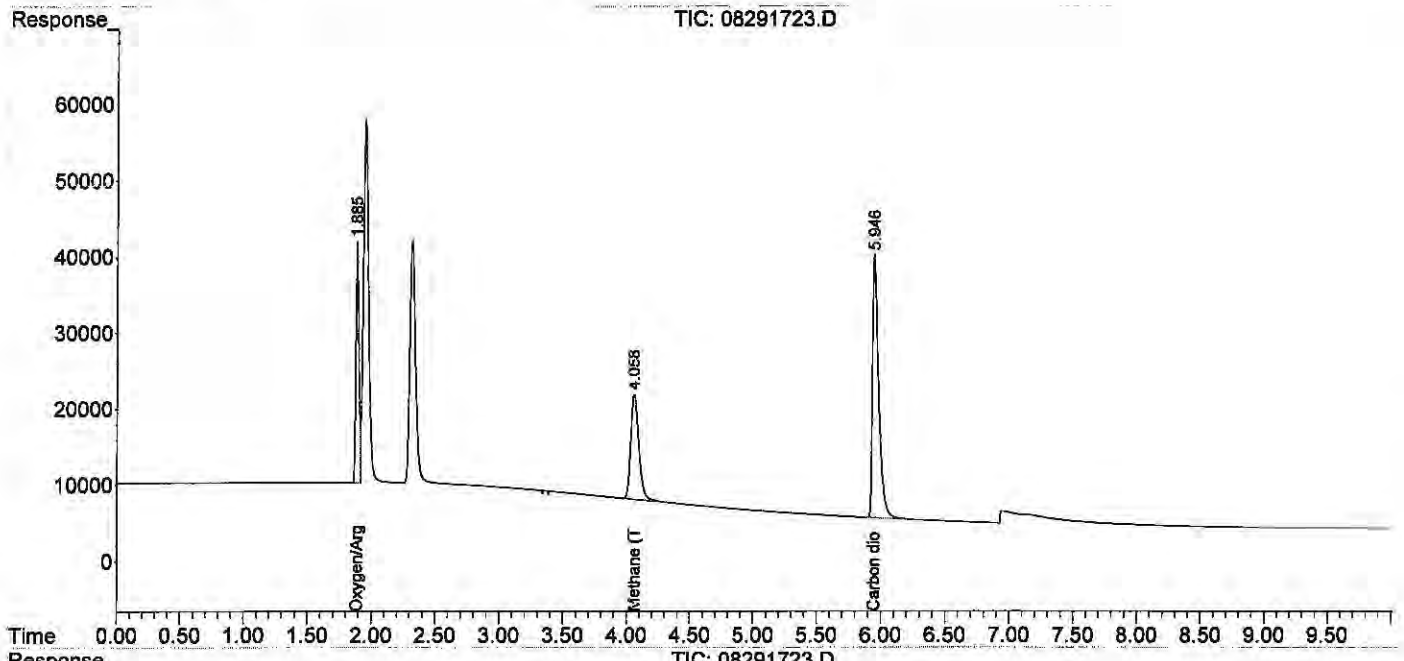
(f)=RT Delta > 1/2 Window (m)=manual int.

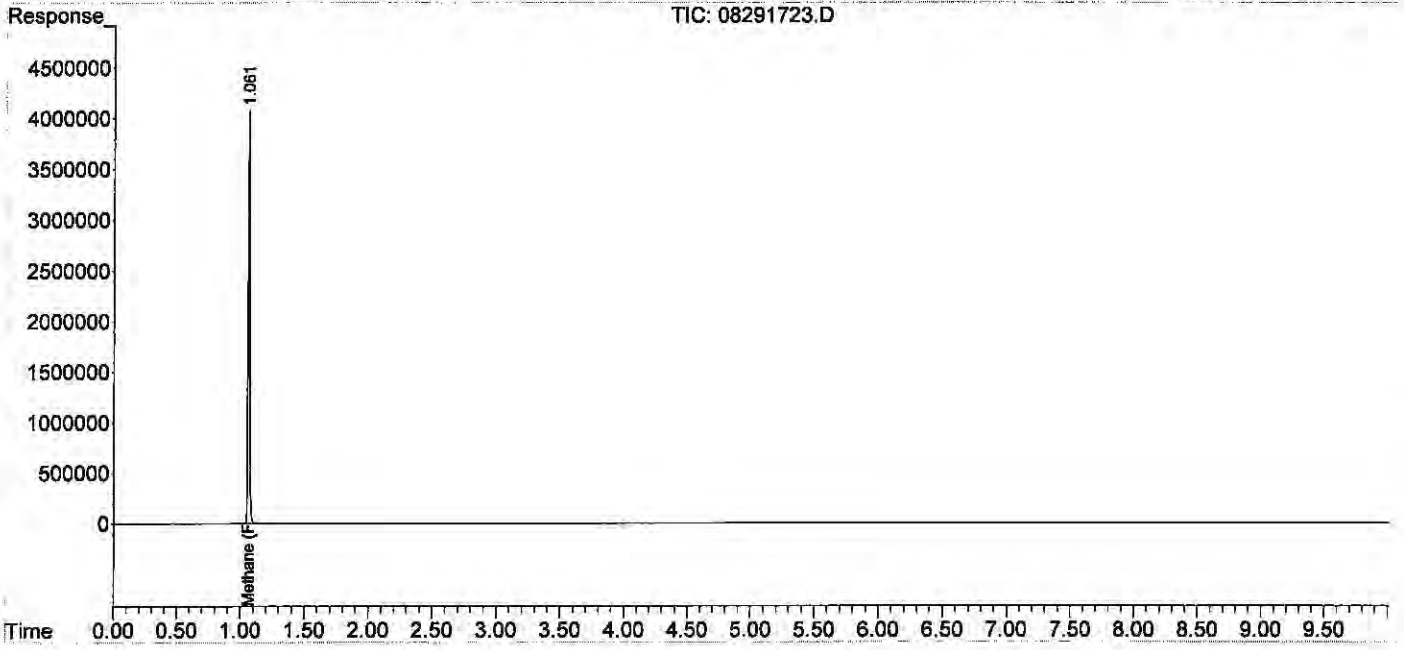
W 9/4/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291723.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 16:35
Operator : MC
Sample : icv s30-07071701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 16:54:07 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
Client : ALS Laboratory Group
Service Request: P1907040
Sample Vol. (ml) : 32.00 ml
Analyst : WH/LD
Date Analysis : 11/22/19
Head Space Vol.(ml) : 8.00 ml
Instrument : GC#10
Detector : FID#10, TCD#10
Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Carbon Dioxide
STD S32-10291901	0.100	5125.467
ACTUAL		5000.00
%Difference		2.5%
MCS 0.1ml	0.100	0.000
RB 0.1ml	0.100	0.000
LCS S32-08141901	0.100	867.235
LCSD S32-08141901	0.100	890.632
P1907040-001 0.1ml	0.100	1210.421
P1907040-002 0.1ml	0.100	4460.958
P1907040-003 0.1ml	0.100	3932.958
P1907040-004 0.1ml	0.100	8493.089
P1907040-004ms 0.1ml	0.100	8932.435
P1907040-004msd 0.1ml	0.100	9747.190
STD S32-10291901		5111.680
ACTUAL		5000.00
%Difference		2.2%

FINAL HEAD SPACE RESULT (ppm)

	Carbon Dioxide
WWt.	44.10
HENRY'S CONSTANT	1.42E+03
RL	100.00
MCS 0.1ml	0.000
LCS S32-08141901	8672.350
LCSD S32-08141901	8906.320
P1907040-001 0.1ml	12104.210
P1907040-002 0.1ml	44609.580
P1907040-003 0.1ml	39329.580
P1907040-004 0.1ml	84930.890
P1907040-004ms 0.1ml	89324.350
P1907040-004msd 0.1ml	97471.900

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 10:14:15
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 09:27:35 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

LD
11/22

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

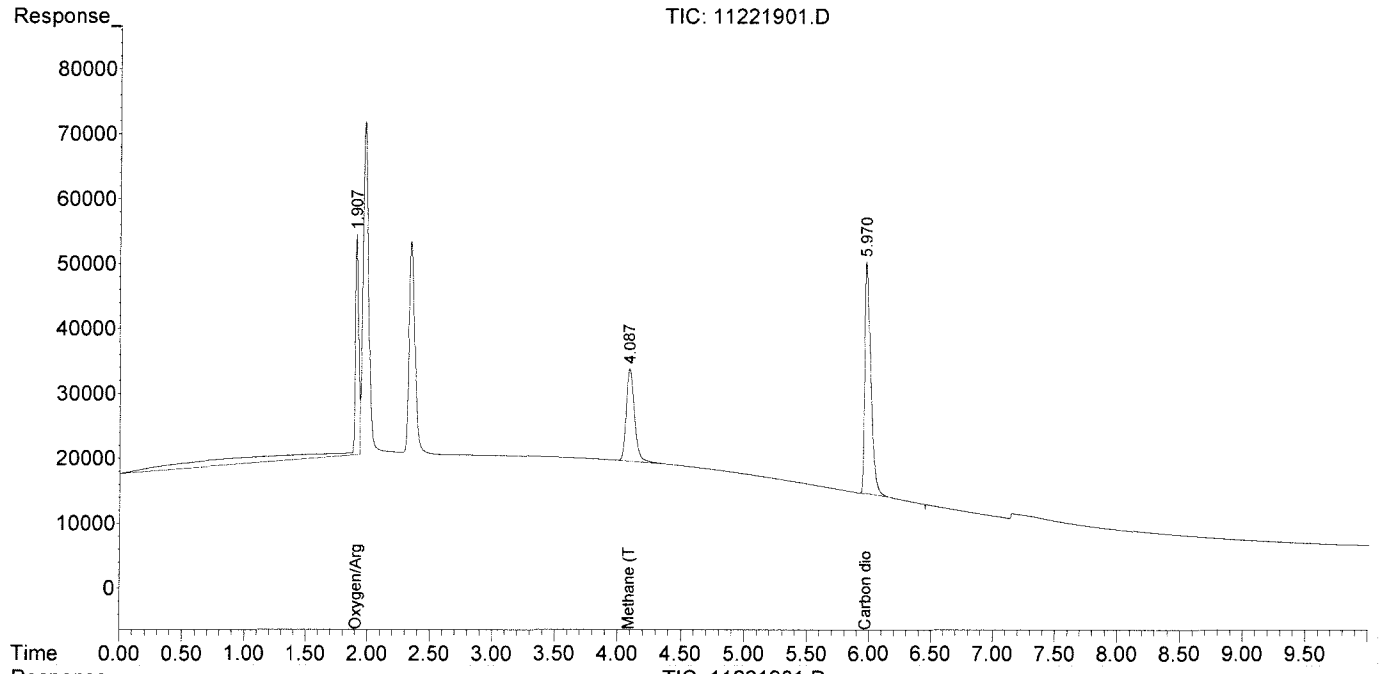
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.907f	1333782	0.280	ppm	
2)	Carbon monoxide	1.907f	1333782	N.D.	ppm	
3)	Methane (TCD)	4.088f	657984	69573.756	ppm	
4)	Carbon dioxide	5.970	1203097	5125.467	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

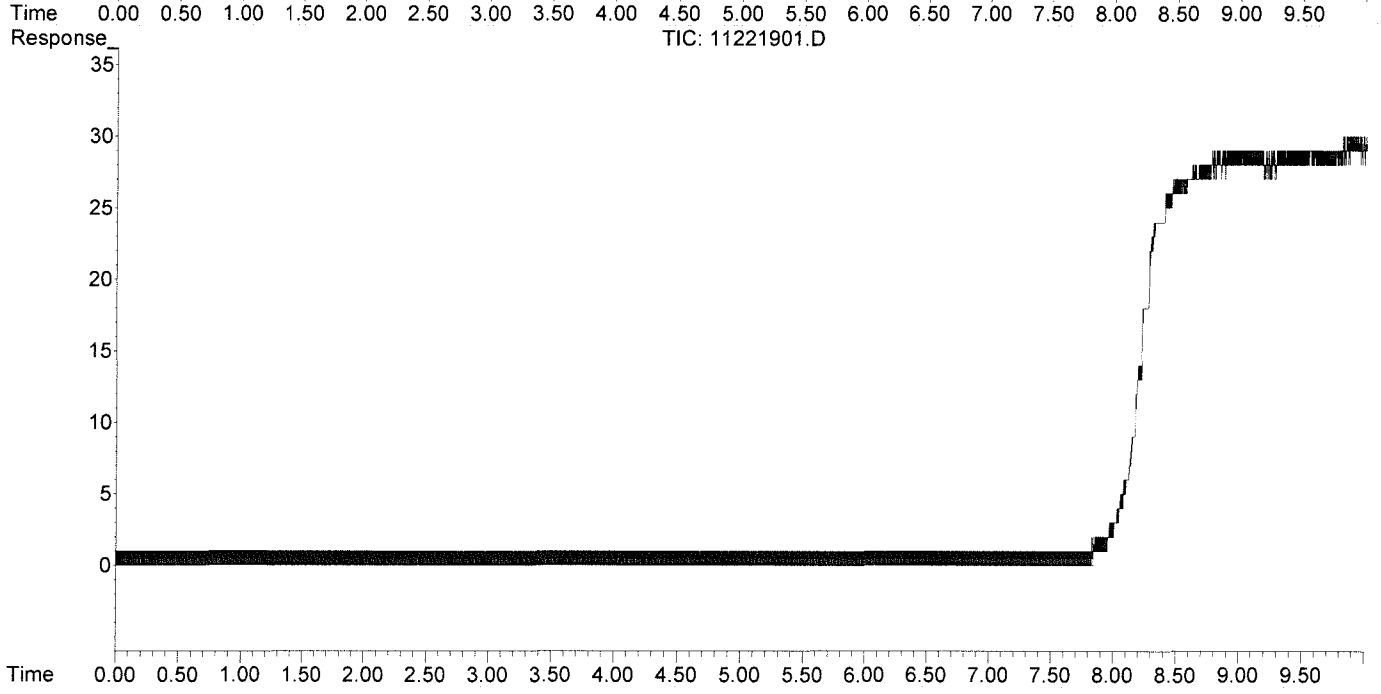
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 10:14:15
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 09:27:35 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



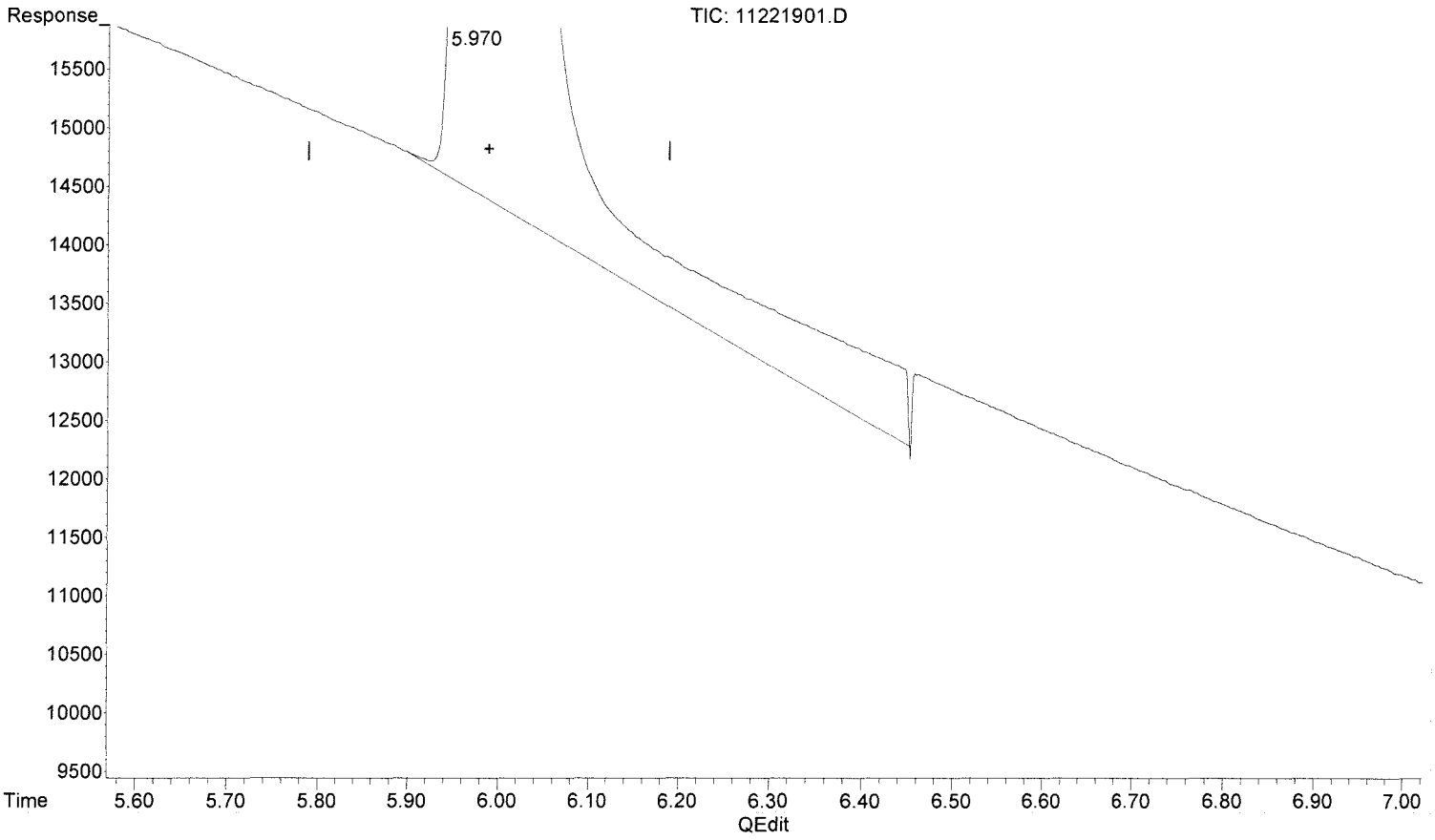


01010487

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 10:14:15
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 09:27:35 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.971min 5637.258 ppm

response 1323229

(+) = Expected Retention Time

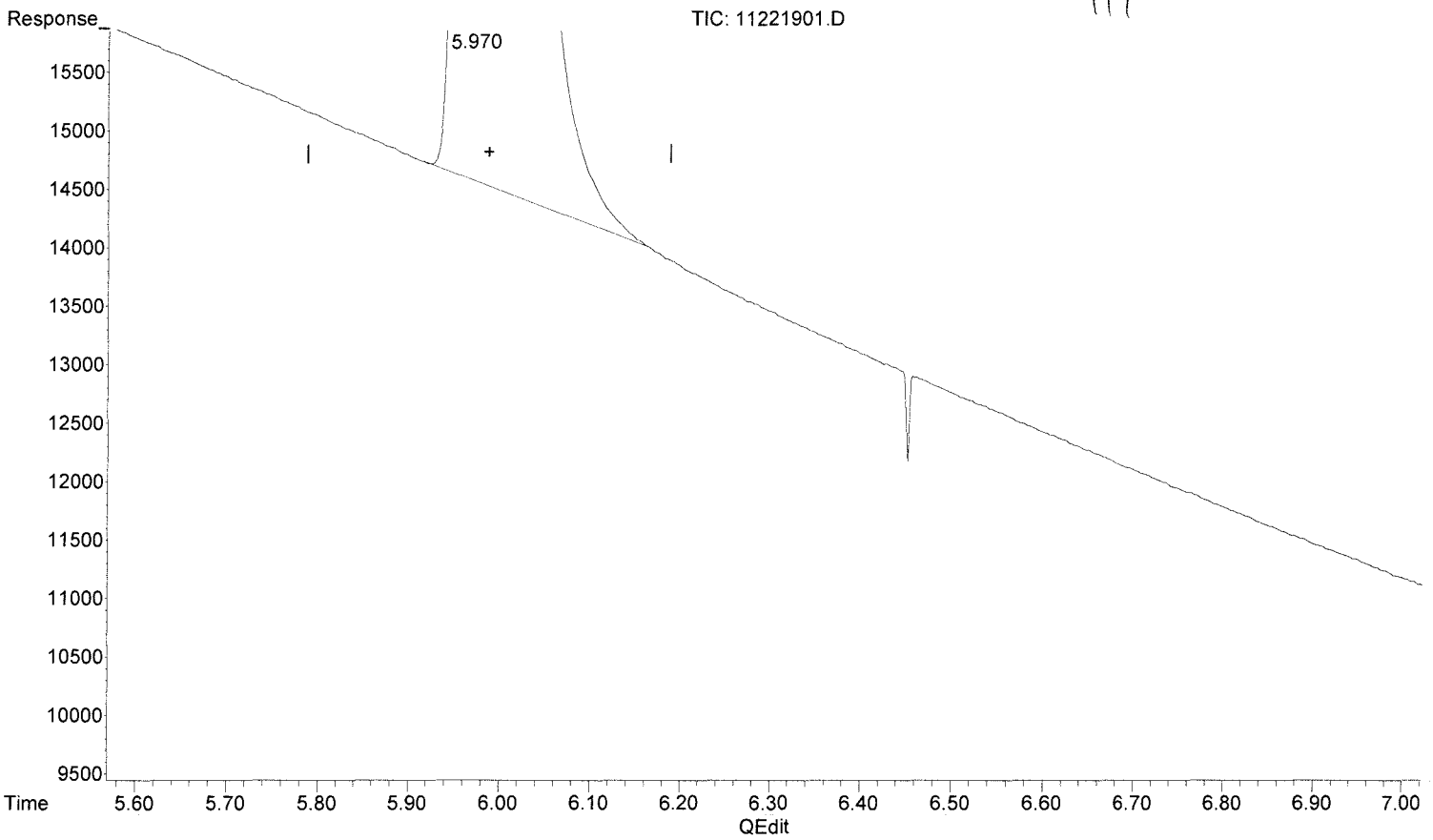
01010488

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 10:14:15
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 09:27:35 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

LD BLC 11/22



(4) Carbon dioxide

5.970min 5125.467 ppm m

response 1203097

11/22/19 MR 11/25/19

(+) = Expected Retention Time

RS082817_CO2.M Fri Nov 22 14:10:15 2019 Page: 1

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 15:00:37
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 14:09:24 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

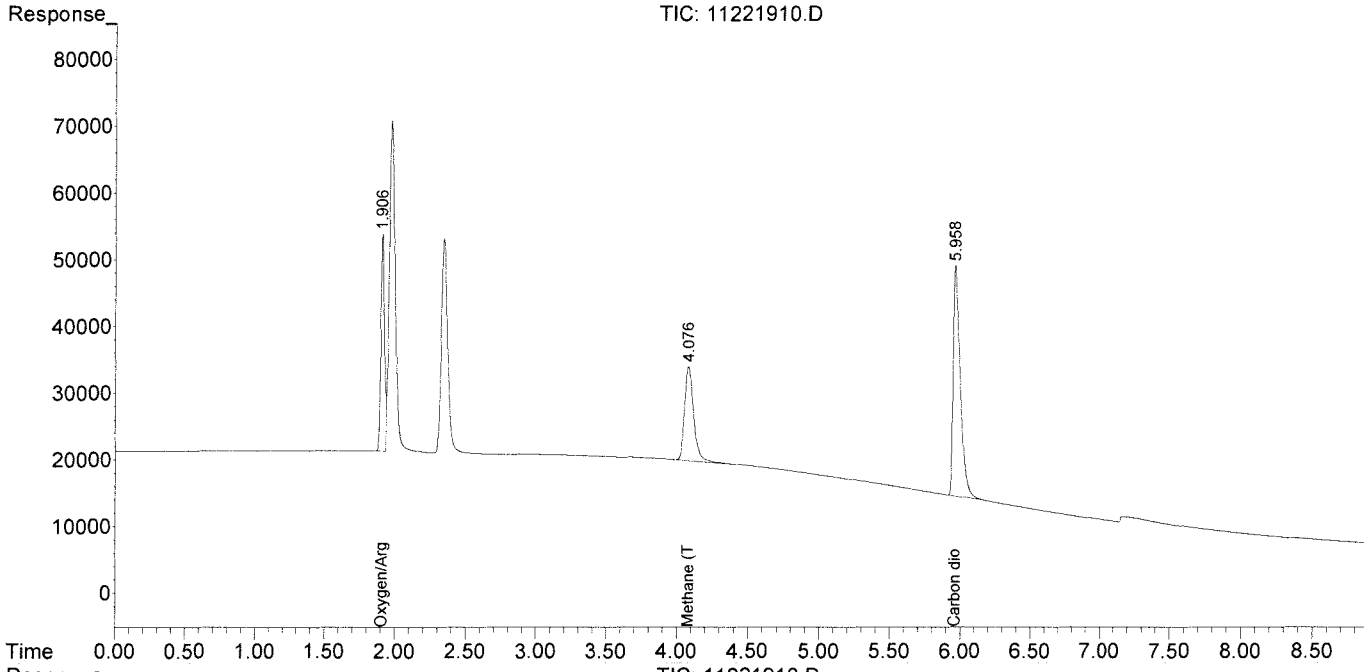
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.907f	567230	0.119	ppm	
2)	Carbon monoxide	1.907f	567230	N.D.	ppm	
3)	Methane (TCD)	4.077f	652521	68996.127	ppm	
4)	Carbon dioxide	5.958	1188740	5064.306	ppm	m
6)	Methane (FID)	0.000	0	N.D.	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

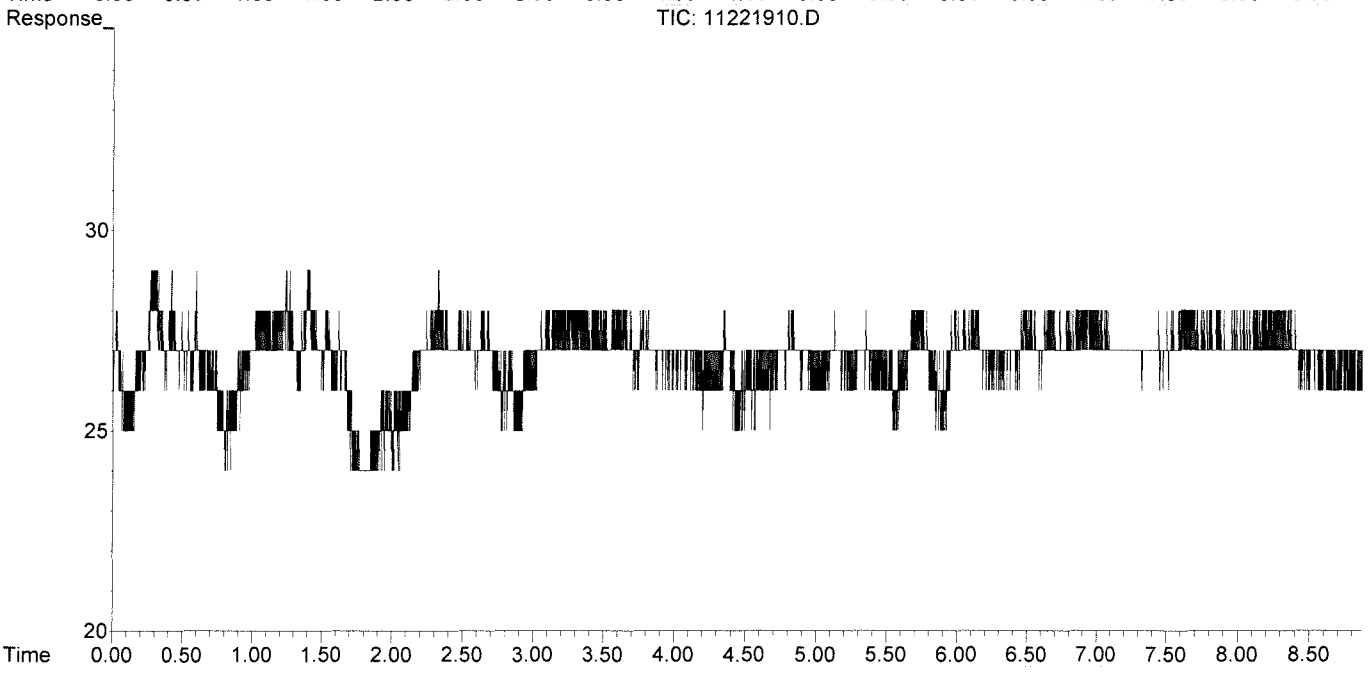
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 15:00:37
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 14:09:24 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



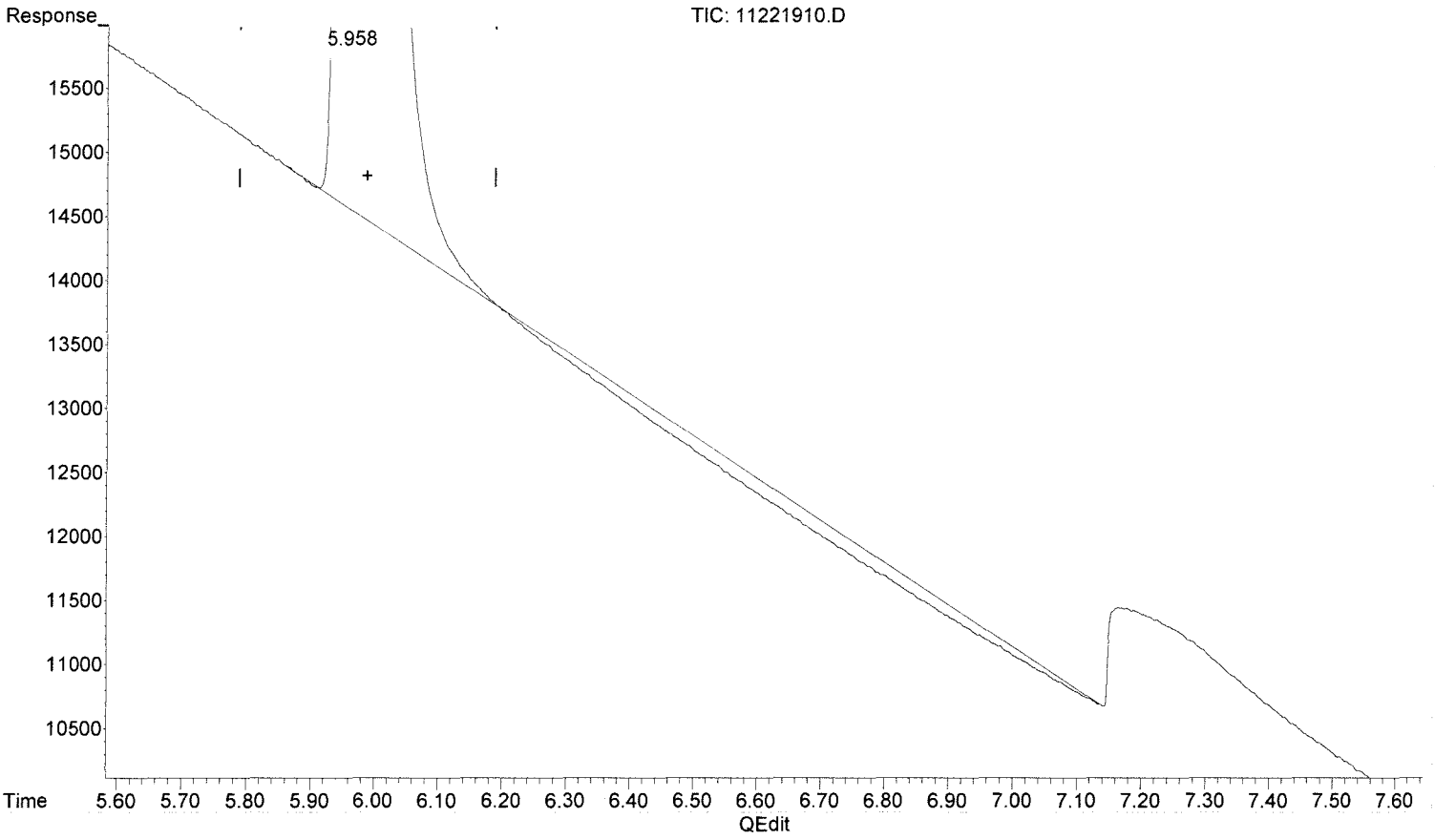


01010491

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 15:00:37
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 14:09:24 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.959min 4884.583 ppm

response 1146554

(+) = Expected Retention Time

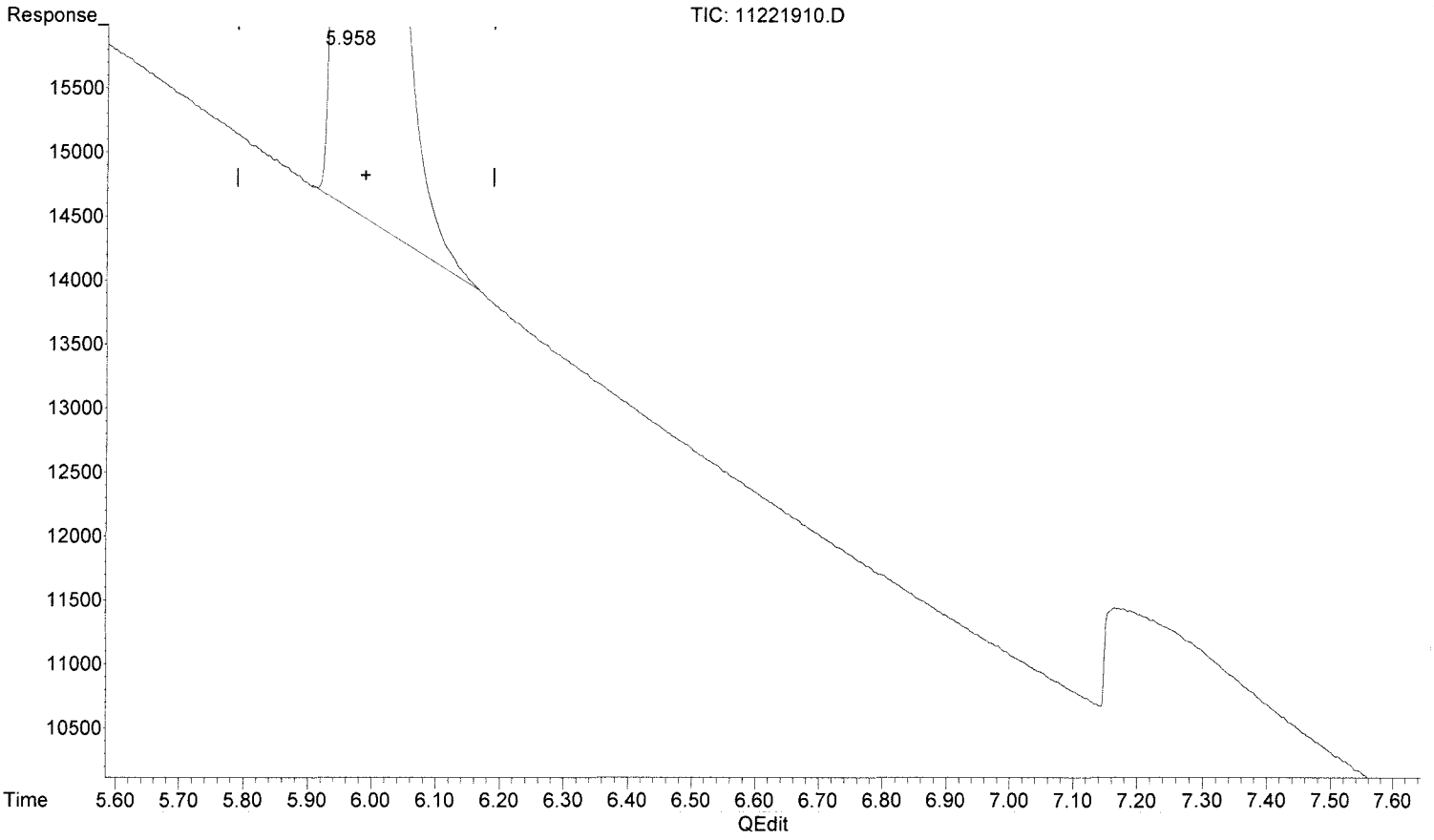
01010492

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 15:00:37
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 22 14:09:24 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

CD
11/22
BLC

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

5.958min 5064.306 ppm m

response 1188740

11/22/19

11/23/19

(+) = Expected Retention Time

RS082817_CO2.M Fri Nov 22 14:09:48 2019 Page: 1

01010493

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 18:57:21
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 09:56:29 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

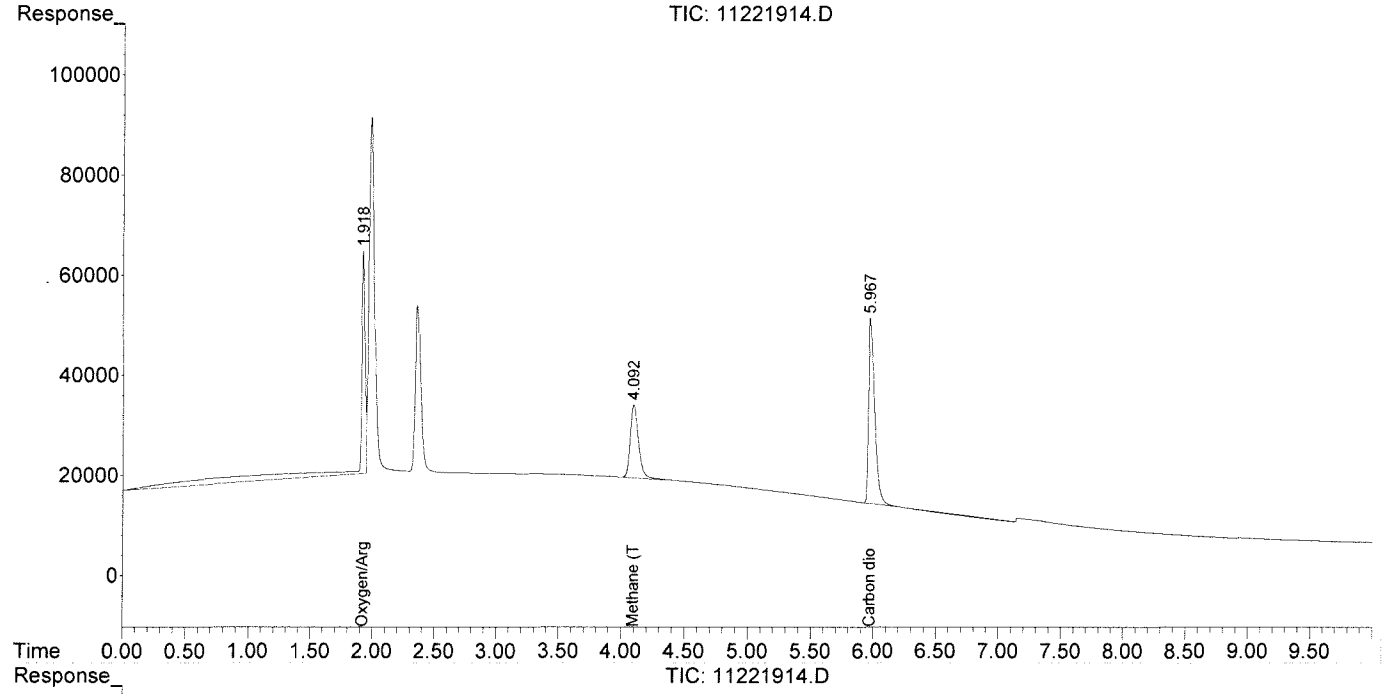
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.919f	1733540	0.364	ppm
2)	Carbon monoxide	1.919f	1733540	N.D.	ppm
3)	Methane (TCD)	4.093f	671120	70962.798	ppm
4)	Carbon dioxide	5.968	1199860	5111.680	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

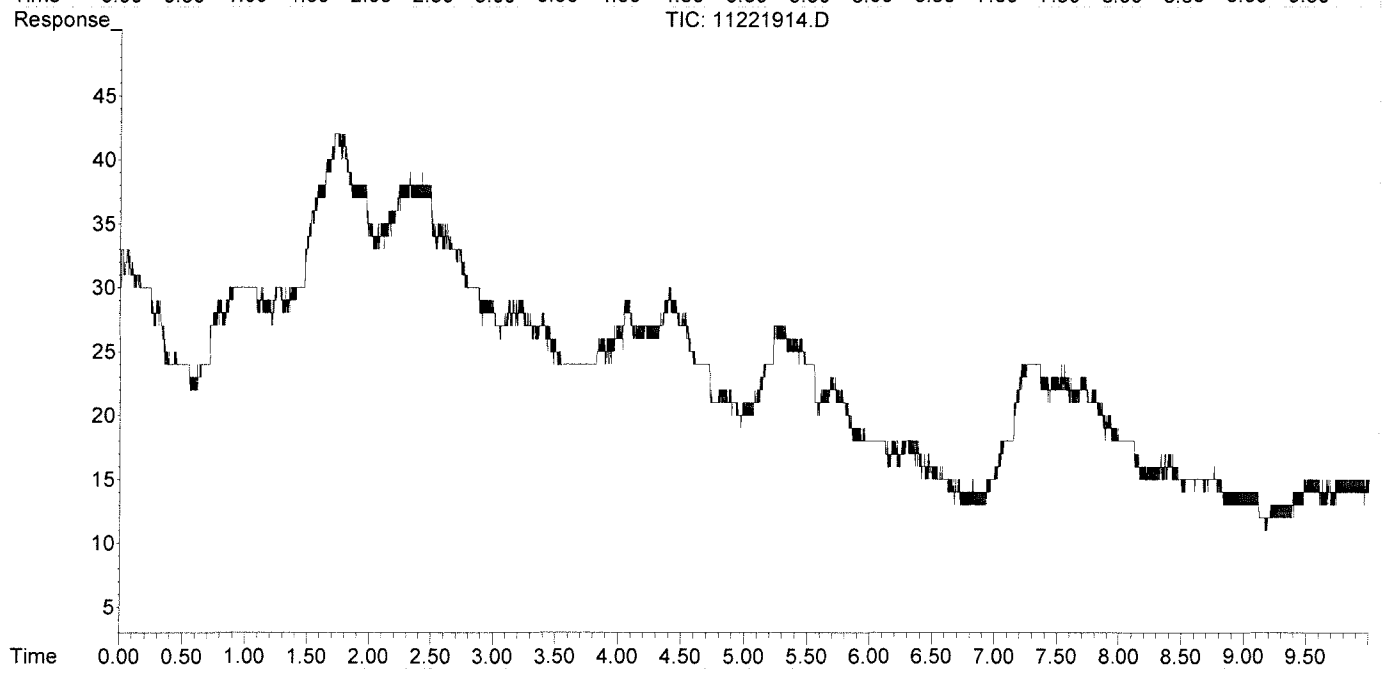
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_TCD\2019_11\22\
Data File : 11221914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 22-Nov-2019, 18:57:21
Operator : WH/LD
Sample : STD S32-10291901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 09:56:29 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_08\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	29-Aug-17, 07:58:00	08291701.D	std s30-06161601		MC	RSKBOTH.M	Pass
2	29-Aug-17, 08:11:02	08291702.D	mb 0.5ml		MC	RSKBOTH.M	Pass
3	29-Aug-17, 08:24:13	08291703.D	4089-001 0.5ml		MC	RSKBOTH.M	
4	29-Aug-17, 08:39:29	08291704.D	4089-002 0.5ml		MC	RSKBOTH.M	
5	29-Aug-17, 08:53:38	08291705.D	4089-003 0.5ml		MC	RSKBOTH.M	
6	29-Aug-17, 09:33:52	08291706.D	4089-004 0.5ml		MC	RSKBOTH.M	
7	29-Aug-17, 09:50:51	08291707.D	4089-005 0.5ml		MC	RSKBOTH.M	
8	29-Aug-17, 10:07:54	08291708.D	4089-006 0.5ml		MC	RSKBOTH.M	
9	29-Aug-17, 10:42:34	08291709.D	4089-007 0.5ml		MC	RSKBOTH.M	
10	29-Aug-17, 11:06:01	08291710.D	4089-008 0.5ml		MC	RSKBOTH.M	
11	29-Aug-17, 11:23:53	08291711.D	4089-009 0.5ml		MC	RSKBOTH.M	
12	29-Aug-17, 11:37:17	08291712.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
13	29-Aug-17, 11:50:31	08291713.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
14	29-Aug-17, 12:29:45	08291714.D	std s30-06161601		MC	RSKBOTH.M	Pass
15	29-Aug-17, 14:07:01	08291715.D	25ppm s32-08291701 0.25ml		MC	RSKBOTH.M	Curve
16	29-Aug-17, 14:22:12	08291716.D	100ppm s32-08291702 0.2ml		MC	RSKBOTH.M	Curve
17	29-Aug-17, 14:53:00	08291717.D	250ppm s32-08291702 0.5ml		MC	RSKBOTH.M	Curve
18	29-Aug-17, 15:07:43	08291718.D	mls inject		MC	RSKBOTH.M	
19	29-Aug-17, 15:23:21	08291719.D	2500ppm s32-08231701 50ul		MC	RSKBOTH.M	Curve
20	29-Aug-17, 15:44:54	08291720.D	5000ppm s32-08231701 0.1ml		MC	RSKBOTH.M	Curve
21	29-Aug-17, 16:00:09	08291721.D	25000ppm s32-08231701 0.5ml		MC	RSKBOTH.M	Curve
22	29-Aug-17, 16:15:43	08291722.D	mb 0.1ml		MC	RSKBOTH.M	Pass
23	29-Aug-17, 16:35:37	08291723.D	lcv s30-07071701		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_TCD\2019_11\22\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	22-Nov-19, 10:14:15	11221901.D	STD S32-10291901		WH/LD	RSKBOTH.M	pass
2	22-Nov-19, 10:29:49	11221902.D	RB 0.1ml		WH/LD	RSKBOTH.M	pass
3	22-Nov-19, 12:56:11	11221903.D	MCS 0.1ml		WH/LD	RSKBOTH.M	pass
4	22-Nov-19, 13:10:20	11221904.D	LCS S32-08141901		WH/LD	RSKBOTH.M	pass
5	22-Nov-19, 13:23:19	11221905.D	LCSD S32-08141901		WH/LD	RSKBOTH.M	pass
6	22-Nov-19, 13:36:14	11221906.D	P1907040-001 0.1ml		WH/LD	RSKBOTH.M	
7	22-Nov-19, 13:49:08	11221907.D	P1907040-002 0.1ml		WH/LD	RSKBOTH.M	
8	22-Nov-19, 14:23:57	11221908.D	P1907040-003 0.1ml		WH/LD	RSKBOTH.M	
9	22-Nov-19, 14:44:44	11221909.D	P1907040-004 0.1ml		WH/LD	RSKBOTH.M	
10	22-Nov-19, 15:00:37	11221910.D	STD S32-10291901		WH/LD	RSKBOTH.M	pass

01010497

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 13:39:41
Operator : WH/LD
Sample : P1907040-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 12:54:17 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

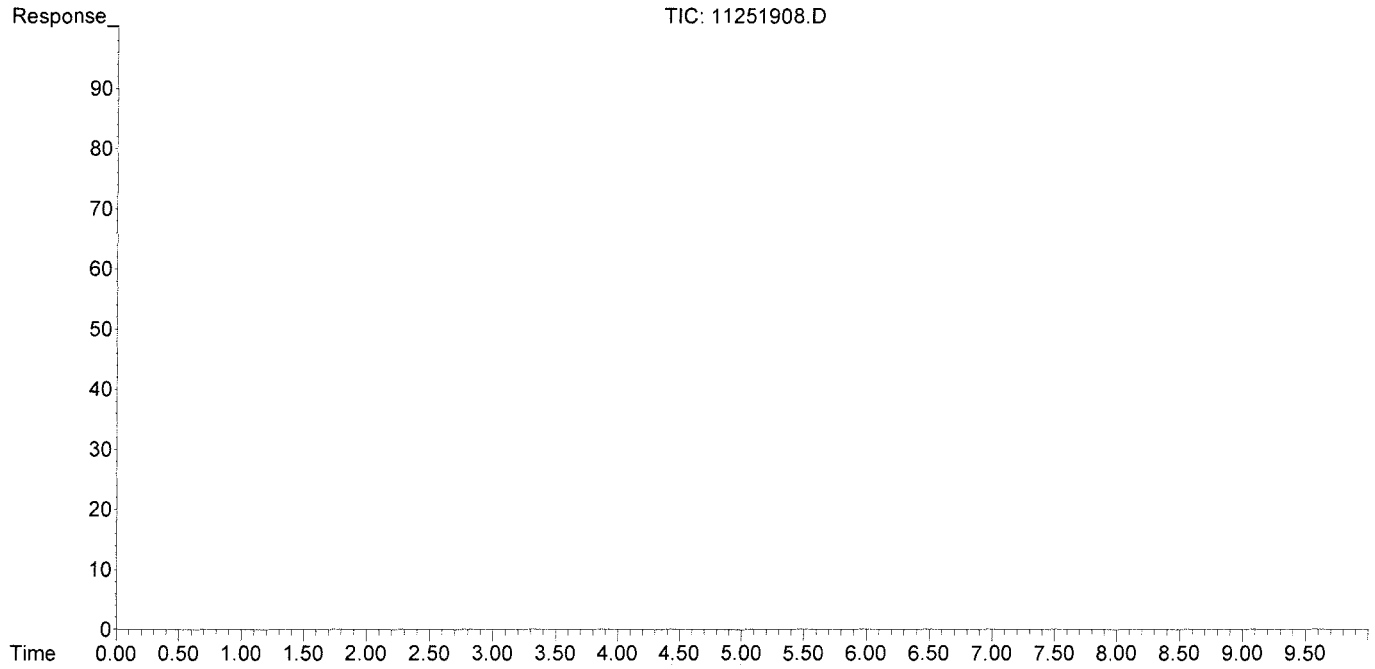
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.123	14169	1.562	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

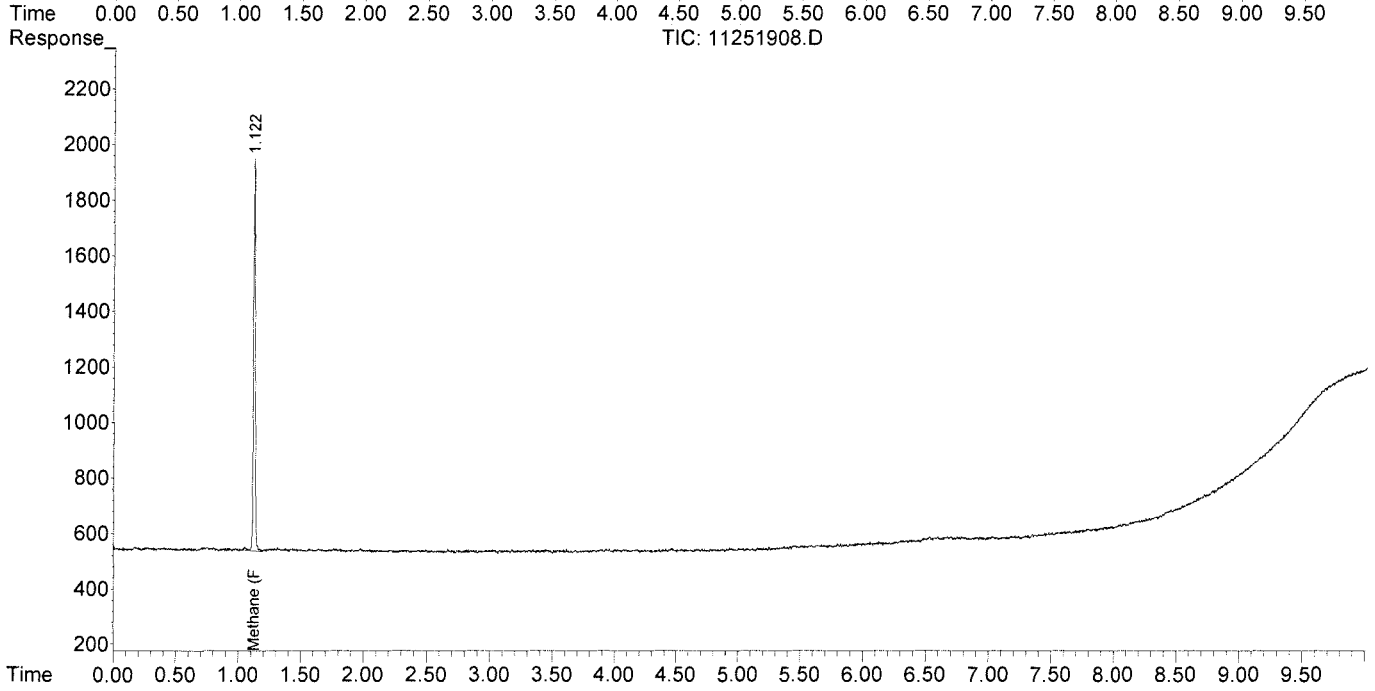
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 13:39:41
Operator : WH/LD
Sample : P1907040-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 12:54:17 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





01010499

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 13:54:05
Operator : WH/LD
Sample : P1907040-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:18:04 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

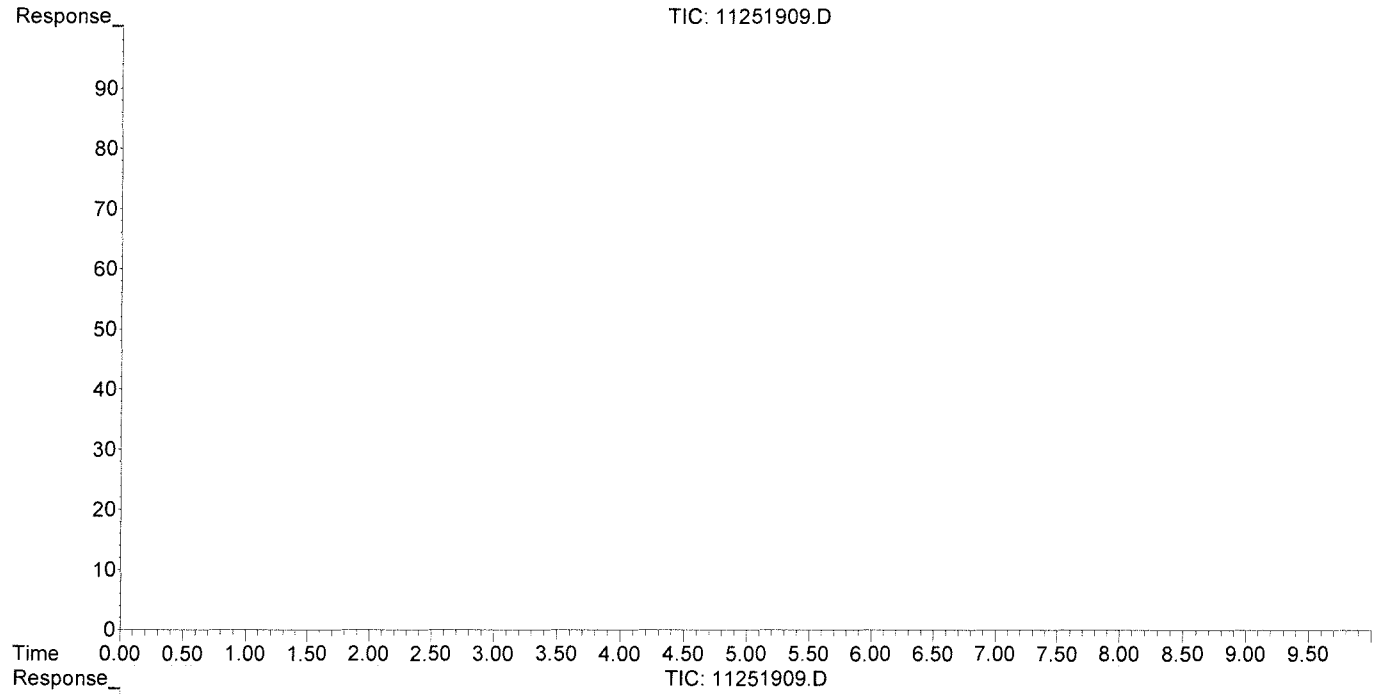
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.122	8793	0.969	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

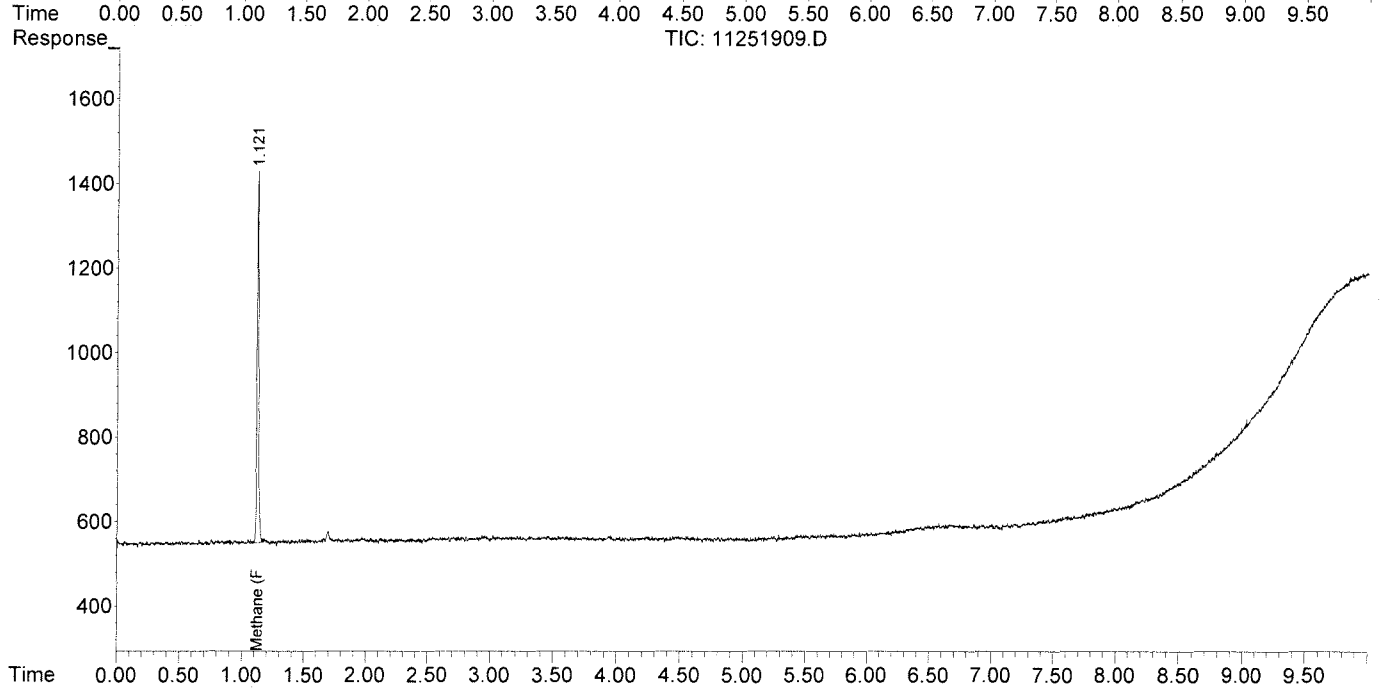
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 13:54:05
Operator : WH/LD
Sample : P1907040-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:18:04 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:07:13
Operator : WH/LD
Sample : P1907040-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:18:25 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

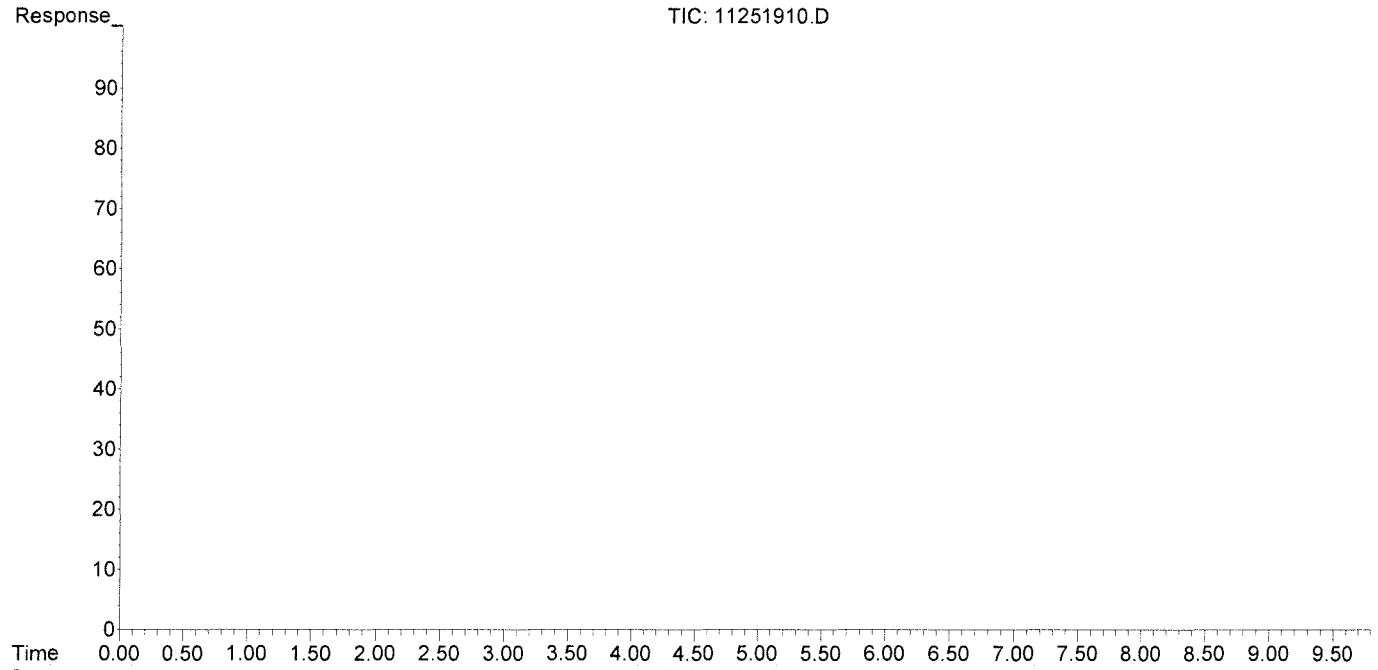
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.120	22318	2.460	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

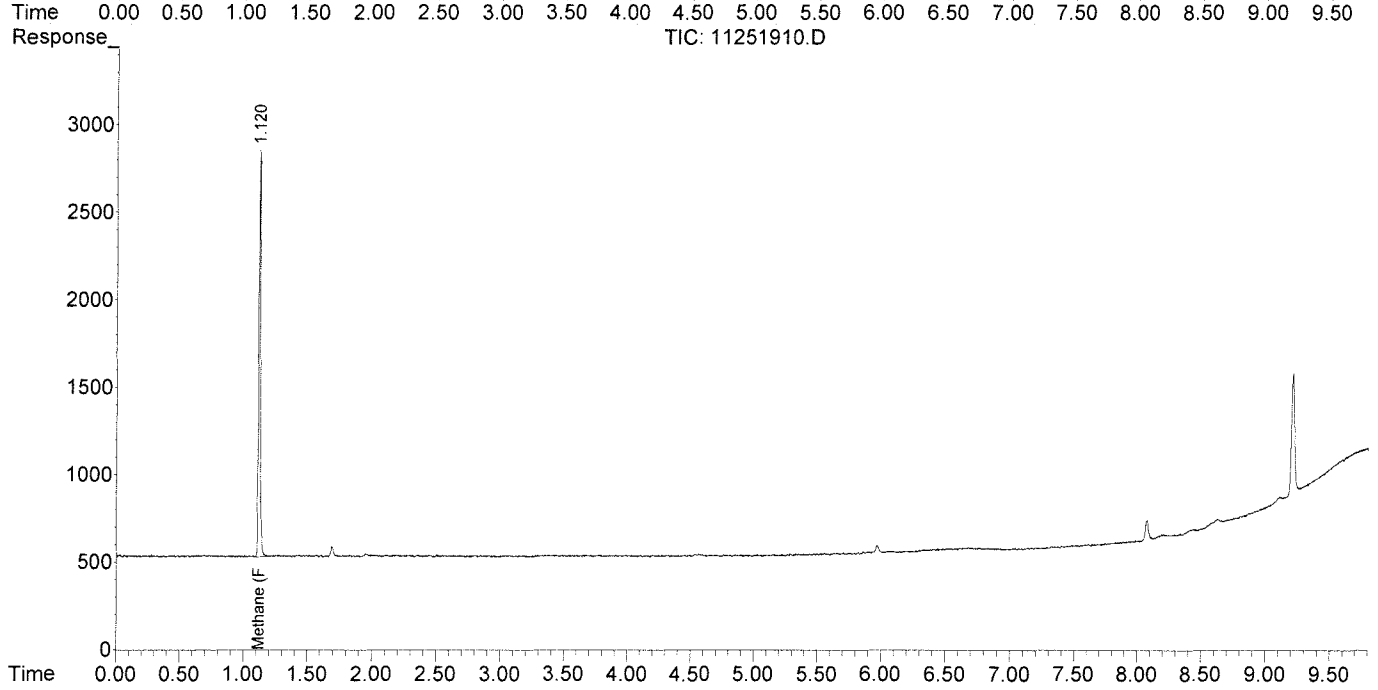
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251910.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:07:13
Operator : WH/LD
Sample : P1907040-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:18:25 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





01010503

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:20:05
Operator : WH/LD
Sample : P1907040-004 0.1
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:33:14 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

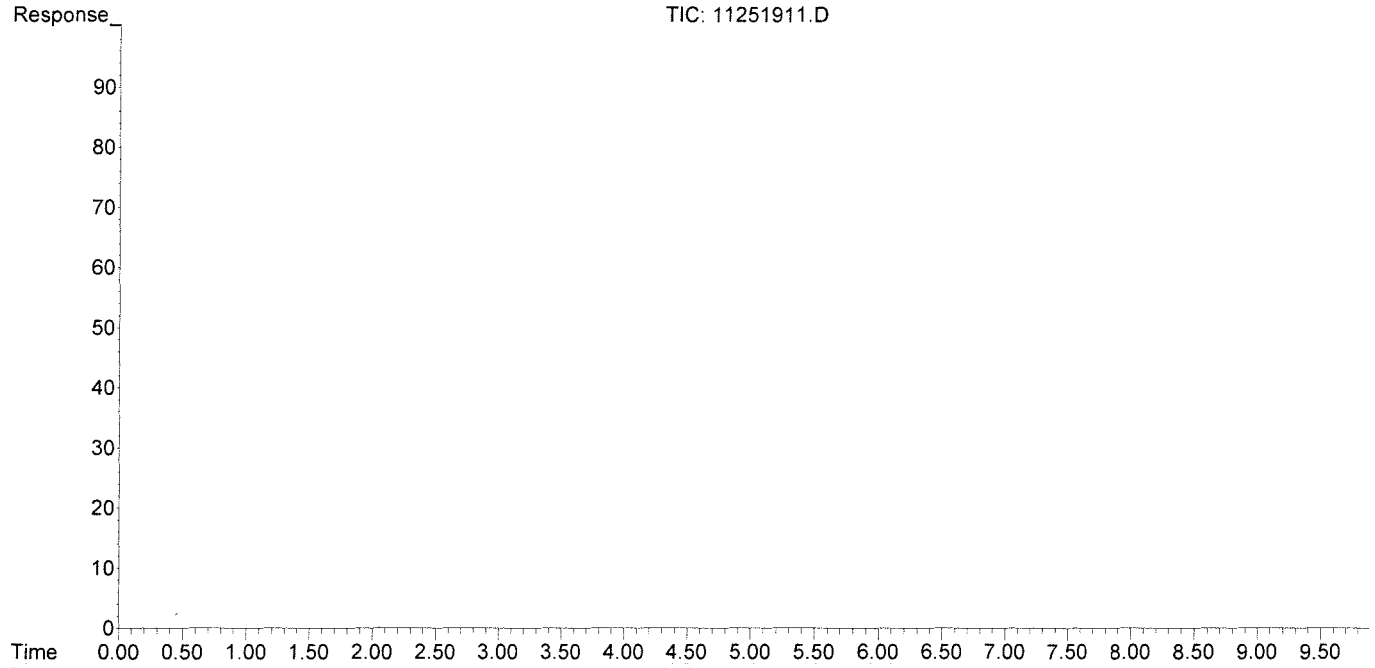
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	0.000	0	N.D.	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	4.431	76866	3.280	ppm
10)	Propane	4.431	76866	3.089	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

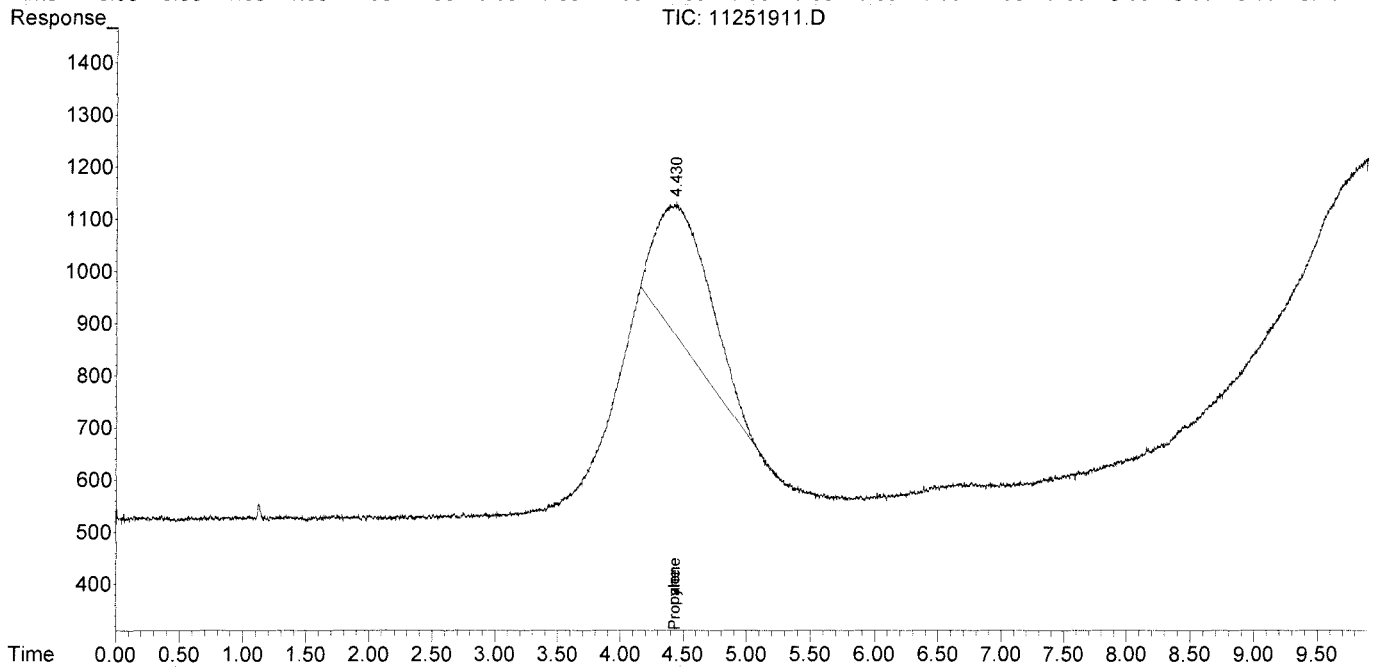
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:20:05
Operator : WH/LD
Sample : P1907040-004 0.1
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:33:14 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 12:23:25
Operator : WH/LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 11:57:21 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

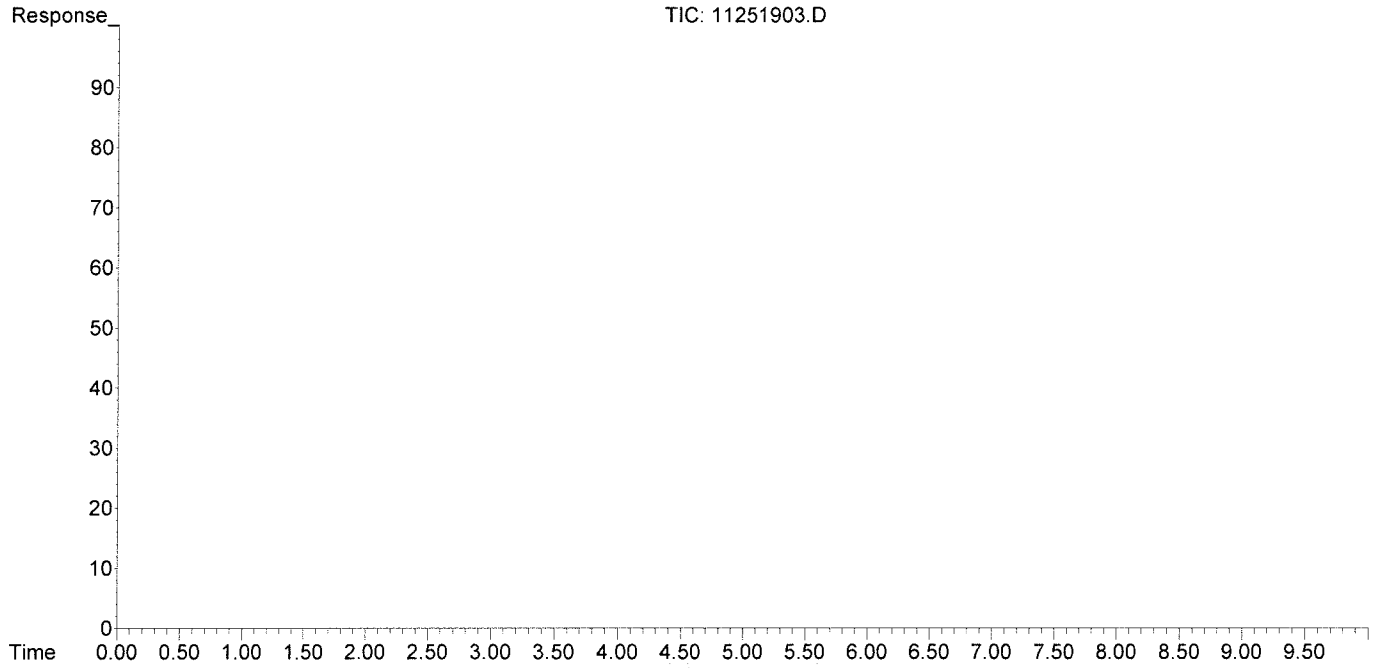
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.120	1262	0.139	ppm
7)	Ethylene	0.000	0	N.D.	ppm
8)	Ethane	0.000	0	N.D.	ppm
9)	Propylene	0.000	0	N.D.	ppm
10)	Propane	0.000	0	N.D.	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

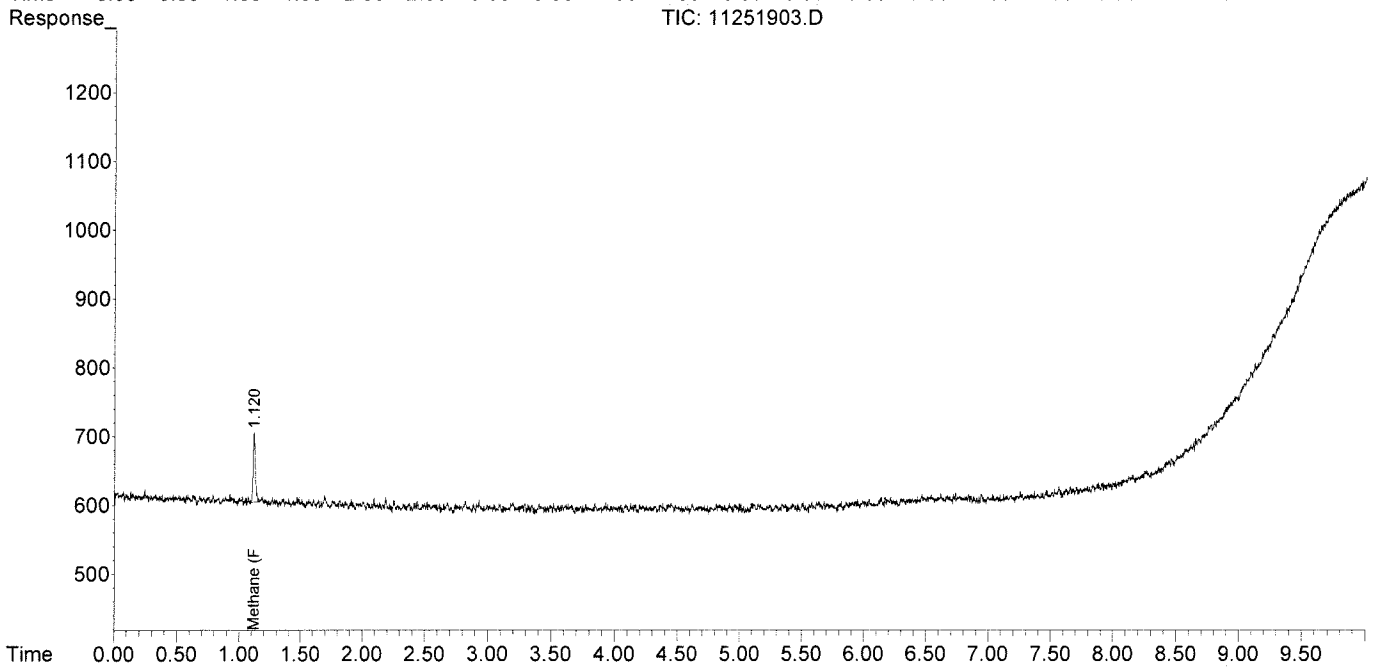
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 12:23:25
Operator : WH/LD
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 11:57:21 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:33:26
Operator : WH/LD
Sample : P1907040-004 MS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:54:50 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

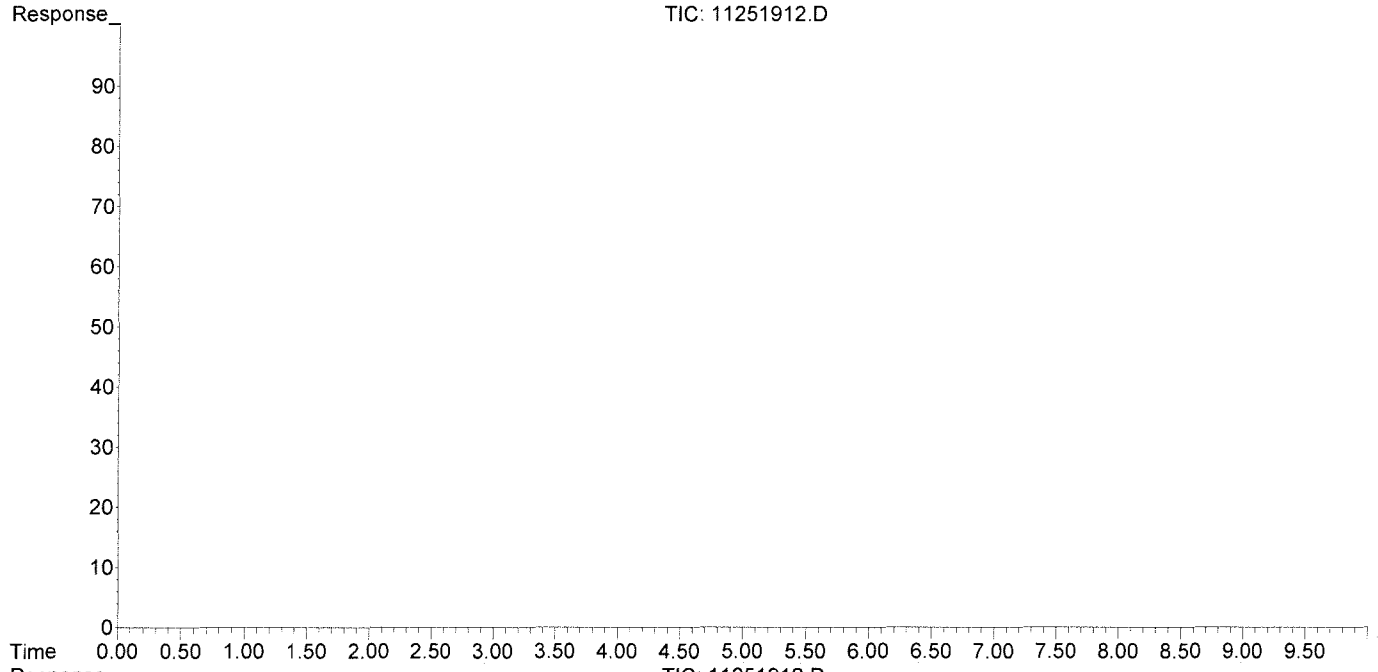
	Compound	R.T.	Response	Conc	Units
	Target Compounds				
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.122	11325	1.249	ppm
7)	Ethylene	1.693	15254	0.912	ppm
8)	Ethane	1.960	19061	1.125	ppm
9)	Propylene	4.335	18557	0.792	ppm
10)	Propane	4.458	28588	1.149	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.658	36414	1.368	ppm
13)	n-Butane	6.658	36414	1.368	ppm

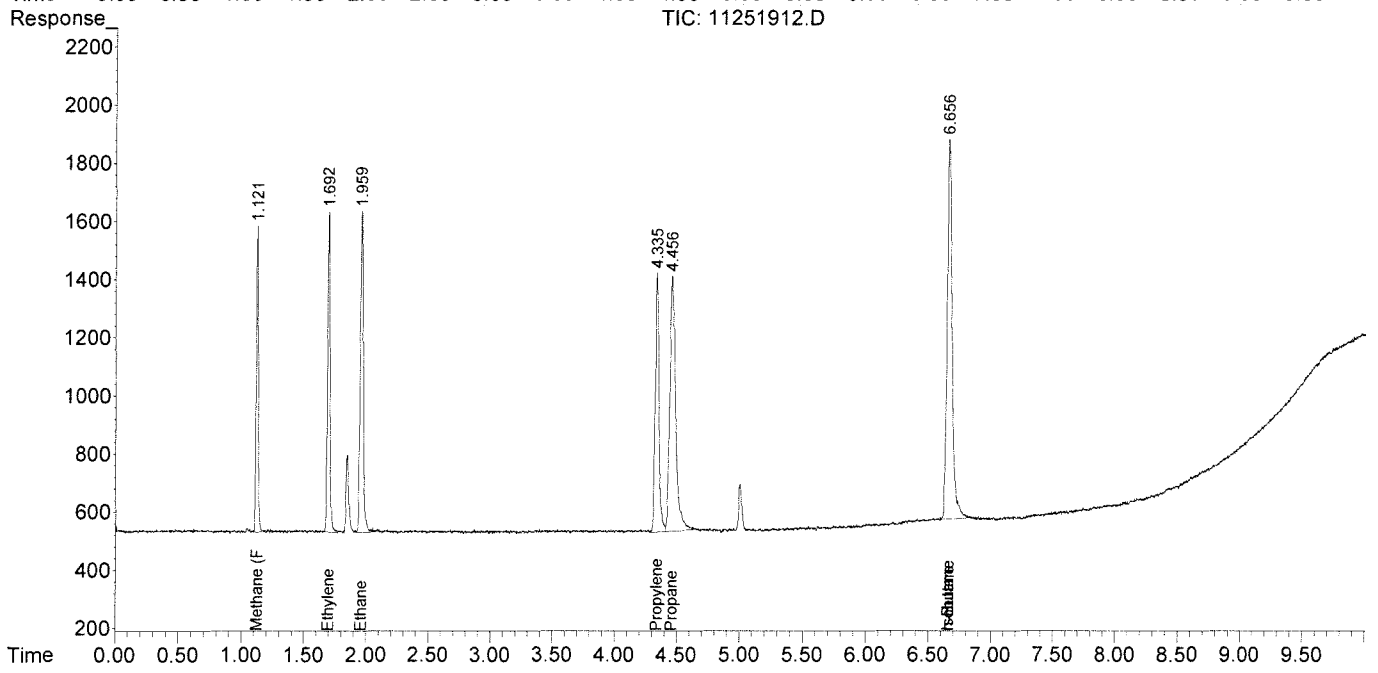
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251912.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:33:26
Operator : WH/LD
Sample : P1907040-004 MS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:54:50 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





01010509

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251913.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:46:48
Operator : WH/LD
Sample : P1907040-004 MSD 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:56:38 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

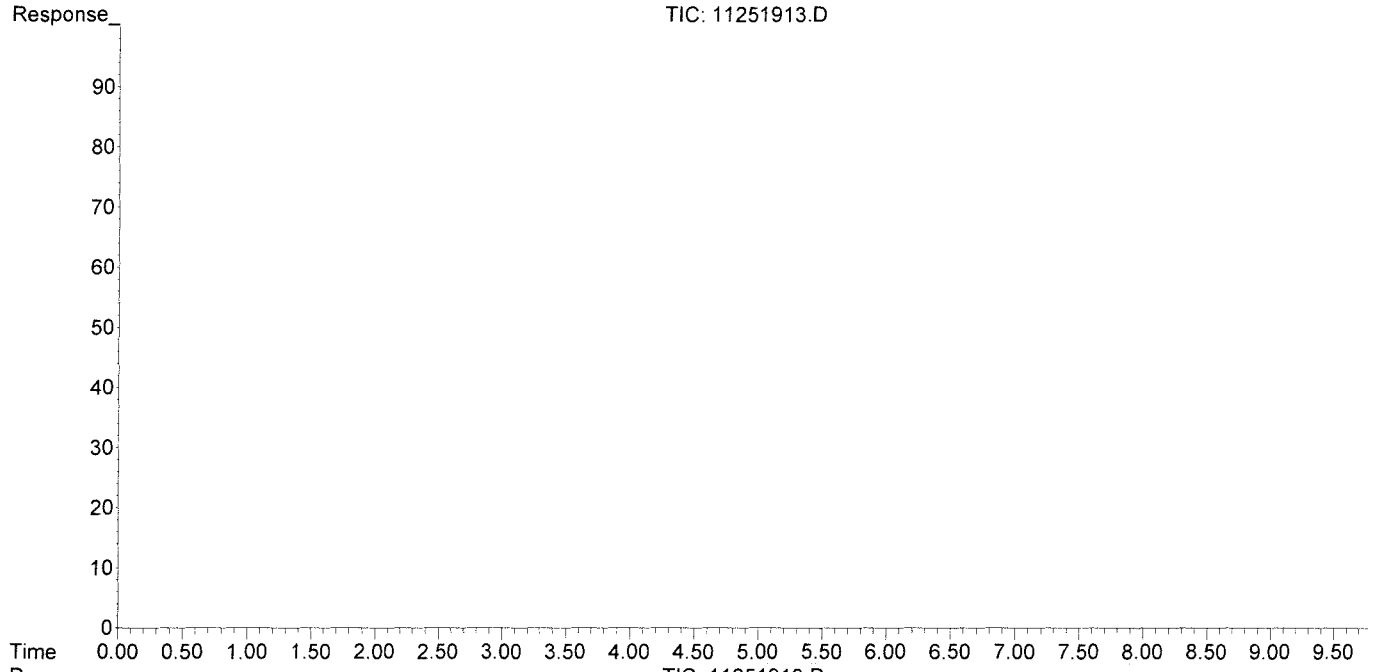
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.122	11178	1.232	ppm
7)	Ethylene	1.694	15965	0.954	ppm
8)	Ethane	1.962	19742	1.165	ppm
9)	Propylene	4.336	19070	0.814	ppm
10)	Propane	4.457	29758	1.196	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.657	39166	1.471	ppm
13)	n-Butane	6.657	39166	1.471	ppm

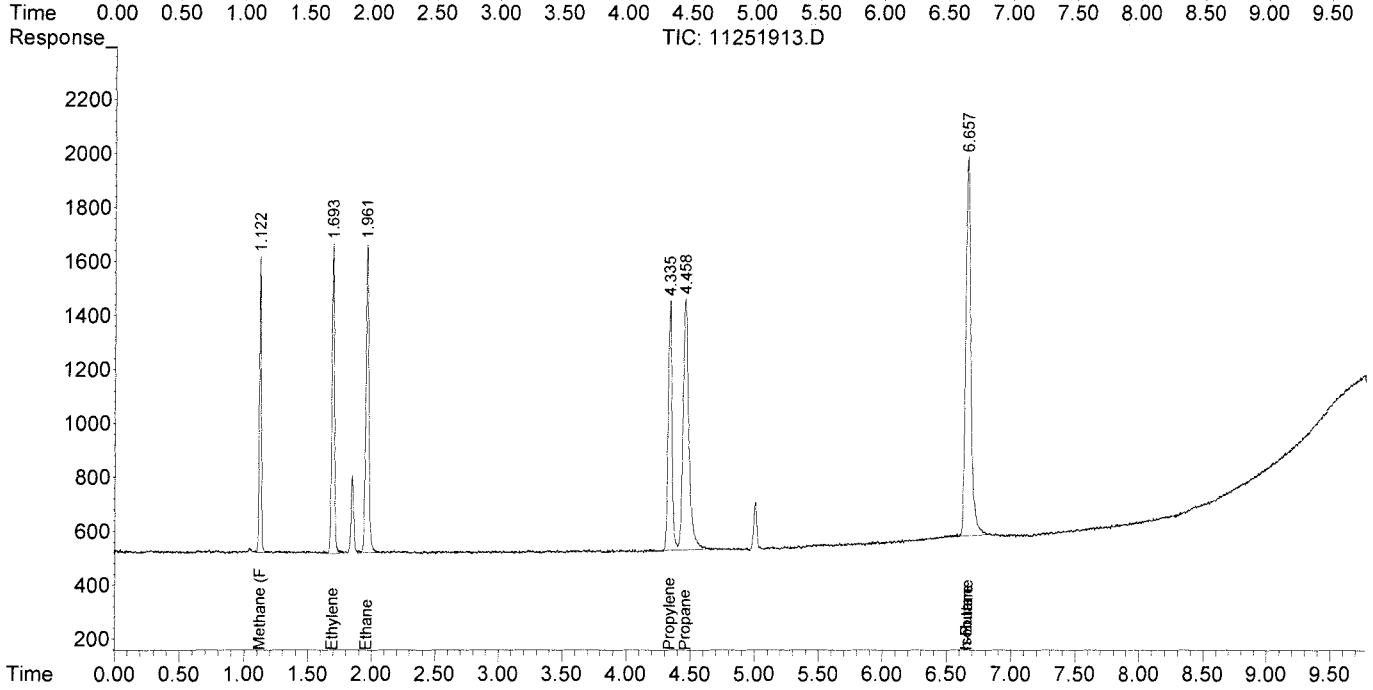
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251913.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:46:48
Operator : WH/LD
Sample : P1907040-004 MSD 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 13:56:38 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





01010511

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 13:13:54
Operator : WH/LD
Sample : LCS FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 12:22:48 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

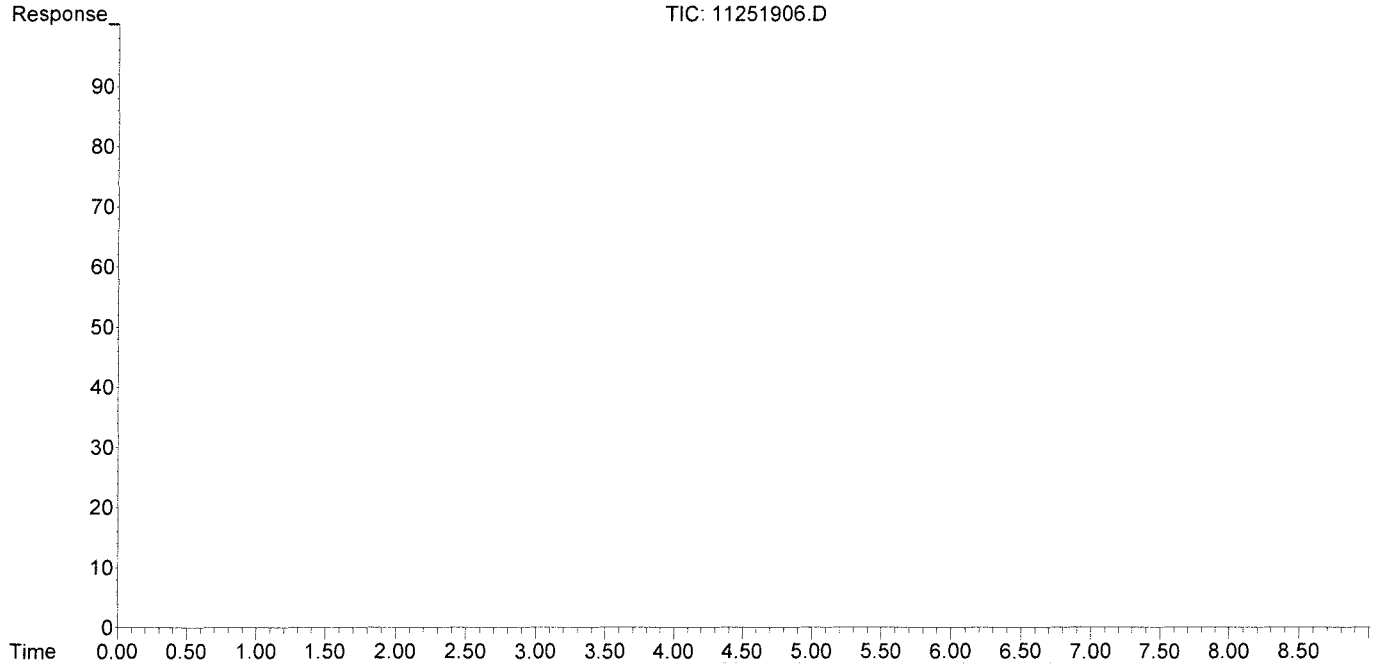
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.118	13110	1.445	ppm
7)	Ethylene	1.691	16736	1.000	ppm
8)	Ethane	1.958	20791	1.227	ppm
9)	Propylene	4.333	22258	0.950	ppm
10)	Propane	4.456	31763	1.277	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.658	42071	1.581	ppm
13)	n-Butane	6.658	42071	1.581	ppm

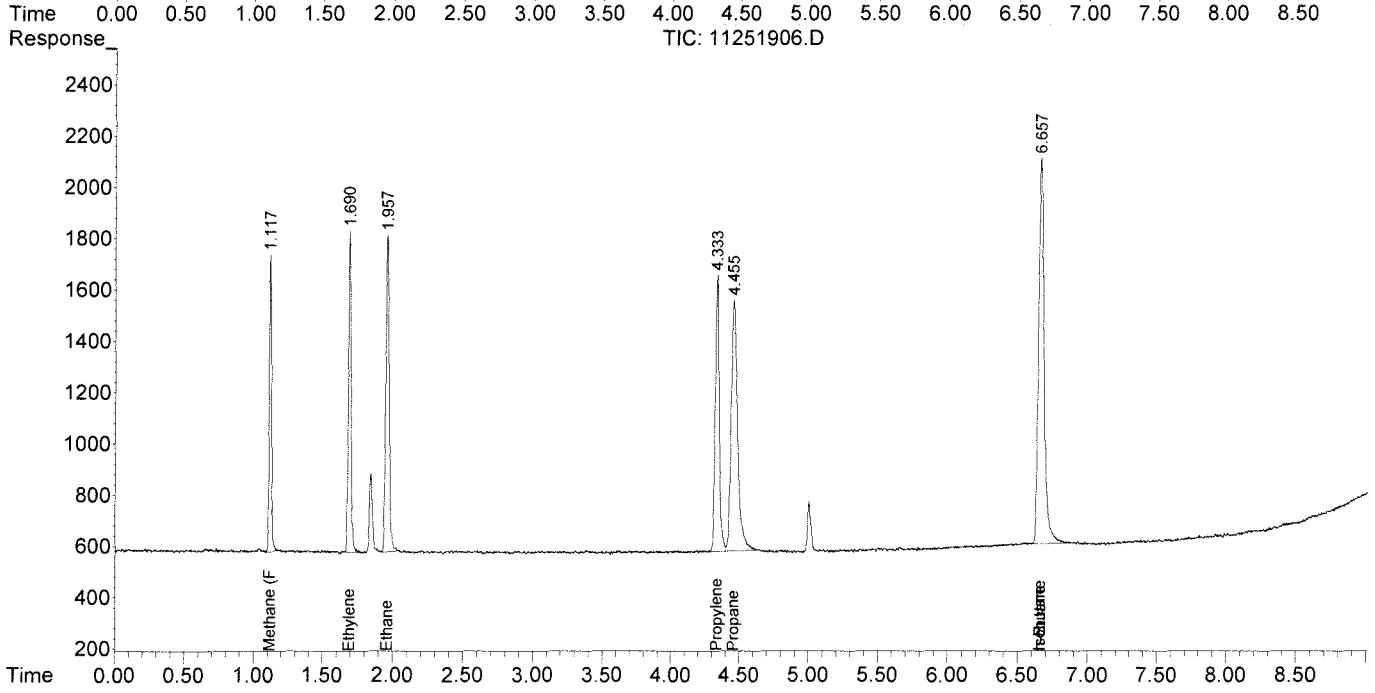
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 13:13:54
Operator : WH/LD
Sample : LCS FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 12:22:48 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251907.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 13:26:49
Operator : WH/LD
Sample : LCSD FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 12:36:31 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

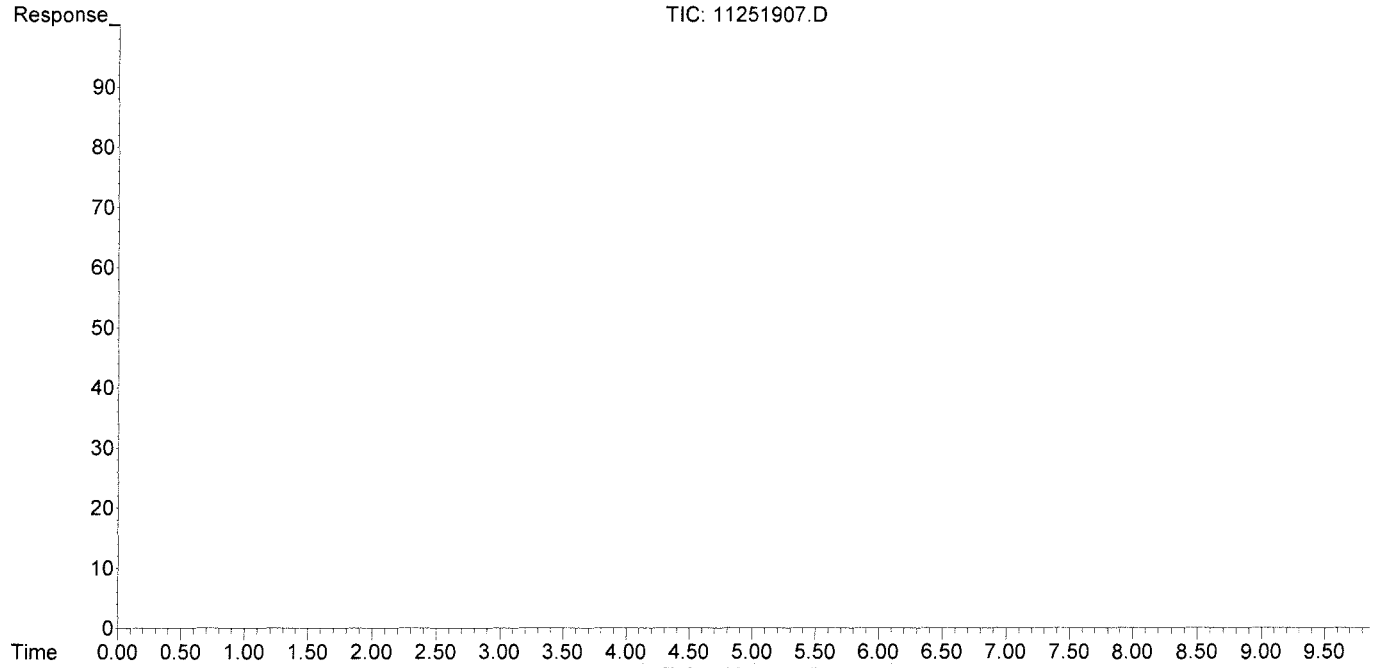
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.125	13333	1.470	ppm
7)	Ethylene	1.699	16844	1.007	ppm
8)	Ethane	1.966	20783	1.226	ppm
9)	Propylene	4.340	22438	0.958	ppm
10)	Propane	4.462	32401	1.302	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.661	41697	1.567	ppm
13)	n-Butane	6.661	41697	1.567	ppm

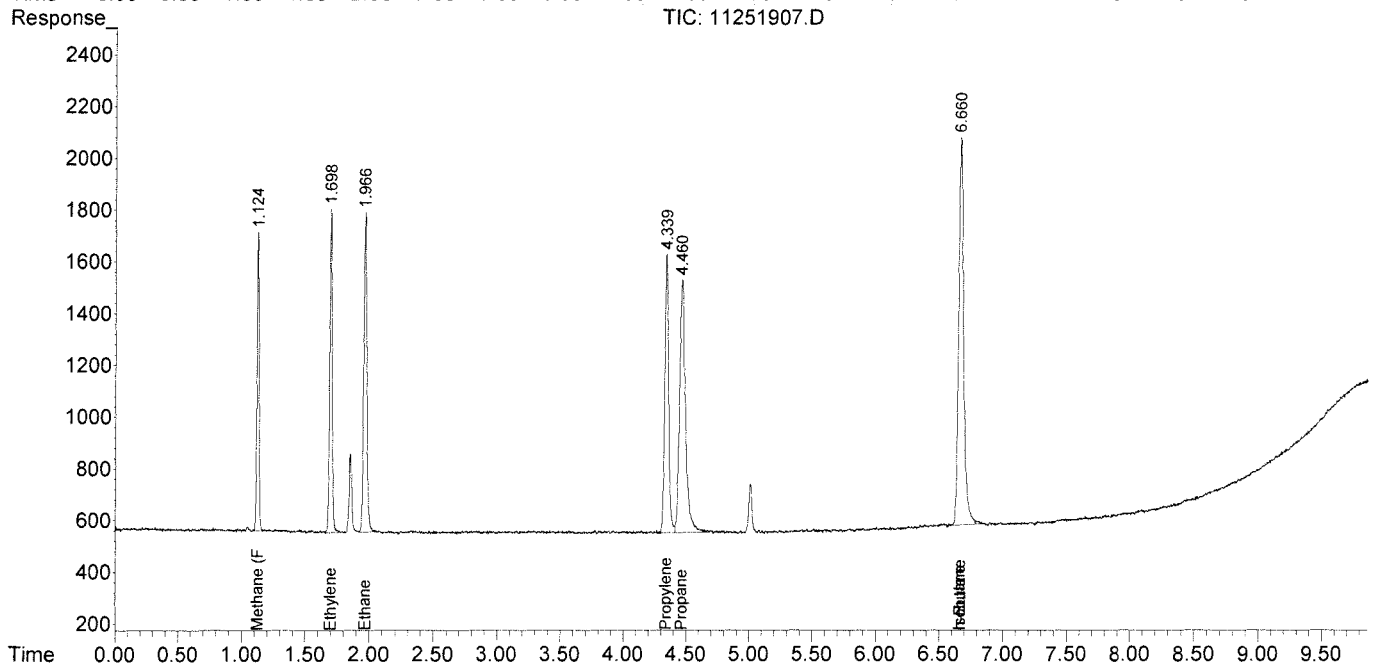
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251907.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 13:26:49
Operator : WH/LD
Sample : LCSD FID 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 12:36:31 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Response Factor Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

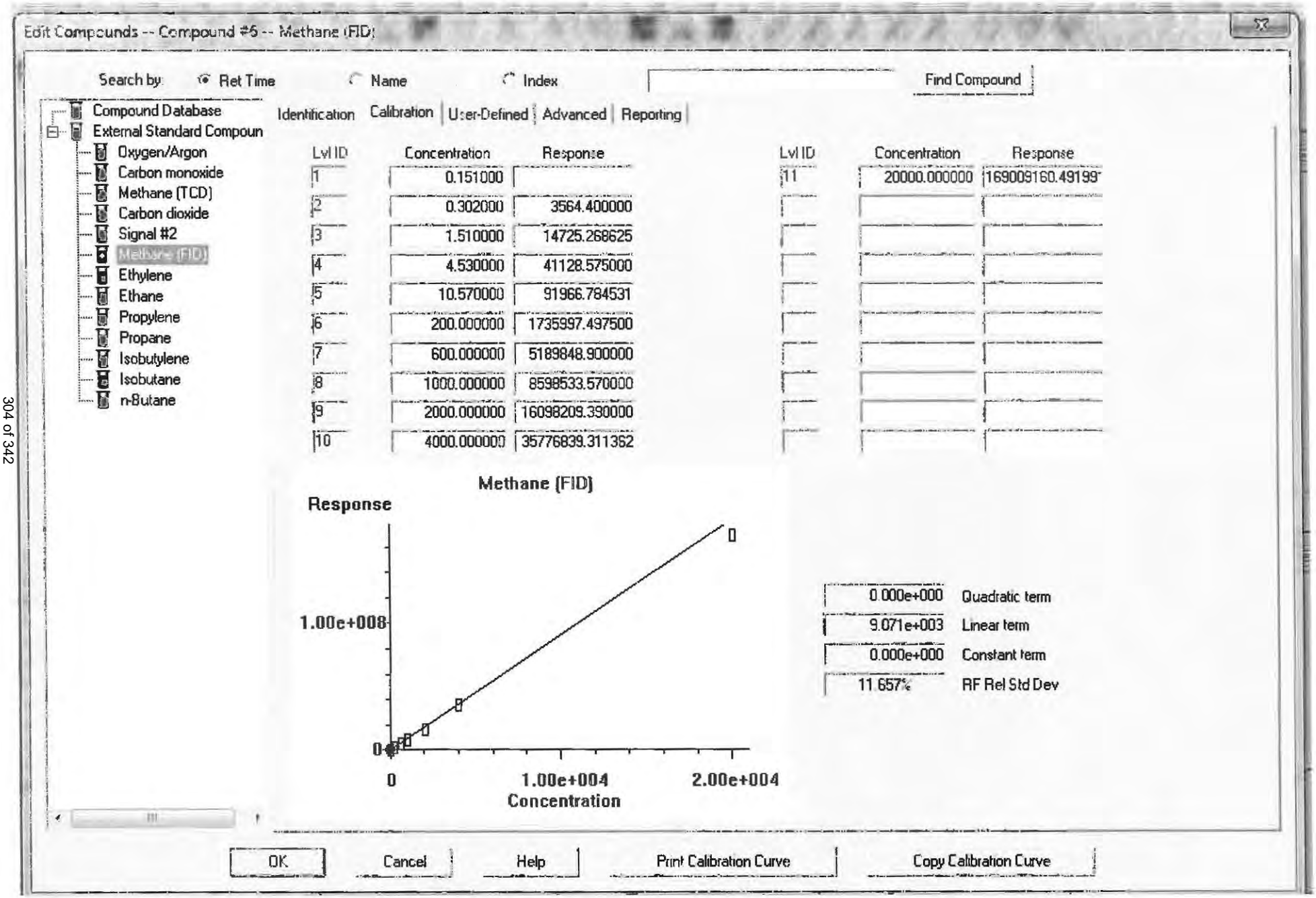
	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Oxygen/Argon	3.739		1.014			0.001	0.793	E6	189.17
2)	Carbon monoxide	3.739		1.014			0.001	0.594	E6	221.92
3)	Methane (TCD)						2.161	0.951	E2	106.37
4)	Carbon dioxide	2.365	2.569	2.558	2.361	2.459	2.314	2.438	E2	4.44

Signal #2 Calibration Files
1 =09121702.D 2 =09121703.D 3 =09121704.D
4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg		%RSD
6)	Methane (FID)		1.180	0.975	0.908	0.870	0.868	0.907	E4	11.66
7)	Ethylene	1.736	1.638	1.780	1.720	1.628	1.670	1.673	E4	3.90
8)	Ethane	1.781	1.676	1.784	1.730	1.692	1.675	1.695	E4	3.83
9)	Propylene	2.505	2.296	2.592	2.480	2.346	2.252	2.343	E4	6.56
10)	Propane	2.439	2.283	2.645	2.555	2.433	2.522	2.488	E4	4.20
11)	Isobutylene							0.652	E1	138.46
12)	Isobutane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17
13)	n-Butane	6.058	4.793	2.214	1.553	1.353		2.662	E4	86.17

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS091217_R.M Wed Sep 13 15:11:48 2017


Edit Compounds -- Compound #6 -- Methane (FID)
Search by: Ret Time Name Index
Find Compound
Compound Database
External Standard Compoun
Oxygen/Argon
Carbon monoxide
Methane (TCD)
Carbon dioxide
Signal #2
Methane (FID)
Ethylene
Ethane
Propylene
Propane
Isobutylene
Isobutane
n-Butane
Identification Calibration User-Defined Advanced Reporting
Lvl ID Concentration Response
1 0.151000
2 0.302000 3564.400000
3 1.510000 14725.268625
4 4.530000 41128.575000
5 10.570000 91966.784531
6 200.000000 1735997.497500
7 600.000000 5189848.900000
8 1000.000000 8598533.570000
9 2000.000000 16098209.390000
10 4000.000000 35776839.311362
Lvl ID Concentration Response
11 20000.000000 169009160.49199
Methane (FID)
Response
1.00e+008
0
0
1.00e+004
2.00e+004
Concentration
0.000e+000 Quadratic term
9.071e+003 Linear term
0.000e+000 Constant term
11.657% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

Edit Compounds -- Compound #7 -- Ethylene

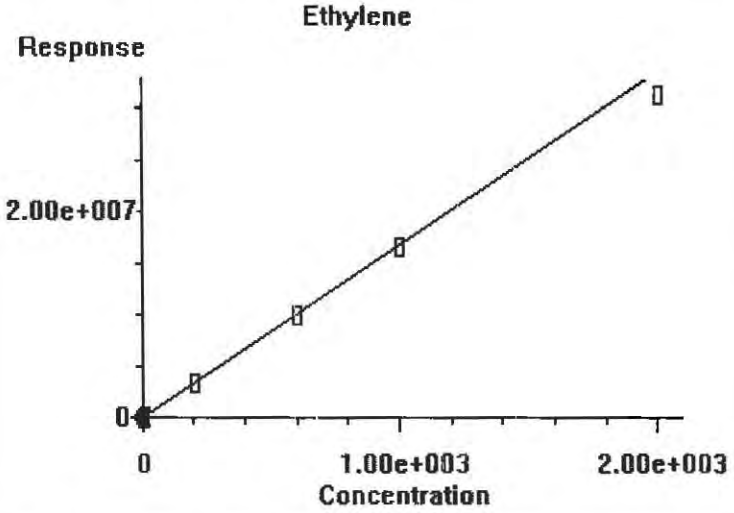
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2621.970000
2	0.302000	4946.731301
3	1.510000	26884.746847
4	4.530000	77902.721497
5	10.570000	172085.529560
6	200.000000	3339702.313219
7	600.000000	10007758.776971
8	1000.000000	16608503.805988
9	2000.000000	31192443.898600
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
1.673e+004	Linear term
0.000e+000	Constant term
3.897%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #8 -- Ethane

Search by: Ret Time | Name | Index — Find Compound

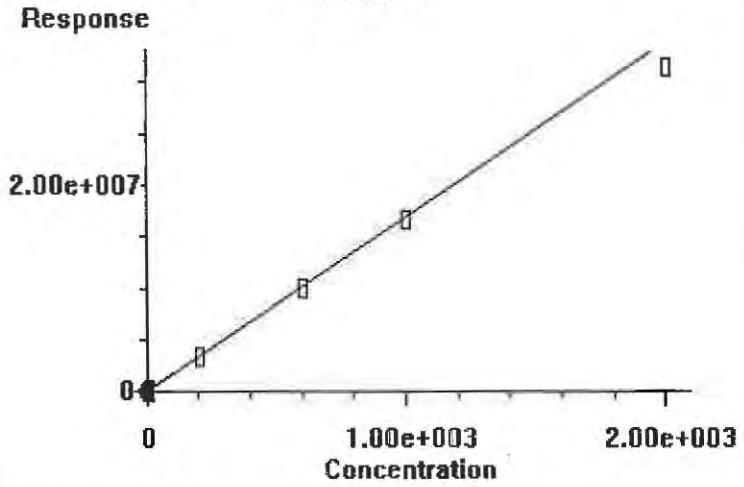
- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	2689.928008
2	0.302000	5060.331943
3	1.510000	26943.667500
4	4.530000	78353.525045
5	10.570000	178840.731148
6	200.000000	3350442.319129
7	600.000000	10048964.218029
8	1000.000000	16703164.879012
9	2000.000000	31424217.938900
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	

Ethane



0.000e+000	Quadratic term
1.695e+004	Linear term
0.000e+000	Constant term
3.831%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #9 -- Propylene

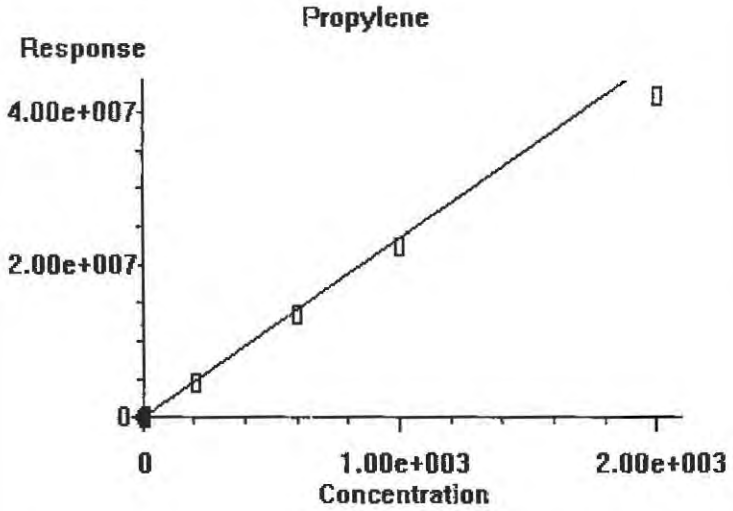
Search by: Ret Time | Name | Index | Find Compound

- Compound Database
- External Standard Compoun
  - Oxygen/Argon
  - Carbon monoxide
  - Methane (TCD)
  - Carbon dioxide
  - Signal #2
  - Methane (FID)
  - Ethylene
  - Ethane
  - Propylene
  - Propane
  - Isobutylene
  - Isobutane
  - n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3782.537646
2	0.302000	6933.285530
3	1.510000	39139.518208
4	4.530000	112341.896872
5	10.570000	248003.903623
6	200.000000	4504060.086084
7	600.000000	13569342.761419
8	1000.000000	22494887.720990
9	2000.000000	42124689.656800
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.343e+004	Linear term
0.000e+000	Constant term
6.559%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Edit Compounds -- Compound #10 -- Propane

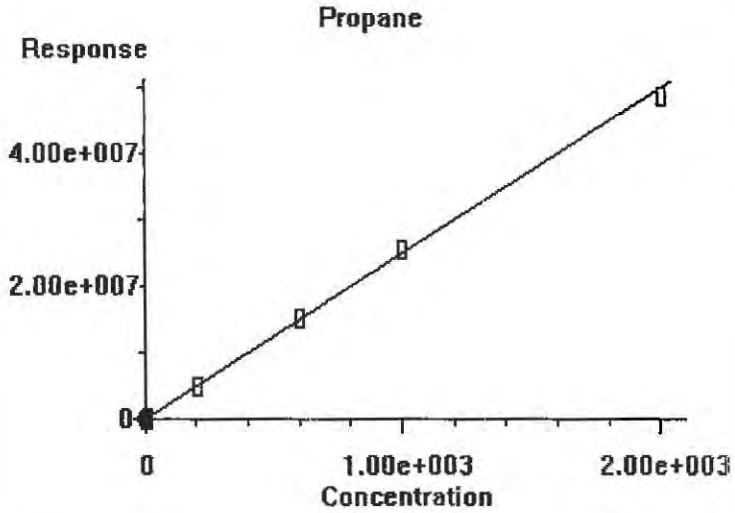
Search by: Ret Time | Name | Index — Find Compound

Compound Database
External Standard Compoun
- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Identification | Calibration | User-Defined | Advanced | Reporting

Lvl ID	Concentration	Response
1	0.151000	3682.897354
2	0.302000	6894.237803
3	1.510000	39934.166792
4	4.530000	115723.428128
5	10.570000	257124.432806
6	200.000000	5043035.663316
7	600.000000	15251325.797404
8	1000.000000	25459410.657938
9	2000.000000	48583085.287451
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	



0.000e+000	Quadratic term
2.488e+004	Linear term
0.000e+000	Constant term
4.200%	RF Rel Std Dev

OK | Cancel | Help | Print Calibration Curve | Copy Calibration Curve

Calibration Status Report HP5890

Method Path : J:\GC10\METHODS\
Method File : RS091217_R.M
Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
Last Update : Wed Sep 13 11:14:47 2017
Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121702.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121703.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121704.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121705.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121706.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121707.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121711.D
11	11	20000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121712.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Sep 13 11:04 2017	Sep 12 15:03 2017	12-Sep-2017, 10:52
2	2	Sep 13 11:05 2017	Sep 13 11:05 2017	12-Sep-2017, 11:05
3	3	Sep 13 11:06 2017	Sep 13 11:05 2017	12-Sep-2017, 11:45
4	4	Sep 13 11:09 2017	Sep 13 11:06 2017	12-Sep-2017, 12:09
5	5	Sep 13 11:09 2017	Sep 13 11:09 2017	12-Sep-2017, 12:30
6	6	Sep 13 11:10 2017	Sep 13 11:10 2017	12-Sep-2017, 12:47
7	7	Sep 13 11:11 2017	Sep 13 11:10 2017	12-Sep-2017, 13:00
8	8	Sep 13 11:12 2017	Sep 13 11:11 2017	12-Sep-2017, 13:47
9	9	Sep 13 11:12 2017	Sep 13 11:12 2017	12-Sep-2017, 14:07
10	10	Sep 13 11:14 2017	Sep 13 11:13 2017	12-Sep-2017, 14:48
11	11	Sep 13 11:14 2017	Sep 13 11:14 2017	12-Sep-2017, 15:21

RS091217_R.M Wed Sep 13 15:11:22 2017

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.767	373920	0.128	ppm	
2)	Carbon monoxide	1.767	373920	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	0.000	0	N.D.	ppm	d
7)	Ethylene	1.595	2622	0.156	ppm	
8)	Ethane	1.848	2690	0.156	ppm	
9)	Propylene	4.222	3783	0.154	ppm	
10)	Propane	4.348	3683	0.139	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.582f	6058	NoCal	ppm	
13)	n-Butane	6.582f	6058	NoCal	ppm	

(f)=RT Delta > 1/2 Window (m)=manual int.

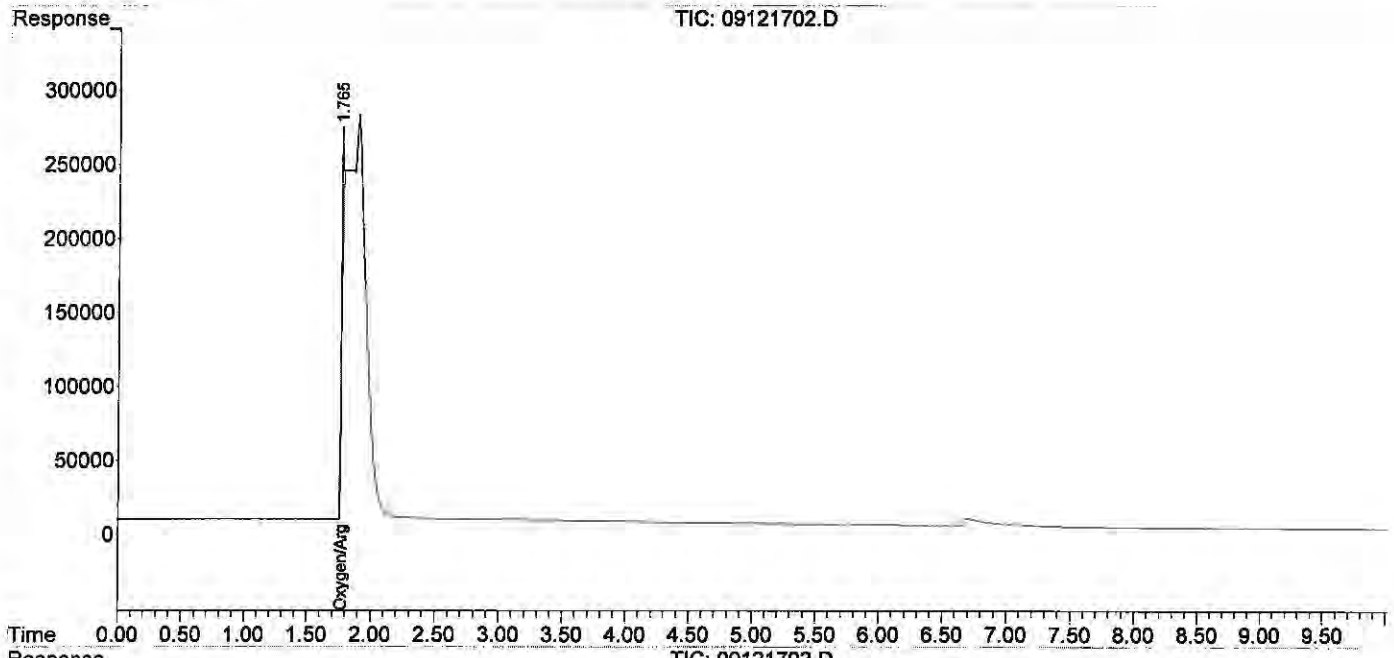
9/13/17

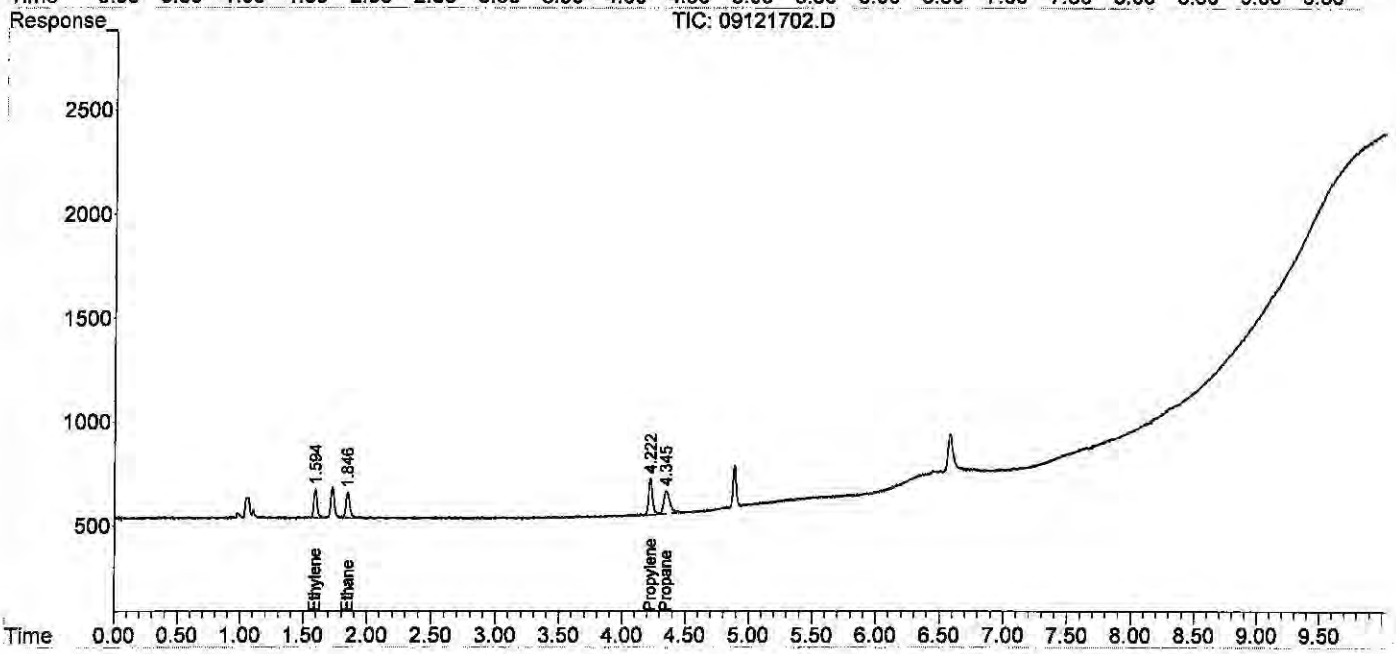
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121702.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 10:52
Operator : MC
Sample : 0.151ppm 0.250ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 12 11:03:15 2017
Quant Method : I:\GC10\METHODS\RS082417.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Fri Aug 25 09:19:14 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





RS091217_R.M Wed Sep 13 14:58:18 2017 Page: 2

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.913f	-25181981	N.D.	ppm	
2)	Carbon monoxide	1.913f	-25181981	1.089	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.049	3564	0.391	ppm	m
7)	Ethylene	1.577	4947	0.292	ppm	
8)	Ethane	1.828	5060	0.293	ppm	
9)	Propylene	4.207	6933	0.281	ppm	
10)	Propane	4.337	6894	0.268	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	9587	0.158	ppm	
13)	n-Butane	6.579f	9587	0.158	ppm	

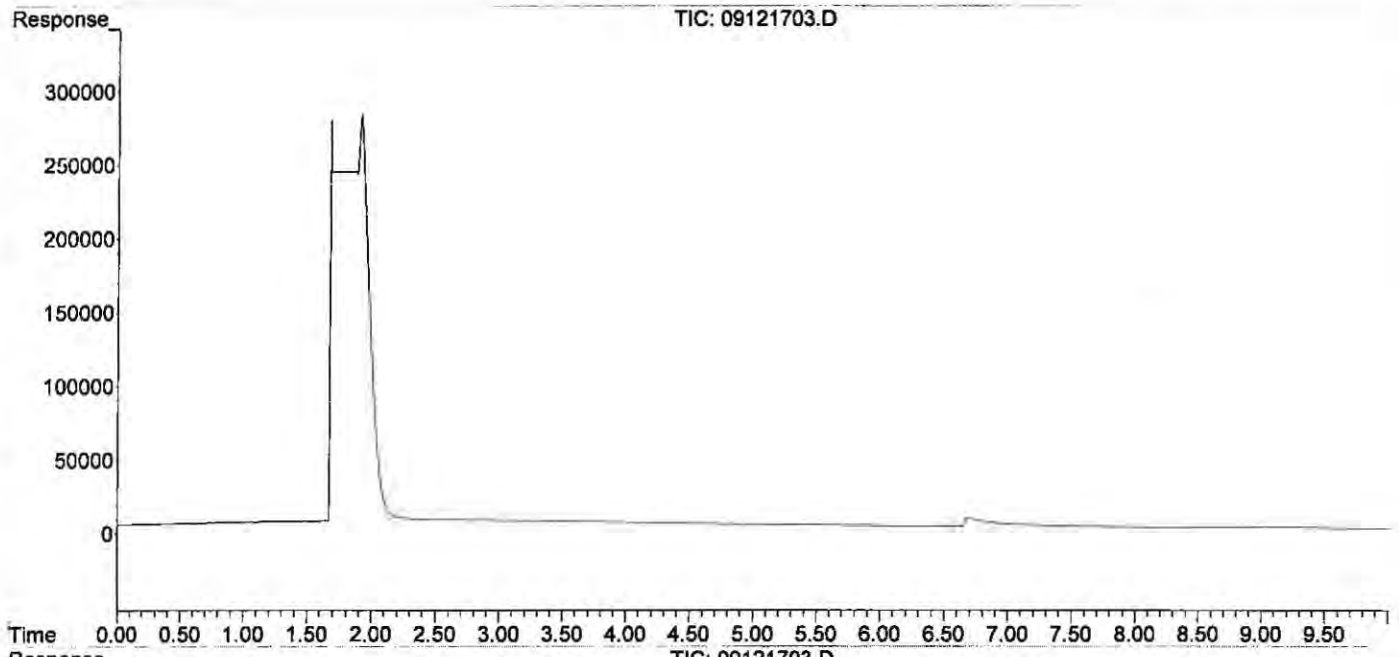
(f)=RT Delta > 1/2 Window (m)=manual int.

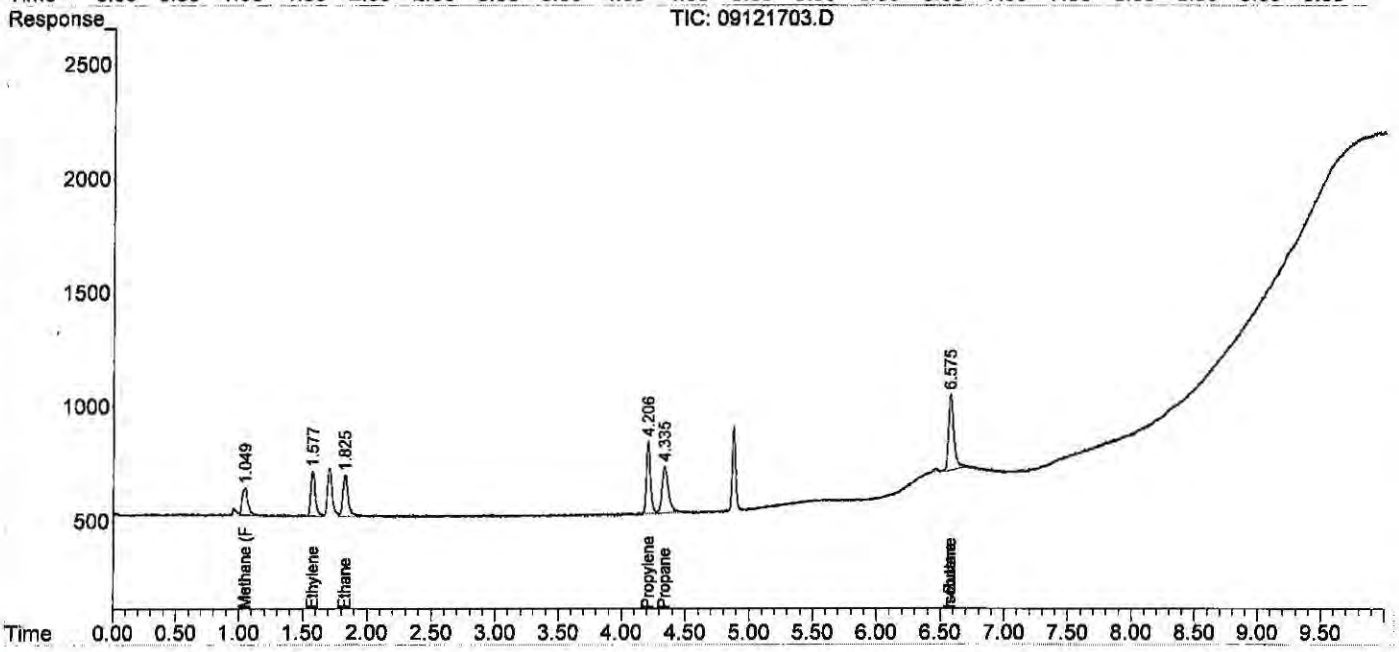
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



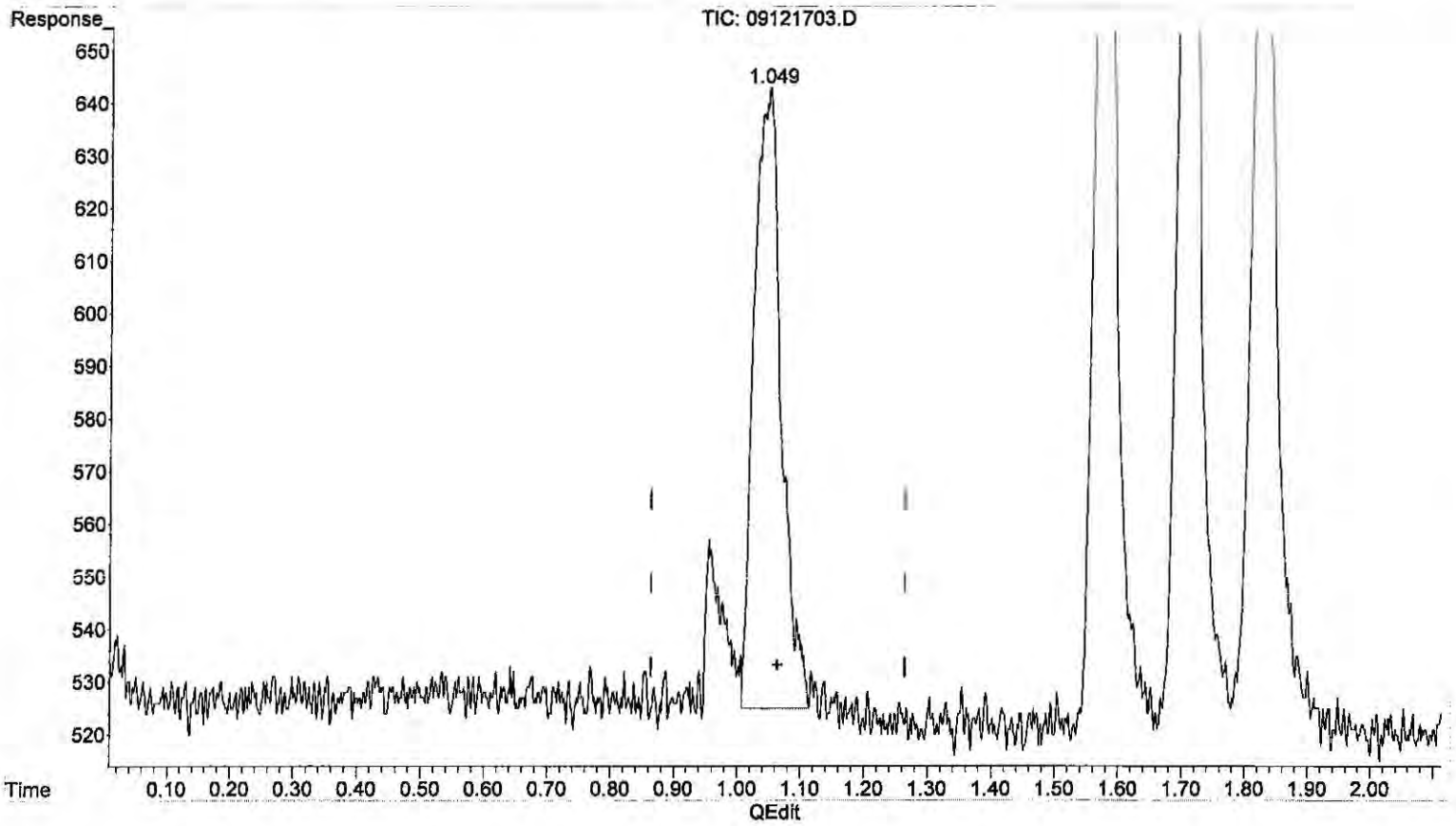


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :



(6) Methane (FID)

1.049min 0.391 ppm m

response 3564

(+) = Expected Retention Time

RS091217_R.M Wed Sep 13 15:00:03 2017 Page: 1

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

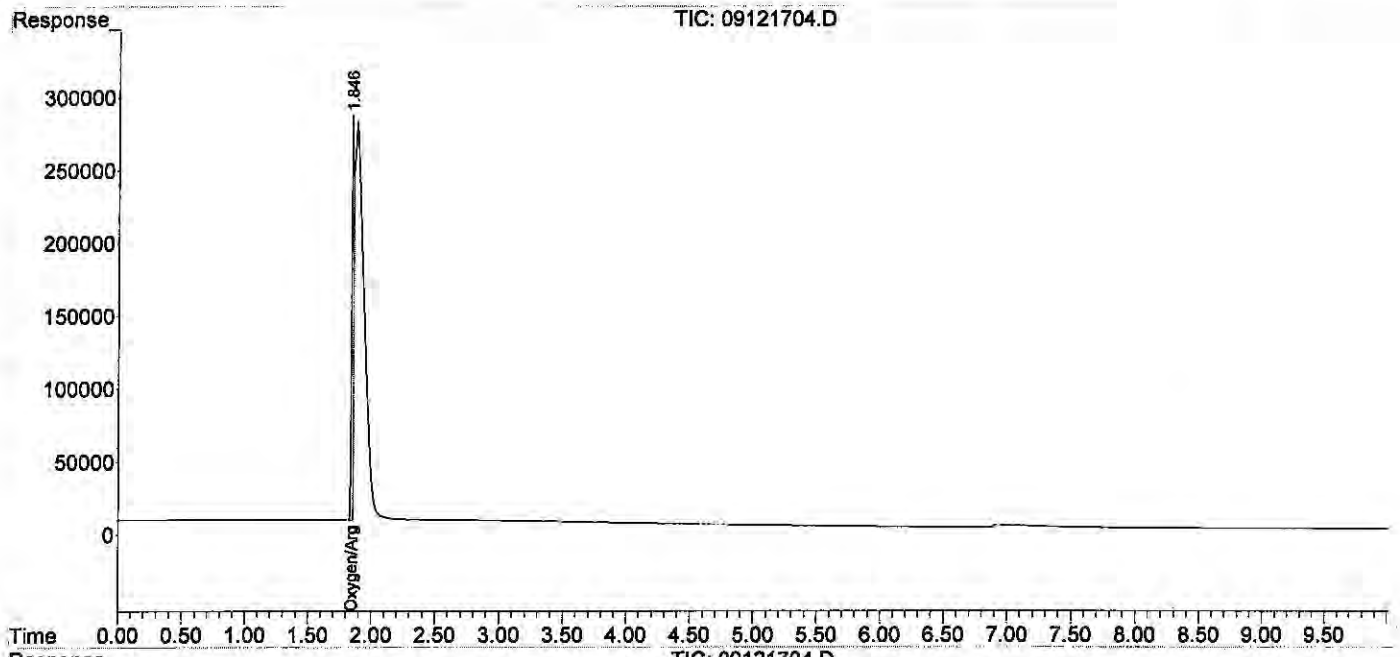
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.847	2536230	1.056	ppm
2)	Carbon monoxide	1.847	2536230	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.064	14725	1.613	ppm
7)	Ethylene	1.598	26885	1.582	ppm
8)	Ethane	1.851	26944	1.555	ppm
9)	Propylene	4.220	39140	1.589	ppm
10)	Propane	4.349	39934	1.596	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	55348	1.020	ppm
13)	n-Butane	6.578f	55348	1.020	ppm

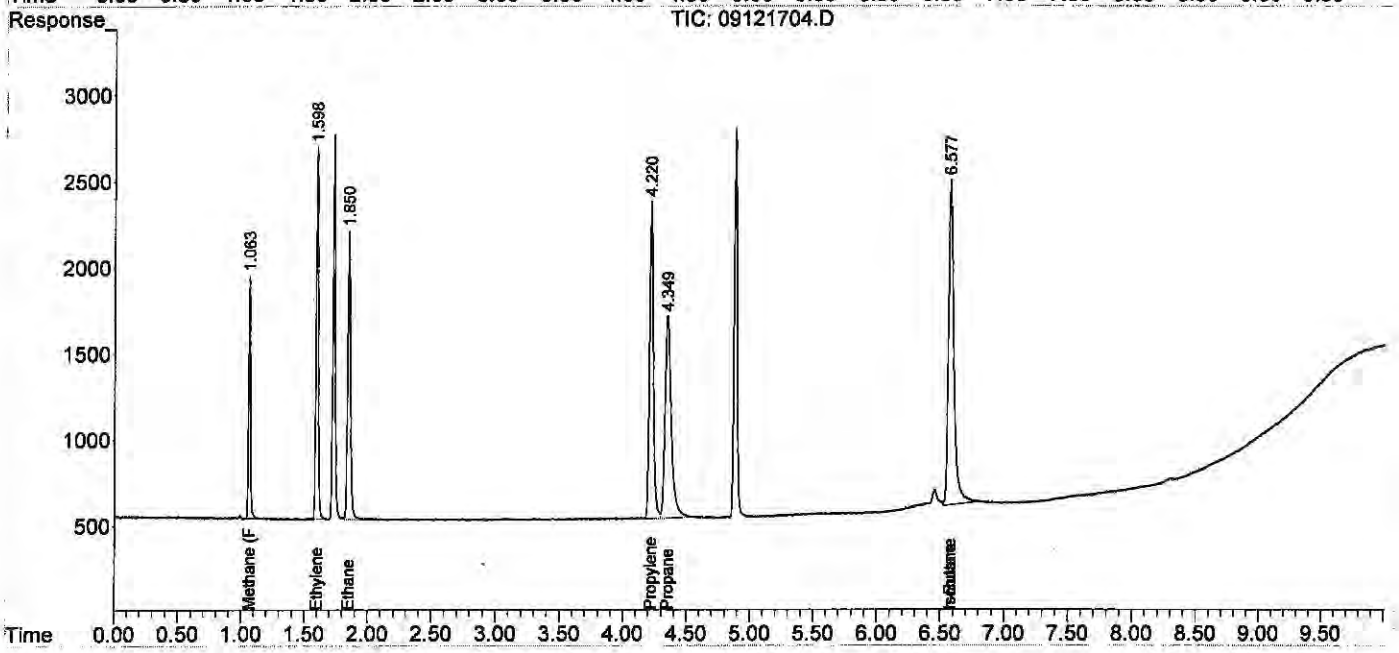
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121704.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:45
Operator : MC
Sample : 1.51ppm 0.1ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:55 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

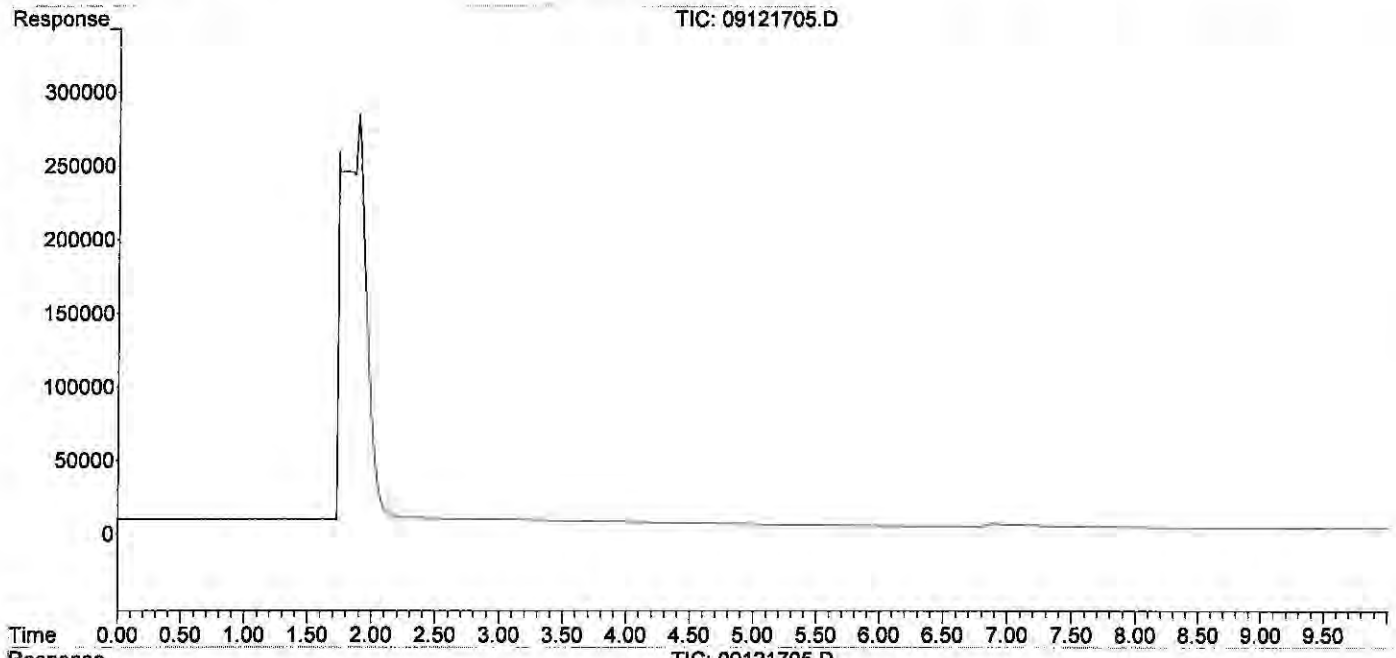
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.738	-331216	N.D.	ppm
2)	Carbon monoxide	1.738	-331216	0.019	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.052	41129	4.522	ppm
7)	Ethylene	1.586	77903	4.637	ppm
8)	Ethane	1.838	78354	4.558	ppm
9)	Propylene	4.218	112342	4.614	ppm
10)	Propane	4.347	115723	4.680	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.580f	155256	3.565	ppm
13)	n-Butane	6.580f	155256	3.565	ppm

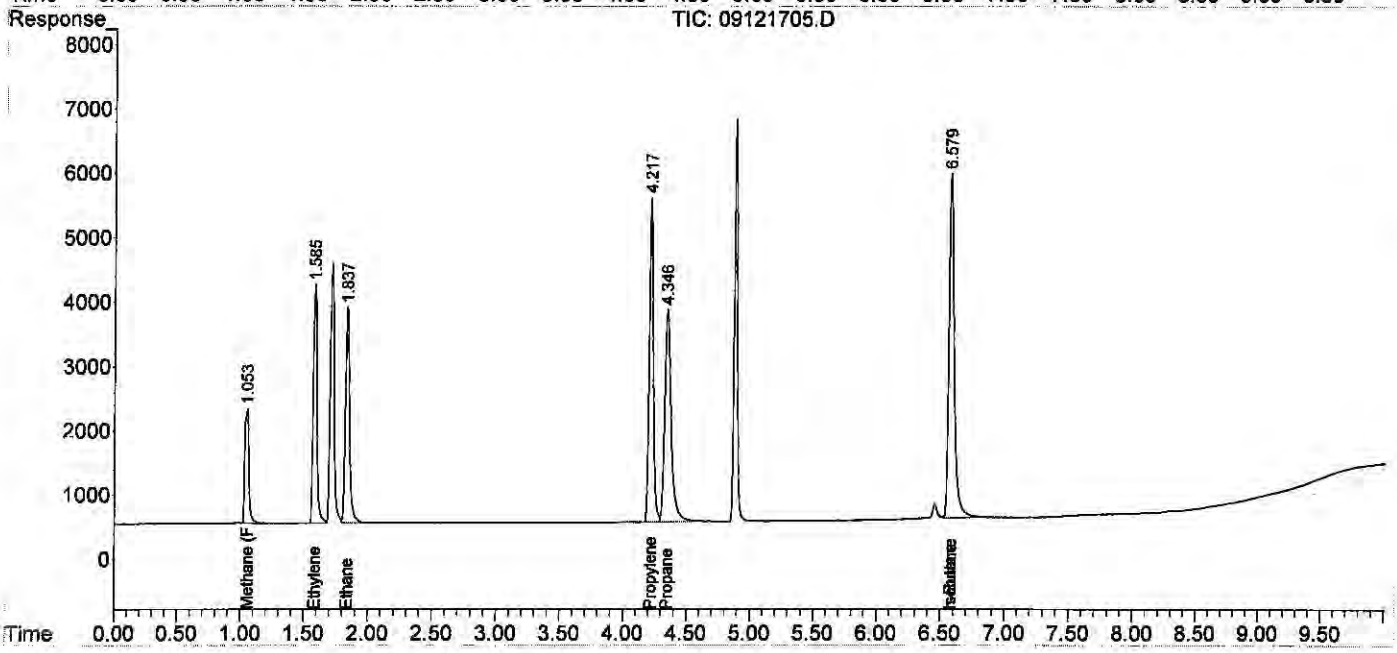
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121705.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:09
Operator : MC
Sample : 4.53ppm 0.3ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:06:32 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.929f	-31871242	N.D.	ppm
2)	Carbon monoxide	1.929f	-31871242	1.818	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.025	91967	10.135	ppm
7)	Ethylene	1.568	172086	10.273	ppm
8)	Ethane	1.822	178841	10.441	ppm
9)	Propylene	4.214	248004	10.236	ppm
10)	Propane	4.344	257124	10.458	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	6.578f	338181	9.254	ppm
13)	n-Butane	6.578f	338181	9.254	ppm

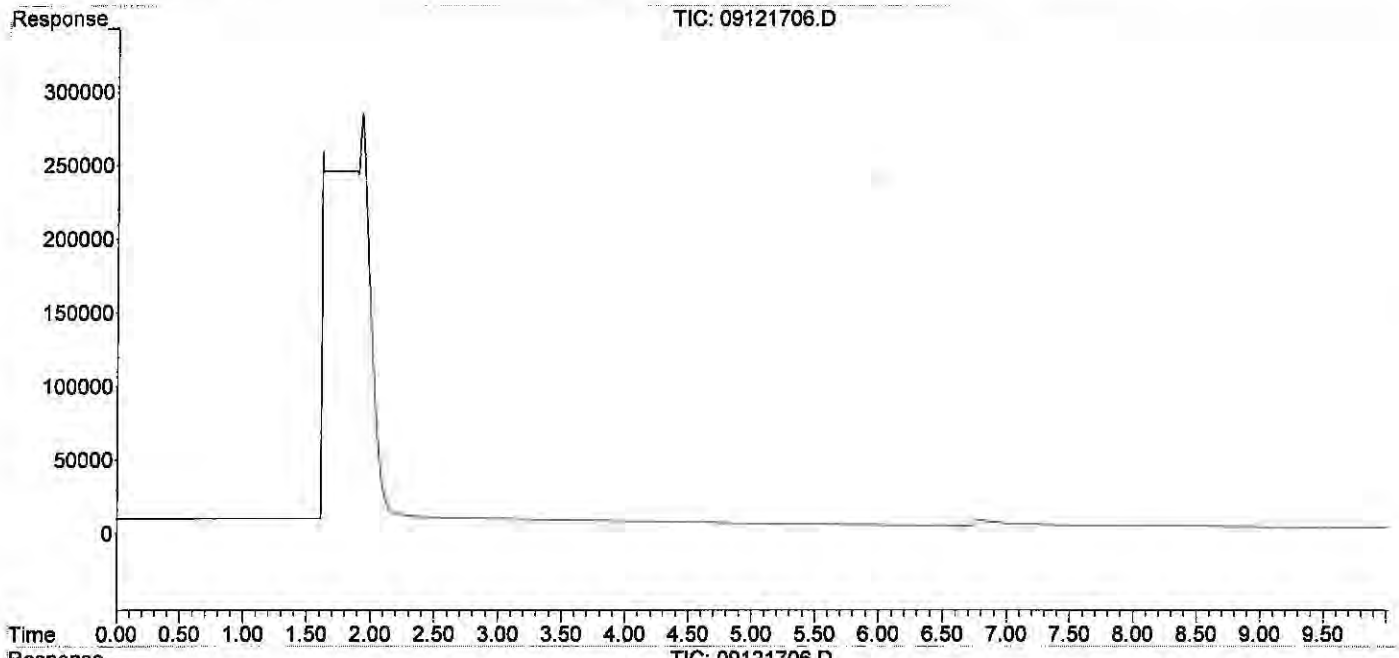
(f)=RT Delta > 1/2 Window (m)=manual int.

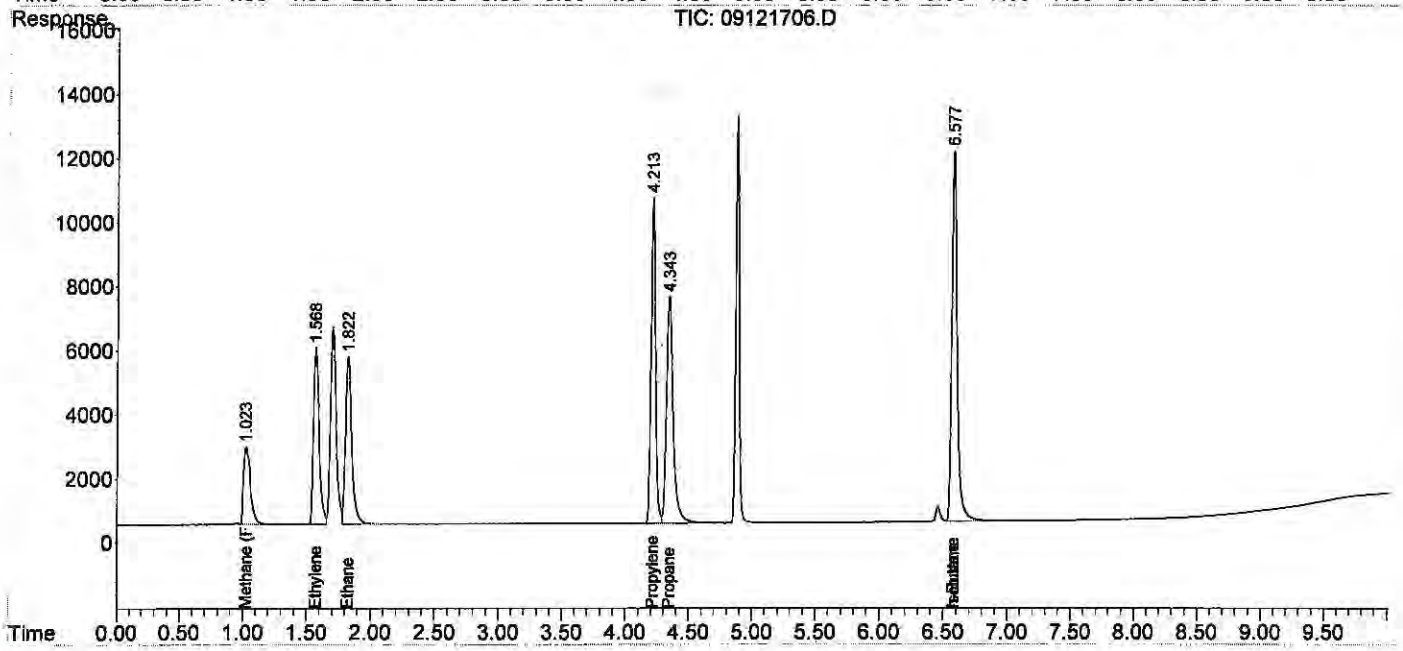
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121706.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:30
Operator : MC
Sample : 10.57ppm 0.7ml s32-09051701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:24 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.897	155286	0.065	ppm
2)	Carbon monoxide	1.897	155286	N.D.	ppm
3)	Methane (TCD)	4.079f	27015	2856.472	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.063	1735997	190.792	ppm
7)	Ethylene	1.597	3339702	198.758	ppm
8)	Ethane	1.849	3350442	194.597	ppm
9)	Propylene	4.201	4504060	185.706	ppm
10)	Propane	4.333	5043036	204.809	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

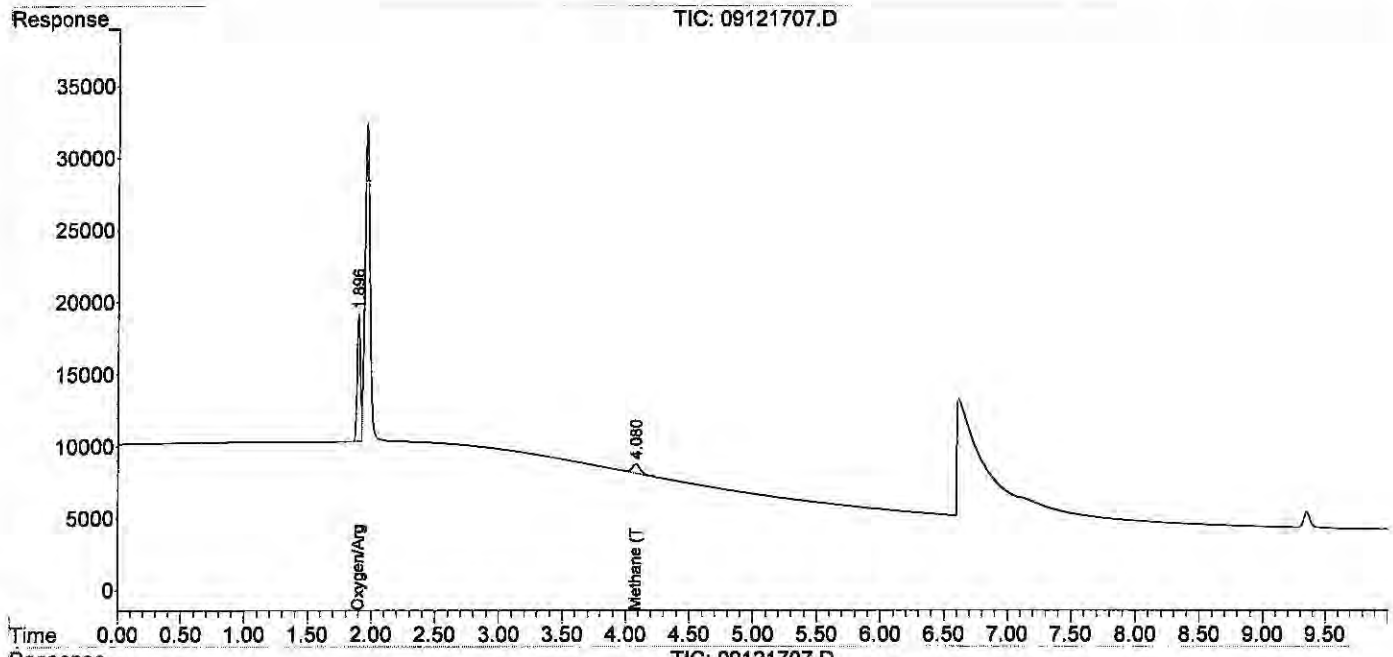
(f)=RT Delta > 1/2 Window (m)=manual int.

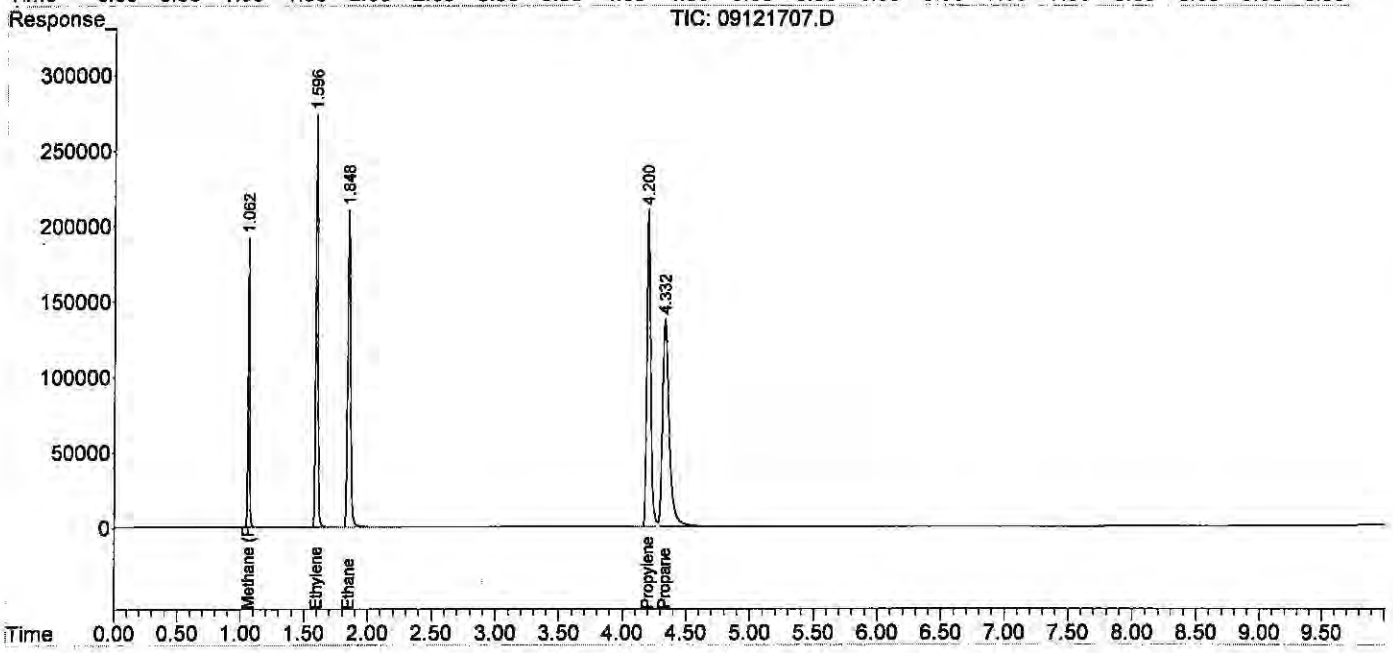
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121707.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 12:47
Operator : MC
Sample : 200ppm 0.1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:09:59 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.884	196022	0.124	ppm
2)	Carbon monoxide	1.884	196022	N.D.	ppm
3)	Methane (TCD)	4.070f	88282	782.730	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.044	5189849	539.759	ppm
7)	Ethylene	1.573	10007759	590.286	ppm
8)	Ethane	1.822	10048964	583.213	ppm
9)	Propylene	4.160	13569343	562.612	ppm
10)	Propane	4.300	15251326	615.171	ppm
11)	Isobutylene	6.143	9815	NoCal	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

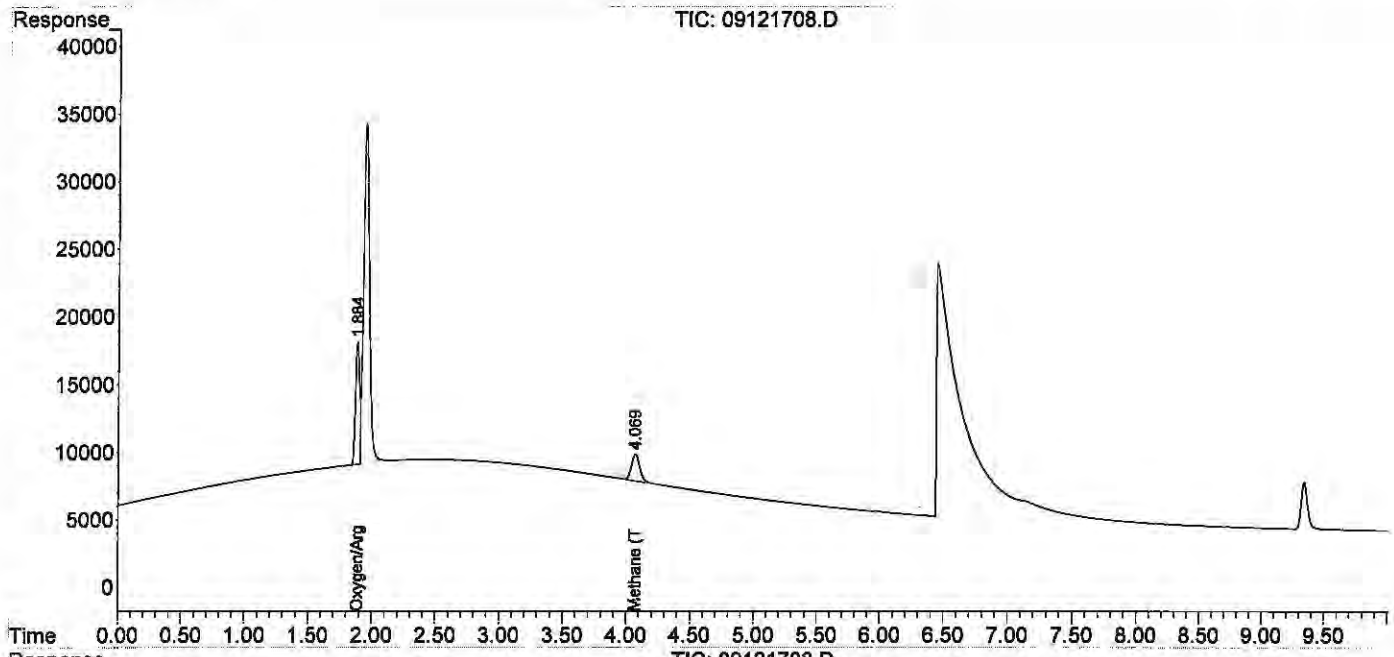
(f)=RT Delta > 1/2 Window (m)=manual int.

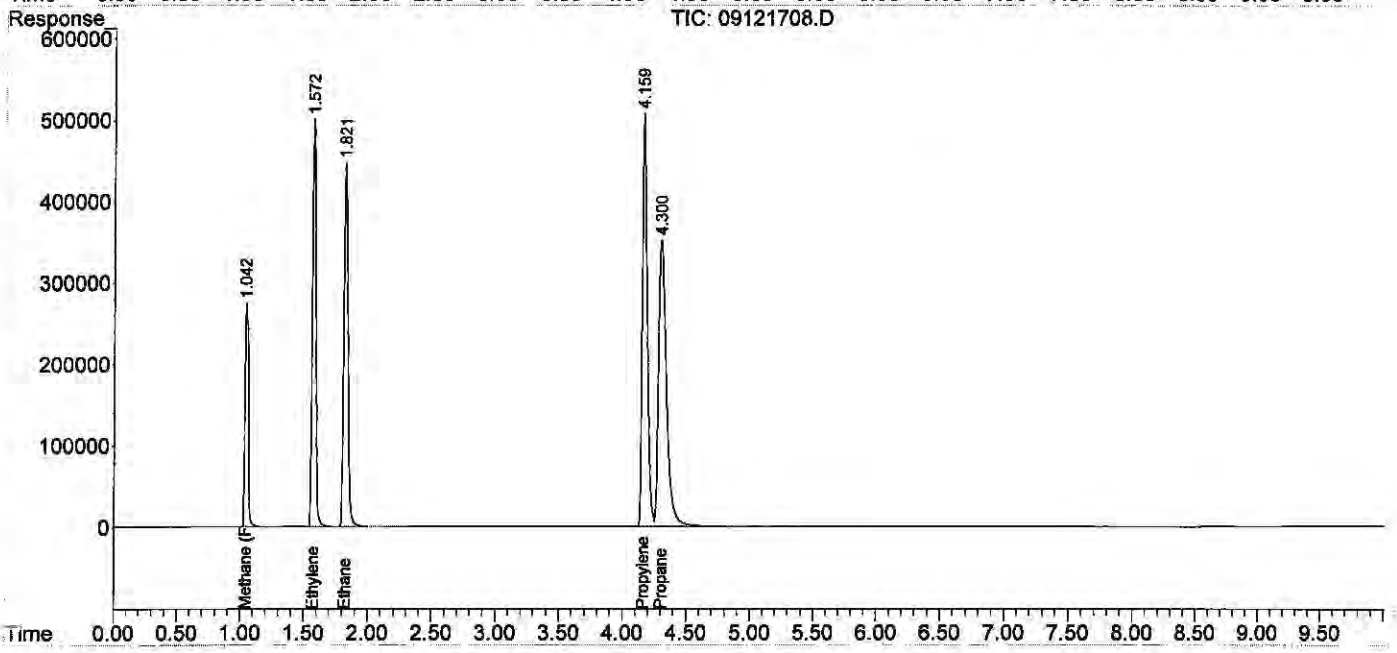
Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121708.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:00
Operator : MC
Sample : 600ppm 0.3ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:10:57 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:10:50 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

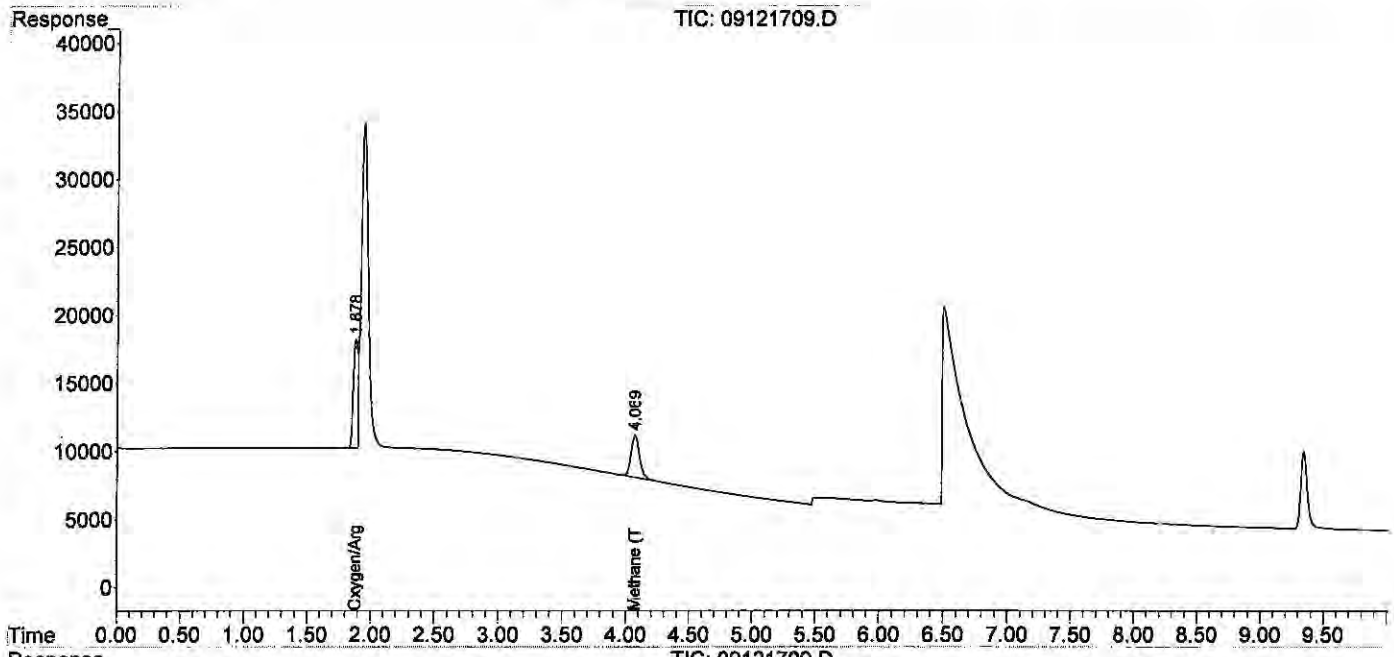
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	1.879	192611	0.162	ppm
2)	Carbon monoxide	1.879	192611	N.D.	ppm
3)	Methane (TCD)	4.070f	145492	1244.729	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.039	8598534	945.644	ppm
7)	Ethylene	1.576	16608504	981.887	ppm
8)	Ethane	1.827	16709165	973.644	ppm
9)	Propylene	4.161	22494888	941.060	ppm
10)	Propane	4.298	25459411	1023.223	ppm
11)	Isobutylene	6.138	16970	8645.243	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

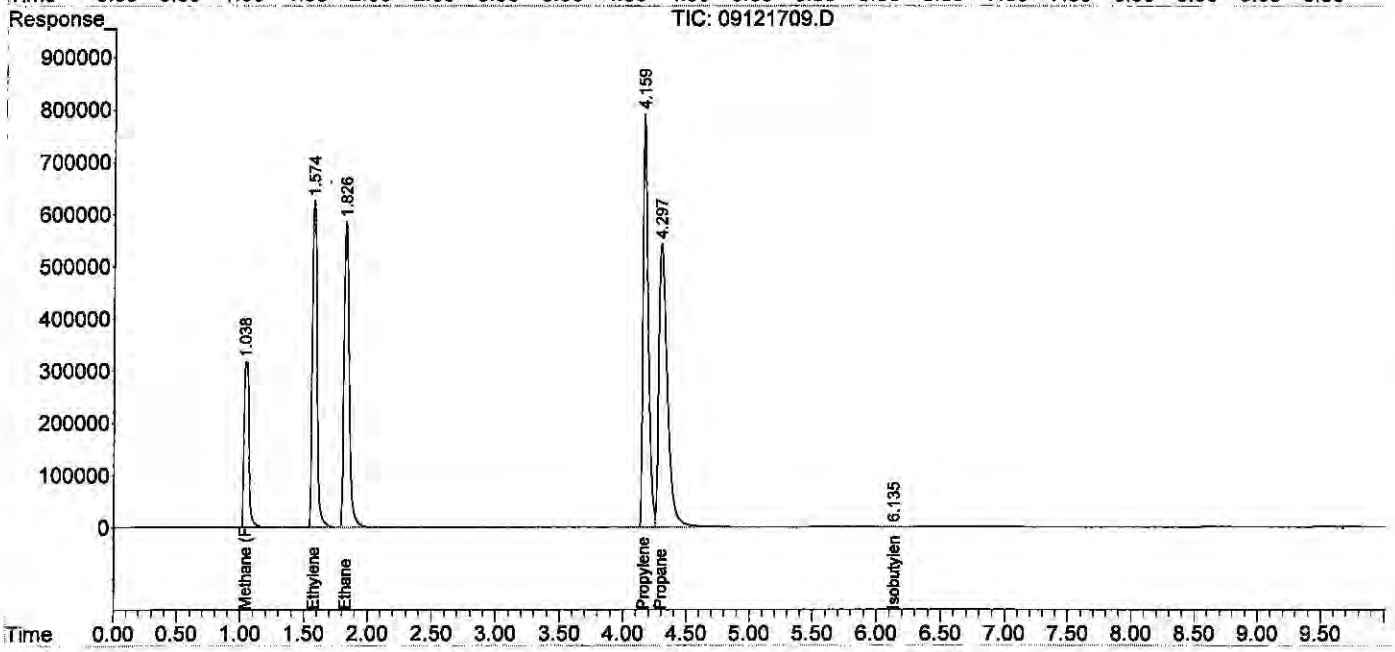
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121709.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 13:47
Operator : MC
Sample : 1000ppm 0.5ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:11:46 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:11:38 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

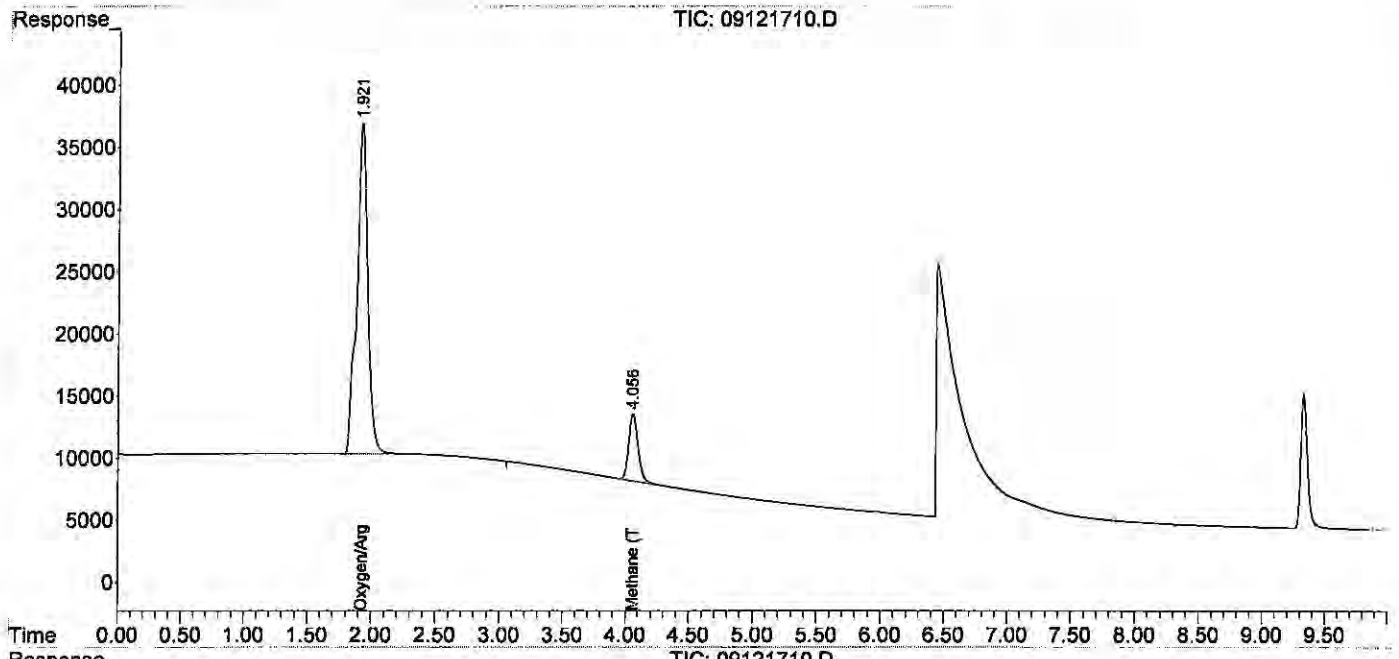
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.922f	1578147	1.659	ppm	
2)	Carbon monoxide	1.922f	1578147	N.D.	ppm	
3)	Methane (TCD)	4.057f	281651	3526.607	ppm	
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.016	16098209	1763.622	ppm	
7)	Ethylene	1.552	31192444	1848.268	ppm	
8)	Ethane	1.801	31424218	1837.143	ppm	
9)	Propylene	4.129	42124690	1775.341	ppm	m
10)	Propane	4.269	48583085	1946.921	ppm	
11)	Isobutylene	6.136	33832	25613.603	ppm	
12)	Isobutane	6.576f	3845	0.120	ppm	
13)	n-Butane	6.576f	3845	0.120	ppm	

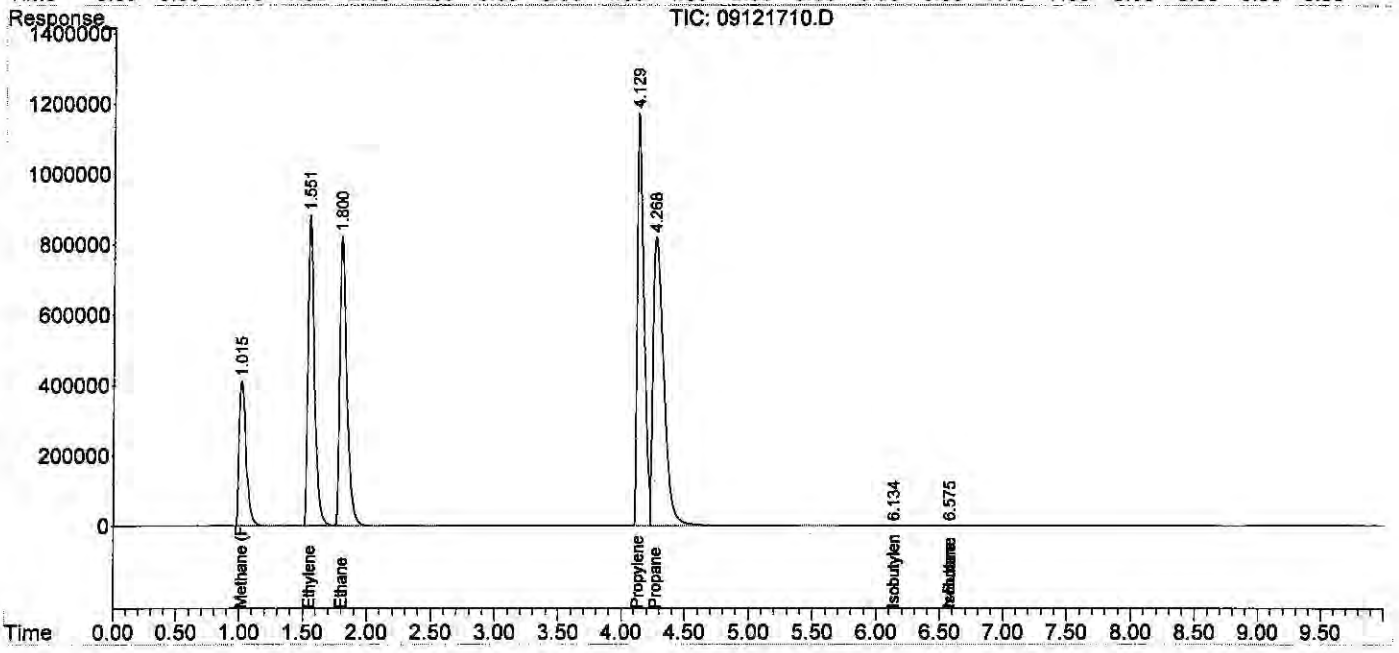
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



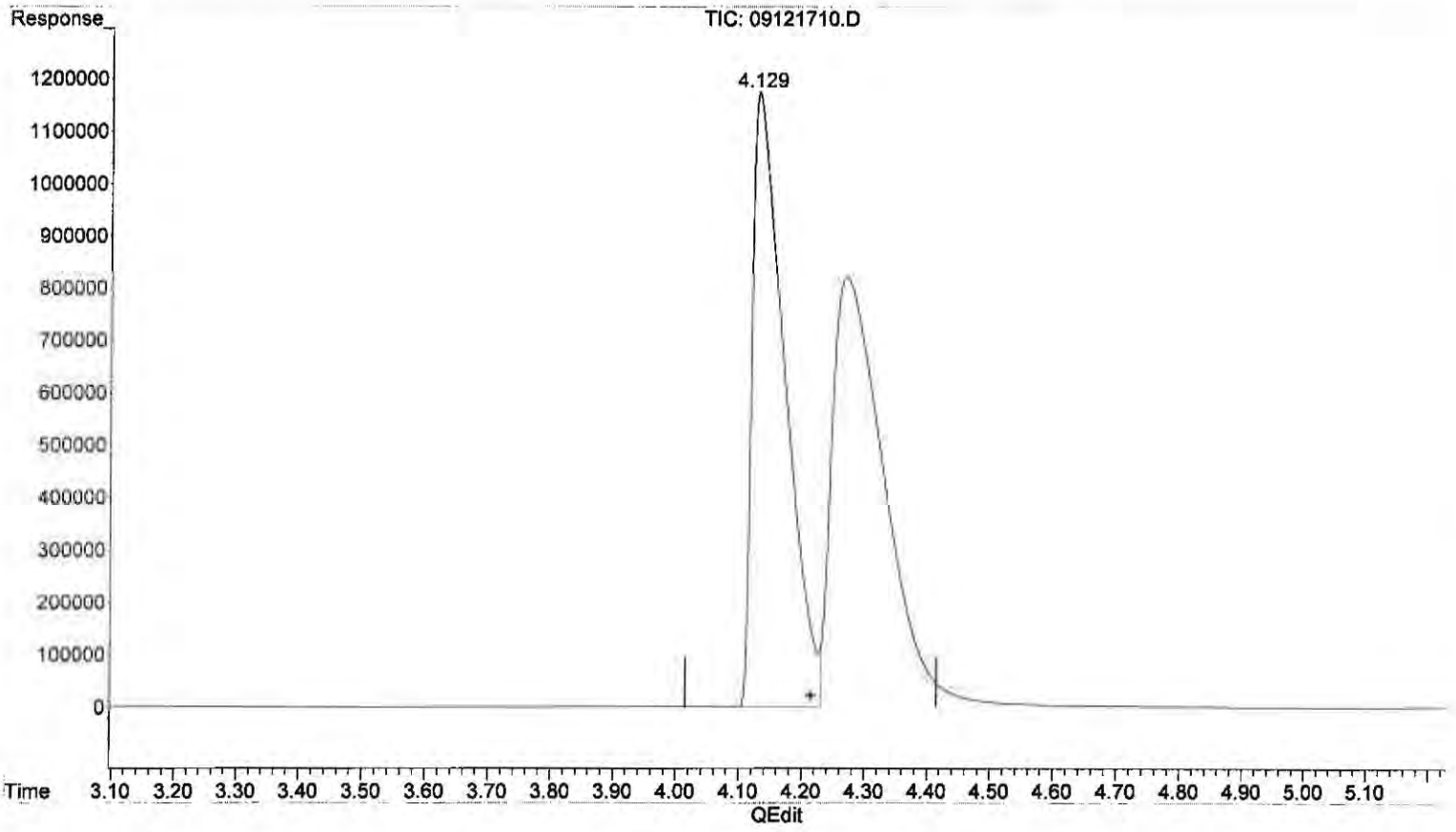


Quantitation Report (Qedit)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121710.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:07
Operator : MC
Sample : 2000ppm 1ml s32-09121701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:12:33 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:12:25 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(9) Propylene
4.129min 1775.341 ppm m
response 42124690

(+) = Expected Retention Time

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

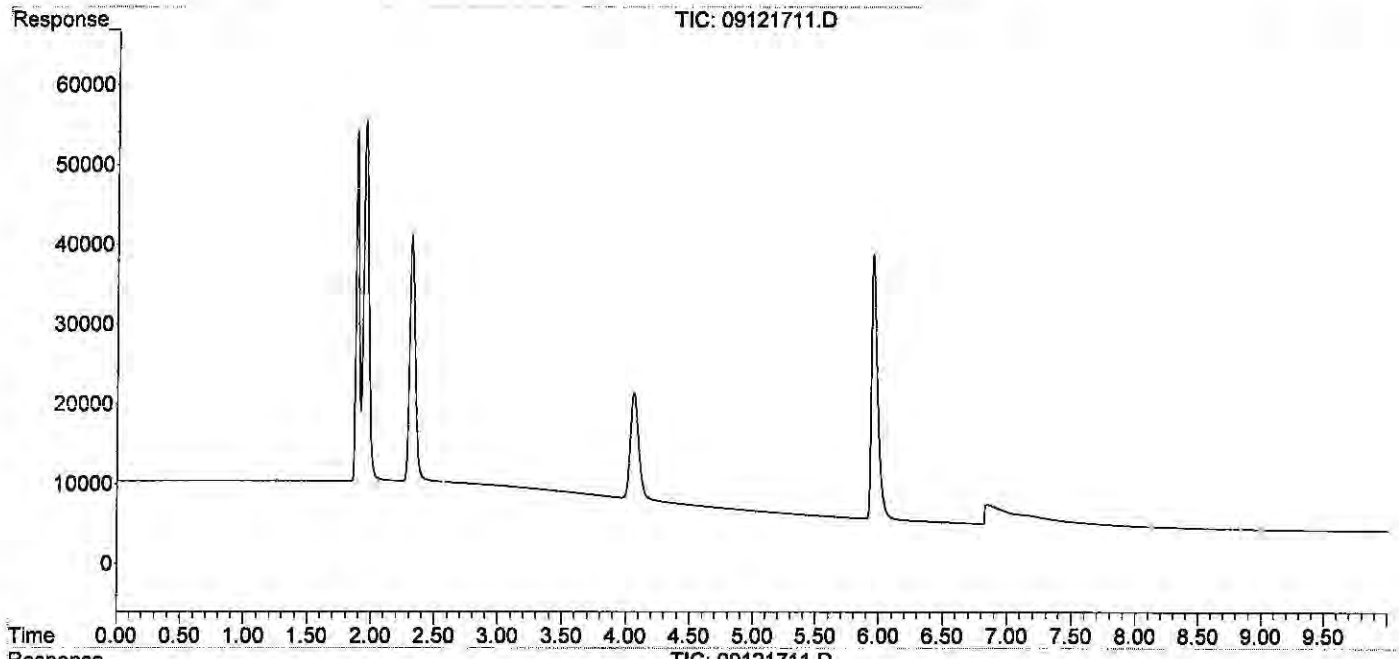
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	0.000	0	N.D.	ppm	d
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.059	35776839	3925.122	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

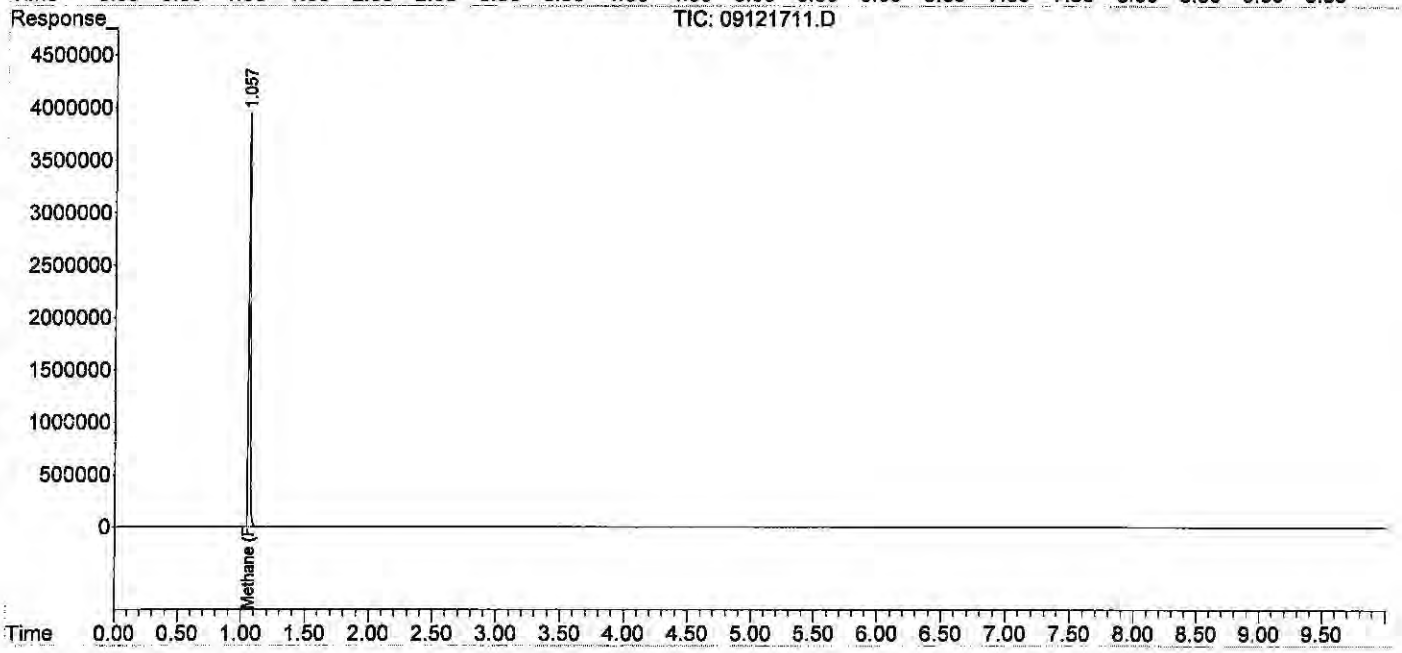
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121711.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 14:48
Operator : MC
Sample : 4000ppm 0.1ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:13:37 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase:
Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

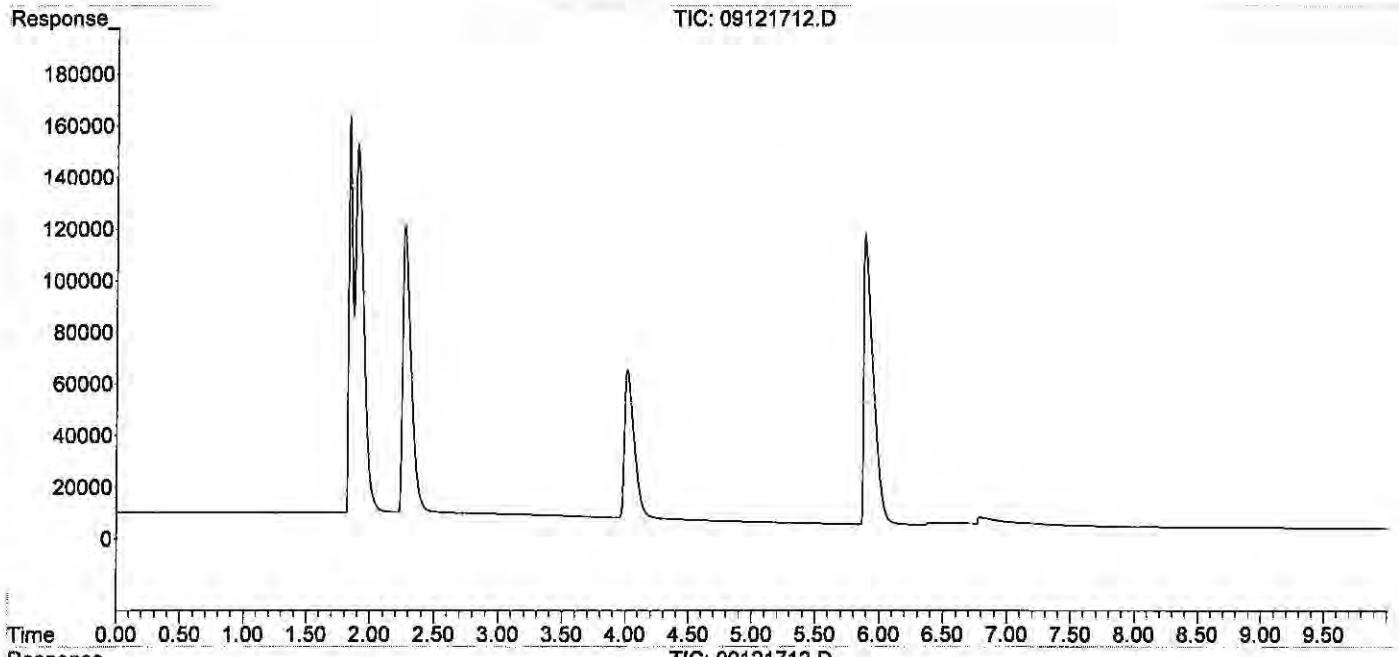
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	0.000	0	N.D.	ppm	d
2)	Carbon monoxide	1.836	3190788	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	d
4)	Carbon dioxide	0.000	0	N.D.	ppm	d
6)	Methane (FID)	1.034	169009160	18492.064	ppm	
7)	Ethylene	0.000	0	N.D.	ppm	
8)	Ethane	0.000	0	N.D.	ppm	
9)	Propylene	0.000	0	N.D.	ppm	
10)	Propane	0.000	0	N.D.	ppm	
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	0.000	0	N.D.	ppm	
13)	n-Butane	0.000	0	N.D.	ppm	

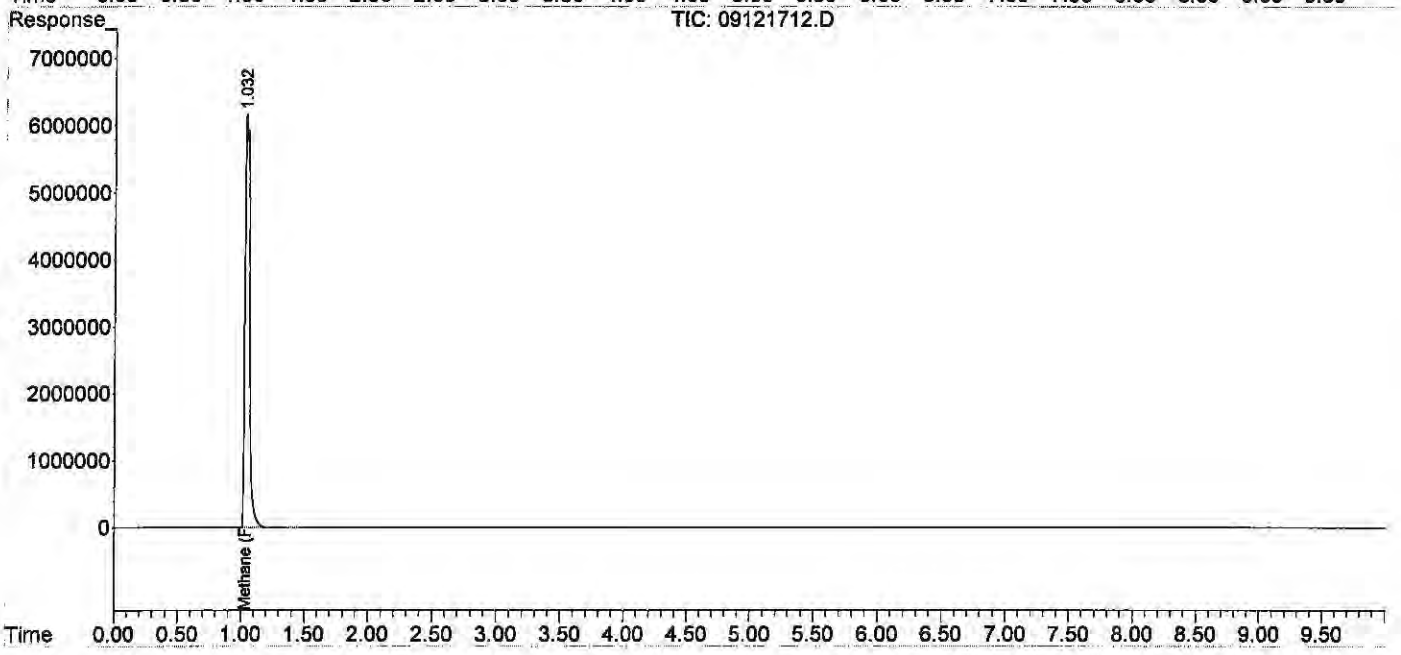
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121712.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 15:21
Operator : MC
Sample : 20000ppm 0.5ml s32-08231701
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:14:17 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Oxygen/Argon	1.843	2922459	3.687	ppm	
2)	Carbon monoxide	1.843	2922459	N.D.	ppm	
3)	Methane (TCD)	0.000	0	N.D.	ppm	actual %D
4)	Carbon dioxide	0.000	0	N.D.	ppm	
6)	Methane (FID)	1.063	13748	1.516	ppm	~~1.510~~ 1.50 101.1
7)	Ethylene	1.598	24153	1.443	ppm	~~1.510~~ 1.50 96.2
8)	Ethane	1.850	24488	1.445	ppm	~~1.510~~ 1.50 96.3
9)	Propylene	4.221	36004	1.537	ppm	~~1.510~~ 1.50 102.5
10)	Propane	4.350	37738	1.517	ppm	~~1.511~~ 1.51 100.5
11)	Isobutylene	0.000	0	N.D.	ppm	
12)	Isobutane	6.579f	48019	1.804	ppm	9/14/2
13)	n-Butane	6.579f	48019	1.804	ppm	

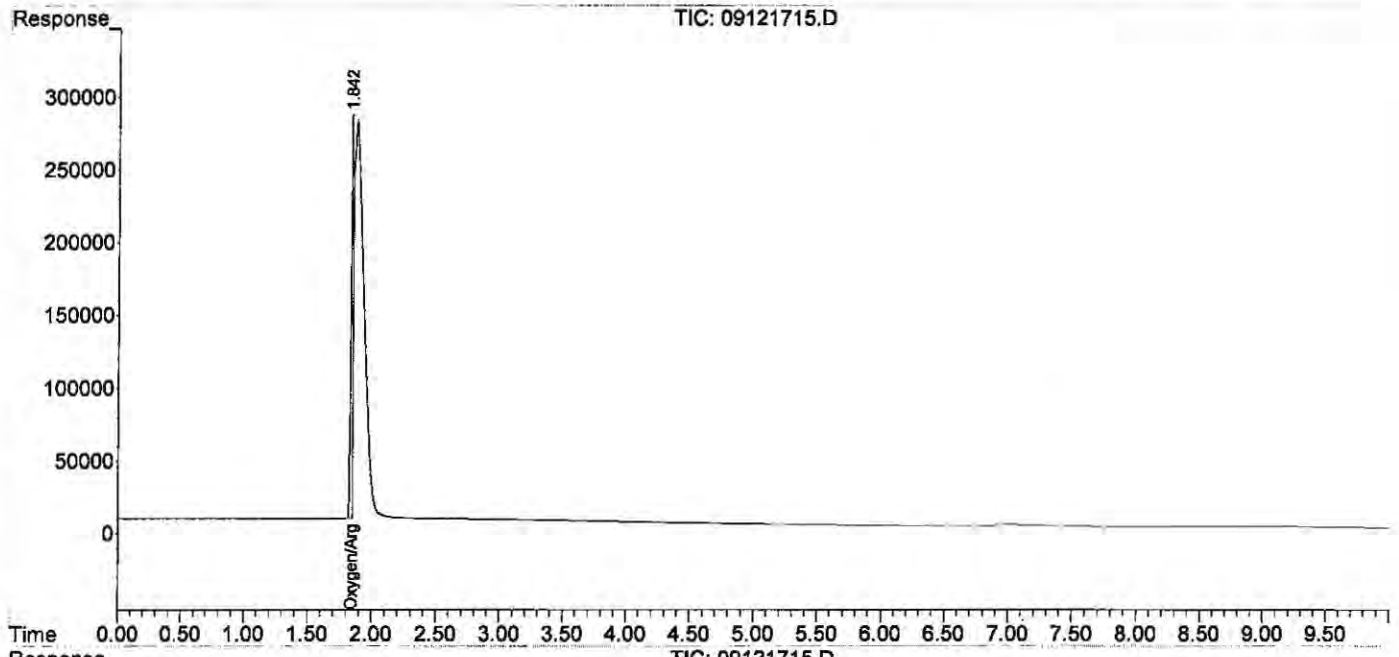
(f)=RT Delta > 1/2 Window (m)=manual int.

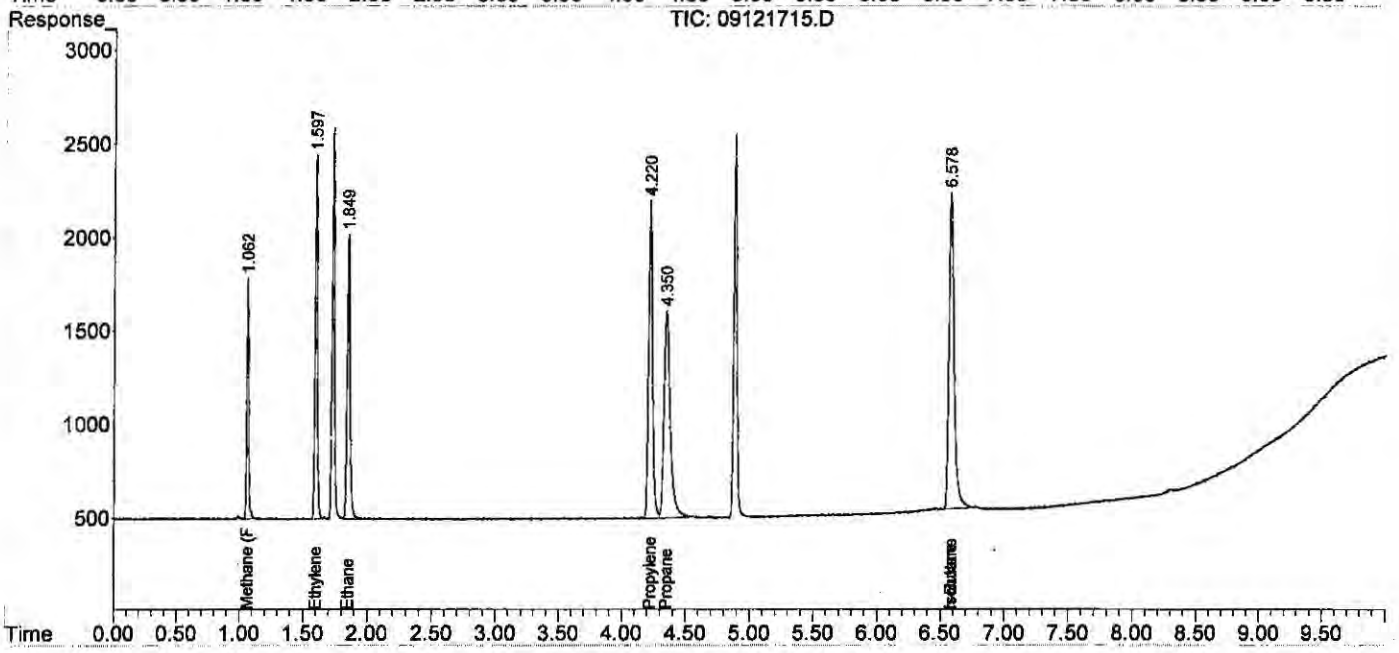
9/14/2017

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121715.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 16:15
Operator : MC
Sample : icv s30-05241604
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:15:11 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:13:29 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Dissolved Gases by RSK175

ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD

Client : ALS Laboratory Group | Analyst : WH/LD | Instrument : GC#10

Service Request: P1907040 | Date Analysis : 11/25/19 | Detector : FID#10, TCD#10

Sample Vol. (ml) : 32.00 ml | Head Space Vol.(ml) : 8.00 ml | Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

Sample ID	Inj. Vol.	Methane	Ethylene	Ethane
STD S32-05221901	0.100	89.437	94.895	94.157
ACTUAL		101.50	100.90	101.40
%Difference		11.9%	6.0%	7.1%
MCS 0.1ml	0.100	0.139	0.000	0.000
RB 0.1ml	0.100	0.000	0.000	0.000
LCS FID 0.1ml	0.100	1.445	1.000	1.227
LCSD FID 0.1ml	0.100	1.470	1.007	1.226
P1907040-001 0.1ml	0.100	1.562	0.000	0.000
P1907040-002 0.1ml	0.100	0.969	0.000	0.000
P1907040-003 0.1ml	0.100	2.460	0.000	0.000
P1907040-004 0.1	0.100	0.000	0.000	0.000
P1907040-004 MS 0.1ml	0.100	1.249	0.912	1.125
P1907040-004 MSD 0.1r	0.100	1.232	0.954	1.165
STD S32-05221901		90.916	96.270	95.571
ACTUAL		101.50	100.90	101.40
%Difference		10.4%	4.6%	5.7%

FINAL HEAD SPACE RESULT (ppm)

	Methane	Ethylene	Ethane
WWt.	16.04	28.05	30.07
HENRY'S CONSTANT	3.76E+04	1.02E+04	2.63E+04
RL	1.30	1.00	0.60
MCS 0.1ml	1.390	0.000	0.000
LCS FID 0.1ml	14.450	10.000	12.270
LCSD FID 0.1ml	14.700	10.070	12.260
P1907040-001 0.1ml	15.620	0.000	0.000
P1907040-002 0.1ml	9.690	0.000	0.000
P1907040-003 0.1ml	24.600	0.000	0.000
P1907040-004 0.1	0.000	0.000	0.000
P1907040-004 MS 0.1ml	12.490	9.120	11.250
P1907040-004 MSD 0.1ml	12.320	9.540	11.650

Quantitation Report (QT Reviewed)

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 11:58:00
Operator : WH/LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 11:07:37 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

LD
11/25

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

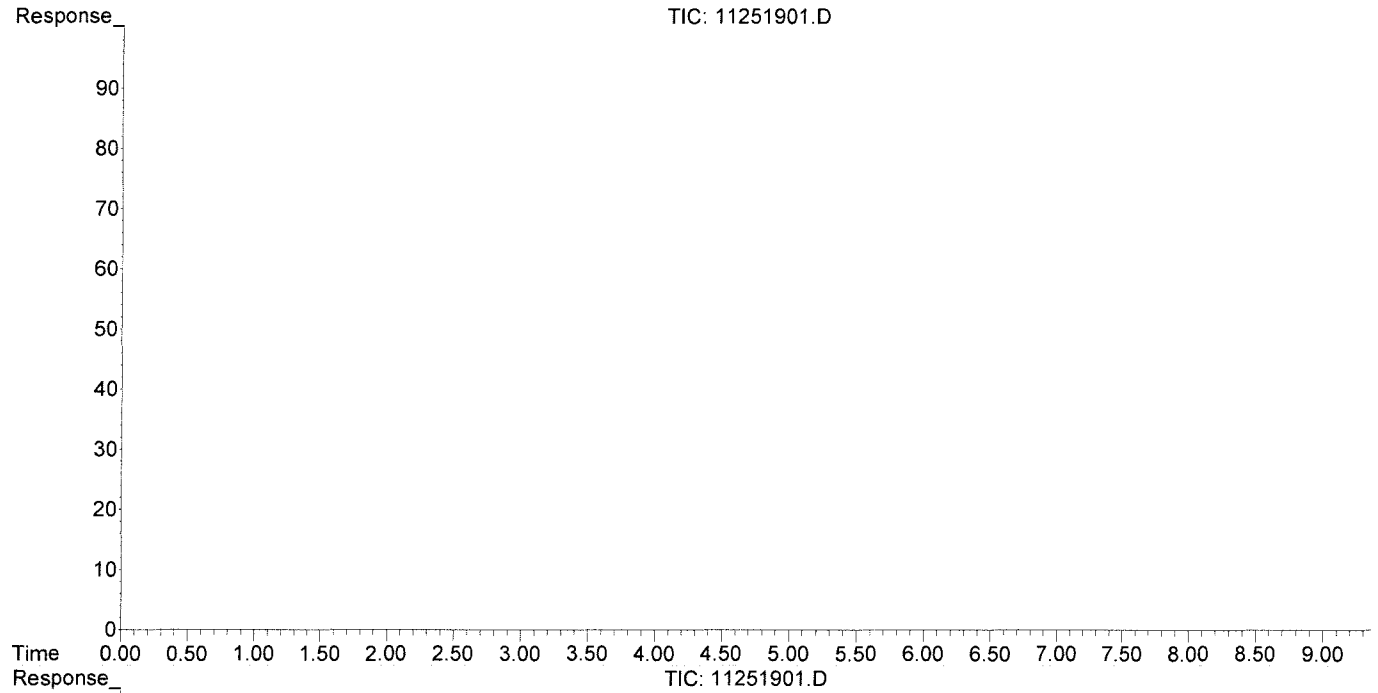
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.122	811249	89.437	ppm
7)	Ethylene	1.697	1587999	94.895	ppm
8)	Ethane	1.965	1595980	94.157	ppm
9)	Propylene	4.336	2314854	98.792	ppm
10)	Propane	4.459	2376881	95.533	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

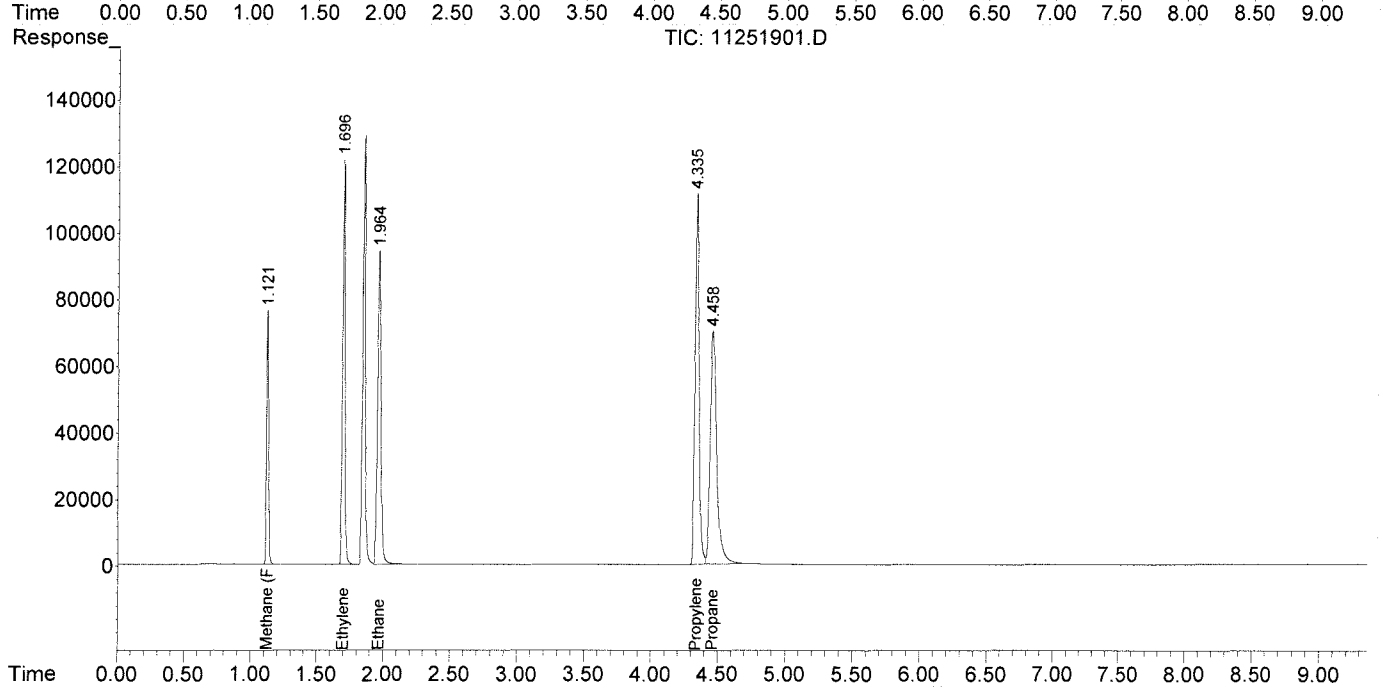
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 11:58:00
Operator : WH/LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 11:07:37 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:59:39
Operator : WH/LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 14:14:15 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

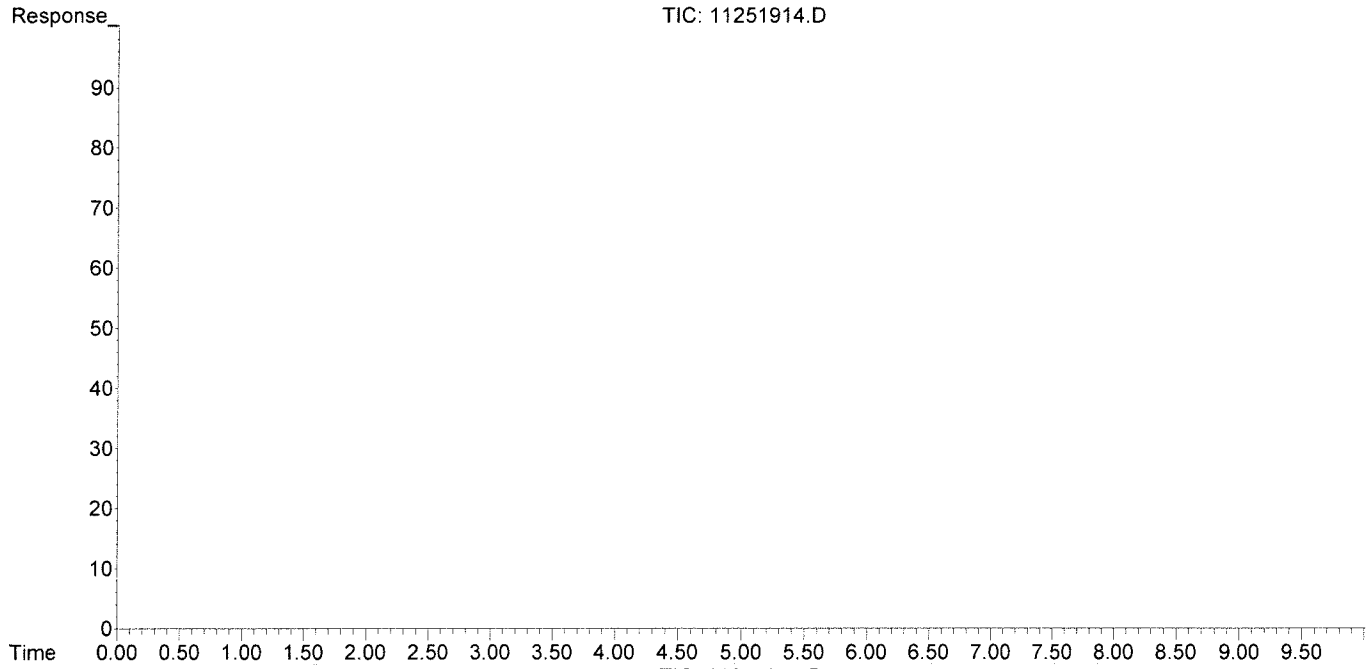
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Oxygen/Argon	0.000	0	N.D.	ppm
2)	Carbon monoxide	0.000	0	N.D.	ppm
3)	Methane (TCD)	0.000	0	N.D.	ppm
4)	Carbon dioxide	0.000	0	N.D.	ppm
6)	Methane (FID)	1.120	824669	90.916	ppm
7)	Ethylene	1.688	1611008	96.270	ppm
8)	Ethane	1.954	1619948	95.571	ppm
9)	Propylene	4.329	2346490	100.142	ppm
10)	Propane	4.452	2414278	97.036	ppm
11)	Isobutylene	0.000	0	N.D.	ppm
12)	Isobutane	0.000	0	N.D.	ppm
13)	n-Butane	0.000	0	N.D.	ppm

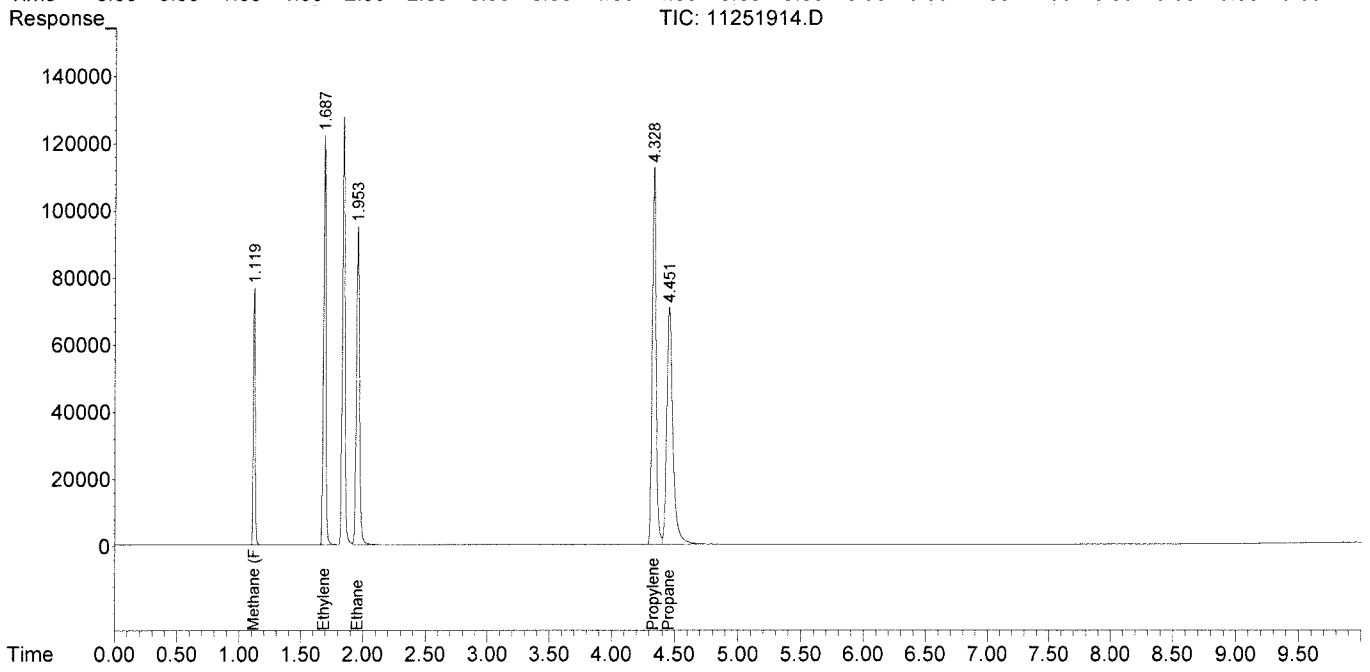
(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_11\25\
Data File : 11251914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 25-Nov-2019, 14:59:39
Operator : WH/LD
Sample : STD S32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Nov 25 14:14:15 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Injection Log

Directory: I:\GC10\DATA\RSK_FID\2017_09\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Sep-17, 08:38:08	09121701.D	test		MC	RSKBOTH.M	
2	12-Sep-17, 10:52:40	09121702.D	0.151ppm 0.250ml s32-09121702		MC	RSKBOTH.M	Curve
3	12-Sep-17, 11:05:49	09121703.D	0.302ppm 0.5ml s32-09121702		MC	RSKBOTH.M	Curve
4	12-Sep-17, 11:45:34	09121704.D	1.51ppm 0.1ml s32-09051701		MC	RSKBOTH.M	Curve
5	12-Sep-17, 12:09:33	09121705.D	4.53ppm 0.3ml s32-09051701		MC	RSKBOTH.M	Curve
6	12-Sep-17, 12:30:23	09121706.D	10.57ppm 0.7ml s32-09051701		MC	RSKBOTH.M	Curve
7	12-Sep-17, 12:47:18	09121707.D	200ppm 0.1ml s32-09121701		MC	RSKBOTH.M	Curve
8	12-Sep-17, 13:00:22	09121708.D	600ppm 0.3ml s32-09121701		MC	RSKBOTH.M	Curve
9	12-Sep-17, 13:47:48	09121709.D	1000ppm 0.5ml s32-09121701		MC	RSKBOTH.M	Curve
10	12-Sep-17, 14:07:58	09121710.D	2000ppm 1ml s32-09121701		MC	RSKBOTH.M	Curve
11	12-Sep-17, 14:48:48	09121711.D	4000ppm 0.1ml s32-08231701		MC	RSKBOTH.M	Curve
12	12-Sep-17, 15:21:51	09121712.D	20000ppm 0.5ml s32-08231701		MC	RSKBOTH.M	Curve
13	12-Sep-17, 15:38:59	09121713.D	mb 0.5ml		MC	RSKBOTH.M	Pass
14	12-Sep-17, 15:55:35	09121714.D	mb 0.1ml		MC	RSKBOTH.M	Pass
15	12-Sep-17, 16:15:26	09121715.D	icv s30-05241604		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2019_11\25\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	25-Nov-19, 11:58:00	11251901.D	STD S32-05221901		WH/LD	RSKBOTH.M	pass
2	25-Nov-19, 12:09:26	11251902.D	RB 0.1ml		WH/LD	RSKBOTH.M	pass
3	25-Nov-19, 12:23:25	11251903.D	MCS 0.1ml		WH/LD	RSKBOTH.M	pass
4	25-Nov-19, 12:39:32	11251904.D	xxxxLCS FID 0.1ml		WH/LD	RSKBOTH.M	fail
5	25-Nov-19, 12:54:16	11251905.D	xxxLCS		WH/LD	RSKBOTH.M	fail
6	25-Nov-19, 13:13:54	11251906.D	LCS FID 0.1ml		WH/LD	RSKBOTH.M	pass
7	25-Nov-19, 13:26:49	11251907.D	LCSD FID 0.1ml		WH/LD	RSKBOTH.M	pass
8	25-Nov-19, 13:39:41	11251908.D	P1907040-001 0.1ml		WH/LD	RSKBOTH.M	
9	25-Nov-19, 13:54:05	11251909.D	P1907040-002 0.1ml		WH/LD	RSKBOTH.M	
10	25-Nov-19, 14:07:13	11251910.D	P1907040-003 0.1ml		WH/LD	RSKBOTH.M	
11	25-Nov-19, 14:20:05	11251911.D	P1907040-004 0.1		WH/LD	RSKBOTH.M	
12	25-Nov-19, 14:33:26	11251912.D	P1907040-004 MS 0.1ml		WH/LD	RSKBOTH.M	
13	25-Nov-19, 14:46:48	11251913.D	P1907040-004 MSD 0.1ml		WH/LD	RSKBOTH.M	
14	25-Nov-19, 14:59:39	11251914.D	STD S32-05221901		WH/LD	RSKBOTH.M	pass
15	25-Nov-19, 15:14:17	11251915.D	K1910833-001 0.1ml		WH/LD	RSKBOTH.M	
16	25-Nov-19, 15:26:59	11251916.D	K1910833-002 0.1ml		WH/LD	RSKBOTH.M	
17	25-Nov-19, 15:39:56	11251917.D	K1910833-003 0.1ml		WH/LD	RSKBOTH.M	
18	25-Nov-19, 15:52:52	11251918.D	K1910833-004 0.1ml		WH/LD	RSKBOTH.M	
19	25-Nov-19, 16:05:53	11251919.D	K1910833-005 0.1ml		WH/LD	RSKBOTH.M	
20	25-Nov-19, 16:18:50	11251920.D	K1910833-006 0.1		WH/LD	RSKBOTH.M	
21	25-Nov-19, 16:31:42	11251921.D	K1910833-007 0.1		WH/LD	RSKBOTH.M	
22	25-Nov-19, 17:03:12	11251922.D	K1910833-008 0.1		WH/LD	RSKBOTH.M	
23	25-Nov-19, 17:48:48	11251923.D	STD S32-05221901		WH/LD	RSKBOTH.M	pass

HS19110684 8260 Raw Data

ALS WO# HS19110684

MSVOA06 -Logbook

Batch: 38366 **Analyst:** Presenta Cabascango

Date: 11-18-2019 **Reviewer:**

Method: 8260 **Laboratory:** Houston

Comments:

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	11-18-2019 01:23 pm	1.00	50 mL	50 mL	X111801.D	Liquid	Y	NA
	Auto find/ purged									
2	VSTD000.25	ICAL1	11-18-2019 01:47 pm	1.00	50 mL	50 mL	X111802.D	Liquid	Y	NA
	0.10 uL cal std/100 mL DI									
3	VSTD000.5	ICAL2	11-18-2019 02:35 pm	1.00	50 mL	50 mL	X111803.D	Liquid	Y	NA
	0.10 uL cal std/50 mL DI									
4	VSTD001	ICAL3	11-18-2019 02:59 pm	1.00	50 mL	50 mL	X111804.D	Liquid	Y	NA
	0.20 uL cal std/50 mL DI									
5	VSTD002	ICAL4	11-18-2019 03:23 pm	1.00	50 mL	50 mL	X111805.D	Liquid	Y	NA
	0.40 uL cal std/50 mL DI									
6	VSTD005	ICAL5	11-18-2019 03:47 pm	1.00	50 mL	50 mL	X111806.D	Liquid	Y	NA
	1.0 uL cal std/50 mL DI									
7	VSTD020	ICAL6	11-18-2019 04:11 pm	1.00	50 mL	50 mL	X111807.D	Liquid	Y	NA
	4.0 uL cal std/50 mL DI									
8	VSTD050	ICAL7	11-18-2019 04:35 pm	1.00	50 mL	50 mL	X111808.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
9	VSTD100	ICAL8	11-18-2019 04:59 pm	1.00	50 mL	50 mL	X111809.D	Liquid	Y	NA
	20 uL cal std/50 mL DI									
10	VSTD150	ICAL9	11-18-2019 05:22 pm	1.00	50 mL	50 mL	X111810.D	Liquid	Y	NA
	30 uL cal std/50 mL DI									
11	VSTD200	ICAL	11-18-2019 05:46 pm	1.00	50 mL	50 mL	X111811.D	Liquid	Y	NA
	40 uL cal std/50 mL DI									
12	BLANK	SAMP	11-18-2019 06:10 pm	1.00	50 mL	50 mL	X111812.D	Liquid	Y	NA
13	BLANK	SAMP	11-18-2019 06:34 pm	1.00	50 mL	50 mL	X111813.D	Liquid	Y	NA
14	CCV	ICCV	11-18-2019 06:58 pm	1.00	50 mL	50 mL	X111814.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
15	BLANK	SAMP	11-18-2019 07:22 pm	1.00	50 mL	50 mL	X111815.D	Liquid	Y	NA
16	BFB	TUNE	11-18-2019 07:47 pm	1.00	50 mL	50 mL	Y111801.D	Liquid	Y	NA
	Auto find/ purged									
17	CCV	CCV	11-18-2019 08:10 pm	1.00	50 mL	50 mL	Y111802a.D	Liquid	Y	NA
	10 uL cal std/50 mL DI/ not used									
18	CCV	CCV	11-18-2019 08:34 pm	1.00	50 mL	50 mL	Y111803.D	Liquid	Y	NA
	10 uL cal std/50 mL DI									
19	CCB	SAMP	11-18-2019 08:58 pm	1.00	50 mL	50 mL	Y111804.D	Liquid	Y	NA
20	VLCSW-191118	LCS	11-18-2019 09:22 pm	1.00	50 mL	50 mL	Y111805.D	Liquid	Y	NA
	4.0 uL cal std/50 mL DI									
21	BLK	SAMP	11-18-2019 09:46 pm	1.00	50 mL	50 mL	Y111806.D	Liquid	Y	NA
22	VBLKW-191118	MBLK	11-18-2019 10:10 pm	1.00	50 mL	50 mL	Y111807.D	Liquid	Y	NA
23	HS19110861-01	SAMP	11-18-2019 10:34 pm	1.00	50 mL	50 mL	Y111808.D	Liquid	Y	NA
24	HS19110861-02	SAMP	11-18-2019 10:59 pm	1.00	50 mL	50 mL	Y111809.D	Liquid	Y	NA
25	HS19110861-03	SAMP	11-18-2019 11:23 pm	1.00	50 mL	50 mL	Y111810.D	Liquid	Y	NA
26	HS19110861-04	SAMP	11-18-2019 11:47 pm	1.00	50 mL	50 mL	Y111811.D	Liquid	Y	NA
27	HS19110861-05	SAMP	11-19-2019 12:11 am	1.00	50 mL	50 mL	Y111812.D	Liquid	Y	NA
28	HS19110861-06	SAMP	11-19-2019 12:35 am	1.00	50 mL	50 mL	Y111813.D	Liquid	Y	NA
29	HS19110829-13	SAMP	11-19-2019 12:59 am	1.00	50 mL	50 mL	Y111814.D	Liquid	Y	NA
30	HS19110829-11	SAMP	11-19-2019 01:23 am	1.00	50 mL	50 mL	Y111815.D	Liquid	Y	NA
31	HS19110829-01	SAMP	11-19-2019 01:47 am	1.00	50 mL	50 mL	Y111816.D	Liquid	Y	NA
32	HS19110829-01MS	MS	11-19-2019 02:11 am	1.00	50 mL	50 mL	Y111817.D	Liquid	Y	NA
	3.50 uL cal std/40 mL samp									

MSVOA06 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
33	HS19110829-01MSD	MSD	11-19-2019 02:35 am	1.00	50 mL	50 mL	Y111818.D	Liquid	Y	NA
	3.5 uL cal std/40 mL samp									
34	HS19110829-02	SAMP	11-19-2019 02:59 am	1.00	50 mL	50 mL	Y111819.D	Liquid	Y	NA
35	HS19110829-03	SAMP	11-19-2019 03:23 am	1.00	50 mL	50 mL	Y111820.D	Liquid	Y	NA
36	HS19110829-04	SAMP	11-19-2019 03:47 am	1.00	50 mL	50 mL	Y111821.D	Liquid	Y	NA
37	HS19110829-05	SAMP	11-19-2019 04:11 am	1.00	50 mL	50 mL	Y111822.D	Liquid	Y	NA
38	HS19110829-06	SAMP	11-19-2019 04:35 am	1.00	50 mL	50 mL	Y111823.D	Liquid	Y	NA
39	HS19110829-07	SAMP	11-19-2019 04:59 am	1.00	50 mL	50 mL	Y111824.D	Liquid	Y	NA
40	HS19110829-08	SAMP	11-19-2019 05:23 am	1.00	50 mL	50 mL	Y111825.D	Liquid	Y	NA
41	HS19110829-09	SAMP	11-19-2019 05:47 am	1.00	50 mL	50 mL	Y111826.D	Liquid	Y	NA
42	HS19110829-10	SAMP	11-19-2019 06:11 am	1.00	50 mL	50 mL	Y111827.D	Liquid	Y	NA
43	HS19110829-12	SAMP	11-19-2019 06:36 am	1.00	50 mL	50 mL	Y111828.D	Liquid	Y	NA
44	HS19110716-06	SAMP	11-19-2019 07:00 am	1.00	50 mL	50 mL	Y111829.D	Liquid	Y	NA

Chemical	Value
SURR SPK ID	31106-04-03
IS ID	31106-04-04
ICV STD ID	30603-92-01
LCS/MS ID	30603-92-01
CAL STD ID	31106-04-01/02
BFB ID	31106-04-03
pH Paper	634-64-11

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	50.00	52.07	104	80-120
trans-1,3-Dichloroprope	50.00	51.83	104	80-120
1,3-Dichlorobenzene	50.00	50.58	101	80-120
2,2-Dichloropropane	50.00	52.35	105	80-120
1,1-Dichloropropene	50.00	49.88	100	80-120
Dibromomethane	50.00	50.50	101	80-120
1,2-Dibromoethane	50.00	50.00	100	80-120
trans-1,2-Dichloroethen	50.00	52.31	105	80-120
1,1,1,2-Tetrachloroetha	50.00	51.37	103	80-120
1,1,1-Trichloroethane	50.00	52.74	105	80-120
1,1,2,2-Tetrachloroetha	50.00	49.68	99	80-120
Toluene	50.00	49.55	99	80-120
1,1,2-Trichloroethane	50.00	49.22	98	80-120
1,1-Dichloroethane	50.00	51.46	103	80-120
1,1-Dichloroethene	50.00	53.02	106	80-120
Trichlorofluoromethane	50.00	55.57	111	80-120
1,2,3-Trichlorobenzene	50.00	58.28	116	80-120
Tetrachloroethene	50.00	49.33	99	80-120
1,2,4-Trichlorobenzene	50.00	55.34	111	80-120
1,2,4-Trimethylbenzene	50.00	50.40	101	80-120
tert-Butylbenzene	50.00	51.37	103	80-120
Trichloroethene	50.00	51.78	104	80-120
1,2-Dichlorobenzene	50.00	49.42	99	80-120
1,2-Dichloroethane	50.00	51.38	103	80-120
1,2-Dichloropropane	50.00	49.50	99	80-120
1,3,5-Trimethylbenzene	50.00	52.04	104	80-120
1,3-Dichloropropane	50.00	49.18	98	80-120
1,4-Dichlorobenzene	50.00	49.63	99	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM III VOA

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
2-Butanone	100.00	105.25	105	80-120
2-Chlorotoluene	50.00	50.41	101	80-120
2-Hexanone	100.00	96.09	96	80-120
4-Chlorotoluene	50.00	50.58	101	80-120
Styrene	50.00	50.35	101	80-120
4-Methyl-2-Pentanone	100.00	97.68	98	80-120
Acetone	100.00	111.37	111	80-120
Benzene	50.00	50.85	102	80-120
Bromobenzene	50.00	51.16	102	80-120
Bromochloromethane	50.00	51.34	103	80-120
Bromodichloromethane	50.00	51.00	102	80-120
Bromoform	50.00	49.08	98	80-120
Bromomethane	50.00	57.73	115	80-120
Carbon Disulfide	100.00	109.76	110	80-120
Carbon Tetrachloride	50.00	51.07	102	80-120
Chlorobenzene	50.00	49.20	98	80-120
Chloroethane	50.00	51.64	103	80-120
Chloroform	50.00	49.36	99	80-120
Chloromethane	50.00	50.43	101	80-120
cis-1,2-Dichloroethene	50.00	53.16	106	80-120
Dibromochloromethane	50.00	49.93	100	80-120
Dichlorodifluoromethane	50.00	52.99	106	80-120
Ethylbenzene	50.00	50.22	100	80-120
Hexachlorobutadiene	50.00	61.69	123*	80-120
Isopropylbenzene	50.00	50.14	100	80-120
m,p-Xylenes	100.00	101.69	102	80-120
Methylene Chloride	50.00	49.65	99	80-120
n-Butylbenzene	50.00	52.07	104	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM 3
WATER VOLATILE METHOD SPIKE RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Matrix Spike - Sample No.: ICV

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE AMOUNT ()	% REC #	QC. LIMITS REC.
n-Propylbenzene	50.00	51.90	104	80-120
Naphthalene	50.00	51.04	102	80-120
o-Xylene	50.00	49.72	99	80-120
sec-Butylbenzene	50.00	51.77	104	80-120
Vinyl Chloride	50.00	51.98	104	80-120
1,2,3-Trichloropropane	50.00	49.40	99	80-120
p-Isopropyltoluene	50.00	51.77	104	80-120
1,2-Dibromo-3-Chloropro	50.00	51.39	103	80-120
Freon TF	50.00	55.79	112	80-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM III VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Lab File ID: X111801 BFB Injection Date: 11/18/19

Instrument ID: VOA6 BFB Injection Time: 1323

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	20.9
75	30.0 - 60.0% of mass 95	54.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.4 (0.7)1
174	Greater than 50.0% of mass 95	65.0
175	5.0 - 9.0% of mass 174	5.8 (8.9)1
176	95.0 - 101.0% of mass 174	62.0 (95.4)1
177	5.0 - 9.0% of mass 176	5.1 (8.2)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	X111802	11/18/19	1347
02	VSTD000.5	VSTD000.5	X111803	11/18/19	1435
03	VSTD001	VSTD001	X111804	11/18/19	1459
04	VSTD002	VSTD002	X111805	11/18/19	1523
05	VSTD005	VSTD005	X111806	11/18/19	1547
06	VSTD020	VSTD020	X111807	11/18/19	1611
07	VSTD050	VSTD050	X111808	11/18/19	1635
08	VSTD100	VSTD100	X111809	11/18/19	1659
09	VSTD150	VSTD150	X111810	11/18/19	1722
10	VSTD200	VSTD200	X111811	11/18/19	1746
11	ICV	ICV	X111814	11/18/19	1858
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM V VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Instrument ID: VOA6 Calibration Date(s): 11/18/19 11/18/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1347 1746

LAB FILE ID: RF0.25: X111802 RF0.5: X111803 RF1: X111804
RF2: X111805 RF5: X111806 RF20: X111807

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
cis-1,3-Dichloropropene		0.326	0.553	0.497	0.554	0.476
trans-1,3-Dichloropropene		0.304	0.464	0.458	0.504	0.445
1,3-Dichlorobenzene		1.036	1.601	1.542	1.622	1.411
2,2-Dichloropropane		0.547	0.815	0.674	0.705	0.610
1,1-Dichloropropene		0.332	0.476	0.441	0.432	0.372
Dibromomethane		0.139	0.244	0.233	0.245	0.207
1,2-Dibromoethane		0.245	0.385	0.380	0.402	0.348
trans-1,2-Dichloroethene		0.285	0.489	0.436	0.440	0.386
1,1,1,2-Tetrachloroethane		0.248	0.403	0.375	0.406	0.356
1,1,1-Trichloroethane		0.492	0.775	0.723	0.717	0.640
1,1,2,2-Tetrachloroethane		0.602	0.844	0.735	0.800	0.680
Toluene		1.077	1.582	1.498	1.570	1.359
1,1,2-Trichloroethane		0.180	0.311	0.285	0.294	0.253
1,1-Dichloroethane		0.569	0.830	0.781	0.786	0.690
1,1-Dichloroethene		0.349	0.423	0.469	0.464	0.390
Trichlorofluoromethane		0.511	0.831	0.818	0.813	0.707
1,2,3-Trichlorobenzene		421	1182	2753	6553	21856
Tetrachloroethene		0.266	0.412	0.394	0.398	0.333
1,2,4-Trichlorobenzene		0.325	0.435	0.465	0.518	0.418
1,2,4-Trimethylbenzene		1.739	2.619	2.442	2.563	2.286
tert-Butylbenzene		1.338	2.168	2.060	2.126	1.865
Trichloroethene		0.226	0.390	0.387	0.396	0.344
1,2-Dichlorobenzene		0.916	1.484	1.429	1.497	1.292
1,2-Dichloroethane		0.277	0.470	0.408	0.432	0.391
1,2-Dichloropropane		0.294	0.294	0.312	0.339	0.284
1,3,5-Trimethylbenzene		1.606	2.354	2.372	2.481	2.215
1,3-Dichloropropane		0.431	0.613	0.570	0.583	0.512
1,4-Dichlorobenzene		1.108	1.632	1.581	1.609	1.417
2-Butanone		0.167	0.156	0.152	0.164	0.146
2-Chlorotoluene		1.263	1.990	1.903	2.032	1.735
2-Hexanone		0.180	0.237	0.204	0.235	0.191
4-Chlorotoluene		1.550	2.500	2.222	2.378	2.079
Styrene		0.702	1.134	1.076	1.148	1.004
4-Methyl-2-Pentanone		0.220	0.321	0.313	0.331	0.281
Acetone		4579	5956	7954	15992	43200
Benzene		0.788	1.327	1.220	1.289	1.109
Bromobenzene		0.584	1.003	0.940	0.994	0.873
Bromochloromethane		0.229	0.323	0.309	0.284	0.255
Bromodichloromethane		0.298	0.490	0.424	0.473	0.395
Bromoform		887	3197	5989	16084	56416
Bromomethane		2741	6334	12041	28671	93456
Carbon Disulfide		0.747	1.257	1.216	1.254	1.101
Carbon Tetrachloride		0.340	0.503	0.483	0.478	0.403
Chlorobenzene		0.738	1.108	1.028	1.090	0.934

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911068

Instrument ID: VOA6 Calibration Date(s): 11/18/19 11/18/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1347 1746

LAB FILE ID: RF0.25: X111802 RF0.5: X111803 RF1: X111804
RF2: X111805 RF5: X111806 RF20: X111807

COMPOUND	RF0.25	RF0.5	RF1	RF2	RF5	RF20
Chloroethane		0.279	0.361	0.345	0.323	0.283
Chloroform		0.775	0.990	0.890	0.850	0.736
Chloromethane		2201	6118	10461	24949	85402
cis-1,2-Dichloroethene		0.327	0.540	0.493	0.541	0.454
Dibromochloromethane		0.253	0.433	0.392	0.429	0.370
Dichlorodifluoromethane		1269	3829	7335	18346	63810
Ethylbenzene		0.353	0.562	0.515	0.576	0.493
Hexachlorobutadiene		1376	2468	4522	11525	37789
Isopropylbenzene		1.054	1.627	1.570	1.602	1.425
m,p-Xylenes		0.393	0.653	0.644	0.678	0.591
Methylene Chloride		0.422	0.556	0.483	0.491	0.406
n-Butylbenzene		1.620	2.055	2.004	2.069	1.888
n-Propylbenzene		2.290	3.358	3.192	3.345	2.976
Naphthalene		0.510	0.569	0.604	0.614	0.512
o-Xylene		0.390	0.677	0.656	0.658	0.582
sec-Butylbenzene		1.995	2.859	2.859	2.813	2.501
Vinyl Chloride		0.490	0.545	0.546	0.504	0.454
1,2,3-Trichloropropane		0.455	0.730	0.701	0.662	0.580
p-Isopropyltoluene		1.839	2.630	2.538	2.573	2.307
1,2-Dibromo-3-Chloropropane		125	464	859	2641	8805
Freon TF		0.296	0.488	0.452	0.457	0.380
4-Bromofluorobenzene		3844	5731	10468	25804	94194
Dibromofluoromethane		2303	3882	8127	20237	75094
Toluene-d8		1.628	1.327	1.357	1.369	1.263
1,2-Dichloroethane-d4		2522	4458	8034	20921	75813

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911068

Instrument ID: VOA6 Calibration Date(s): 11/18/19 11/18/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1347 1746

LAB FILE ID: RF50: X111808 RF100: X111809 RF150: X111810
RF200: X111811

COMPOUND	RF50	RF100	RF150	RF200
cis-1,3-Dichloropropene	0.499	0.494	0.497	0.493
trans-1,3-Dichloropropene	0.452	0.455	0.456	0.461
1,3-Dichlorobenzene	1.457	1.422	1.398	1.417
2,2-Dichloropropane	0.644	0.644	0.646	0.658
1,1-Dichloropropene	0.402	0.392	0.391	0.392
Dibromomethane	0.211	0.206	0.208	0.208
1,2-Dibromoethane	0.348	0.347	0.350	0.351
trans-1,2-Dichloroethene	0.410	0.413	0.416	0.427
1,1,1,2-Tetrachloroethane	0.368	0.369	0.369	0.370
1,1,1-Trichloroethane	0.673	0.676	0.678	0.697
1,1,2,2-Tetrachloroethane	0.672	0.670	0.662	0.661
Toluene	1.411	1.408	1.420	1.435
1,1,2-Trichloroethane	0.256	0.258	0.256	0.259
1,1-Dichloroethane	0.710	0.716	0.728	0.737
1,1-Dichloroethene	0.430	0.429	0.426	0.434
Trichlorofluoromethane	0.823	0.824	0.813	0.840
1,2,3-Trichlorobenzene	52554	102660	156391	210414
Tetrachloroethene	0.352	0.340	0.332	0.334
1,2,4-Trichlorobenzene	0.421	0.402	0.400	0.406
1,2,4-Trimethylbenzene	2.419	2.440	2.397	2.446
tert-Butylbenzene	2.012	2.011	1.967	1.996
Trichloroethene	0.359	0.350	0.348	0.348
1,2-Dichlorobenzene	1.330	1.327	1.324	1.344
1,2-Dichloroethane	0.401	0.397	0.397	0.398
1,2-Dichloropropane	0.295	0.290	0.290	0.290
1,3,5-Trimethylbenzene	2.368	2.377	2.339	2.377
1,3-Dichloropropane	0.516	0.521	0.514	0.516
1,4-Dichlorobenzene	1.465	1.445	1.412	1.445
2-Butanone	0.146	0.147	0.153	0.148
2-Chlorotoluene	1.853	1.827	1.787	1.800
2-Hexanone	0.192	0.201	0.204	0.204
4-Chlorotoluene	2.208	2.230	2.205	2.250
Styrene	1.056	1.073	1.093	1.113
4-Methyl-2-Pentanone	0.283	0.291	0.298	0.298
Acetone	103091	202207	284604	372223
Benzene	1.164	1.135	1.133	1.128
Bromobenzene	0.878	0.857	0.837	0.854
Bromochloromethane	0.263	0.261	0.260	0.255
Bromodichloromethane	0.412	0.408	0.412	0.412
Bromoform	143798	293256	447981	602595
Bromomethane	215480	396733	529714	
Carbon Disulfide	1.192	1.188	1.192	1.228
Carbon Tetrachloride	0.452	0.442	0.435	0.440
Chlorobenzene	0.965	0.966	0.974	0.982

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911068

Instrument ID: VOA6 Calibration Date(s): 11/18/19 11/18/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1347 1746

LAB FILE ID: RF50: X111808 RF100: X111809 RF150: X111810
RF200: X111811

COMPOUND	RF50	RF100	RF150	RF200
Chloroethane	0.311	0.311	0.310	0.311
Chloroform	0.751	0.754	0.761	0.780
Chloromethane	215753	420936	613254	811388
cis-1,2-Dichloroethene	0.470	0.475	0.478	0.488
Dibromochloromethane	0.381	0.386	0.386	0.387
Dichlorodifluoromethane	186161	359790	504807	695305
Ethylbenzene	0.512	0.509	0.506	0.512
Hexachlorobutadiene	99881	192455		
Isopropylbenzene	1.523	1.544	1.538	1.560
m,p-Xylenes	0.623	0.628	0.627	0.639
Methylene Chloride	0.421	0.425	0.428	0.436
n-Butylbenzene	2.162	2.176	2.153	2.197
n-Propylbenzene	3.234	3.176	3.089	3.155
Naphthalene	0.521	0.505	0.514	0.512
o-Xylene	0.600	0.608	0.611	0.623
sec-Butylbenzene	2.823	2.798	2.726	2.790
Vinyl Chloride	0.505	0.510	0.510	0.523
1,2,3-Trichloropropane	0.577	0.564	0.549	0.543
p-Isopropyltoluene	2.571	2.546	2.480	2.534
1,2-Dibromo-3-Chloropropane	21800	42468	65470	86827
Freon TF	0.459	0.462	0.452	0.472
4-Bromofluorobenzene	222328	465570	688600	933083
Dibromofluoromethane	173990	354918	514854	681300
Toluene-d8	1.212	1.246	1.223	1.231
1,2-Dichloroethane-d4	178006	364646	532181	713282

FORM VI VOA

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911068

Instrument ID: VOA6 Calibration Date(s): 11/18/19 11/18/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1347 1746

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
cis-1,3-Dichloropropene	AVRG		0.48761342		13.630	15.000
trans-1,3-Dichloropropene	AVRG		0.44441818		12.432	15.000
1,3-Dichlorobenzene	AVRG		1.43390401		11.978	15.000
2,2-Dichloropropane	AVRG		0.66029305		11.040	15.000
1,1-Dichloropropene	AVRG		0.40332539		10.380	15.000
Dibromomethane	AVRG		0.21136309		14.886	15.000
1,2-Dibromoethane	AVRG		0.35067597		12.763	15.000
trans-1,2-Dichloroethene	AVRG		0.41138839		13.381	15.000
1,1,1,2-Tetrachloroethane	AVRG		0.36274186		12.717	15.000
1,1,1-Trichloroethane	AVRG		0.67453438		11.648	15.000
1,1,2,2-Tetrachloroethane	AVRG		0.70308768		10.825	15.000
Toluene	AVRG		1.41788930		10.479	15.000
1,1,2-Trichloroethane	AVRG		0.26137158		14.102	15.000
1,1-Dichloroethane	AVRG		0.72750643		10.197	15.000
1,1-Dichloroethene	AVRG		0.42373367		8.607	15.000
Trichlorofluoromethane	AVRG		0.77561874		13.736	15.000
1,2,3-Trichlorobenzene	2ORDR	-1.73e-002	5.50264123	-0.1707432	0.9998373	0.9900000
Tetrachloroethene	AVRG		0.35131312		12.801	15.000
1,2,4-Trichlorobenzene	AVRG		0.42118311		12.391	15.000
1,2,4-Trimethylbenzene	AVRG		2.37245105		10.778	15.000
tert-Butylbenzene	AVRG		1.94917789		12.586	15.000
Trichloroethene	AVRG		0.34966887		14.517	15.000
1,2-Dichlorobenzene	AVRG		1.32701574		12.905	15.000
1,2-Dichloroethane	AVRG		0.39691390		12.978	15.000
1,2-Dichloropropane	AVRG		0.29867989		5.660	15.000
1,3,5-Trimethylbenzene	AVRG		2.27648393		11.444	15.000
1,3-Dichloropropane	AVRG		0.53064503		9.928	15.000
1,4-Dichlorobenzene	AVRG		1.45709302		10.715	15.000
2-Butanone	AVRG		0.15342086		5.109	15.000
2-Chlorotoluene	AVRG		1.79889065		12.374	15.000
2-Hexanone	AVRG		0.20539492		9.225	15.000
4-Chlorotoluene	AVRG		2.18043218		12.121	15.000
Styrene	AVRG		1.04451403		12.966	15.000
4-Methyl-2-Pentanone	AVRG		0.29296235		10.958	15.000
Acetone	LINR	-7.72e-002	8.02348321		0.9999004	0.9900000
Benzene	AVRG		1.14377224		13.444	15.000
Bromobenzene	AVRG		0.86897432		14.186	15.000
Bromochloromethane	AVRG		0.27086566		10.835	15.000
Bromodichloromethane	AVRG		0.41377448		13.021	15.000
Bromoform	LINR	1.997e-002	3.29171060		0.9995506	0.9900000
Bromomethane	LINR	-4.72e-002	2.10632186		0.9967362	0.9900000
Carbon Disulfide	AVRG		1.15275096		13.789	15.000
Carbon Tetrachloride	AVRG		0.44181701		10.990	15.000
Chlorobenzene	AVRG		0.97614522		10.975	15.000

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911068

Instrument ID: VOA6 Calibration Date(s): 11/18/19 11/18/19

Column: DB624 ID: 0.18 (mm) Calibration Time(s): 1347 1746

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2	MAX %RSD OR R^2
Chloroethane	AVRG		0.31480657		8.302	15.000
Chloroform	AVRG		0.80974969		10.425	15.000
Chloromethane	LINR	3.748e-003	1.83460007		0.9998260	0.9900000
cis-1,2-Dichloroethene	AVRG		0.47416954		13.204	15.000
Dibromochloromethane	AVRG		0.37970849		13.683	15.000
Dichlorodifluoromethane	LINR	1.763e-002	2.15619239		0.9988587	0.9900000
Ethylbenzene	AVRG		0.50436028		12.486	15.000
Hexachlorobutadiene	LINR	-1.03e-002	2.88504774		0.9991601	0.9900000
Isopropylbenzene	AVRG		1.49389834		11.672	15.000
m,p-Xylenes	AVRG		0.60861655		13.850	15.000
Methylene Chloride	AVRG		0.45210476		10.732	15.000
n-Butylbenzene	AVRG		2.03598696		9.063	15.000
n-Propylbenzene	AVRG		3.09059969		10.434	15.000
Naphthalene	AVRG		0.54020307		8.055	15.000
o-Xylene	AVRG		0.60066696		14.145	15.000
sec-Butylbenzene	AVRG		2.68486077		10.468	15.000
Vinyl Chloride	AVRG		0.50958661		5.494	15.000
1,2,3-Trichloropropane	AVRG		0.59573805		14.502	15.000
p-Isopropyltoluene	AVRG		2.44651692		10.015	15.000
1,2-Dibromo-3-Chloropropane	LINR	-6.81e-003	12.9714748		0.9998714	0.9900000
Freon TF	AVRG		0.43530320		13.846	15.000
4-Bromofluorobenzene	LINR	8.357e-003	2.13170980		0.9997055	0.9900000
Dibromofluoromethane	LINR	7.36e-003	2.18334297		0.9997712	0.9900000
Toluene-d8	AVRG		1.31739803		9.895	15.000
1,2-Dichloroethane-d4	LINR	1.473e-002	2.09453233		0.9994184	0.9900000

FORM VI VOA

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111801.D

Date : 18-NOV-2019 13:23

Client ID: BFB

Instrument: voa6.i

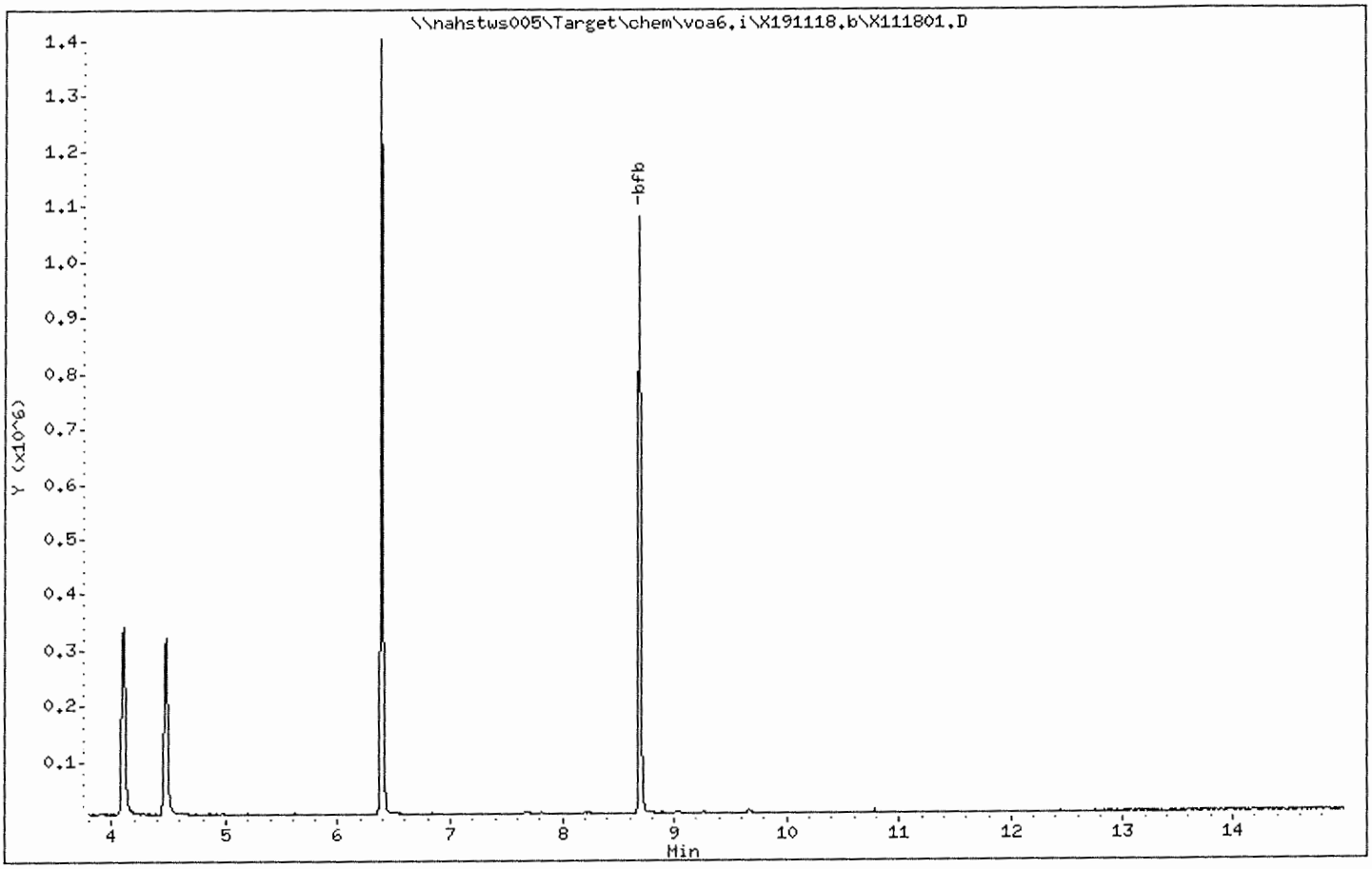
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111801.D

Date : 18-NOV-2019 13:23

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

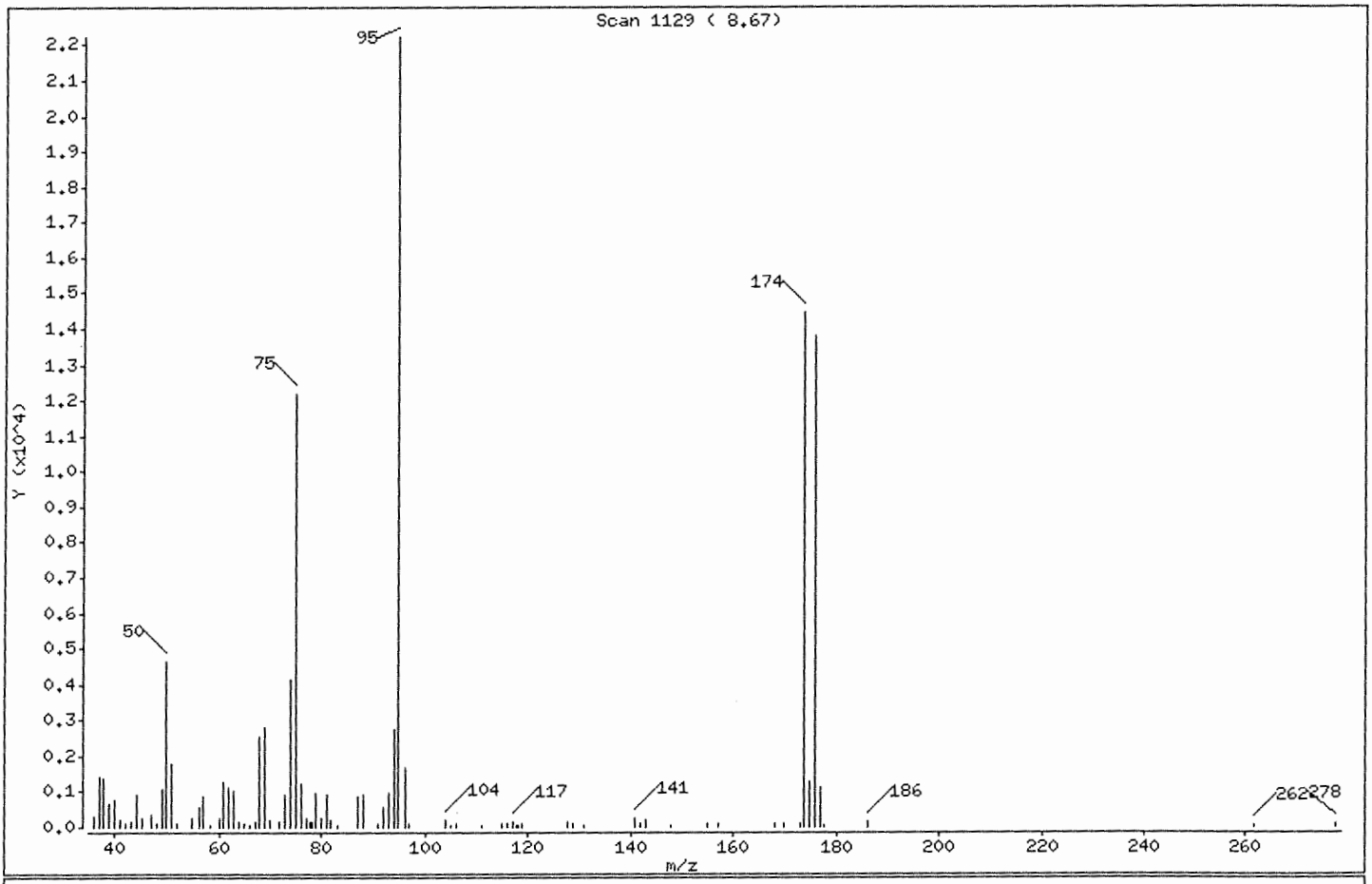
Volume Injected (uL): 2.0

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	20.86
75	30.00 - 60.00% of mass 95	54.86
96	5.00 - 9.00% of mass 95	7.62
173	Less than 2.00% of mass 174	0.43 (0.66)
174	Greater than 50.00% of mass 95	65.03
175	5.00 - 9.00% of mass 174	5.82 (8.95)
176	95.00 - 101.00% of mass 174	62.04 (95.41)
177	5.00 - 9.00% of mass 176	5.11 (8.24)

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111801.D

Date : 18-NOV-2019 13:23

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: X111801.D
Spectrum: Scan 1129 (8.67)
Location of Maximum: 95.00
Number of points: 83

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	329	61.00	1259	81.80	217	127.90	153
37.00	1409	62.00	1149	83.00	50	128.90	116
38.00	1370	62.90	1001	86.90	880	130.90	70
39.00	662	64.00	138	88.00	941	141.00	249
40.00	775	65.10	110	91.10	116	141.90	94
41.00	191	66.00	72	92.10	565	142.90	216
42.00	77	67.10	153	93.00	990	148.10	62
43.00	166	68.00	2578	94.00	2783	155.00	87
44.10	928	69.00	2816	95.00	22224	157.00	77
45.10	261	69.90	217	96.10	1694	168.00	85
47.00	367	71.90	143	97.00	111	170.00	86
48.10	104	73.00	931	103.90	180	172.90	96
49.00	1057	74.00	4135	105.10	52	173.90	14452
50.00	4636	75.00	12193	106.00	100	174.90	1293
51.00	1802	76.00	1227	111.10	63	175.90	13788
52.10	85	77.10	248	115.10	93	176.90	1136
55.00	269	77.80	150	116.00	100	177.80	71
56.10	539	78.10	174	117.00	158	186.00	161
56.90	843	78.90	948	117.70	74	261.90	57
58.20	60	79.90	265	118.10	74	277.90	85
60.00	231	80.90	936	119.00	127		

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111802.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111802.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 18-NOV-2019 13:47
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 17:46 Cal File: X111811.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

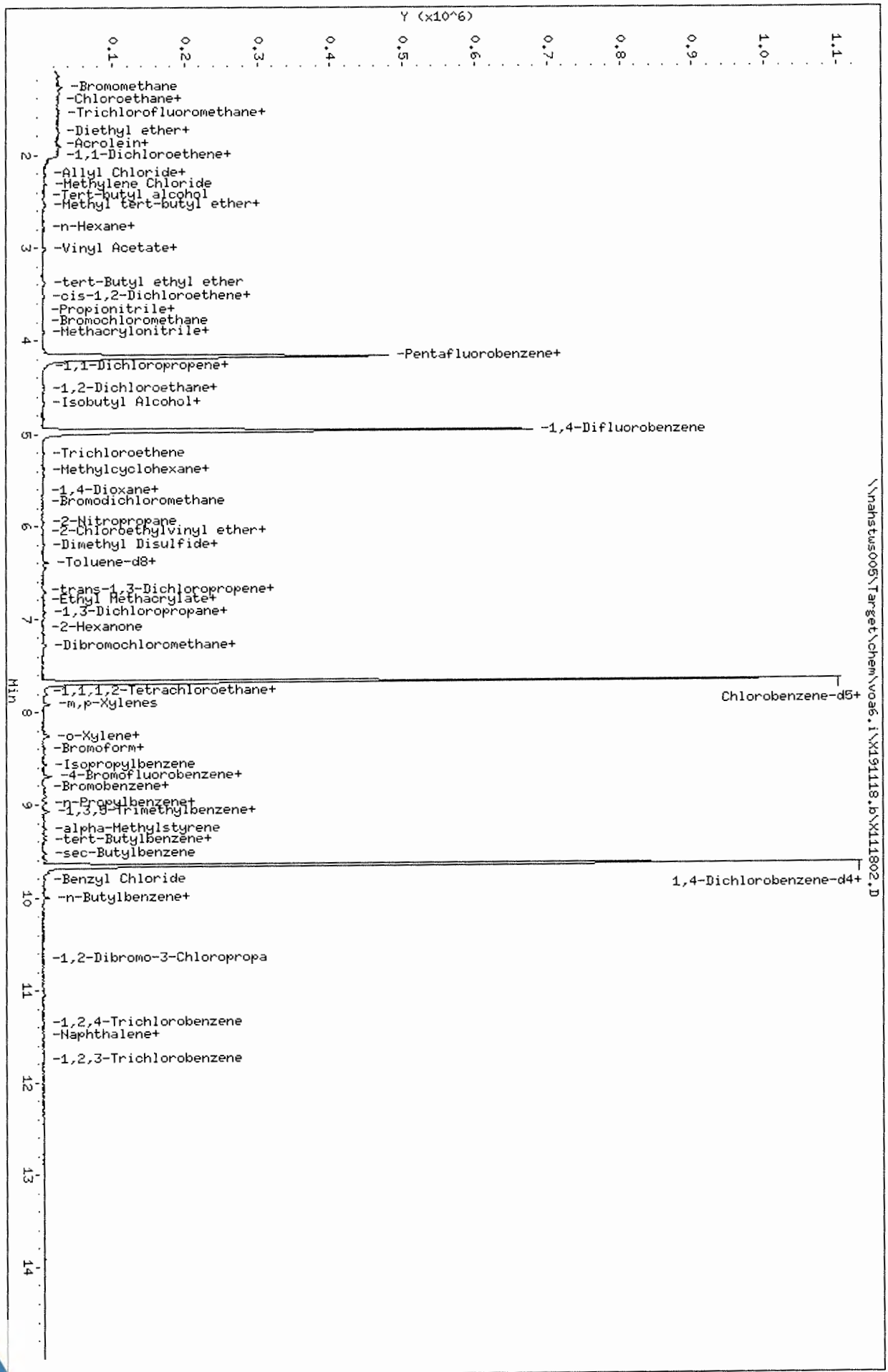
Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.182	4.182	(1.000)	431958	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	586737	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	529029	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.662	9.662	(1.000)	277425	50.0000	
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	1323	0.25000	1.05(Ta)
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	3260	0.25000	1.07(a)
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	1295	0.25000	0.69(a)
$	48 Toluene-d8	98	6.388	6.388	(0.833)	5247	0.25000	0.37(Ta)
	60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	814	0.25000	0.21(a)
	31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	1177	0.25000	0.20(a)
	68 1,1,2,2-Tetrachloroethane	83	8.845	8.845	(0.915)	861	0.25000	0.22(aM)
	138 Freon TF	101	1.912	1.912	(0.457)	755	0.25000	0.20(aM)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	656	0.25000	0.23(aM)
	22 1,1-Dichloroethane	63	2.922	2.922	(0.699)	1571	0.25000	0.24(aM)
	11 1,1-Dichloroethene	96	1.919	1.919	(0.459)	909	0.25000	0.24(a)
	32 1,1-Dichloropropene	75	4.283	4.283	(0.862)	1579	0.25000	0.33(a)
	93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.216)	224	0.25000	(aM)
	71 1,2,3-Trichloropropane	75	8.867	8.867	(0.918)	702	0.25000	0.21(aM)
	90 1,2,4-Trichlorobenzene	180	11.345	11.345	(1.174)	320	0.25000	0.13(aM)
	79 1,2,4-Trimethylbenzene	105	9.383	9.383	(0.971)	2742	0.25000	0.20(a)
	89 1,2-Dibromo-3-Chloropropane	155	10.658	10.658	(1.103)	103	0.25000	(aM)
	57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	708	0.25000	0.19(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	9.999	9.999	(1.035)	1523	0.25000	0.20(a)
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	938	0.25000	0.20(aM)
42	1,2-Dichloropropane	63	5.450	5.450	(1.097)	858	0.25000	0.24(aM)
75	1,3,5-Trimethylbenzene	105	9.075	9.075	(0.939)	2444	0.25000	0.19(a)
83	1,3-Dichlorobenzene	146	9.612	9.612	(0.995)	1534	0.25000	0.19(a)
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	1126	0.25000	0.20(a)
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.002)	1760	0.25000	0.21(a)
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	1234	0.25000	0.21(aM)
24	2-Butanone	43	3.588	3.588	(0.858)	827	0.50000	0.62(aM)
76	2-Chlorotoluene	91	8.974	8.974	(0.929)	2277	0.25000	0.22(a)
52	2-Hexanone	43	7.090	7.090	(0.924)	809	0.50000	0.37(Ta)
77	4-Chlorotoluene	91	9.075	9.075	(0.939)	2873	0.25000	0.23(a)
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	2596	0.25000	0.19(a)
45	4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	1190	0.50000	0.38(aM)
10	Acetone	43	1.969	1.969	(0.471)	3213	0.50000	(aM)
37	Benzene	78	4.519	4.519	(0.909)	3088	0.25000	0.23(a)
74	Bromobenzene	156	8.817	8.817	(0.913)	940	0.25000	0.19(a)
29	Bromochloromethane	128	3.795	3.795	(0.908)	660	0.25000	0.28(aM)
39	Bromodichloromethane	83	5.729	5.729	(1.153)	1101	0.25000	0.22(aM)
66	Bromoform	173	8.416	8.416	(1.097)	495	0.25000	1.15(aM)
6	Bromomethane	94	1.339	1.339	(0.320)	1552	0.25000	(aM)
19	Carbon Disulfide	76	2.069	2.069	(0.495)	3999	0.50000	0.40(a)
34	Carbon Tetrachloride	117	4.275	4.275	(0.860)	1084	0.25000	0.20(aM)
59	Chlorobenzene	112	7.692	7.692	(1.003)	2603	0.25000	0.25(a)
7	Chloroethane	64	1.403	1.403	(0.336)	672	0.25000	0.24(aM)
28	Chloroform	83	3.910	3.910	(0.935)	2414	0.25000	0.34(aM)
3	Chloromethane	50	1.074	1.074	(0.257)	1640	0.25000	0.53(aM)
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	1103	0.25000	0.26(a)
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	1351	0.25000	0.23(aM)
55	Dibromochloromethane	129	7.184	7.184	(0.937)	883	0.25000	0.21(a)
44	Dibromomethane	93	5.558	5.558	(1.118)	573	0.25000	0.23(aM)
2	Dichlorodifluoromethane	85	0.973	0.973	(0.233)	642	0.25000	1.04(aM)
61	Ethylbenzene	106	7.800	7.800	(1.017)	1072	0.25000	0.20(a)
91	Hexachlorobutadiene	225	11.481	11.481	(1.188)	367	0.25000	(aM)
67	Isopropylbenzene	105	8.566	8.566	(1.117)	2992	0.25000	0.18(a)
62	m,p-Xylenes	106	7.907	7.907	(1.031)	2521	0.50000	0.39(a)
17	Methylene Chloride	84	2.306	2.306	(0.551)	1174	0.25000	0.30(a)
87	n-Butylbenzene	91	9.999	9.999	(1.035)	2169	0.25000	0.19(a)
73	n-Propylbenzene	91	8.917	8.917	(0.923)	3456	0.25000	0.20(a)
92	Naphthalene	128	11.553	11.553	(1.196)	764	0.25000	0.25(a)
63	o-Xylene	106	8.244	8.244	(1.075)	1221	0.25000	0.19(a)
81	sec-Butylbenzene	105	9.526	9.526	(0.986)	3012	0.25000	0.20(a)
64	Styrene	104	8.265	8.265	(1.078)	2388	0.25000	0.21(a)
78	tert-Butylbenzene	119	9.340	9.340	(0.967)	2350	0.25000	0.21(a)
56	Tetrachloroethene	164	6.933	6.933	(0.904)	914	0.25000	0.24(a)
50	Toluene	91	6.453	6.453	(0.841)	3631	0.25000	0.24(a)
20	trans-1,2-Dichloroethene	96	2.535	2.535	(0.606)	826	0.25000	0.23(aM)
51	trans-1,3-Dichloropropene	75	6.689	6.689	(1.346)	996	0.25000	0.19(a)
38	Trichloroethene	130	5.214	5.214	(1.049)	945	0.25000	0.23(a)
8	Trichlorofluoromethane	101	1.561	1.561	(0.373)	1233	0.25000	0.18(a)
5	Vinyl Chloride	62	1.138	1.138	(0.272)	1052	0.25000	0.23(a)

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\X191118.b\X111802.D
Date : 18-NOV-2019 13:47
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

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111803.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111803.D
Lab Smp Id: VSTD000.5 Client Smp ID: VSTD000.5
Inj Date : 18-NOV-2019 14:35
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 13:47 Cal File: X111802.D
Als bottle: 4 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

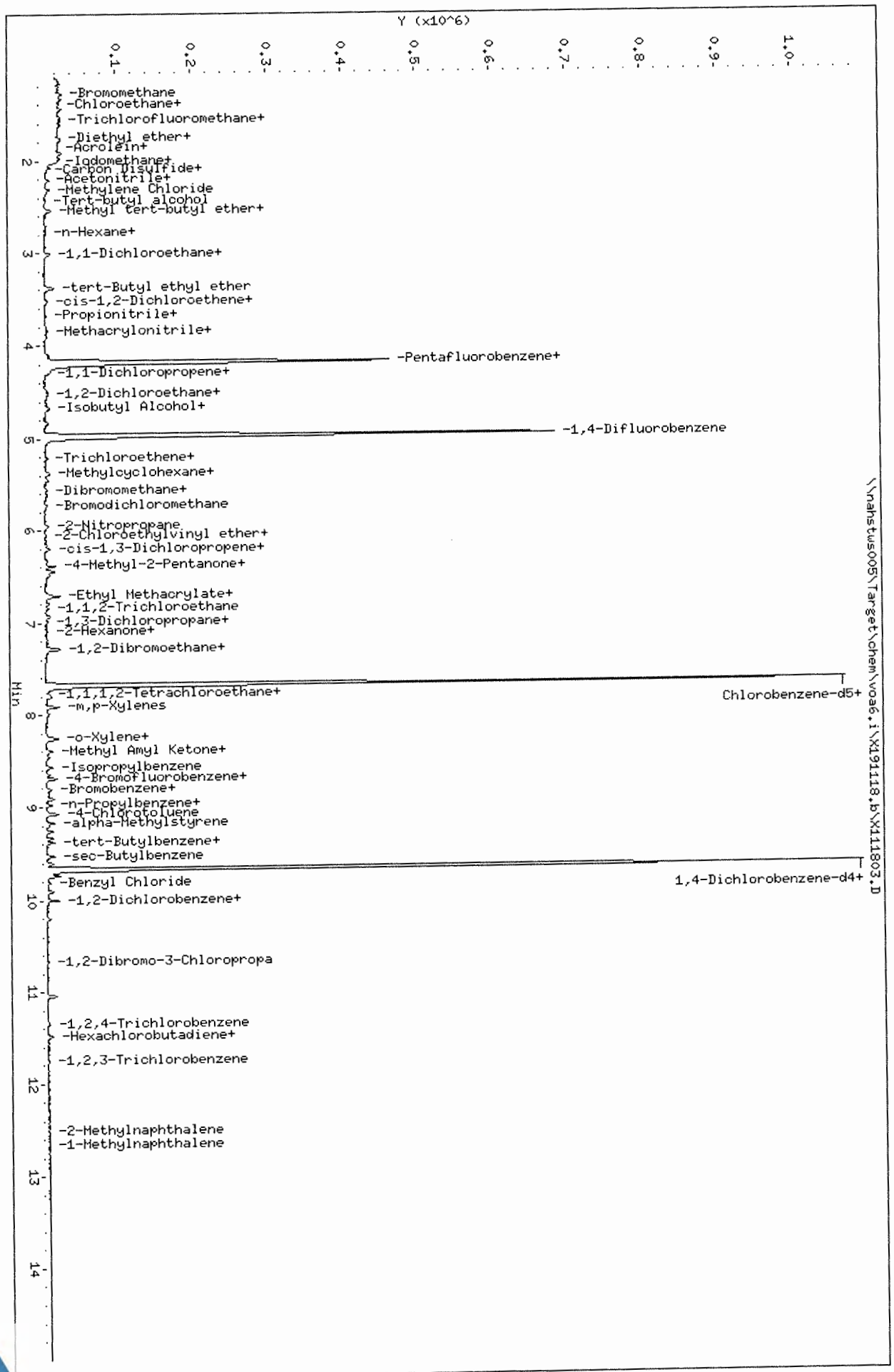
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	417797	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	575000	50.0000	
* 47 Chlorobenzene-d5	117	7.670	7.670	(1.000)	520290	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	274172	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	2522	0.50000	1.36(Ta)
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	3844	0.50000	1.20(a)
$ 30 Dibromofluoromethane	113	4.110	4.110	(0.983)	2303	0.50000	0.96(a)
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	8468	0.50000	0.61(a)
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	1290	0.50000	0.34(a)
31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	2055	0.50000	0.36(a)
68 1,1,2,2-Tetrachloroethane	83	8.845	8.845	(0.915)	1652	0.50000	0.42(aM)
138 Freon TF	101	1.911	1.911	(0.457)	1235	0.50000	0.33(a)
53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	936	0.50000	0.34(a)
22 1,1-Dichloroethane	63	2.928	2.928	(0.700)	2376	0.50000	0.39(Ta)
11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	1458	0.50000	0.41(aM)
32 1,1-Dichloropropene	75	4.289	4.289	(0.863)	1907	0.50000	0.41(a)
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	421	0.50000	(aM)
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	1248	0.50000	0.38(aM)
90 1,2,4-Trichlorobenzene	180	11.345	11.345	(1.173)	892	0.50000	0.38(aM)
79 1,2,4-Trimethylbenzene	105	9.382	9.382	(0.970)	4769	0.50000	0.36(aM)
89 1,2-Dibromo-3-Chloropropane	155	10.665	10.665	(1.103)	125	0.50000	(aM)
57 1,2-Dibromoethane	107	7.269	7.269	(0.948)	1273	0.50000	0.34(a)

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111803.D Page 2
Report Date: 06-Dec-2019 19:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	9.998	9.998	(1.034)	2511	0.50000	0.34 (a)
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	1591	0.50000	0.34 (aM)
42	1,2-Dichloropropane	63	5.443	5.443	(1.095)	1693	0.50000	0.49 (aM)
75	1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	4403	0.50000	0.35 (a)
83	1,3-Dichlorobenzene	146	9.612	9.612	(0.994)	2841	0.50000	0.36 (a)
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	2241	0.50000	0.40 (a)
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	3038	0.50000	0.38 (a)
26	2,2-Dichloropropane	77	3.523	3.523	(0.842)	2284	0.50000	0.41 (aM)
24	2-Butanone	43	3.595	3.595	(0.860)	1395	1.00000	1.08 (aM)
76	2-Chlorotoluene	91	8.981	8.981	(0.929)	3464	0.50000	0.35 (a)
52	2-Hexanone	43	7.090	7.090	(0.924)	1875	1.00000	0.87 (a)
77	4-Chlorotoluene	91	9.074	9.074	(0.939)	4251	0.50000	0.35 (a)
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	5043	0.50000	0.37 (a)
45	4-Methyl-2-Pentanone	43	6.331	6.331	(0.825)	2291	1.00000	0.75 (a)
10	Acetone	43	1.976	1.976	(0.473)	4579	1.00000	0.53 (aM)
37	Benzene	78	4.519	4.519	(0.909)	4530	0.50000	0.34 (a)
74	Bromobenzene	156	8.809	8.809	(0.911)	1601	0.50000	0.33 (a)
29	Bromochloromethane	128	3.802	3.802	(0.909)	956	0.50000	0.42 (a)
39	Bromodichloromethane	83	5.729	5.729	(1.153)	1712	0.50000	0.35 (aM)
66	Bromoform	173	8.415	8.415	(1.097)	887	0.50000	1.27 (aM)
6	Bromomethane	94	1.338	1.338	(0.320)	2741	0.50000	(a)
19	Carbon Disulfide	76	2.069	2.069	(0.495)	6243	1.00000	0.64 (aM)
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	1955	0.50000	0.38 (aM)
59	Chlorobenzene	112	7.699	7.699	(1.004)	3839	0.50000	0.37 (a)
7	Chloroethane	64	1.403	1.403	(0.336)	1164	0.50000	0.44 (aM)
28	Chloroform	83	3.917	3.917	(0.937)	3238	0.50000	0.47 (a)
3	Chloromethane	50	1.073	1.073	(0.257)	2201	0.50000	0.67 (a)
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	1368	0.50000	0.34 (a)
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	1873	0.50000	0.33 (a)
55	Dibromochloromethane	129	7.176	7.176	(0.936)	1318	0.50000	0.33 (a)
44	Dibromomethane	93	5.564	5.564	(1.120)	802	0.50000	0.32 (a)
2	Dichlorodifluoromethane	85	0.973	0.973	(0.233)	1269	0.50000	1.20 (aM)
61	Ethylbenzene	106	7.807	7.807	(1.018)	1838	0.50000	0.35 (a)
91	Hexachlorobutadiene	225	11.481	11.481	(1.187)	1376	0.50000	0.21 (a)
67	Isopropylbenzene	105	8.566	8.566	(1.117)	5484	0.50000	0.35 (a)
62	m,p-Xylenes	106	7.907	7.907	(1.031)	4089	1.00000	0.64 (a)
17	Methylene Chloride	84	2.305	2.305	(0.551)	1764	0.50000	0.46 (aM)
87	n-Butylbenzene	91	9.998	9.998	(1.034)	4442	0.50000	0.39 (aM)
73	n-Propylbenzene	91	8.917	8.917	(0.922)	6280	0.50000	0.37 (a)
92	Naphthalene	128	11.560	11.560	(1.196)	1399	0.50000	0.47 (a)
63	o-Xylene	106	8.243	8.243	(1.075)	2028	0.50000	0.32 (a)
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	5469	0.50000	0.37 (a)
64	Styrene	104	8.265	8.265	(1.078)	3653	0.50000	0.33 (a)
78	tert-Butylbenzene	119	9.339	9.339	(0.966)	3670	0.50000	0.34 (a)
56	Tetrachloroethene	164	6.933	6.933	(0.904)	1382	0.50000	0.37 (a)
50	Toluene	91	6.453	6.453	(0.841)	5603	0.50000	0.37 (a)
20	trans-1,2-Dichloroethene	96	2.535	2.535	(0.606)	1192	0.50000	0.34 (a)
51	trans-1,3-Dichloropropene	75	6.689	6.689	(1.346)	1749	0.50000	0.34 (a)
38	Trichloroethene	130	5.206	5.206	(1.048)	1298	0.50000	0.32 (a)
8	Trichlorofluoromethane	101	1.560	1.560	(0.373)	2137	0.50000	0.32 (a)
5	Vinyl Chloride	62	1.138	1.138	(0.272)	2046	0.50000	0.48 (aM)

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.



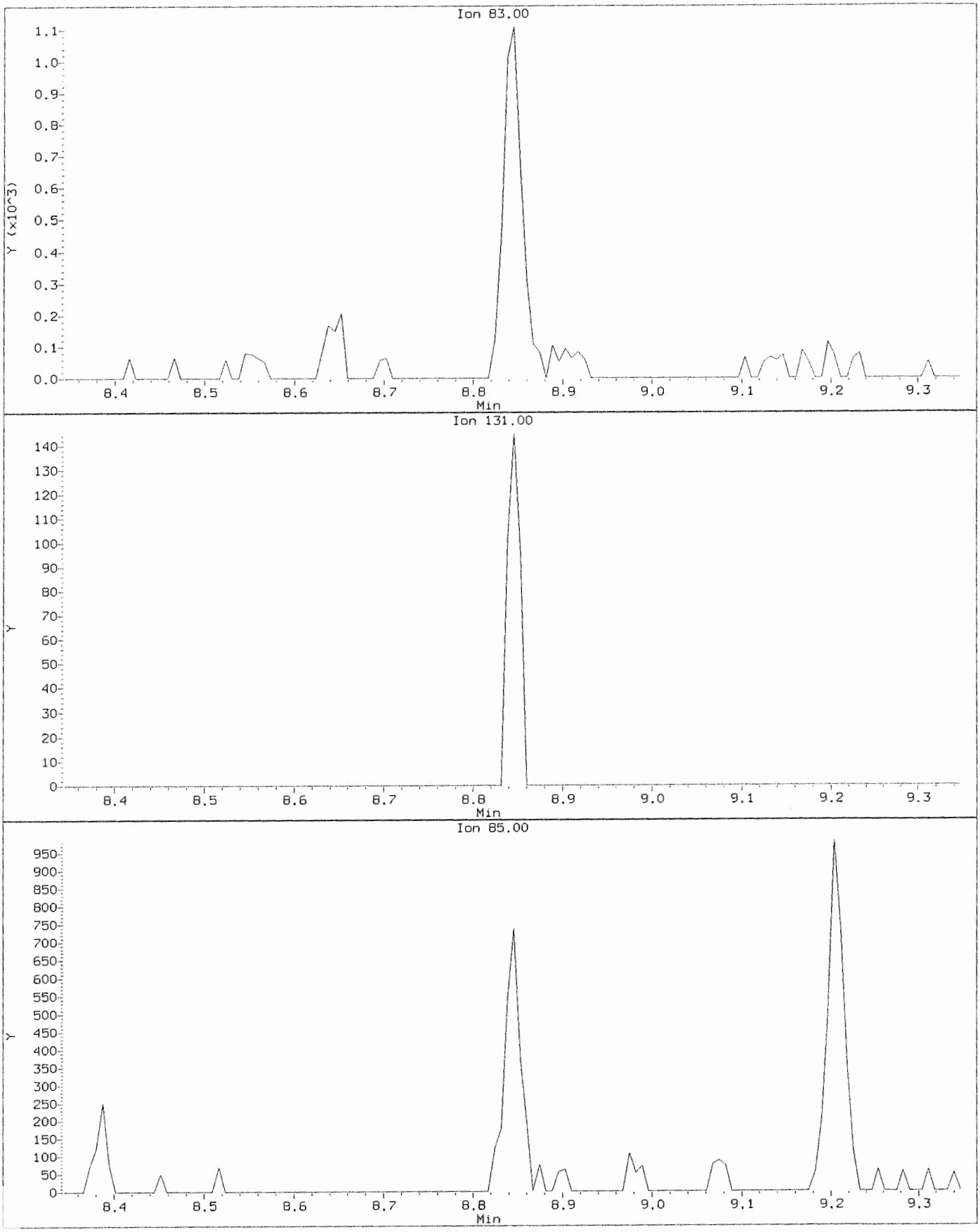
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Sample Info: VSTD000.5;VSTD000.5;1;2;
Purge Volume: 5.0
Column phase: DB624

\\nahstws005\Target\chem\voa6.i\X191118.b\X111803.D

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

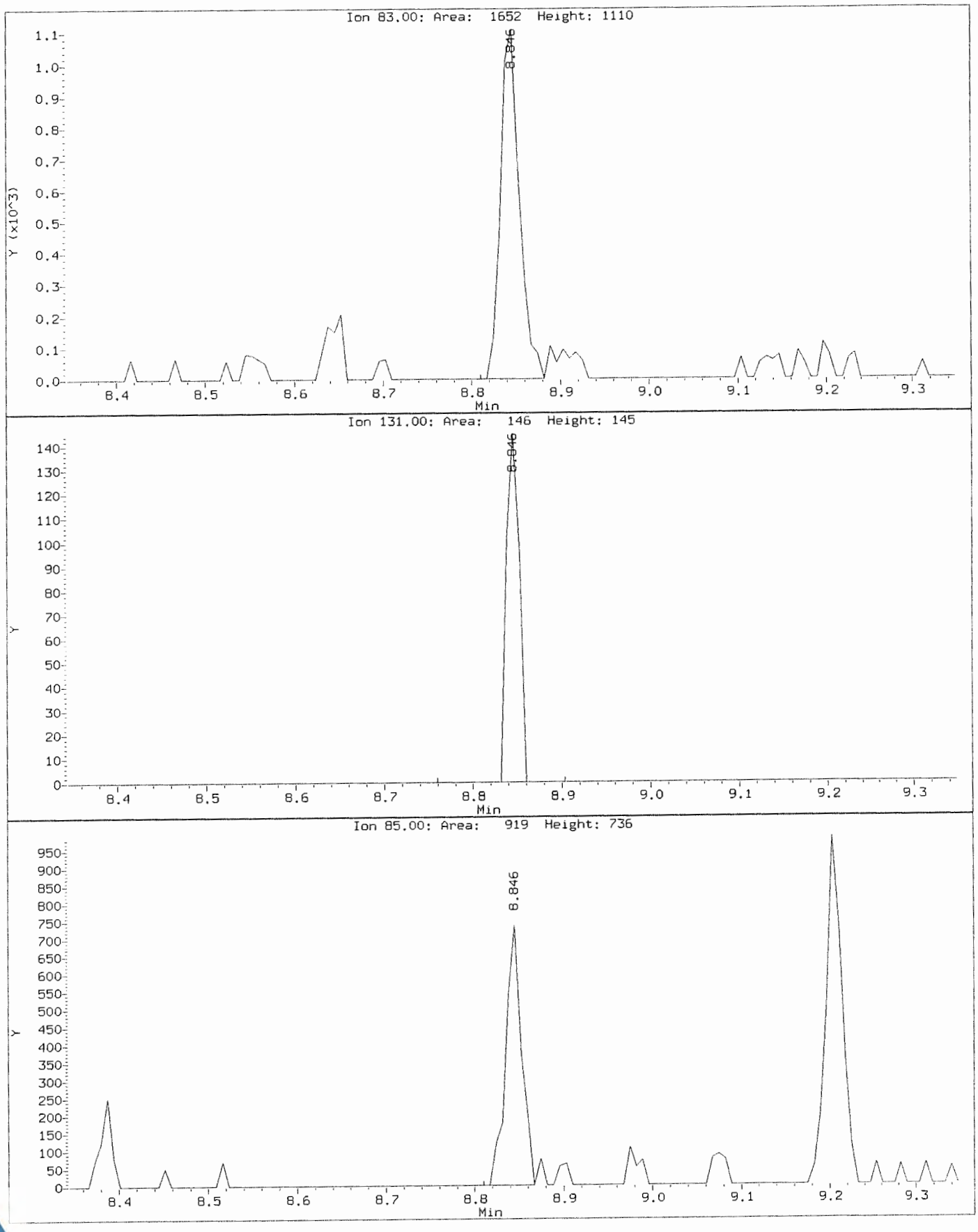
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Client Sample ID: VSTD000.5

Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



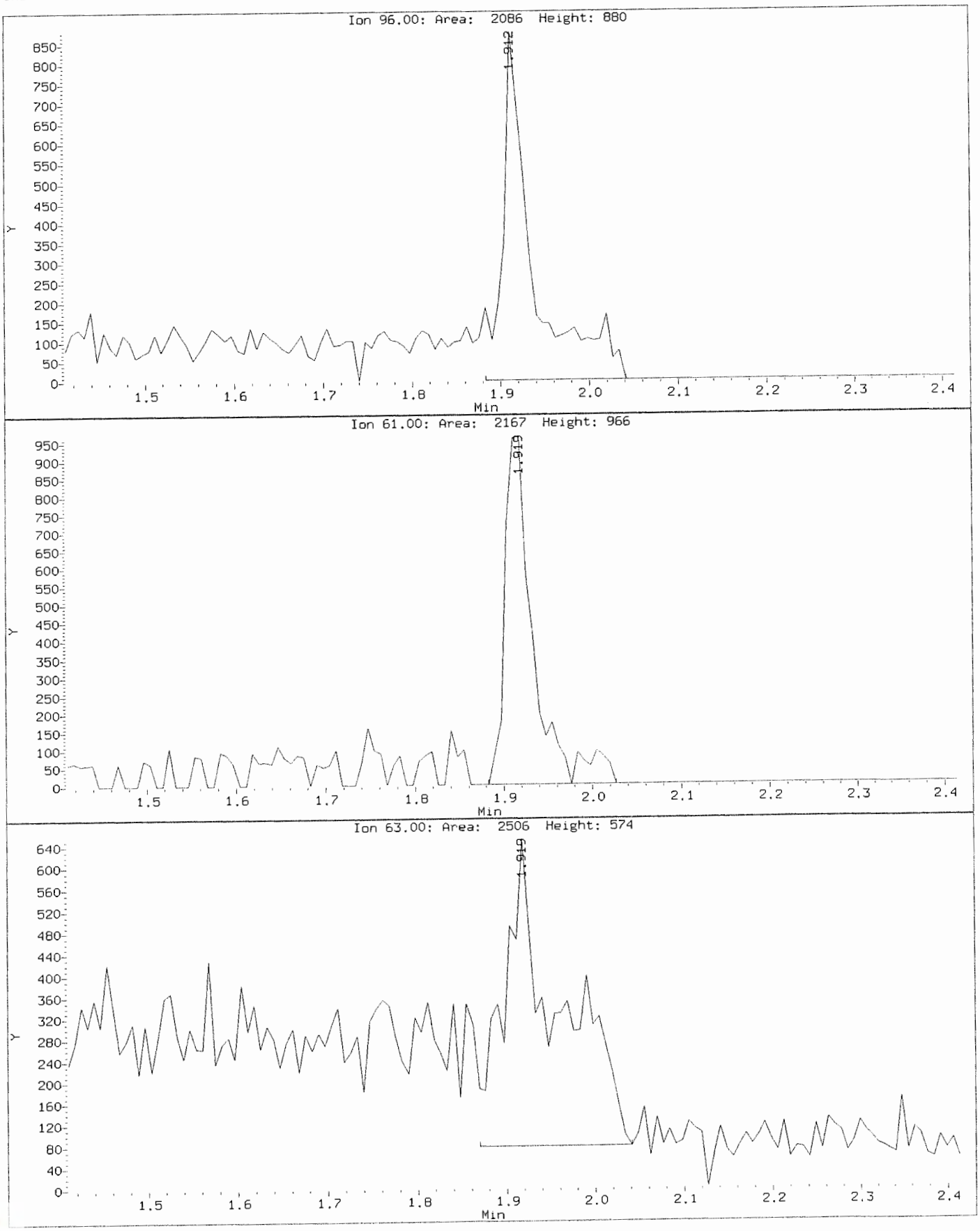
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Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5



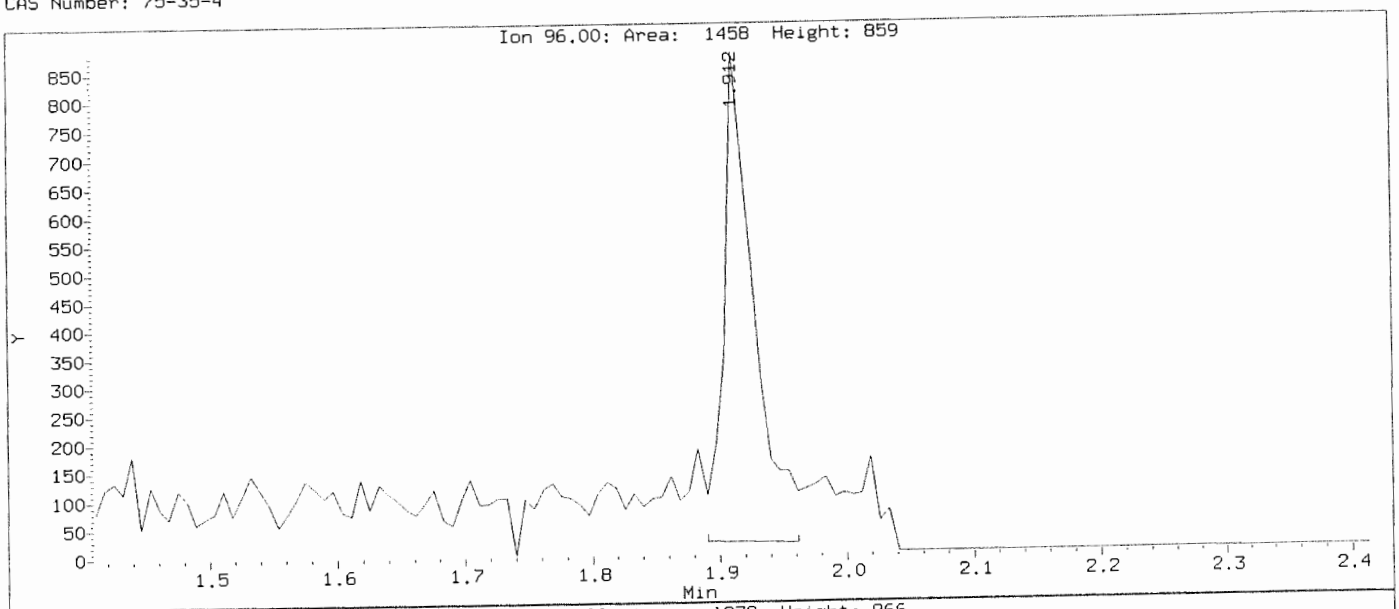
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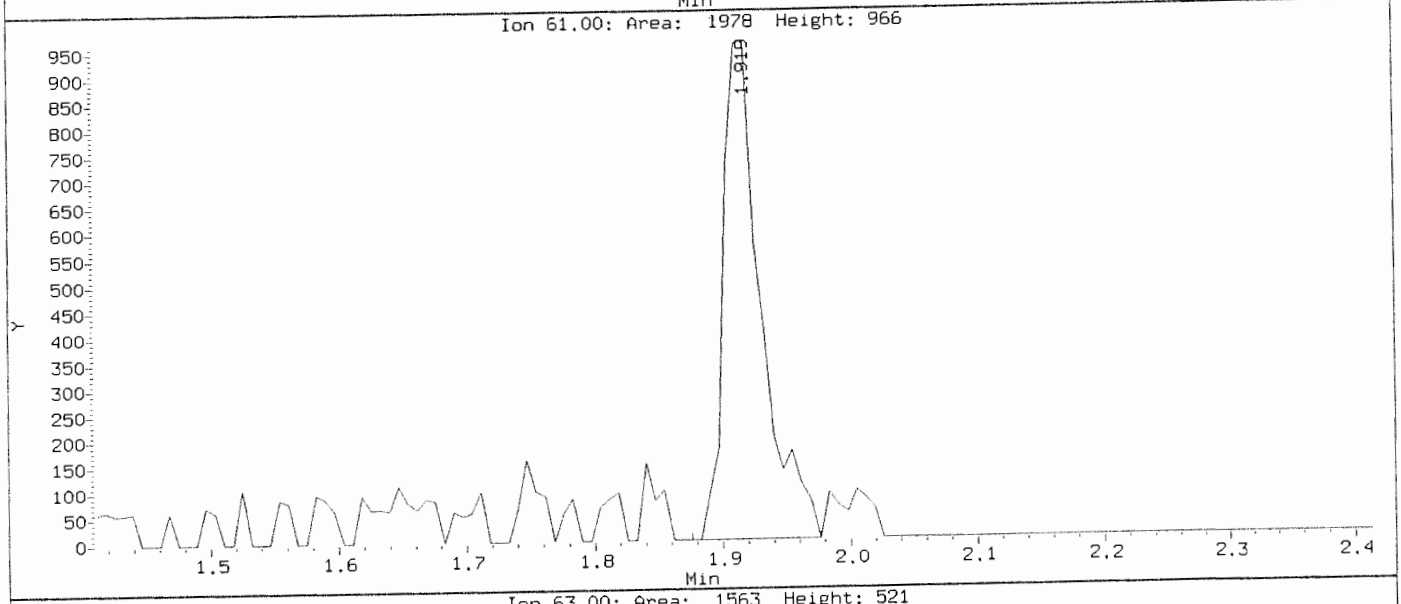
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CAS Number: 75-35-4

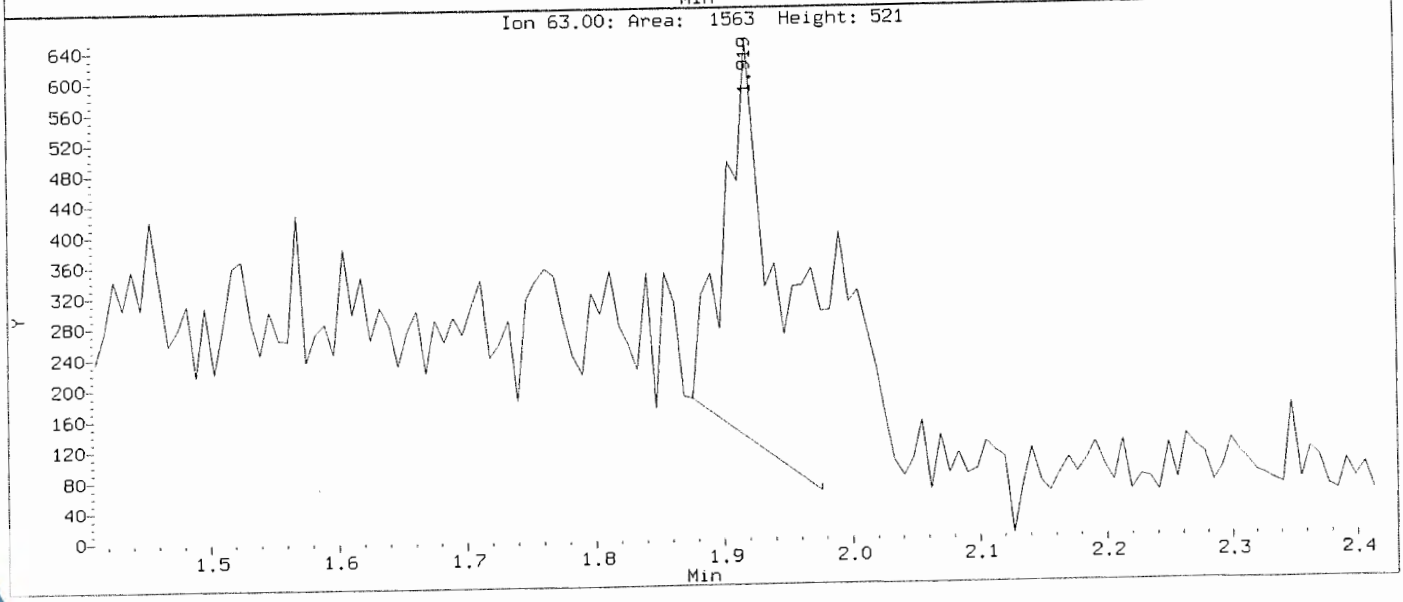


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Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: 1,1-Dichloroethene
CAS Number: 75-35-4

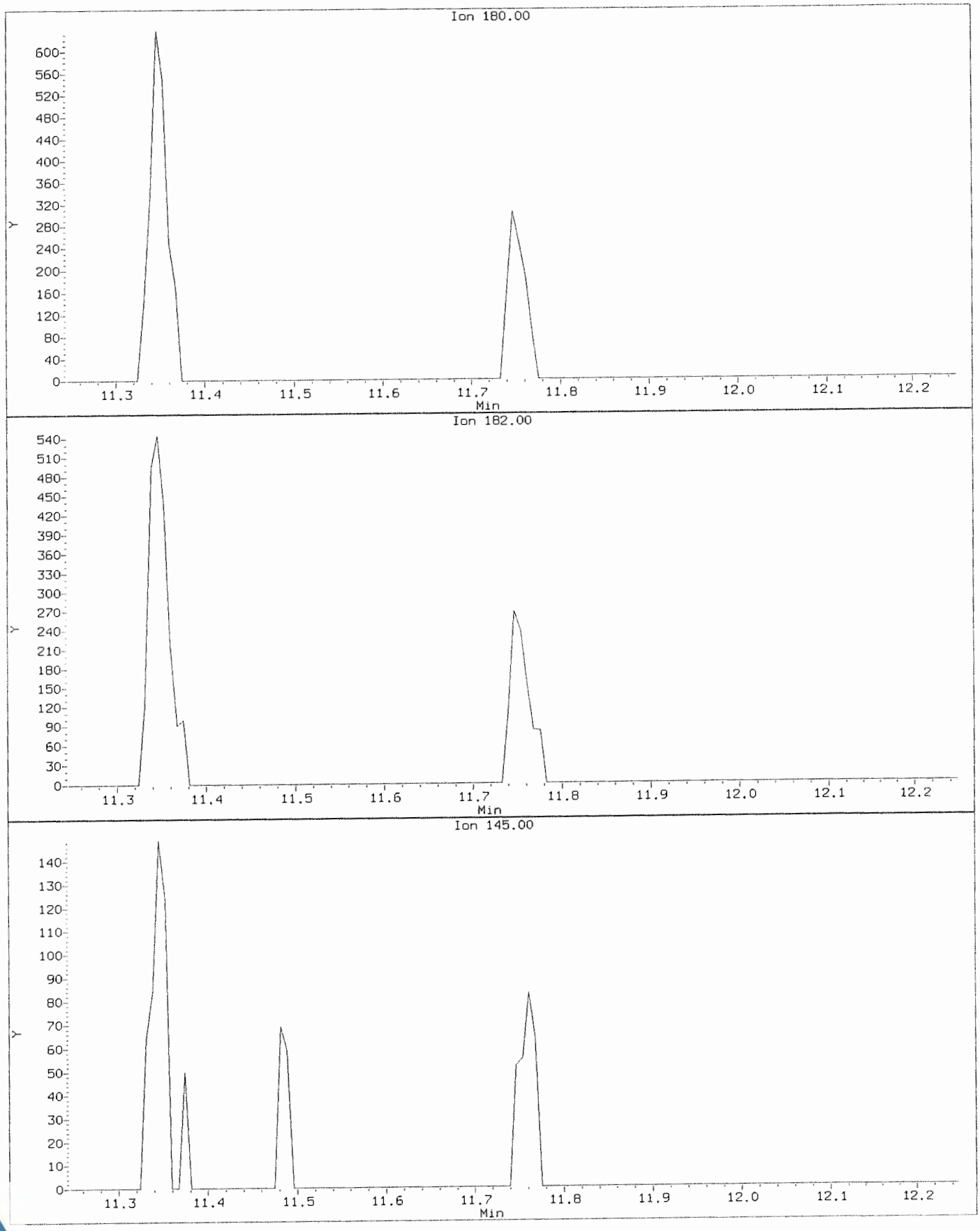






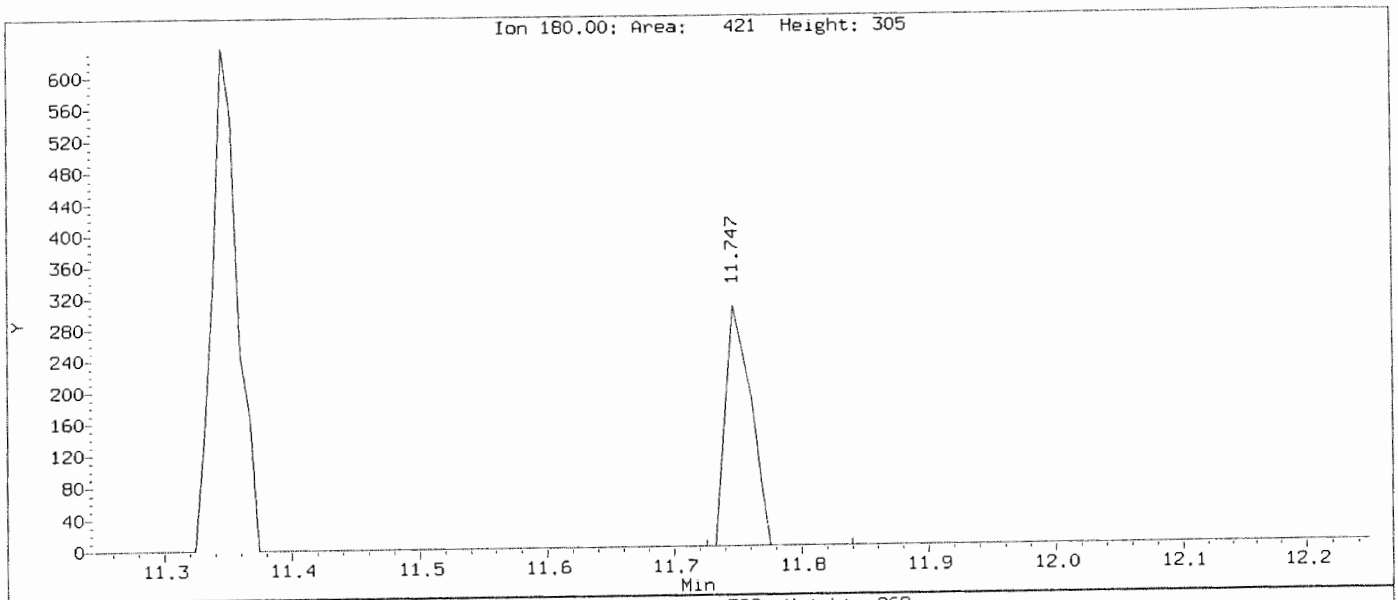
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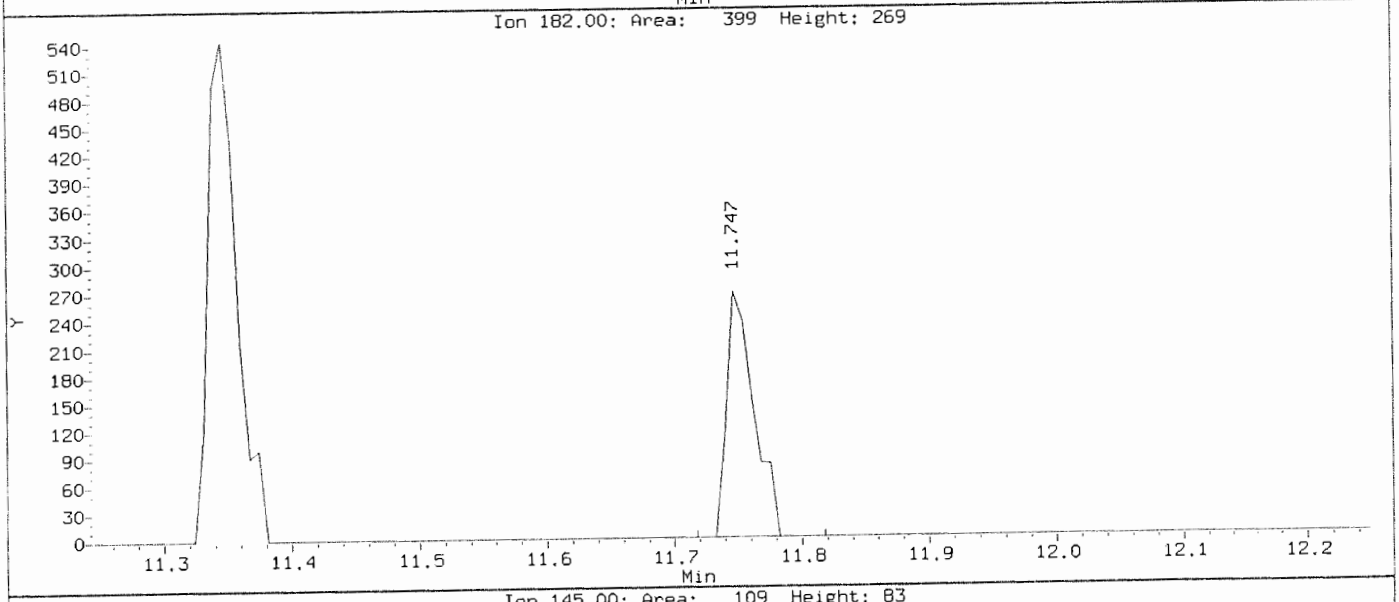
Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6

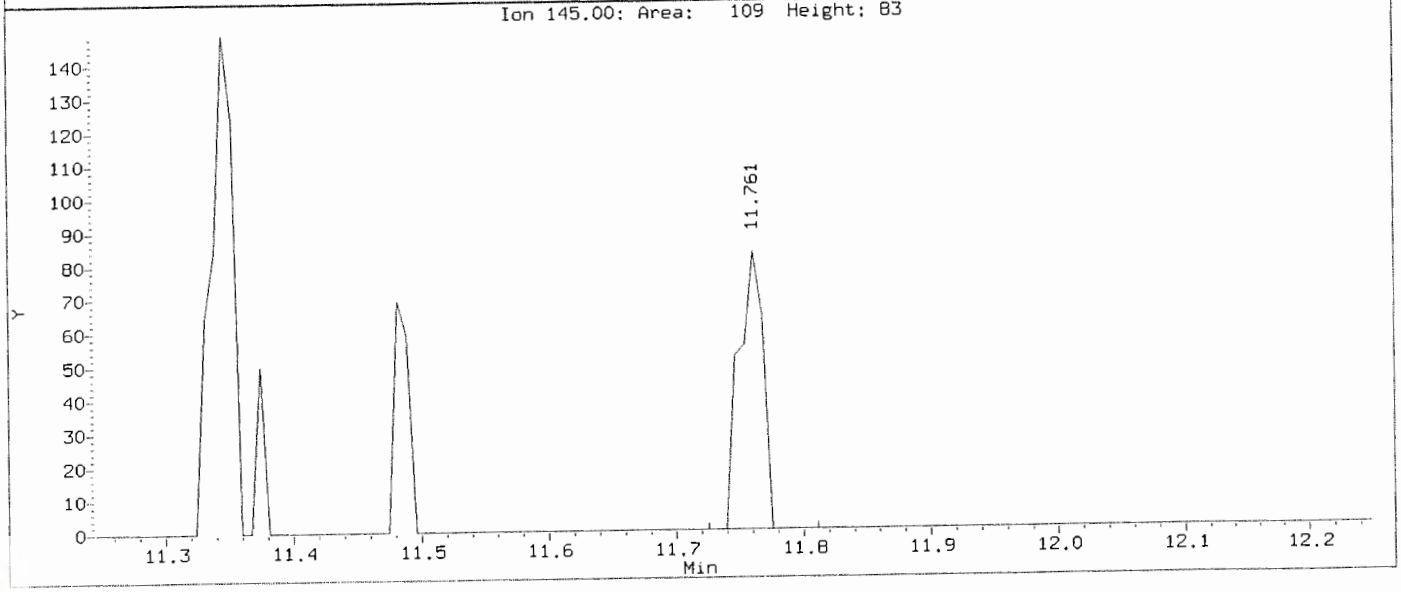


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Compound: 1,2,3-Trichlorobenzene
CAS Number: 87-61-6

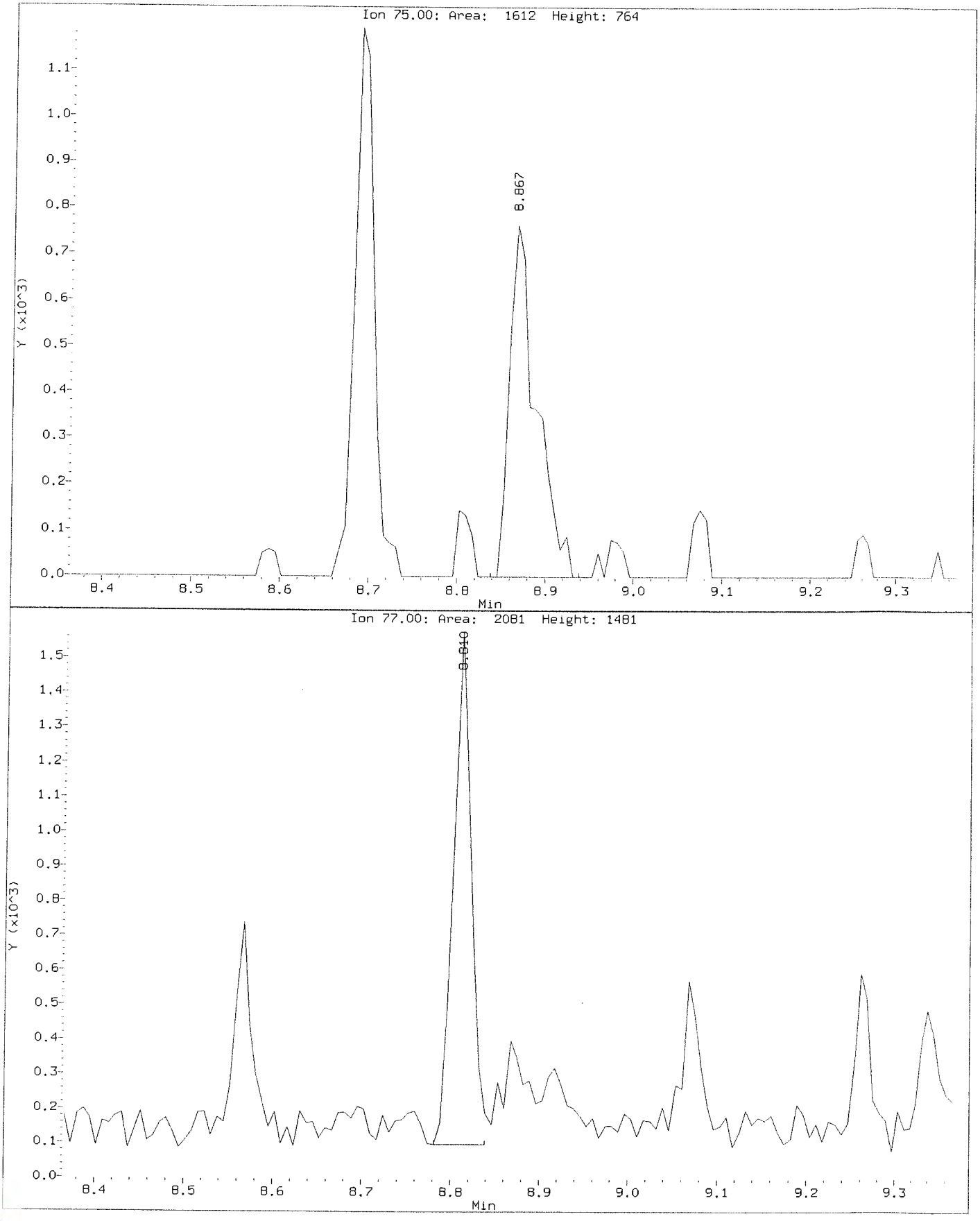






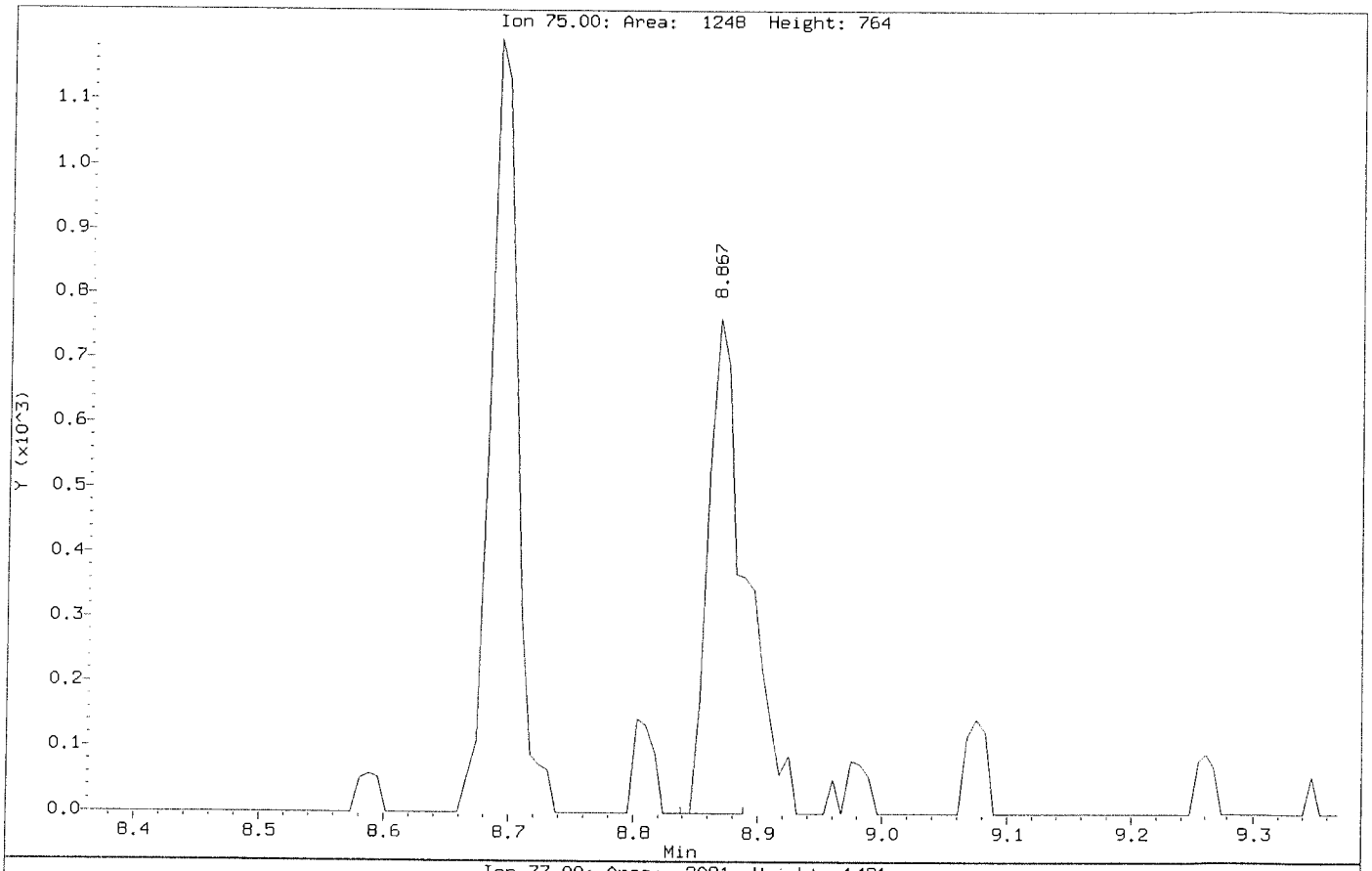
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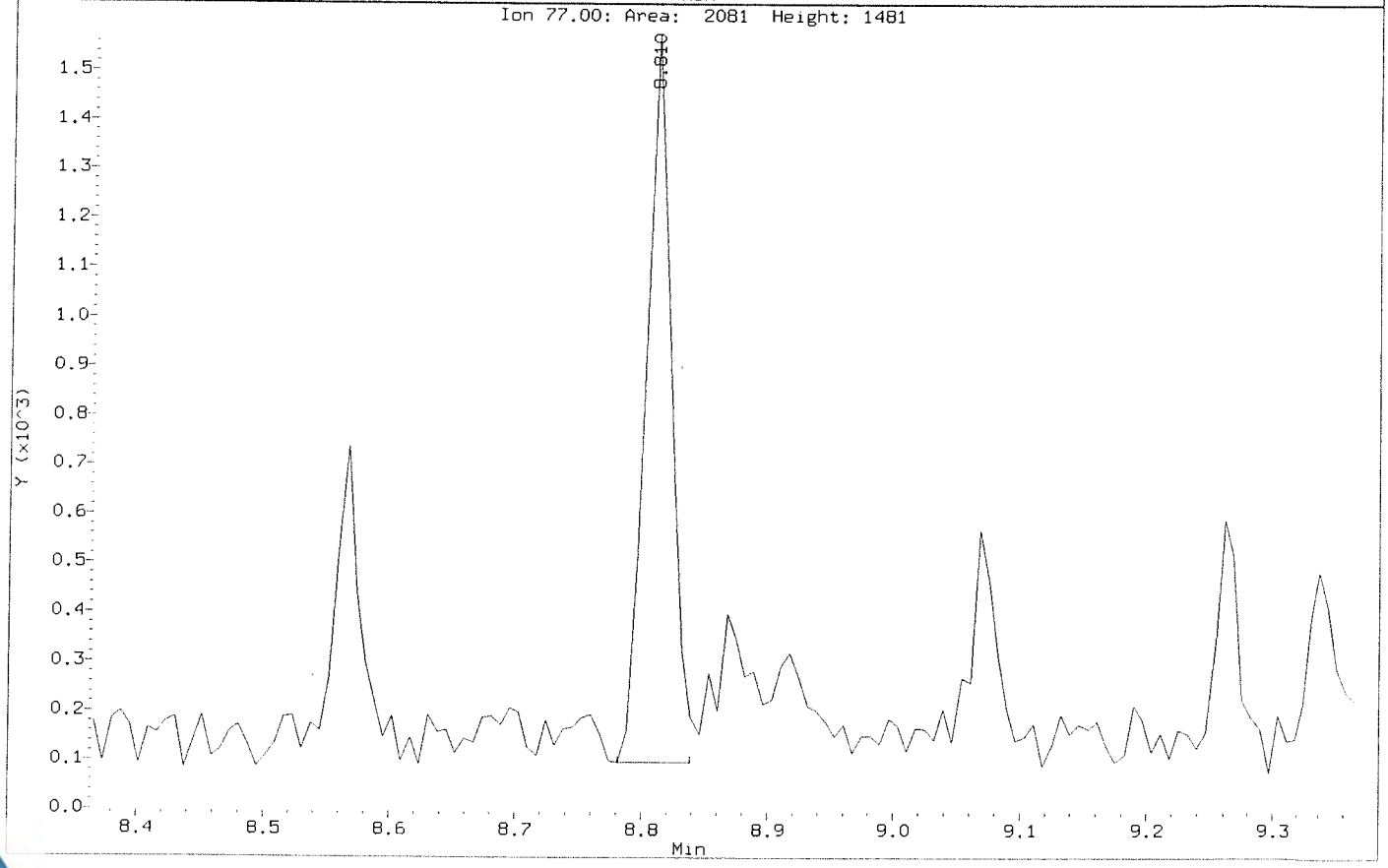
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4



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Client Sample ID: VSTD000.5

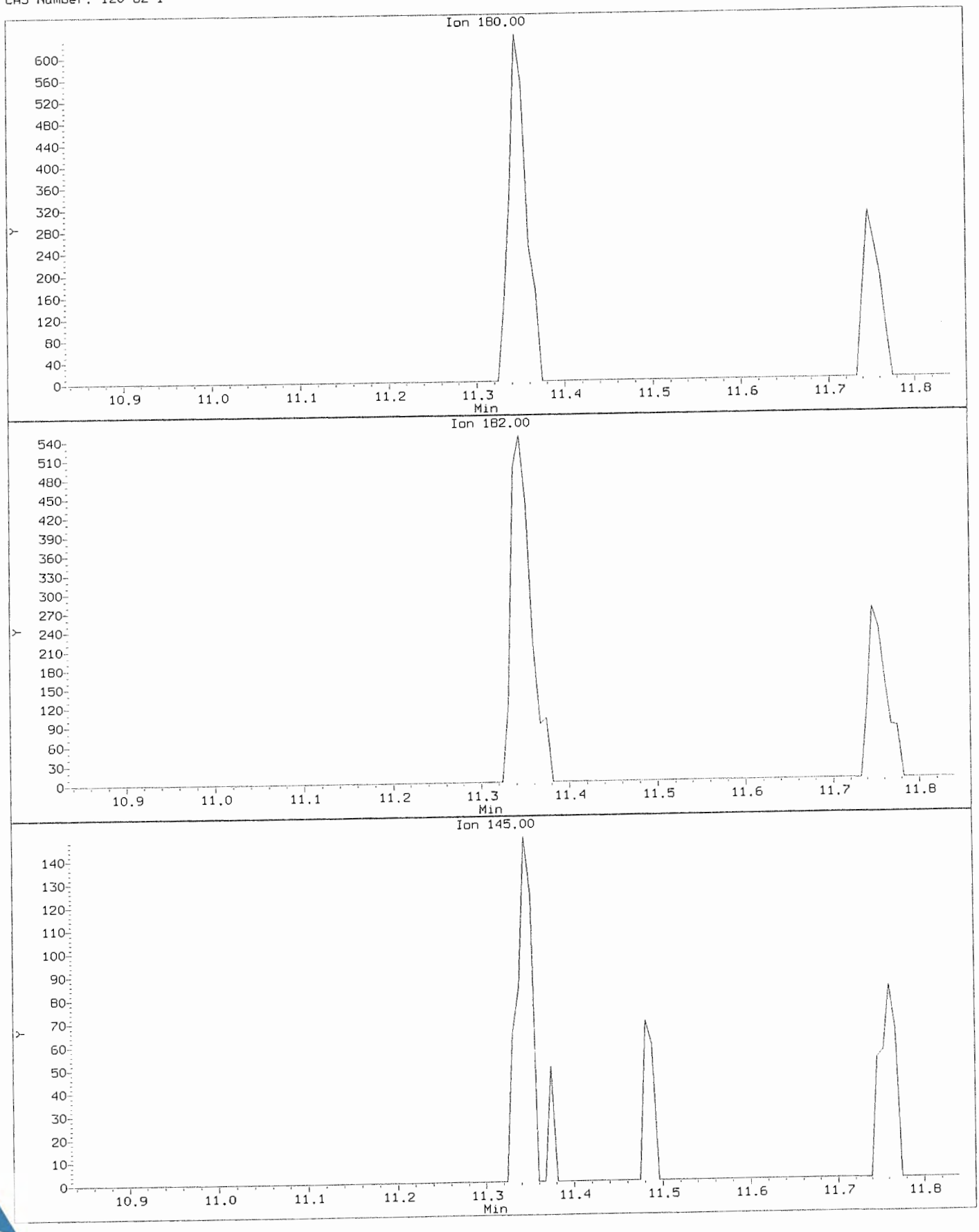
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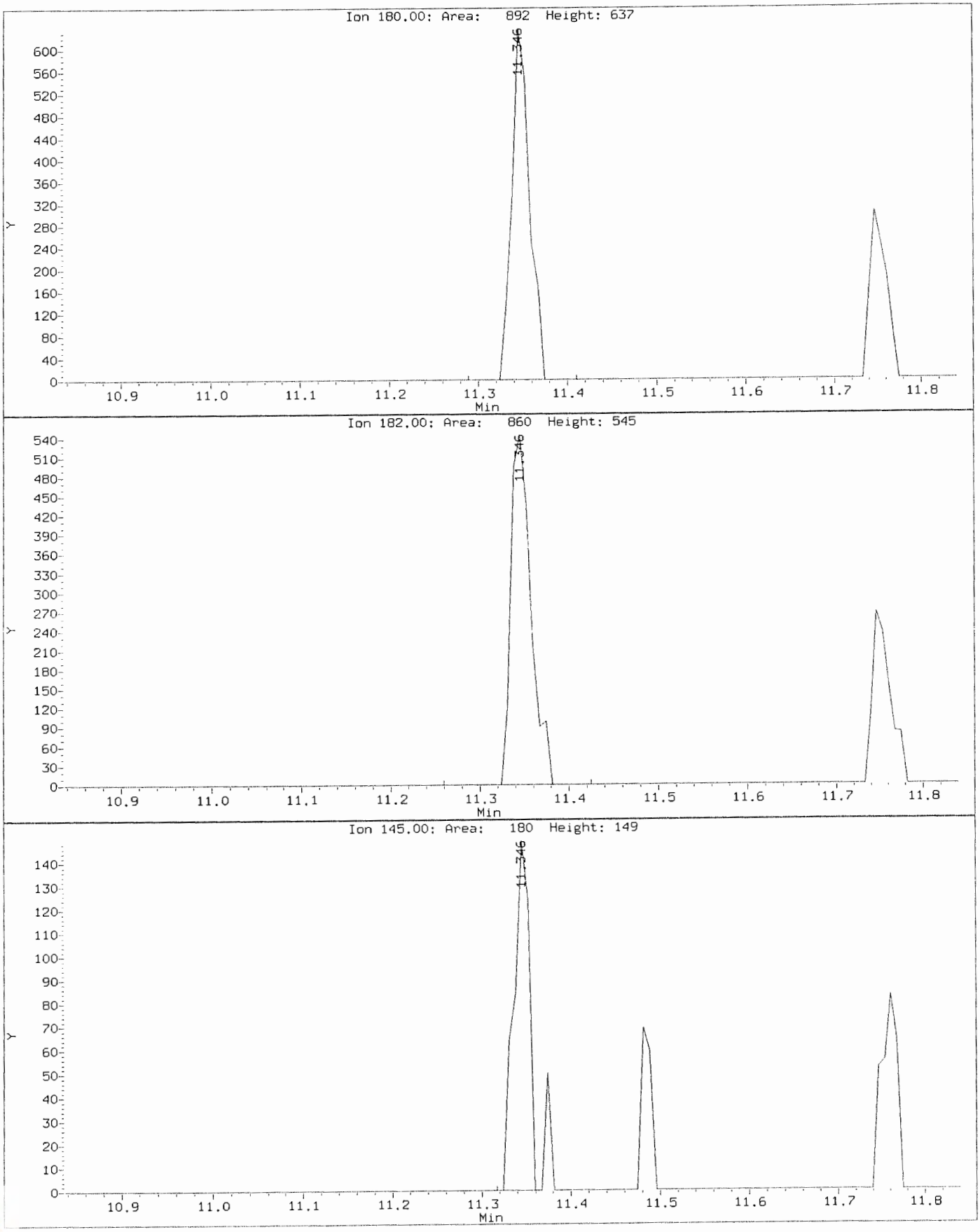
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Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1



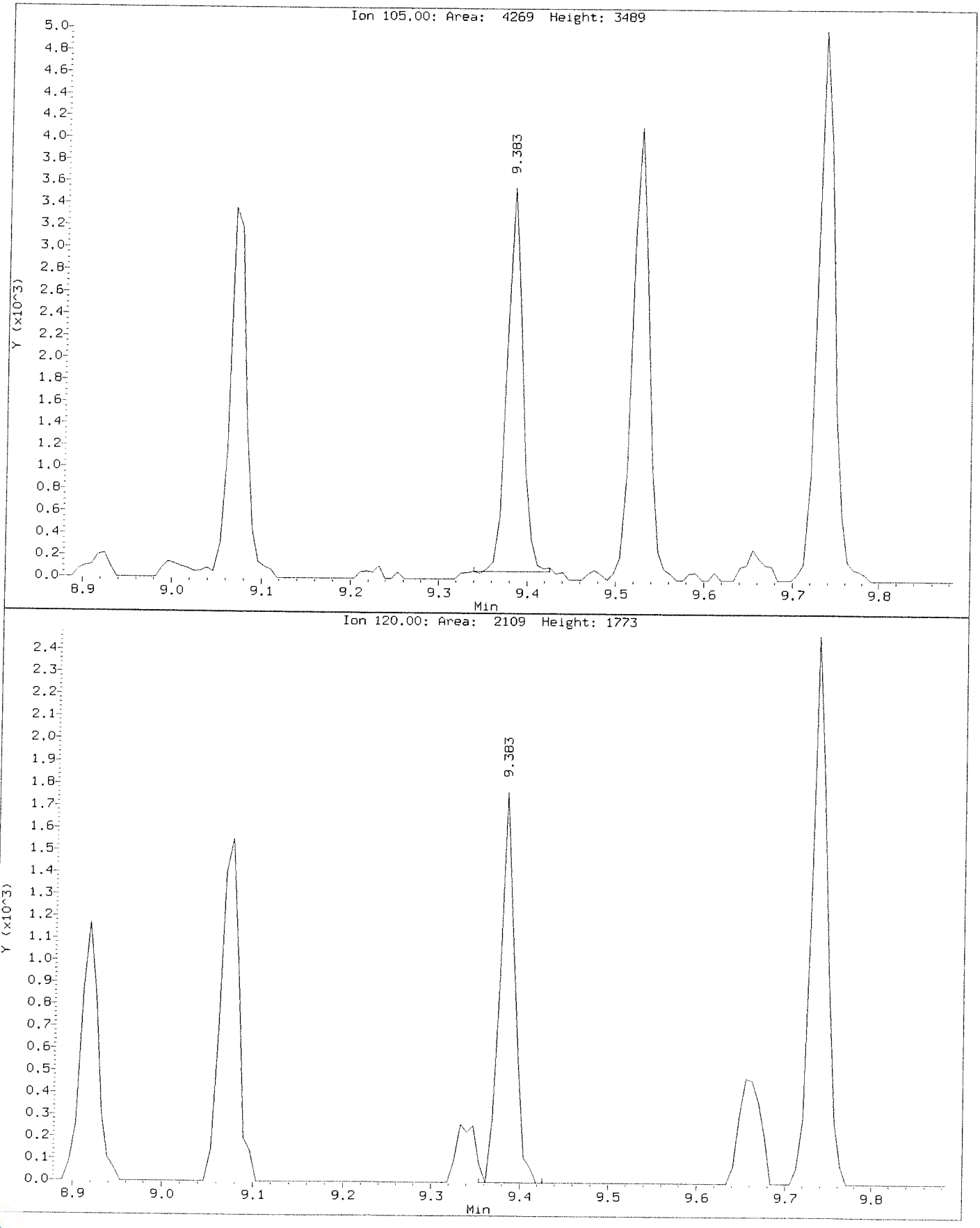
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Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1



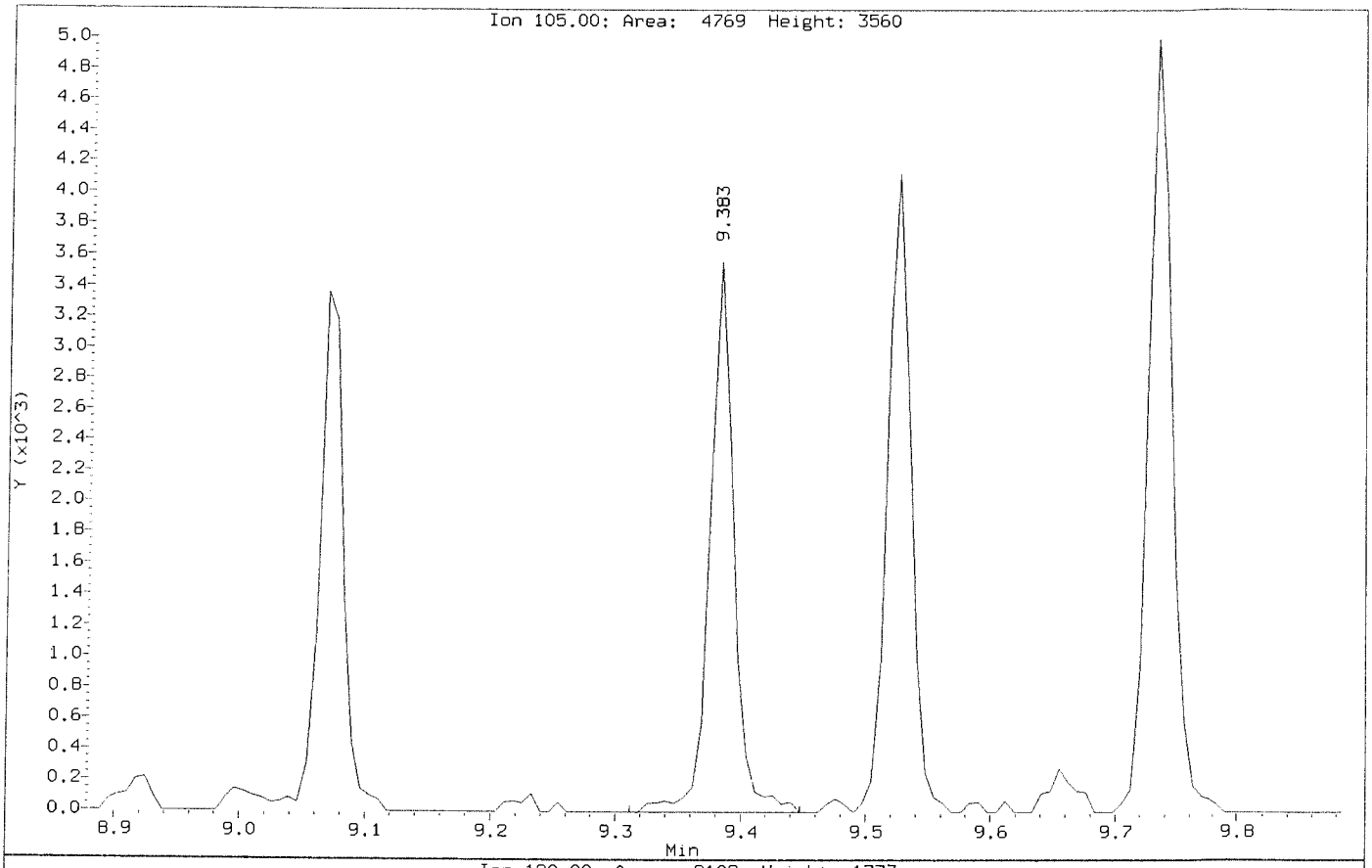
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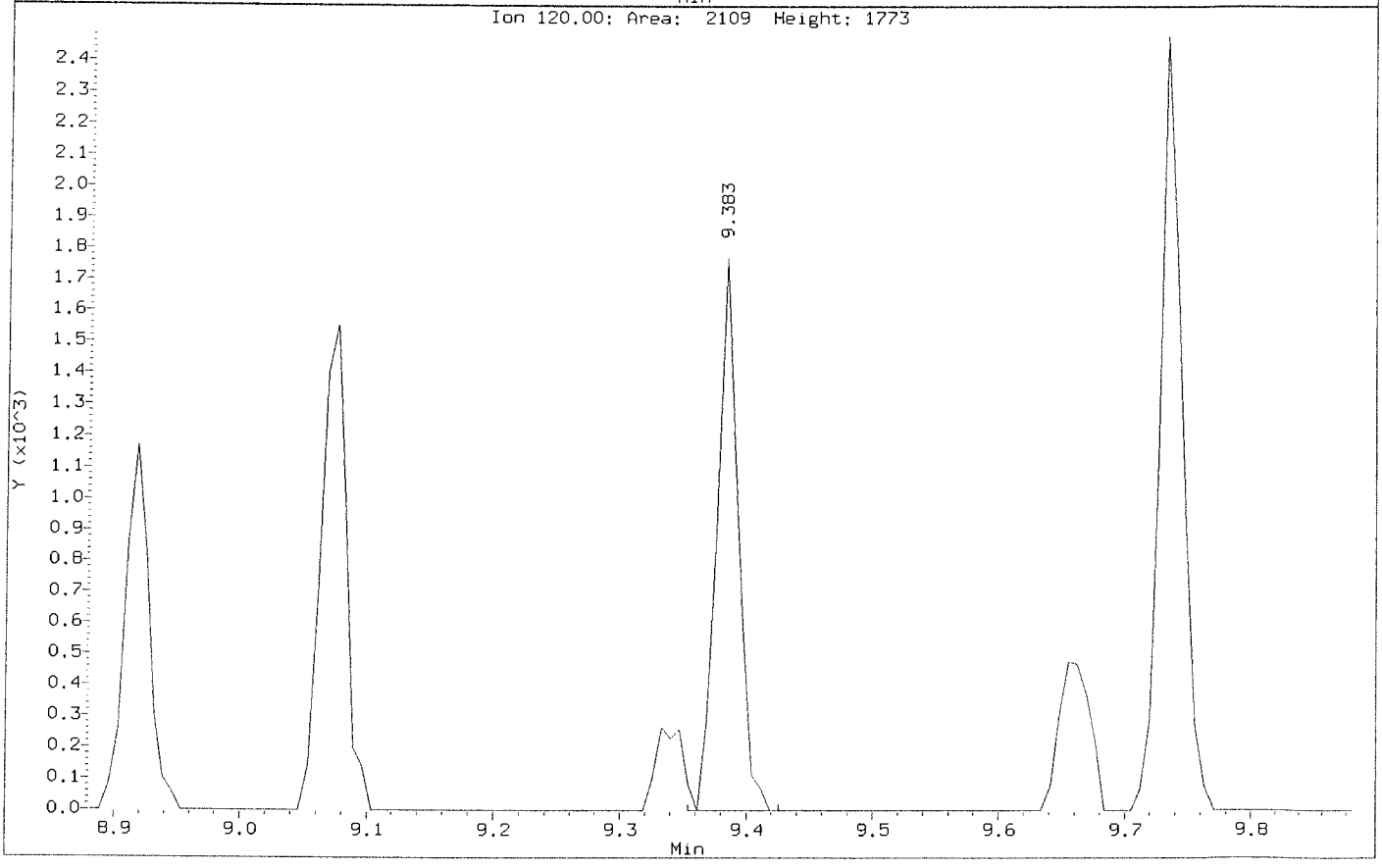
Compound: 1,2,4-Trimethylbenzene
CAS Number: 95-63-6



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Instrument: voa6.i
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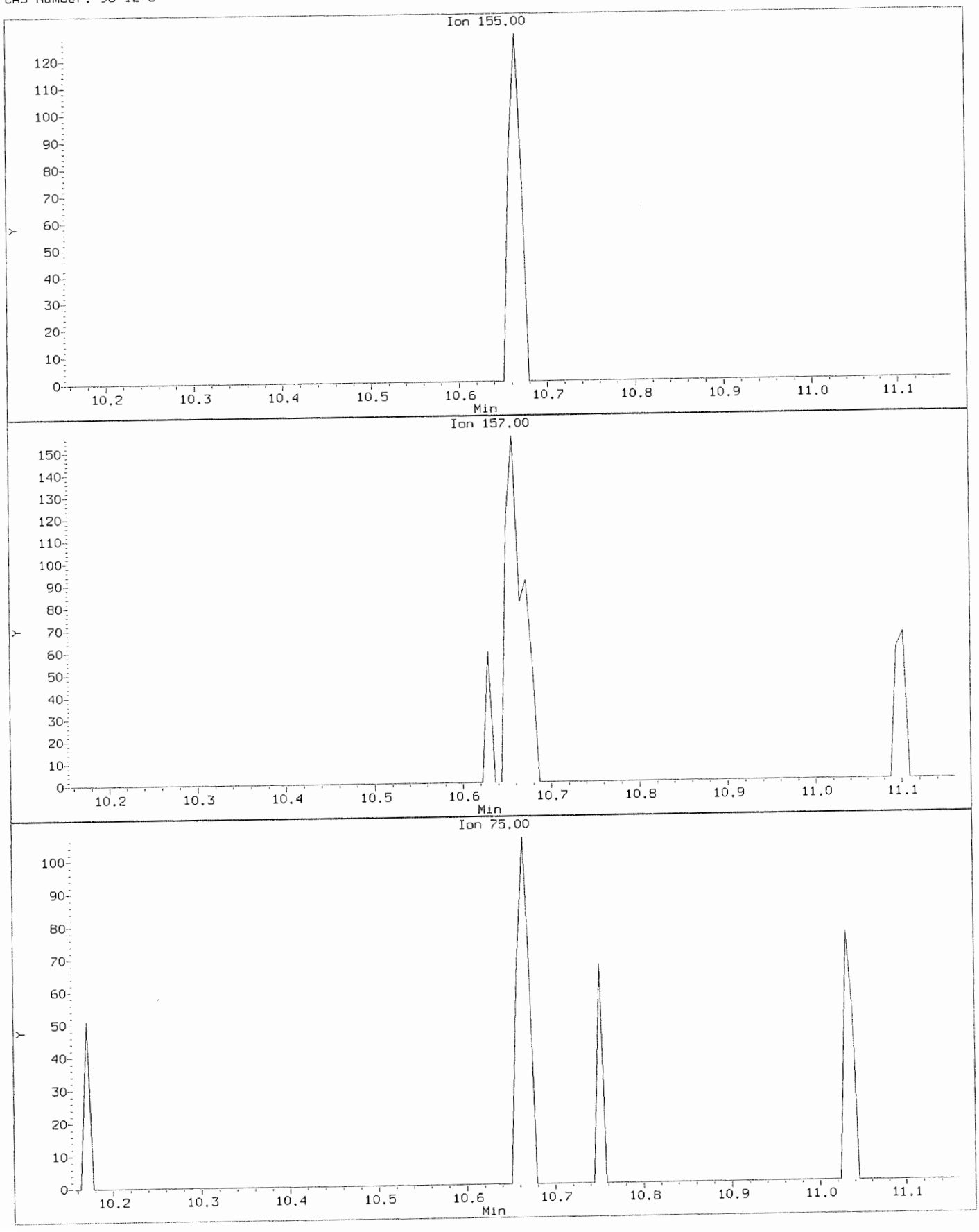
Compound: 1,2,4-Trimethylbenzene
CAS Number: 95-63-6





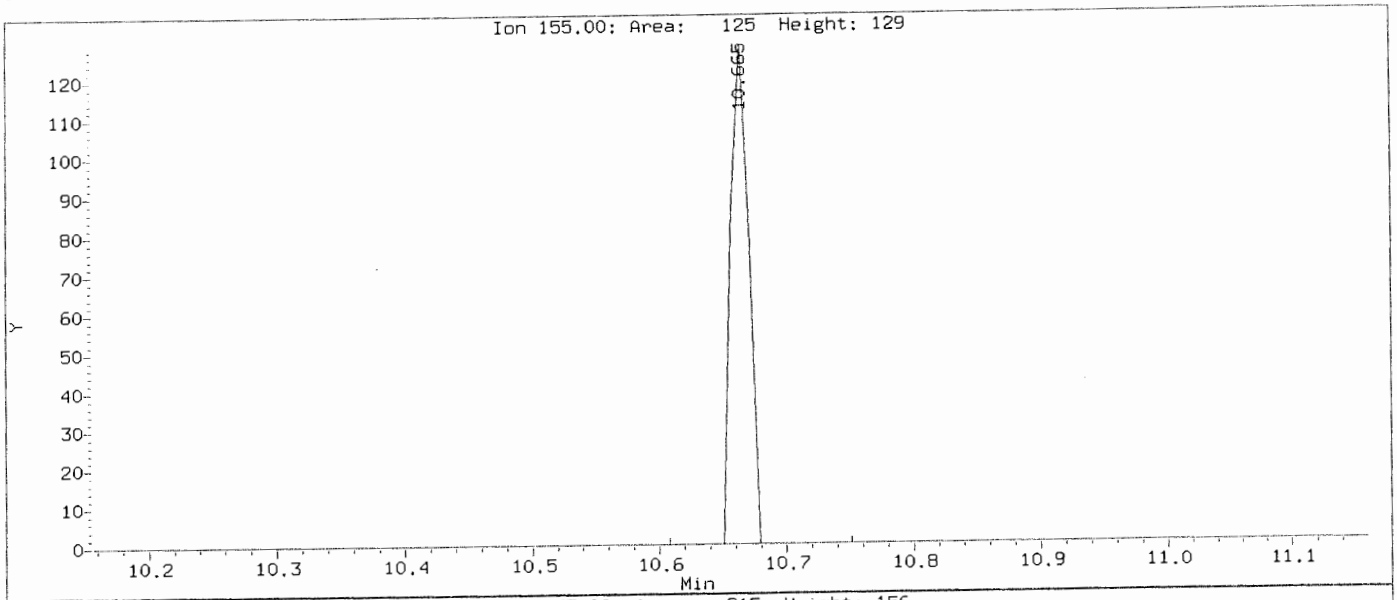
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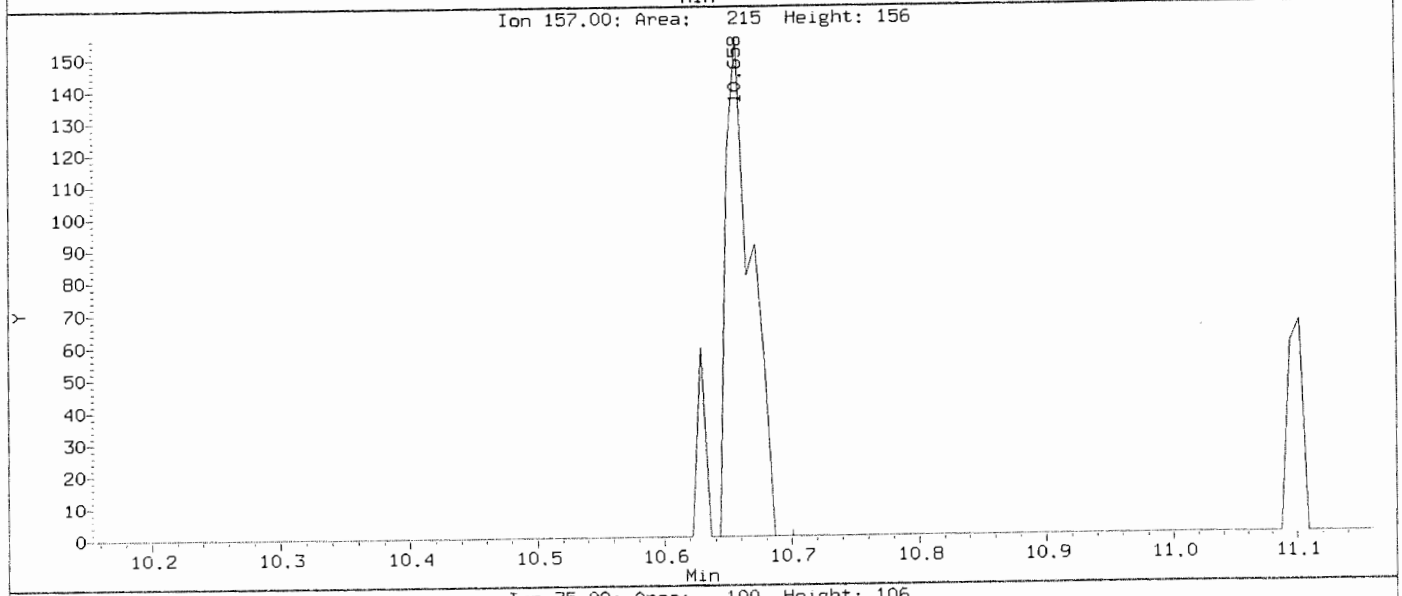
Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

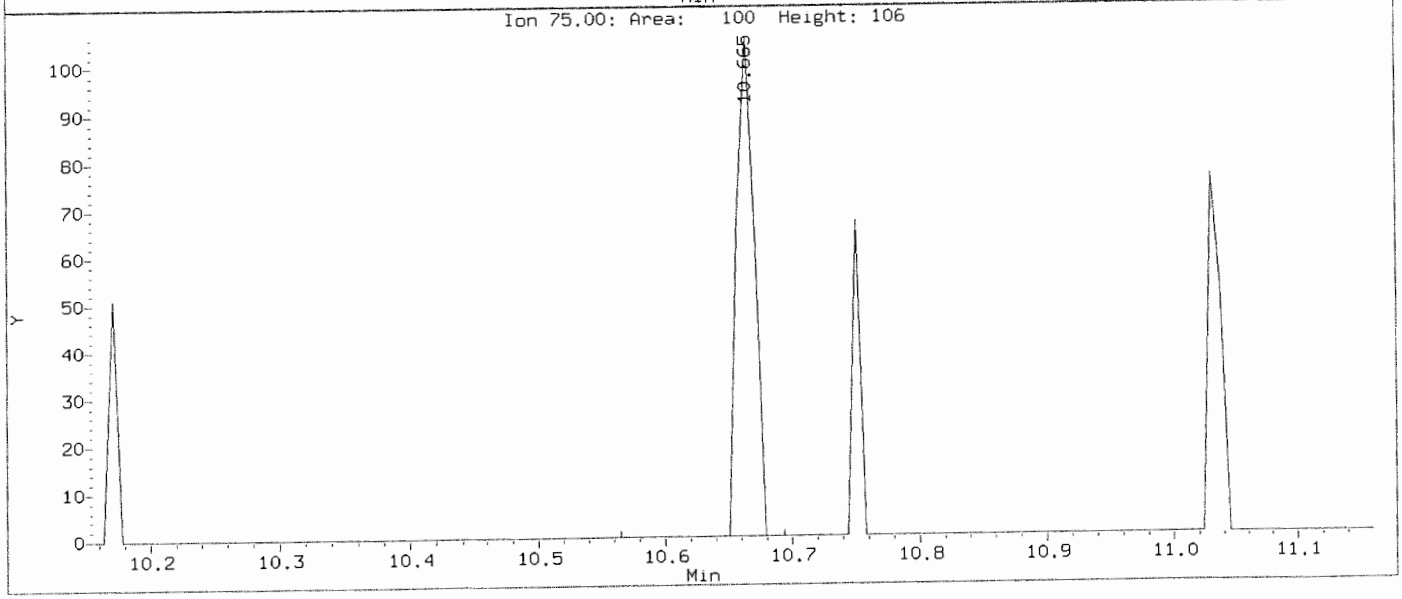


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Client Sample ID: VSTD000.5

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8

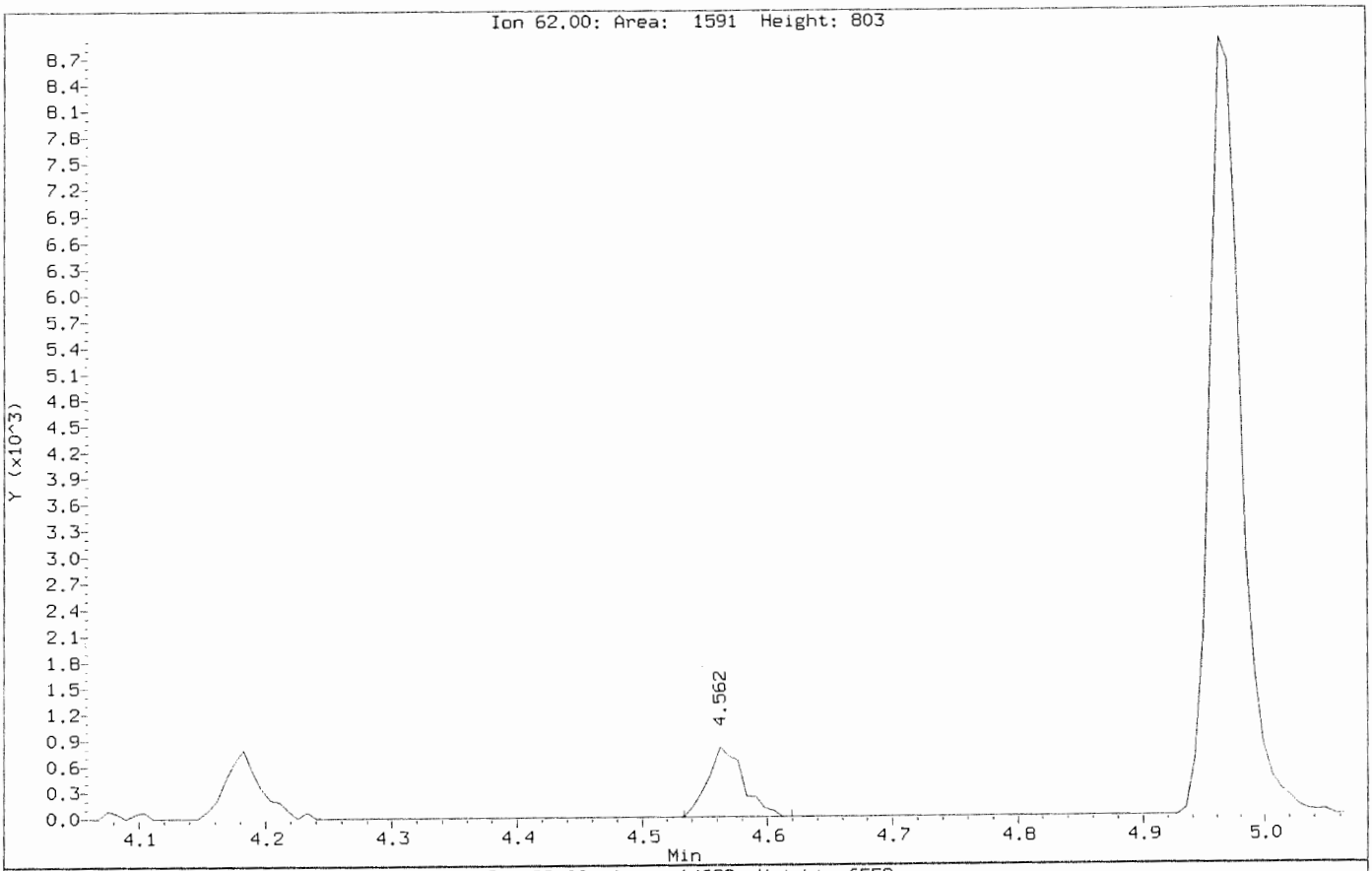


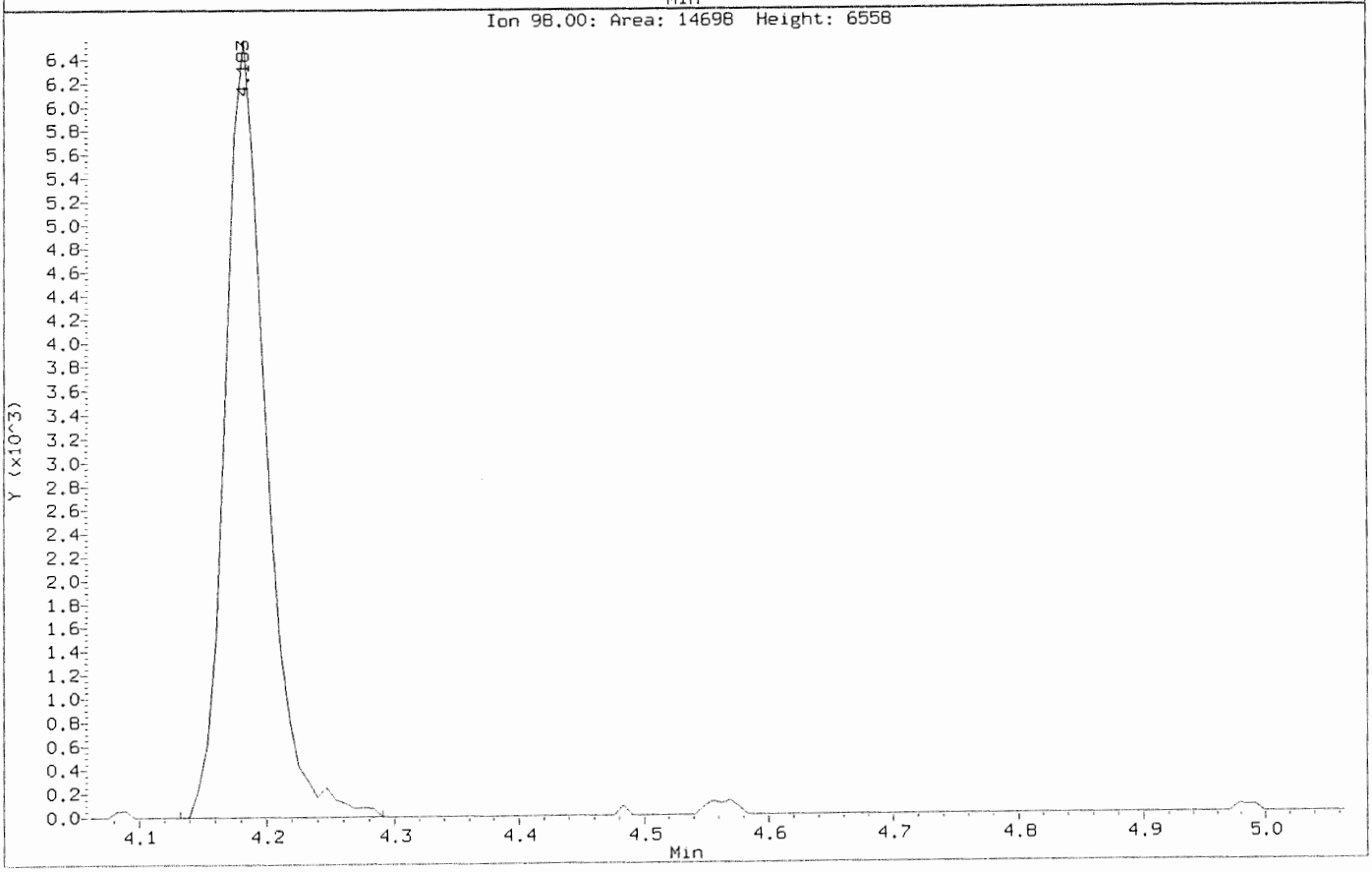




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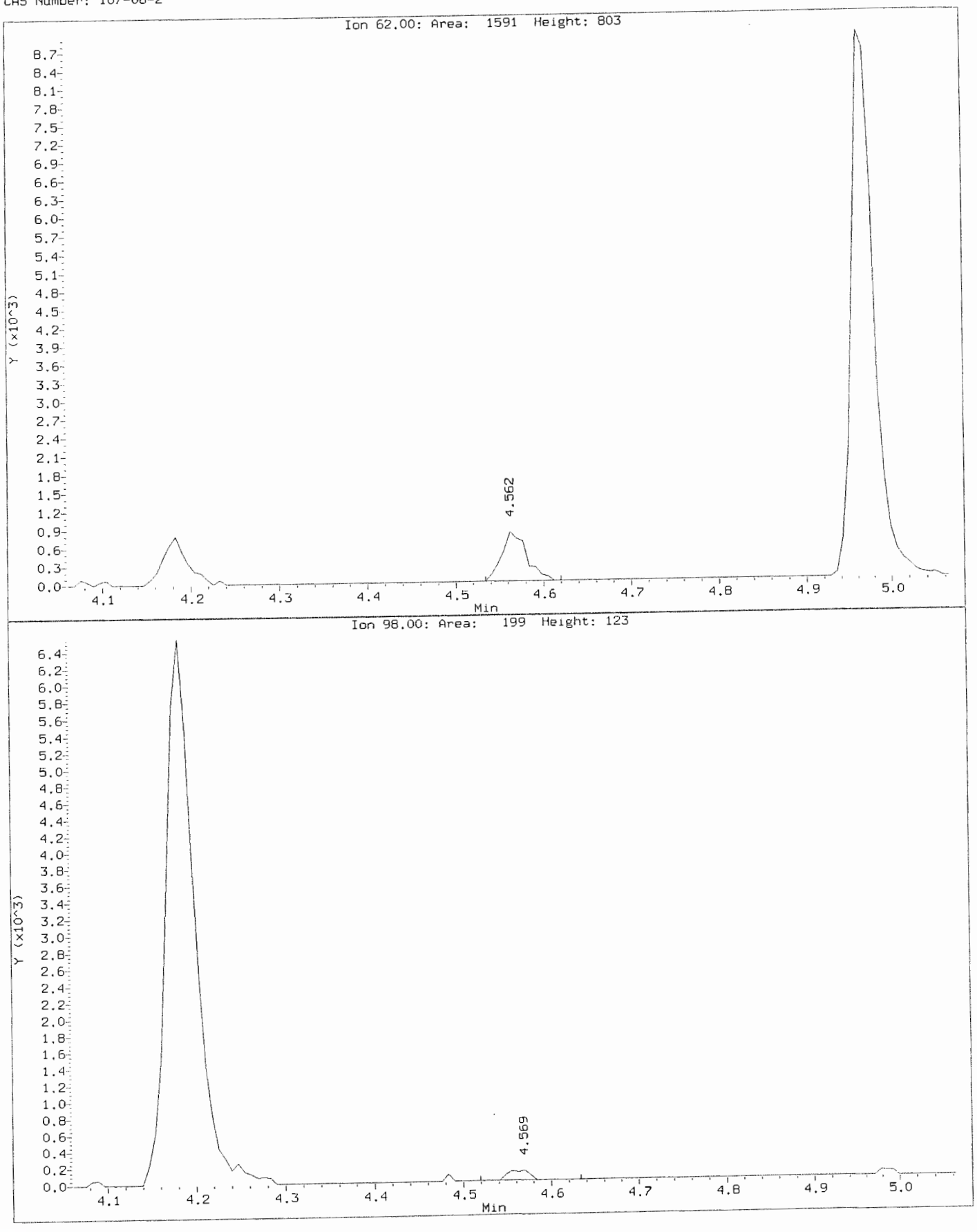
Compound: 1,2-Dichloroethane
CAS Number: 107-06-2





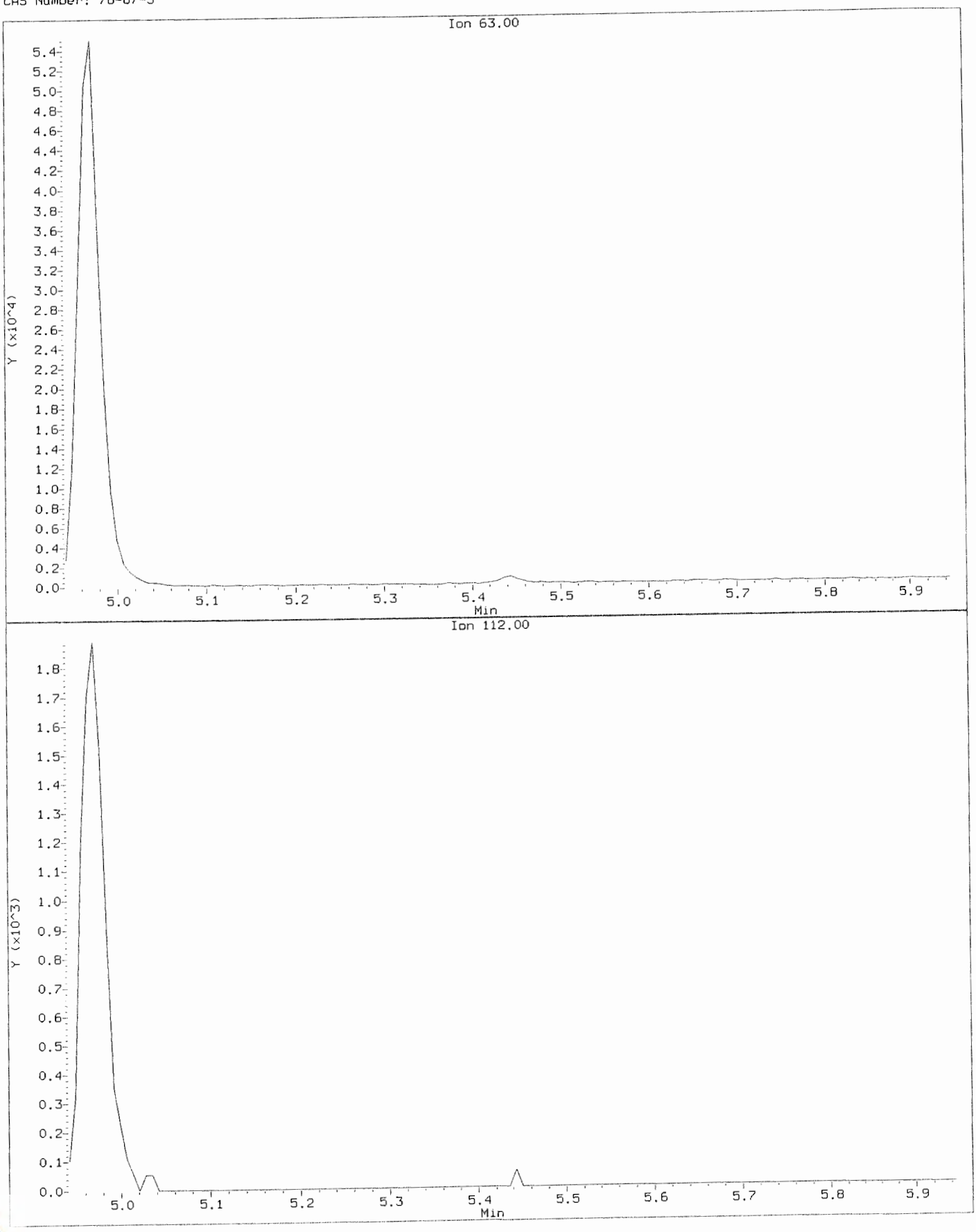
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Compound: 1,2-Dichloroethane
CAS Number: 107-06-2



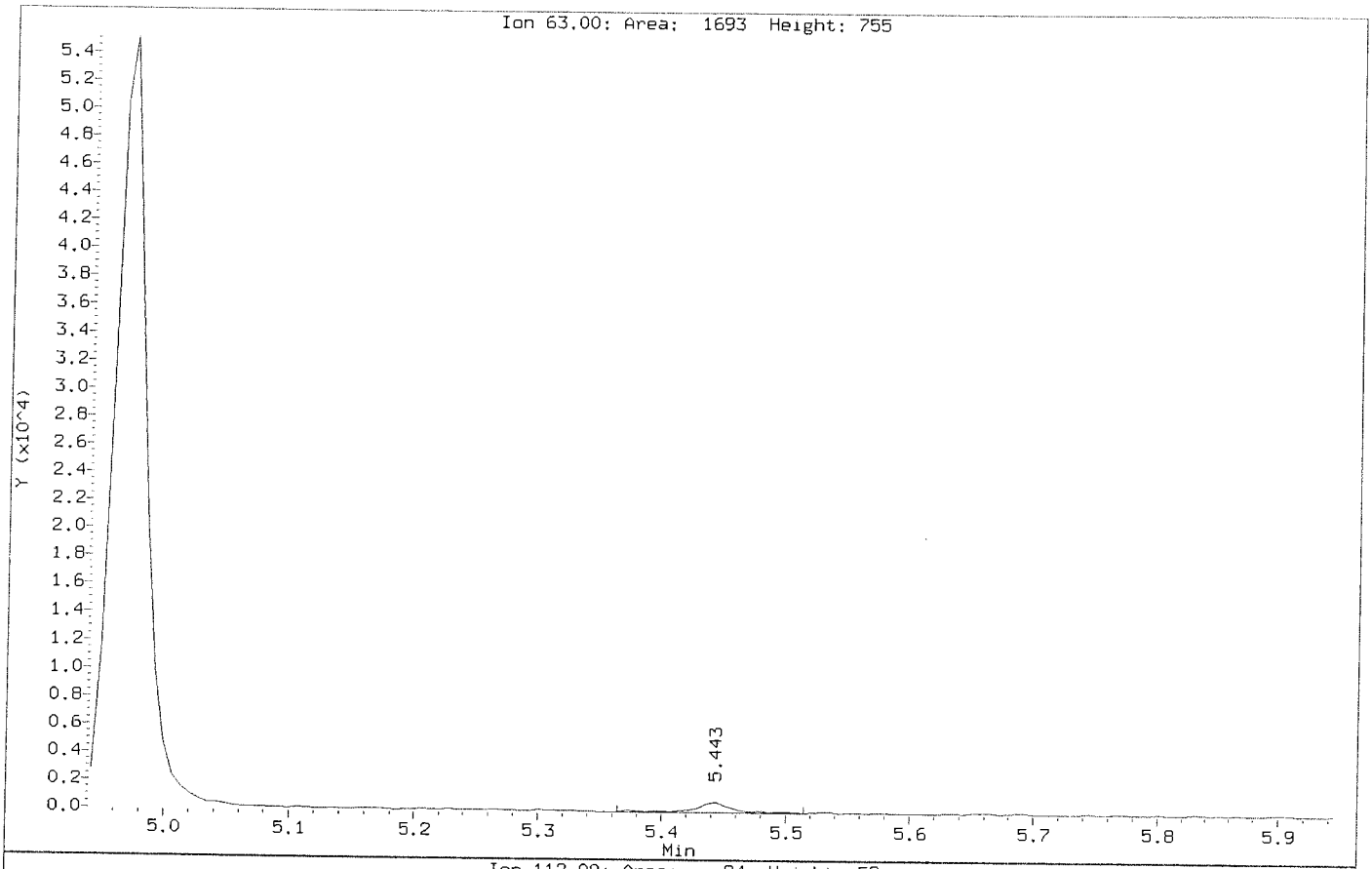
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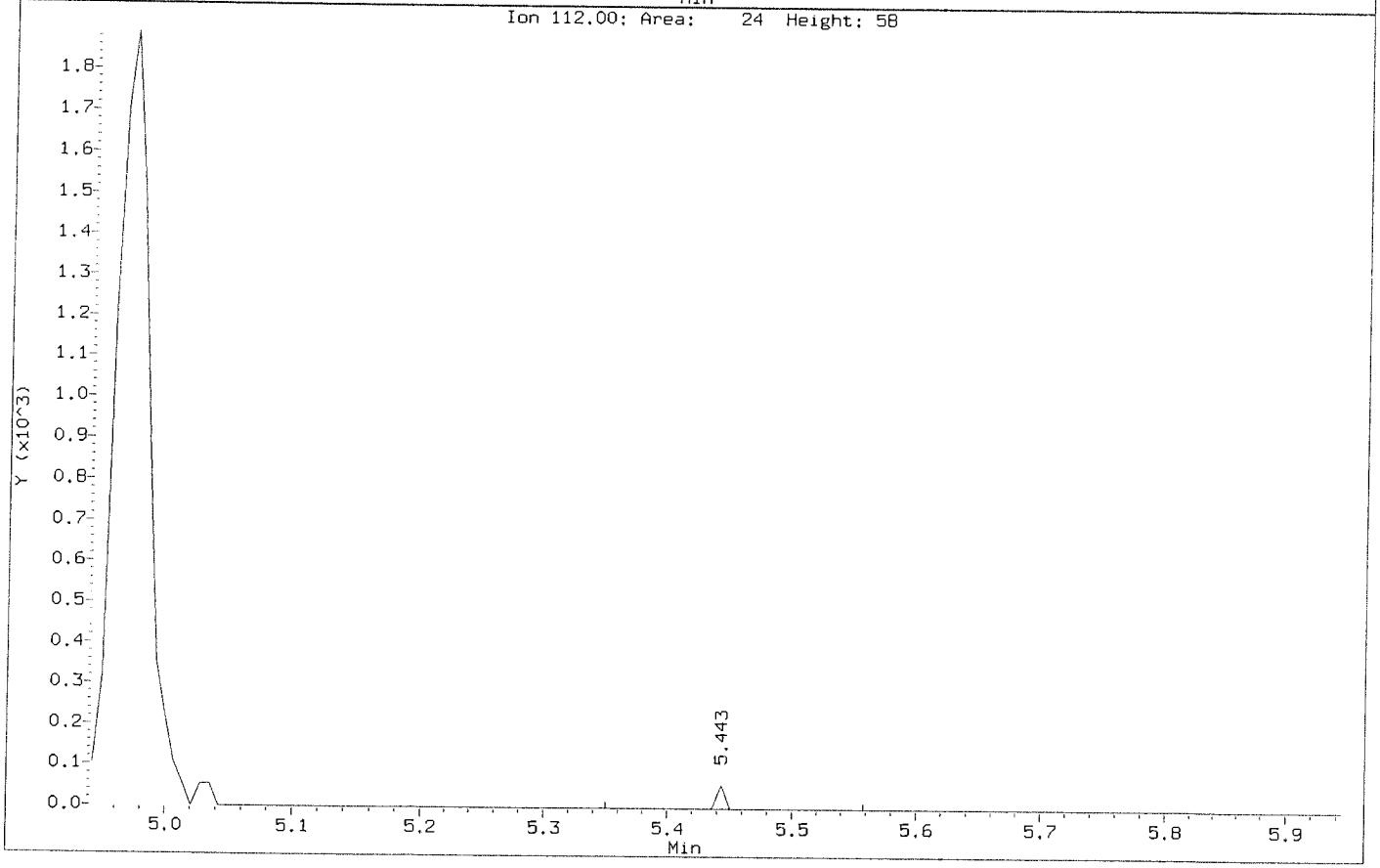
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5



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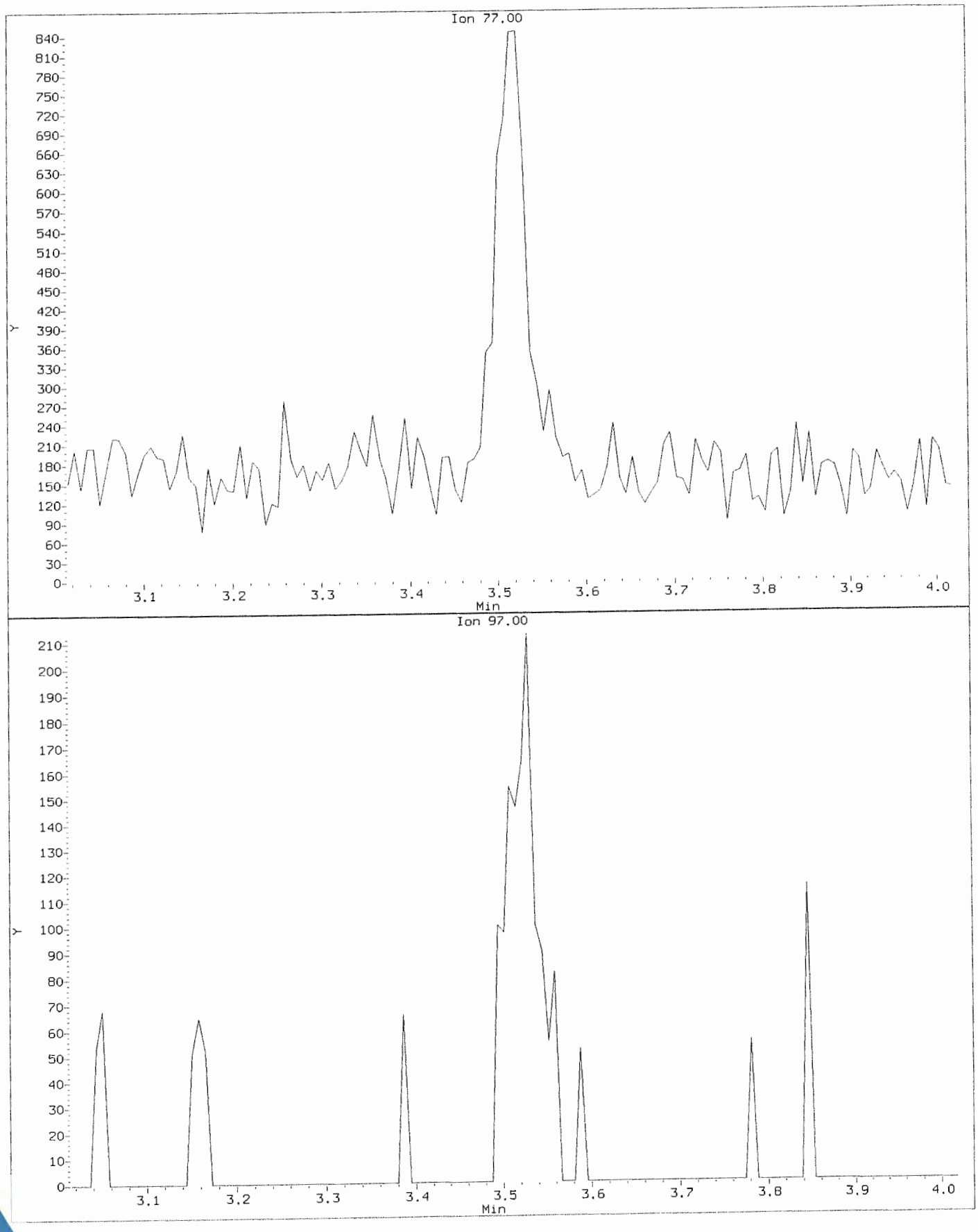
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5





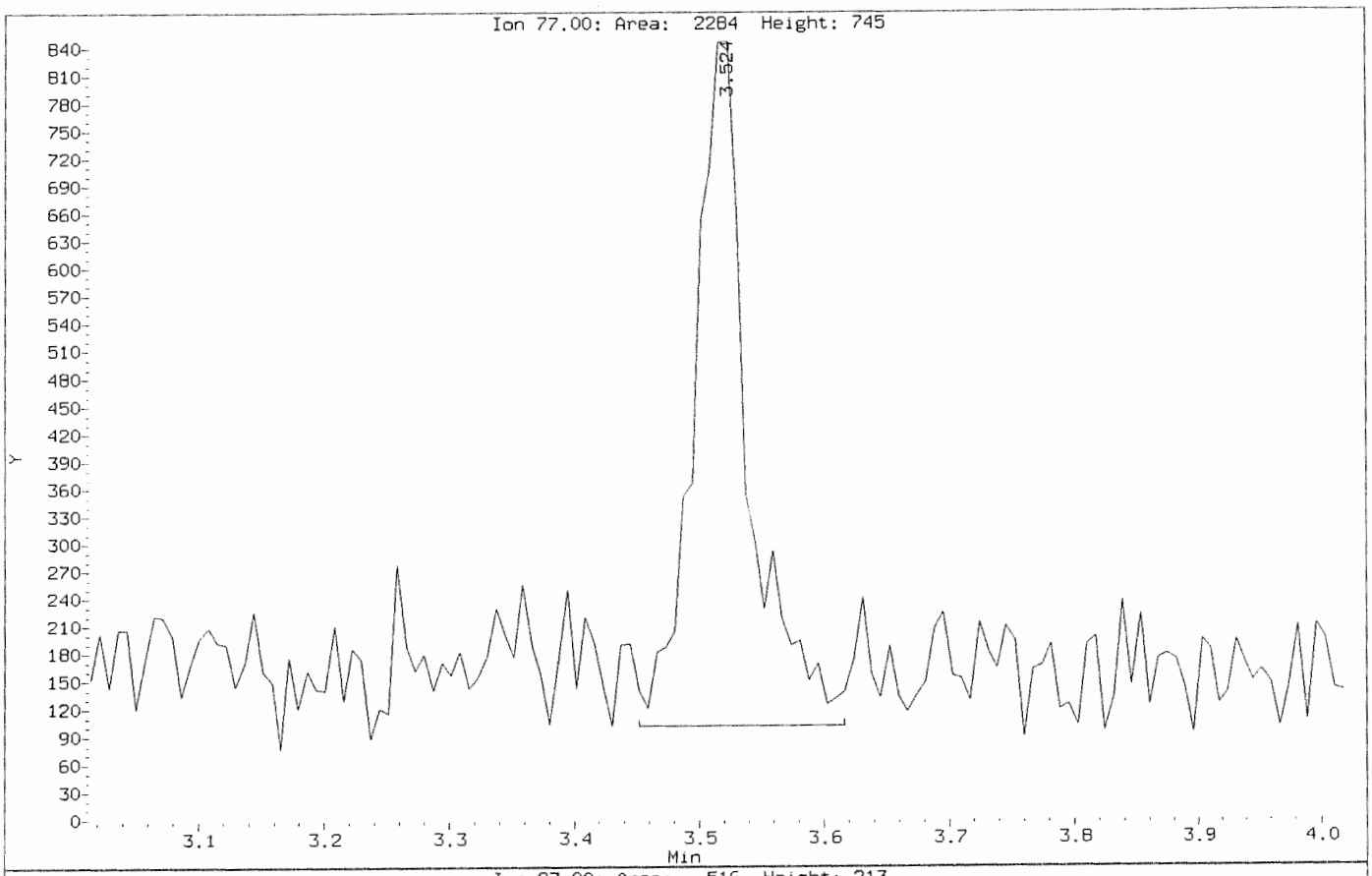
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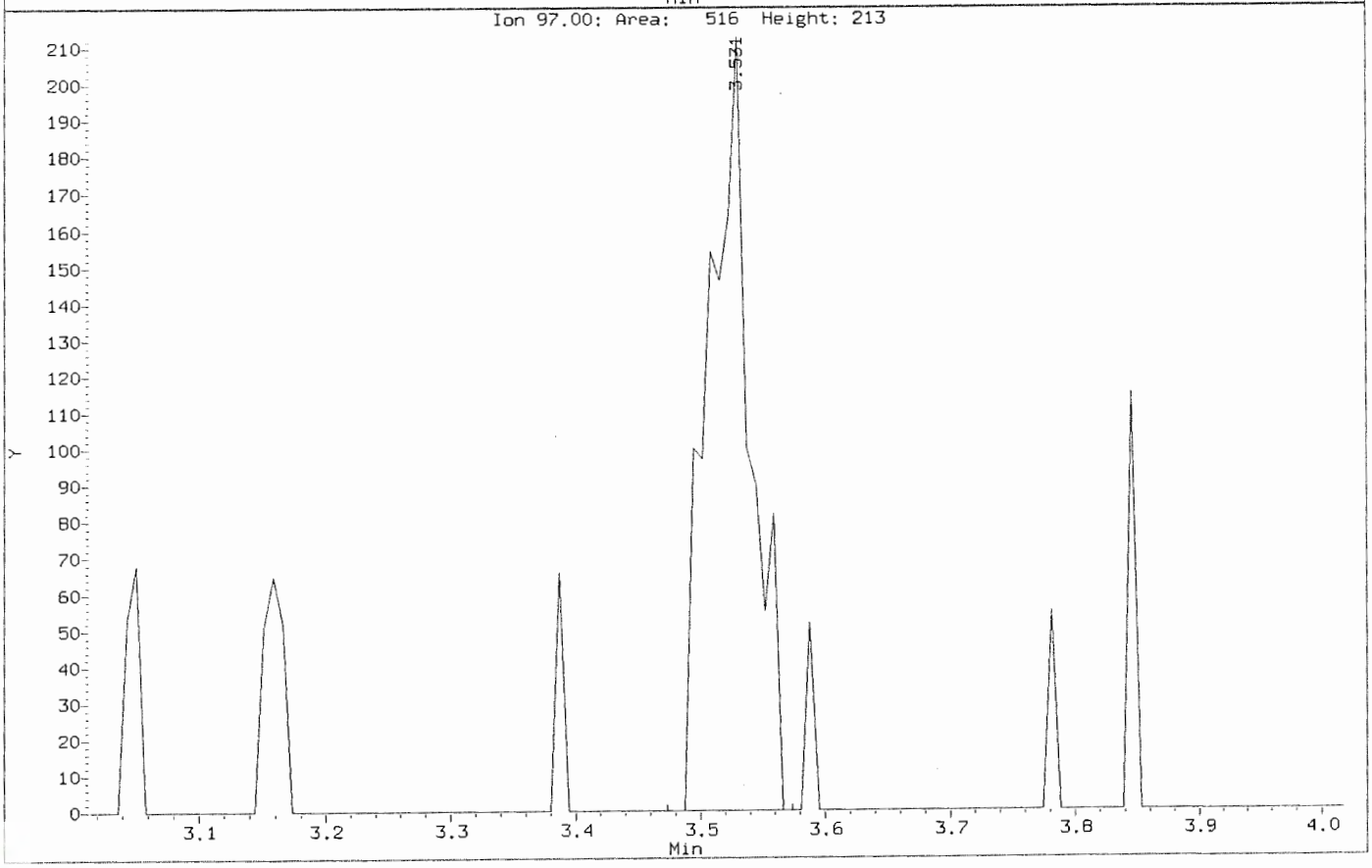
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7



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Instrument: voa6.i
Client Sample ID: VSTD000.5

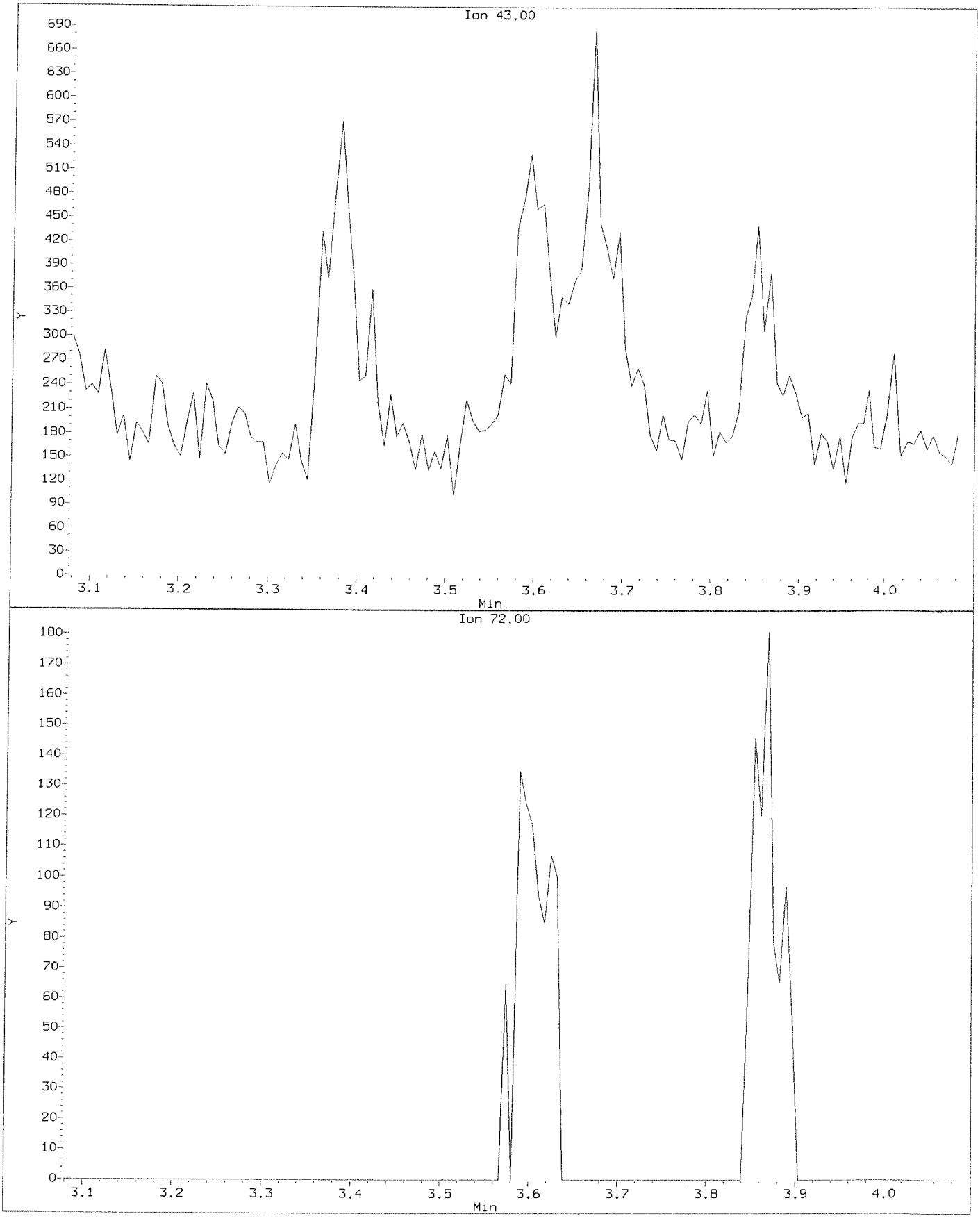
Compound: 2,2-Dichloropropane
CAS Number: 594-20-7





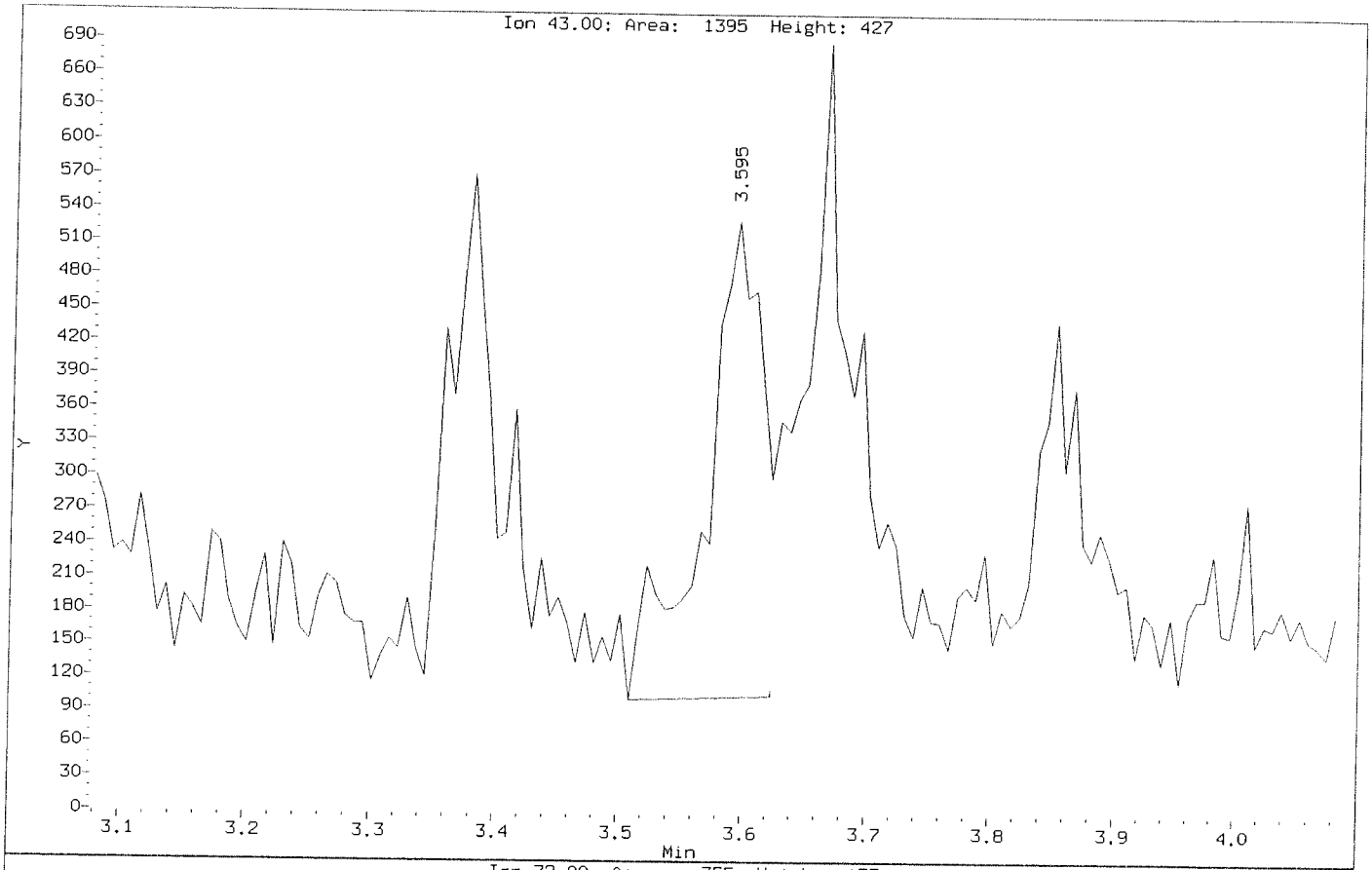
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Client Sample ID: VSTD000.5

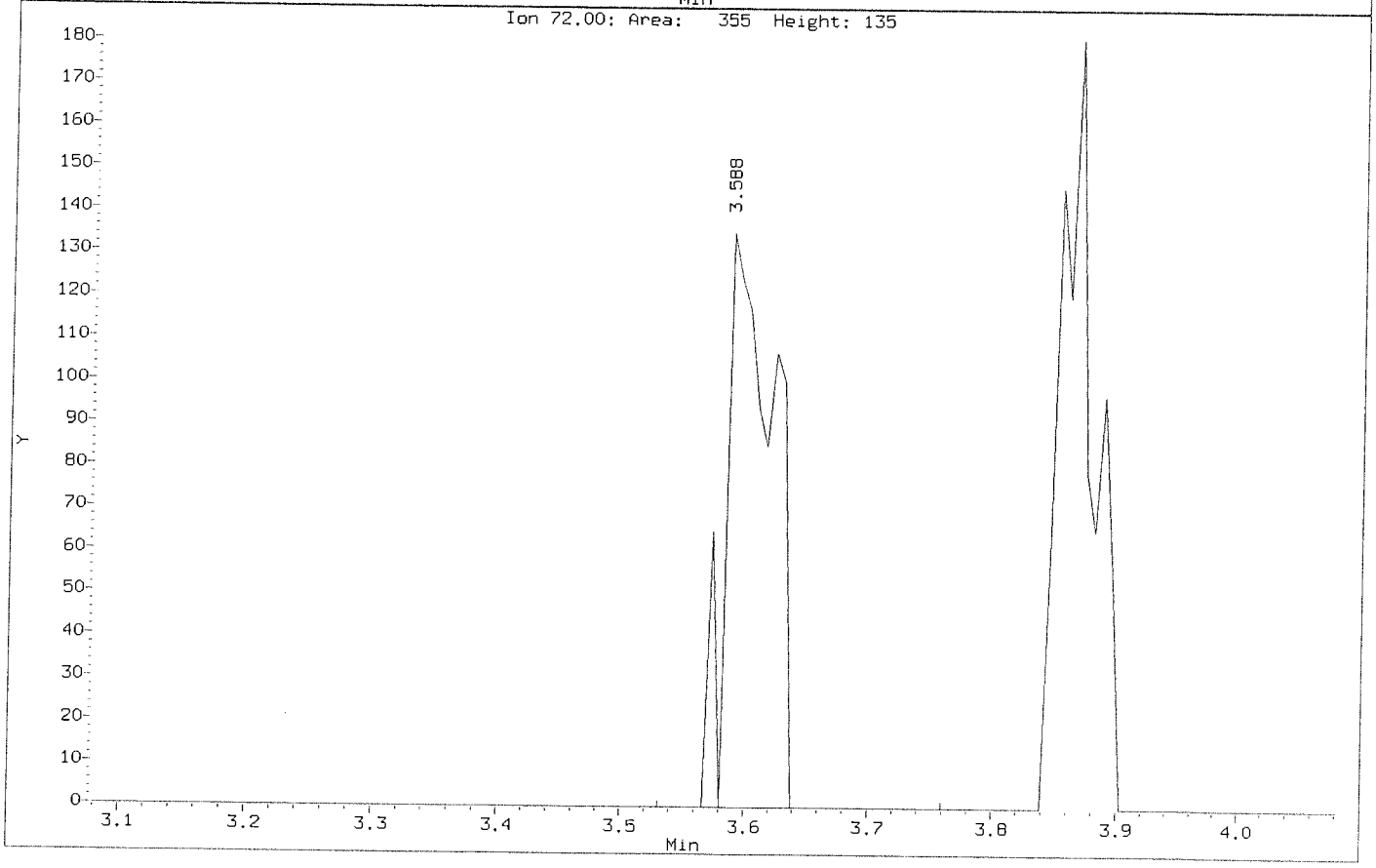
Compound: 2-Butanone
CAS Number: 78-93-3



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Injection Date: 18-NOV-2019 14:35
Instrument: voa6.i
Client Sample ID: VSTD000.5

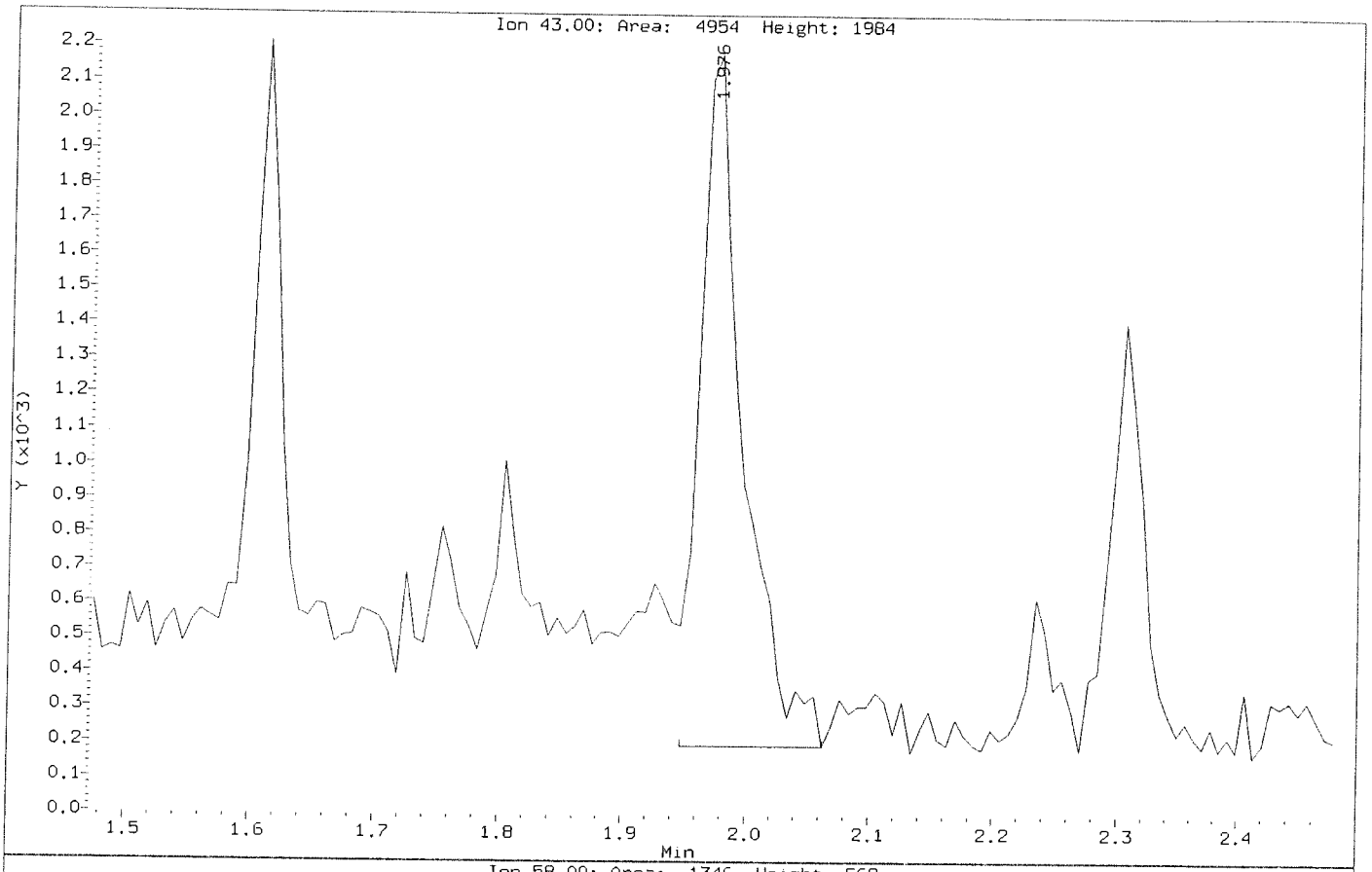
Compound: 2-Butanone
CAS Number: 78-93-3

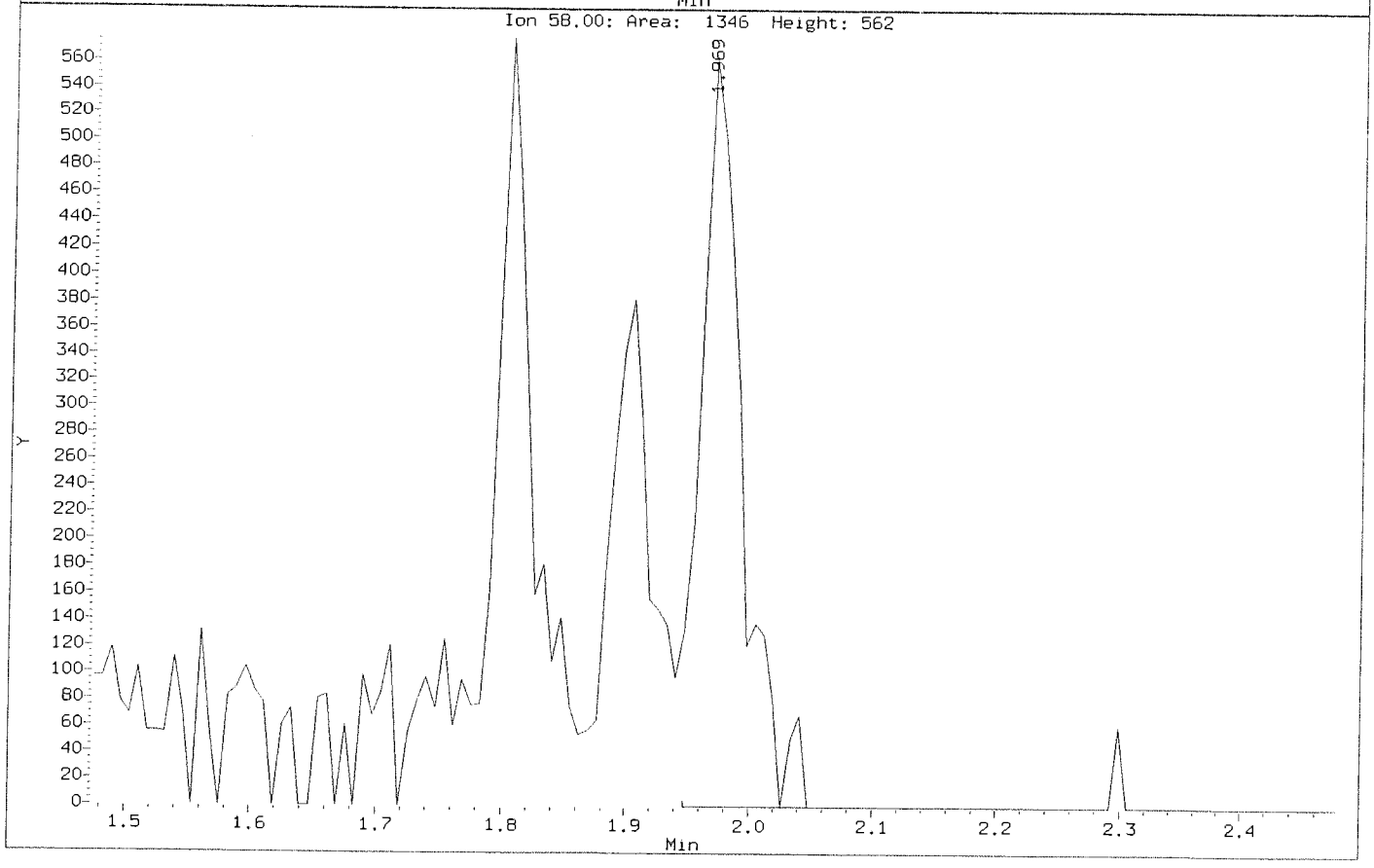




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Injection Date: 18-NOV-2019 14:35
Instrument: voa6.i
Client Sample ID: VSTD000.5

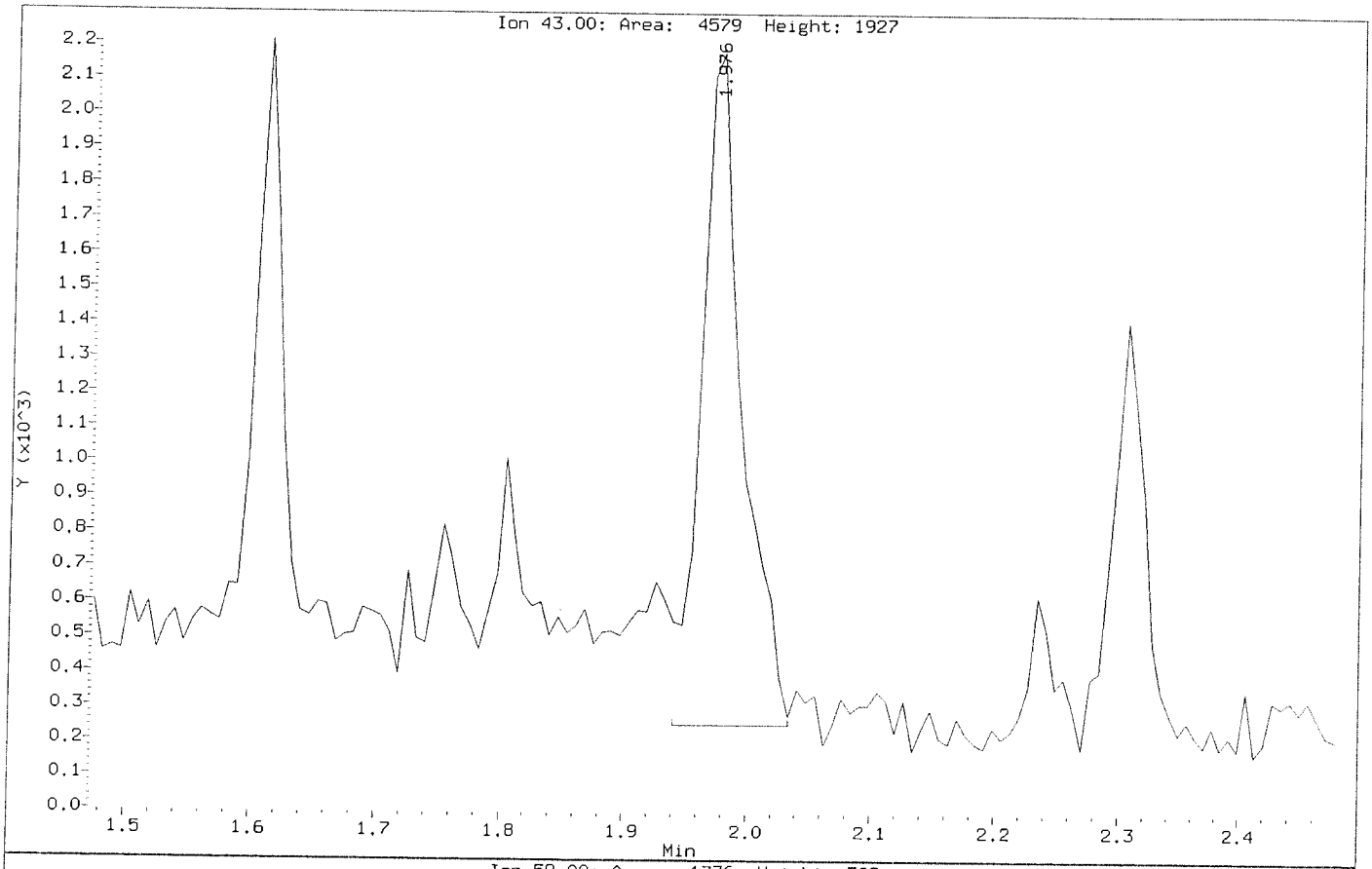
Compound: Acetone
CAS Number: 67-64-1

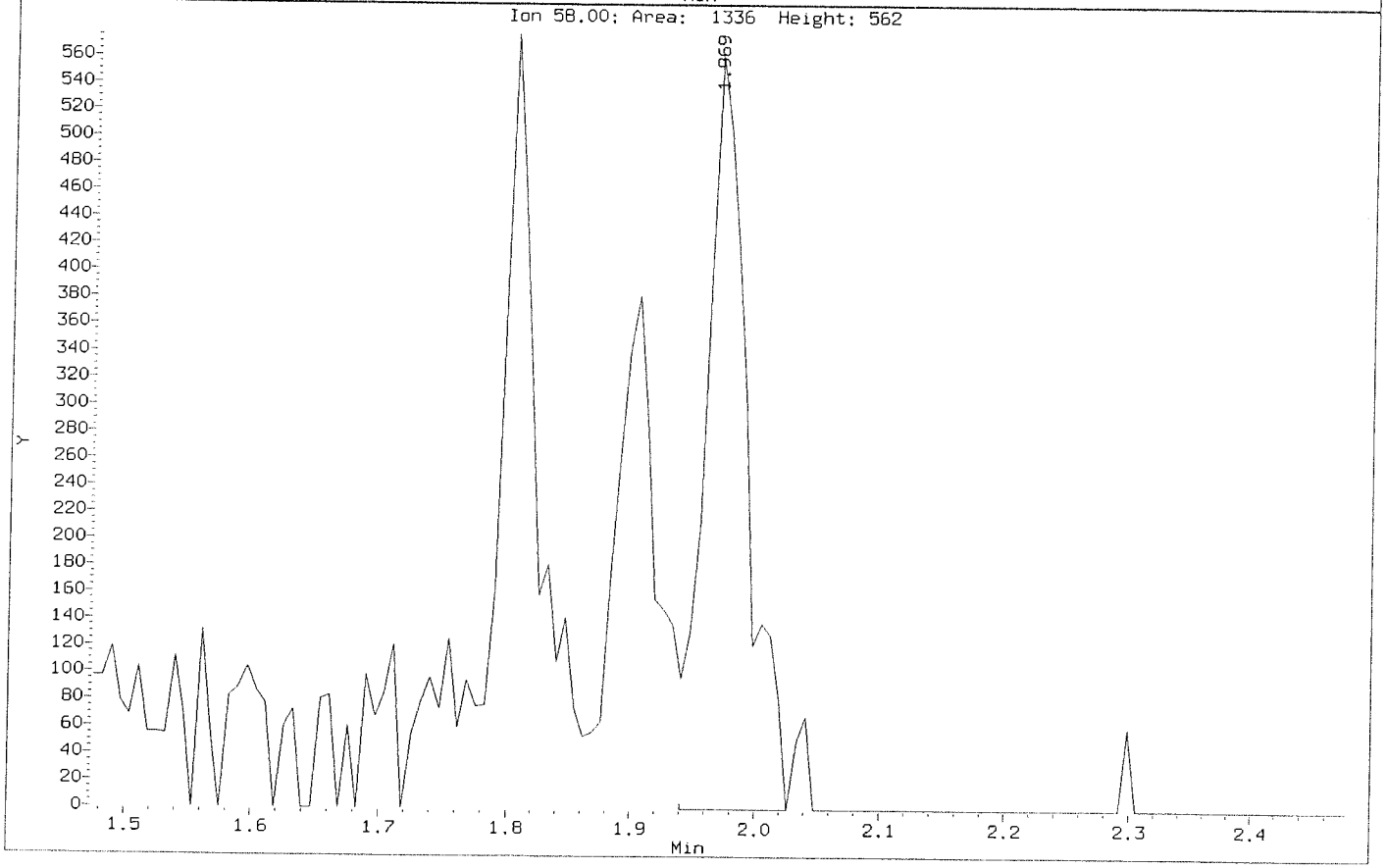




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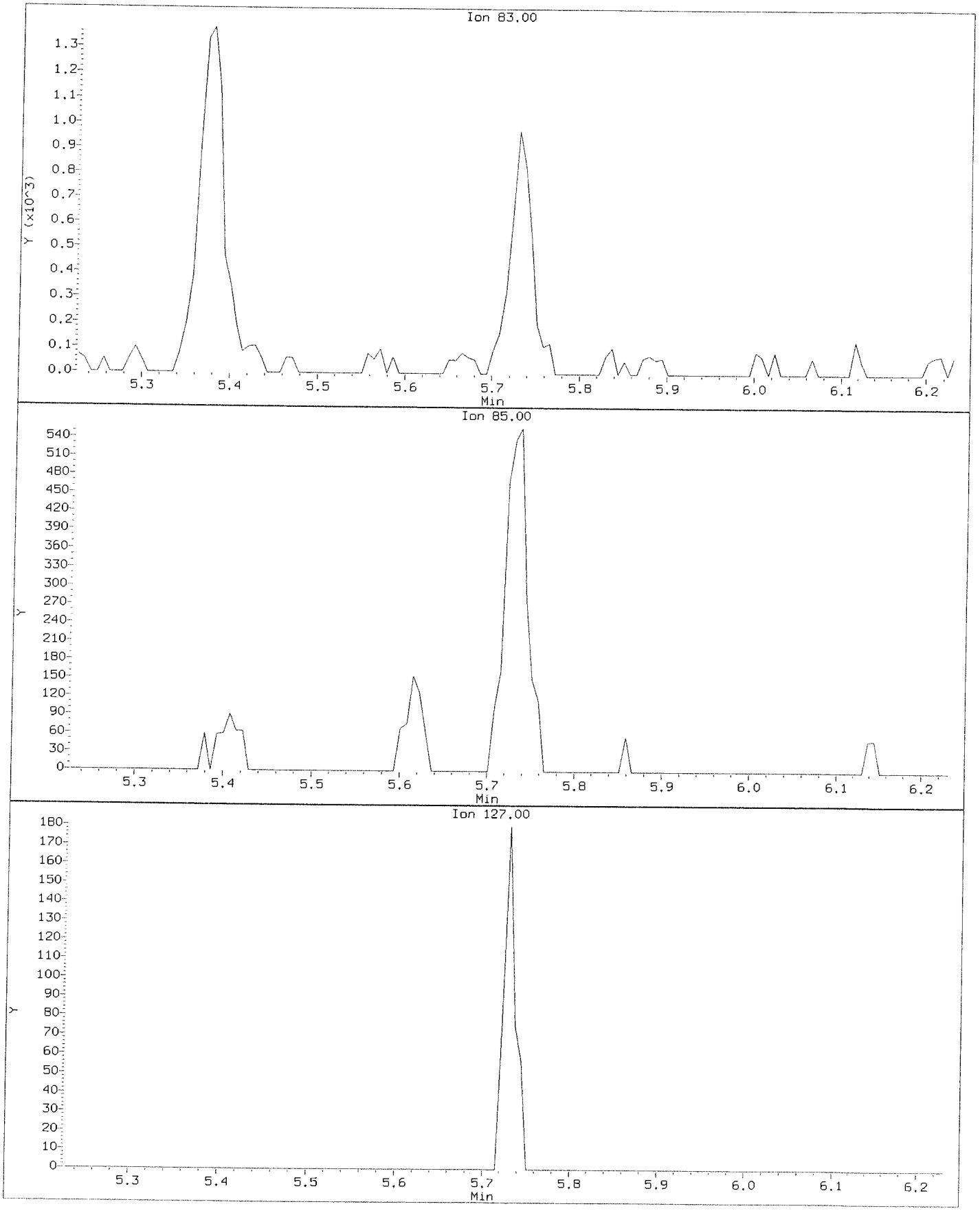
Compound: Acetone
CAS Number: 67-64-1





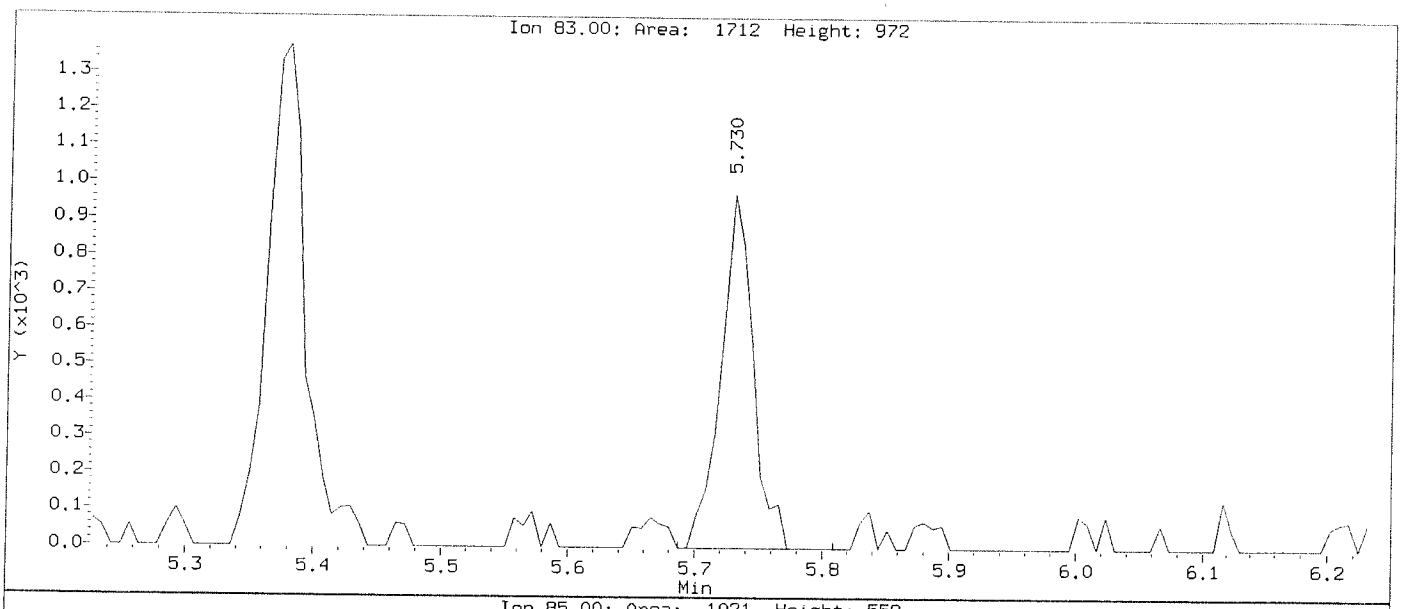
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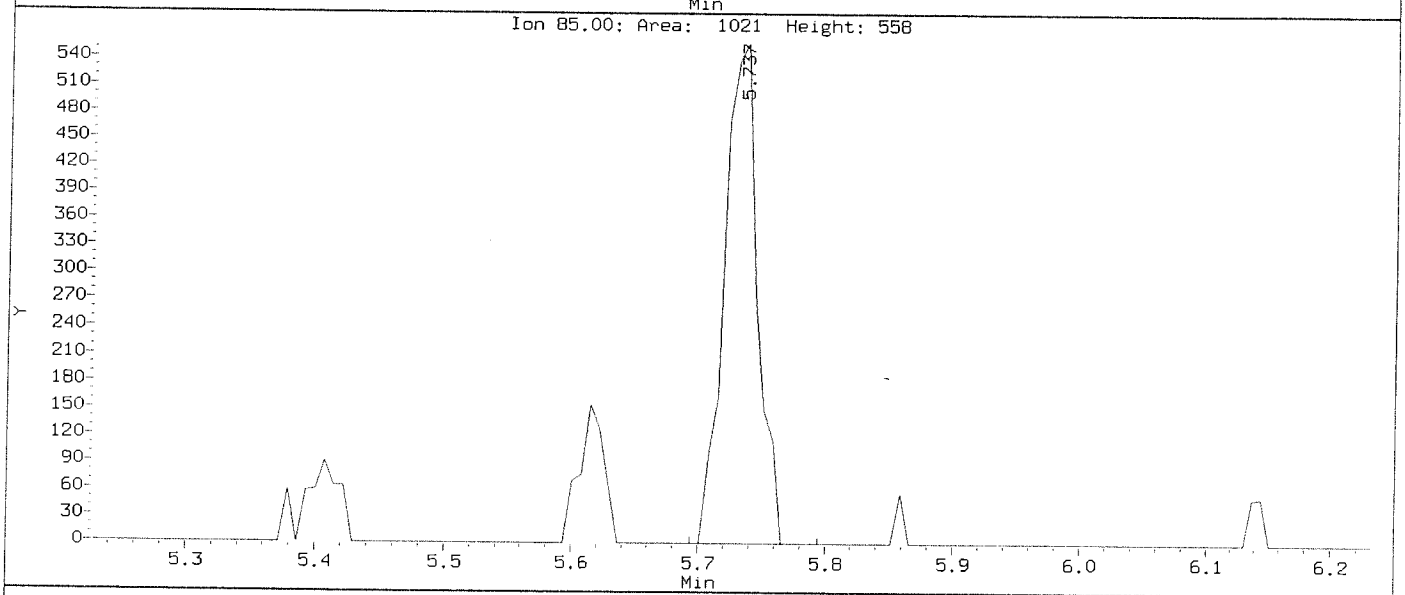
Compound: Bromodichloromethane
CAS Number: 75-27-4

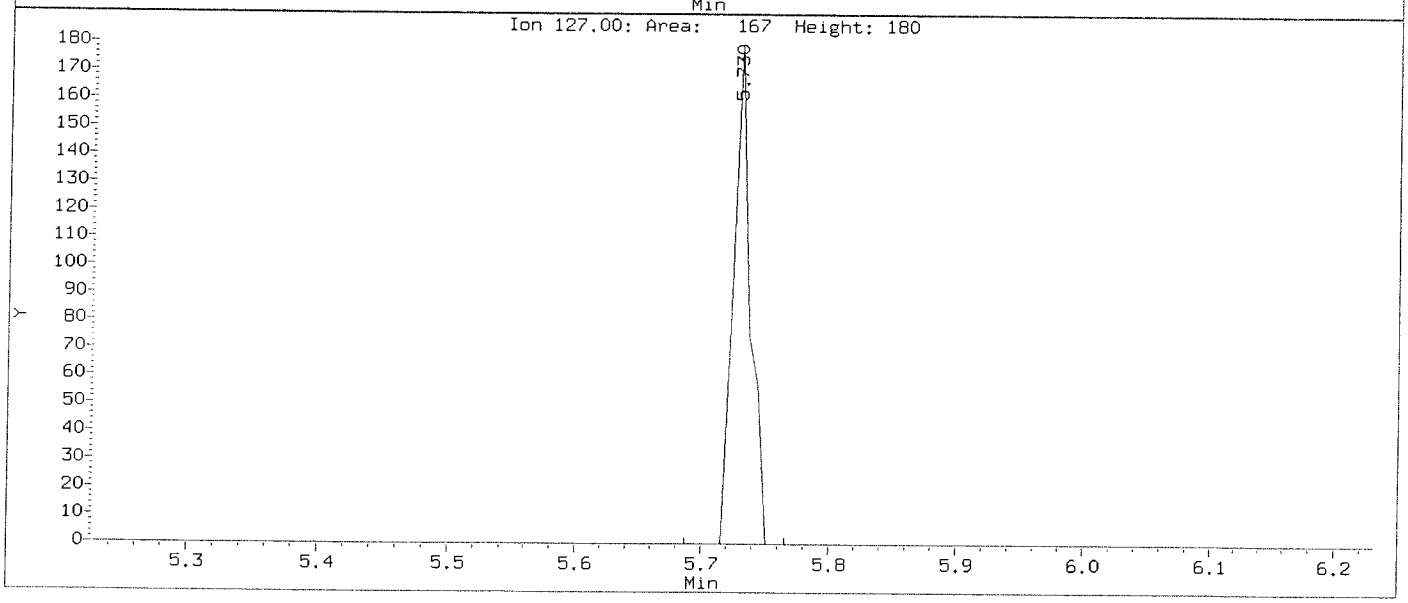


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Injection Date: 18-NOV-2019 14:35
Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: Bromodichloromethane
CAS Number: 75-27-4

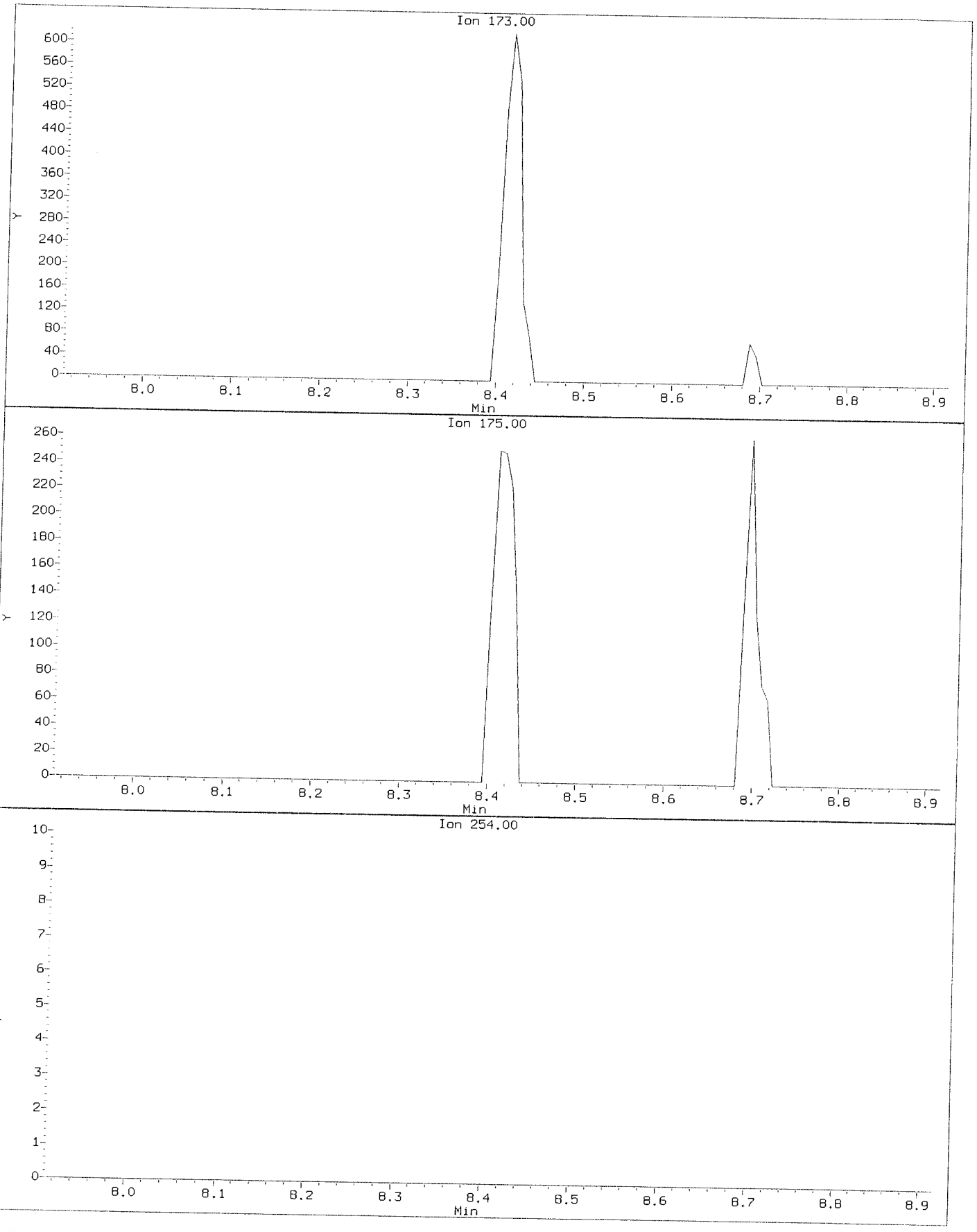






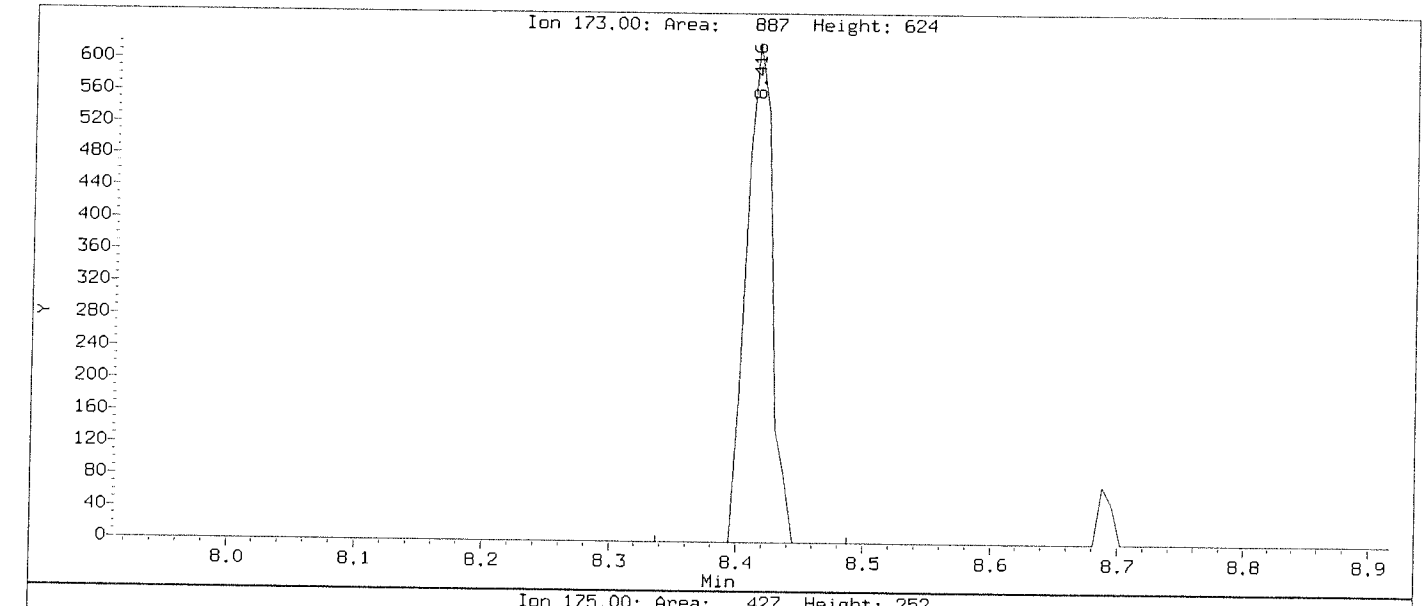
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Injection Date: 18-NOV-2019 14:35
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Client Sample ID: VSTD000.5

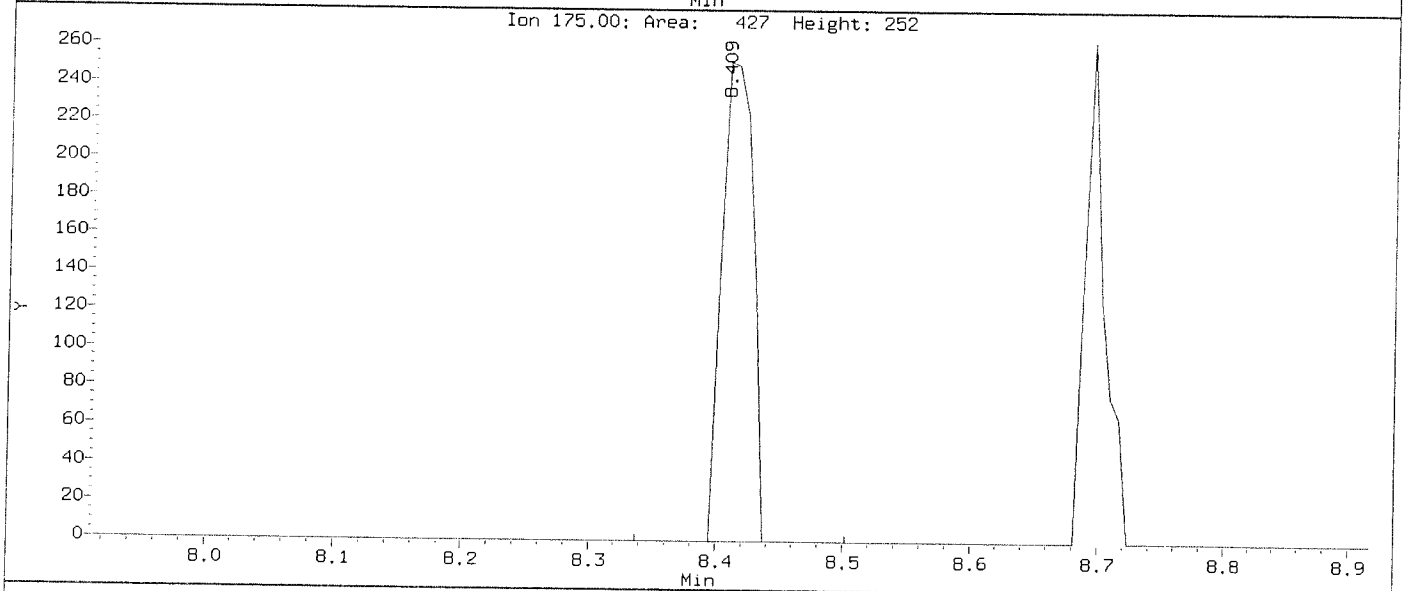
Compound: Bromoform
CAS Number: 75-25-2

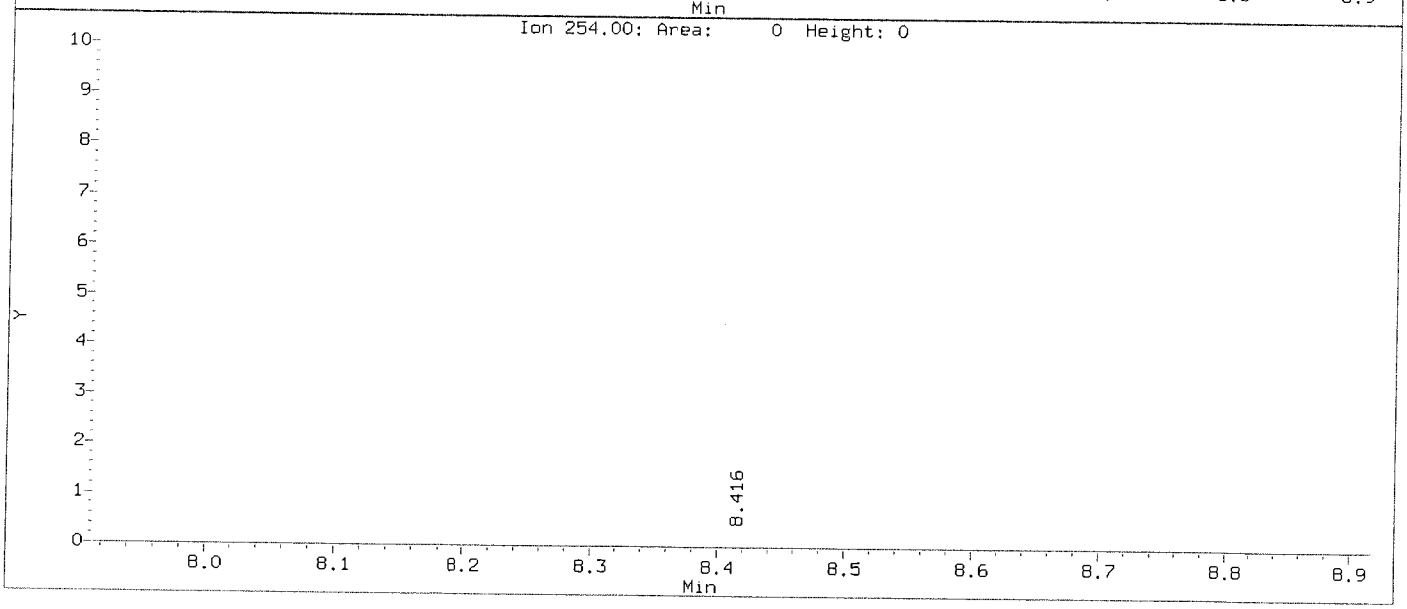


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Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: Bromoform
CAS Number: 75-25-2

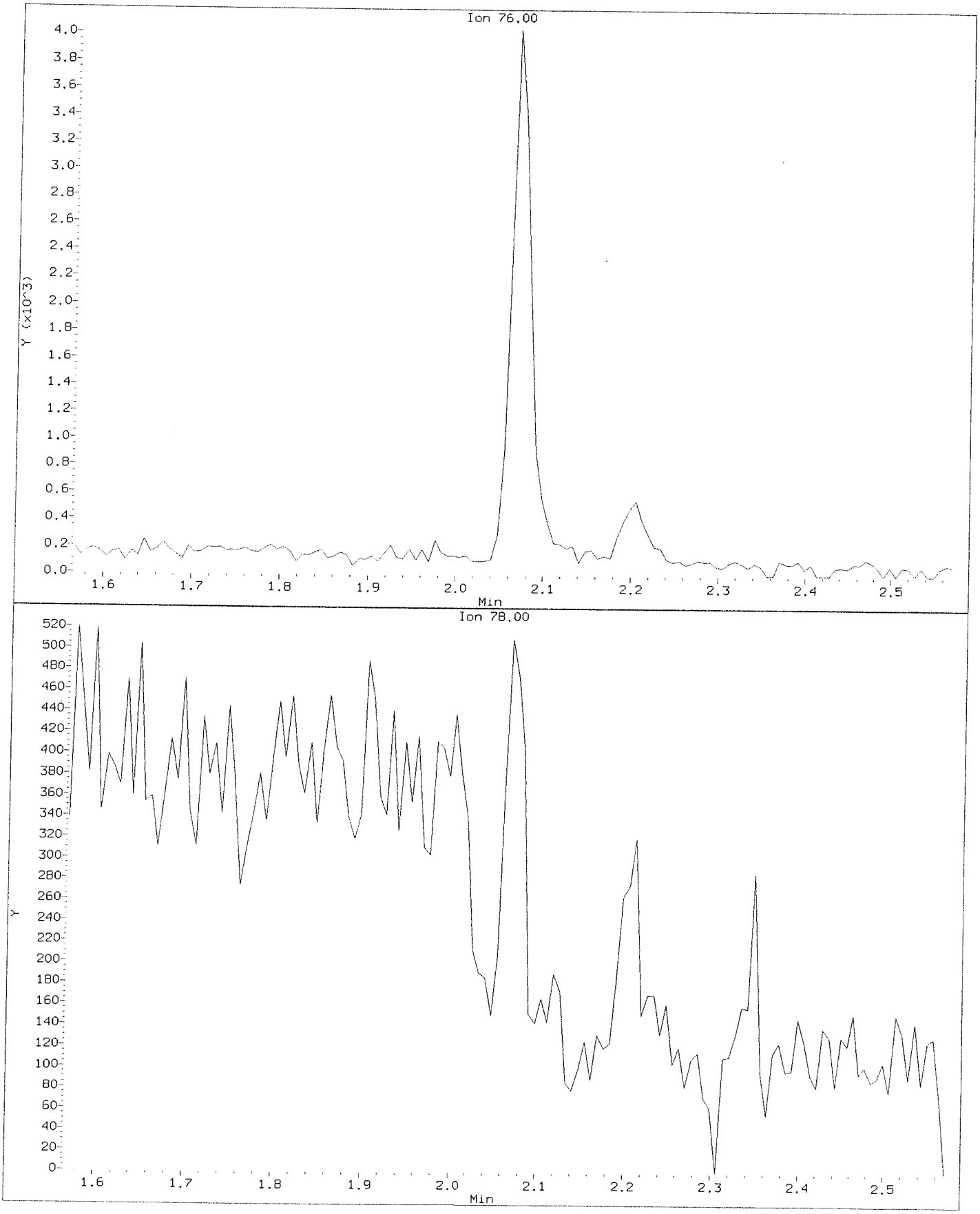






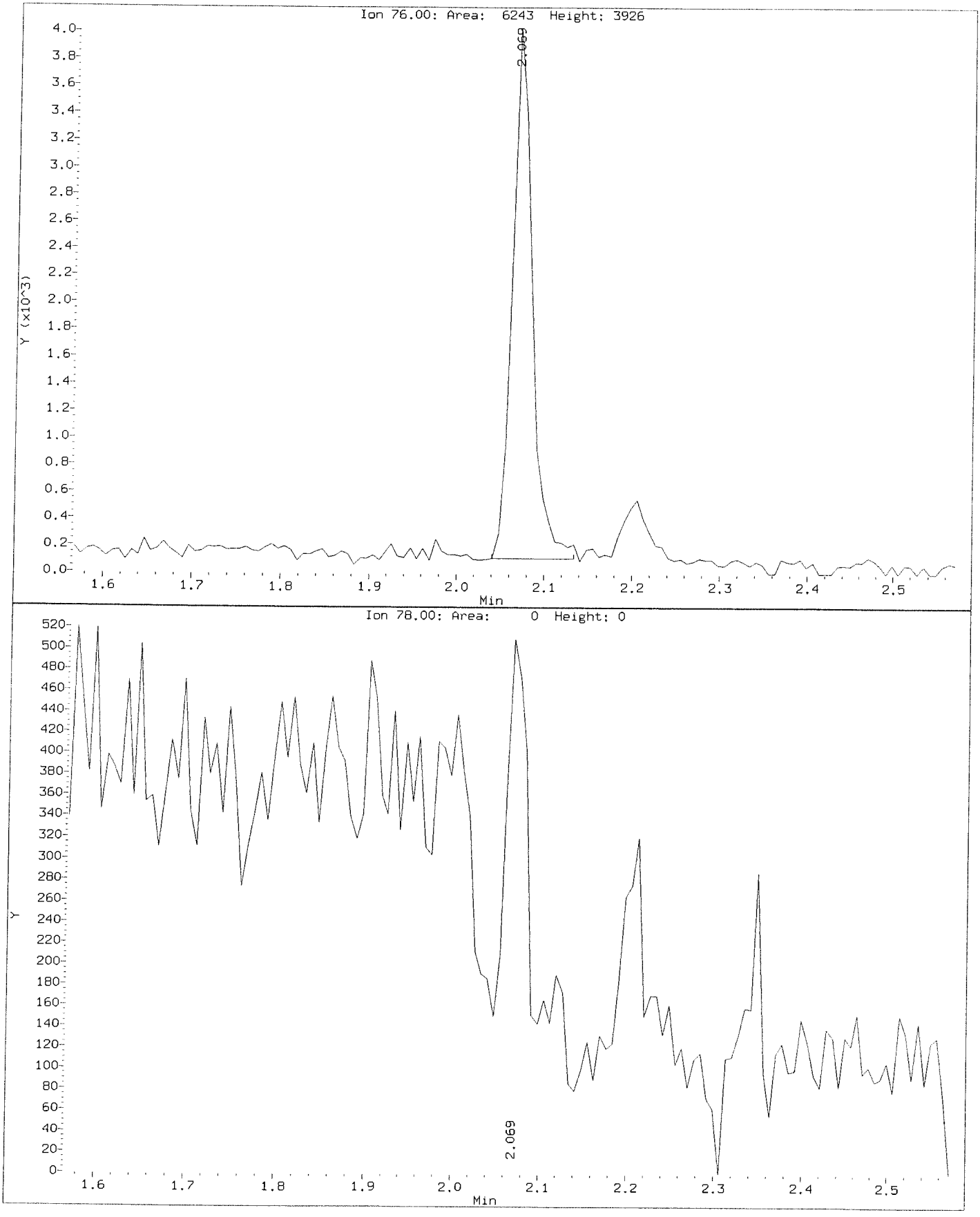
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Injection Date: 18-NOV-2019 14:35
Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: Carbon Disulfide
CAS Number: 75-15-0



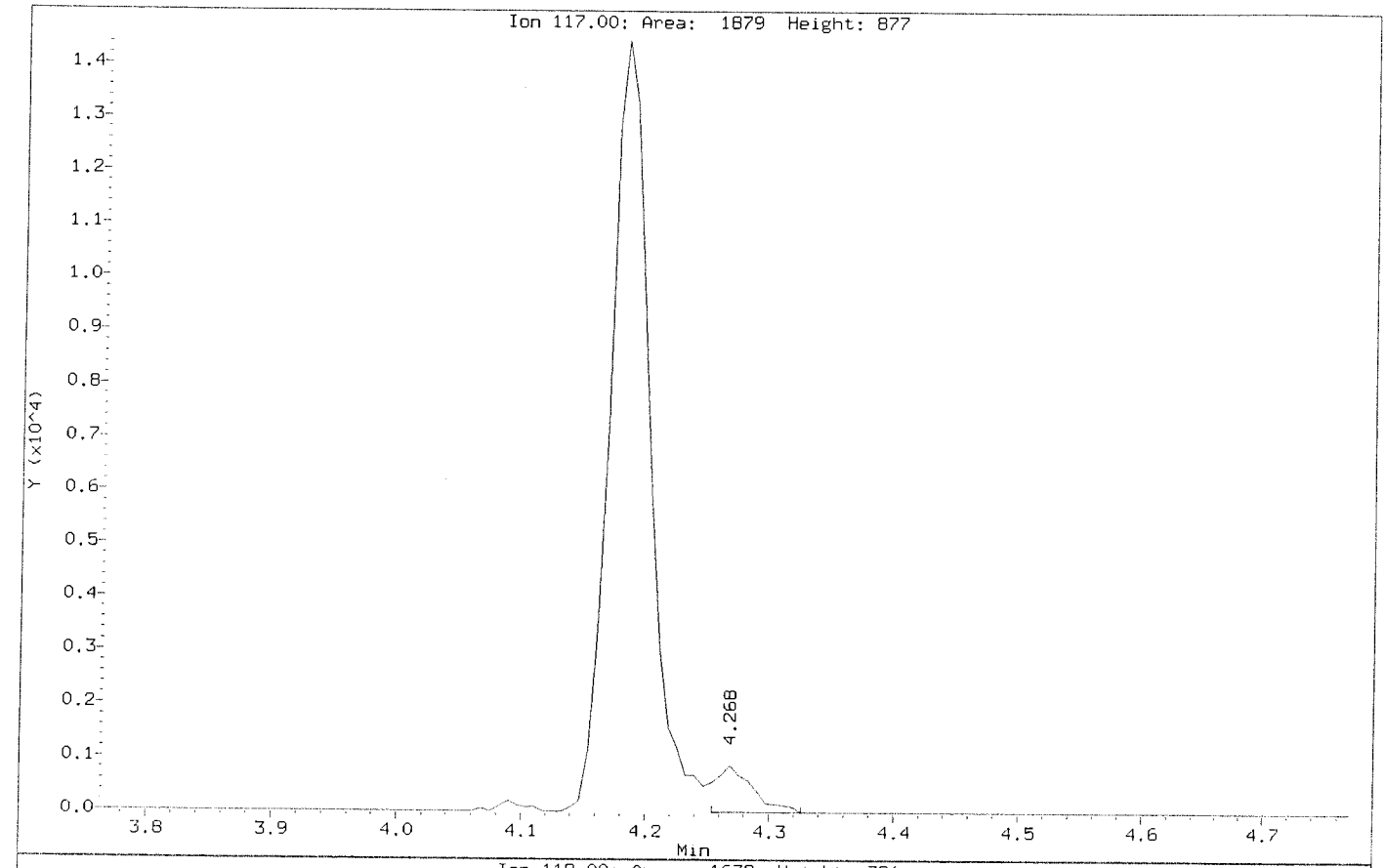
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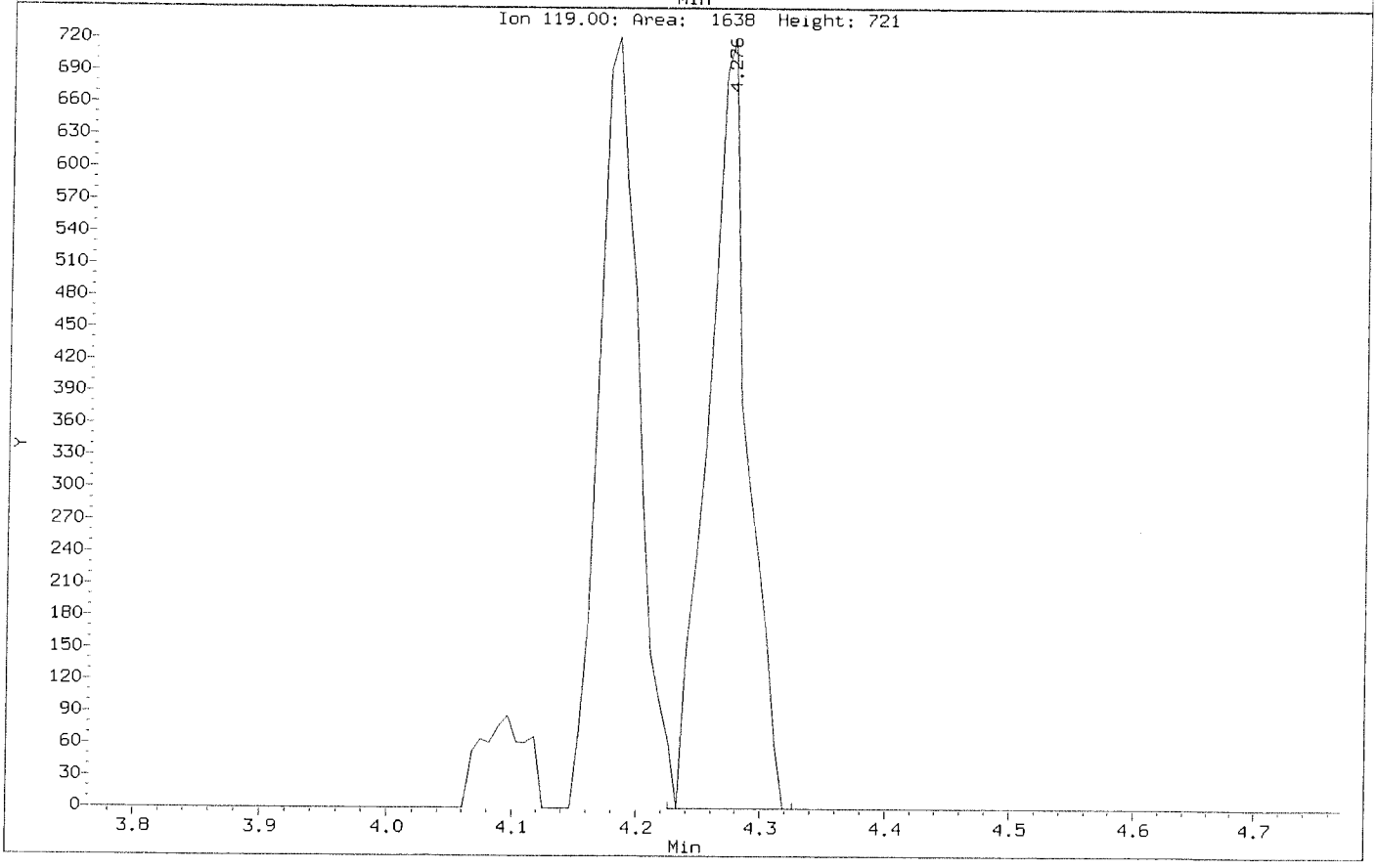
Compound: Carbon Disulfide
CAS Number: 75-15-0



Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\BEFORE\X111803.D
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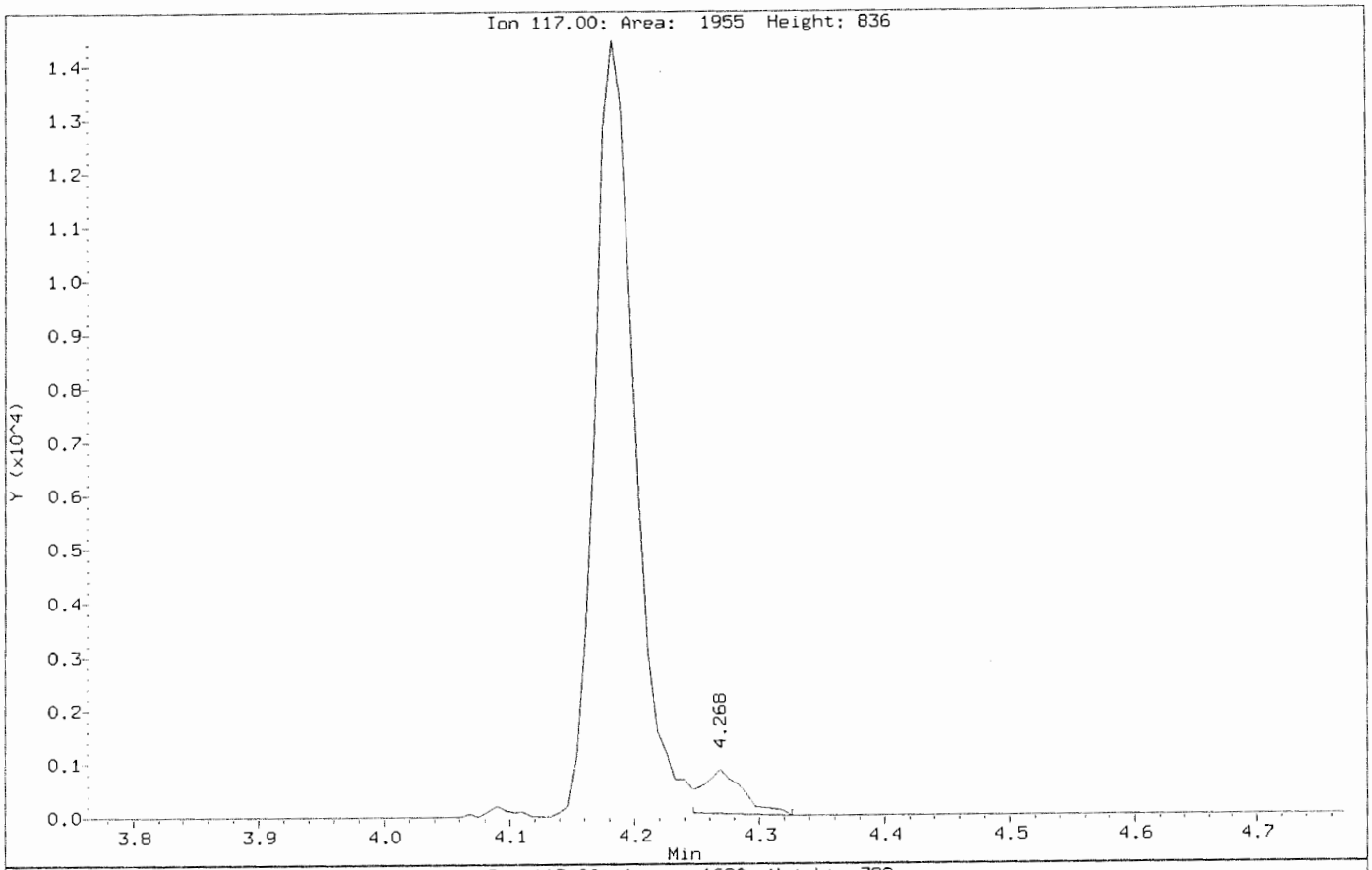
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

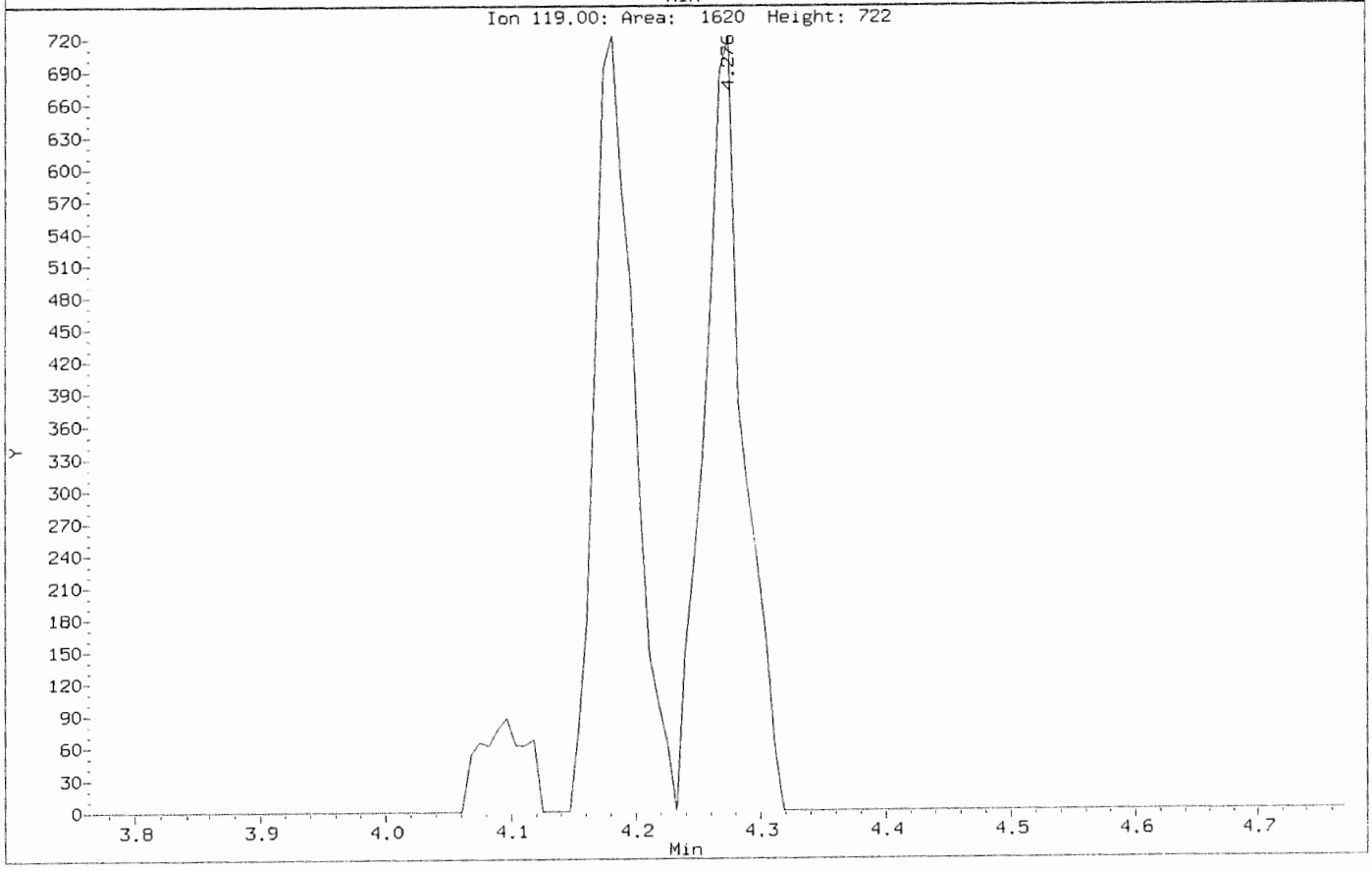




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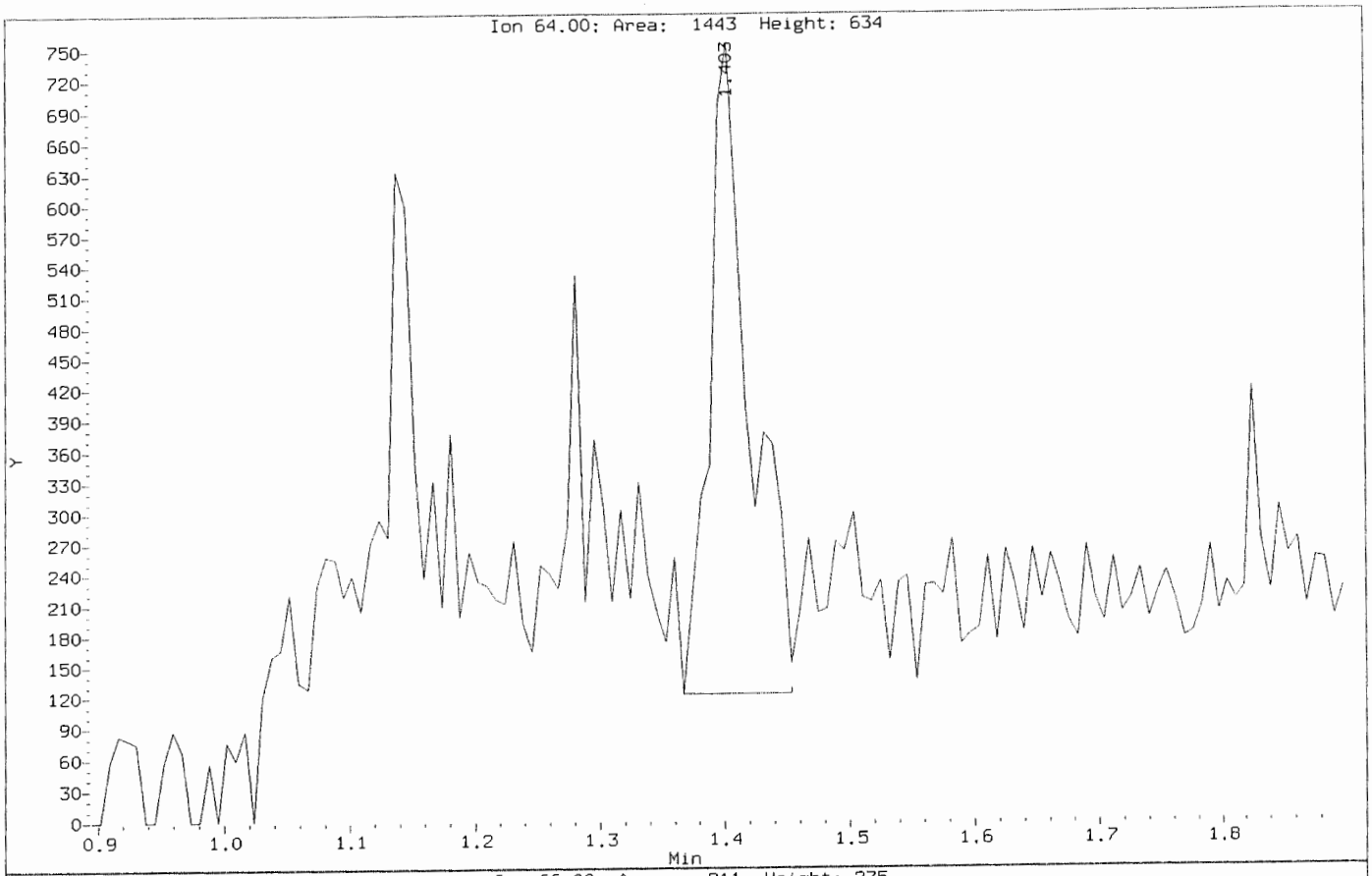
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

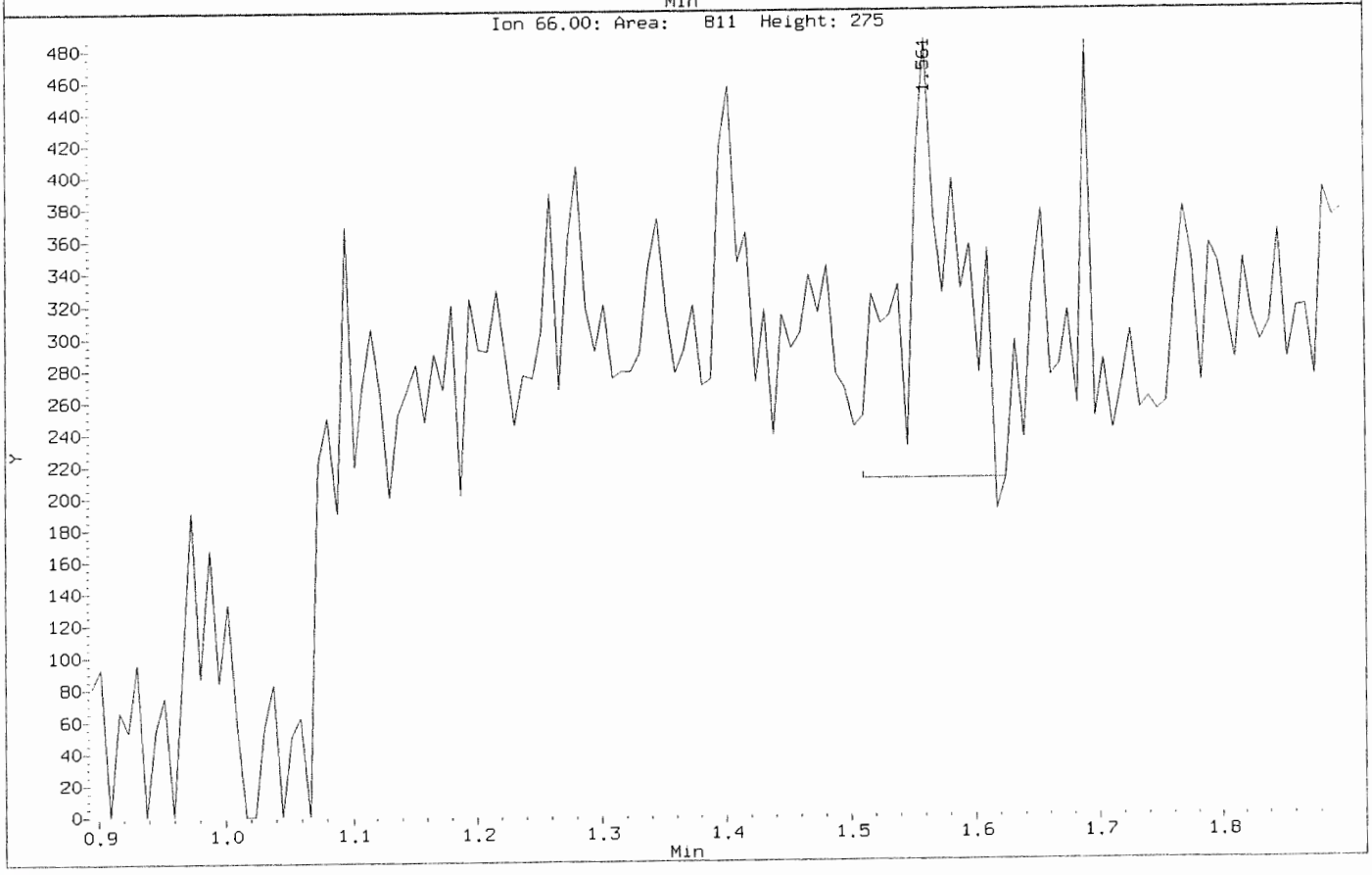




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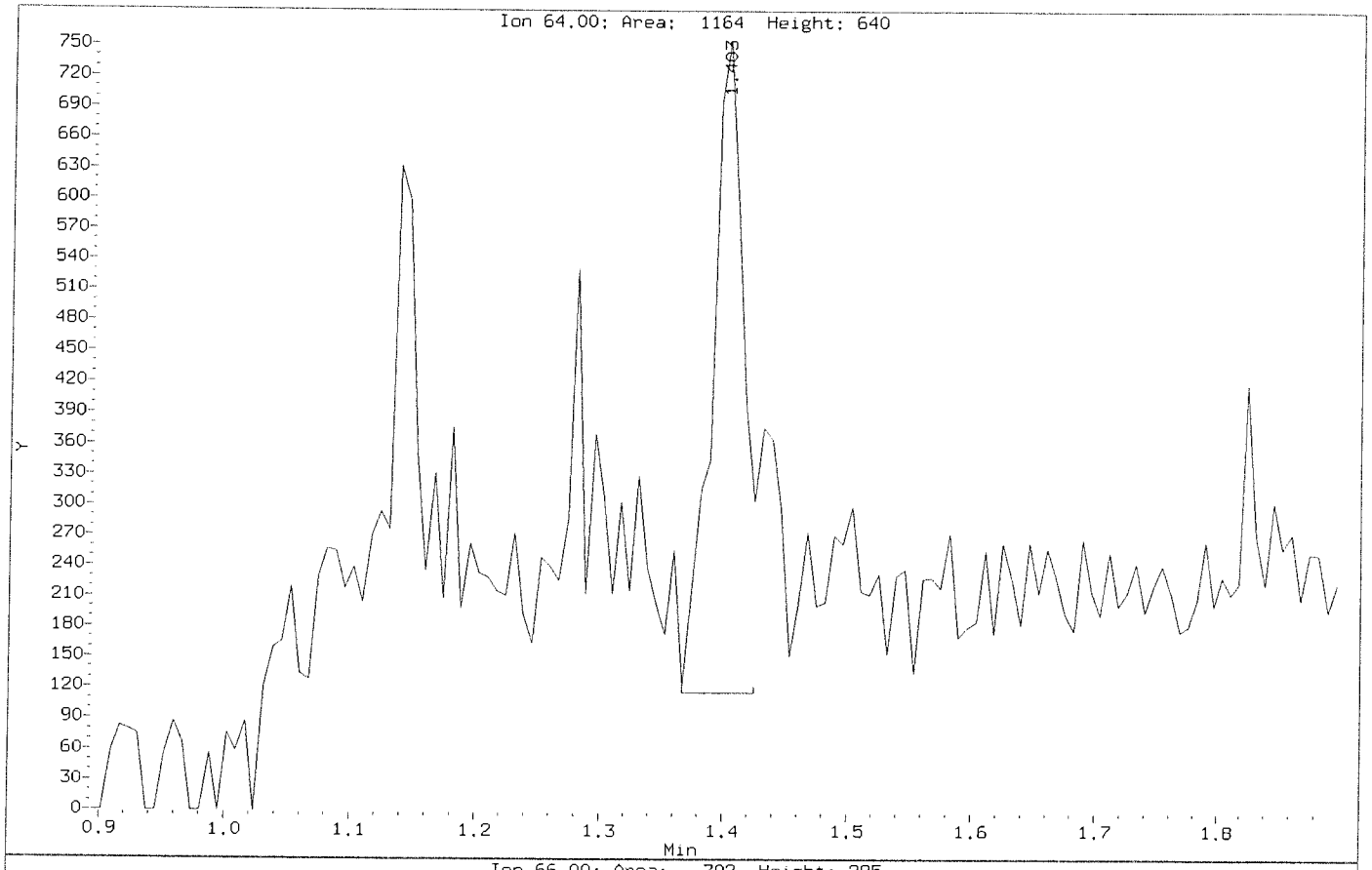
Compound: Chloroethane
CAS Number: 75-00-3

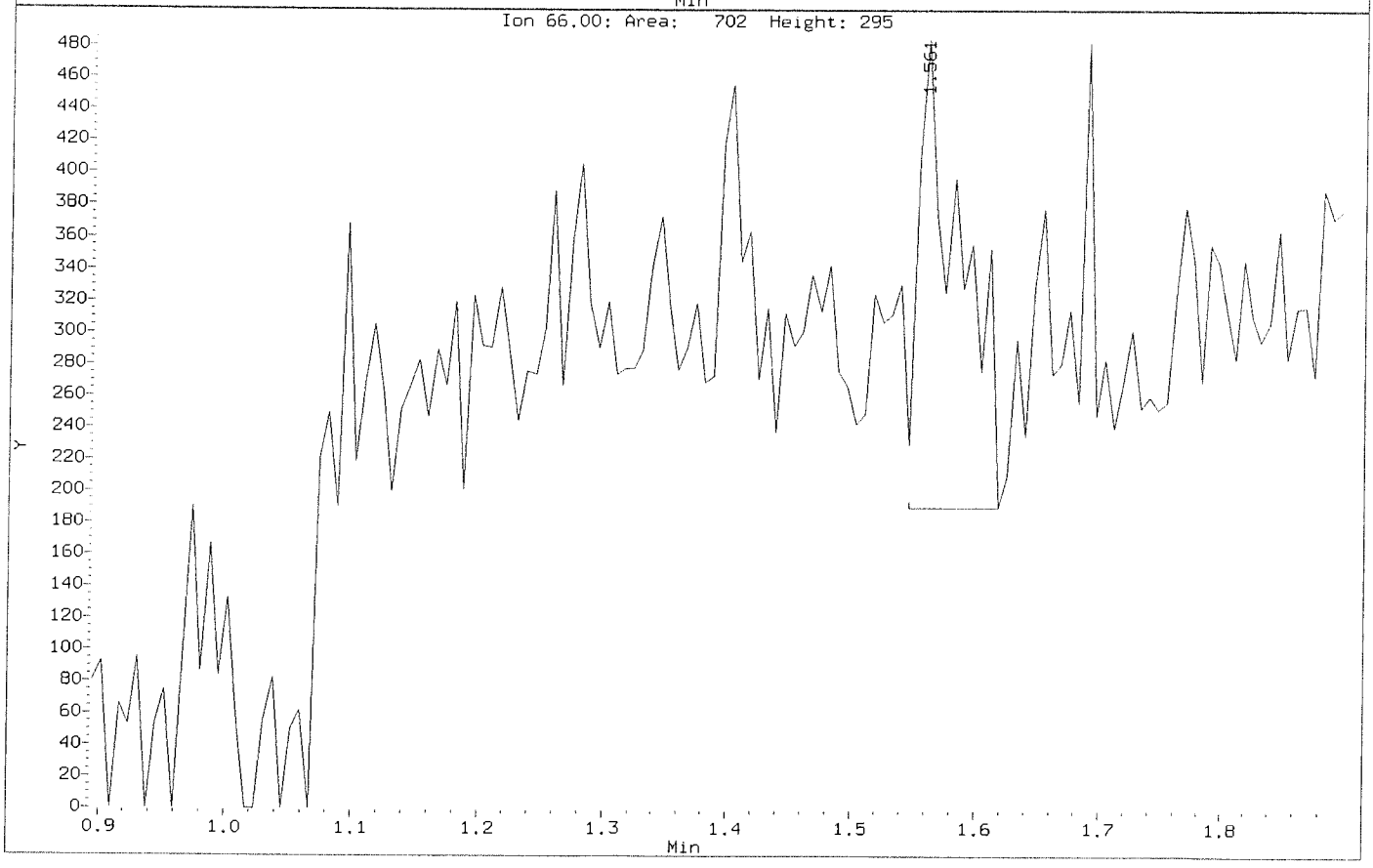




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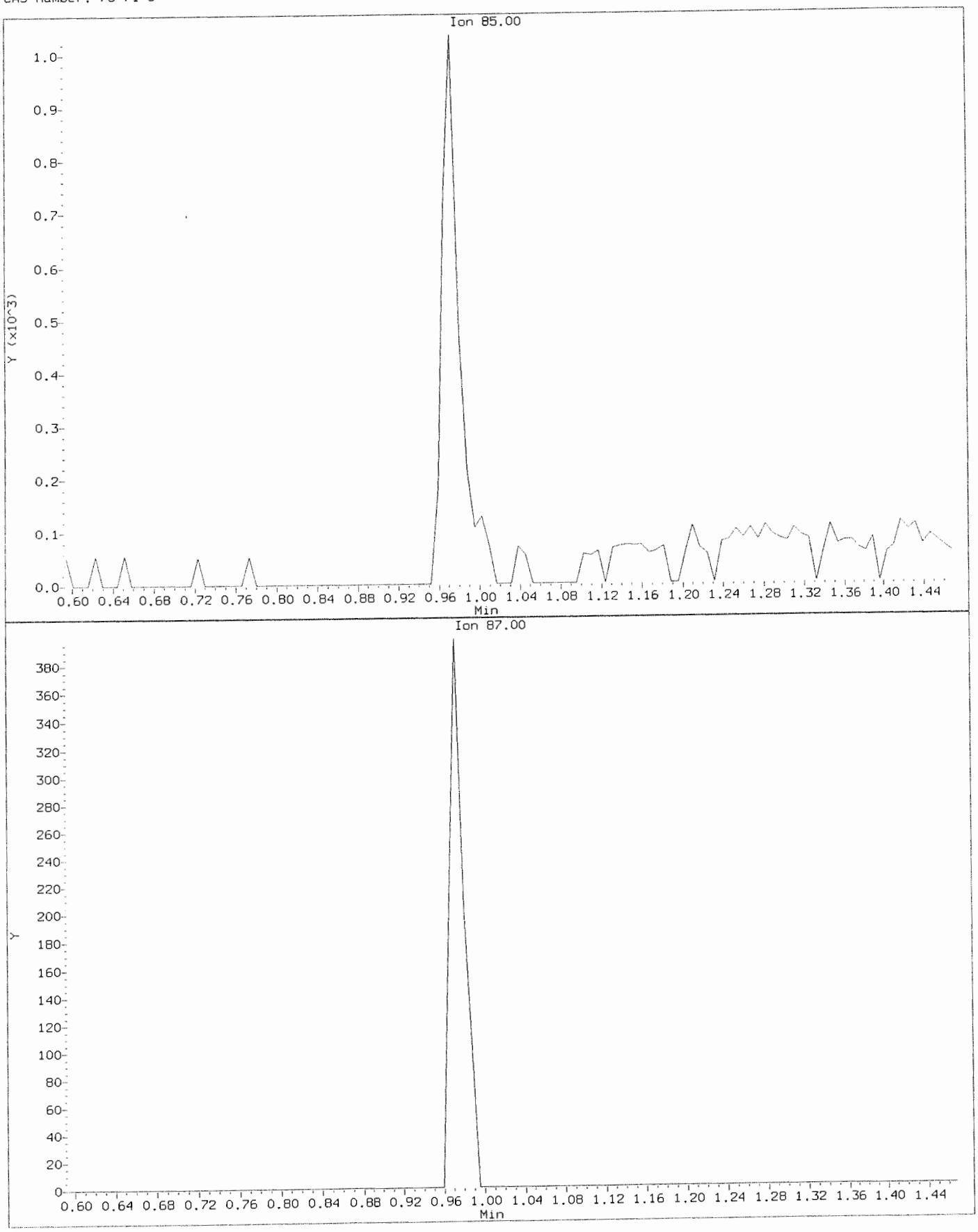
Compound: Chloroethane
CAS Number: 75-00-3





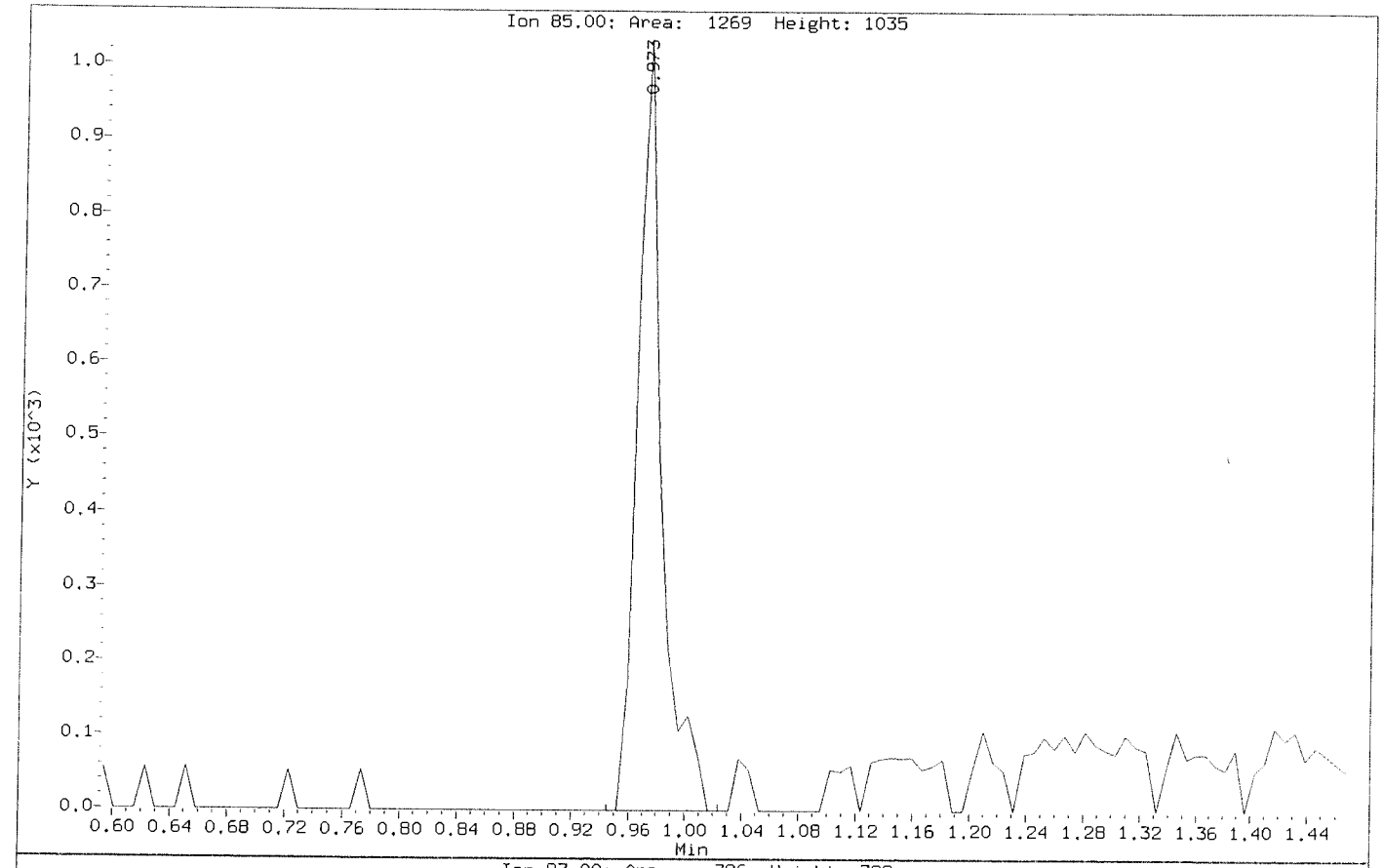
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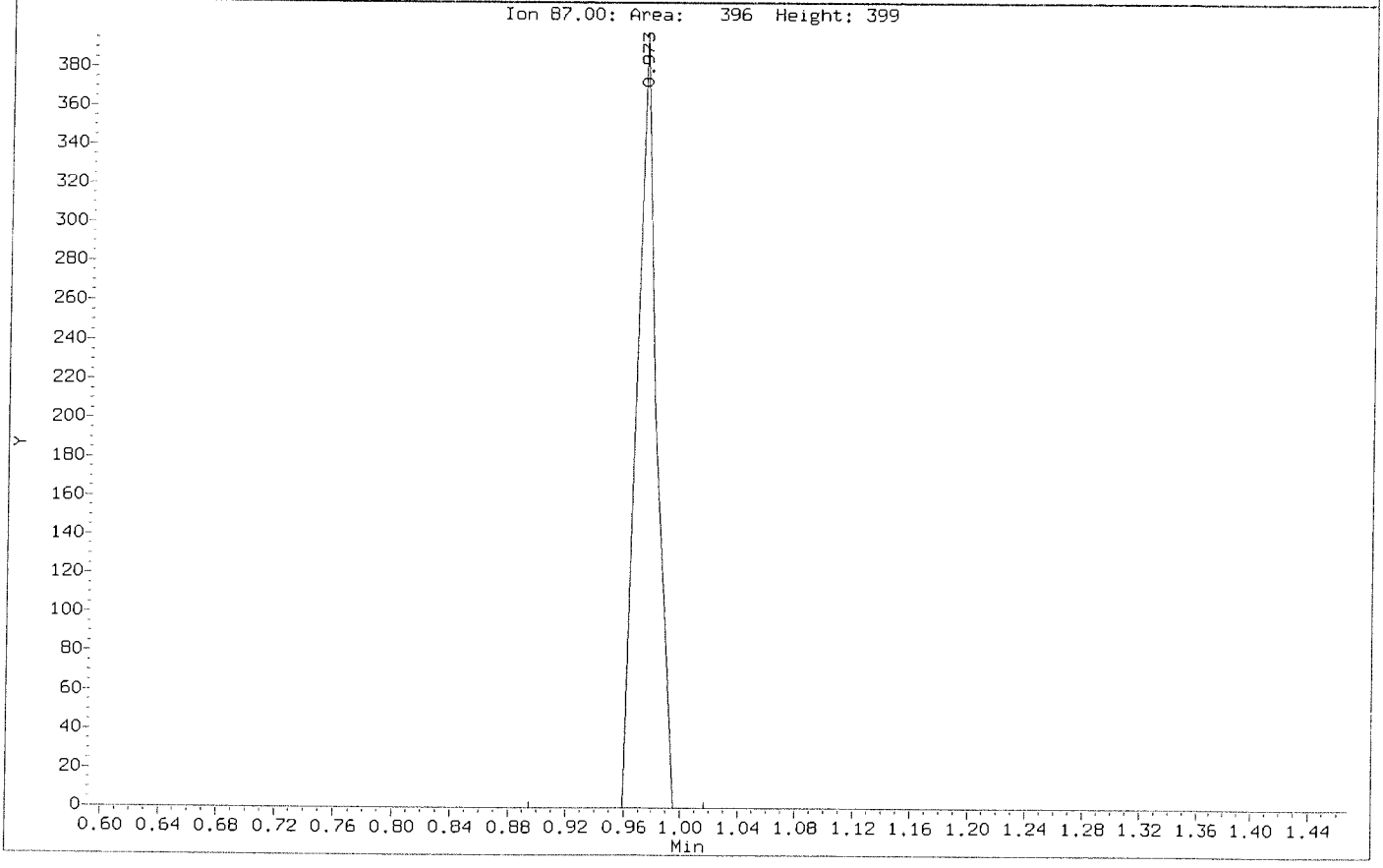
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8



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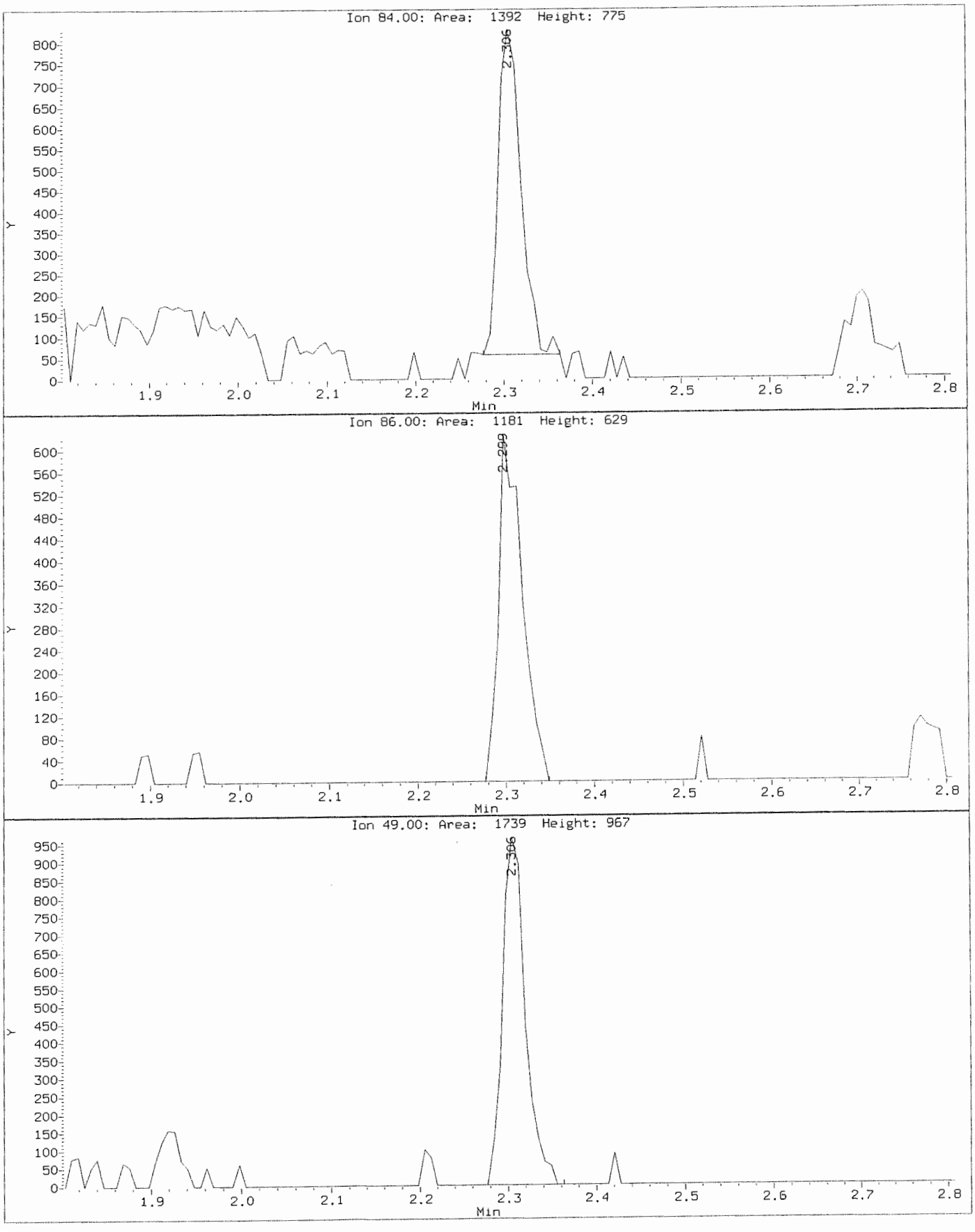
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8





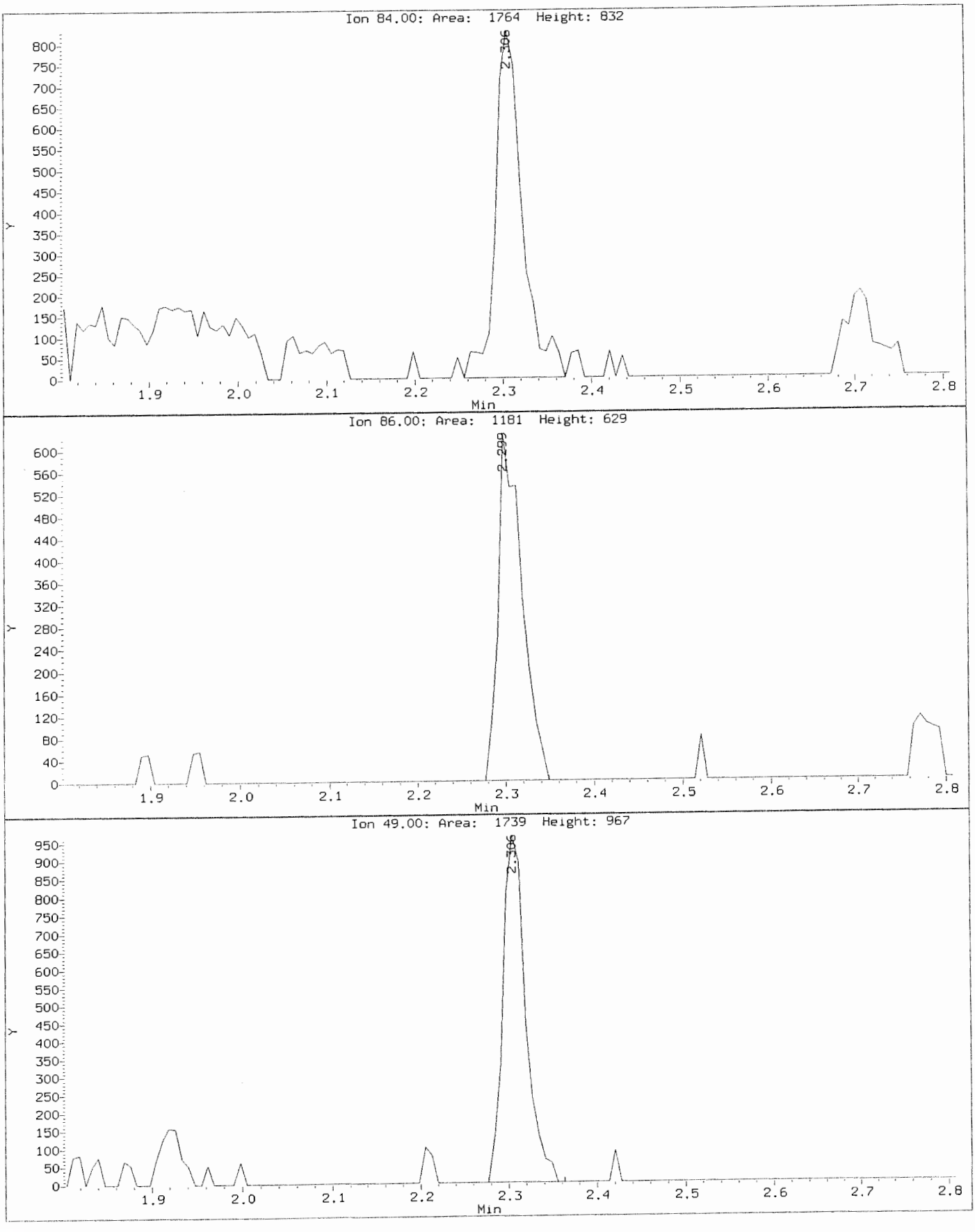
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Injection Date: 18-NOV-2019 14:35
Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: Methylene Chloride
CAS Number: 75-09-2



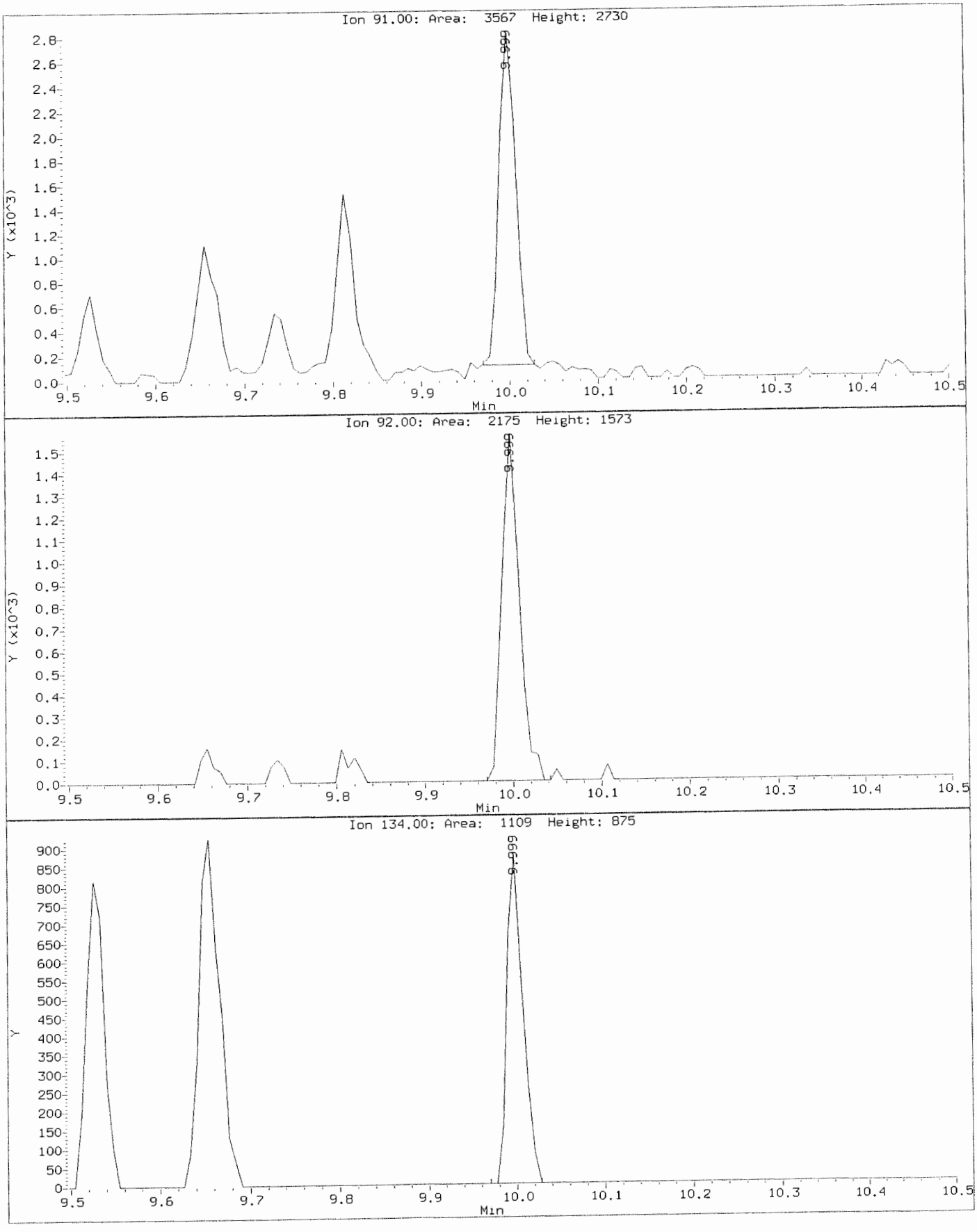
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Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: Methylene Chloride
CAS Number: 75-09-2



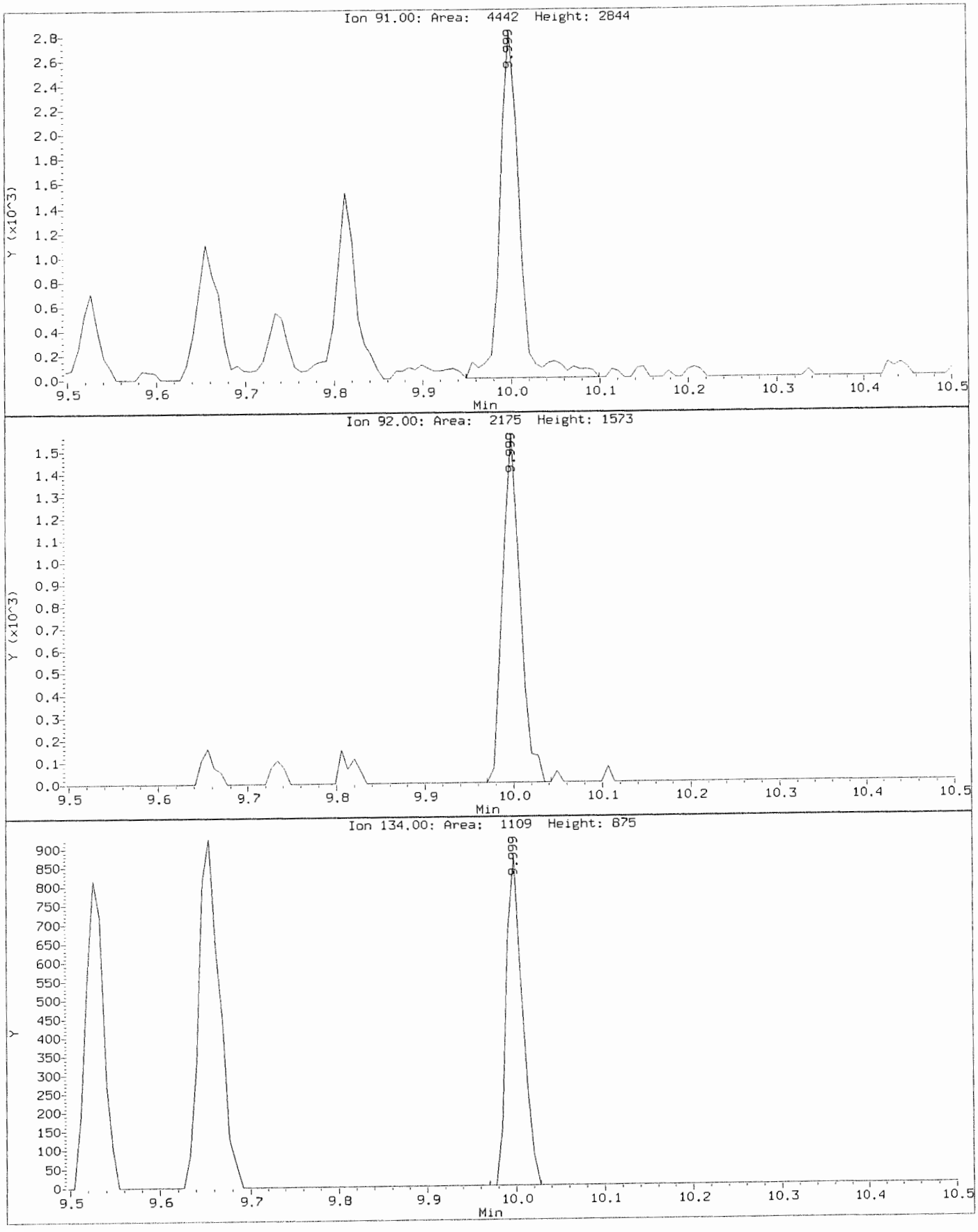
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Injection Date: 18-NOV-2019 14:35
Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: n-Butylbenzene
CAS Number: 104-51-8



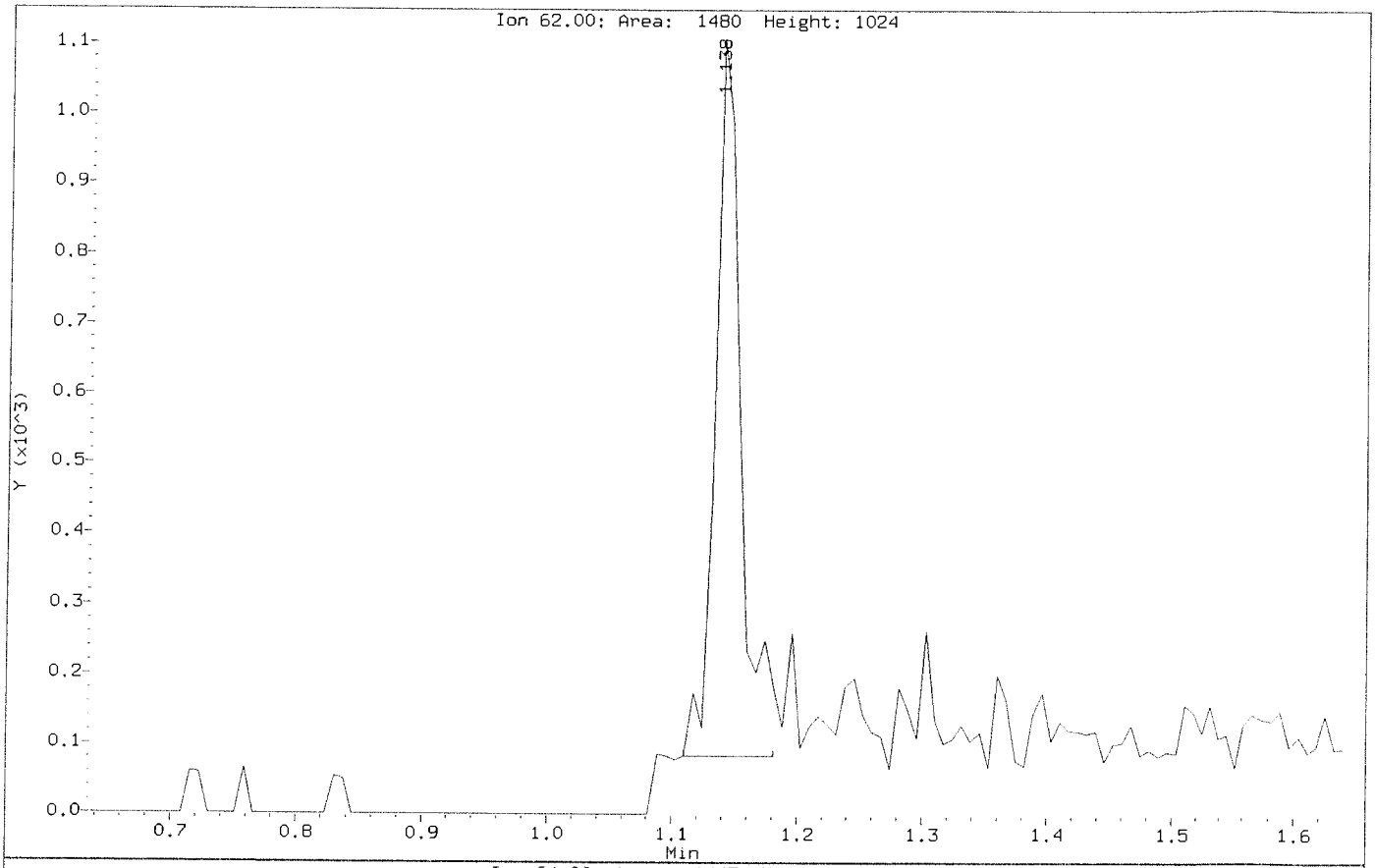
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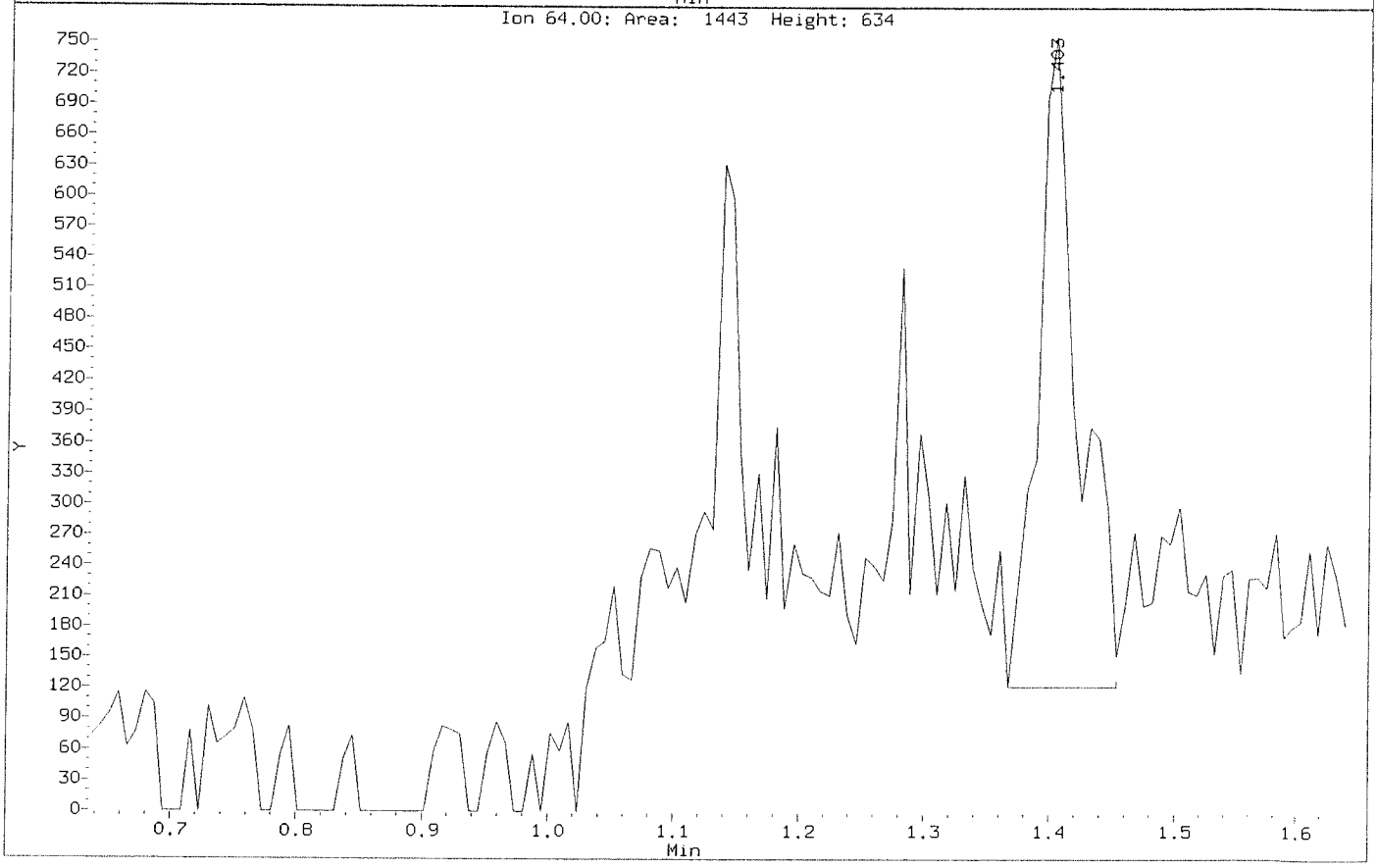
Compound: n-Butylbenzene
CAS Number: 104-51-8



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Injection Date: 18-NOV-2019 14:35
Instrument: voa6.i
Client Sample ID: VSTD000.5

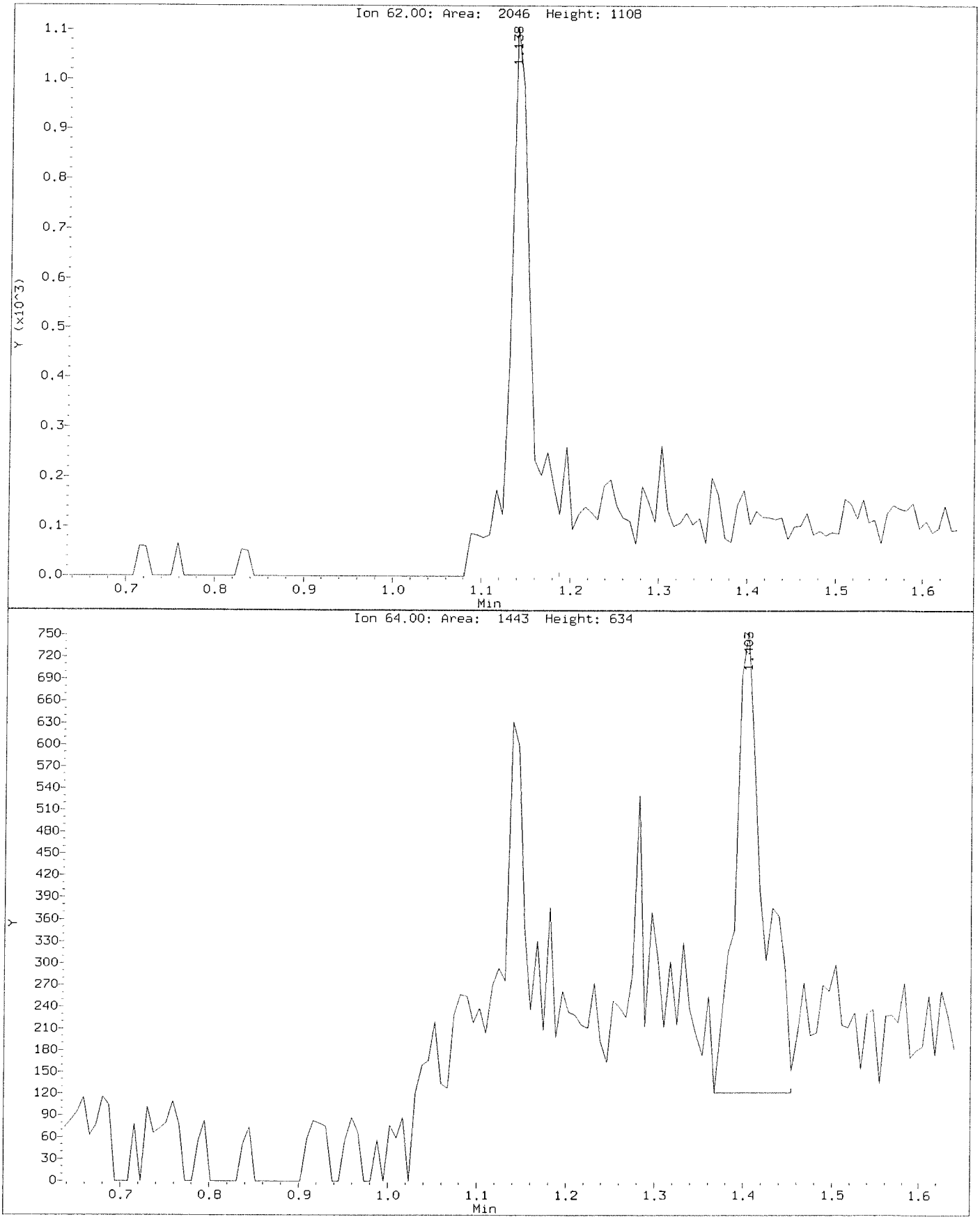
Compound: Vinyl Chloride
CAS Number: 75-01-4





Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111803.D
Injection Date: 18-NOV-2019 14:35
Instrument: voa6.i
Client Sample ID: VSTD000.5

Compound: Vinyl Chloride
CAS Number: 75-01-4



Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111804.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111804.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 18-NOV-2019 14:59
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 14:35 Cal File: X111803.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

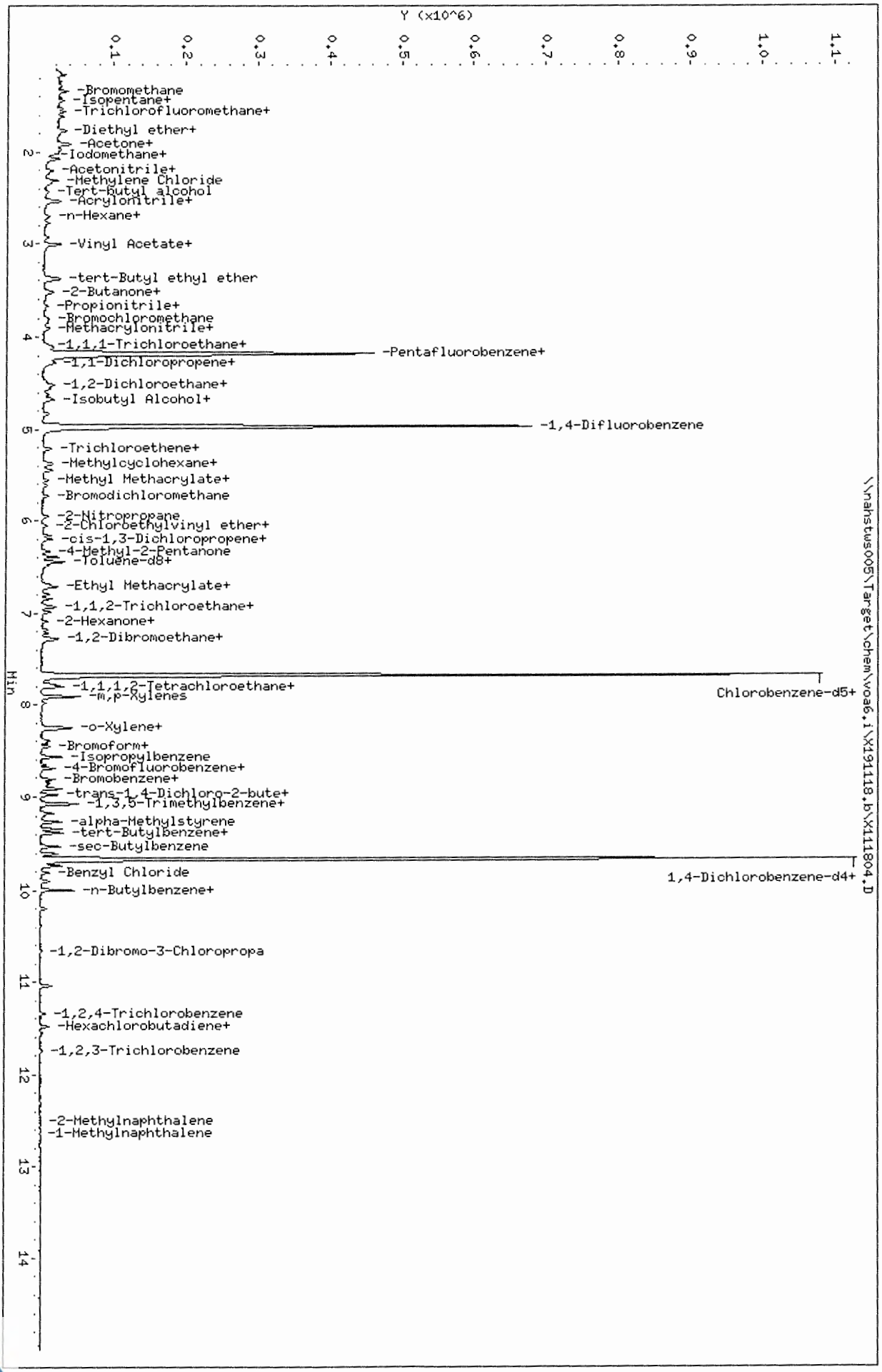
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.182	4.182	(1.000)	416007	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	570122	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	516622	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	279609	50.0000	
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	4458	1.00000	1.85(a)
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	5731	1.00000	1.60(a)
$	30 Dibromofluoromethane	113	4.104	4.104	(0.981)	3882	1.00000	1.38(a)
$	48 Toluene-d8	98	6.389	6.389	(0.833)	13715	1.00000	1.00(a)
	60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	4166	1.00000	1.11(a)
	31 1,1,1-Trichloroethane	97	4.082	4.082	(0.976)	6451	1.00000	1.14(a)
	68 1,1,2,2-Tetrachloroethane	83	8.845	8.845	(0.915)	4719	1.00000	1.20(aM)
	138 Freon TF	101	1.919	1.919	(0.459)	4065	1.00000	1.12(a)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	3216	1.00000	1.19(a)
	22 1,1-Dichloroethane	63	2.929	2.929	(0.700)	6907	1.00000	1.14(a)
	11 1,1-Dichloroethene	96	1.912	1.912	(0.457)	3522	1.00000	0.99(a)
	32 1,1-Dichloropropene	75	4.283	4.283	(0.862)	5427	1.00000	1.18(a)
	93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	1182	1.00000	0.29(a)
	71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	4081	1.00000	1.22(aM)
	90 1,2,4-Trichlorobenzene	180	11.345	11.345	(1.173)	2432	1.00000	1.03(aM)
	79 1,2,4-Trimethylbenzene	105	9.383	9.383	(0.970)	14648	1.00000	1.10(a)
	89 1,2-Dibromo-3-Chloropropane	155	10.665	10.665	(1.103)	464	1.00000	0.73(aM)
	57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	3982	1.00000	1.09(a)

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111804.D Page 2
Report Date: 06-Dec-2019 19:56

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	9.999	9.999	(1.034)	8297	1.00000	1.11(a)
33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	5359	1.00000	1.18(a)
42 1,2-Dichloropropane	63	5.443	5.443	(1.095)	3352	1.00000	0.98(aM)
75 1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	13162	1.00000	1.03(a)
83 1,3-Dichlorobenzene	146	9.605	9.605	(0.993)	8955	1.00000	1.11(a)
54 1,3-Dichloropropane	76	6.983	6.983	(0.910)	6334	1.00000	1.15(a)
84 1,4-Dichlorobenzene	146	9.684	9.684	(1.001)	9129	1.00000	1.12(a)
26 2,2-Dichloropropane	77	3.516	3.516	(0.841)	6785	1.00000	1.23(a)
24 2-Butanone	43	3.588	3.588	(0.858)	2602	2.00000	2.03(a)
76 2-Chlorotoluene	91	8.974	8.974	(0.928)	11127	1.00000	1.10(a)
52 2-Hexanone	43	7.090	7.090	(0.924)	4893	2.00000	2.30(a)
77 4-Chlorotoluene	91	9.075	9.075	(0.939)	13982	1.00000	1.14(a)
82 p-Isopropyltoluene	119	9.655	9.655	(0.999)	14705	1.00000	1.07(a)
45 4-Methyl-2-Pentanone	43	6.331	6.331	(0.825)	6643	2.00000	2.19(a)
10 Acetone	43	1.969	1.969	(0.471)	5956	2.00000	1.88(a)
37 Benzene	78	4.519	4.519	(0.909)	15129	1.00000	1.16(a)
74 Bromobenzene	156	8.810	8.810	(0.911)	5611	1.00000	1.15(a)
29 Bromochloromethane	128	3.803	3.803	(0.909)	2687	1.00000	1.19(a)
39 Bromodichloromethane	83	5.730	5.730	(1.153)	5583	1.00000	1.18(aM)
66 Bromoform	173	8.416	8.416	(1.097)	3197	1.00000	2.01(Ta)
6 Bromomethane	94	1.339	1.339	(0.320)	6334	1.00000	(aM)
19 Carbon Disulfide	76	2.069	2.069	(0.495)	20920	2.00000	2.18(a)
34 Carbon Tetrachloride	117	4.268	4.268	(0.859)	5740	1.00000	1.13(aM)
59 Chlorobenzene	112	7.699	7.699	(1.004)	11449	1.00000	1.13(a)
7 Chloroethane	64	1.403	1.403	(0.336)	3001	1.00000	1.14(aM)
28 Chloroform	83	3.910	3.910	(0.935)	8234	1.00000	1.22(a)
3 Chloromethane	50	1.074	1.074	(0.257)	6118	1.00000	1.53(aM)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	4494	1.00000	1.13(a)
46 cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	6302	1.00000	1.13(a)
55 Dibromochloromethane	129	7.176	7.176	(0.936)	4470	1.00000	1.13(a)
44 Dibromomethane	93	5.558	5.558	(1.118)	2789	1.00000	1.15(a)
2 Dichlorodifluoromethane	85	0.973	0.973	(0.233)	3829	1.00000	1.87(aM)
61 Ethylbenzene	106	7.800	7.800	(1.017)	5813	1.00000	1.11(a)
91 Hexachlorobutadiene	225	11.481	11.481	(1.187)	2468	1.00000	0.76(a)
67 Isopropylbenzene	105	8.566	8.566	(1.117)	16809	1.00000	1.08(a)
62 m,p-Xylenes	106	7.907	7.907	(1.031)	13495	2.00000	2.14(a)
17 Methylene Chloride	84	2.306	2.306	(0.551)	4626	1.00000	1.22(a)
87 n-Butylbenzene	91	9.999	9.999	(1.034)	11491	1.00000	1.00(a)
73 n-Propylbenzene	91	8.917	8.917	(0.922)	18779	1.00000	1.08(a)
92 Naphthalene	128	11.553	11.553	(1.195)	3182	1.00000	1.05(a)
63 o-Xylene	106	8.244	8.244	(1.075)	6995	1.00000	1.12(a)
81 sec-Butylbenzene	105	9.526	9.526	(0.985)	15987	1.00000	1.06(a)
64 Styrene	104	8.265	8.265	(1.078)	11719	1.00000	1.08(a)
78 tert-Butylbenzene	119	9.340	9.340	(0.966)	12122	1.00000	1.11(a)
56 Tetrachloroethene	164	6.933	6.933	(0.904)	4263	1.00000	1.17(a)
50 Toluene	91	6.453	6.453	(0.841)	16346	1.00000	1.11(a)
20 trans-1,2-Dichloroethene	96	2.535	2.535	(0.606)	4068	1.00000	1.18(a)
51 trans-1,3-Dichloropropene	75	6.689	6.689	(1.346)	5295	1.00000	1.04(a)
38 Trichloroethene	130	5.214	5.214	(1.049)	4445	1.00000	1.11(a)
8 Trichlorofluoromethane	101	1.561	1.561	(0.373)	6912	1.00000	1.07(a)
5 Vinyl Chloride	62	1.138	1.138	(0.272)	4533	1.00000	1.06(aM)

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.

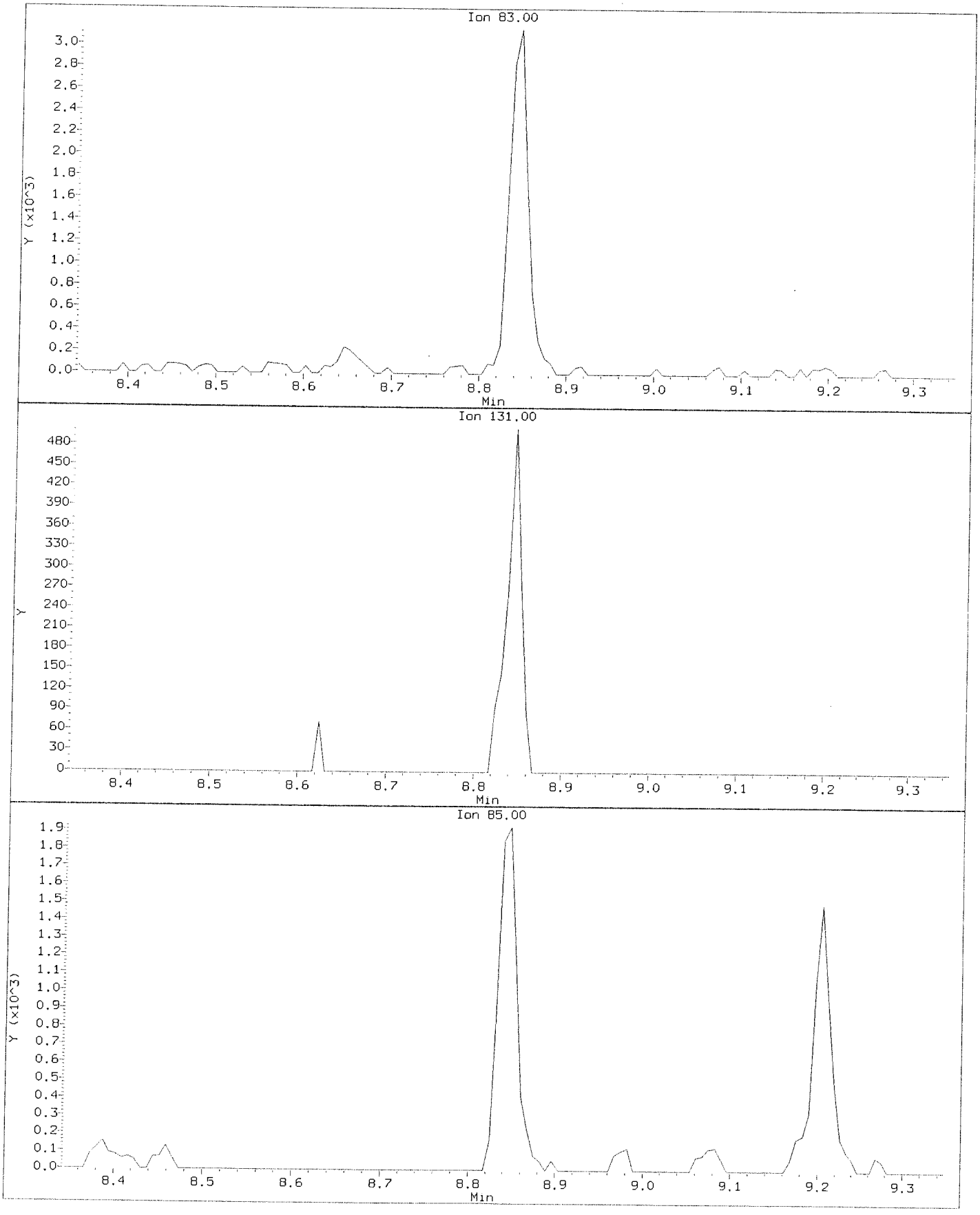


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Date : 18-NOV-2019 14:59
Client ID: WSTD001
Sample Info: WSTD001;WSTD001;1;3;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6,i
Operator: PC
Column diameter: 0.18

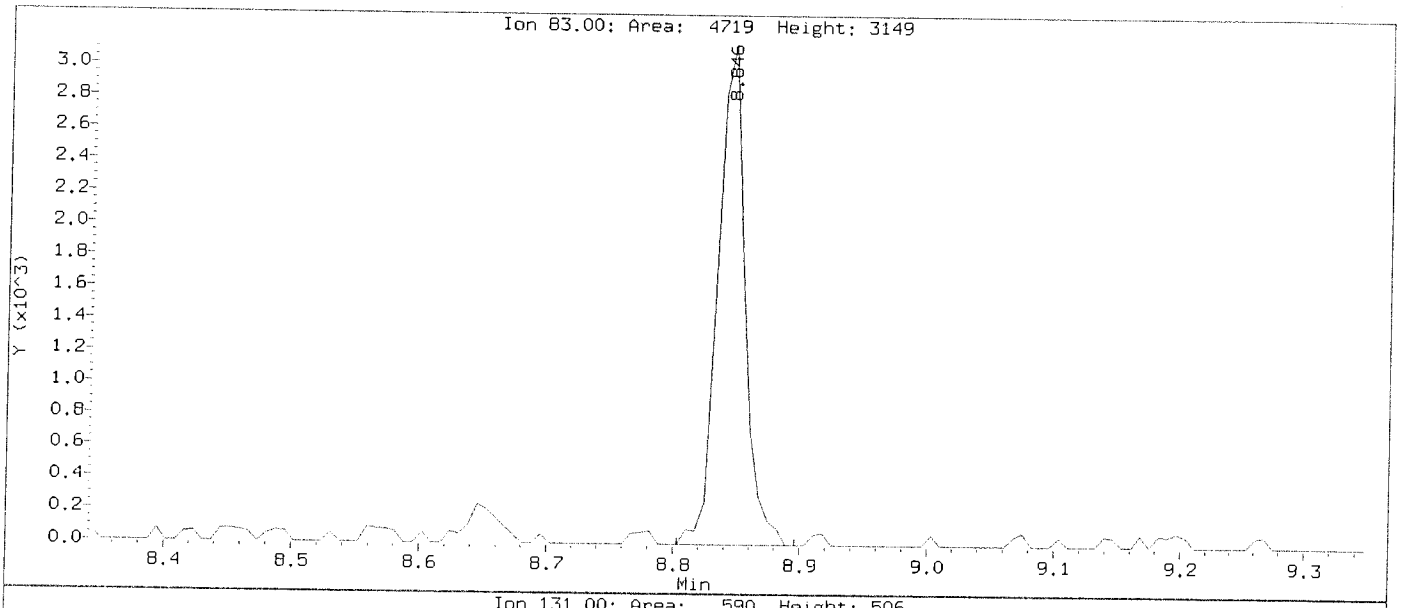
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Injection Date: 18-NOV-2019 14:59
Instrument: voa6.i
Client Sample ID: VSTD001

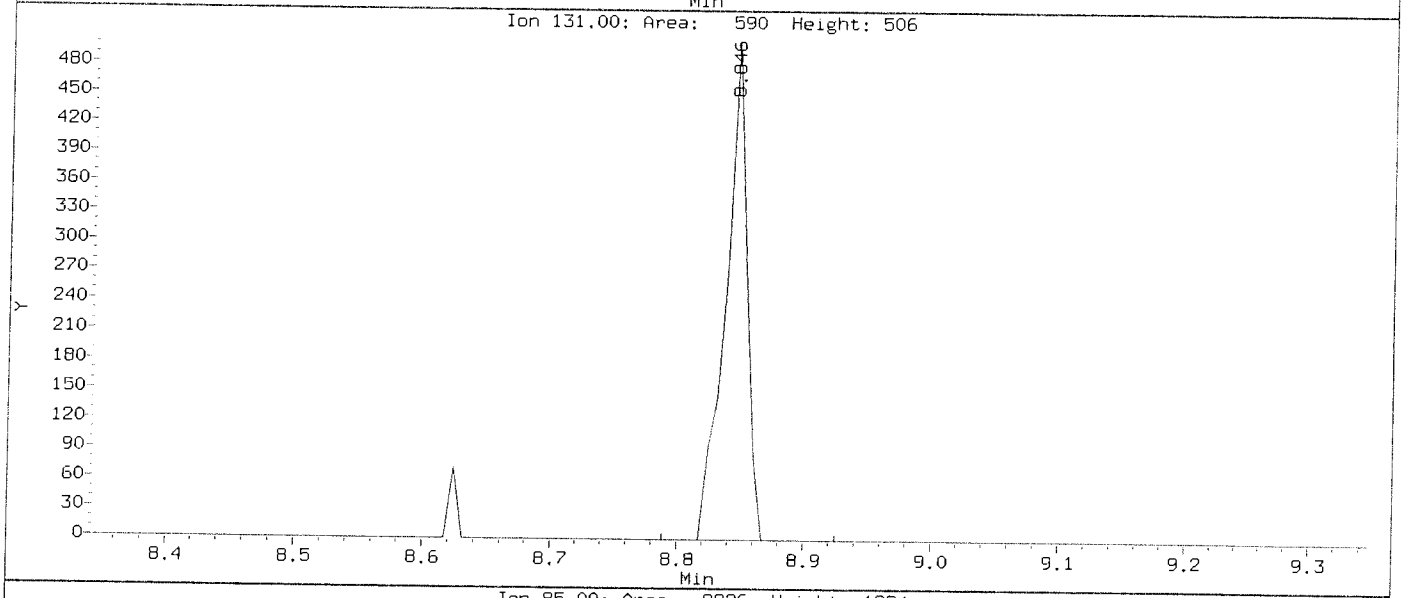
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CAS Number: 79-34-5

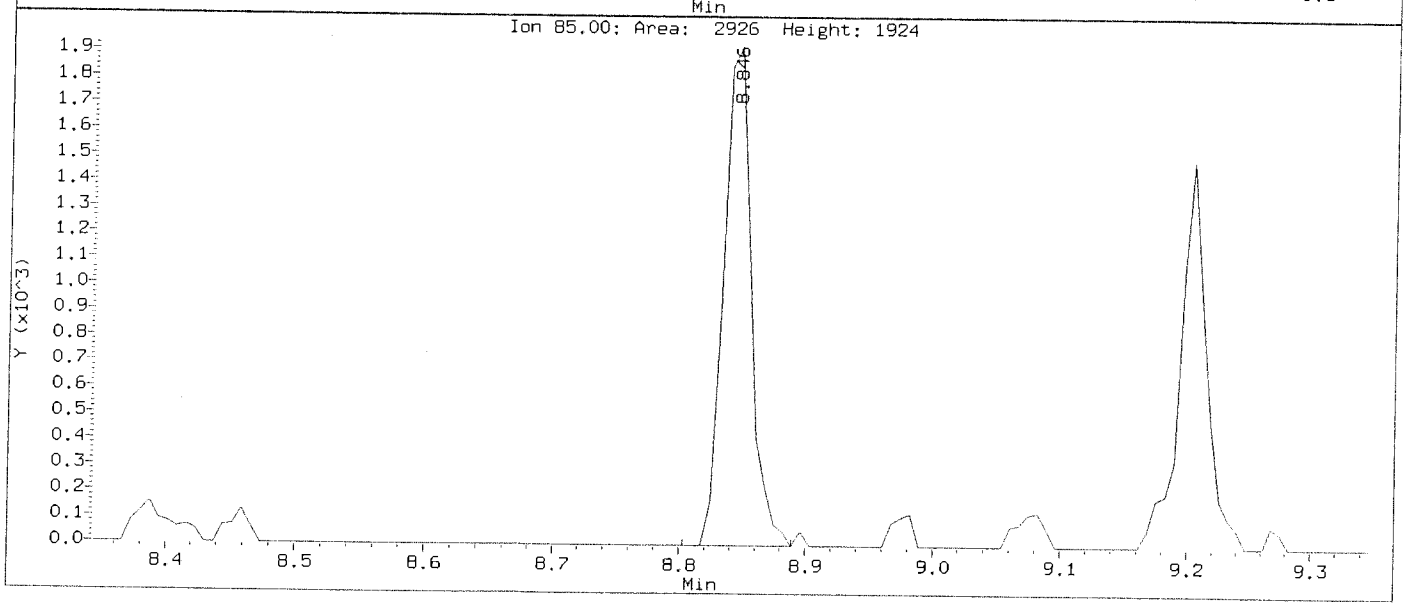


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Compound: 1,1,2,2-Tetrachloroethane
CAS Number: 79-34-5

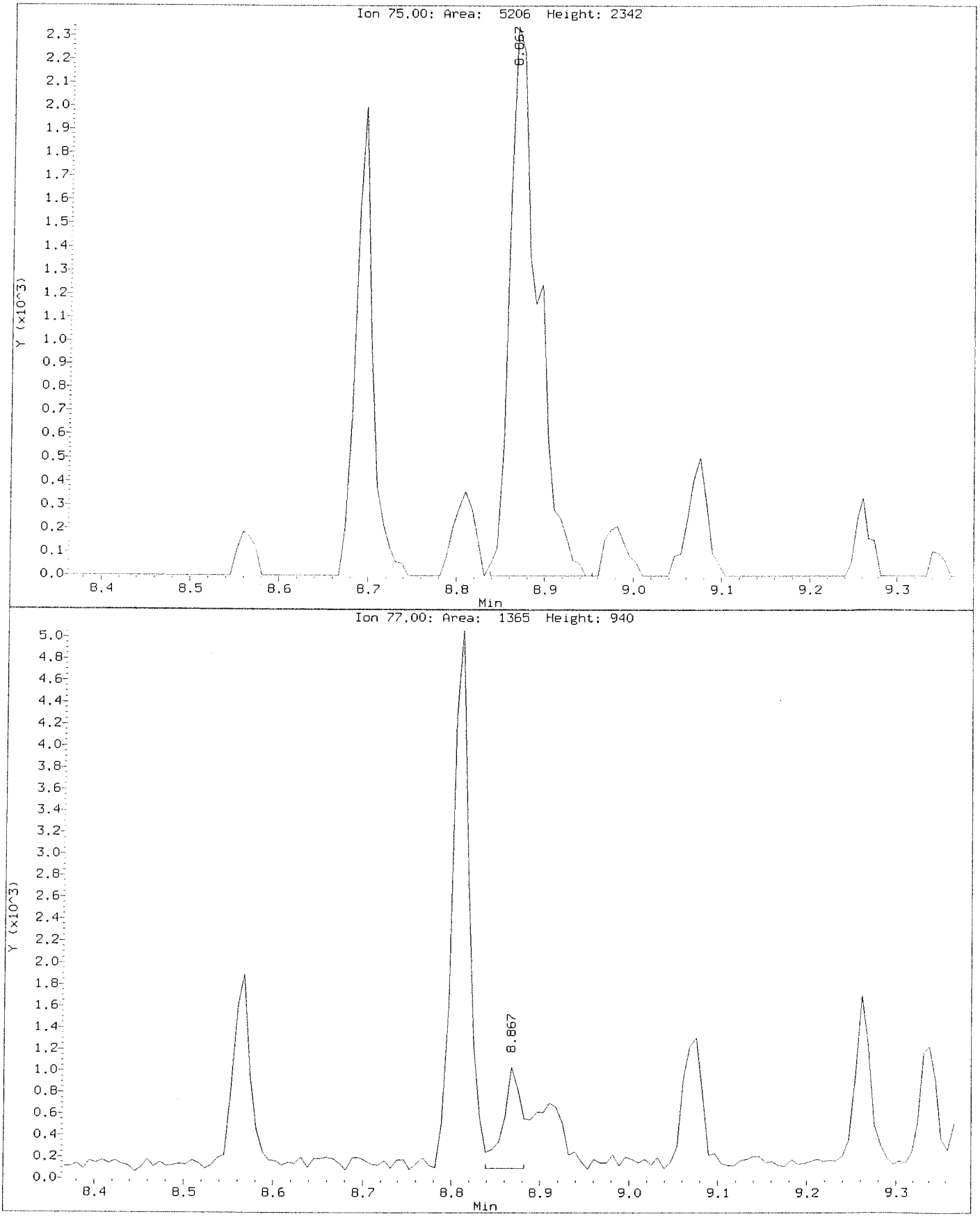






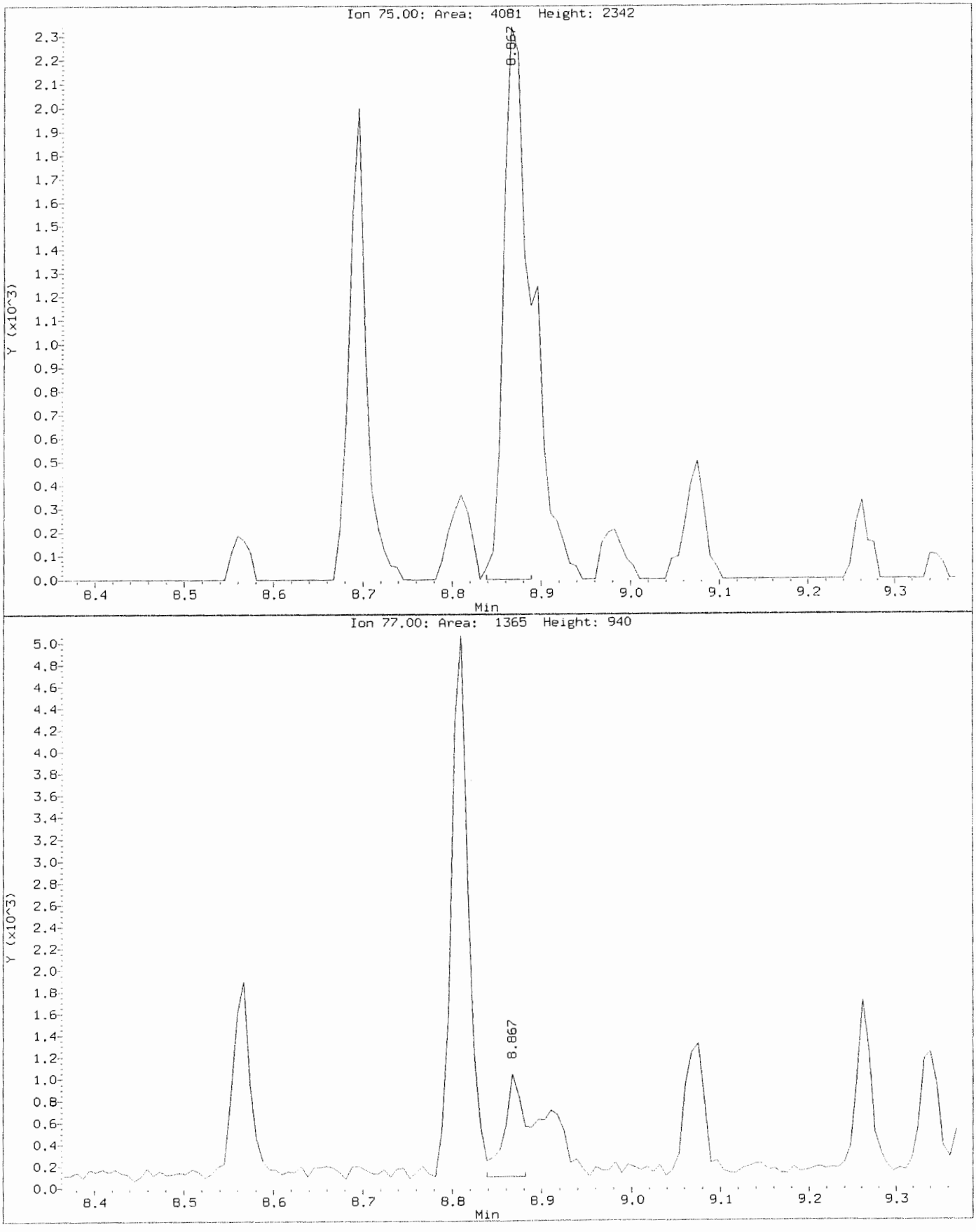
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Injection Date: 18-NOV-2019 14:59
Instrument: voa6.i
Client Sample ID: VSTD001

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4



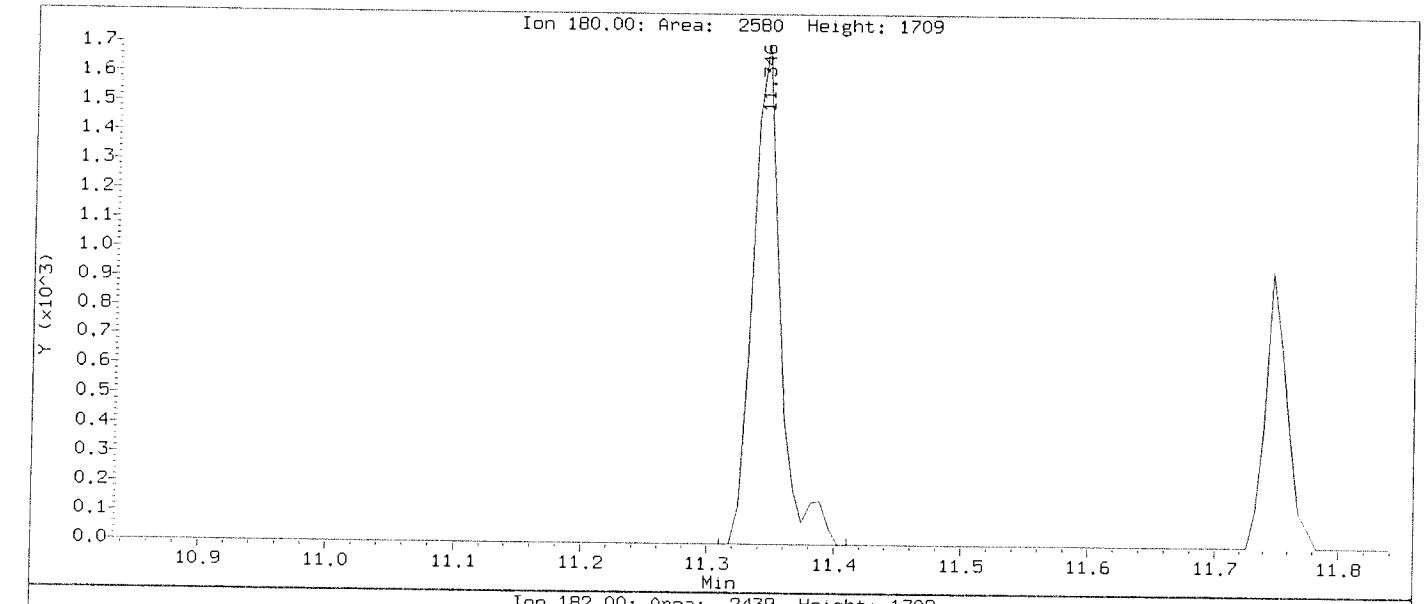
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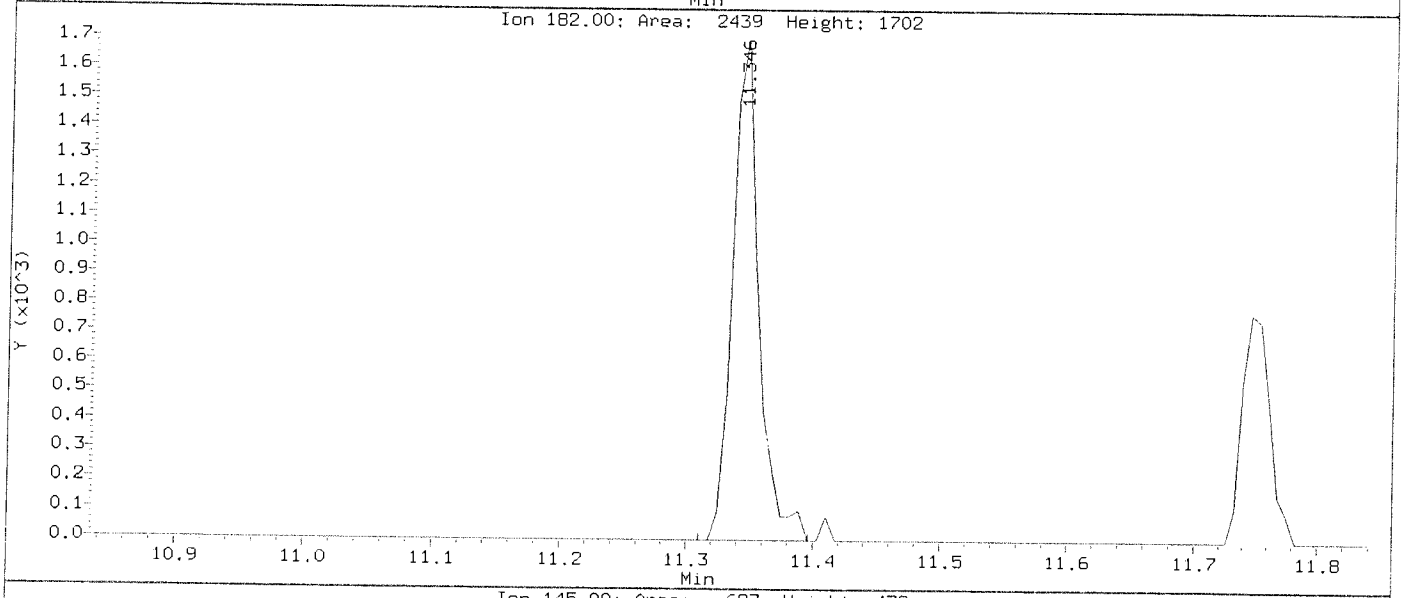
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CAS Number: 96-18-4

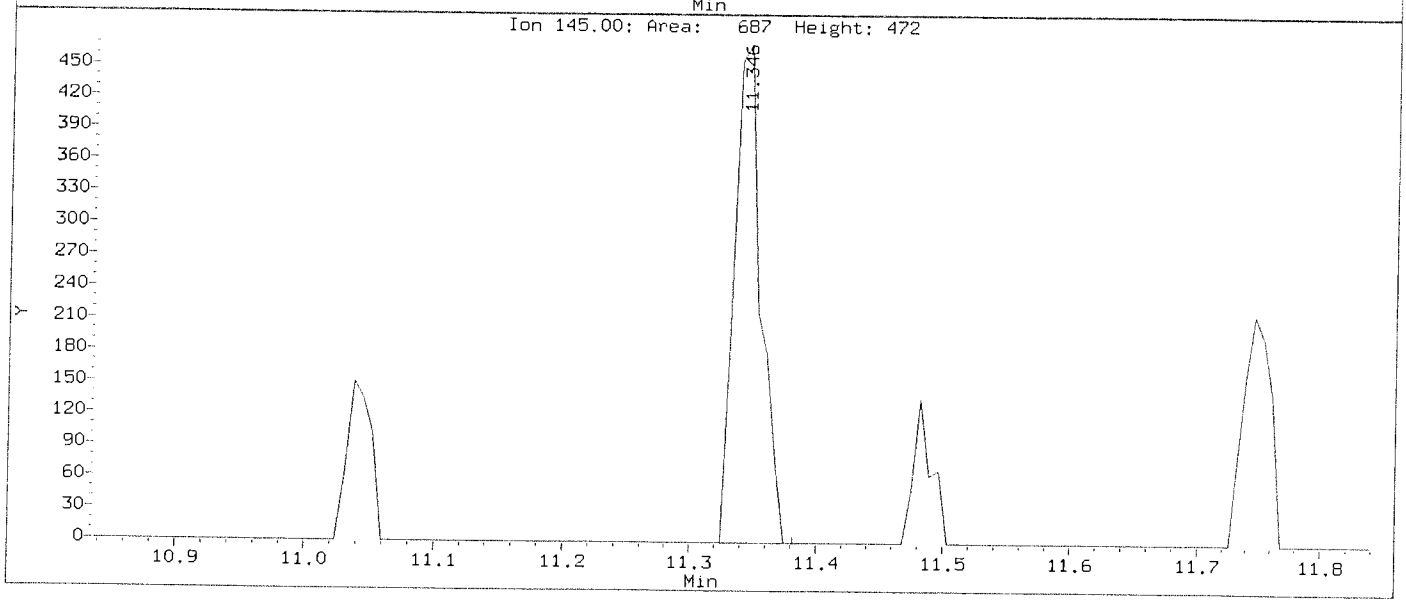


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Client Sample ID: VSTD001

Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1

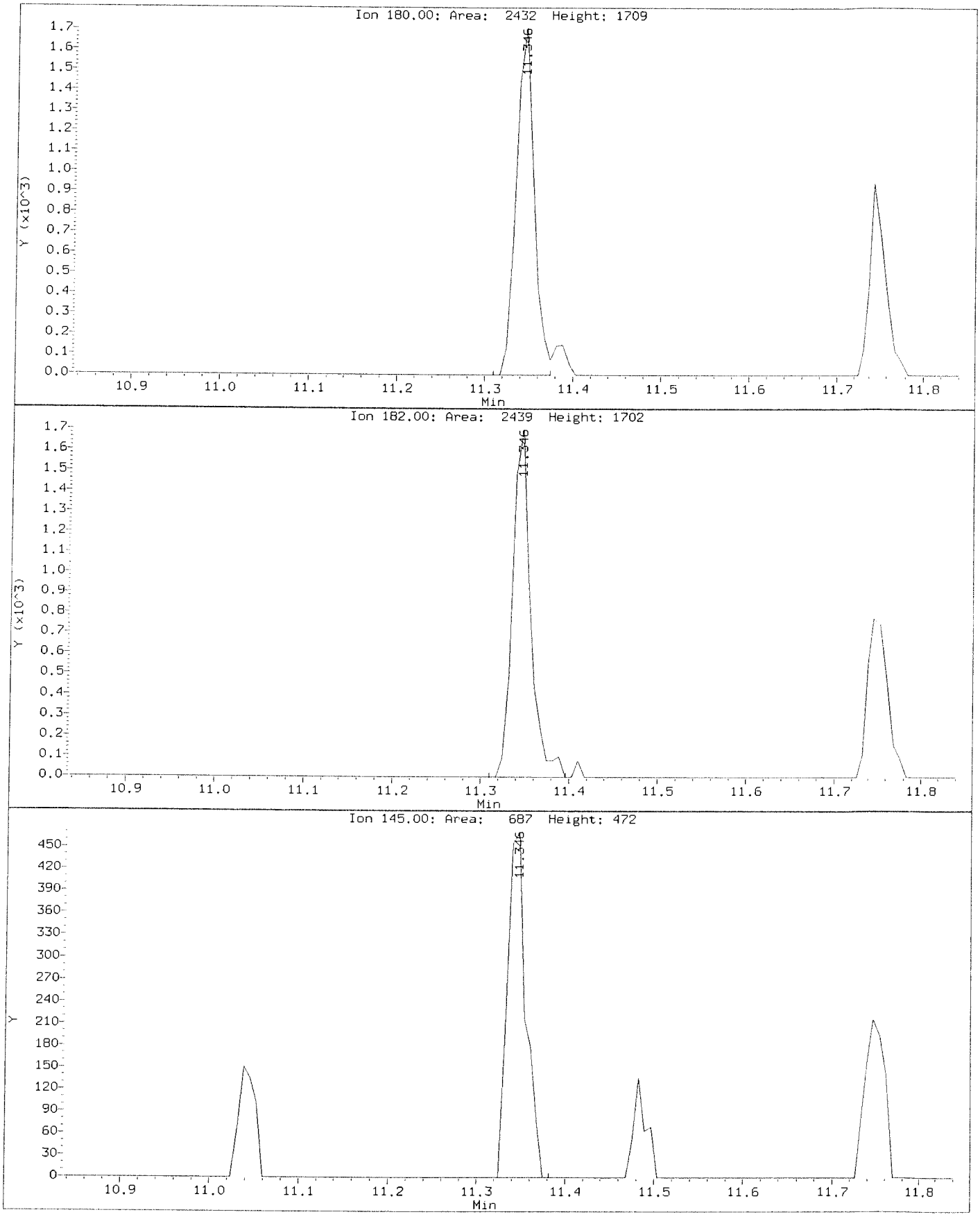






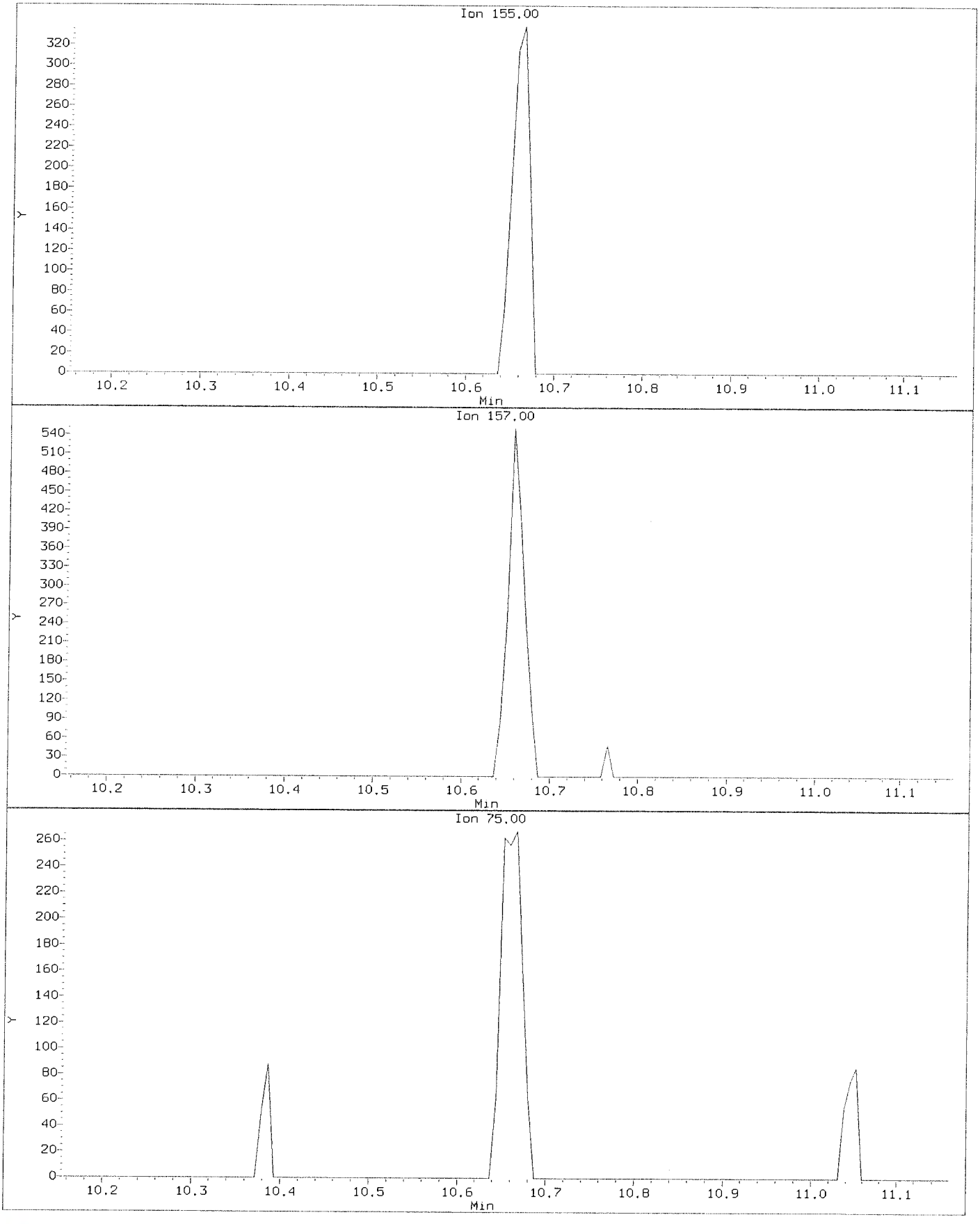
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Instrument: voa6.i
Client Sample ID: VSTD001

Compound: 1,2,4-Trichlorobenzene
CAS Number: 120-82-1



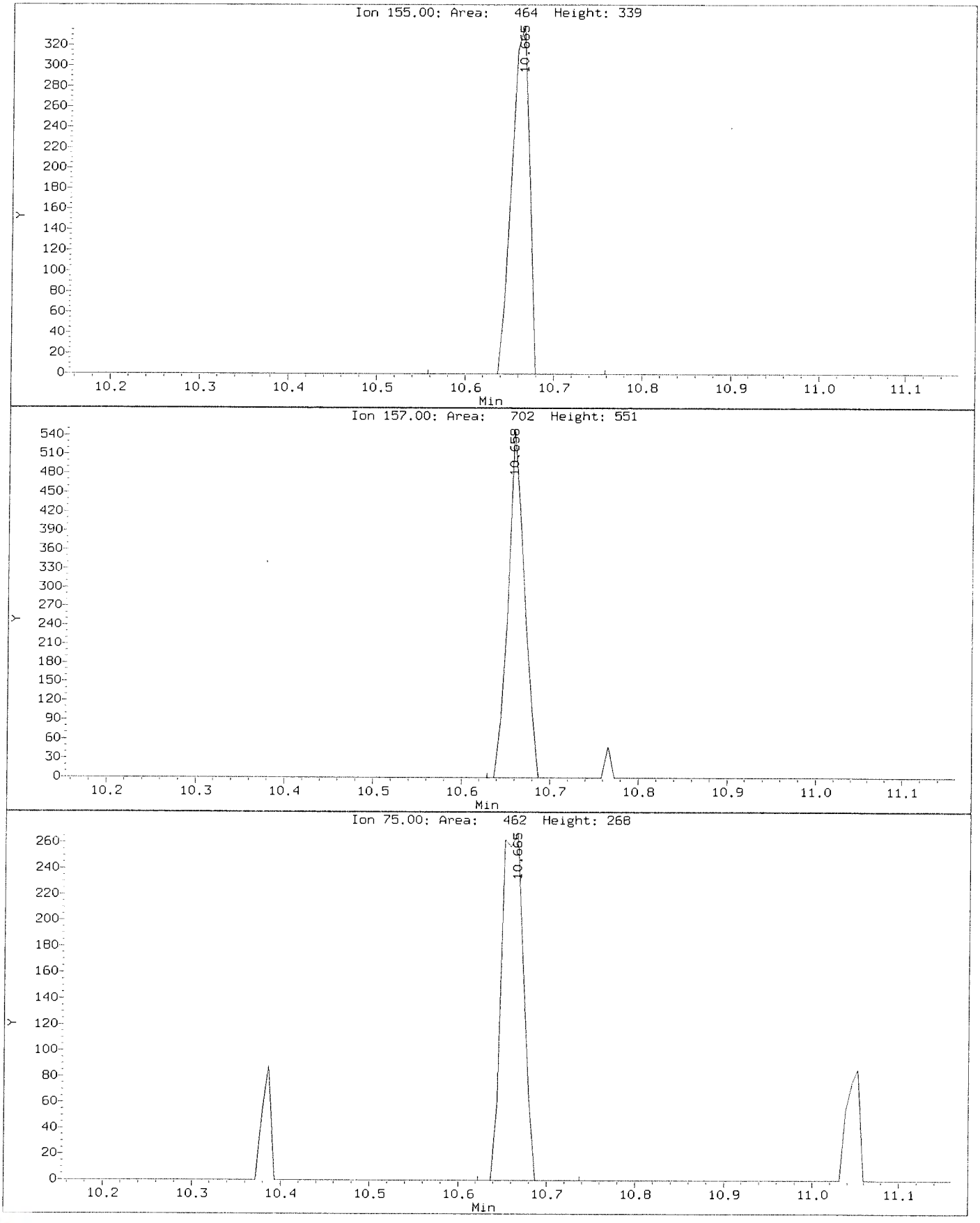
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Instrument: voa6.i
Client Sample ID: VSTD001

Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



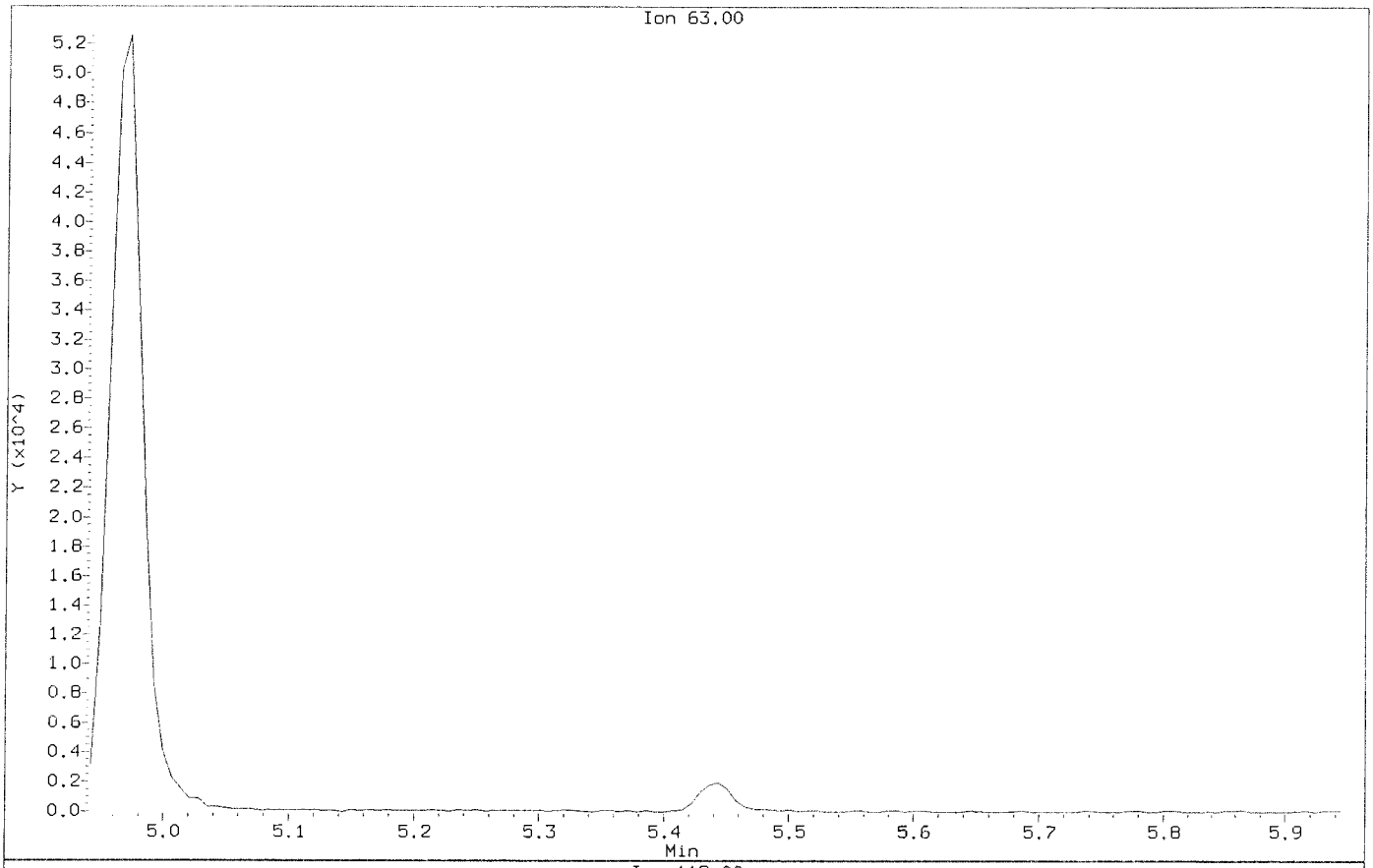
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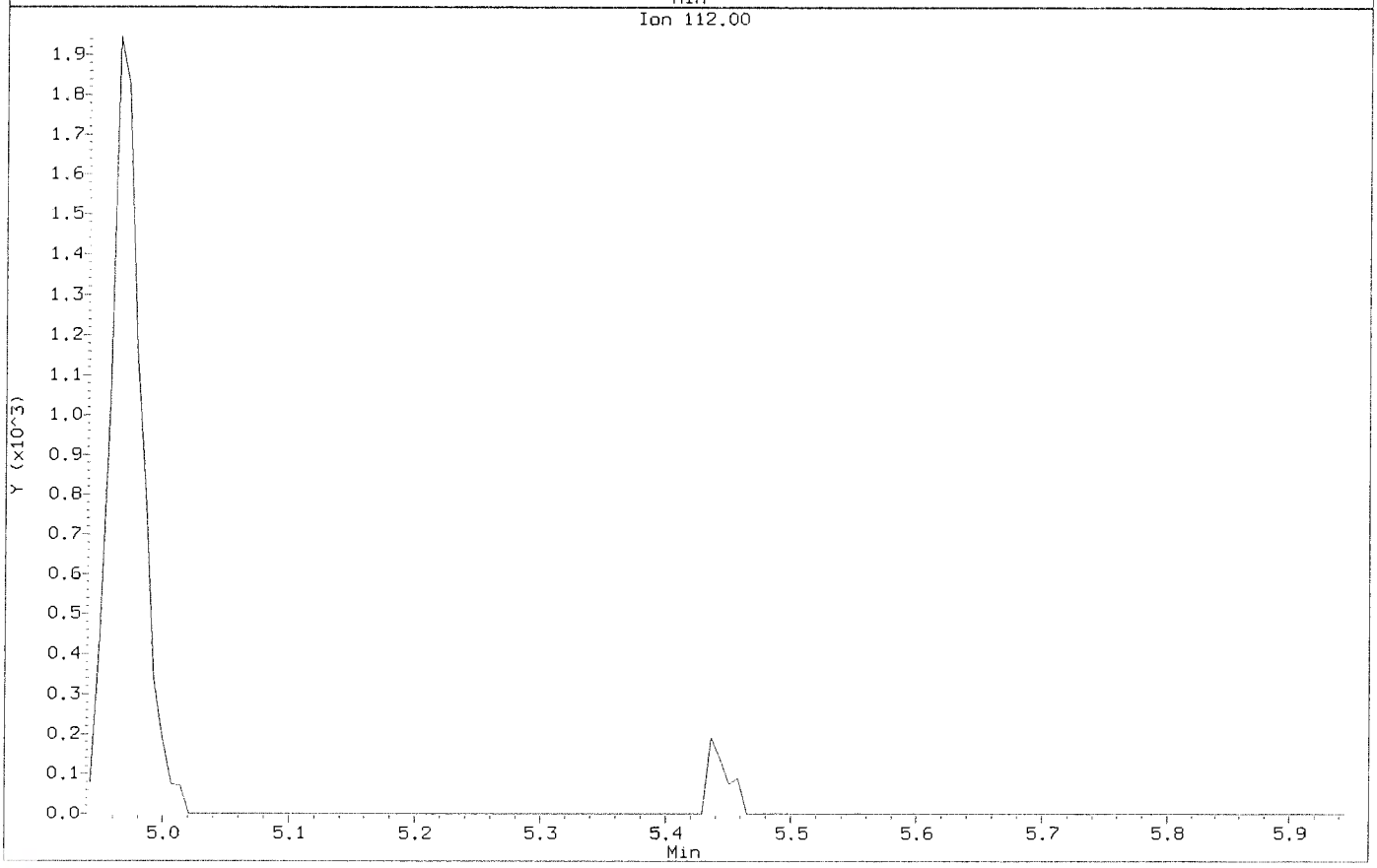
Compound: 1,2-Dibromo-3-Chloropropane
CAS Number: 96-12-8



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Instrument: voa6.i
Client Sample ID: VSTD001

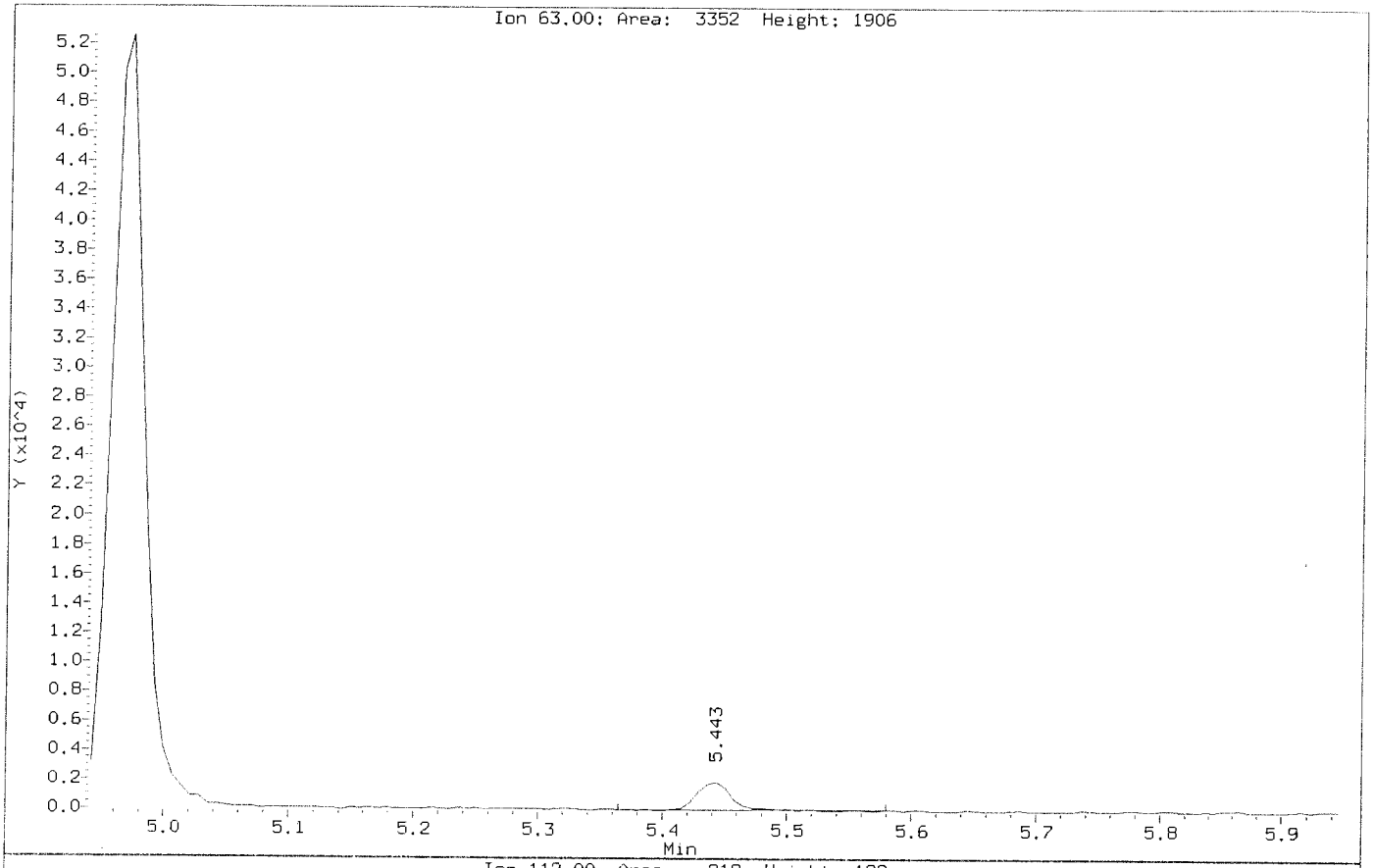
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5

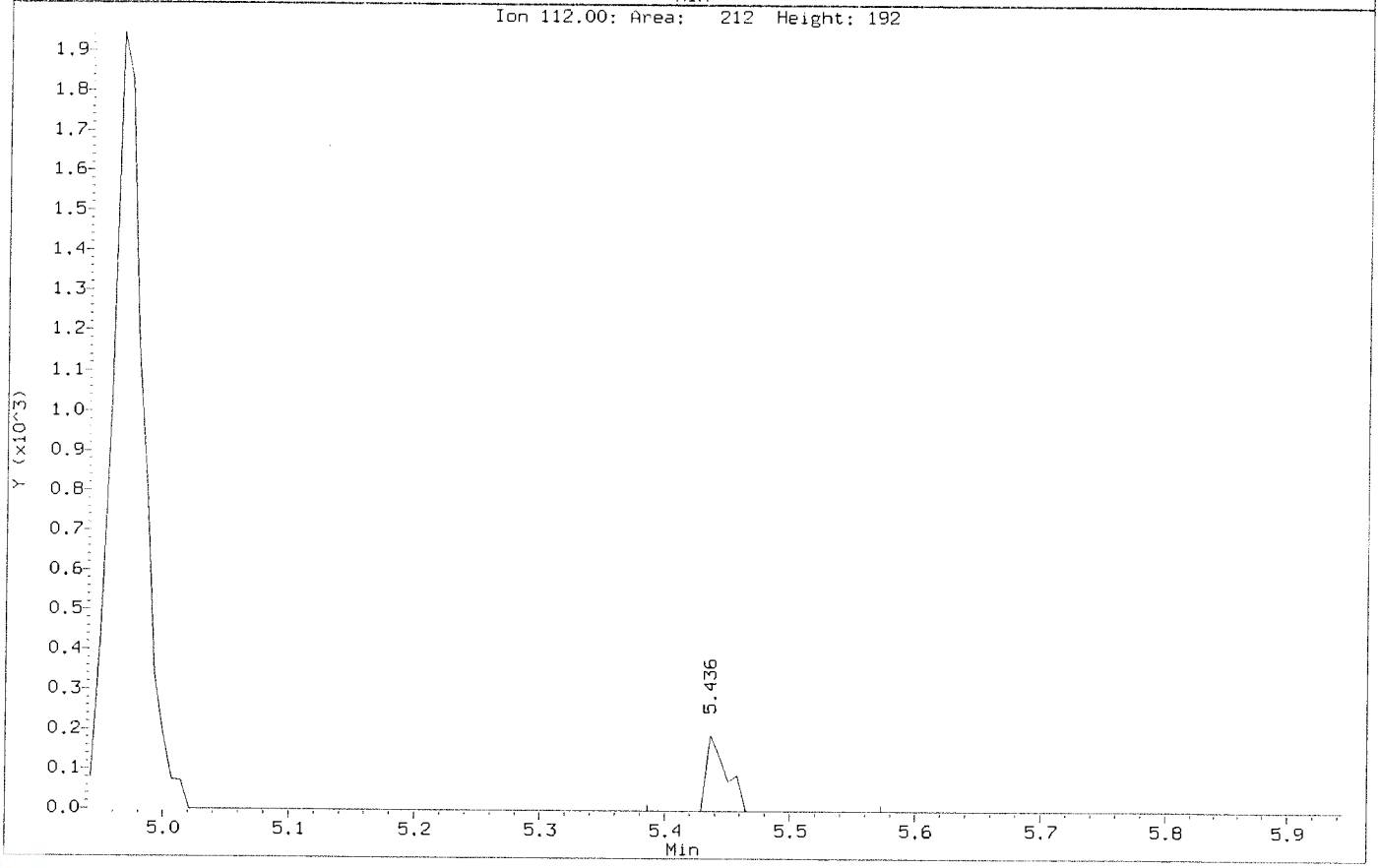




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Instrument: voa6.i
Client Sample ID: VSTD001

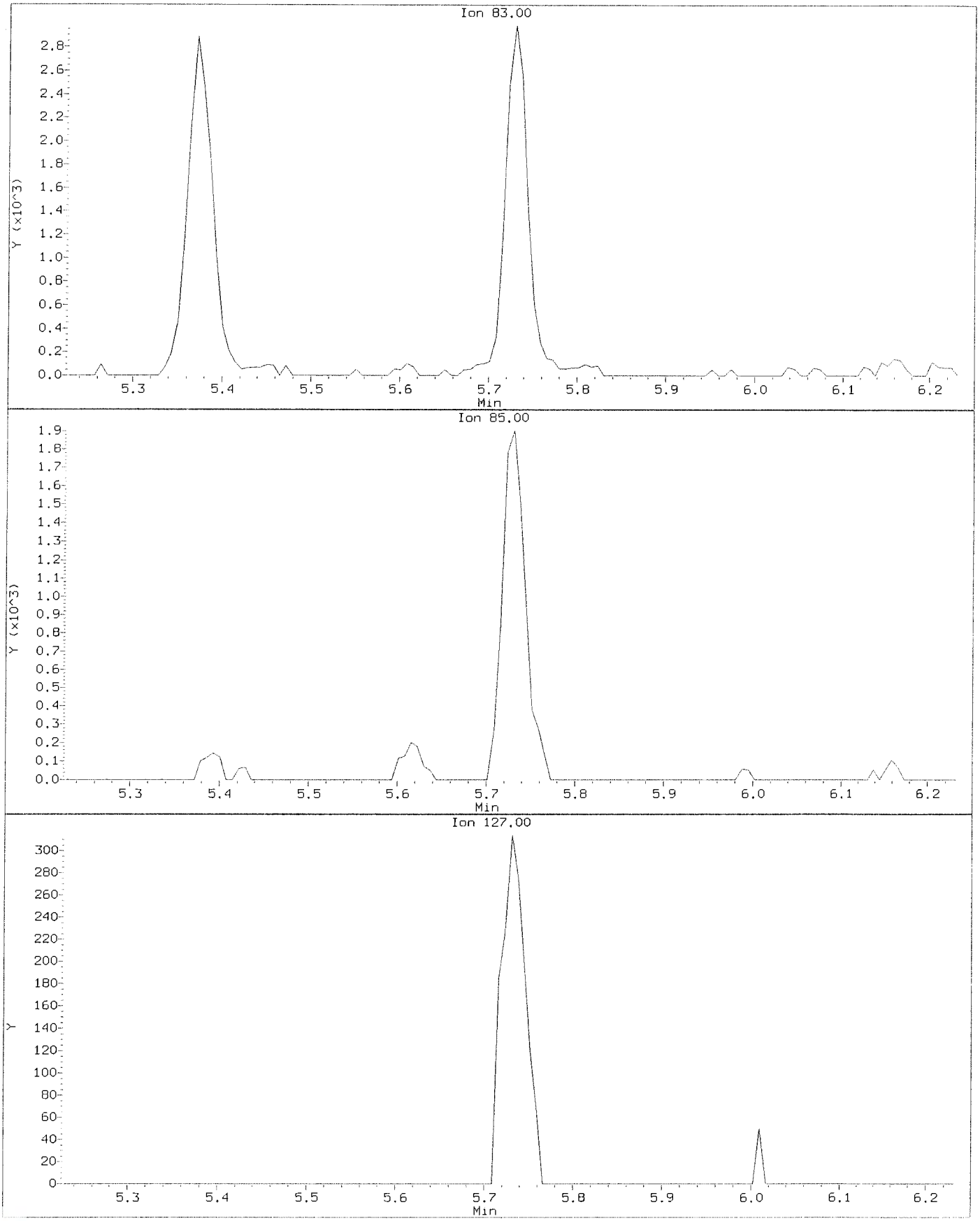
Compound: 1,2-Dichloropropane
CAS Number: 78-87-5





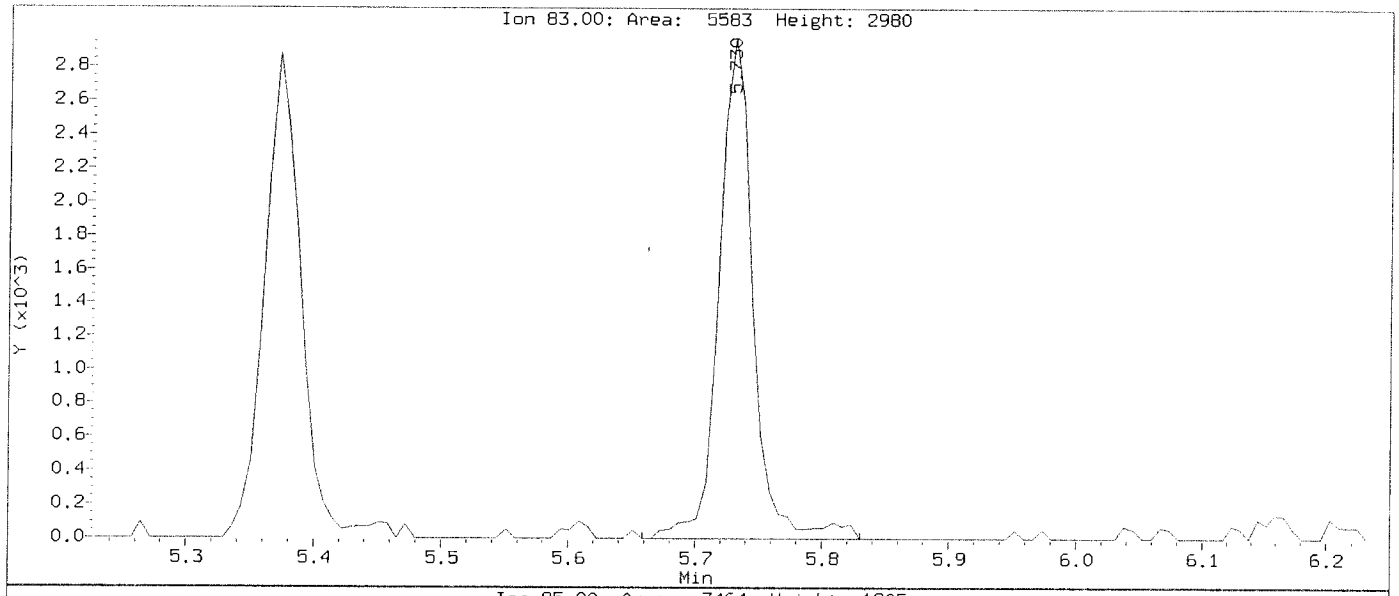
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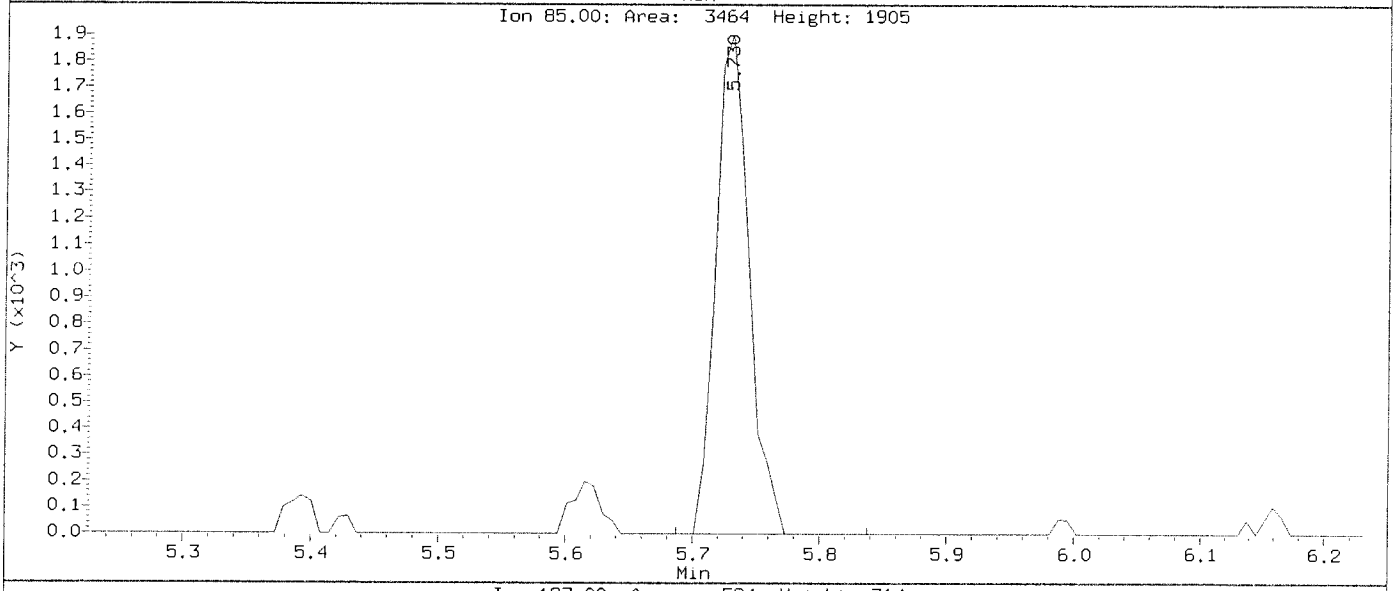
Compound: Bromodichloromethane
CAS Number: 75-27-4

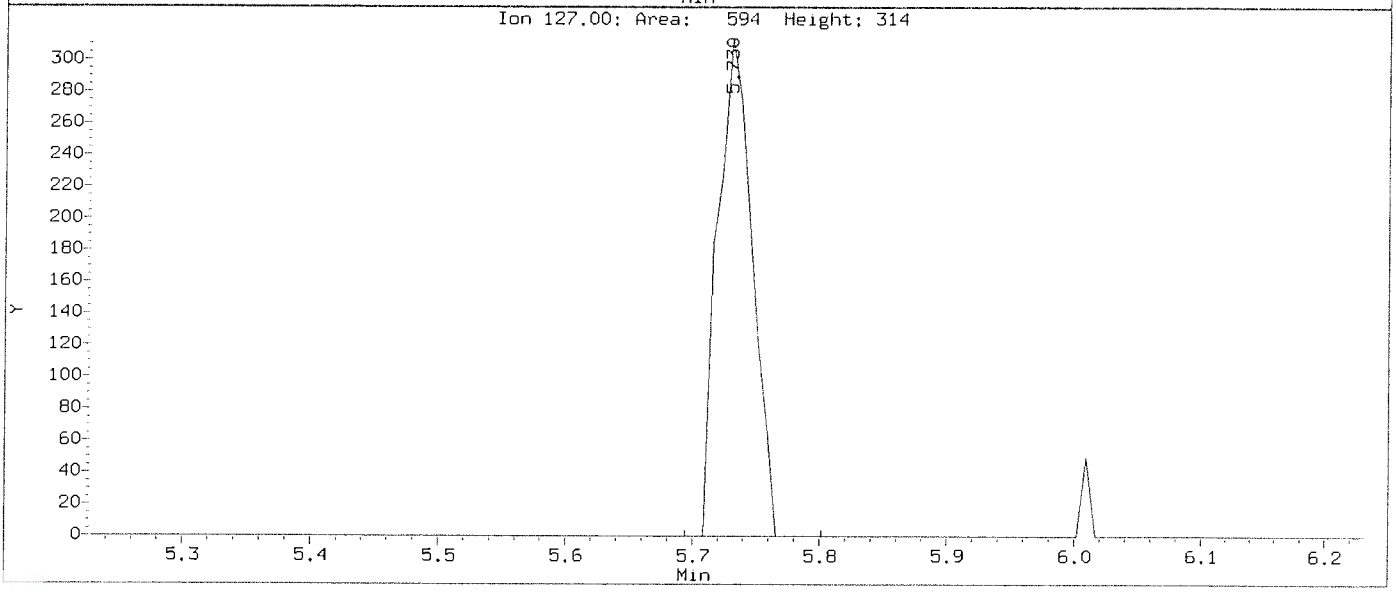


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Instrument: voa6.i
Client Sample ID: VSTD001

Compound: Bromodichloromethane
CAS Number: 75-27-4

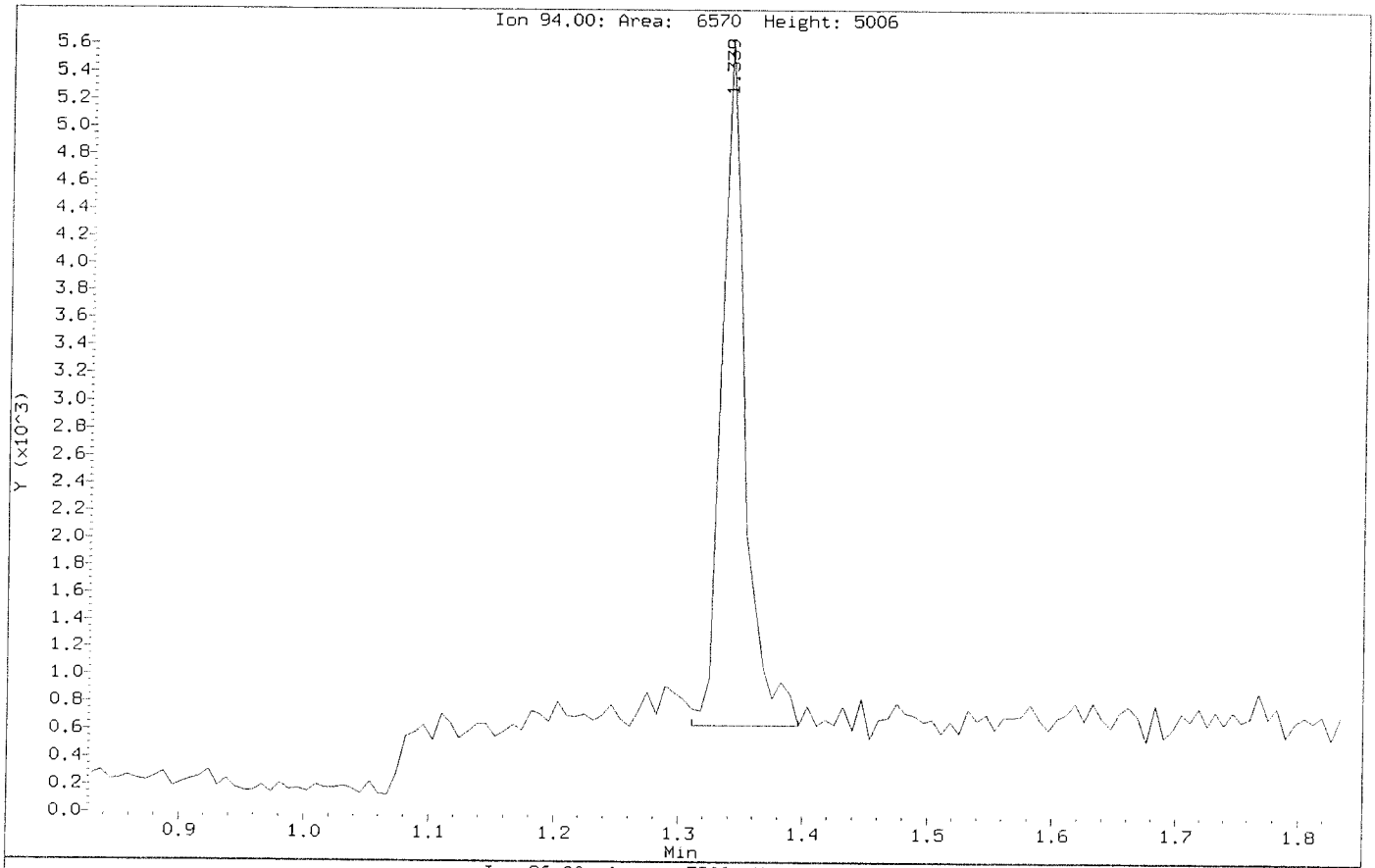


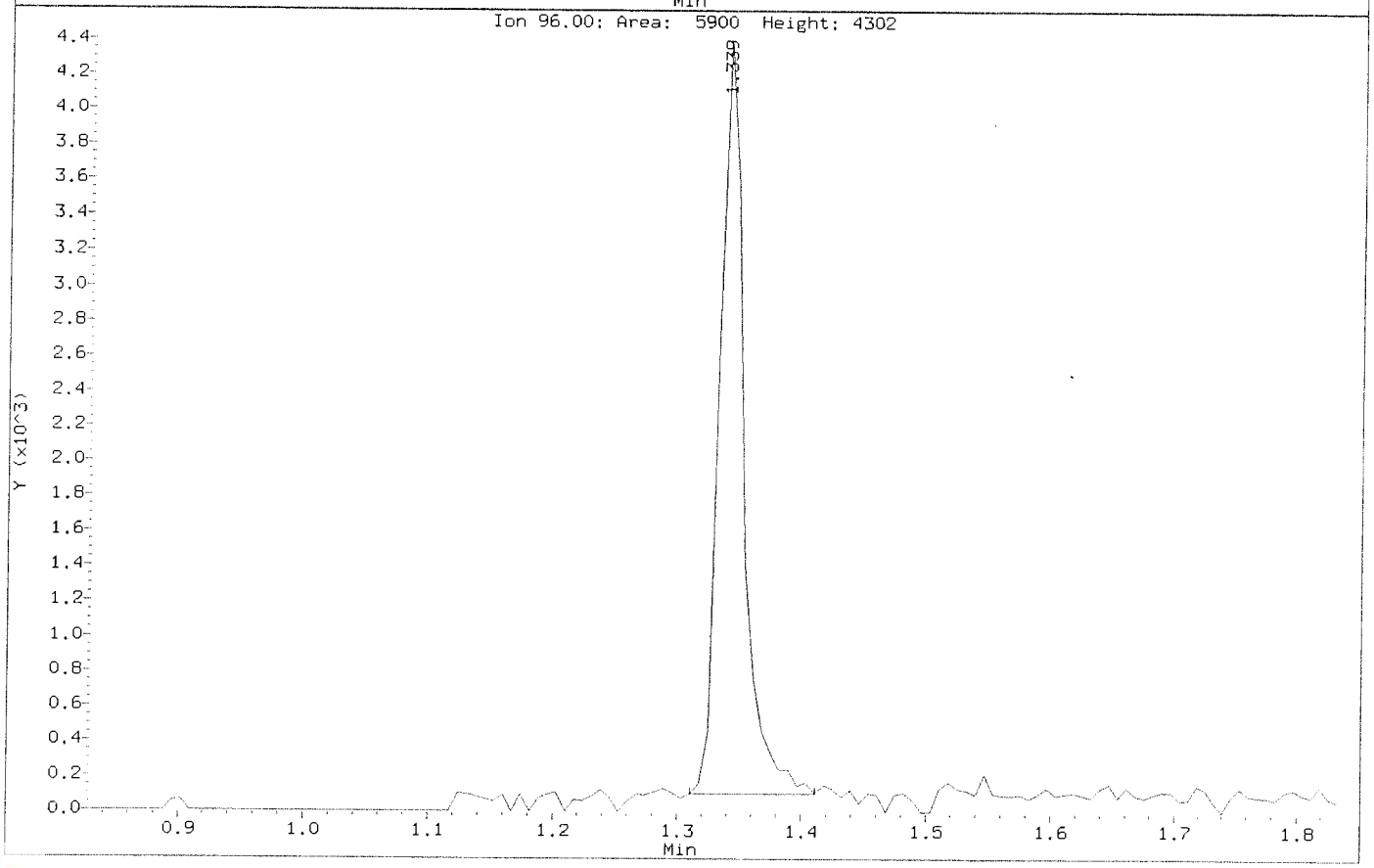




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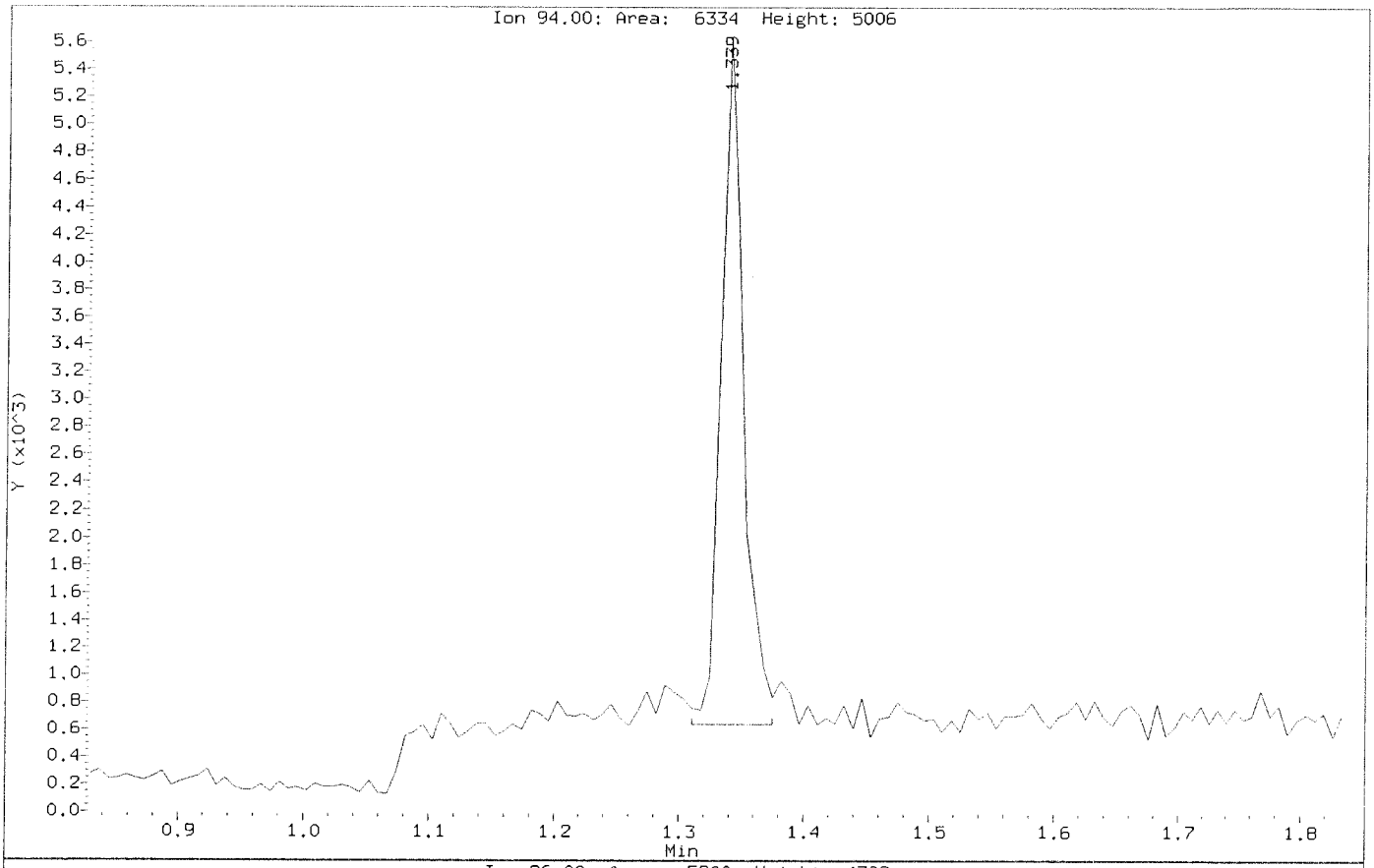
Compound: Bromomethane
CAS Number: 74-83-9

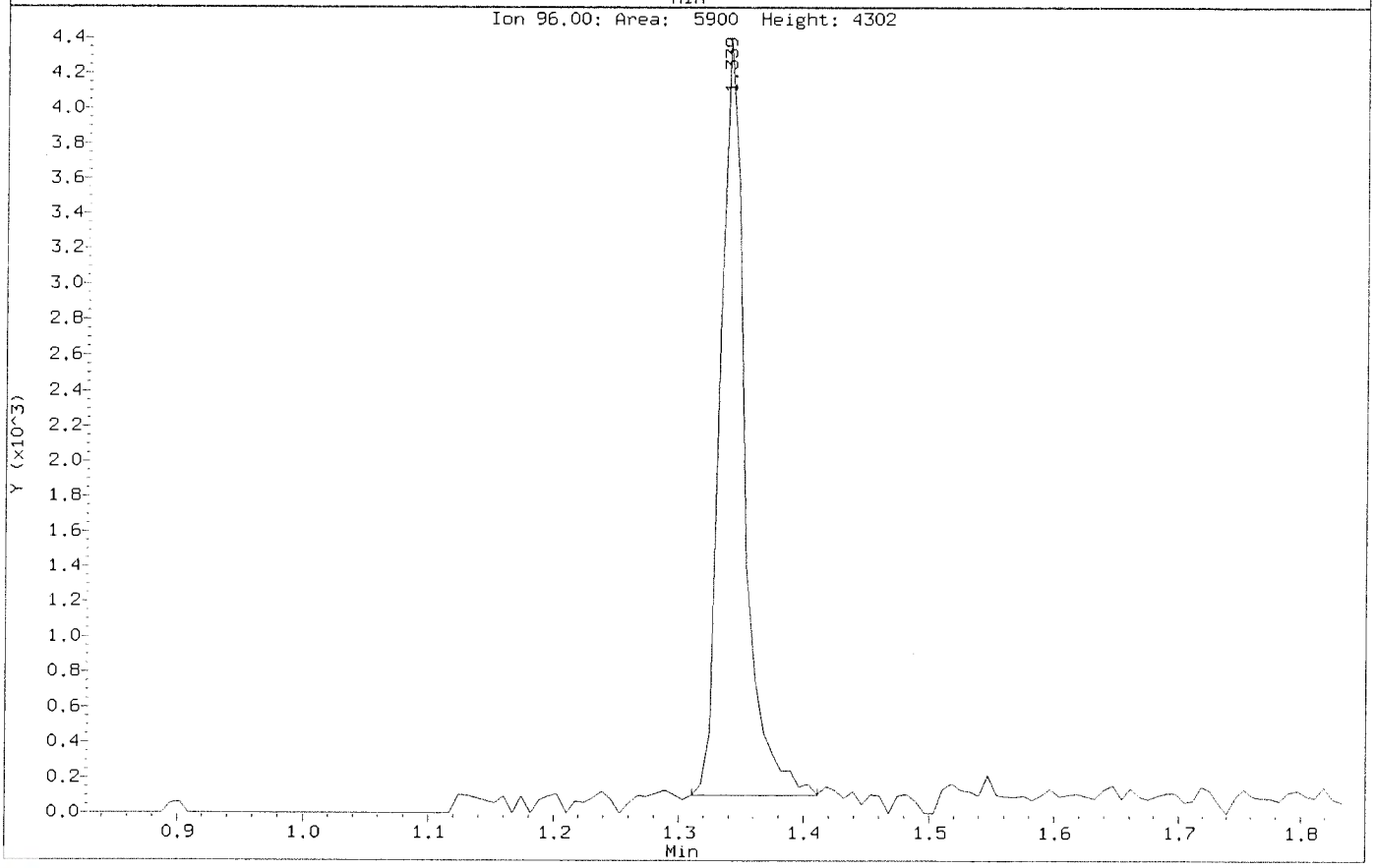




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Instrument: voa6.i
Client Sample ID: VSTD001

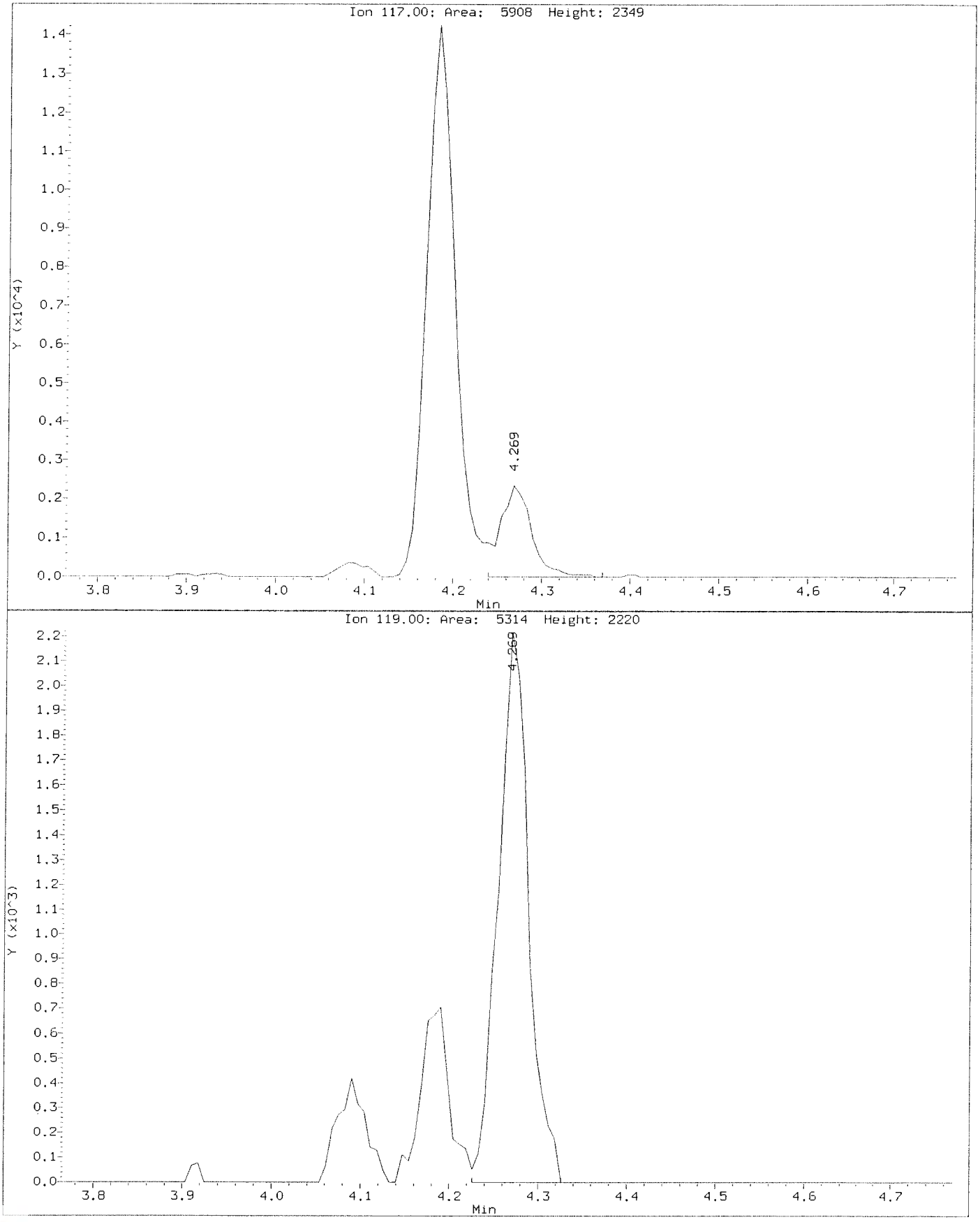
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CAS Number: 74-83-9





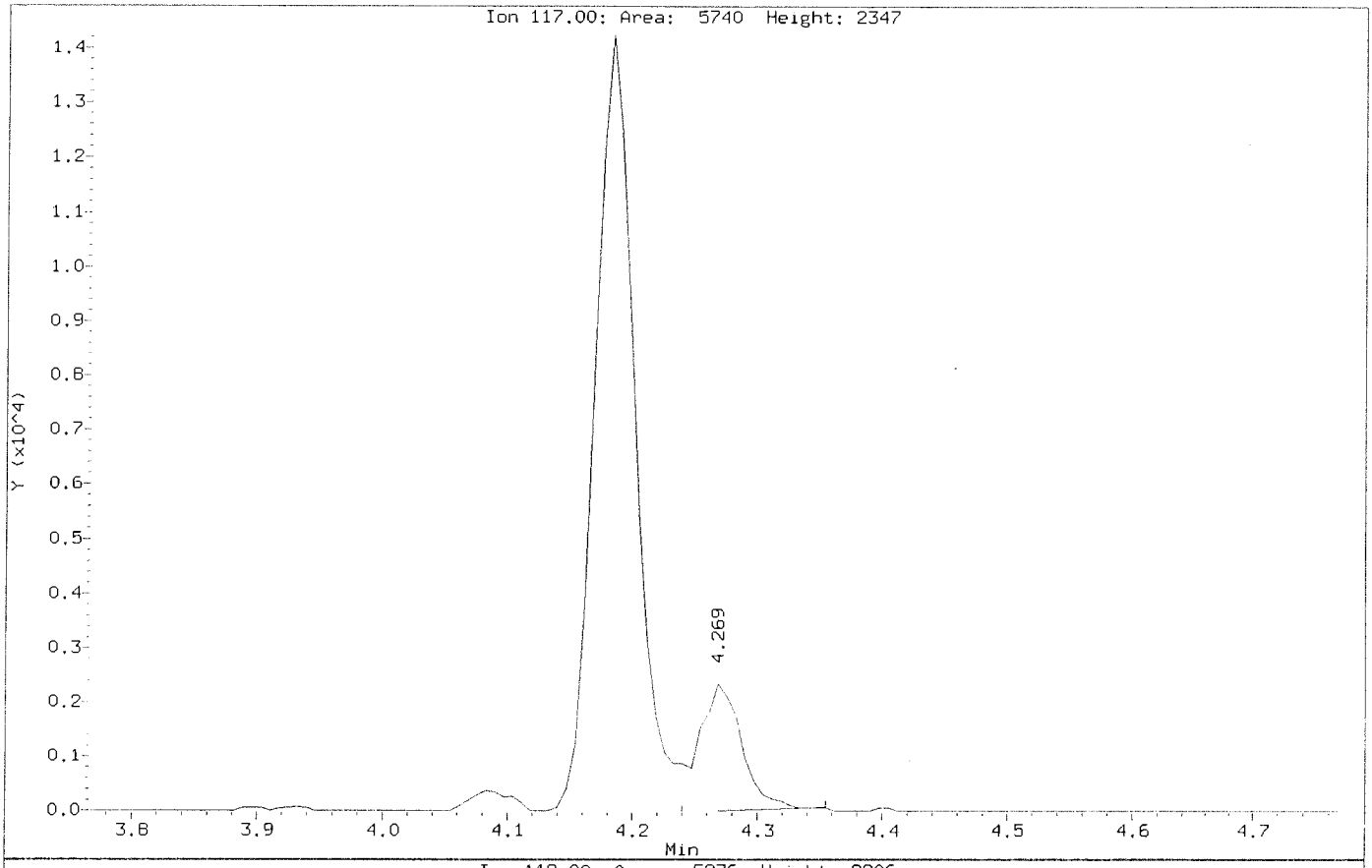
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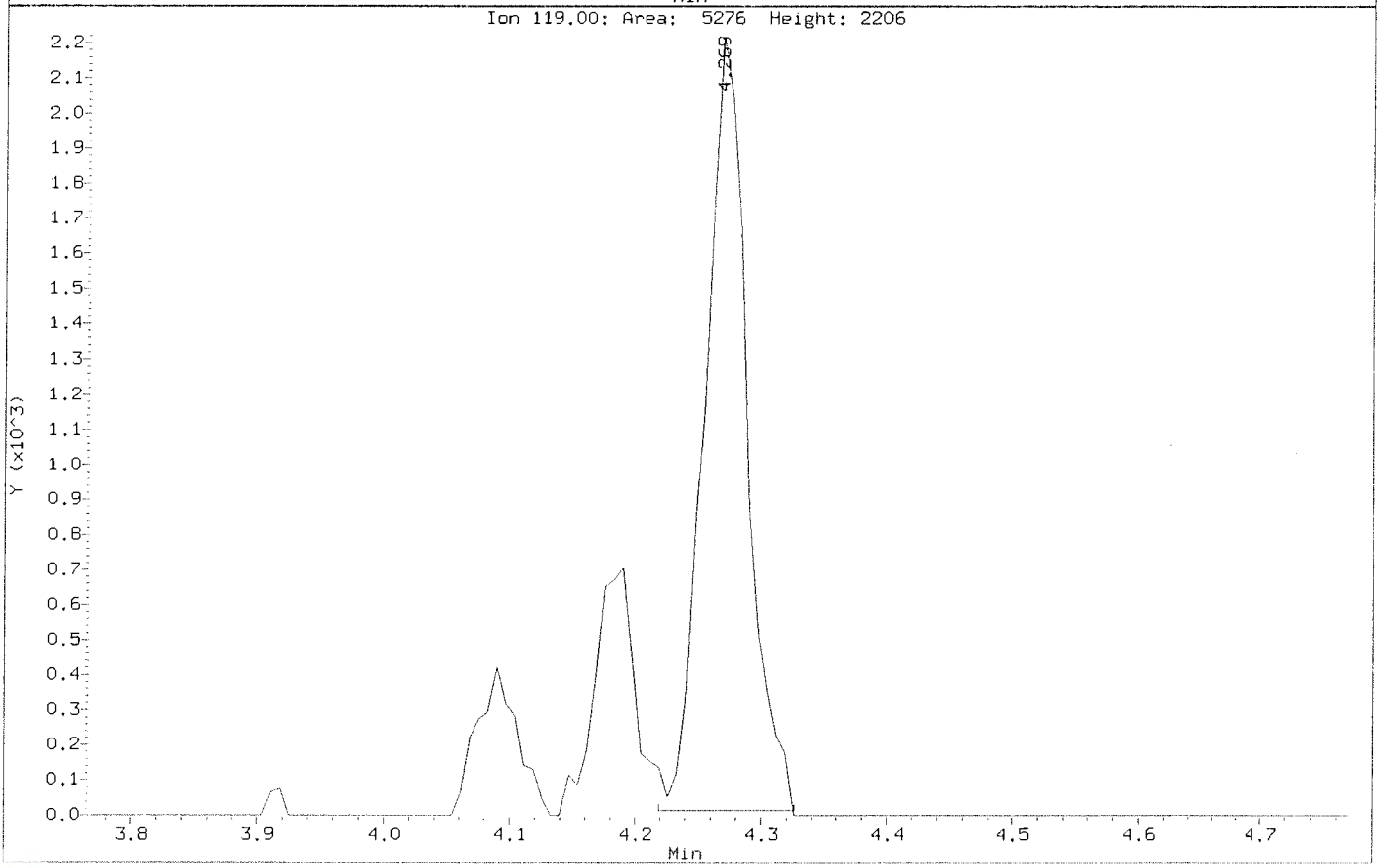
Compound: Carbon Tetrachloride
CAS Number: 56-23-5



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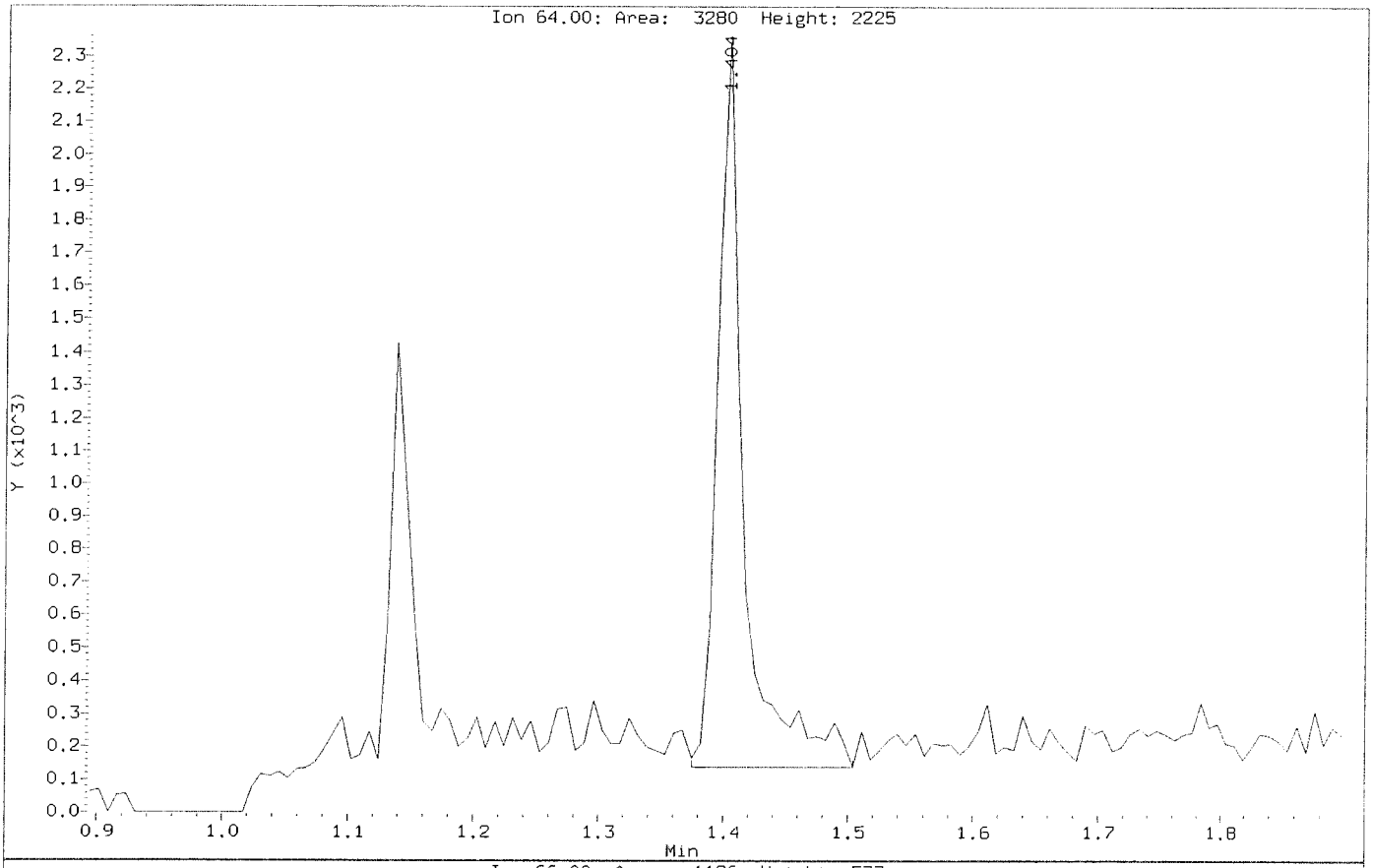
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CAS Number: 56-23-5

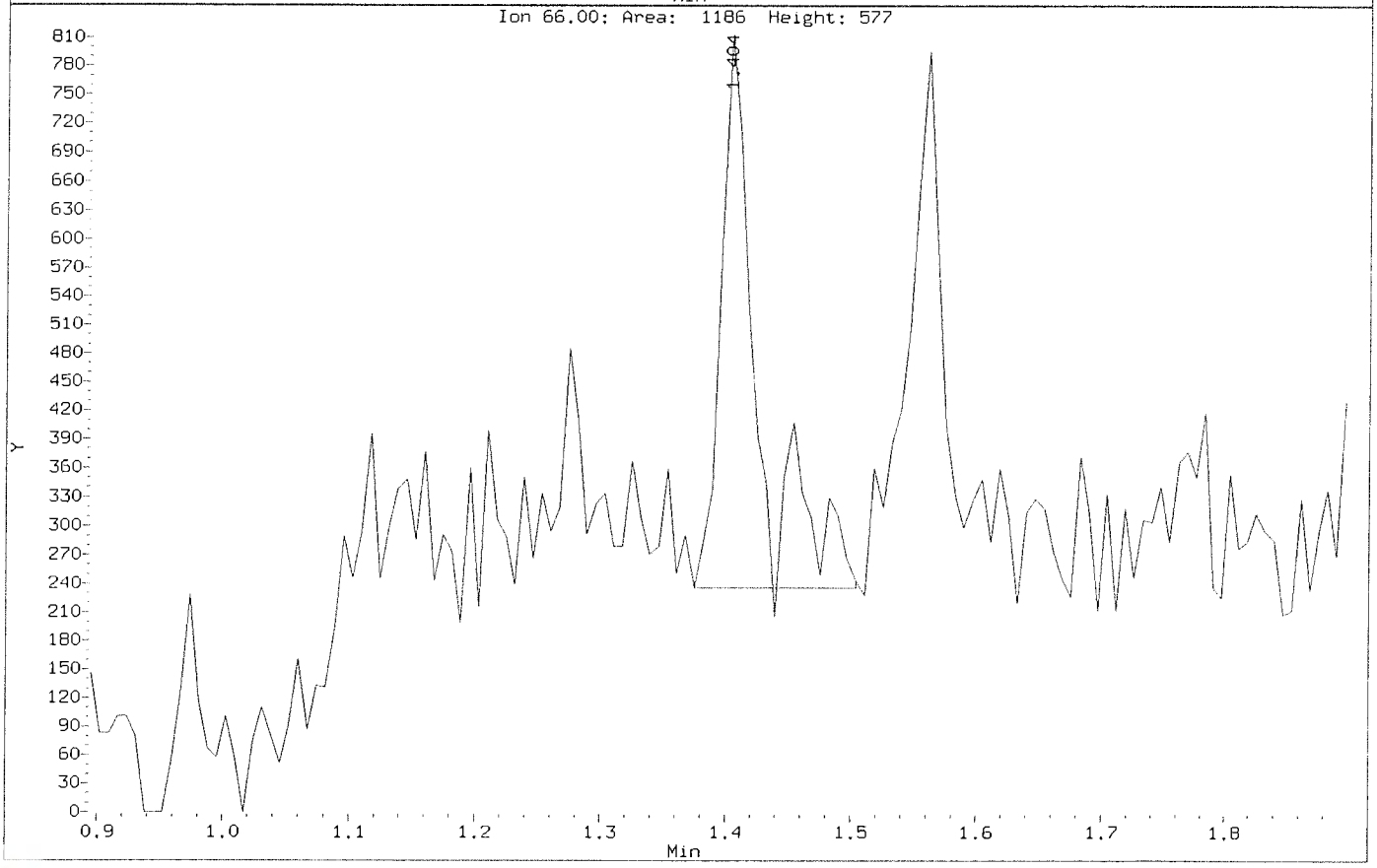




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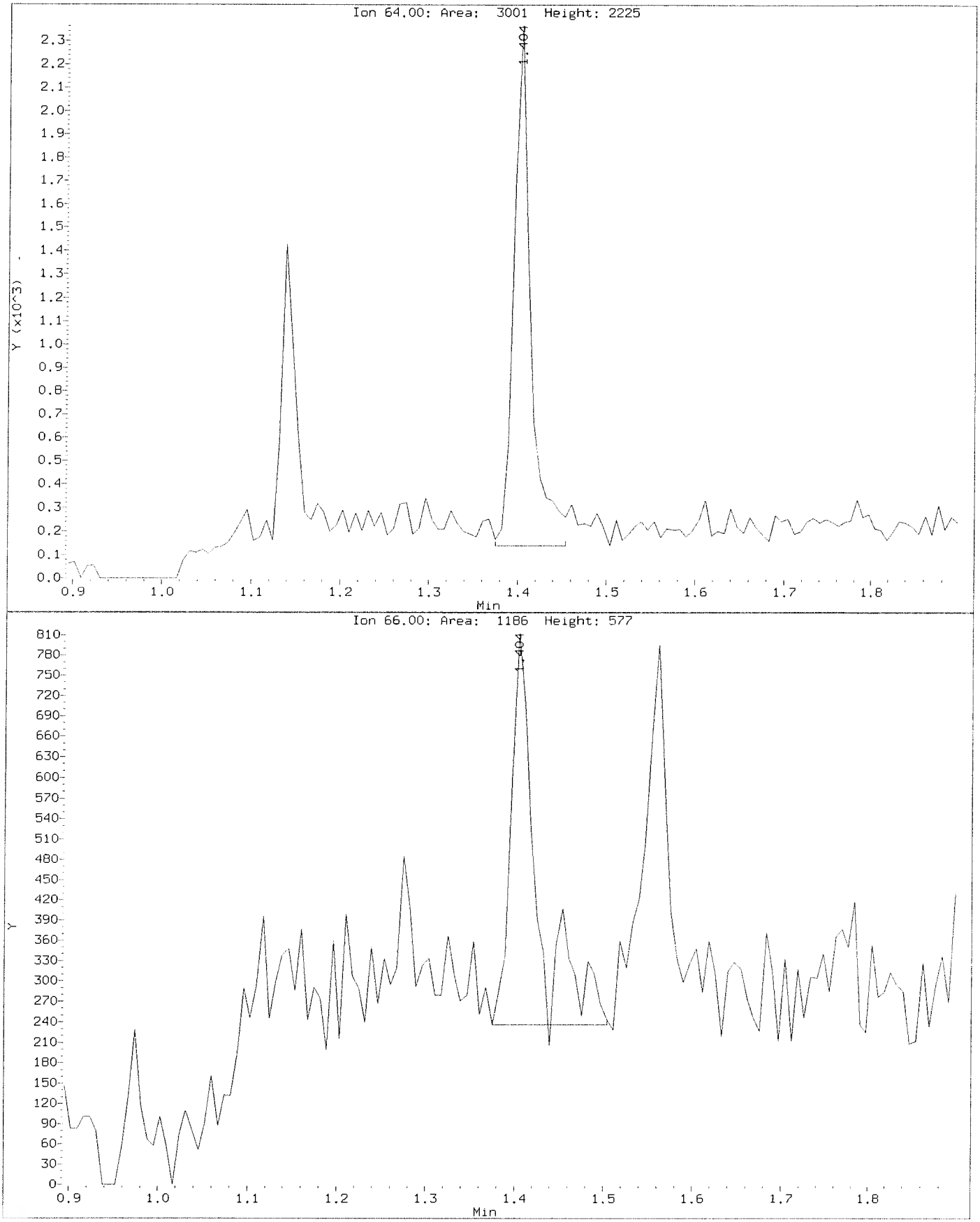
Compound: Chloroethane
CAS Number: 75-00-3





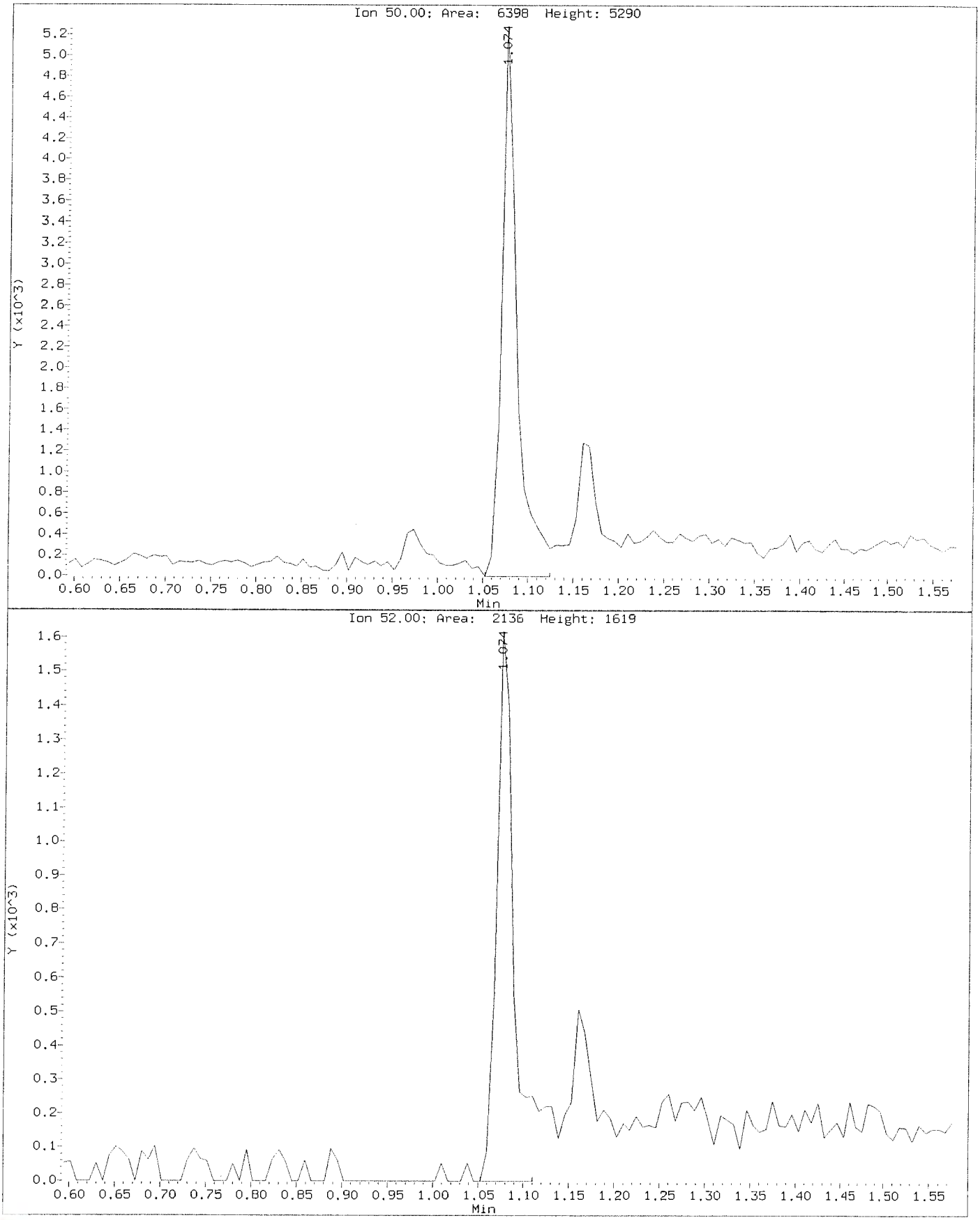
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Injection Date: 18-NOV-2019 14:59
Instrument: voa6.i
Client Sample ID: VSTD001

Compound: Chloroethane
CAS Number: 75-00-3



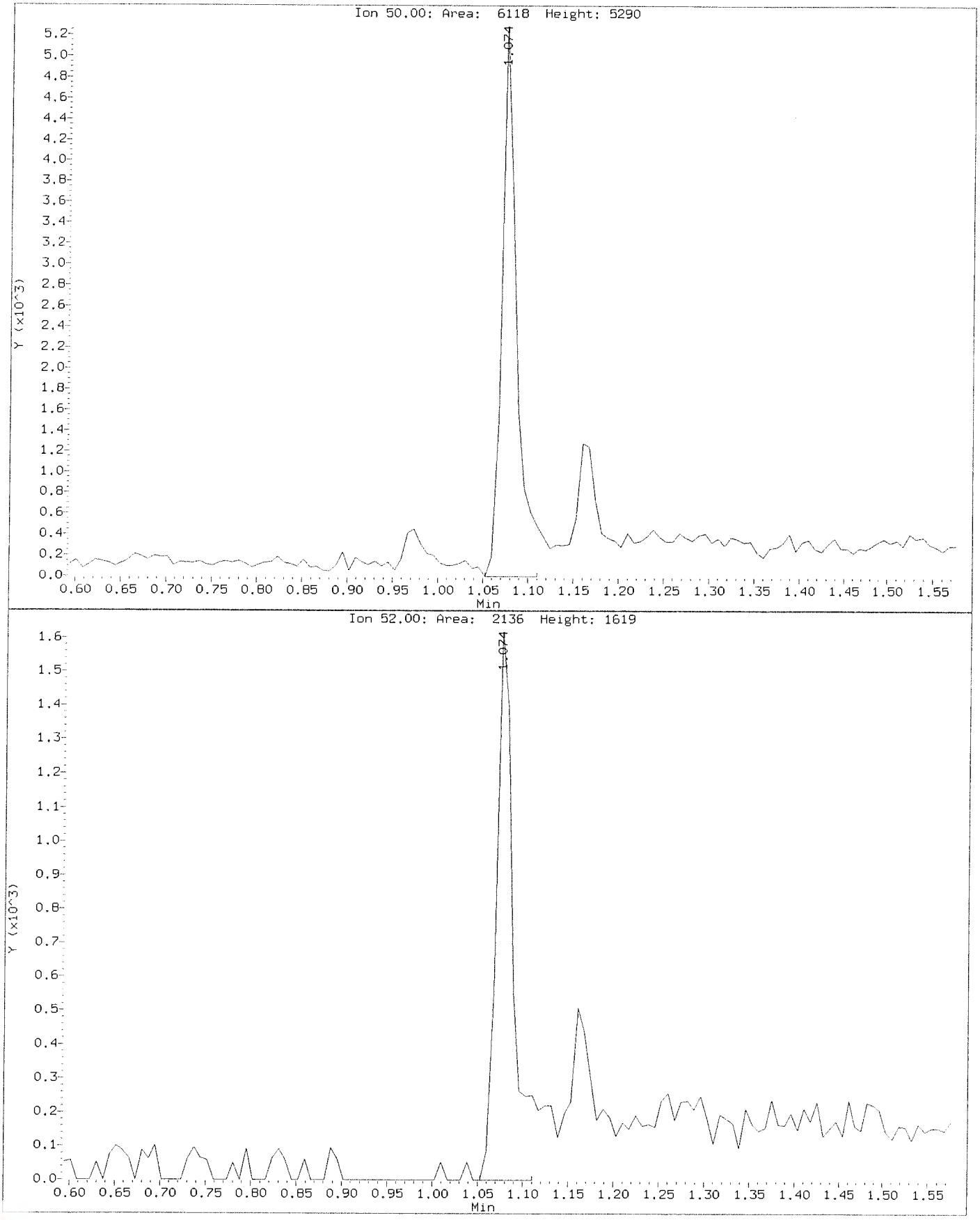
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Instrument: voa6.i
Client Sample ID: VSTD001

Compound: Chloromethane
CAS Number: 74-87-3



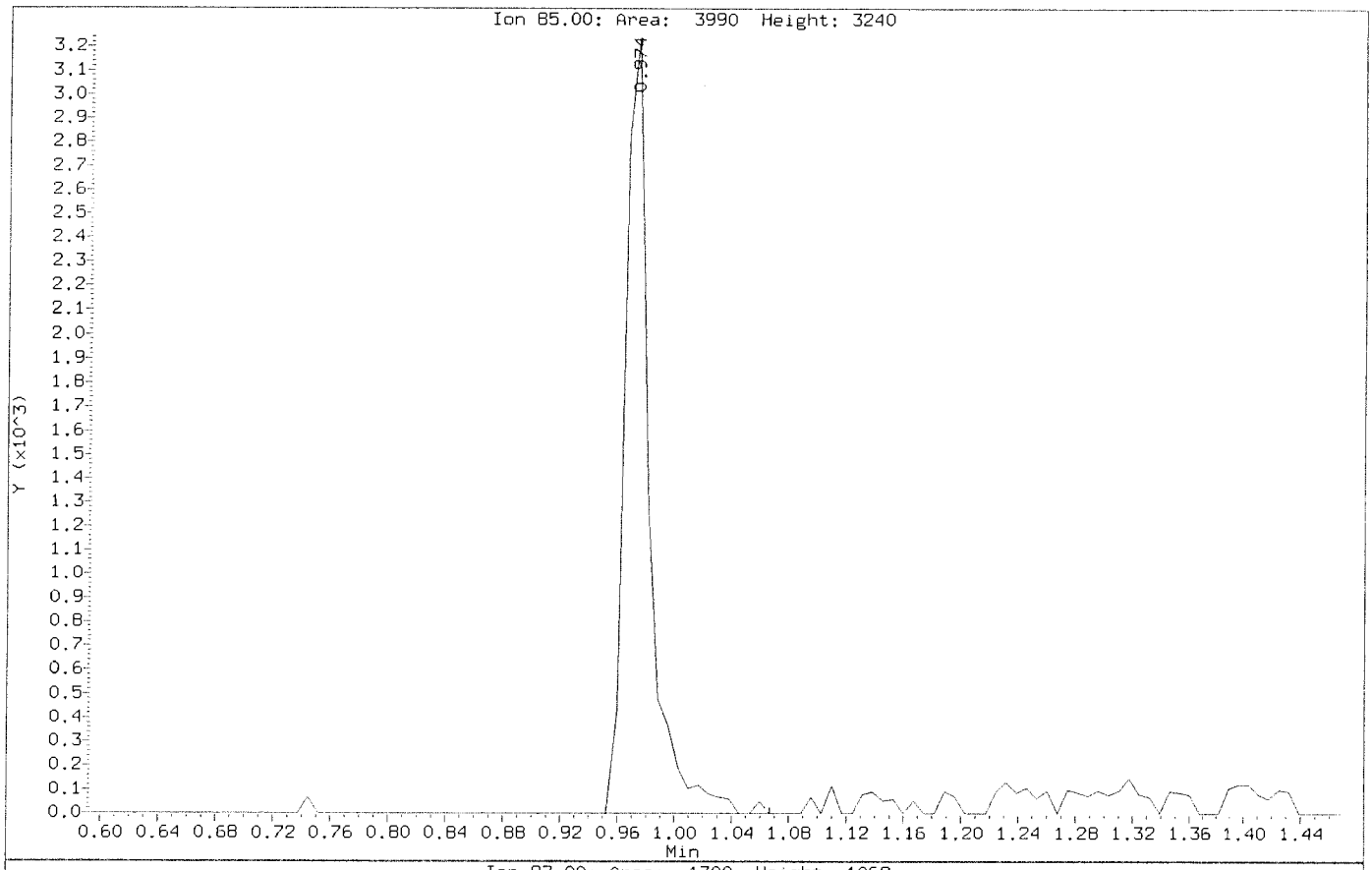
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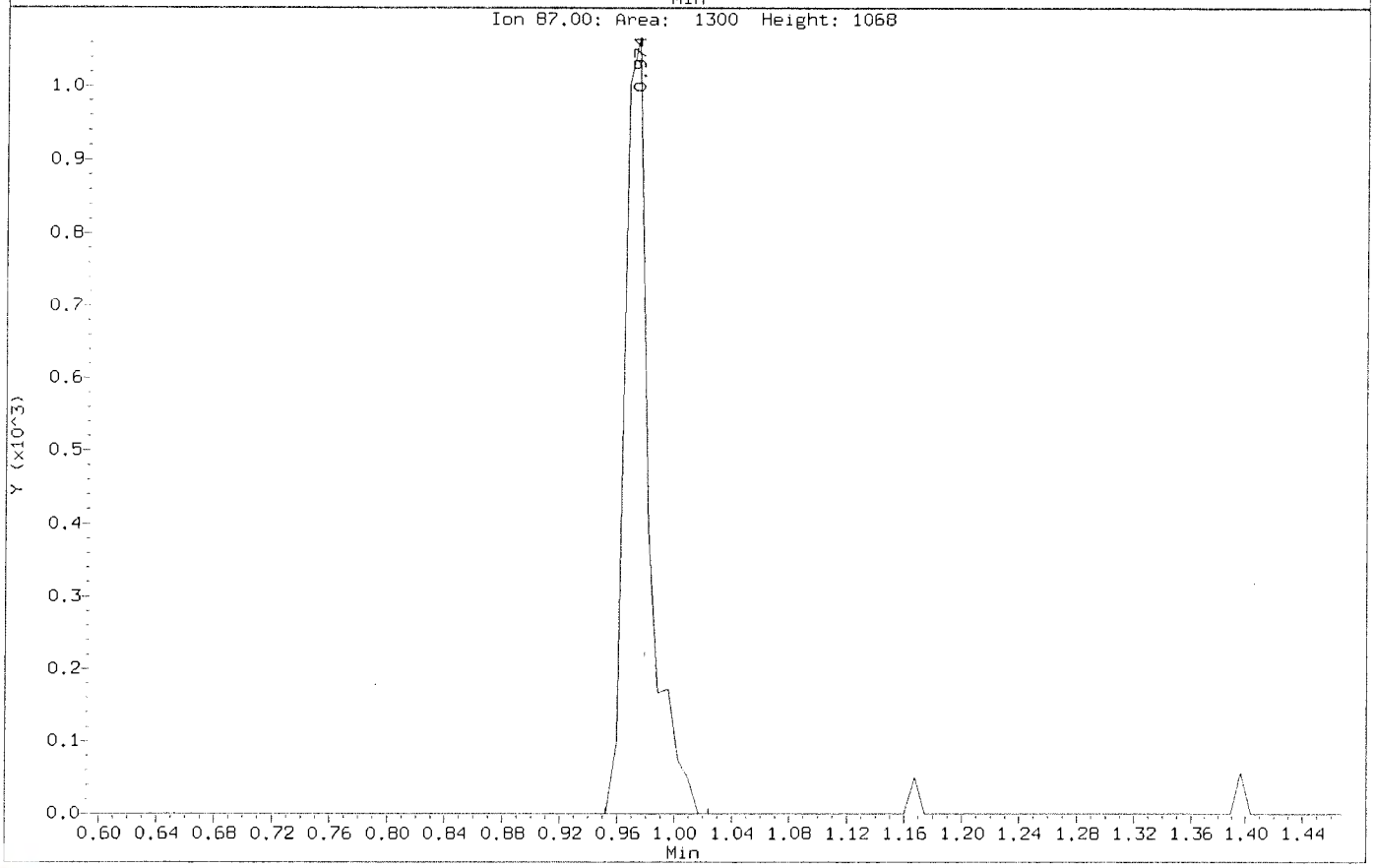
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CAS Number: 74-87-3



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Instrument: voa6.i
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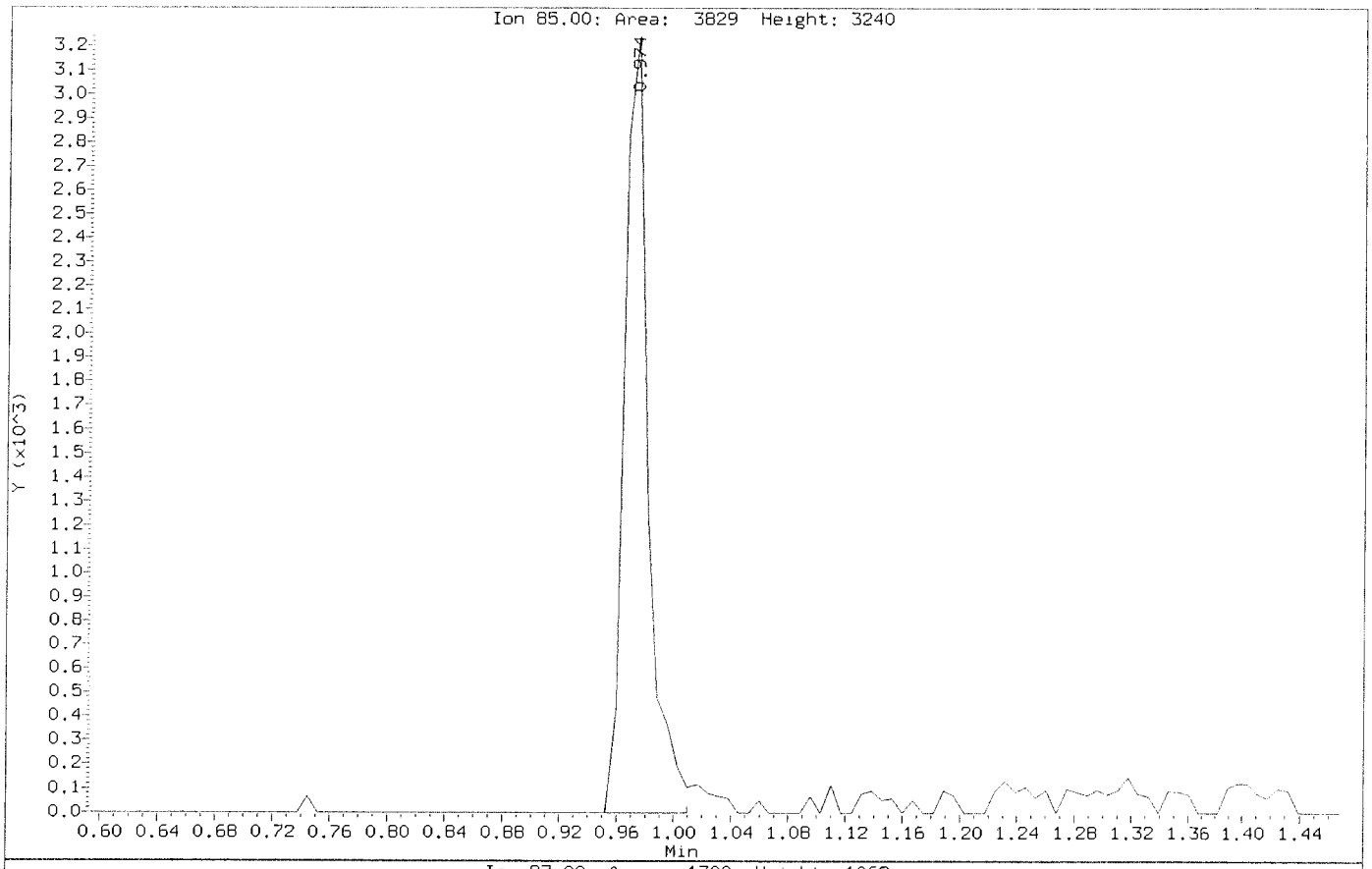
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8

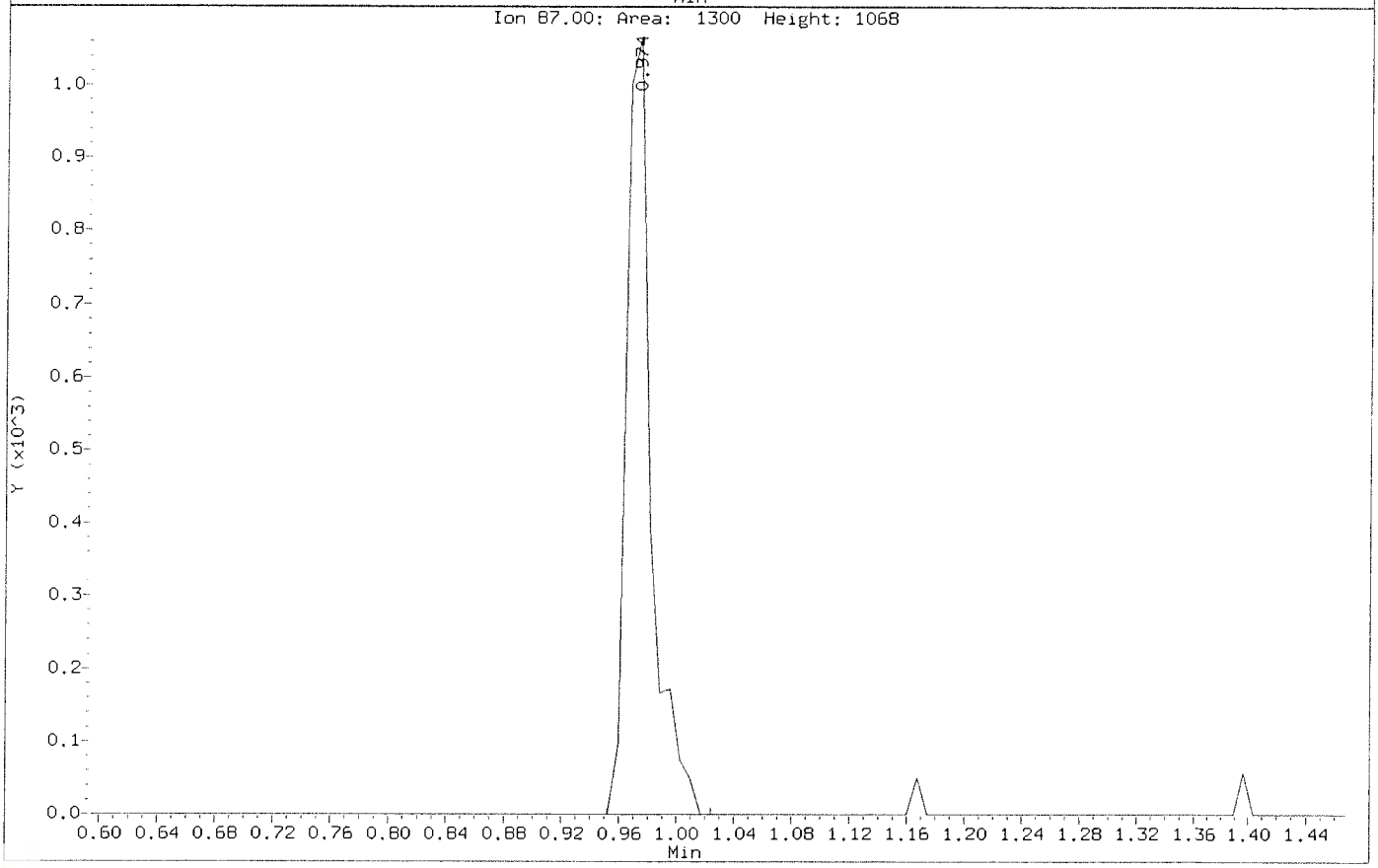




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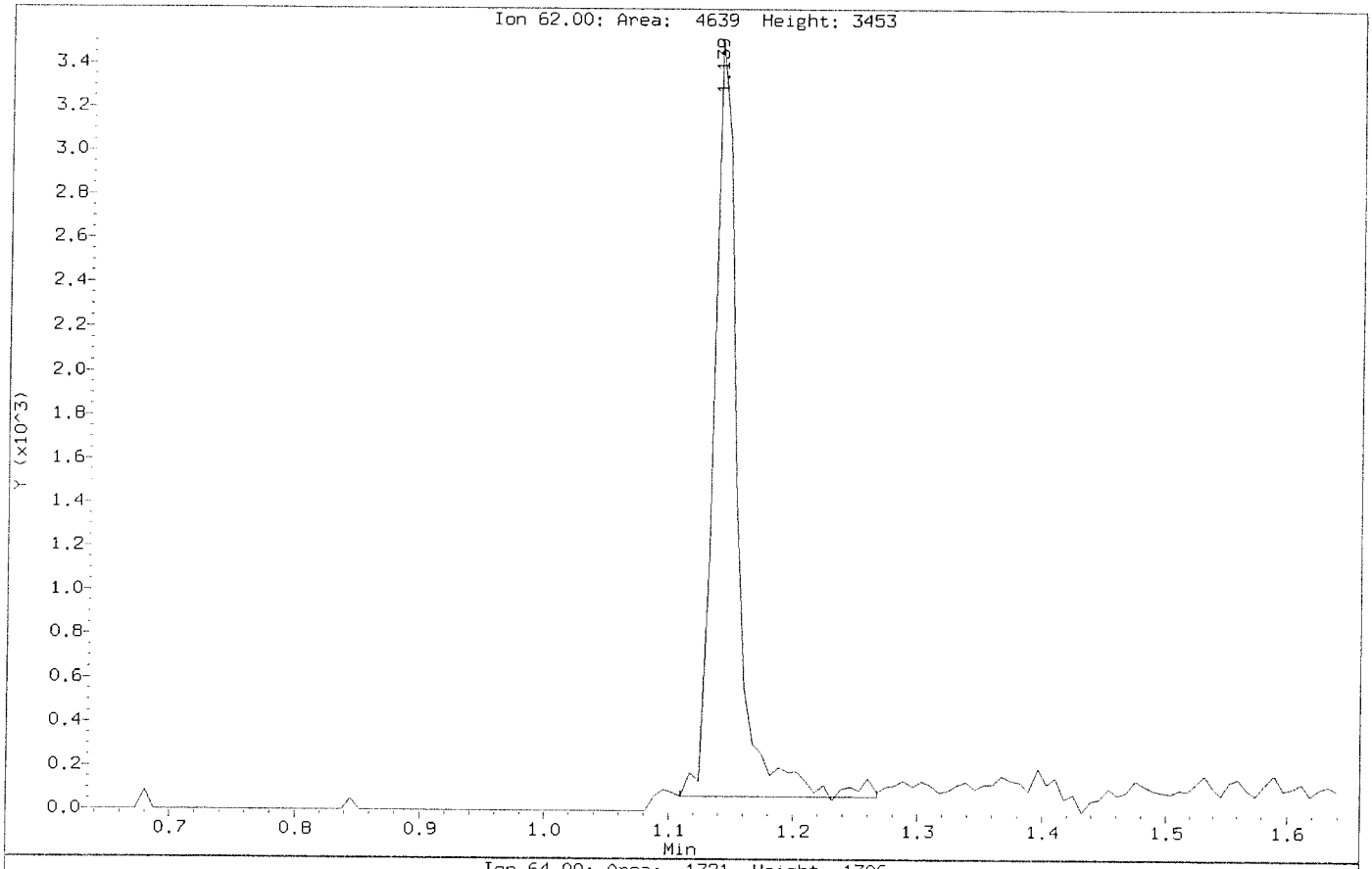
Compound: Dichlorodifluoromethane
CAS Number: 75-71-8

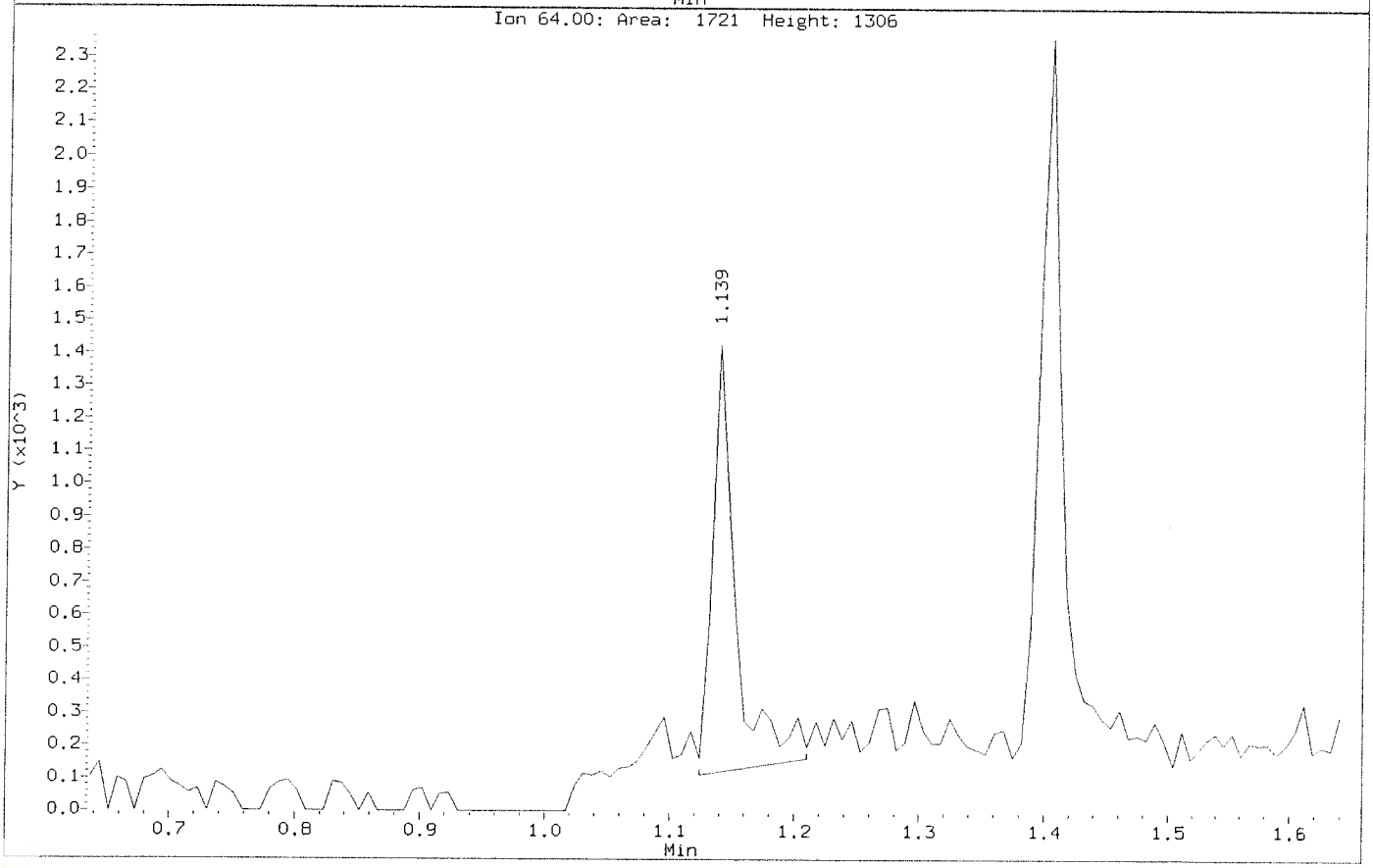




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Client Sample ID: VSTD001

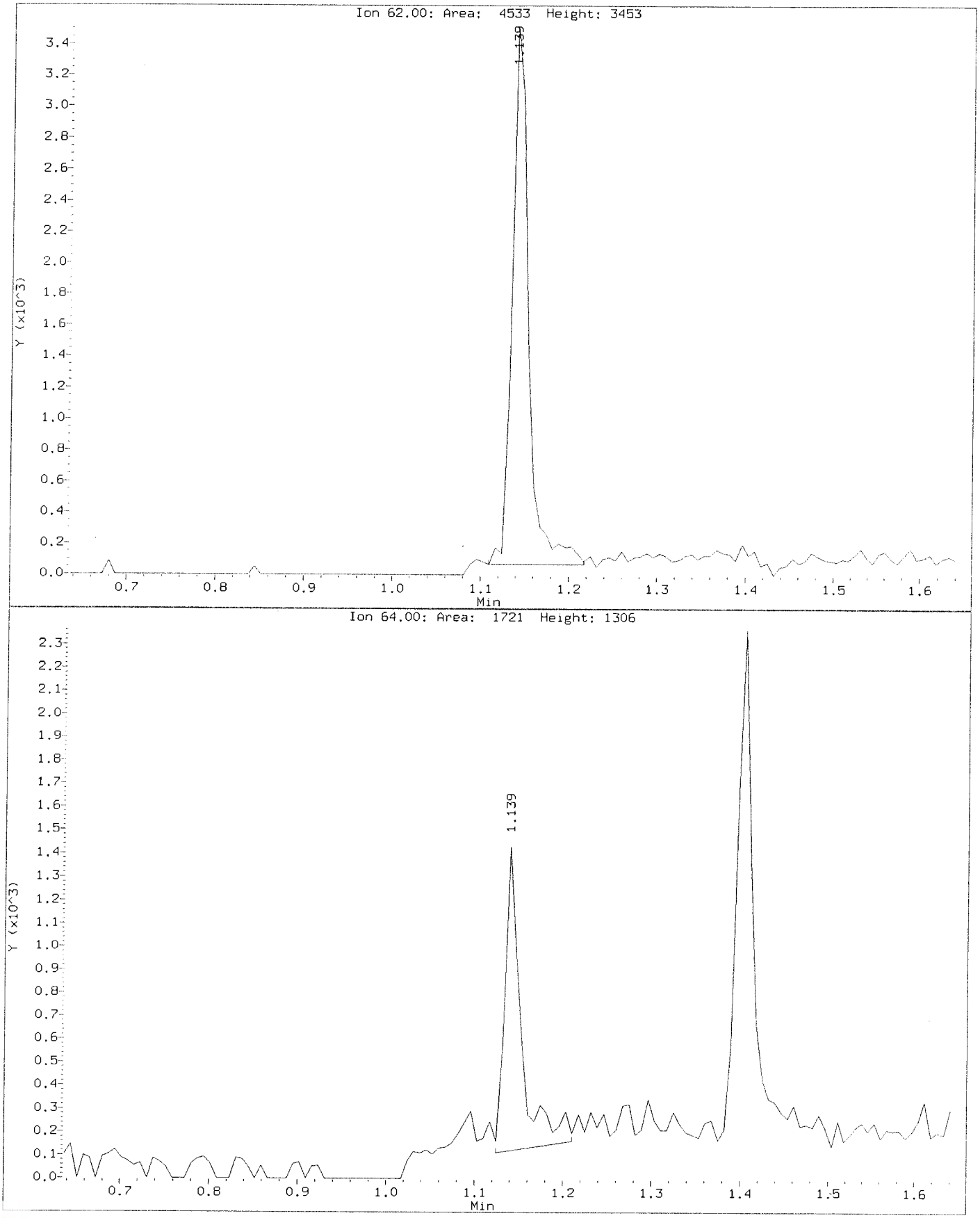
Compound: Vinyl Chloride
CAS Number: 75-01-4





Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111804.D
Injection Date: 18-NOV-2019 14:59
Instrument: voa6.i
Client Sample ID: VSTD001

Compound: Vinyl Chloride
CAS Number: 75-01-4



Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111805.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111805.D
Lab Smp Id: VSTD002 Client Smp ID: VSTD002
Inj Date : 18-NOV-2019 15:23
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 14:59 Cal File: X111804.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

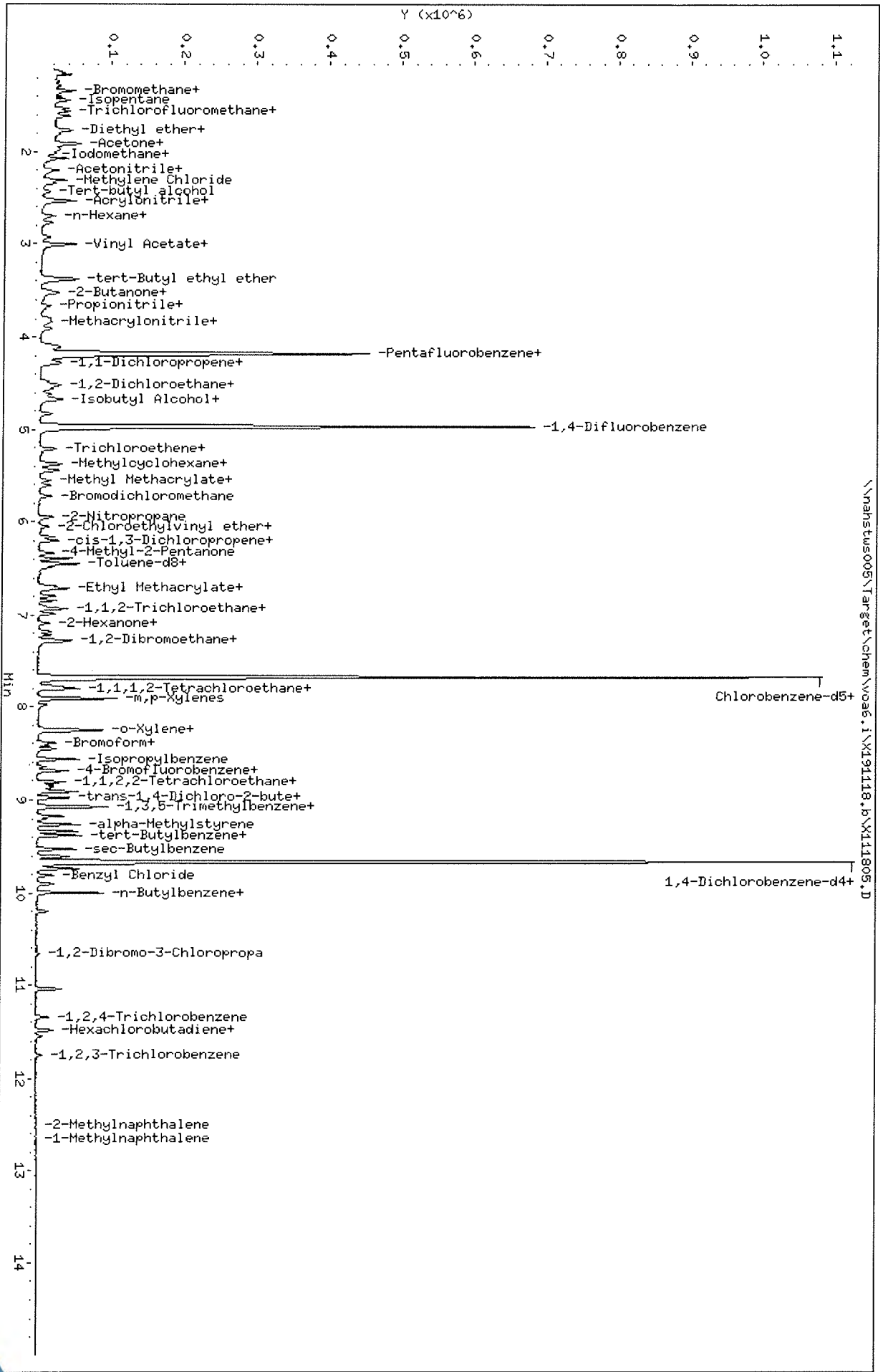
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	415277	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	574320	50.0000	
* 47 Chlorobenzene-d5	117	7.670	7.670	(1.000)	519547	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	278615	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	8034	2.00000	2.76(a)
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	10468	2.00000	2.56(a)
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	8127	2.00000	2.50(a)
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	28201	2.00000	2.06(a)
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	7788	2.00000	2.06(a)
31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	12006	2.00000	2.14(a)
68 1,1,2,2-Tetrachloroethane	83	8.838	8.838	(0.914)	8194	2.00000	2.09(a)
138 Freon TF	101	1.911	1.911	(0.457)	7504	2.00000	2.07(a)
53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	5924	2.00000	2.18(a)
22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	12973	2.00000	2.14(a)
11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	7795	2.00000	2.21(a)
32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	10135	2.00000	2.18(a)
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	2753	2.00000	1.85(a)
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	7810	2.00000	2.35(aM)
90 1,2,4-Trichlorobenzene	180	11.345	11.345	(1.173)	5184	2.00000	2.20(a)
79 1,2,4-Trimethylbenzene	105	9.382	9.382	(0.970)	27218	2.00000	2.05(a)
89 1,2-Dibromo-3-Chloropropane	155	10.657	10.657	(1.102)	859	2.00000	1.65(a)
57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	7900	2.00000	2.16(a)

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111805.D Page 2
Report Date: 06-Dec-2019 19:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	9.998	9.998	(1.034)	15931	2.00000	2.15(a)
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	9378	2.00000	2.05(a)
42	1,2-Dichloropropane	63	5.443	5.443	(1.095)	7169	2.00000	2.08(aM)
75	1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	26432	2.00000	2.08(a)
83	1,3-Dichlorobenzene	146	9.612	9.612	(0.994)	17183	2.00000	2.15(a)
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	11850	2.00000	2.14(a)
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	17620	2.00000	2.17(a)
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	11201	2.00000	2.04(a)
24	2-Butanone	43	3.588	3.588	(0.858)	5067	4.00000	3.97(a)
76	2-Chlorotoluene	91	8.974	8.974	(0.928)	21210	2.00000	2.11(a)
52	2-Hexanone	43	7.090	7.090	(0.924)	8468	4.00000	3.96(a)
77	4-Chlorotoluene	91	9.074	9.074	(0.939)	24759	2.00000	2.03(a)
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	28289	2.00000	2.07(a)
45	4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	13007	4.00000	4.27(a)
10	Acetone	43	1.976	1.976	(0.473)	7954	4.00000	3.82(a)
37	Benzene	78	4.519	4.519	(0.909)	28031	2.00000	2.13(a)
74	Bromobenzene	156	8.809	8.809	(0.911)	10482	2.00000	2.16(a)
29	Bromochloromethane	128	3.795	3.795	(0.908)	5128	2.00000	2.27(a)
39	Bromodichloromethane	83	5.729	5.729	(1.153)	9742	2.00000	2.04(a)
66	Bromoform	173	8.415	8.415	(1.097)	5989	2.00000	2.89(a)
6	Bromomethane	94	1.338	1.338	(0.320)	12041	2.00000	0.69(a)
19	Carbon Disulfide	76	2.069	2.069	(0.495)	40384	4.00000	4.21(a)
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	11097	2.00000	2.18(aM)
59	Chlorobenzene	112	7.699	7.699	(1.004)	21369	2.00000	2.10(a)
7	Chloroethane	64	1.403	1.403	(0.336)	5731	2.00000	2.19(a)
28	Chloroform	83	3.910	3.910	(0.935)	14792	2.00000	2.19(a)
3	Chloromethane	50	1.073	1.073	(0.257)	10461	2.00000	2.49(a)
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	8197	2.00000	2.08(a)
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	11415	2.00000	2.03(a)
55	Dibromochloromethane	129	7.176	7.176	(0.936)	8154	2.00000	2.06(a)
44	Dibromomethane	93	5.557	5.557	(1.118)	5355	2.00000	2.20(a)
2	Dichlorodifluoromethane	85	0.973	0.973	(0.233)	7335	2.00000	2.78(a)
61	Ethylbenzene	106	7.799	7.799	(1.017)	10700	2.00000	2.04(a)
91	Hexachlorobutadiene	225	11.488	11.488	(1.188)	4522	2.00000	1.82(a)
67	Isopropylbenzene	105	8.566	8.566	(1.117)	32629	2.00000	2.10(a)
62	m,p-Xylenes	106	7.907	7.907	(1.031)	26786	4.00000	4.23(a)
17	Methylene Chloride	84	2.305	2.305	(0.551)	8025	2.00000	2.13(a)
87	n-Butylbenzene	91	9.998	9.998	(1.034)	22333	2.00000	1.96(a)
73	n-Propylbenzene	91	8.917	8.917	(0.922)	35573	2.00000	2.06(a)
92	Naphthalene	128	11.553	11.553	(1.195)	6733	2.00000	2.23(a)
63	o-Xylene	106	8.244	8.244	(1.075)	13637	2.00000	2.18(a)
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	31860	2.00000	2.12(a)
64	Styrene	104	8.265	8.265	(1.078)	22366	2.00000	2.06(a)
78	tert-Butylbenzene	119	9.339	9.339	(0.966)	22956	2.00000	2.11(a)
56	Tetrachloroethene	164	6.933	6.933	(0.904)	8185	2.00000	2.24(a)
50	Toluene	91	6.453	6.453	(0.841)	31139	2.00000	2.11(a)
20	trans-1,2-Dichloroethene	96	2.535	2.535	(0.606)	7239	2.00000	2.11(a)
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	10523	2.00000	2.06(a)
38	Trichloroethene	130	5.214	5.214	(1.049)	8894	2.00000	2.21(a)
8	Trichlorofluoromethane	101	1.560	1.560	(0.373)	13581	2.00000	2.10(a)
5	Vinyl Chloride	62	1.138	1.138	(0.272)	9073	2.00000	2.14(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

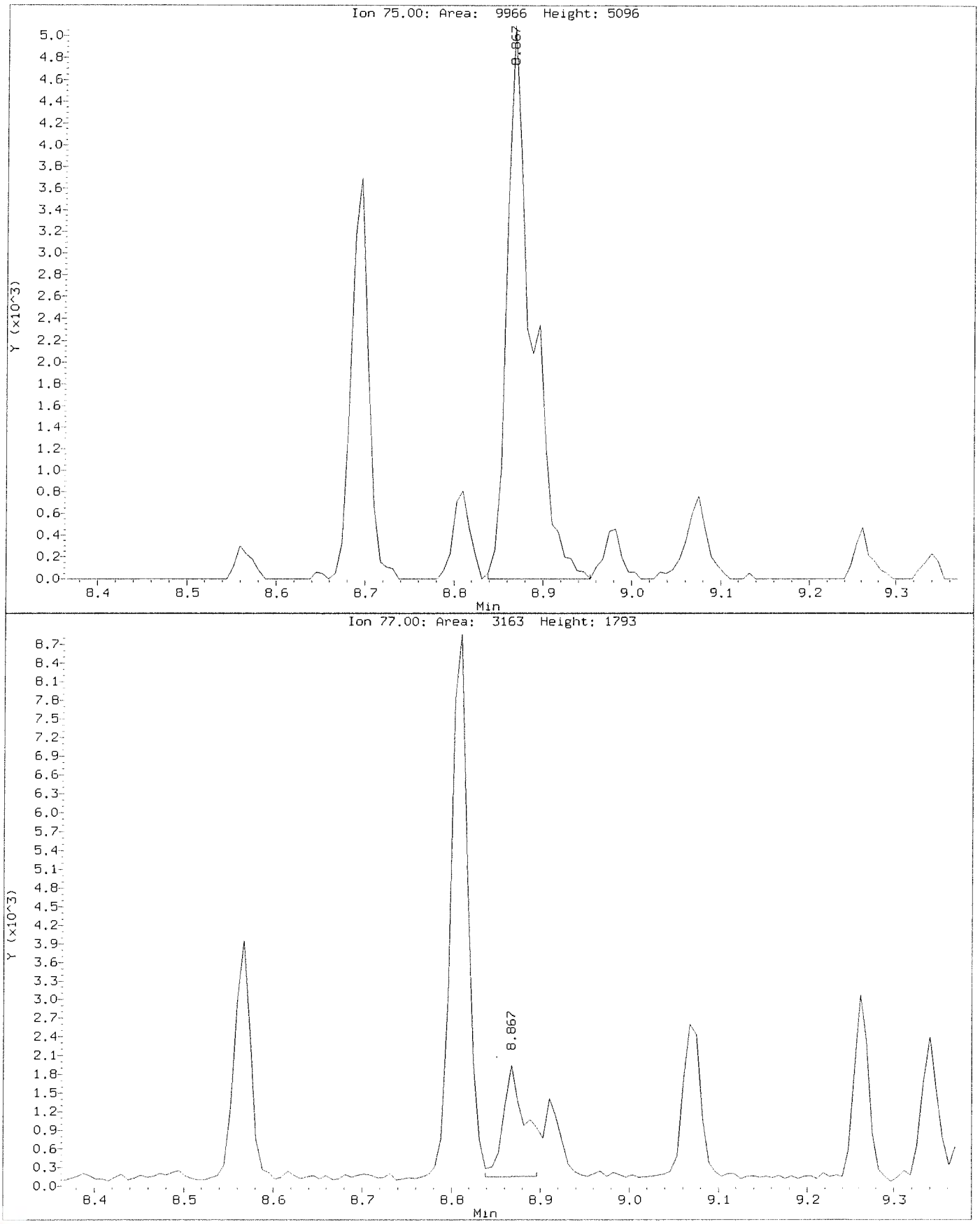


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Client ID: VSTD002
Sample Info: VSTD002;VSTD002;1;4;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

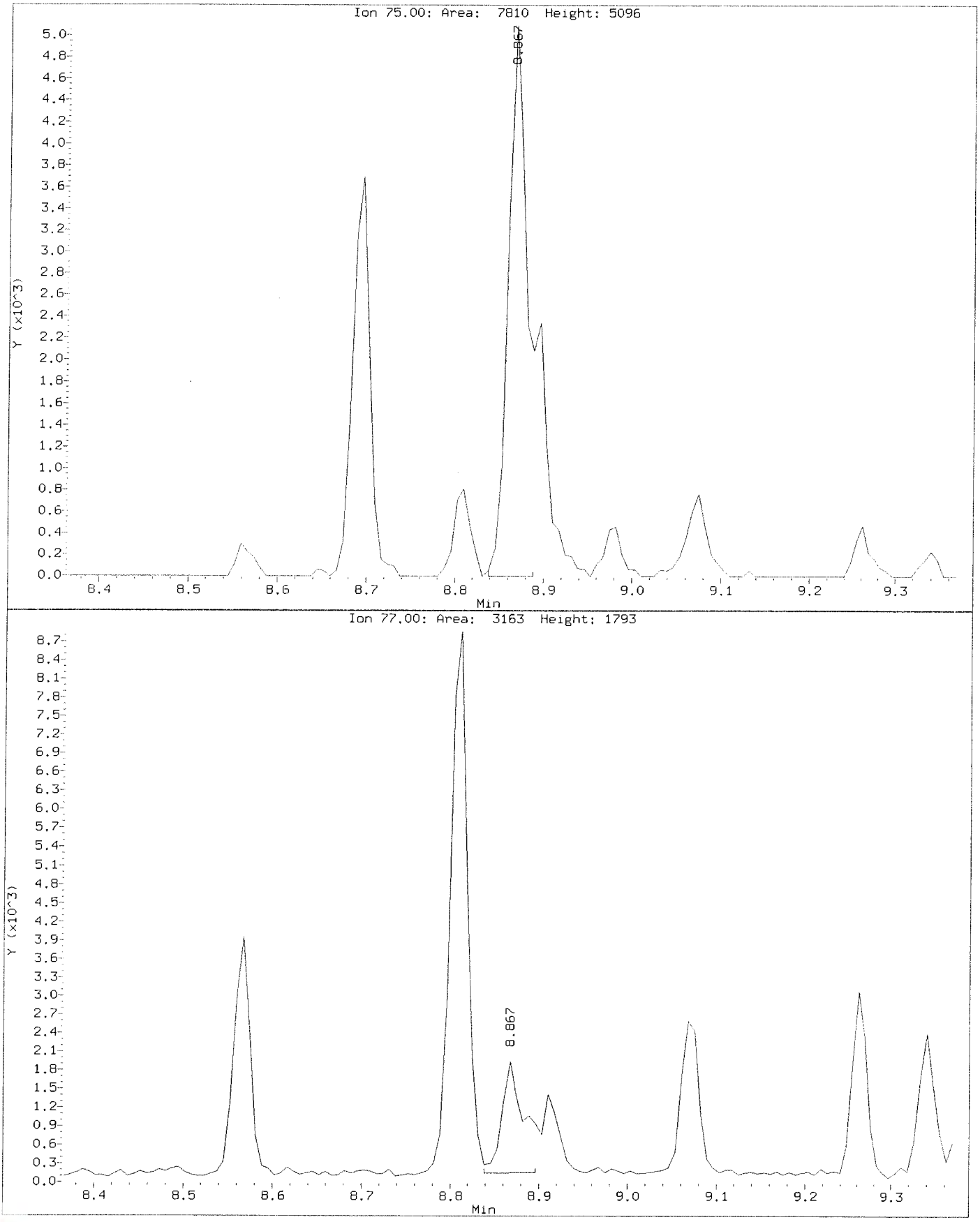
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Injection Date: 18-NOV-2019 15:23
Instrument: voa6.i
Client Sample ID: VSTD002

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4



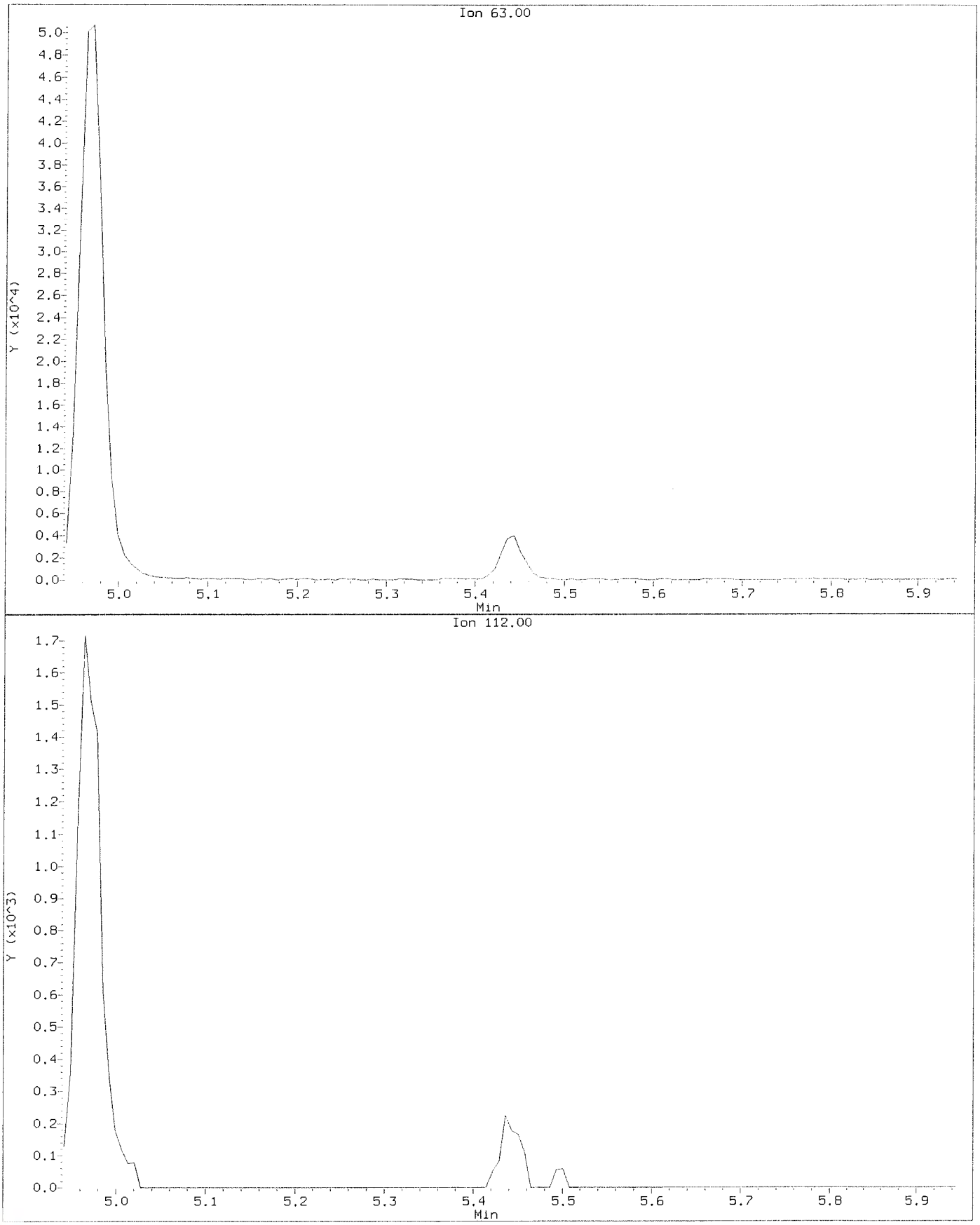
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Injection Date: 18-NOV-2019 15:23
Instrument: voa6.i
Client Sample ID: VSTD002

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4



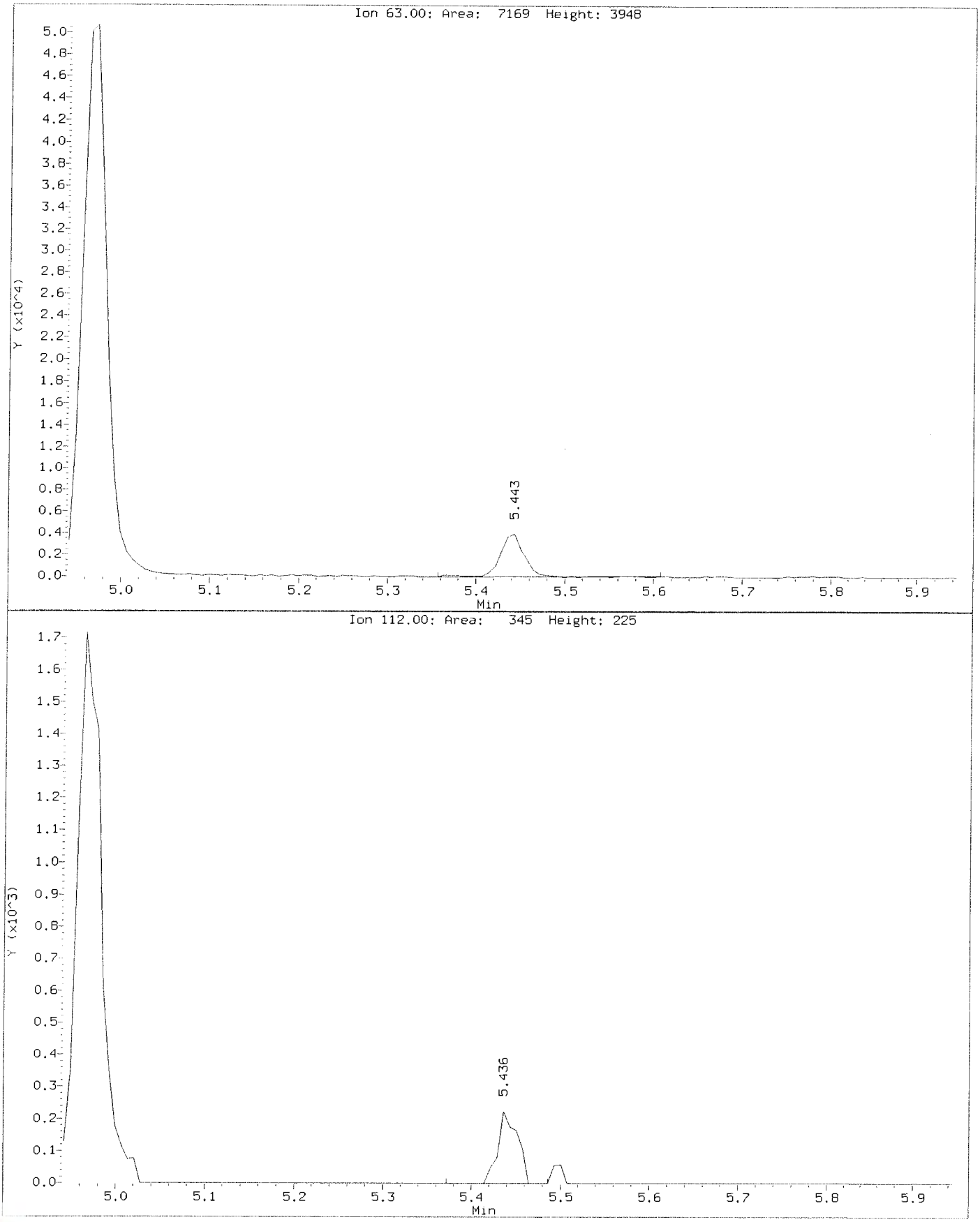
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Injection Date: 18-NOV-2019 15:23
Instrument: voa6.i
Client Sample ID: VSTD002

Compound: 1,2-Dichloropropane
CAS Number: 78-87-5



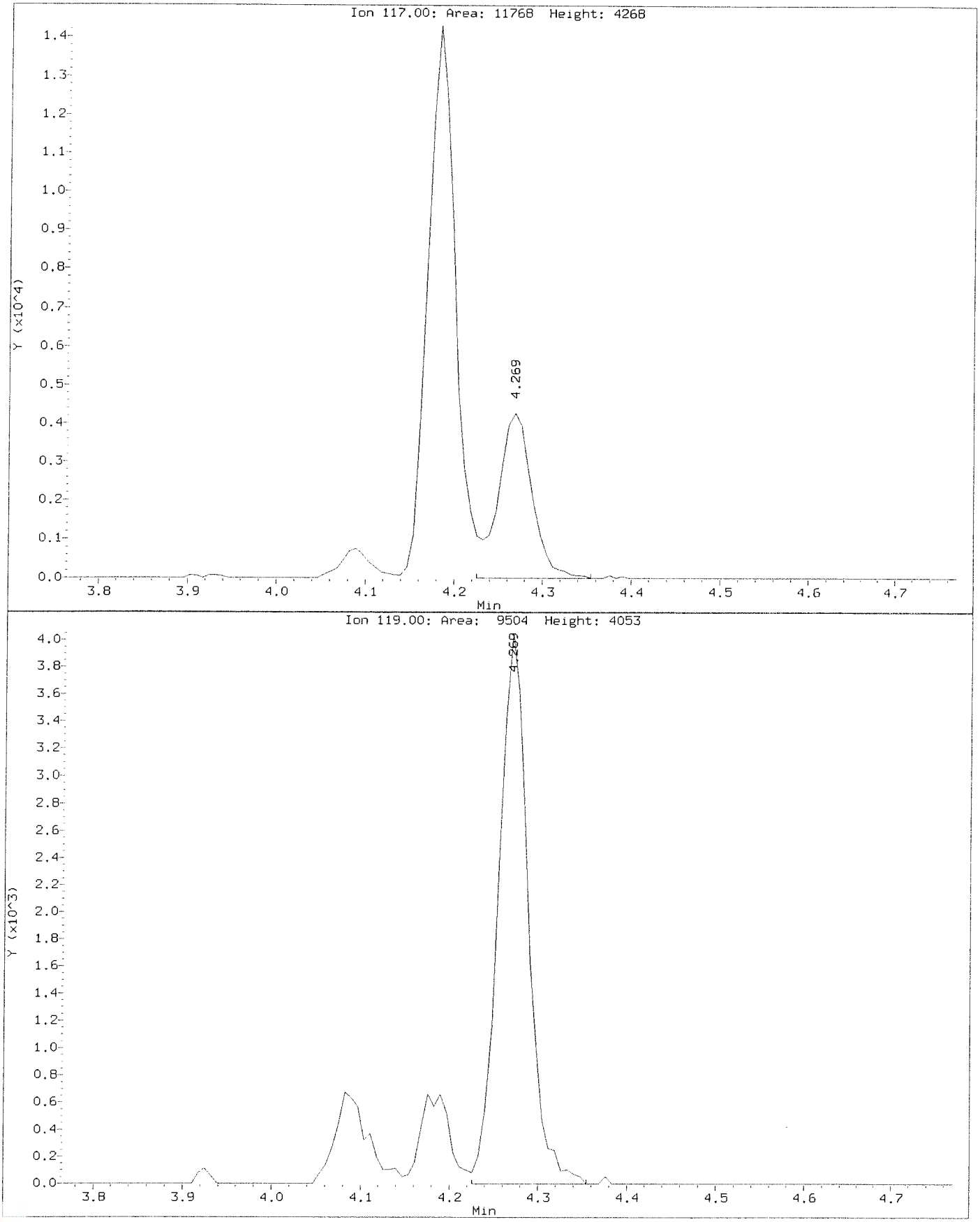
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Injection Date: 18-NOV-2019 15:23
Instrument: voa6.i
Client Sample ID: VSTD002

Compound: 1,2-Dichloropropane
CAS Number: 78-87-5



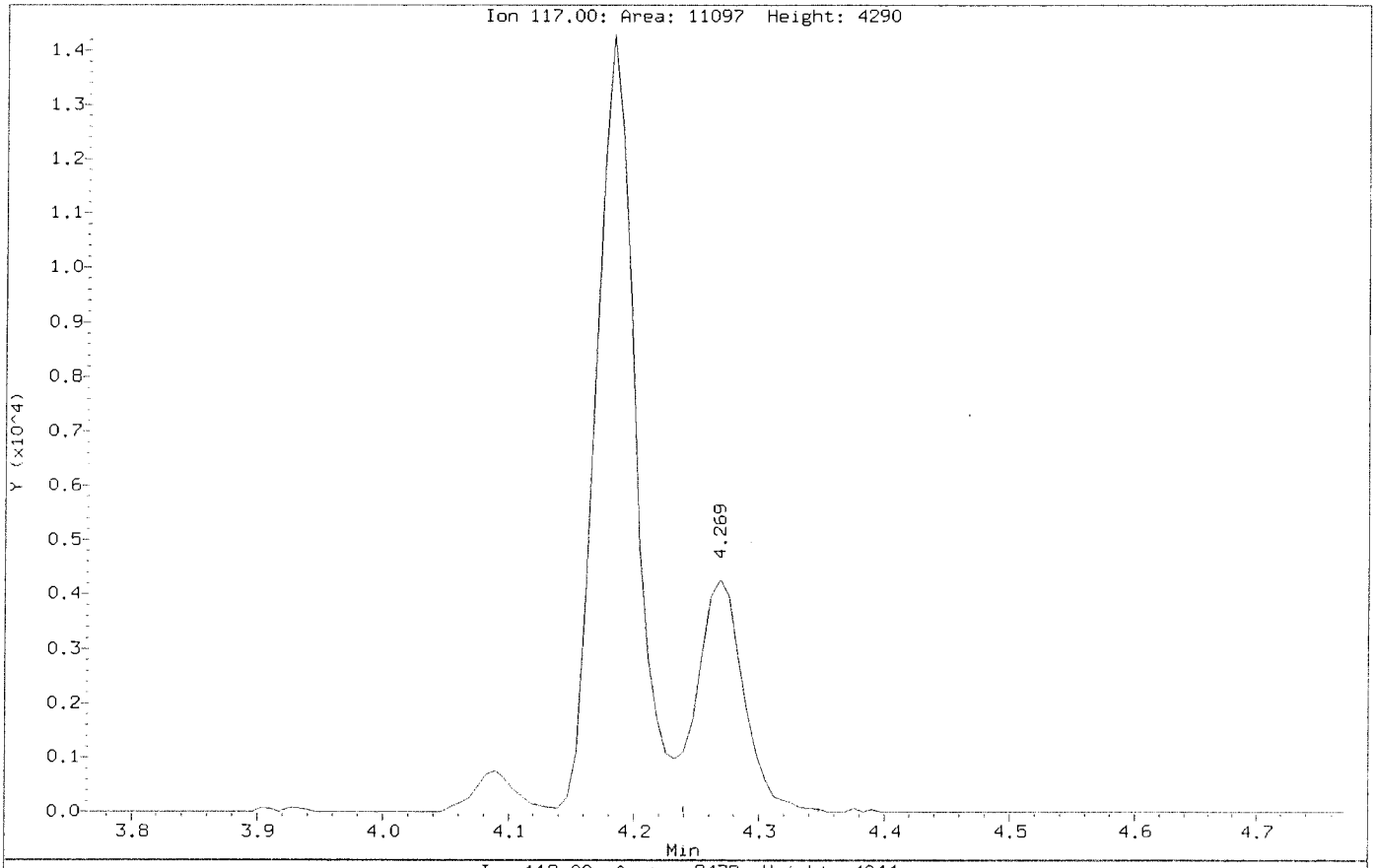
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Injection Date: 18-NOV-2019 15:23
Instrument: voa6.i
Client Sample ID: VSTD002

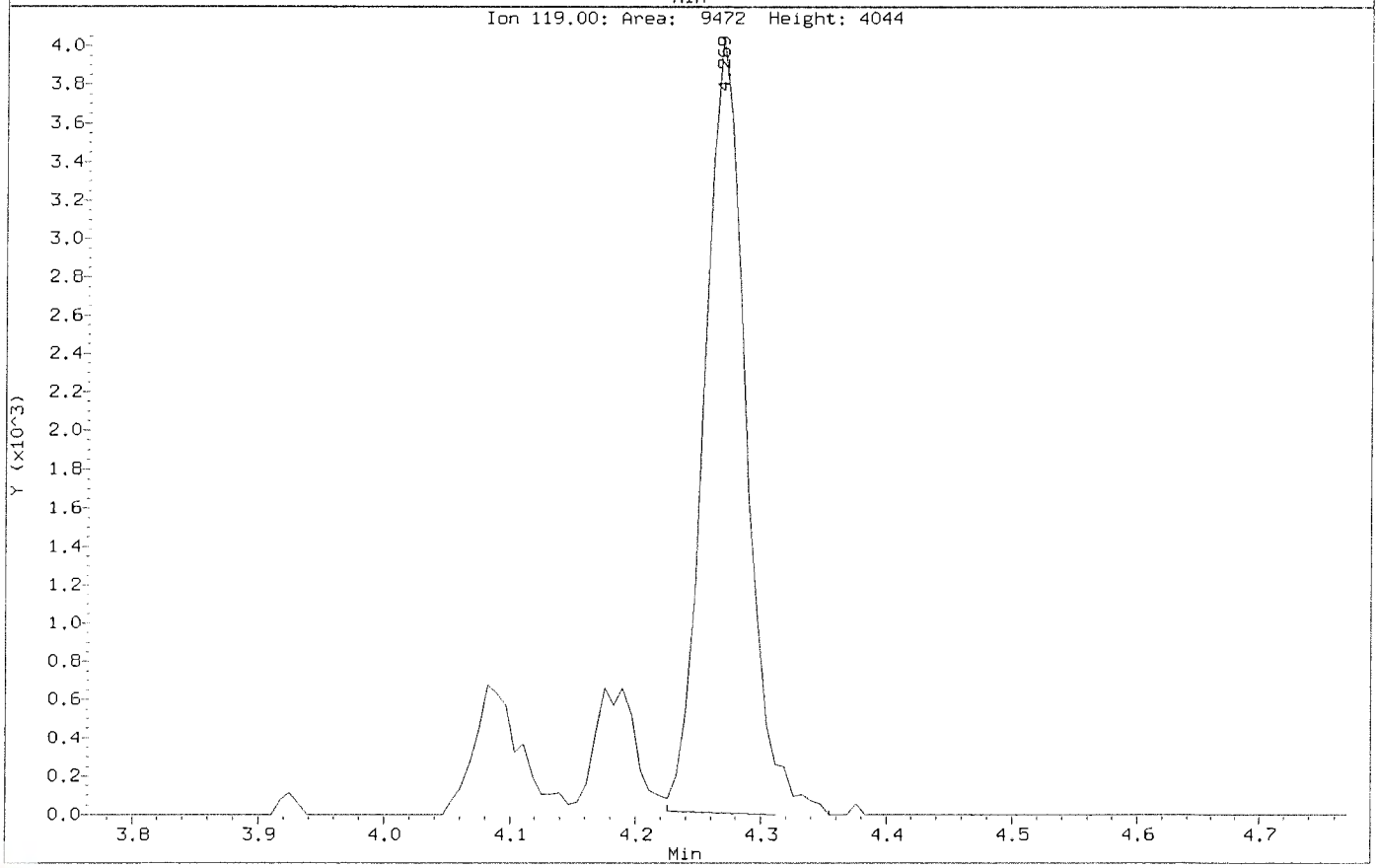
Compound: Carbon Tetrachloride
CAS Number: 56-23-5



Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111B05.D
Injection Date: 18-NOV-2019 15:23
Instrument: voa6.i
Client Sample ID: VSTD002

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111806.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111806.D
Lab Smp Id: VSTD005 Client Smp ID: VSTD005
Inj Date : 18-NOV-2019 15:47
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 15:23 Cal File: X111805.D
Als bottle: 7 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

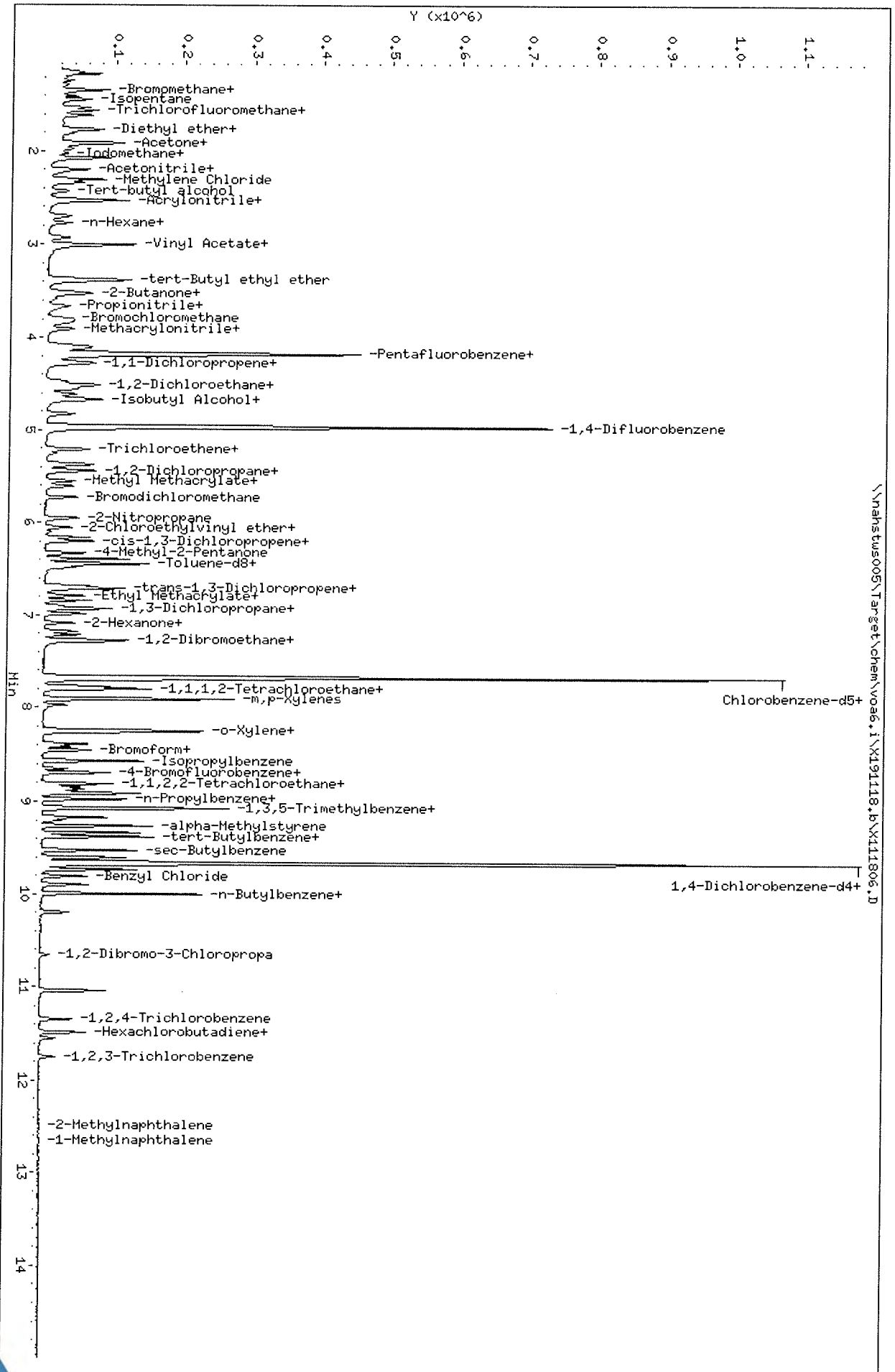
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.182	4.182	(1.000)	410845	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	563063	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	510927	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	277846	50.0000	
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	20921	5.00000	6.06
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	25804	5.00000	5.80
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	20237	5.00000	5.74
$	48 Toluene-d8	98	6.388	6.388	(0.833)	69936	5.00000	5.19
	60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	20728	5.00000	5.59
	31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	29459	5.00000	5.31
	68 1,1,2,2-Tetrachloroethane	83	8.838	8.838	(0.914)	22230	5.00000	5.68
	138 Freon TF	101	1.919	1.919	(0.459)	18786	5.00000	5.25
	53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	15003	5.00000	5.61
	22 1,1-Dichloroethane	63	2.922	2.922	(0.699)	32313	5.00000	5.40
	11 1,1-Dichloroethene	96	1.912	1.912	(0.457)	19077	5.00000	5.47
	32 1,1-Dichloropropene	75	4.283	4.283	(0.862)	24310	5.00000	5.35
	93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	6553	5.00000	5.62
	71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	18403	5.00000	5.55(M)
	90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	14399	5.00000	6.15
	79 1,2,4-Trimethylbenzene	105	9.383	9.383	(0.970)	71210	5.00000	5.40
	89 1,2-Dibromo-3-Chloropropane	155	10.658	10.658	(1.102)	2641	5.00000	5.82
	57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	20565	5.00000	5.73

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111806.D Page 2
Report Date: 06-Dec-2019 19:56

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	9.999	9.999	(1.034)	41602	5.00000	5.64
33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	24346	5.00000	5.44
42 1,2-Dichloropropane	63	5.436	5.436	(1.094)	19076	5.00000	5.67
75 1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	68944	5.00000	5.45
83 1,3-Dichlorobenzene	146	9.605	9.605	(0.993)	45064	5.00000	5.65
54 1,3-Dichloropropane	76	6.983	6.983	(0.910)	29776	5.00000	5.49
84 1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	44703	5.00000	5.52
26 2,2-Dichloropropane	77	3.516	3.516	(0.841)	28965	5.00000	5.33
24 2-Butanone	43	3.581	3.581	(0.856)	13522	10.0000	10.72
76 2-Chlorotoluene	91	8.974	8.974	(0.928)	56464	5.00000	5.64
52 2-Hexanone	43	7.090	7.090	(0.924)	23980	10.0000	11.42
77 4-Chlorotoluene	91	9.075	9.075	(0.939)	66074	5.00000	5.45
82 p-Isopropyltoluene	119	9.655	9.655	(0.999)	71485	5.00000	5.25
45 4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	33803	10.0000	11.29
10 Acetone	43	1.969	1.969	(0.471)	15992	10.0000	11.75
37 Benzene	78	4.512	4.512	(0.908)	72584	5.00000	5.63
74 Bromobenzene	156	8.810	8.810	(0.911)	27619	5.00000	5.71
29 Bromochloromethane	128	3.795	3.795	(0.908)	11669	5.00000	5.24
39 Bromodichloromethane	83	5.729	5.729	(1.153)	26638	5.00000	5.71
66 Bromoform	173	8.416	8.416	(1.097)	16084	5.00000	6.17
6 Bromomethane	94	1.338	1.338	(0.320)	28671	5.00000	4.99(a)
19 Carbon Disulfide	76	2.069	2.069	(0.495)	103008	10.0000	10.87
34 Carbon Tetrachloride	117	4.268	4.268	(0.859)	26931	5.00000	5.41(M)
59 Chlorobenzene	112	7.699	7.699	(1.004)	55668	5.00000	5.58
7 Chloroethane	64	1.403	1.403	(0.336)	13261	5.00000	5.12
28 Chloroform	83	3.910	3.910	(0.935)	34944	5.00000	5.25
3 Chloromethane	50	1.073	1.073	(0.257)	24949	5.00000	5.75
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	22227	5.00000	5.70
46 cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	31191	5.00000	5.68
55 Dibromochloromethane	129	7.176	7.176	(0.936)	21920	5.00000	5.64
44 Dibromomethane	93	5.558	5.558	(1.118)	13775	5.00000	5.78
2 Dichlorodifluoromethane	85	0.973	0.973	(0.233)	18346	5.00000	5.69
61 Ethylbenzene	106	7.800	7.800	(1.017)	29424	5.00000	5.70
91 Hexachlorobutadiene	225	11.489	11.489	(1.188)	11525	5.00000	5.47
67 Isopropylbenzene	105	8.566	8.566	(1.117)	81869	5.00000	5.36
62 m,p-Xylenes	106	7.907	7.907	(1.031)	69325	10.0000	11.14
17 Methylene Chloride	84	2.306	2.306	(0.551)	20180	5.00000	5.43
87 n-Butylbenzene	91	9.999	9.999	(1.034)	57498	5.00000	5.08
73 n-Propylbenzene	91	8.917	8.917	(0.922)	92937	5.00000	5.41
92 Naphthalene	128	11.546	11.546	(1.194)	17063	5.00000	5.68
63 o-Xylene	106	8.244	8.244	(1.075)	33646	5.00000	5.48
81 sec-Butylbenzene	105	9.526	9.526	(0.985)	78149	5.00000	5.23
64 Styrene	104	8.258	8.258	(1.077)	58650	5.00000	5.49
78 tert-Butylbenzene	119	9.340	9.340	(0.966)	59074	5.00000	5.45
56 Tetrachloroethene	164	6.933	6.933	(0.904)	20334	5.00000	5.66
50 Toluene	91	6.446	6.446	(0.840)	80201	5.00000	5.53
20 trans-1,2-Dichloroethene	96	2.535	2.535	(0.606)	18086	5.00000	5.35
51 trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	28395	5.00000	5.67
38 Trichloroethene	130	5.207	5.207	(1.048)	22280	5.00000	5.65
8 Trichlorofluoromethane	101	1.561	1.561	(0.373)	33411	5.00000	5.24
5 Vinyl Chloride	62	1.138	1.138	(0.272)	20691	5.00000	4.94(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



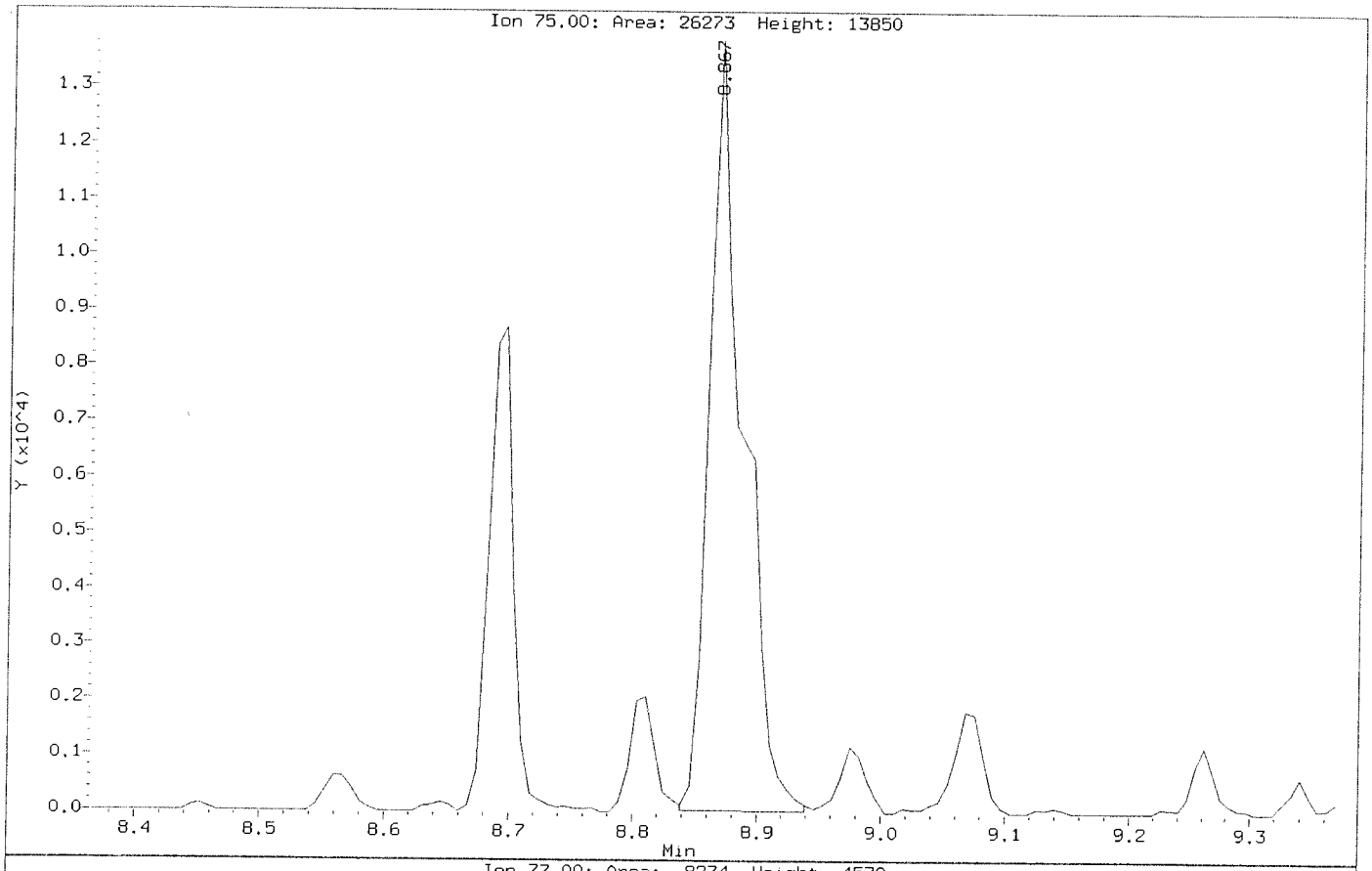
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Sample Info: VSTD005;VSTD005f1;5;
Purge Volume: 5.0
Column phase: DB624

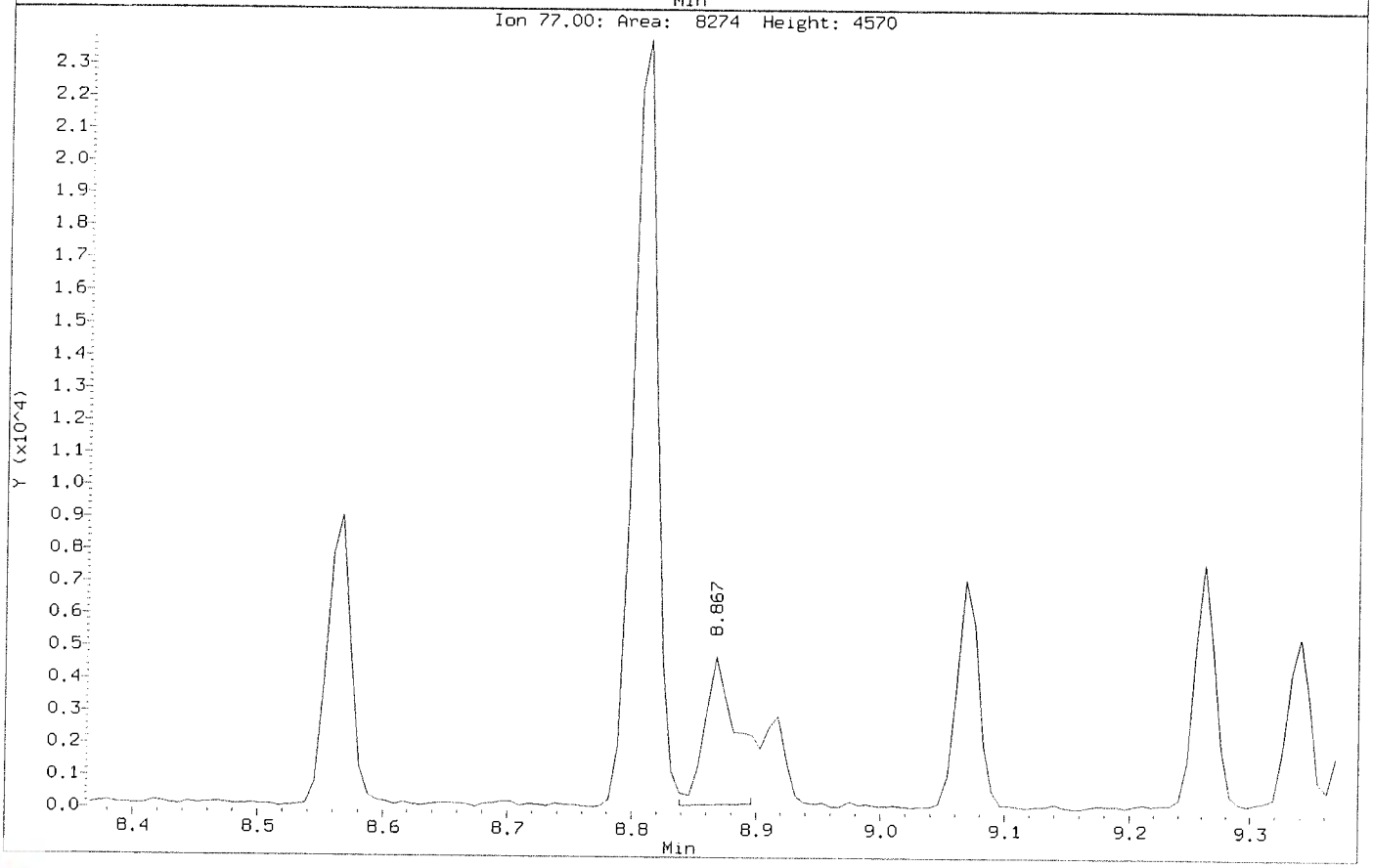
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Instrument: voa6.i
Operator: PC
Column diameter: 0.18

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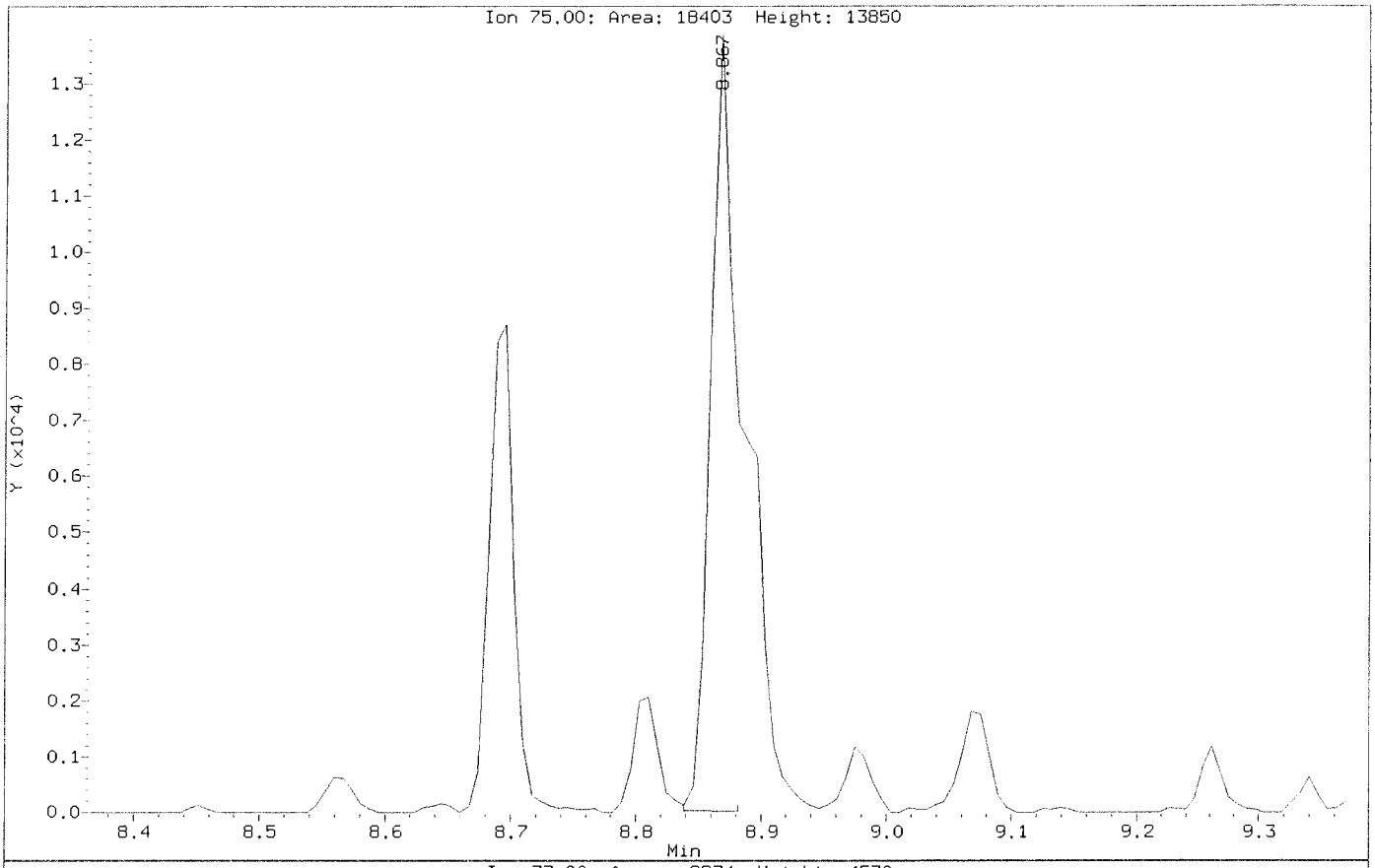
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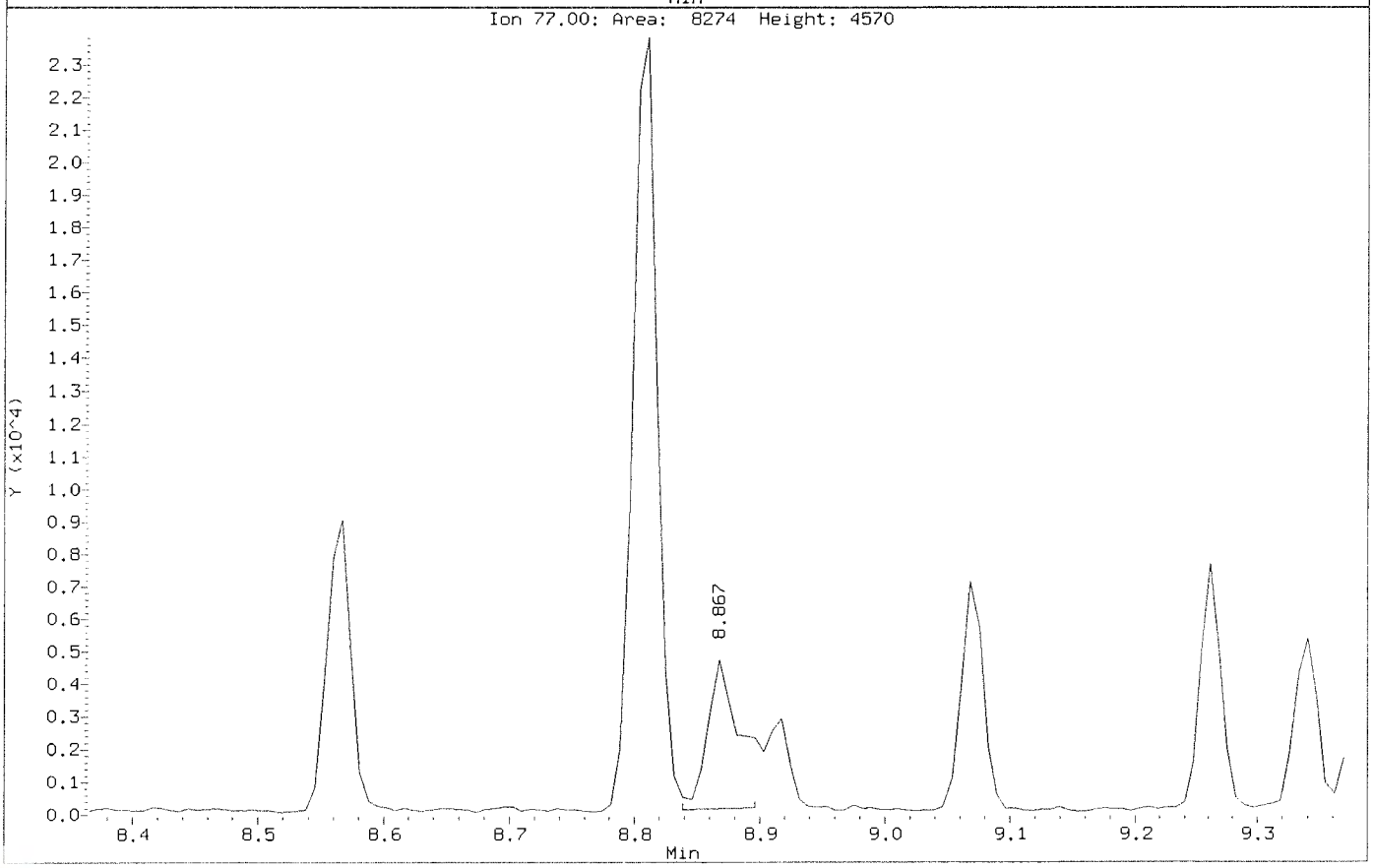




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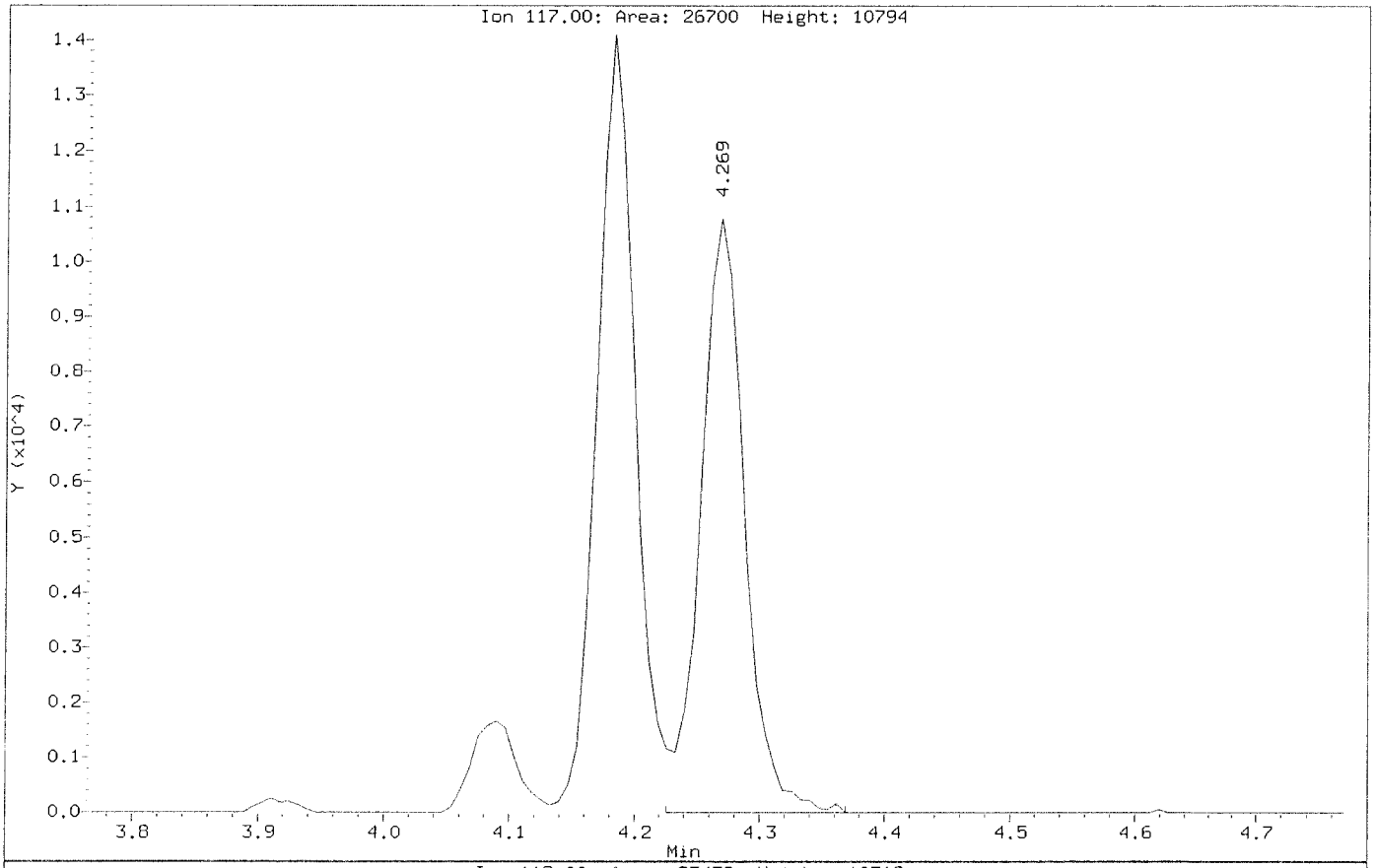
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CAS Number: 96-18-4

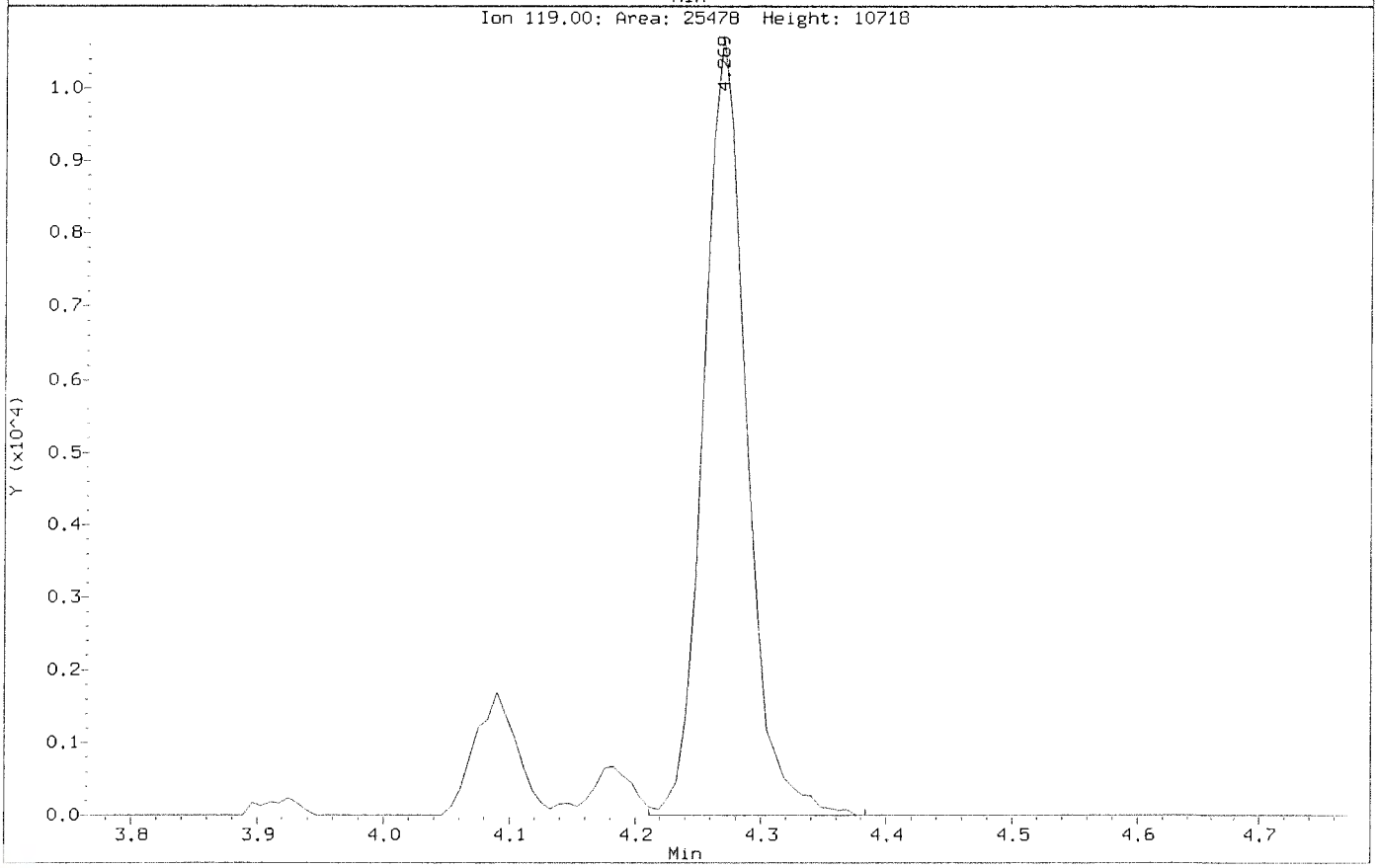




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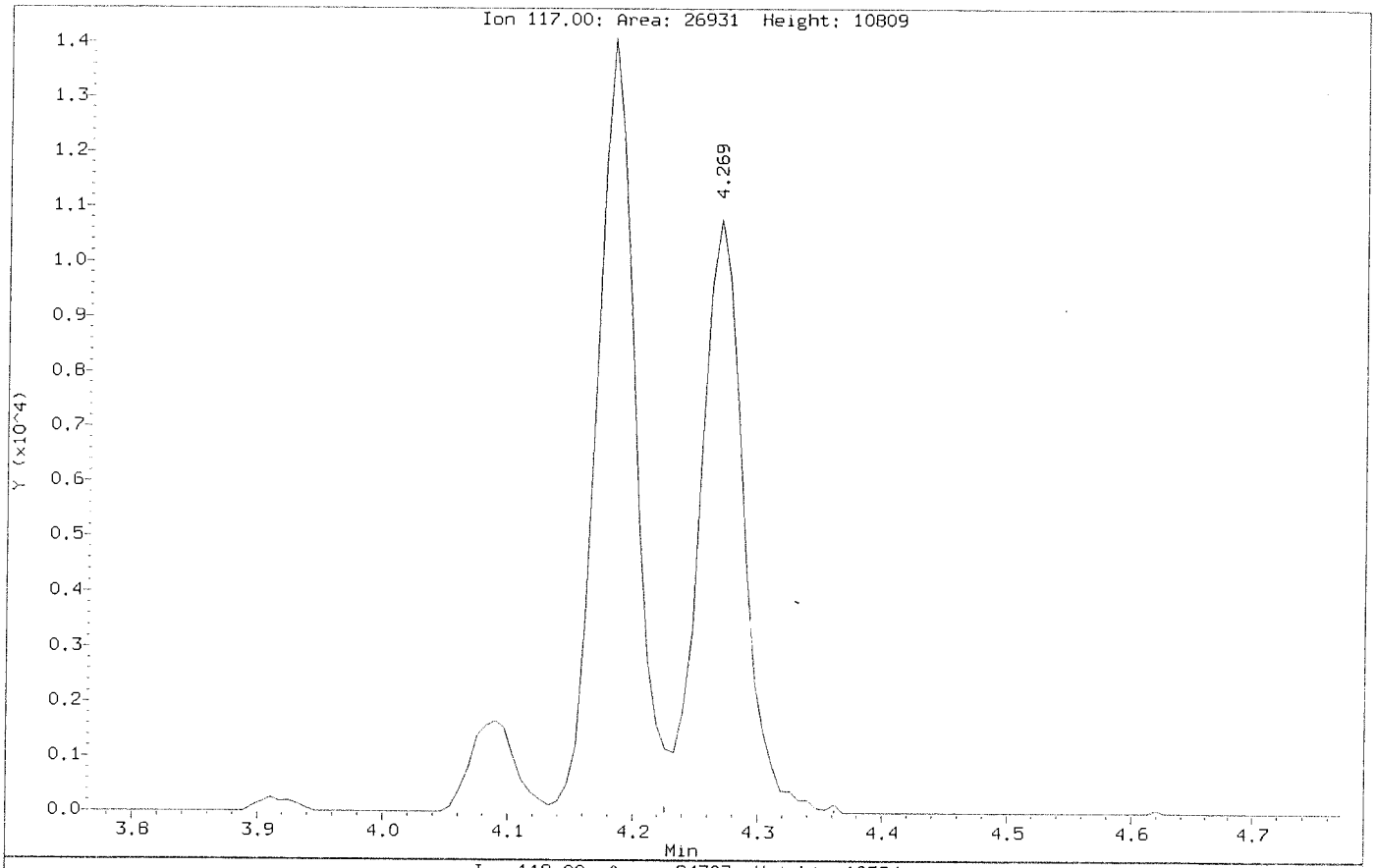
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

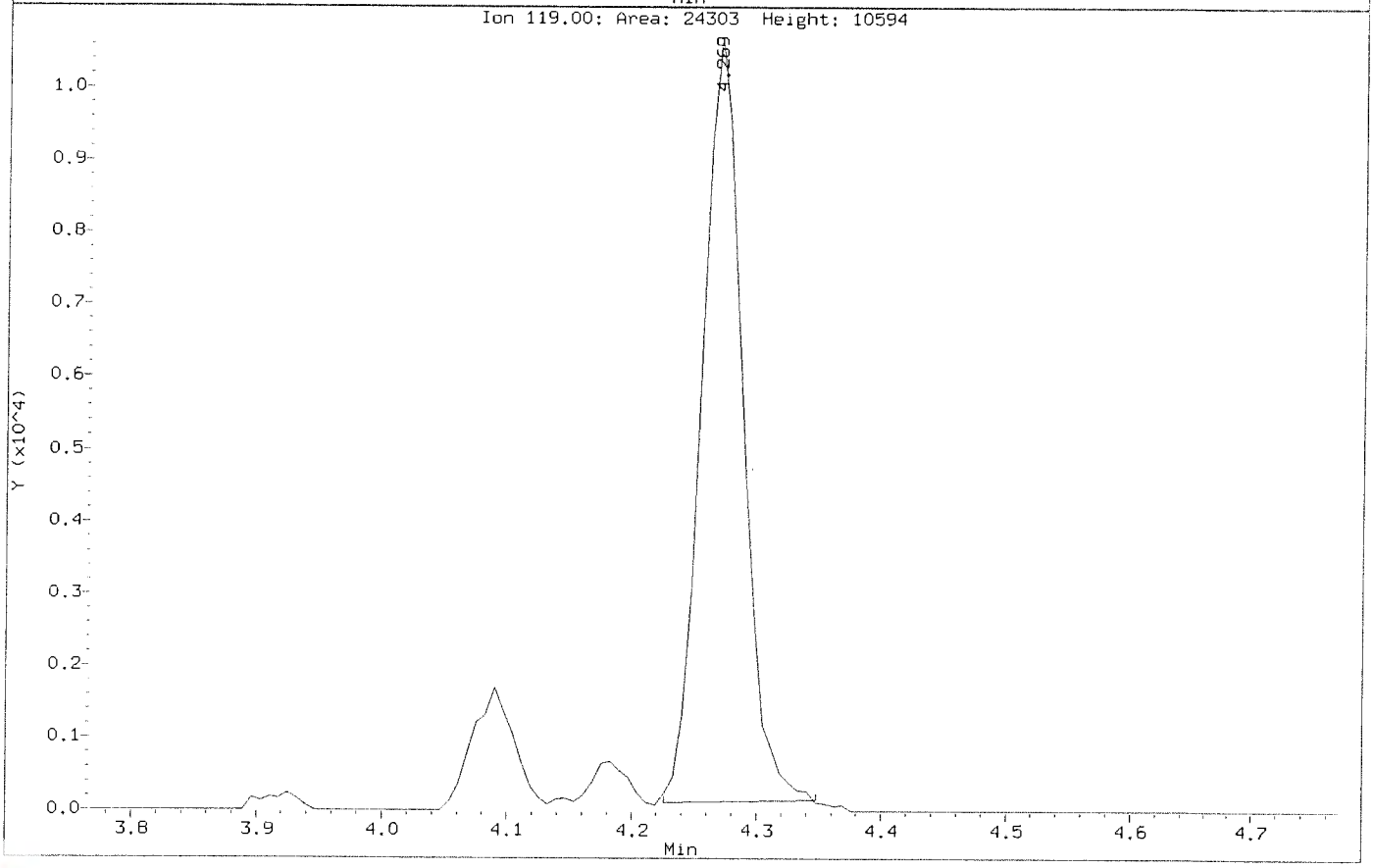




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Injection Date: 18-NOV-2019 15:47
Instrument: voa6.i
Client Sample ID: VSTD005

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111807.D
Lab Smp Id: VSTD020 Client Smp ID: VSTD020
Inj Date : 18-NOV-2019 16:11
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Misc Info : HS18090001;WATER;0;1;
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Cal Date : 18-NOV-2019 15:47 Cal File: X111806.D
Als bottle: 8 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
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Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

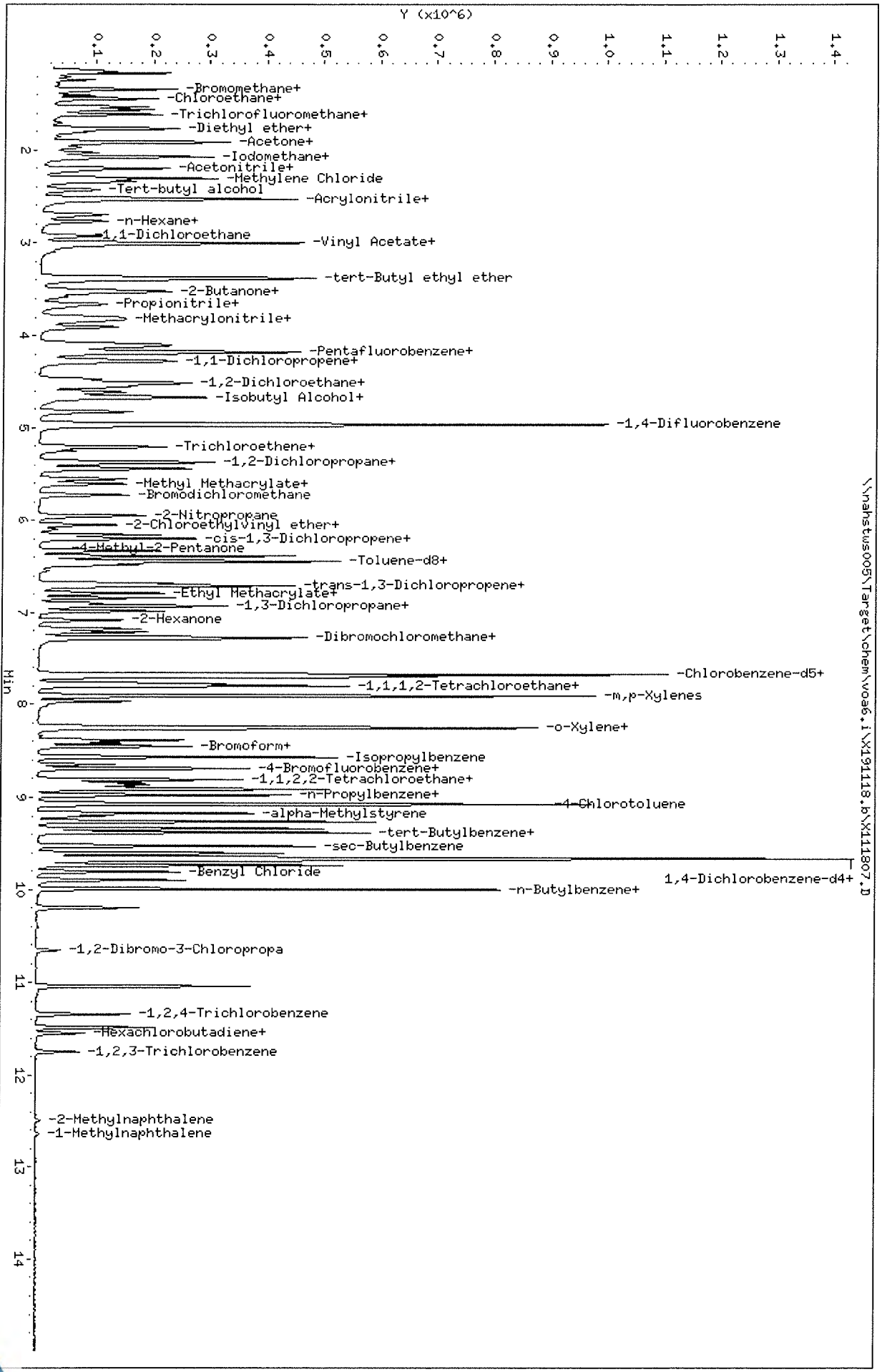
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	411693	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	563792	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	515046	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.662	9.662	(1.000)	278890	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	75813	20.0000	20.02
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	94194	20.0000	19.91
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	75094	20.0000	20.28
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	260273	20.0000	19.17
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	73347	20.0000	19.62
31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	105363	20.0000	18.97
68 1,1,2,2-Tetrachloroethane	83	8.838	8.838	(0.915)	75821	20.0000	19.33
138 Freon TF	101	1.919	1.919	(0.459)	62543	20.0000	17.44
53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	52184	20.0000	19.38
22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	113669	20.0000	18.97
11 1,1-Dichloroethene	96	1.919	1.919	(0.459)	64160	20.0000	18.38
32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	84000	20.0000	18.47
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.216)	21856	20.0000	20.64
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.918)	64689	20.0000	19.46(M)
90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	46623	20.0000	19.84
79 1,2,4-Trimethylbenzene	105	9.382	9.382	(0.971)	254992	20.0000	19.26
89 1,2-Dibromo-3-Chloropropane	155	10.657	10.657	(1.103)	8805	20.0000	20.13
57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	71738	20.0000	19.85

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111807.D Page 2
Report Date: 06-Dec-2019 19:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	9.998	9.998	(1.035)	144121	20.0000	19.47
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	88277	20.0000	19.72
42	1,2-Dichloropropane	63	5.443	5.443	(1.095)	64004	20.0000	19.00
75	1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	247054	20.0000	19.45
83	1,3-Dichlorobenzene	146	9.605	9.605	(0.994)	157428	20.0000	19.68
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	105400	20.0000	19.28
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.002)	158049	20.0000	19.44
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	100376	20.0000	18.46
24	2-Butanone	43	3.580	3.580	(0.856)	48098	40.0000	38.07
76	2-Chlorotoluene	91	8.974	8.974	(0.929)	193547	20.0000	19.28
52	2-Hexanone	43	7.083	7.083	(0.923)	78795	40.0000	37.24
77	4-Chlorotoluene	91	9.074	9.074	(0.939)	231980	20.0000	19.07
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	257377	20.0000	18.86
45	4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	115695	40.0000	38.33
10	Acetone	43	1.976	1.976	(0.473)	43200	40.0000	38.23
37	Benzene	78	4.512	4.512	(0.908)	250181	20.0000	19.39
74	Bromobenzene	156	8.809	8.809	(0.912)	97394	20.0000	20.09
29	Bromochloromethane	128	3.795	3.795	(0.908)	41933	20.0000	18.80
39	Bromodichloromethane	83	5.729	5.729	(1.153)	89170	20.0000	19.11
66	Bromoform	173	8.415	8.415	(1.097)	56416	20.0000	19.02
6	Bromomethane	94	1.338	1.338	(0.320)	93456	20.0000	21.54
19	Carbon Disulfide	76	2.069	2.069	(0.495)	362755	40.0000	38.21
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	90839	20.0000	18.23(M)
59	Chlorobenzene	112	7.699	7.699	(1.004)	192384	20.0000	19.13
7	Chloroethane	64	1.403	1.403	(0.336)	46616	20.0000	17.98
28	Chloroform	83	3.910	3.910	(0.935)	121141	20.0000	18.16
3	Chloromethane	50	1.073	1.073	(0.257)	85402	20.0000	19.21
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	74754	20.0000	19.14
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	107408	20.0000	19.53
55	Dibromochloromethane	129	7.176	7.176	(0.936)	76215	20.0000	19.48
44	Dibromomethane	93	5.557	5.557	(1.118)	46676	20.0000	19.58
2	Dichlorodifluoromethane	85	0.973	0.973	(0.233)	63810	20.0000	17.59
61	Ethylbenzene	106	7.799	7.799	(1.017)	101554	20.0000	19.54
91	Hexachlorobutadiene	225	11.481	11.481	(1.188)	37789	20.0000	19.03
67	Isopropylbenzene	105	8.566	8.566	(1.117)	293670	20.0000	19.08
62	m,p-Xylenes	106	7.907	7.907	(1.031)	243460	40.0000	38.83
17	Methylene Chloride	84	2.305	2.305	(0.551)	66846	20.0000	17.95
87	n-Butylbenzene	91	9.998	9.998	(1.035)	210608	20.0000	18.54
73	n-Propylbenzene	91	8.917	8.917	(0.923)	331965	20.0000	19.25
92	Naphthalene	128	11.546	11.546	(1.195)	57138	20.0000	18.96
63	o-Xylene	106	8.244	8.244	(1.075)	119876	20.0000	19.37
81	sec-Butylbenzene	105	9.526	9.526	(0.986)	278964	20.0000	18.62
64	Styrene	104	8.258	8.258	(1.077)	206802	20.0000	19.22
78	tert-Butylbenzene	119	9.339	9.339	(0.967)	208031	20.0000	19.13
56	Tetrachloroethene	164	6.933	6.933	(0.904)	68625	20.0000	18.96
50	Toluene	91	6.446	6.446	(0.840)	280019	20.0000	19.17
20	trans-1,2-Dichloroethene	96	2.535	2.535	(0.606)	63600	20.0000	18.77
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	100272	20.0000	20.00
38	Trichloroethene	130	5.206	5.206	(1.048)	77608	20.0000	19.68
8	Trichlorofluoromethane	101	1.560	1.560	(0.373)	116474	20.0000	18.23
5	Vinyl Chloride	62	1.138	1.138	(0.272)	74818	20.0000	17.83

QC Flag Legend

M - Compound response manually integrated.

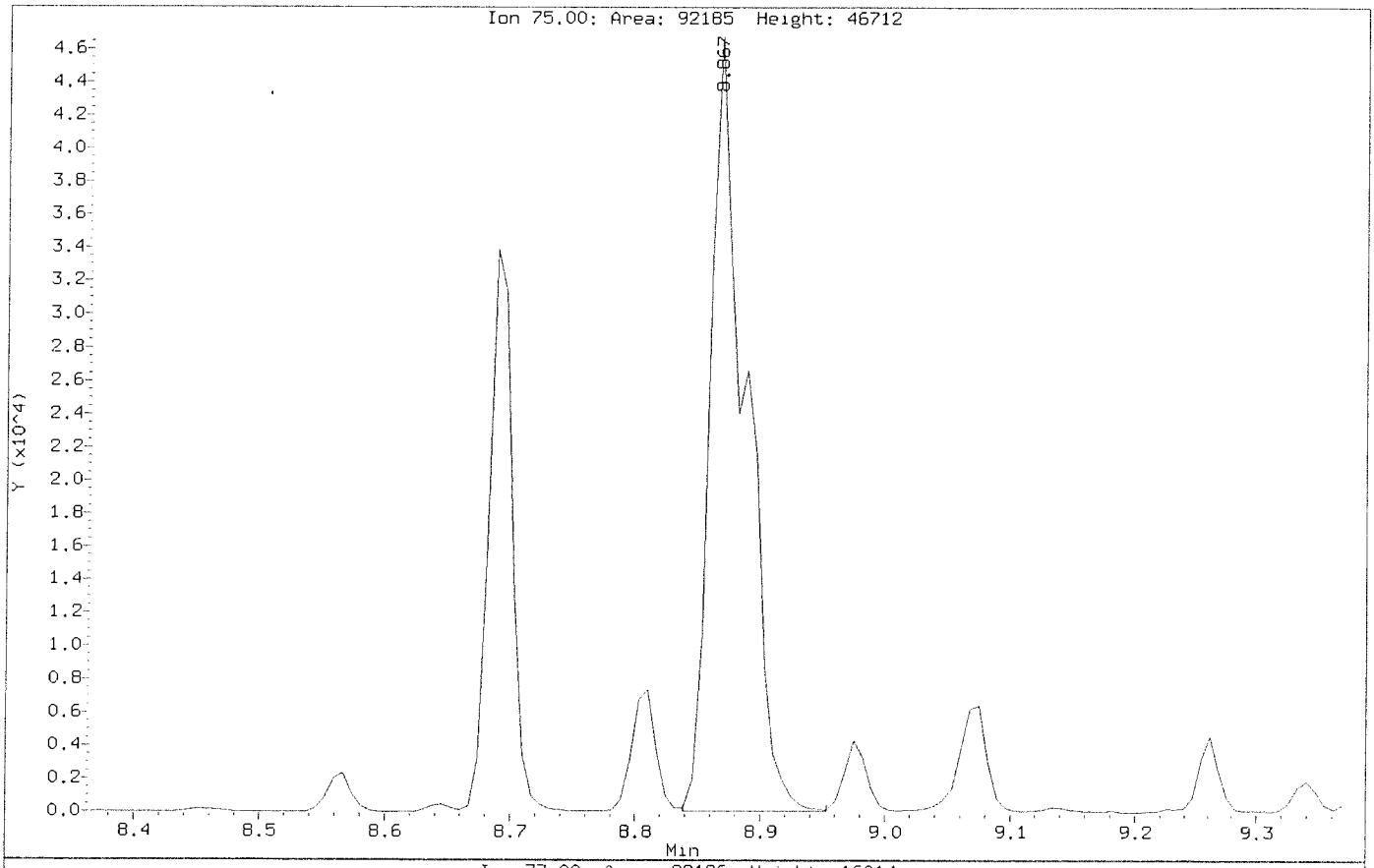


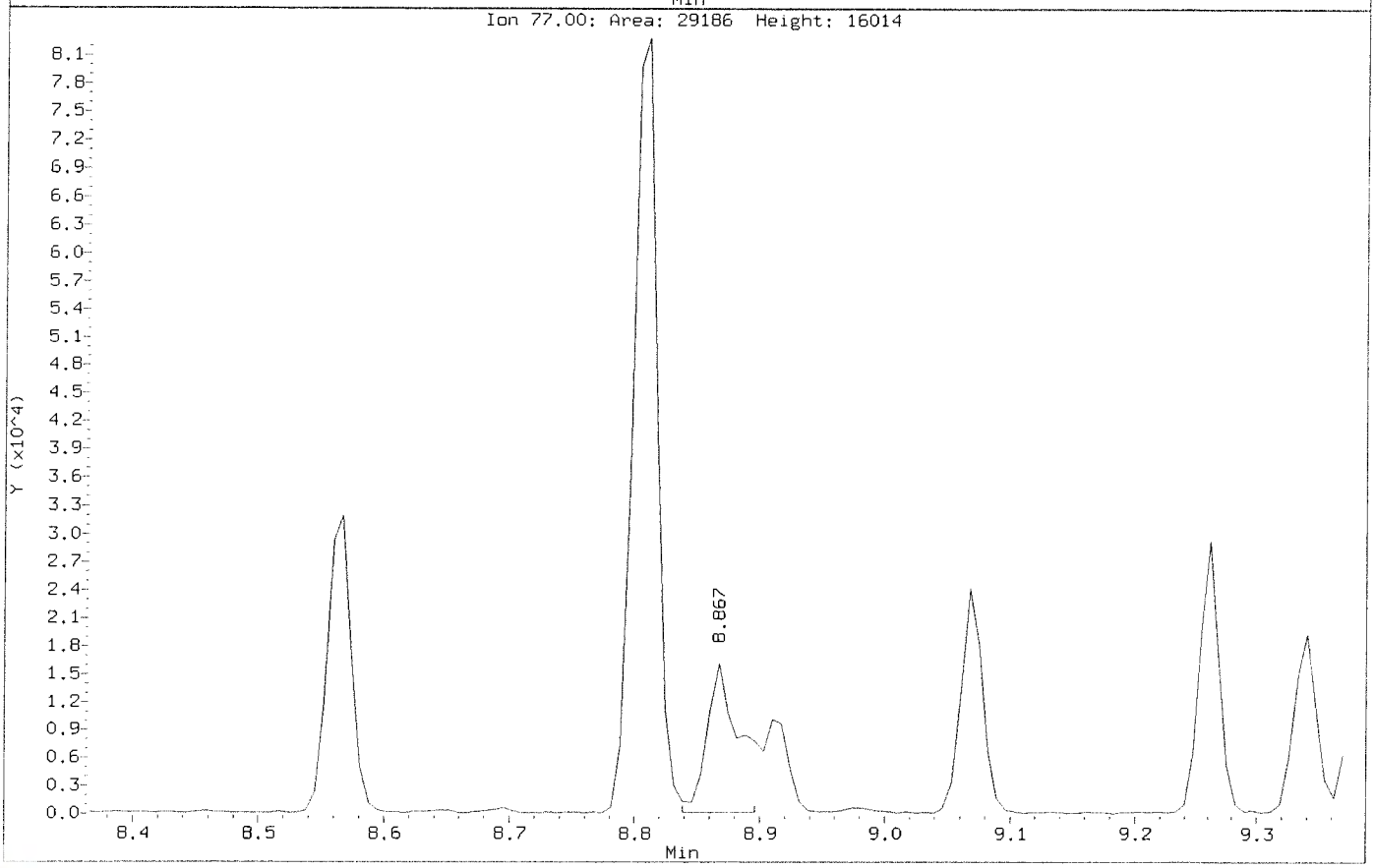
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Operator: PC
Column diameter: 0.18

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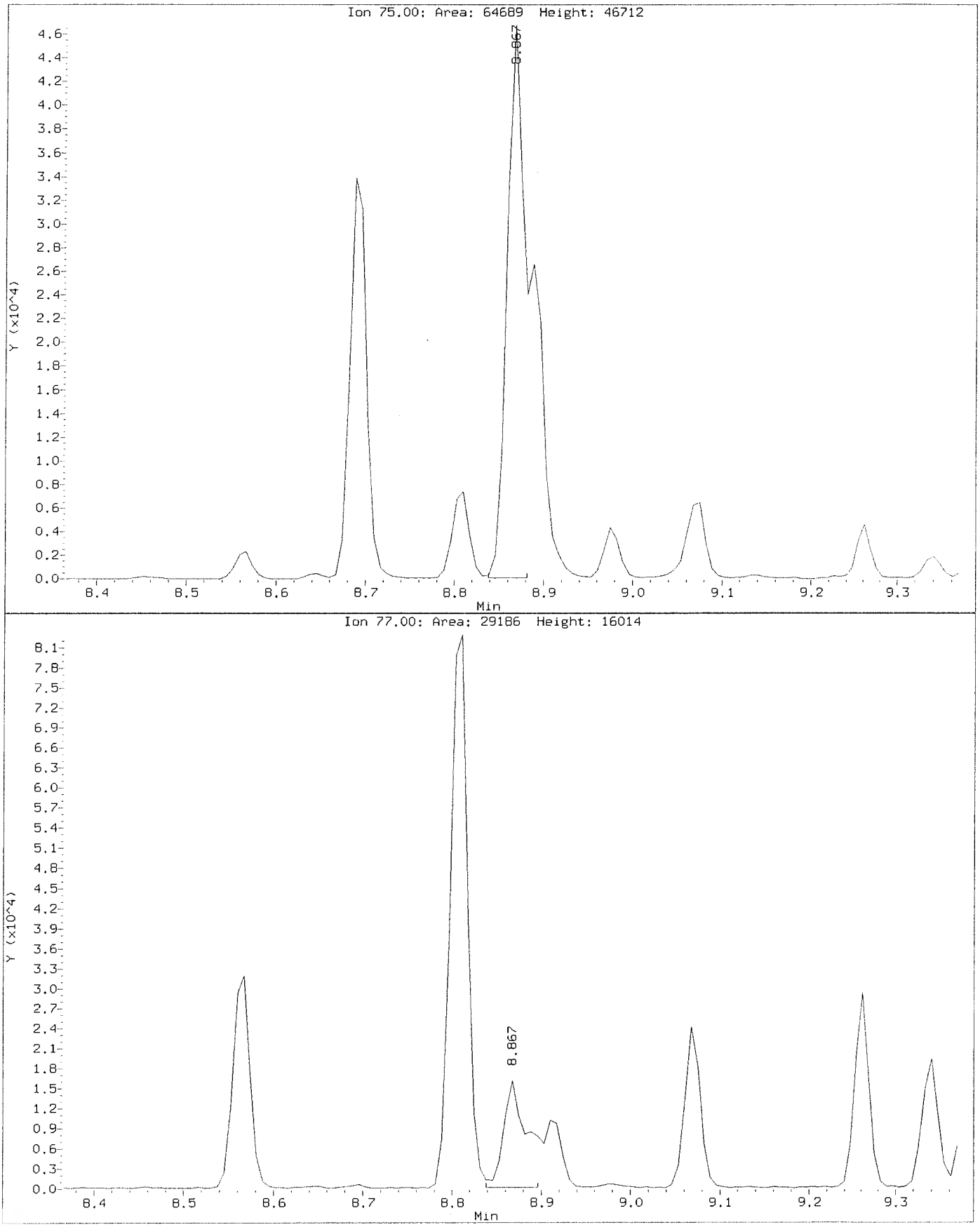
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4





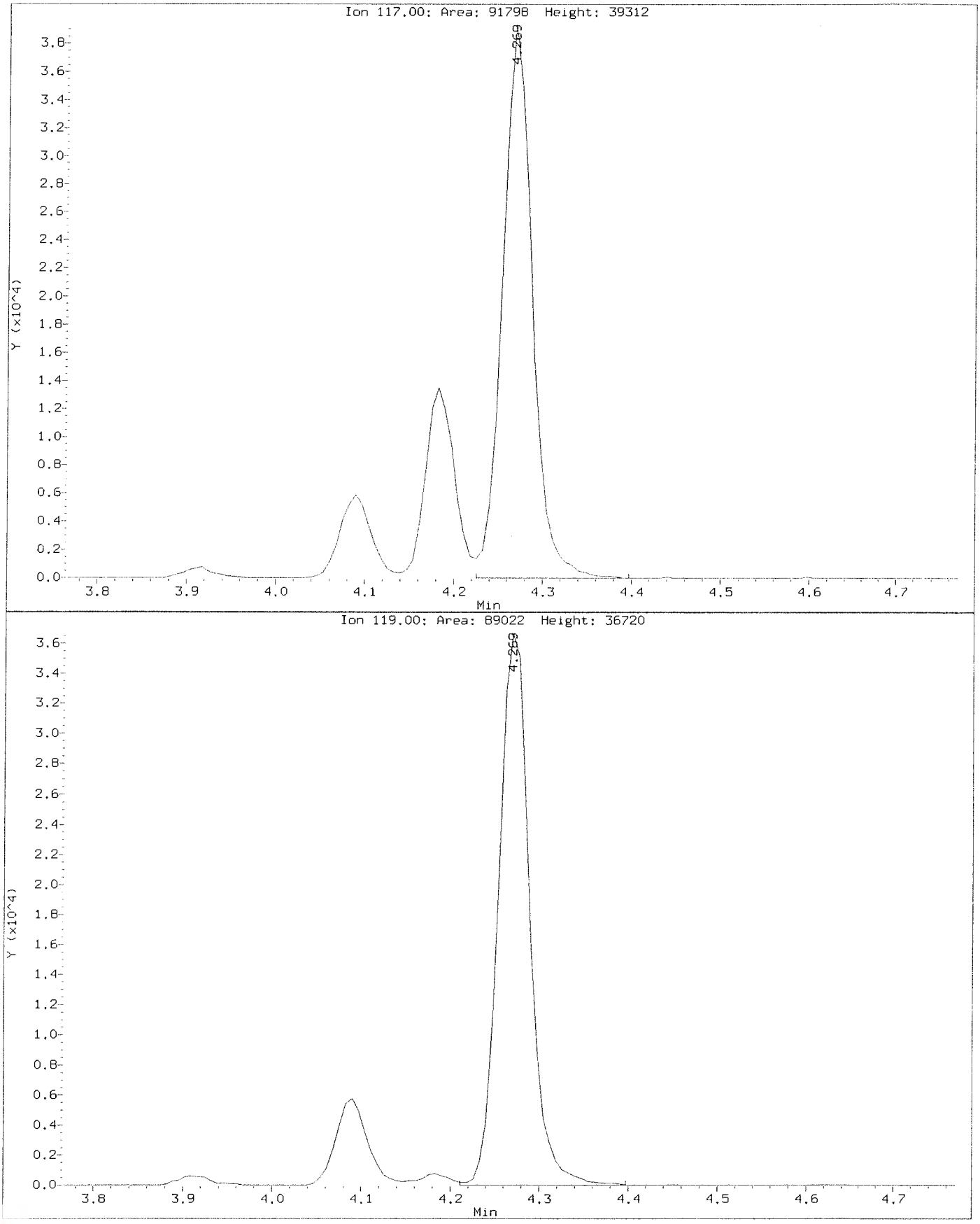
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Injection Date: 18-NOV-2019 16:11
Instrument: voa6.i
Client Sample ID: VSTD020

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4



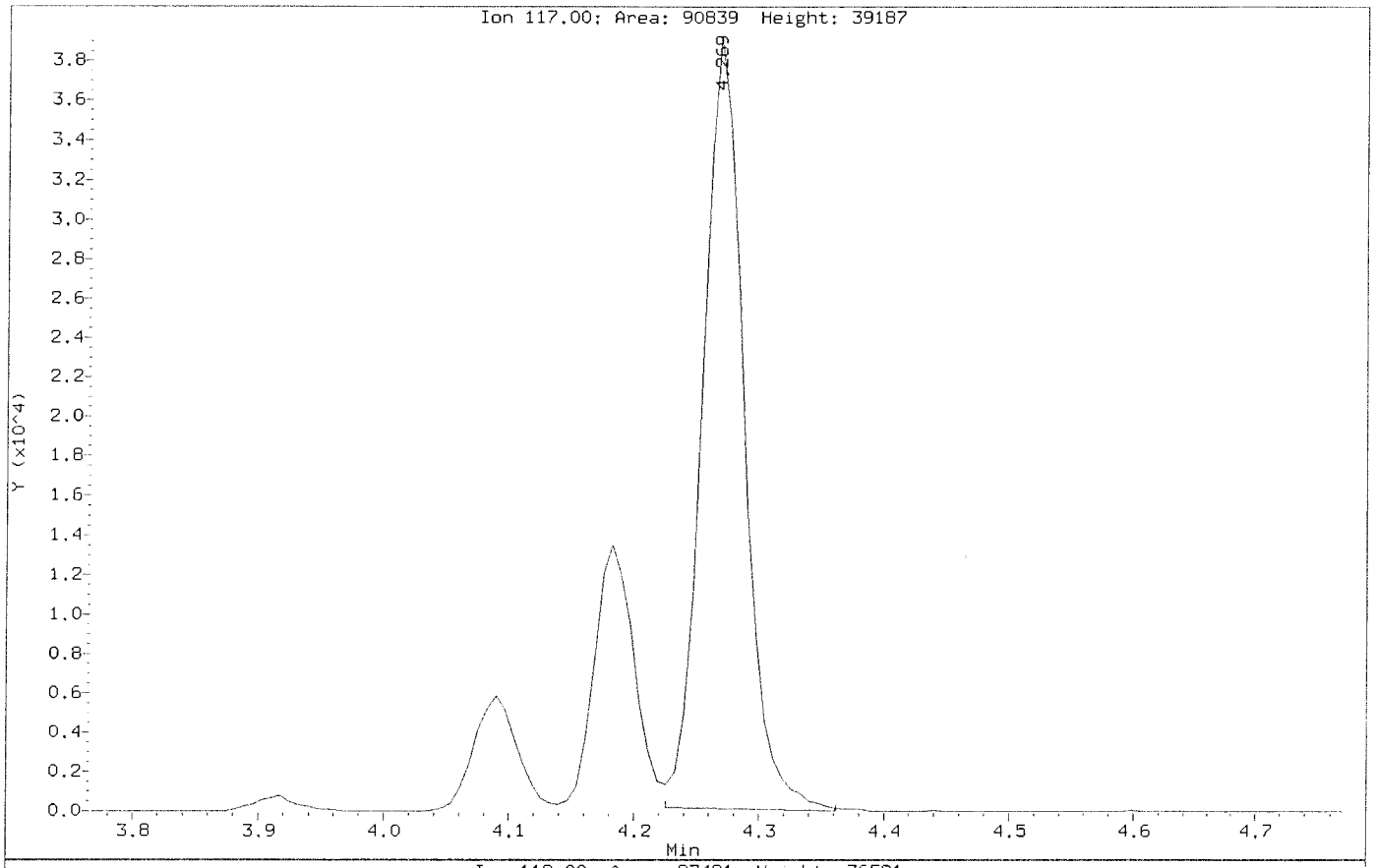
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Instrument: voa6.i
Client Sample ID: VSTD020

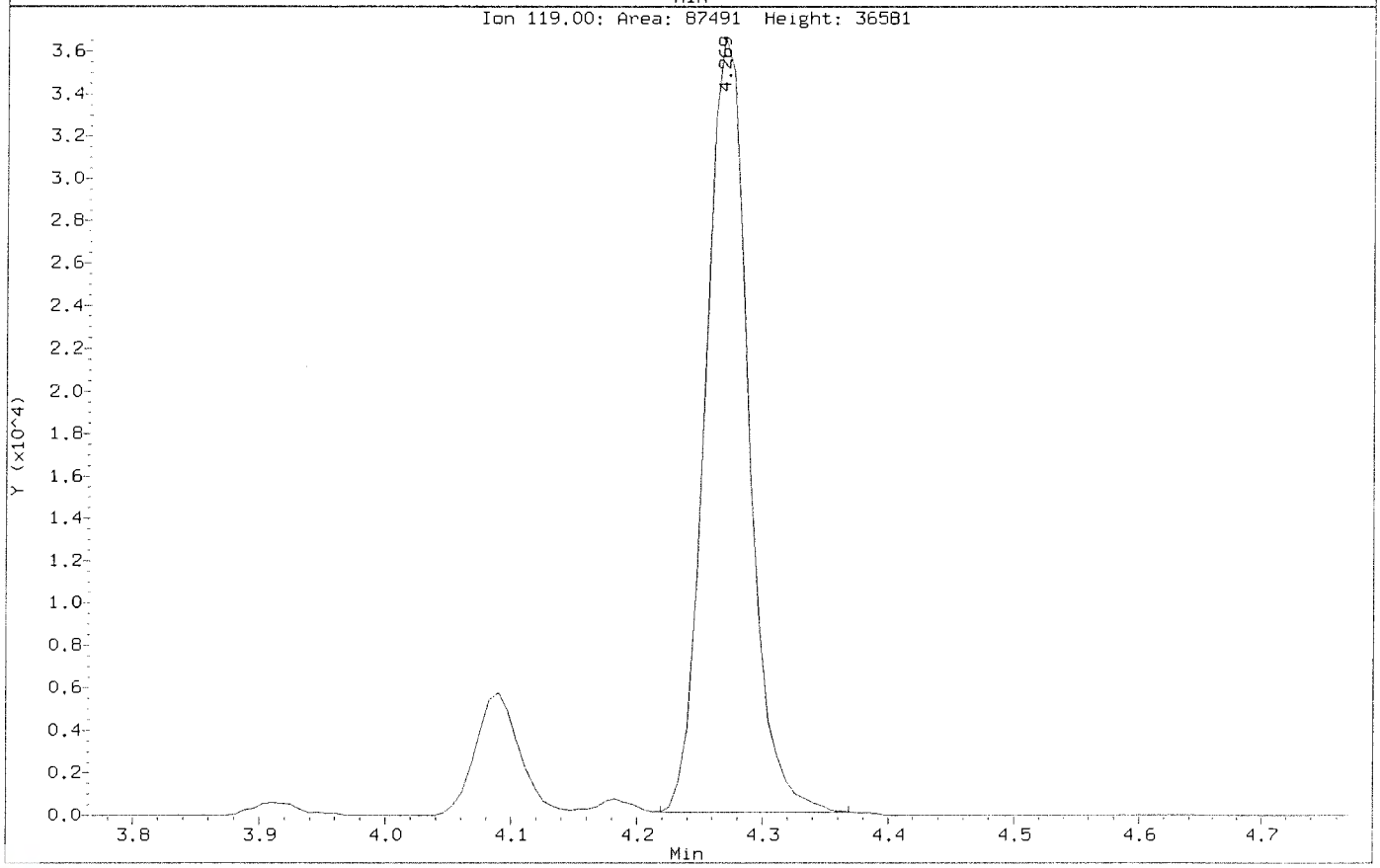
Compound: Carbon Tetrachloride
CAS Number: 56-23-5



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Injection Date: 18-NOV-2019 16:11
Instrument: voa6.i
Client Sample ID: VSTD020

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111808.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111808.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 18-NOV-2019 16:35
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 16:11 Cal File: X111807.D
Als bottle: 9 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

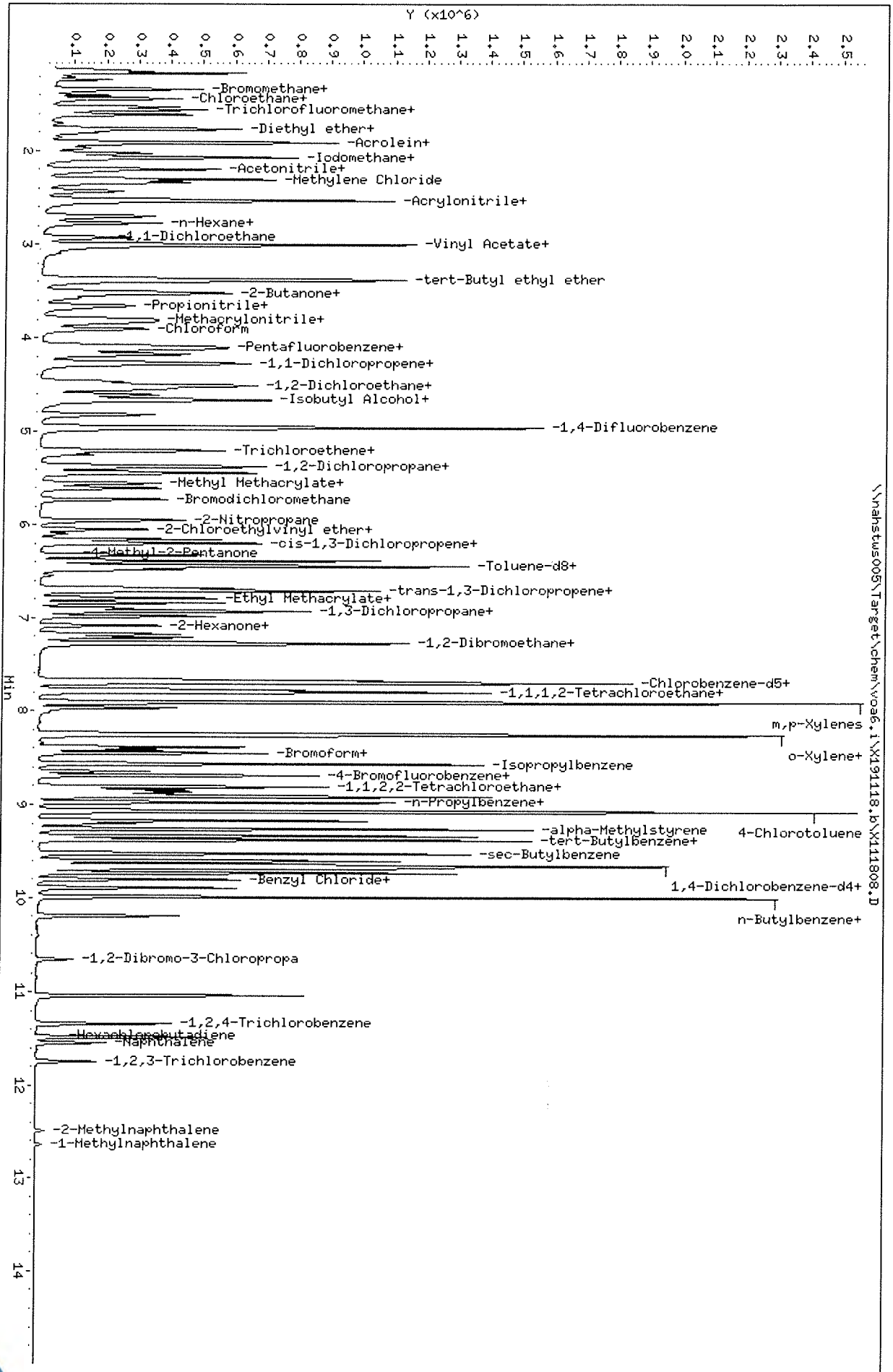
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	399282	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	548073	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	502523	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	273444	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	178006	50.0000	47.42
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	222328	50.0000	47.57
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	173990	50.0000	47.93
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	608955	50.0000	45.99
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	184913	50.0000	50.72
31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	268813	50.0000	49.90
68 1,1,2,2-Tetrachloroethane	83	8.845	8.845	(0.915)	183844	50.0000	47.81
138 Freon TF	101	1.911	1.911	(0.457)	183115	50.0000	52.67
53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	128481	50.0000	48.90
22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	283343	50.0000	48.77
11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	171500	50.0000	50.68
32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	220463	50.0000	49.86
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	52554	50.0000	51.69
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	157820	50.0000	48.44(M)
90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	115181	50.0000	50.00
79 1,2,4-Trimethylbenzene	105	9.383	9.383	(0.970)	661580	50.0000	50.99
89 1,2-Dibromo-3-Chloropropane	155	10.658	10.658	(1.102)	21800	50.0000	51.36
57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	174730	50.0000	49.57

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111808.D Page 2
Report Date: 06-Dec-2019 19:56

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88 1,2-Dichlorobenzene	146	9.999	9.999	(1.034)	363670	50.0000	50.11
33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	219760	50.0000	50.51
42 1,2-Dichloropropane	63	5.443	5.443	(1.095)	161607	50.0000	49.36
75 1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	647527	50.0000	52.01
83 1,3-Dichlorobenzene	146	9.605	9.605	(0.993)	398343	50.0000	50.79
54 1,3-Dichloropropane	76	6.983	6.983	(0.910)	259218	50.0000	48.60
84 1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	400593	50.0000	50.27
26 2,2-Dichloropropane	77	3.516	3.516	(0.841)	257082	50.0000	48.75
24 2-Butanone	43	3.573	3.573	(0.854)	116745	100.000	95.28
76 2-Chlorotoluene	91	8.974	8.974	(0.928)	506692	50.0000	51.50
52 2-Hexanone	43	7.090	7.090	(0.924)	193251	100.000	93.61
77 4-Chlorotoluene	91	9.075	9.075	(0.939)	603806	50.0000	50.63
82 p-Isopropyltoluene	119	9.655	9.655	(0.999)	703086	50.0000	52.54
45 4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	284508	100.000	96.62
10 Acetone	43	1.976	1.976	(0.473)	103091	100.000	99.72
37 Benzene	78	4.512	4.512	(0.908)	637799	50.0000	50.87
74 Bromobenzene	156	8.809	8.809	(0.911)	240153	50.0000	50.53
29 Bromochloromethane	128	3.795	3.795	(0.908)	105150	50.0000	48.61
39 Bromodichloromethane	83	5.729	5.729	(1.153)	226127	50.0000	49.85
66 Bromoform	173	8.416	8.416	(1.097)	143798	50.0000	48.09
6 Bromomethane	94	1.338	1.338	(0.320)	215480	50.0000	54.47
19 Carbon Disulfide	76	2.069	2.069	(0.495)	951783	100.000	103.39
34 Carbon Tetrachloride	117	4.268	4.268	(0.859)	247524	50.0000	51.11(M)
59 Chlorobenzene	112	7.699	7.699	(1.004)	485055	50.0000	49.44
7 Chloroethane	64	1.403	1.403	(0.336)	124291	50.0000	49.44
28 Chloroform	83	3.910	3.910	(0.935)	300015	50.0000	46.39
3 Chloromethane	50	1.073	1.073	(0.257)	215753	50.0000	49.75
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	187629	50.0000	49.55
46 cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	273432	50.0000	51.15
55 Dibromochloromethane	129	7.176	7.176	(0.936)	191497	50.0000	50.17
44 Dibromomethane	93	5.557	5.557	(1.118)	115707	50.0000	49.94
2 Dichlorodifluoromethane	85	0.973	0.973	(0.233)	186161	50.0000	51.14
61 Ethylbenzene	106	7.799	7.799	(1.017)	257283	50.0000	50.75
91 Hexachlorobutadiene	225	11.488	11.488	(1.188)	99881	50.0000	52.17
67 Isopropylbenzene	105	8.566	8.566	(1.117)	765390	50.0000	50.97
62 m,p-Xylenes	106	7.907	7.907	(1.031)	625932	100.000	102.32
17 Methylene Chloride	84	2.305	2.305	(0.551)	168044	50.0000	46.54
87 n-Butylbenzene	91	9.999	9.999	(1.034)	591076	50.0000	53.08
73 n-Propylbenzene	91	8.917	8.917	(0.922)	884464	50.0000	52.32
92 Naphthalene	128	11.546	11.546	(1.194)	142473	50.0000	48.22
63 o-Xylene	106	8.244	8.244	(1.075)	301622	50.0000	49.96
81 sec-Butylbenzene	105	9.526	9.526	(0.985)	772064	50.0000	52.58
64 Styrene	104	8.258	8.258	(1.077)	530825	50.0000	50.56
78 tert-Butylbenzene	119	9.340	9.340	(0.966)	550071	50.0000	51.60
56 Tetrachloroethene	164	6.933	6.933	(0.904)	176674	50.0000	50.03
50 Toluene	91	6.446	6.446	(0.840)	709296	50.0000	49.77
20 trans-1,2-Dichloroethene	96	2.527	2.527	(0.604)	163591	50.0000	49.79
51 trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	247921	50.0000	50.89
38 Trichloroethene	130	5.206	5.206	(1.048)	196625	50.0000	51.29
8 Trichlorofluoromethane	101	1.560	1.560	(0.373)	328789	50.0000	53.08
5 Vinyl Chloride	62	1.138	1.138	(0.272)	201503	50.0000	49.51

QC Flag Legend

M - Compound response manually integrated.

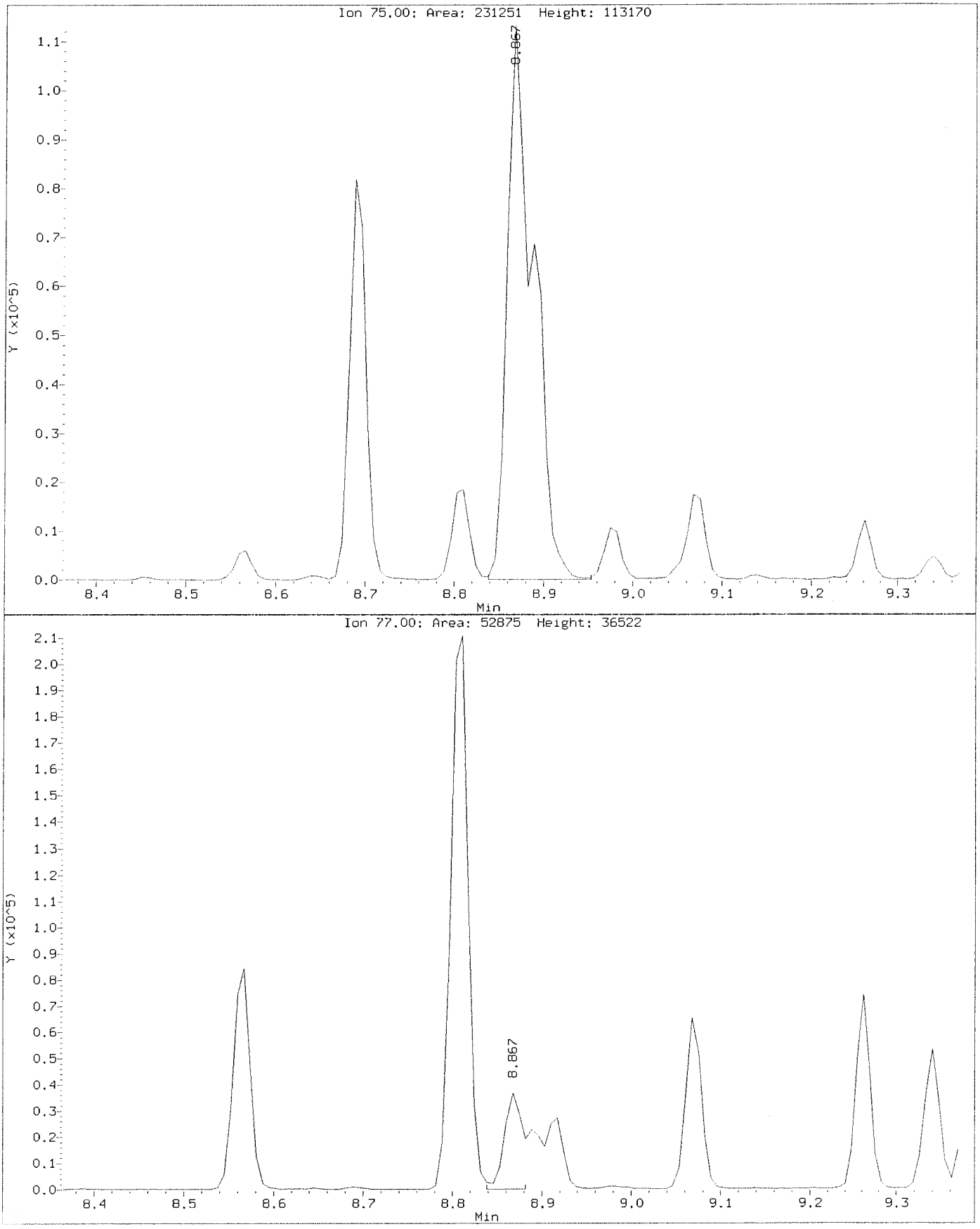


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Client ID: VSTD050
Sample Info: VSTD050;VSTD050;1;7;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

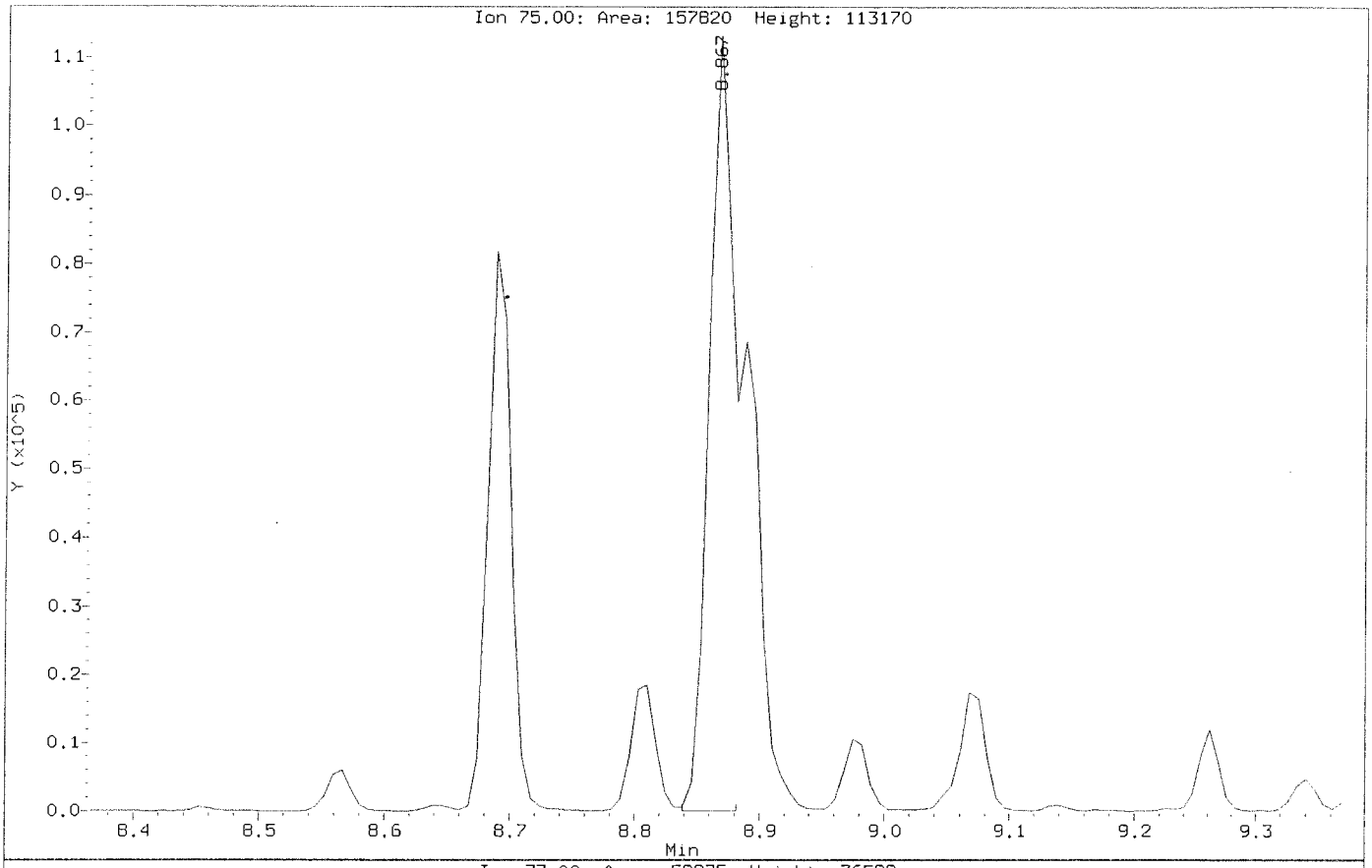
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Injection Date: 18-NOV-2019 16:35
Instrument: voa6.i
Client Sample ID: VSTD050

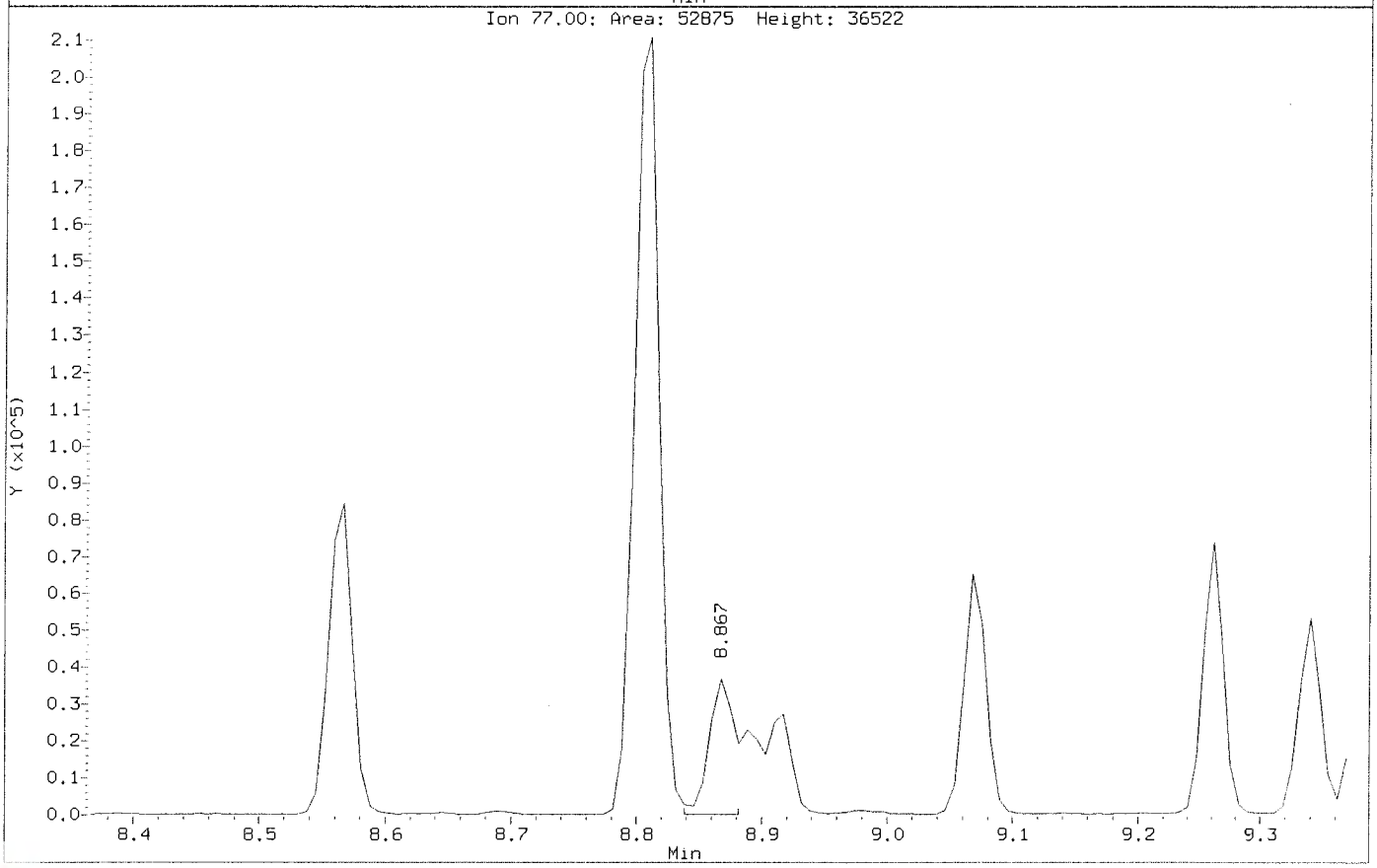
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4



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Injection Date: 18-NOV-2019 16:35
Instrument: voa6.i
Client Sample ID: VSTD050

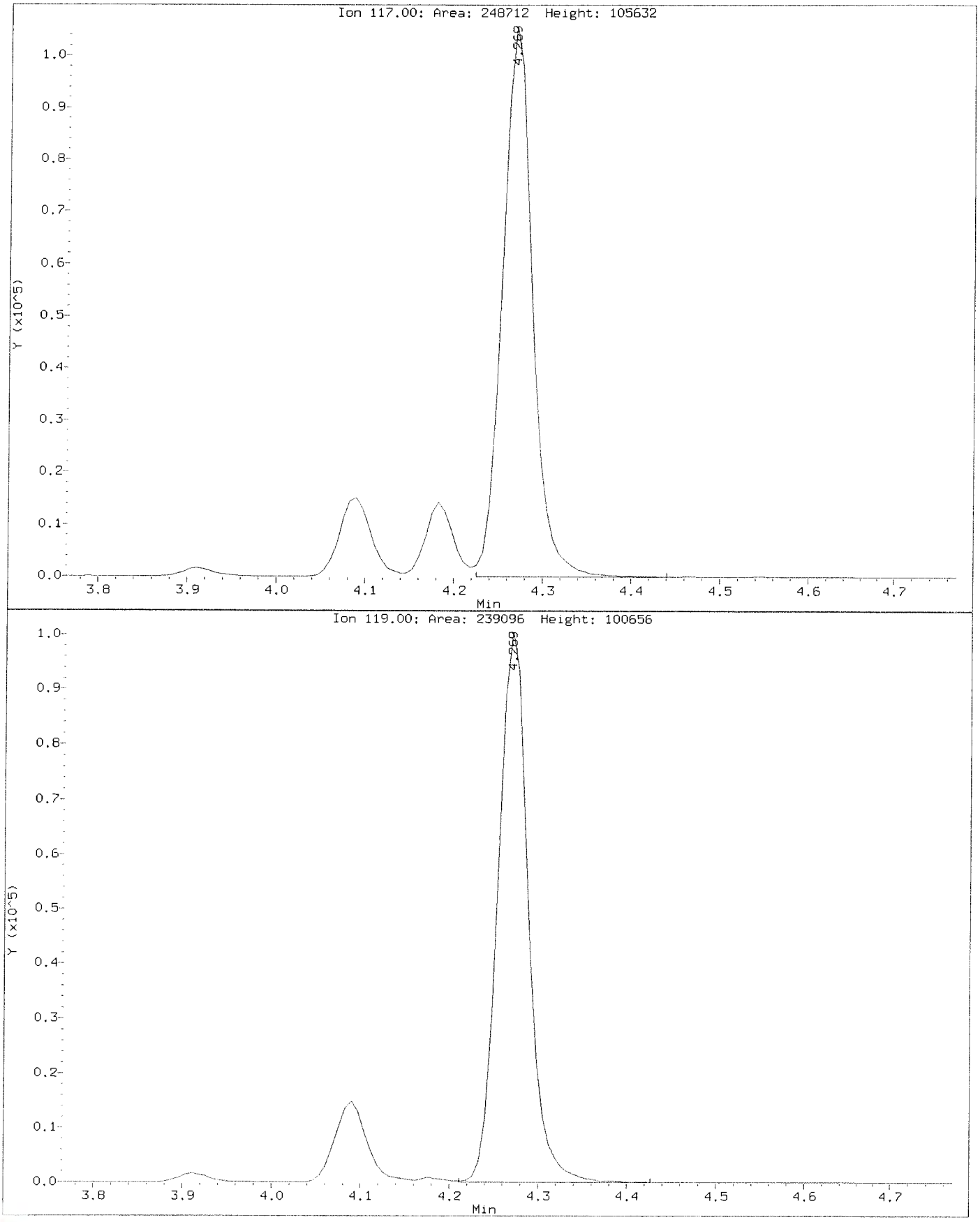
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4





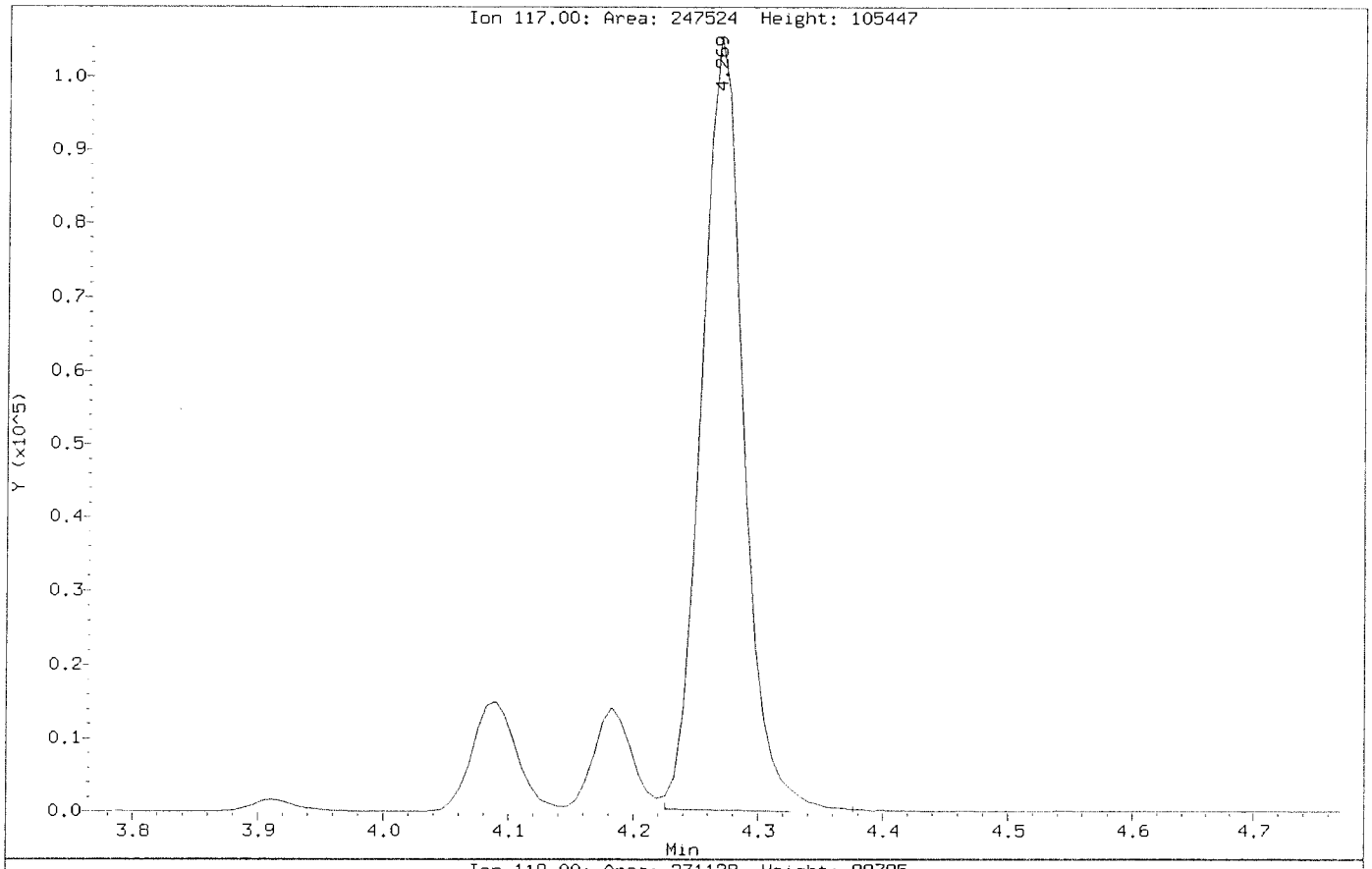
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Instrument: voa6.i
Client Sample ID: VSTD050

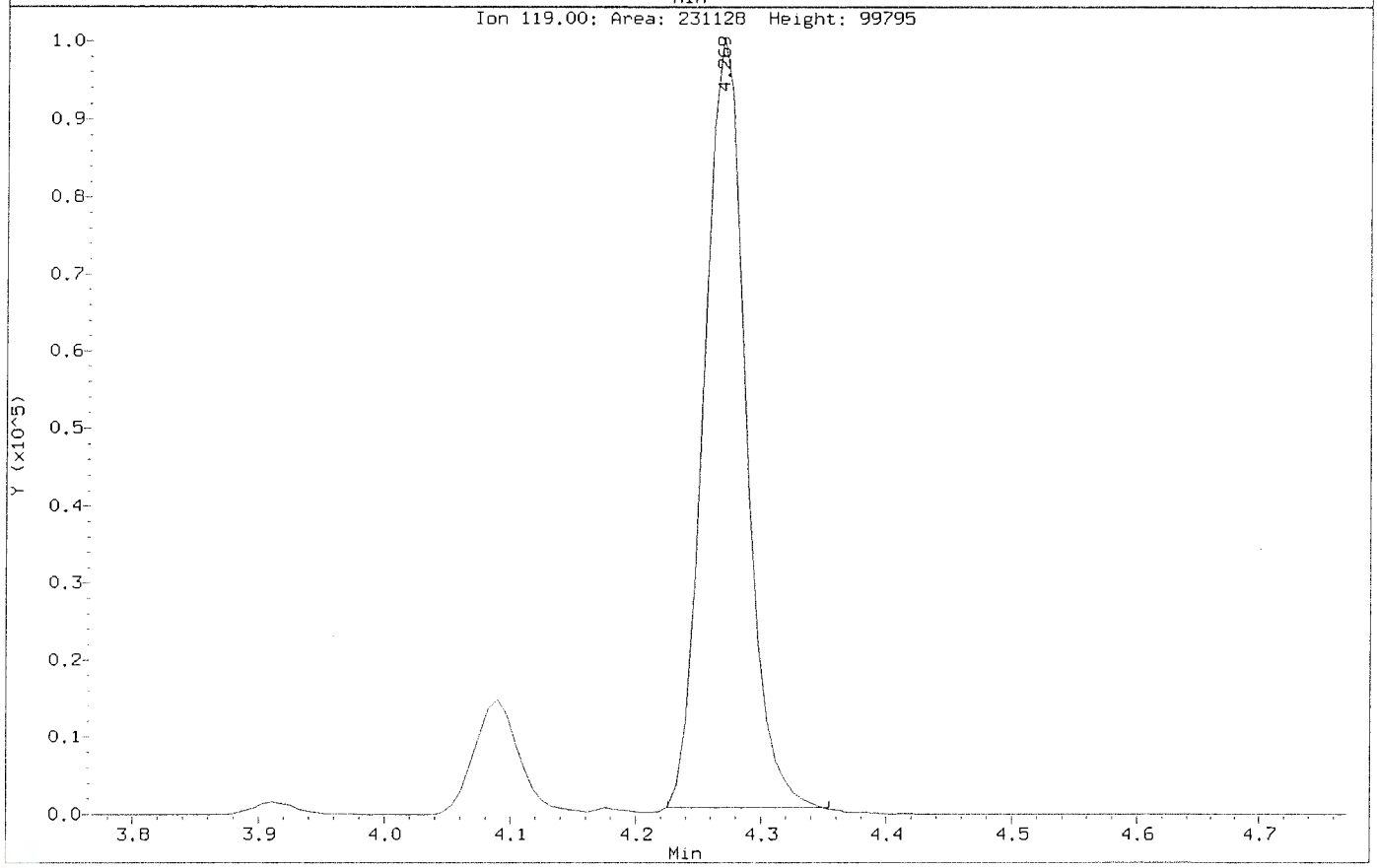
Compound: Carbon Tetrachloride
CAS Number: 56-23-5



Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111808.D
Injection Date: 18-NOV-2019 16:35
Instrument: voa6.i
Client Sample ID: VSTD050

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111809.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111809.D
Lab Smp Id: VSTD100 Client Smp ID: VSTD100
Inj Date : 18-NOV-2019 16:59
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 10 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
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Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

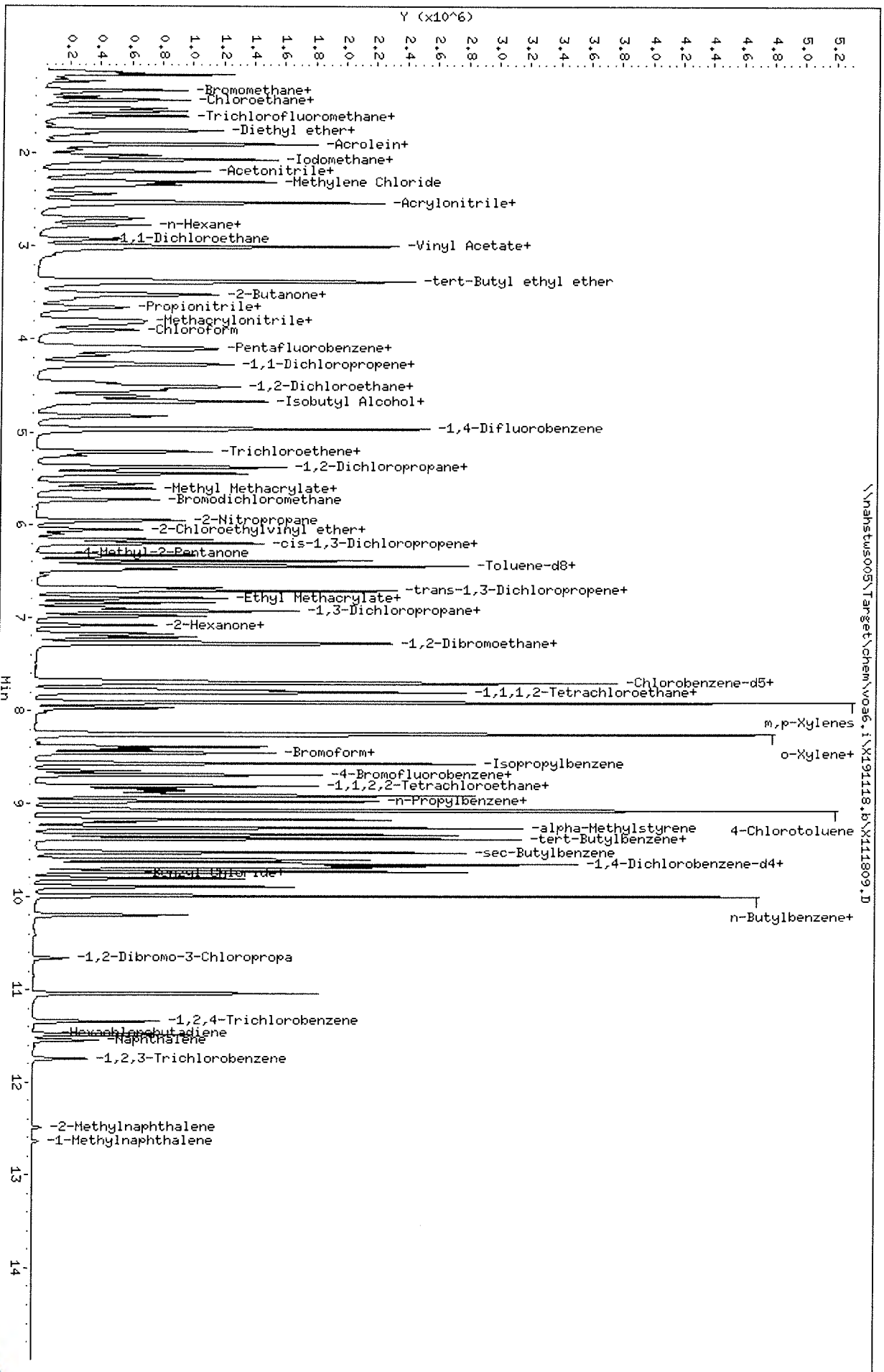
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	392699	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	554744	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	502006	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	278931	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	364646	100.000	97.98
$ 69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	465570	100.000	99.26
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	354918	100.000	99.03
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	1251601	100.000	94.62
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	370675	100.000	101.77
31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	531073	100.000	100.24
68 1,1,2,2-Tetrachloroethane	83	8.845	8.845	(0.915)	374065	100.000	95.36
138 Freon TF	101	1.911	1.911	(0.457)	363001	100.000	106.17
53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	259169	100.000	98.76
22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	562516	100.000	98.44
11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	336639	100.000	101.15
32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	435155	100.000	97.24
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	102660	100.000	99.24
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	314678	100.000	94.68(M)
90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	224252	100.000	95.44
79 1,2,4-Trimethylbenzene	105	9.382	9.382	(0.970)	1360930	100.000	102.82
89 1,2-Dibromo-3-Chloropropane	155	10.658	10.658	(1.102)	42468	100.000	98.40
57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	348356	100.000	98.94

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111809.D Page 2
Report Date: 06-Dec-2019 19:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	9.999	9.999	(1.034)	740257	100.000	99.99
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	440676	100.000	100.06
42	1,2-Dichloropropane	63	5.443	5.443	(1.095)	322033	100.000	97.17
75	1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	1326043	100.000	104.41
83	1,3-Dichlorobenzene	146	9.612	9.612	(0.994)	793024	100.000	99.13
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	523367	100.000	98.23
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	805891	100.000	99.14
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	505741	100.000	97.52
24	2-Butanone	43	3.580	3.580	(0.856)	231090	200.000	191.78
76	2-Chlorotoluene	91	8.974	8.974	(0.928)	1019206	100.000	101.56
52	2-Hexanone	43	7.090	7.090	(0.924)	404339	200.000	196.07
77	4-Chlorotoluene	91	9.074	9.074	(0.939)	1244013	100.000	102.27
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	1420650	100.000	104.09
45	4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	584699	200.000	198.78
10	Acetone	43	1.976	1.976	(0.473)	202207	200.000	202.71(A)
37	Benzene	78	4.519	4.519	(0.909)	1259183	100.000	99.22
74	Bromobenzene	156	8.809	8.809	(0.911)	477901	100.000	98.58
29	Bromochloromethane	128	3.795	3.795	(0.908)	204995	100.000	96.36
39	Bromodichloromethane	83	5.729	5.729	(1.153)	453036	100.000	98.68
66	Bromoform	173	8.415	8.415	(1.097)	293256	100.000	97.14
6	Bromomethane	94	1.331	1.331	(0.318)	396733	100.000	104.04
19	Carbon Disulfide	76	2.069	2.069	(0.495)	1866170	200.000	206.12(A)
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	490954	100.000	100.15(H)
59	Chlorobenzene	112	7.699	7.699	(1.004)	969904	100.000	98.96
7	Chloroethane	64	1.396	1.396	(0.334)	244234	100.000	98.78
28	Chloroform	83	3.910	3.910	(0.935)	592217	100.000	93.11
3	Chloromethane	50	1.073	1.073	(0.257)	420936	100.000	98.51
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	373378	100.000	100.25
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	548280	100.000	101.34
55	Dibromochloromethane	129	7.176	7.176	(0.936)	387071	100.000	101.53
44	Dibromomethane	93	5.557	5.557	(1.118)	228649	100.000	97.50
2	Dichlorodifluoromethane	85	0.973	0.973	(0.233)	359790	100.000	99.65
61	Ethylbenzene	106	7.799	7.799	(1.017)	511284	100.000	100.96
91	Hexachlorobutadiene	225	11.488	11.488	(1.188)	192455	100.000	99.01
67	Isopropylbenzene	105	8.566	8.566	(1.117)	1550450	100.000	103.37
62	m,p-Xylenes	106	7.907	7.907	(1.031)	1262031	200.000	206.53(A)
17	Methylene Chloride	84	2.305	2.305	(0.551)	333987	100.000	94.05
87	n-Butylbenzene	91	9.999	9.999	(1.034)	1214189	100.000	106.90
73	n-Propylbenzene	91	8.917	8.917	(0.922)	1771664	100.000	102.75
92	Naphthalene	128	11.546	11.546	(1.194)	281768	100.000	93.49
63	o-Xylene	106	8.244	8.244	(1.075)	610719	100.000	101.26
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	1561099	100.000	104.22
64	Styrene	104	8.258	8.258	(1.077)	1077784	100.000	102.77
78	tert-Butylbenzene	119	9.340	9.340	(0.966)	1121644	100.000	103.15
56	Tetrachloroethene	164	6.933	6.933	(0.904)	341567	100.000	96.83
50	Toluene	91	6.446	6.446	(0.840)	1413996	100.000	99.32
20	trans-1,2-Dichloroethene	96	2.527	2.527	(0.604)	324394	100.000	100.39
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	504686	100.000	102.35
38	Trichloroethene	130	5.206	5.206	(1.048)	388311	100.000	100.09
8	Trichlorofluoromethane	101	1.560	1.560	(0.373)	647137	100.000	106.23
5	Vinyl Chloride	62	1.138	1.138	(0.272)	400884	100.000	100.16

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

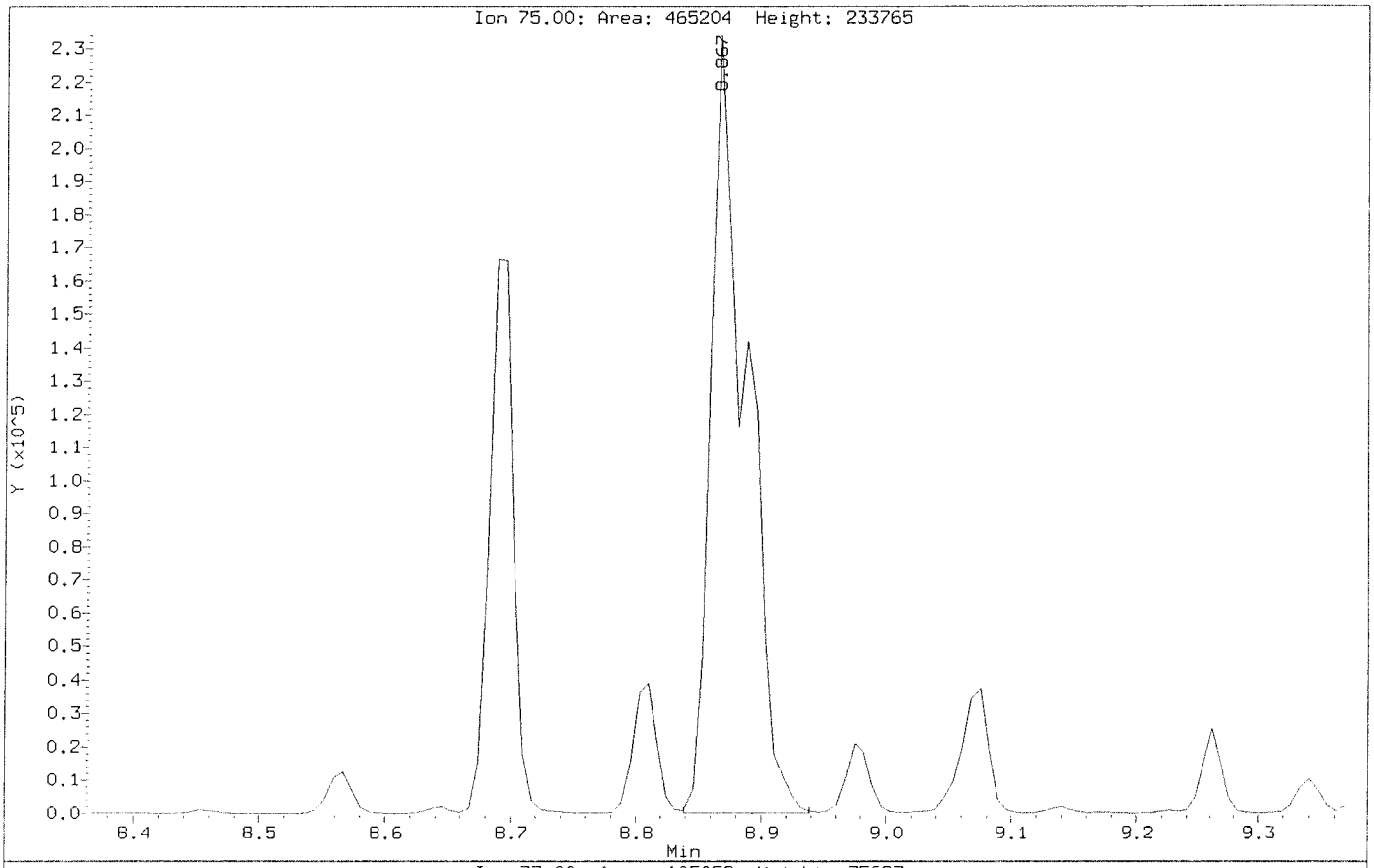


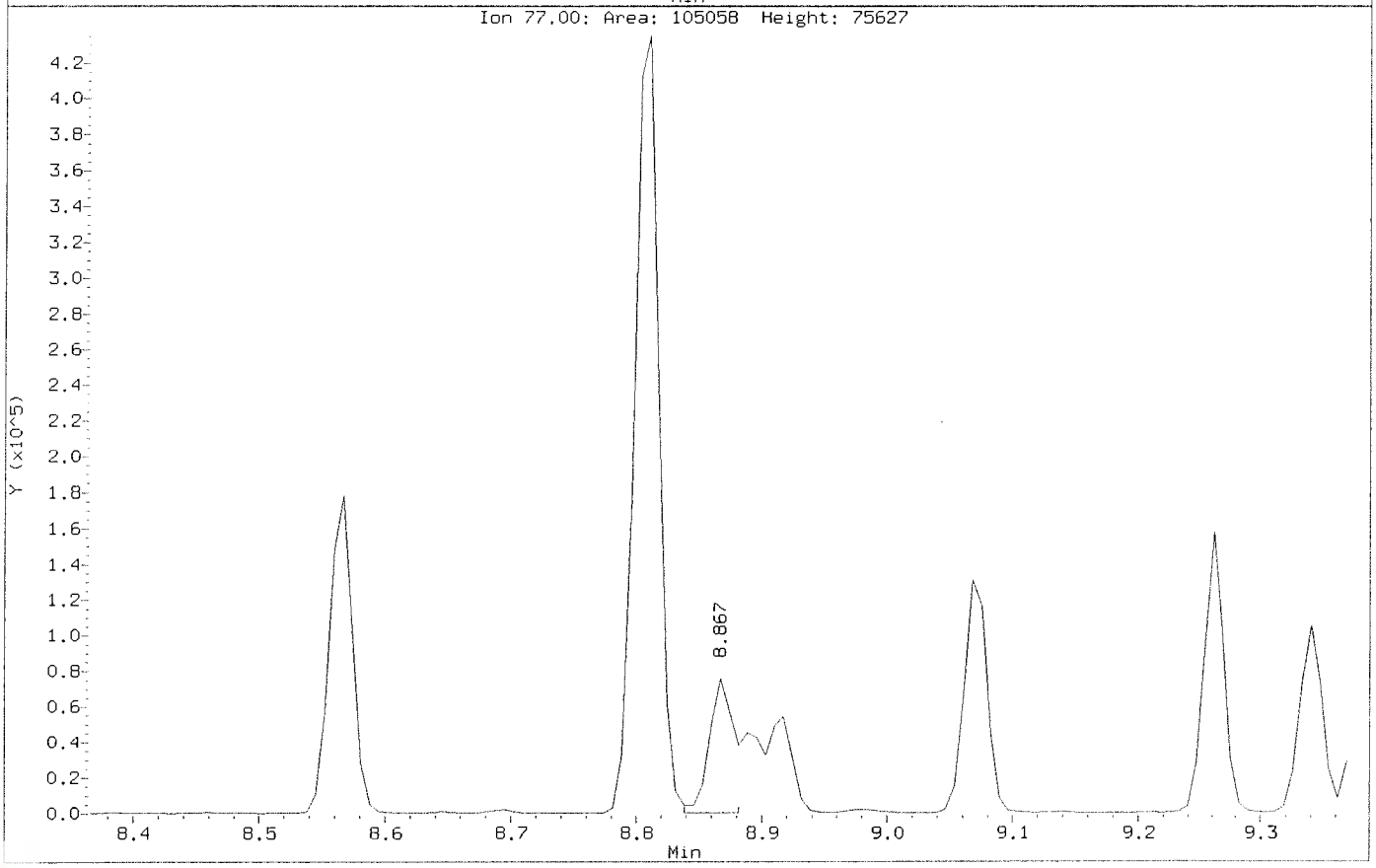
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Client ID: VSTD100
Sample Info: VSTD100;VSTD100;1;8;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\BEFORE\X111809.D
Injection Date: 18-NOV-2019 16:59
Instrument: voa6.i
Client Sample ID: VSTD100

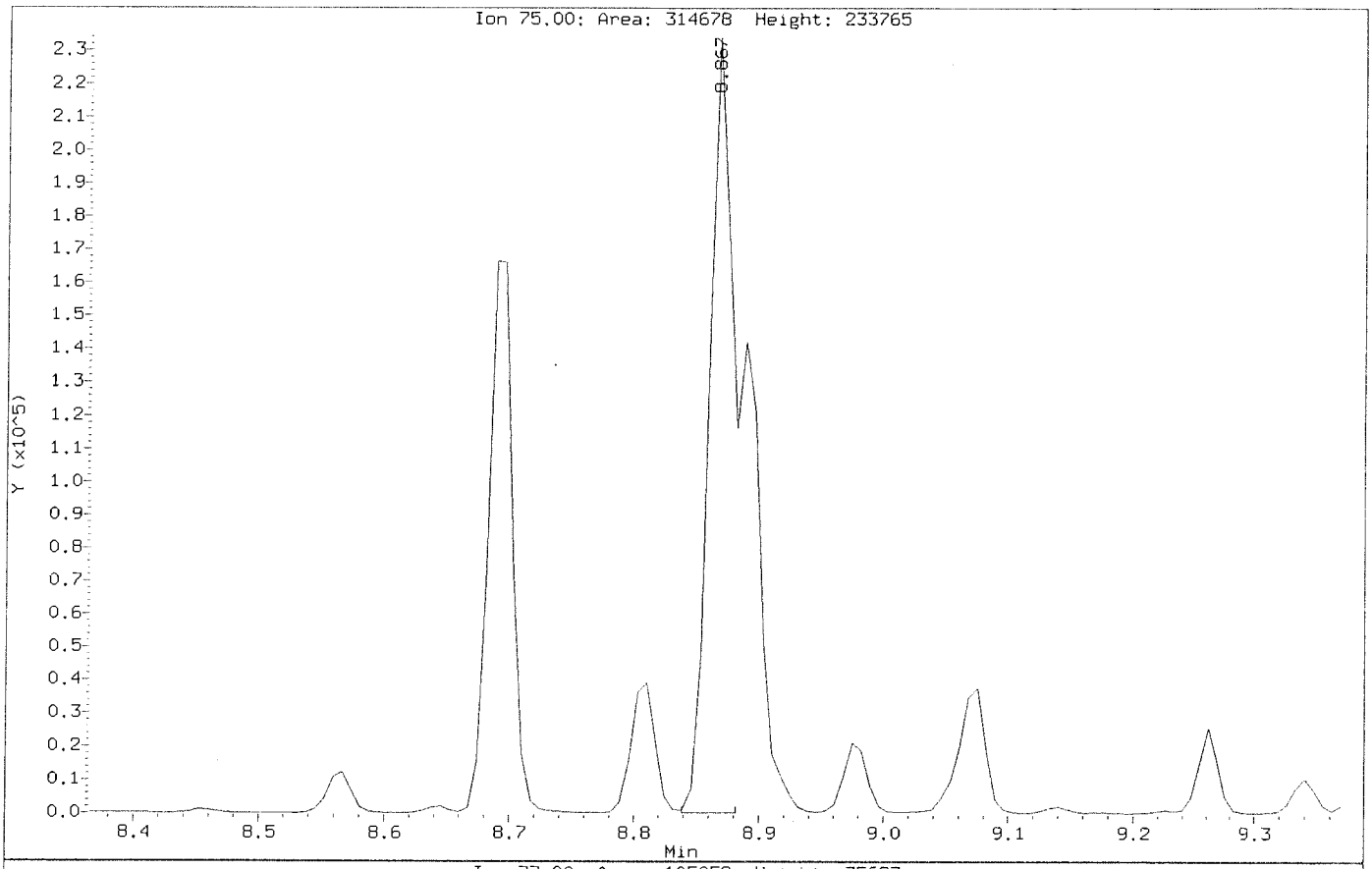
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4

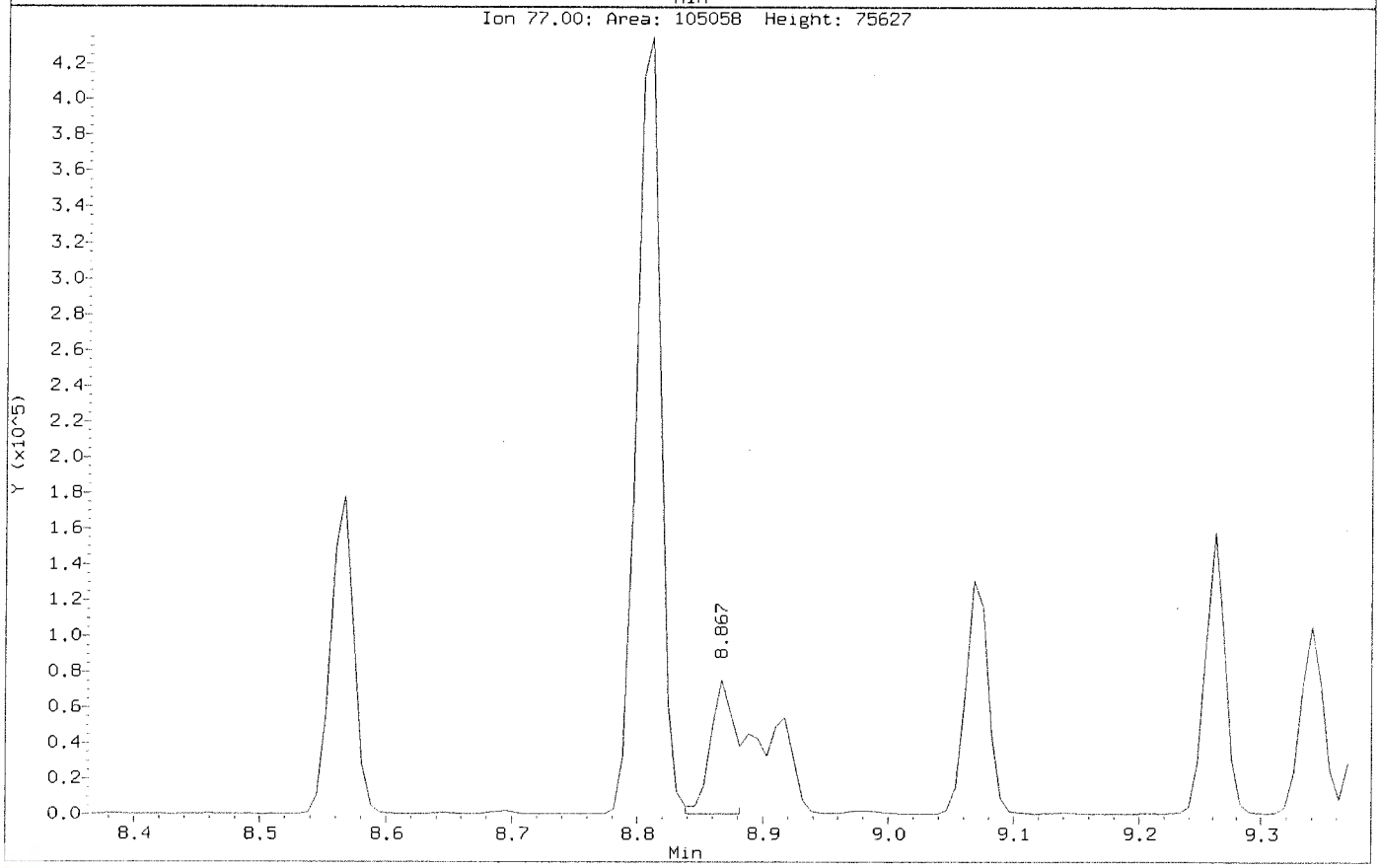




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Instrument: voa6.i
Client Sample ID: VSTD100

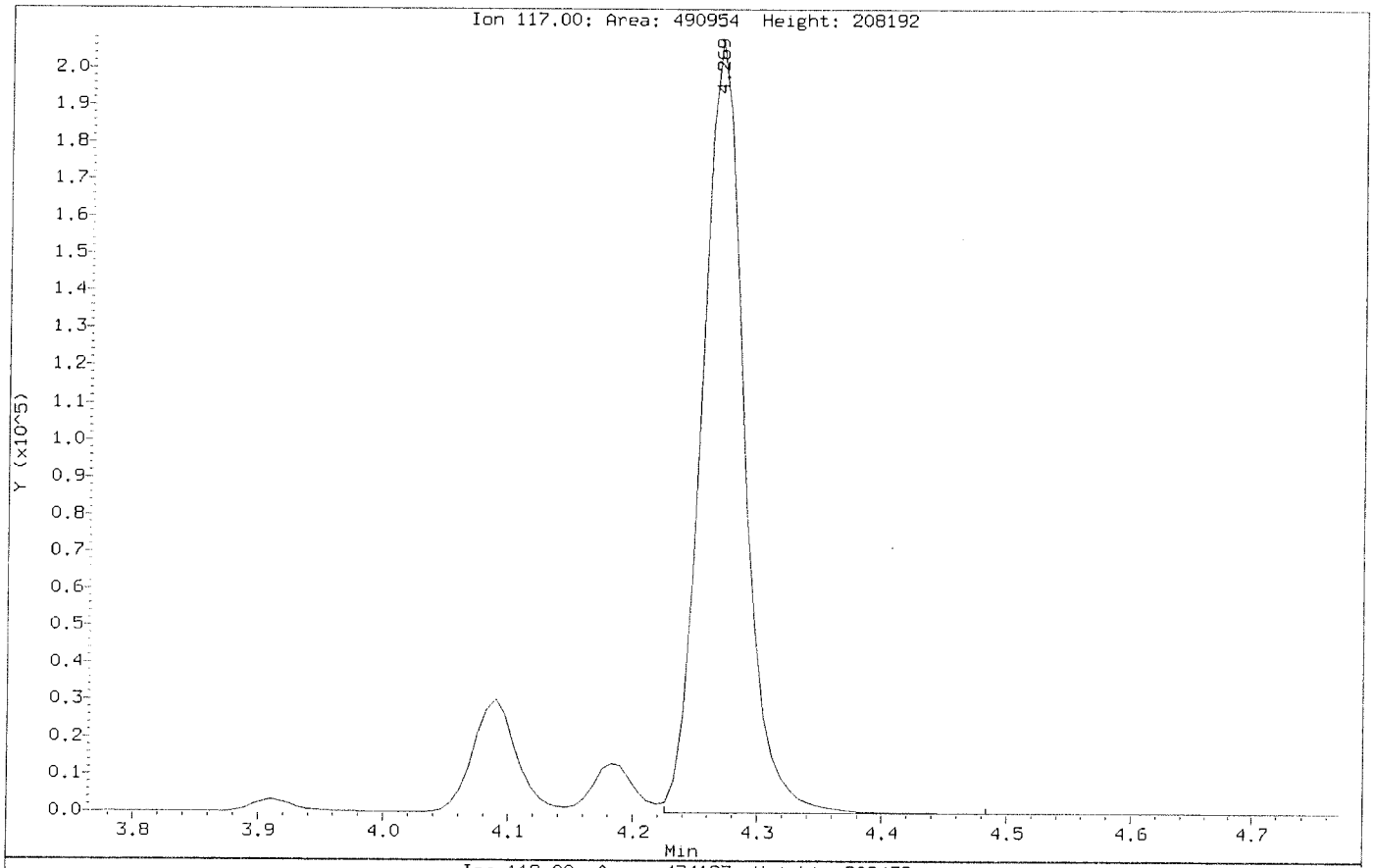
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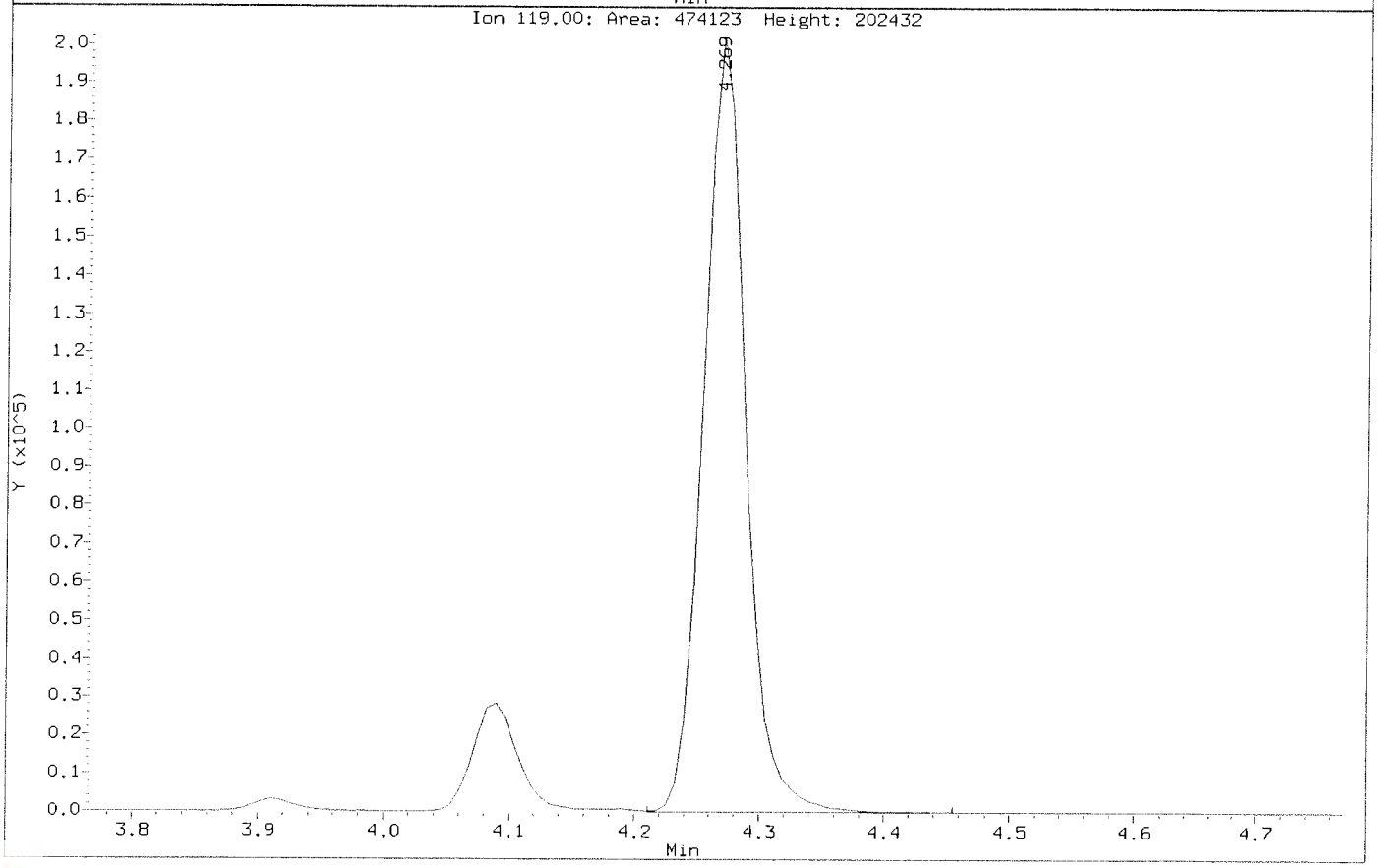




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Instrument: voa6.i
Client Sample ID: VSTD100

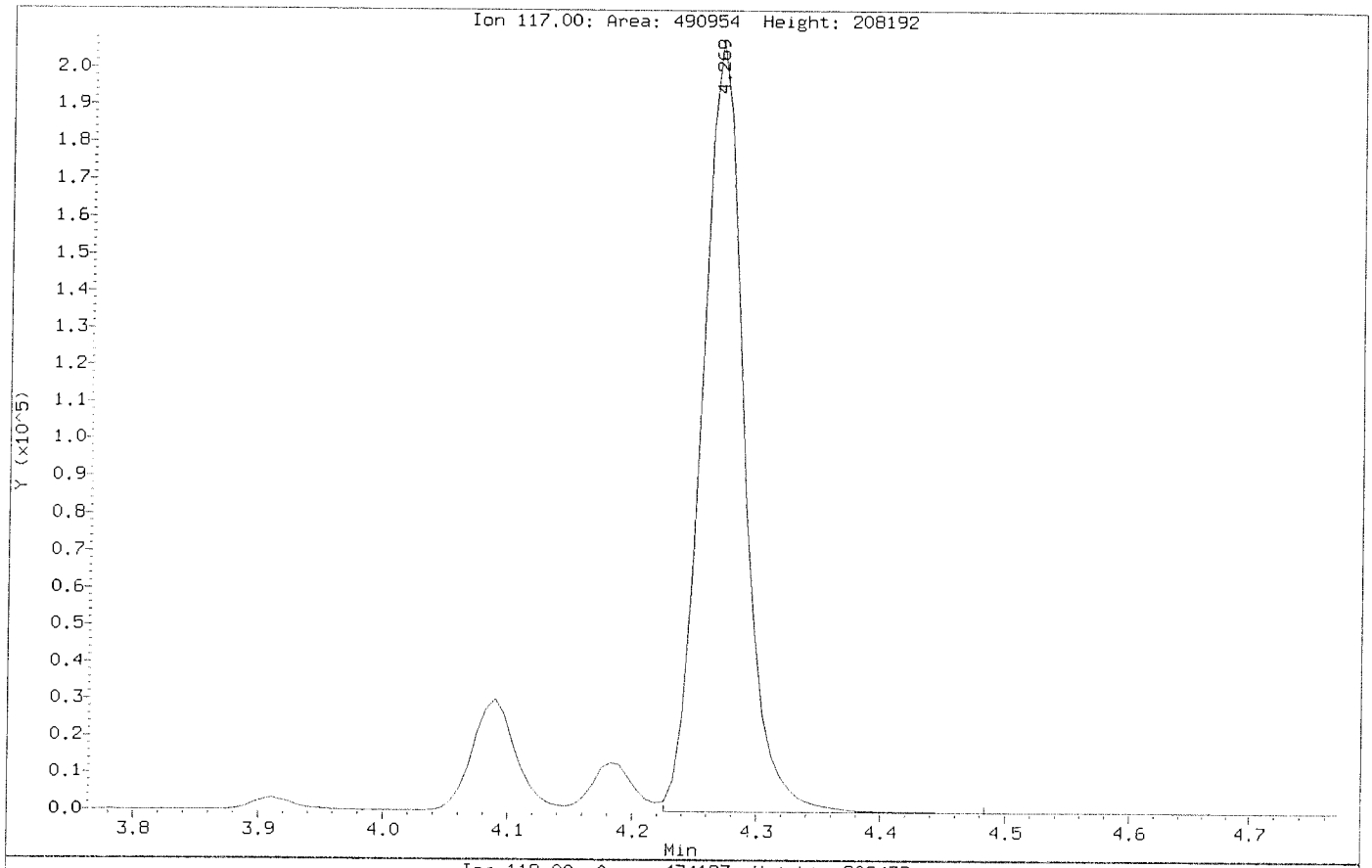
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

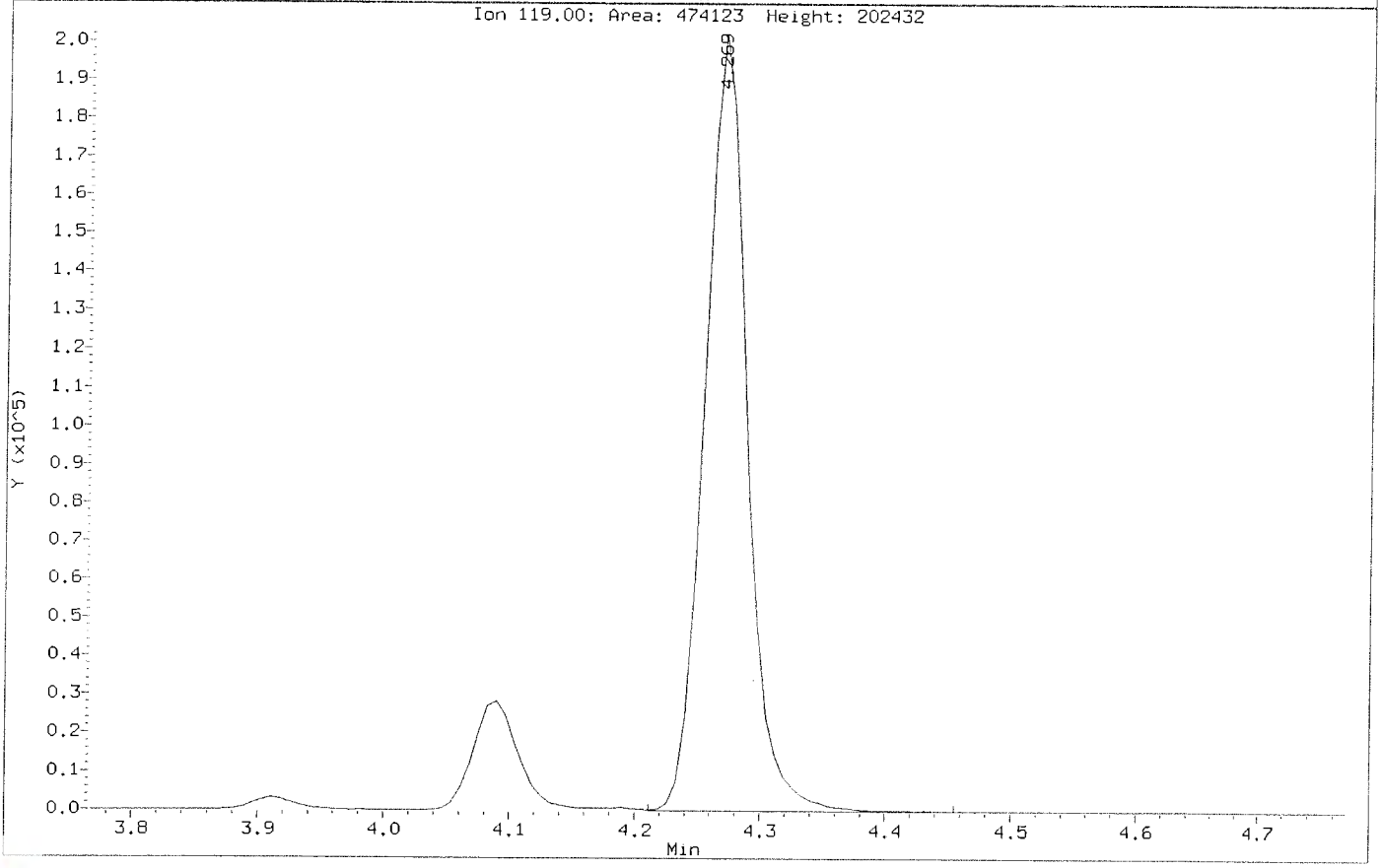




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Injection Date: 18-NOV-2019 16:59
Instrument: voa6.i
Client Sample ID: VSTD100

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111810.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111810.D
Lab Smp Id: VSTD150 Client Smp ID: VSTD150
Inj Date : 18-NOV-2019 17:22
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 16:59 Cal File: X111809.D
Als bottle: 11 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

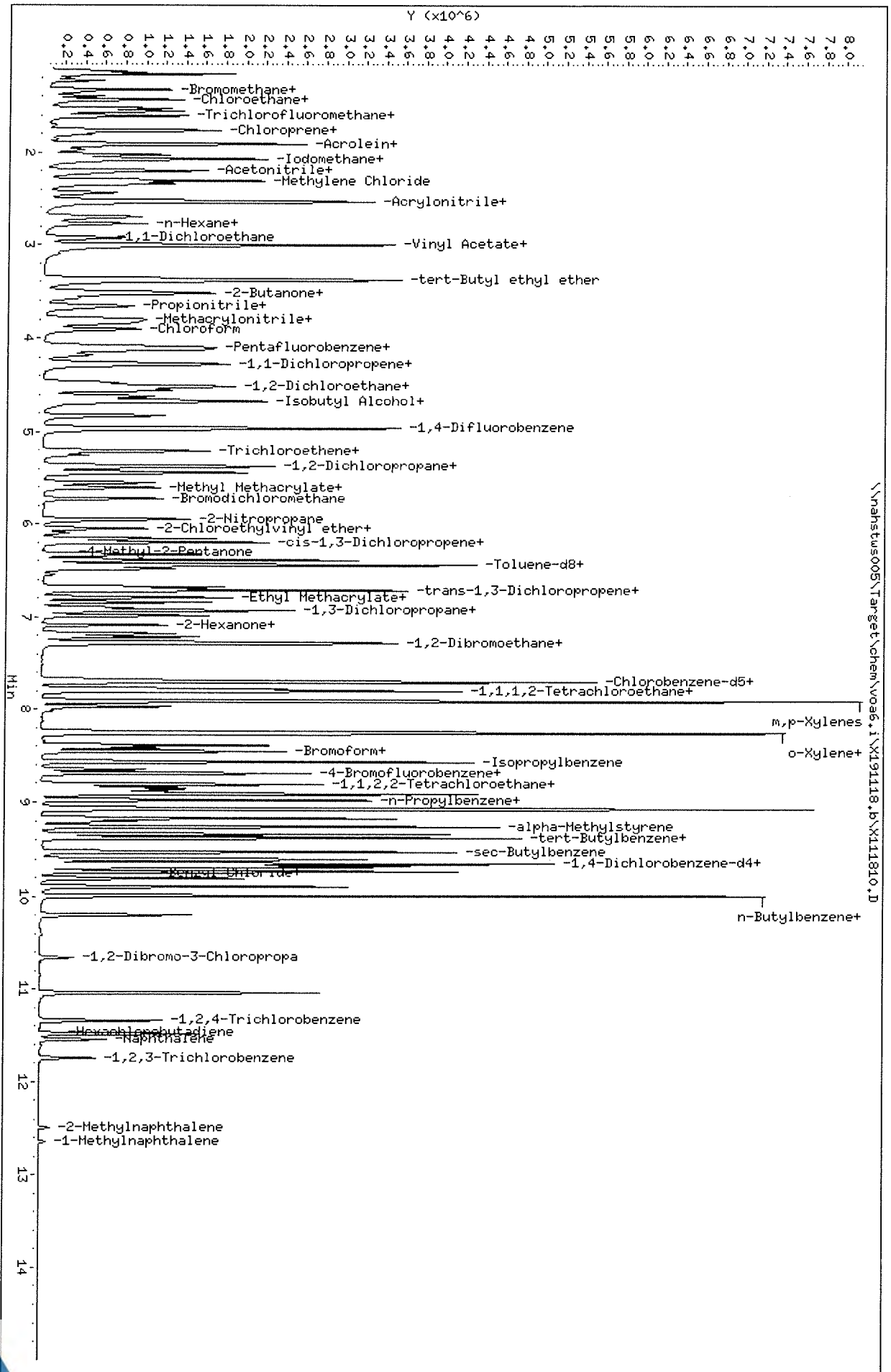
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.182	4.182	(1.000)	378157	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	542191	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	494760	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	282310	50.0000	
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	532181	150.000	148.11
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	688600	150.000	148.76
$	30 Dibromofluoromethane	113	4.104	4.104	(0.981)	514854	150.000	148.99
$	48 Toluene-d8	98	6.389	6.389	(0.833)	1815269	150.000	139.25
	60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	548257	150.000	152.74
	31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	768782	150.000	150.69
	68 1,1,2,2-Tetrachloroethane	83	8.845	8.845	(0.915)	560927	150.000	141.29
	138 Freon TF	101	1.912	1.912	(0.457)	513260	150.000	155.89
	53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	380298	150.000	147.04
	22 1,1-Dichloroethane	63	2.922	2.922	(0.699)	825788	150.000	150.08
	11 1,1-Dichloroethene	96	1.912	1.912	(0.457)	483391	150.000	150.83
	32 1,1-Dichloropropene	75	4.283	4.283	(0.862)	635821	150.000	145.37
	93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	156391	150.000	148.93
	71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	465353	150.000	138.34(M)
	90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	338737	150.000	142.44
	79 1,2,4-Trimethylbenzene	105	9.383	9.383	(0.970)	2030171	150.000	151.55
	89 1,2-Dibromo-3-Chloropropane	155	10.658	10.658	(1.102)	65470	150.000	150.06
	57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	518766	150.000	149.49

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111810.D Page 2
Report Date: 06-Dec-2019 19:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	9.999	9.999	(1.034)	1121580	150.000	149.69
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	645436	150.000	149.95
42	1,2-Dichloropropane	63	5.443	5.443	(1.095)	471959	150.000	145.71
75	1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	1980658	150.000	154.09
83	1,3-Dichlorobenzene	146	9.612	9.612	(0.994)	1183710	150.000	146.20
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	763789	150.000	145.46
84	1,4-Dichlorobenzene	146	9.684	9.684	(1.001)	1195790	150.000	145.34
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	732900	150.000	146.75
24	2-Butanone	43	3.573	3.573	(0.854)	346972	300.000	299.02(A)
76	2-Chlorotoluene	91	8.982	8.982	(0.929)	1513395	150.000	149.00
52	2-Hexanone	43	7.090	7.090	(0.924)	606144	300.000	298.23(A)
77	4-Chlorotoluene	91	9.075	9.075	(0.939)	1867848	150.000	151.71
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	2100293	150.000	152.04
45	4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	884349	300.000	305.06(A)
10	Acetone	43	1.976	1.976	(0.473)	284604	300.000	298.06(A)
37	Benzene	78	4.512	4.512	(0.908)	1843665	150.000	148.64
74	Bromobenzene	156	8.810	8.810	(0.911)	709083	150.000	144.52
29	Bromochloromethane	128	3.795	3.795	(0.908)	294445	150.000	143.73
39	Bromodichloromethane	83	5.730	5.730	(1.153)	669356	150.000	149.18
66	Bromoform	173	8.416	8.416	(1.097)	447981	150.000	150.02
6	Bromomethane	94	1.331	1.331	(0.318)	529714	150.000	145.16
19	Carbon Disulfide	76	2.069	2.069	(0.495)	2705391	300.000	310.30(A)
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	707541	150.000	147.68(H)
59	Chlorobenzene	112	7.699	7.699	(1.004)	1445648	150.000	149.66
7	Chloroethane	64	1.396	1.396	(0.334)	351927	150.000	147.81
28	Chloroform	83	3.910	3.910	(0.935)	863467	150.000	140.99
3	Chloromethane	50	1.074	1.074	(0.257)	613254	150.000	148.94
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	542390	150.000	151.24
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	808388	150.000	152.88
55	Dibromochloromethane	129	7.176	7.176	(0.936)	573494	150.000	152.63
44	Dibromomethane	93	5.558	5.558	(1.118)	338759	150.000	147.80
2	Dichlorodifluoromethane	85	0.966	0.966	(0.231)	504807	150.000	144.79
61	Ethylbenzene	106	7.800	7.800	(1.017)	751250	150.000	150.52
91	Hexachlorobutadiene	225	11.489	11.489	(1.188)	279881	150.000	142.49
67	Isopropylbenzene	105	8.566	8.566	(1.117)	2283588	150.000	154.47
62	m,p-Xylenes	106	7.907	7.907	(1.031)	1861660	300.000	309.12(A)
17	Methylene Chloride	84	2.306	2.306	(0.551)	485622	150.000	142.02
87	n-Butylbenzene	91	9.999	9.999	(1.034)	1823176	150.000	158.59
73	n-Propylbenzene	91	8.917	8.917	(0.922)	2616190	150.000	149.92
92	Naphthalene	128	11.546	11.546	(1.194)	435593	150.000	142.81
63	o-Xylene	106	8.244	8.244	(1.075)	906786	150.000	152.56
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	2308597	150.000	152.28
64	Styrene	104	8.258	8.258	(1.077)	1622659	150.000	156.99
78	tert-Butylbenzene	119	9.340	9.340	(0.966)	1665732	150.000	151.35
56	Tetrachloroethene	164	6.933	6.933	(0.904)	493485	150.000	141.95
50	Toluene	91	6.446	6.446	(0.840)	2107838	150.000	150.23
20	trans-1,2-Dichloroethene	96	2.528	2.528	(0.604)	472385	150.000	151.82
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	741568	150.000	153.87
38	Trichloroethene	130	5.207	5.207	(1.048)	566006	150.000	149.27
8	Trichlorofluoromethane	101	1.553	1.553	(0.372)	922117	150.000	157.19
5	Vinyl Chloride	62	1.138	1.138	(0.272)	578026	150.000	149.97

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

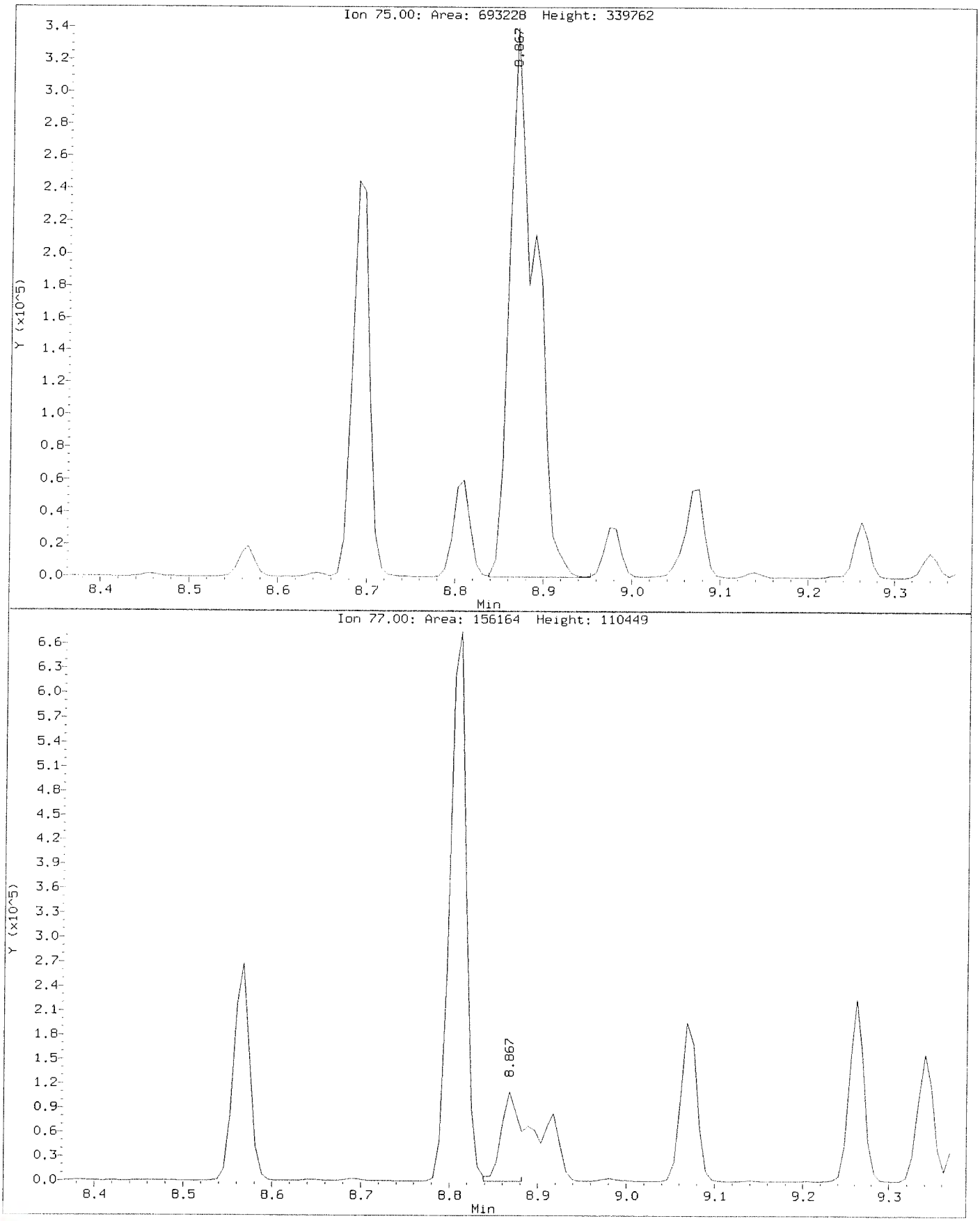


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Date : 18-NOV-2019 17:22
Client ID: VSTD150
Sample Info: VSTD150;VSTD150;1;9;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6,i
Operator: PC
Column diameter: 0.18

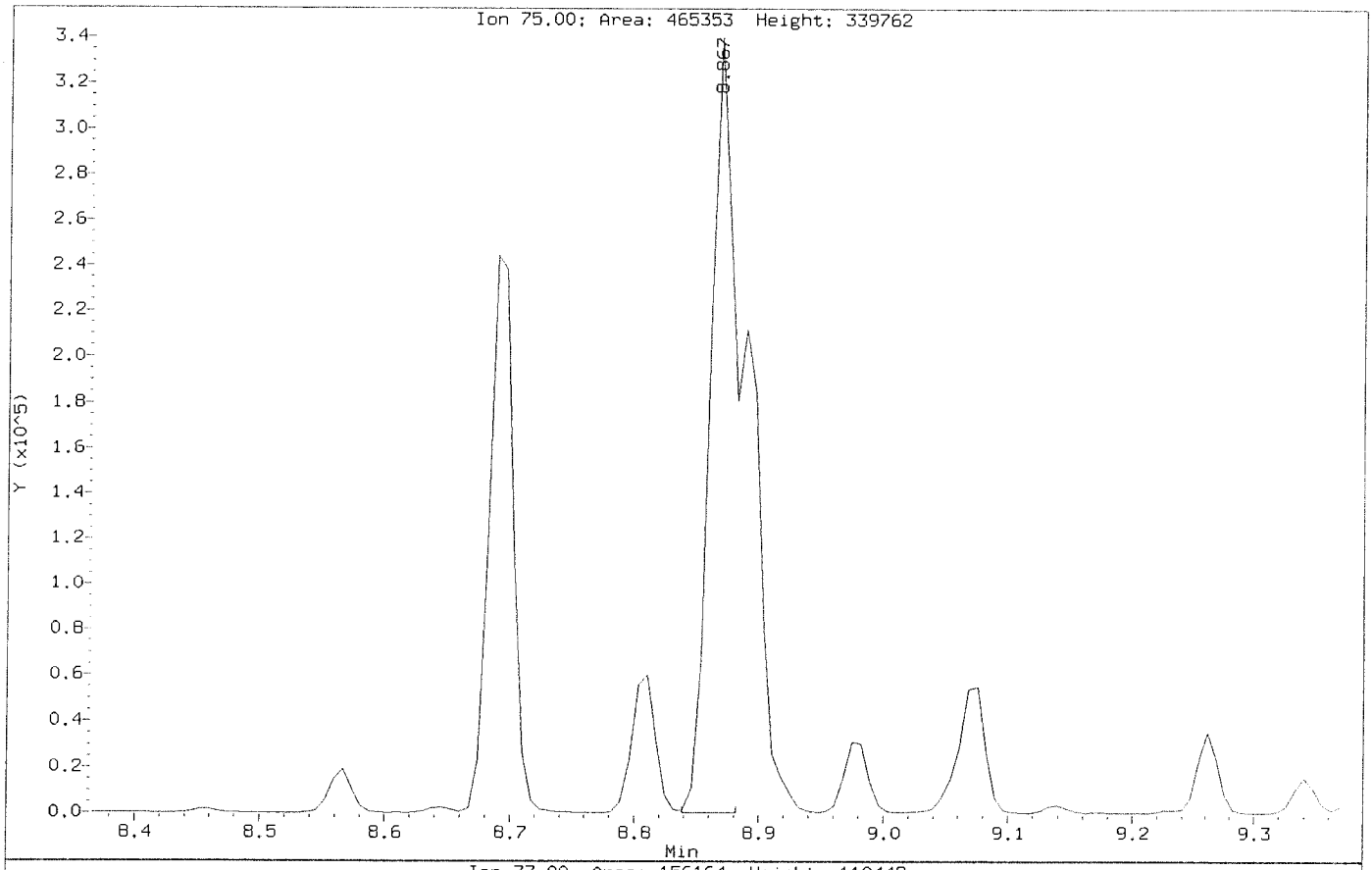
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Instrument: voa6.i
Client Sample ID: VSTD150

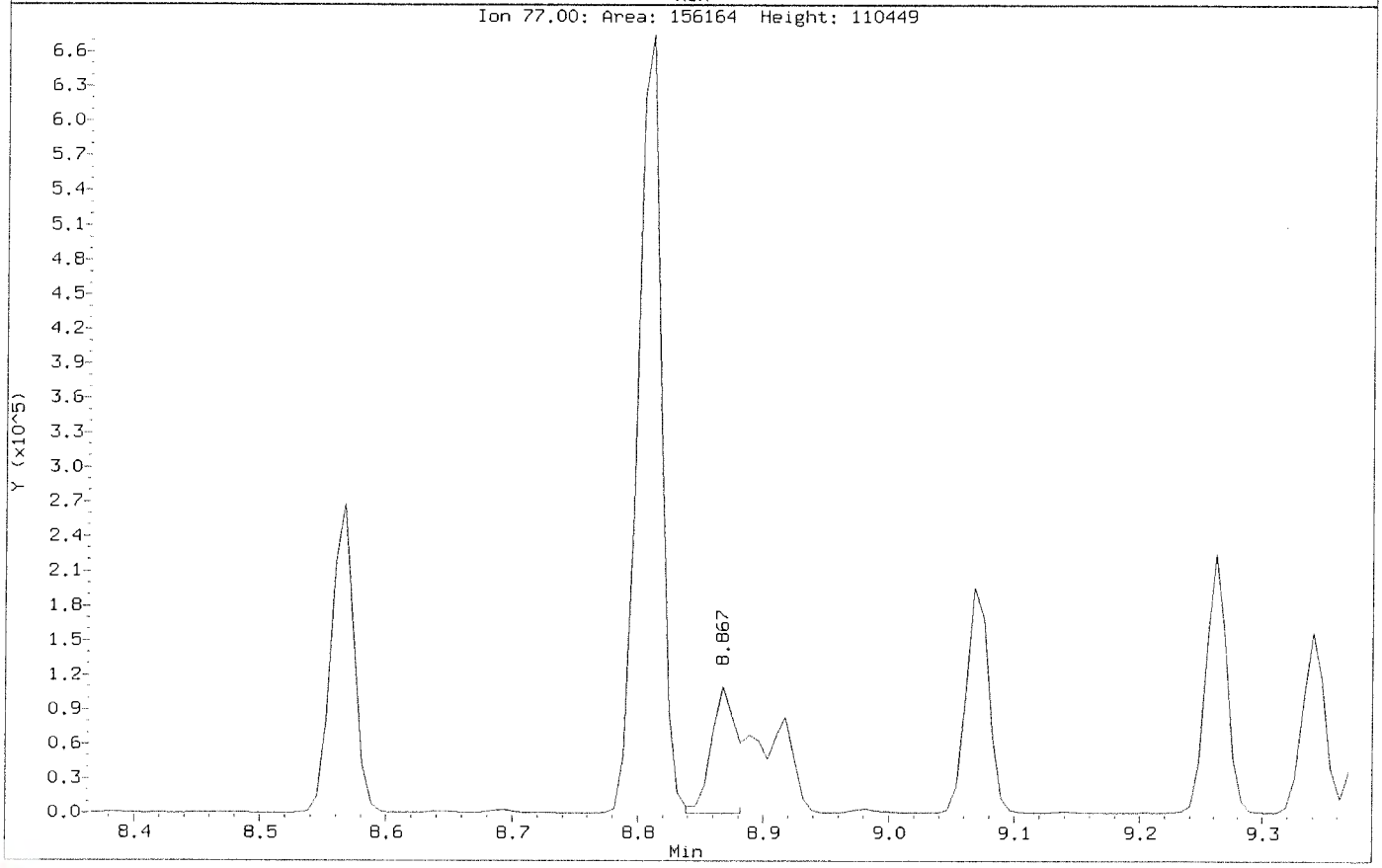
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4



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Instrument: voa6.i
Client Sample ID: VSTD150

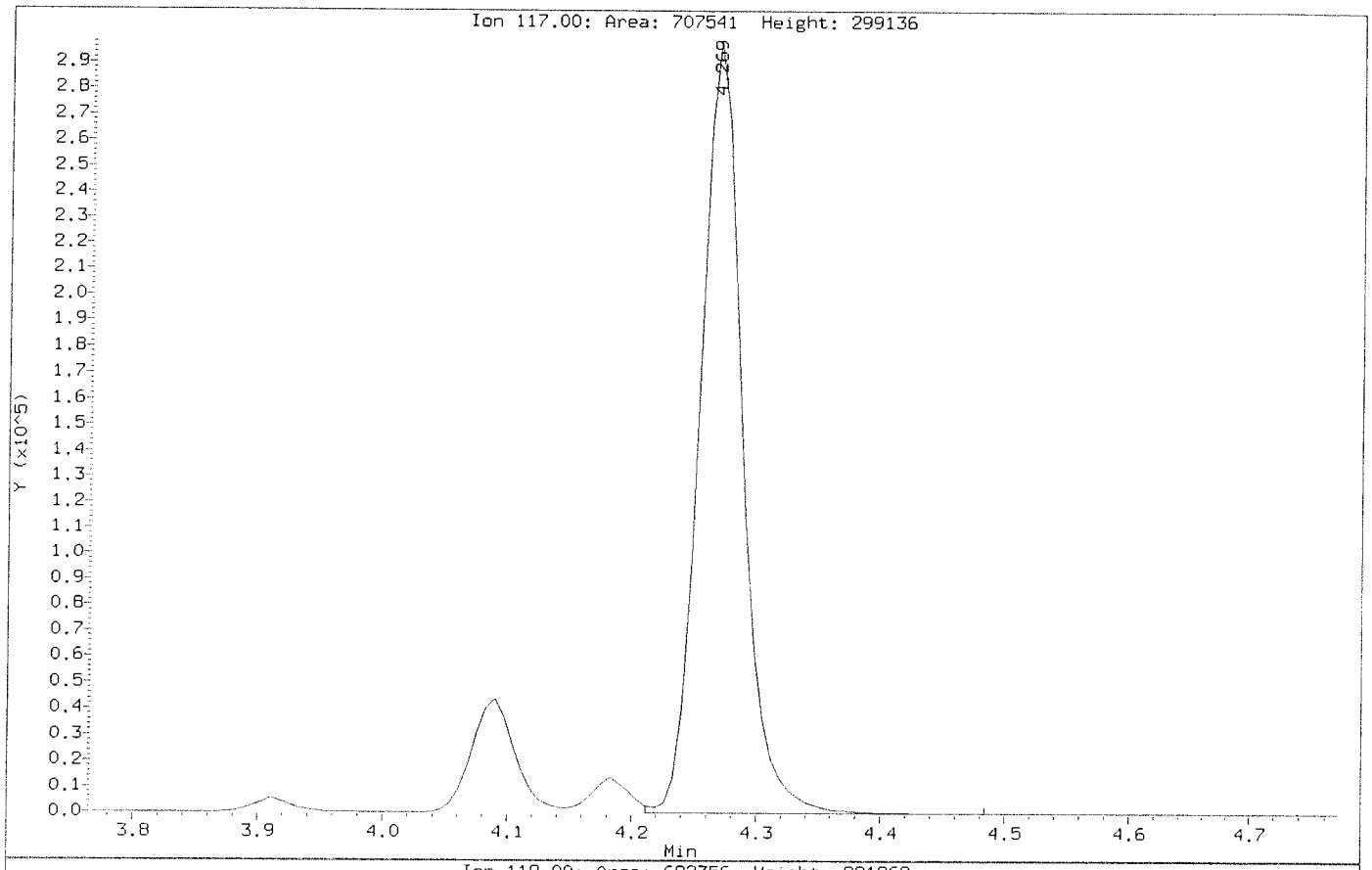
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4

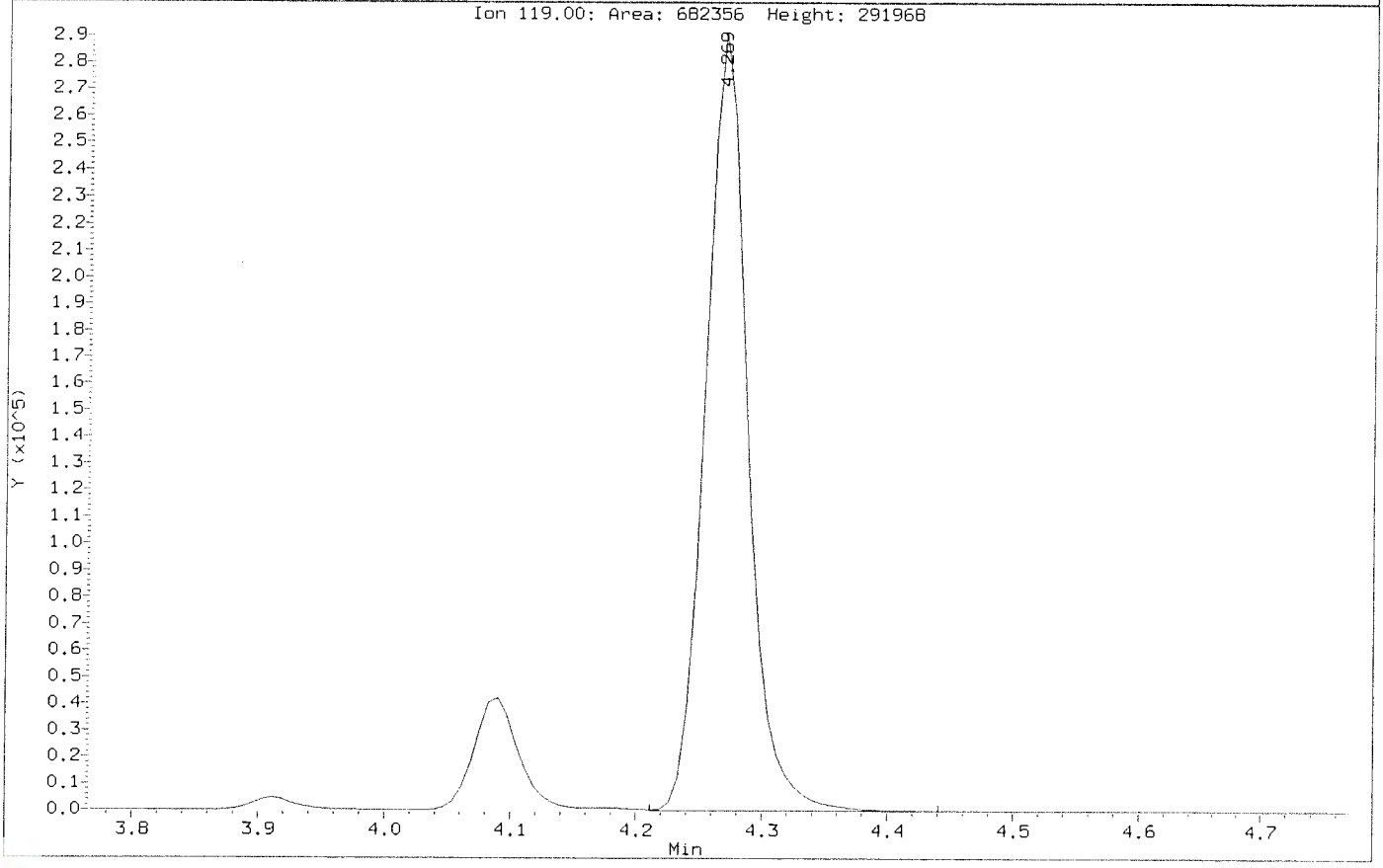




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Injection Date: 18-NOV-2019 17:22
Instrument: voa6.i
Client Sample ID: VSTD150

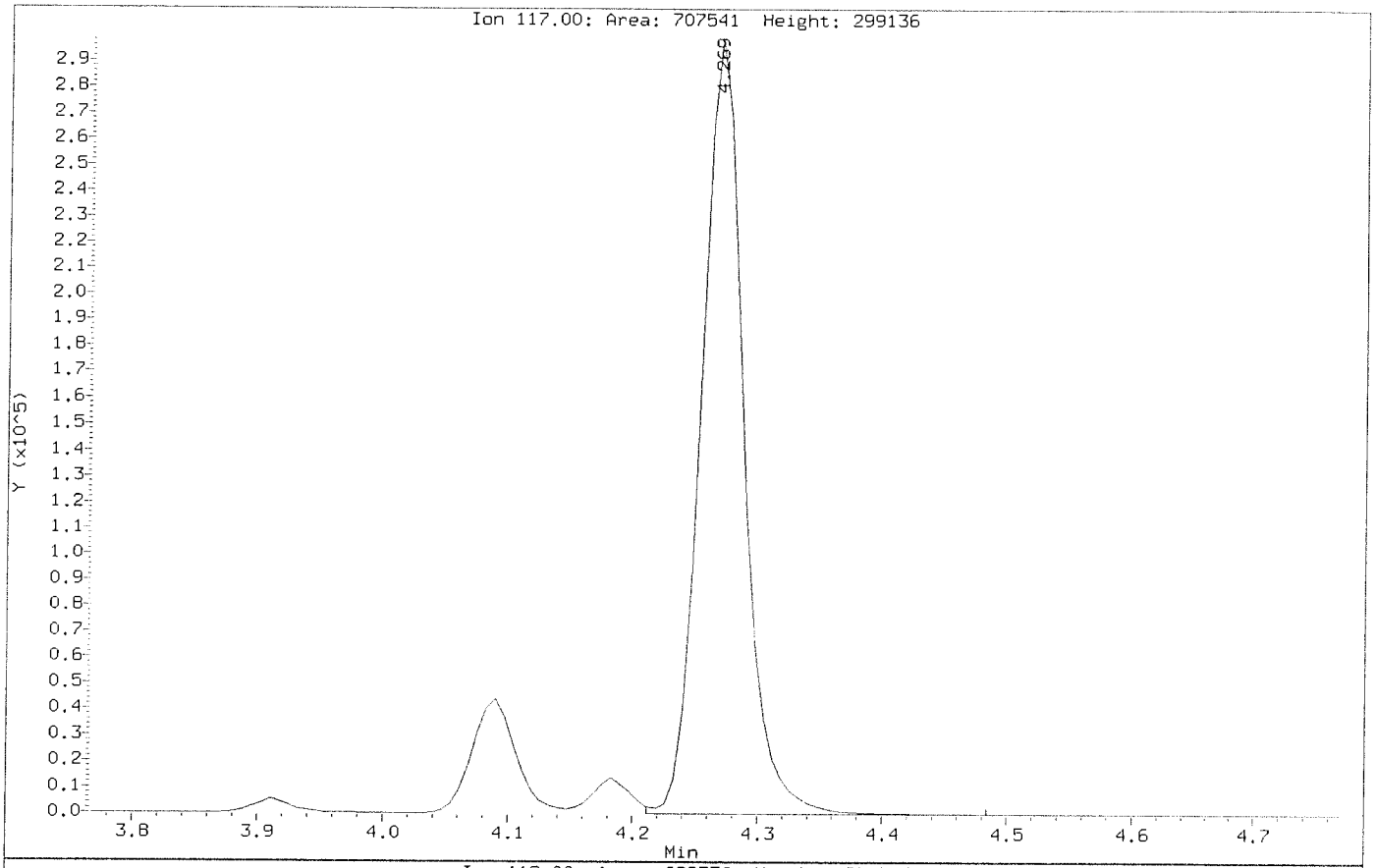
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

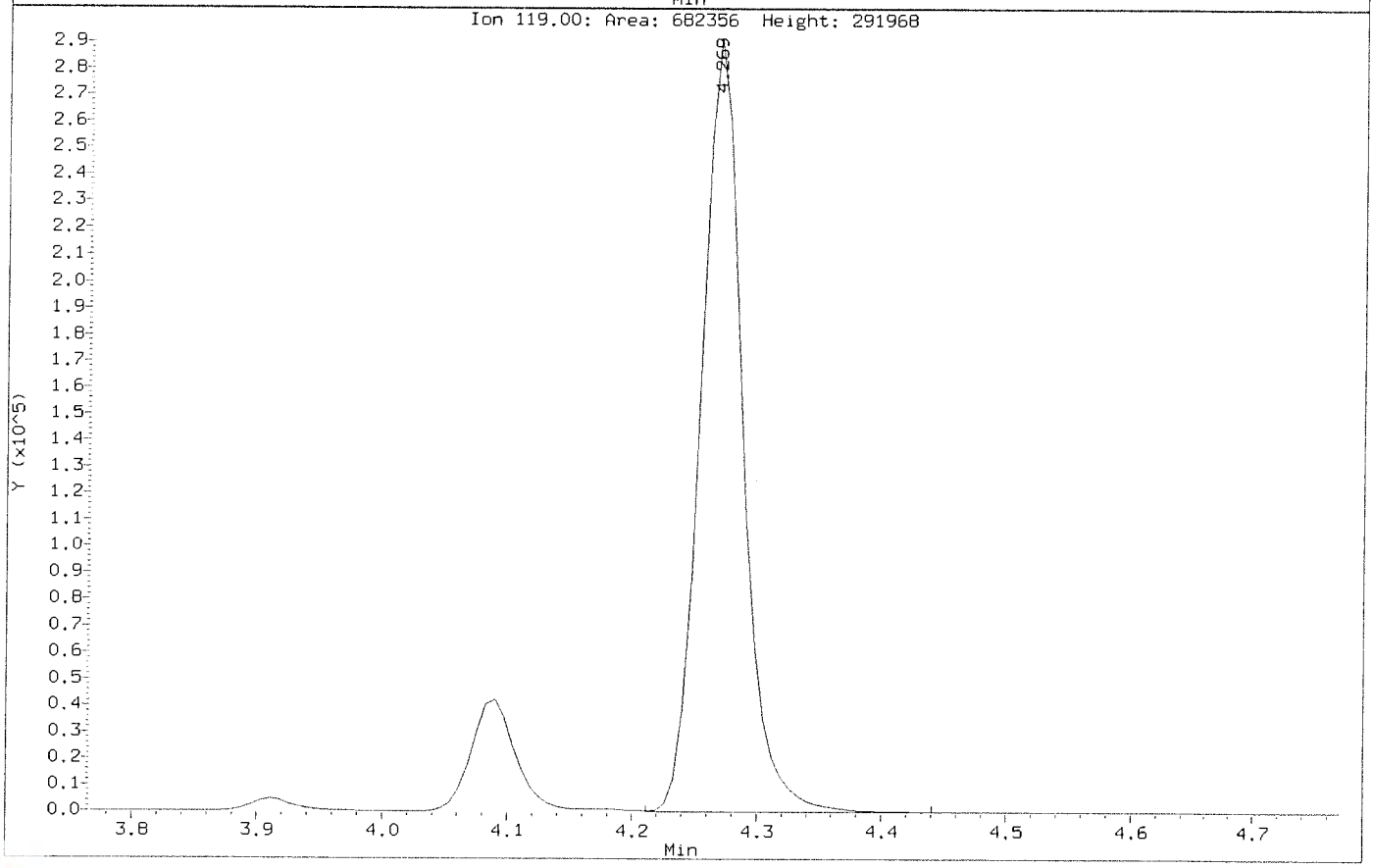




Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111810.D
Injection Date: 18-NOV-2019 17:22
Instrument: voa6.i
Client Sample ID: VSTD150

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111811.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111811.D
Lab Smp Id: VSTD200 Client Smp ID: VSTD200
Inj Date : 18-NOV-2019 17:46
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 17:22 Cal File: X111810.D
Als bottle: 12 Calibration Sample, Level: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

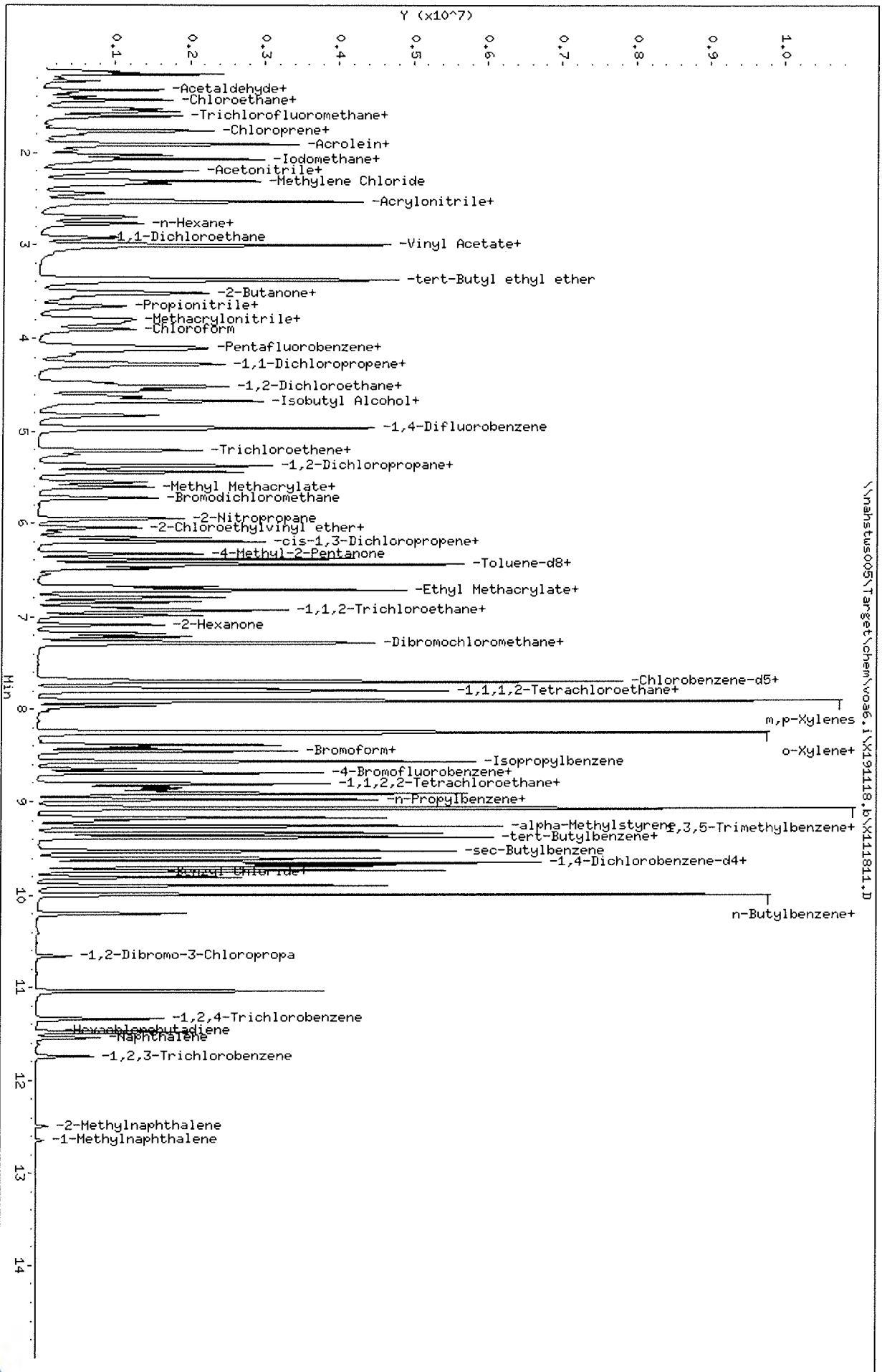
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.182	4.182	(1.000)	369517	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	542684	50.0000	
*	47 Chlorobenzene-d5	117	7.670	7.670	(1.000)	493817	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	280605	50.0000	
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	713282	200.000	202.89(A)
$	69 4-Bromofluorobenzene	95	8.695	8.695	(1.134)	933083	200.000	201.81(A)
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	681300	200.000	201.64(A)
$	48 Toluene-d8	98	6.388	6.388	(0.833)	2431773	200.000	186.90
	60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	731912	200.000	204.29(A)
	31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	1030058	200.000	206.62(A)
	68 1,1,2,2-Tetrachloroethane	83	8.845	8.845	(0.915)	742176	200.000	188.09
	138 Freon TF	101	1.911	1.911	(0.457)	696977	200.000	216.65(A)
	53 1,1,2-Trichloroethane	83	6.847	6.847	(0.893)	511936	200.000	198.31
	22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	1089650	200.000	202.66(A)
	11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	641291	200.000	204.78(A)
	32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	849992	200.000	194.17
	93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	210414	200.000	200.64(A)
	71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	609450	200.000	182.28(M)
	90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	455609	200.000	192.75
	79 1,2,4-Trimethylbenzene	105	9.382	9.382	(0.970)	2745695	200.000	206.21(A)
	89 1,2-Dibromo-3-Chloropropane	155	10.657	10.657	(1.102)	86827	200.000	200.34(A)
	57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	693307	200.000	200.18(A)

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111811.D Page 2
Report Date: 06-Dec-2019 19:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
88	1,2-Dichlorobenzene	146	9.998	9.998	(1.034)	1508205	200.000	202.51(A)
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	865099	200.000	200.81(A)
42	1,2-Dichloropropane	63	5.443	5.443	(1.095)	629023	200.000	194.03
75	1,3,5-Trimethylbenzene	105	9.074	9.074	(0.939)	2668415	200.000	208.86(A)
83	1,3-Dichlorobenzene	146	9.612	9.612	(0.994)	1590132	200.000	197.60
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	1018788	200.000	194.39
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	1621999	200.000	198.35
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	972273	200.000	199.24
24	2-Butanone	43	3.580	3.580	(0.856)	437867	400.000	386.18(A)
76	2-Chlorotoluene	91	8.981	8.981	(0.929)	2019887	200.000	200.07(A)
52	2-Hexanone	43	7.090	7.090	(0.924)	806375	400.000	397.51(A)
77	4-Chlorotoluene	91	9.074	9.074	(0.939)	2525879	200.000	206.41(A)
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	2843849	200.000	207.12(A)
45	4-Methyl-2-Pentanone	43	6.331	6.331	(0.825)	1178590	400.000	407.33(A)
10	Acetone	43	1.976	1.976	(0.473)	372223	400.000	400.25(A)
37	Benzene	78	4.512	4.512	(0.908)	2449808	200.000	197.34
74	Bromobenzene	156	8.809	8.809	(0.911)	958177	200.000	196.47
29	Bromochloromethane	128	3.795	3.795	(0.908)	376537	200.000	188.10
39	Bromodichloromethane	83	5.729	5.729	(1.153)	893499	200.000	198.95
66	Bromoform	173	8.415	8.415	(1.097)	602595	200.000	201.83(A)
6	Bromomethane	94	1.331	1.331	(0.318)	631015	200.000	177.48(M)
19	Carbon Disulfide	76	2.069	2.069	(0.495)	3628864	400.000	425.96(A)
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	954439	200.000	199.03(H)
59	Chlorobenzene	112	7.699	7.699	(1.004)	1940751	200.000	201.30(A)
7	Chloroethane	64	1.396	1.396	(0.334)	459143	200.000	197.35
28	Chloroform	83	3.910	3.910	(0.935)	1152726	200.000	192.62
3	Chloromethane	50	1.073	1.073	(0.257)	811388	200.000	201.60(A)
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	721487	200.000	205.88(A)
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	1069987	200.000	202.17(A)
55	Dibromochloromethane	129	7.183	7.183	(0.937)	764698	200.000	203.91(A)
44	Dibromomethane	93	5.557	5.557	(1.118)	451528	200.000	196.82
2	Dichlorodifluoromethane	85	0.966	0.966	(0.231)	695305	200.000	203.74(A)
61	Ethylbenzene	106	7.807	7.807	(1.018)	1011964	200.000	203.15(A)
91	Hexachlorobutadiene	225	11.488	11.488	(1.188)	373475	200.000	191.48
67	Isopropylbenzene	105	8.566	8.566	(1.117)	3082382	200.000	208.91(A)
62	m,p-Xylenes	106	7.907	7.907	(1.031)	2525960	400.000	420.22(A)
17	Methylene Chloride	84	2.305	2.305	(0.551)	644942	200.000	193.02
87	n-Butylbenzene	91	9.998	9.998	(1.034)	2465783	200.000	215.80(A)
73	n-Propylbenzene	91	8.917	8.917	(0.922)	3540988	200.000	204.15(A)
92	Naphthalene	128	11.546	11.546	(1.194)	574298	200.000	189.43
63	o-Xylene	106	8.244	8.244	(1.075)	1231007	200.000	207.50(A)
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	3131997	200.000	207.86(A)
64	Styrene	104	8.265	8.265	(1.078)	2199171	200.000	213.18(A)
78	tert-Butylbenzene	119	9.339	9.339	(0.966)	2240944	200.000	204.85(A)
56	Tetrachloroethene	164	6.933	6.933	(0.904)	660581	200.000	190.38
50	Toluene	91	6.453	6.453	(0.841)	2834294	200.000	202.39(A)
20	trans-1,2-Dichloroethene	96	2.527	2.527	(0.604)	630988	200.000	207.54(A)
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	1000892	200.000	207.50(A)
38	Trichloroethene	130	5.206	5.206	(1.048)	754871	200.000	198.90
8	Trichlorofluoromethane	101	1.553	1.553	(0.371)	1241567	200.000	216.59(A)
5	Vinyl Chloride	62	1.138	1.138	(0.272)	773023	200.000	205.26(A)

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

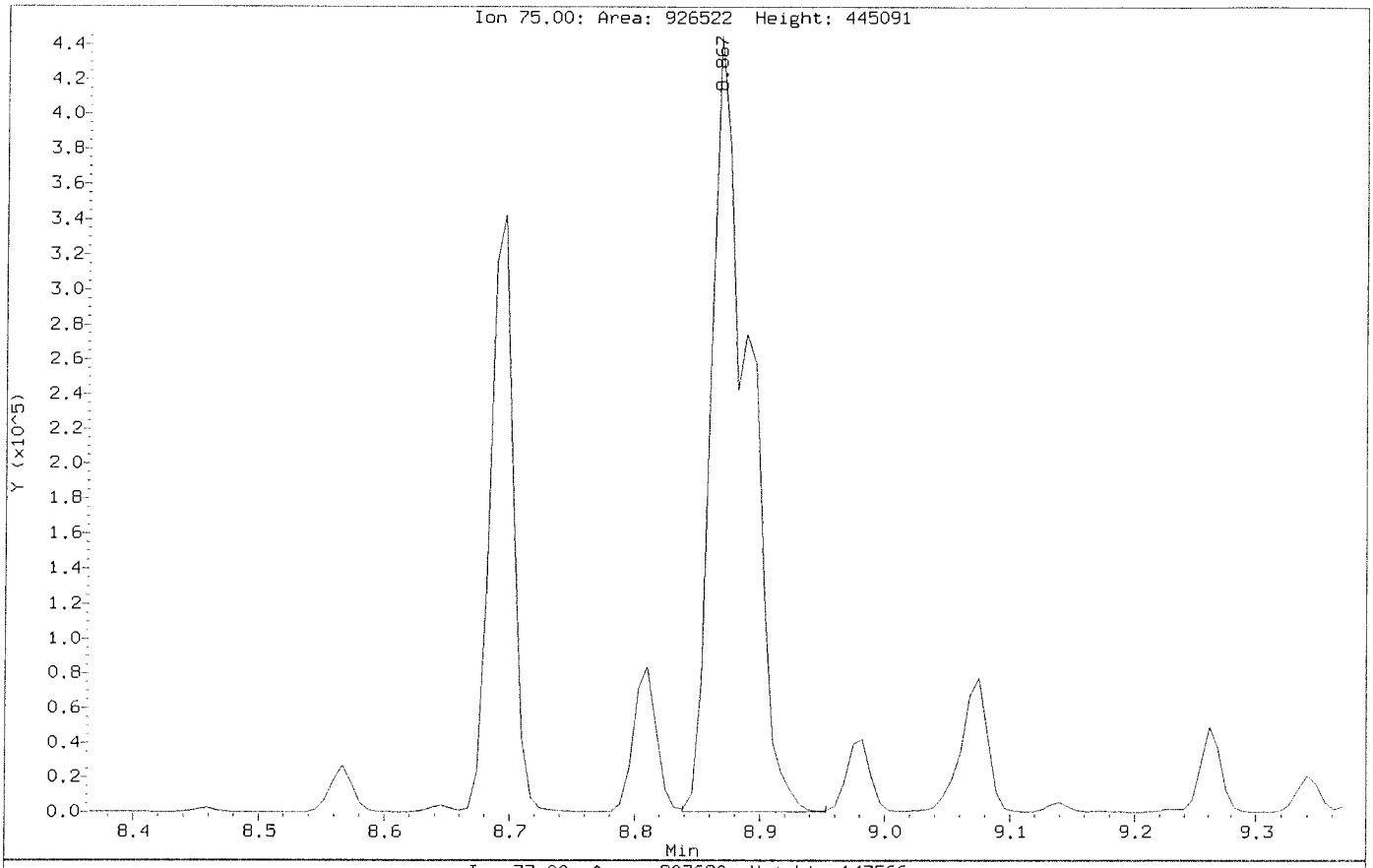


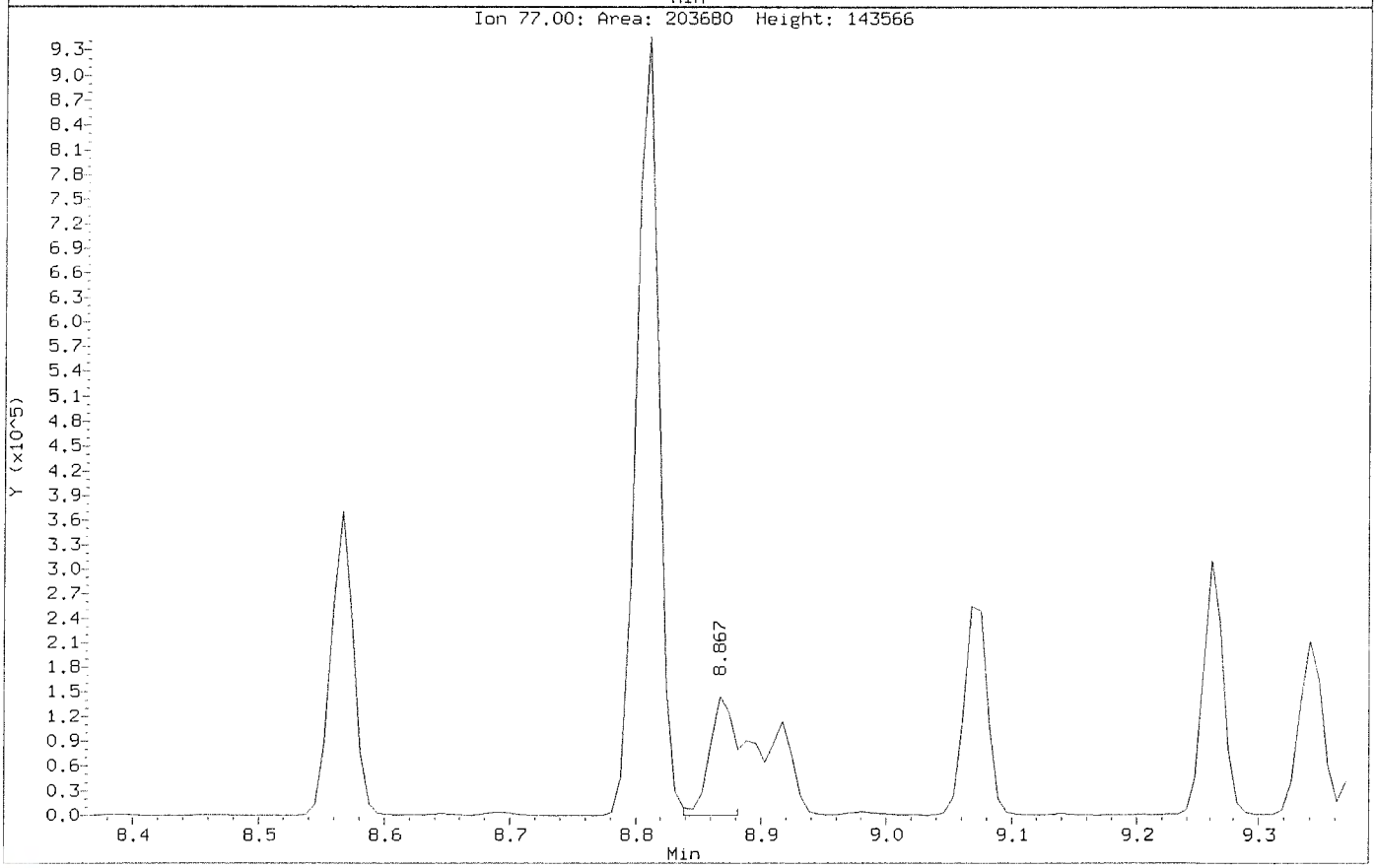
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Client ID: VSTD200
Sample Info: VSTD200;VSTD200;1;10;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\BEFORE\X111811.D
Injection Date: 18-NOV-2019 17:46
Instrument: voa6.i
Client Sample ID: VSTD200

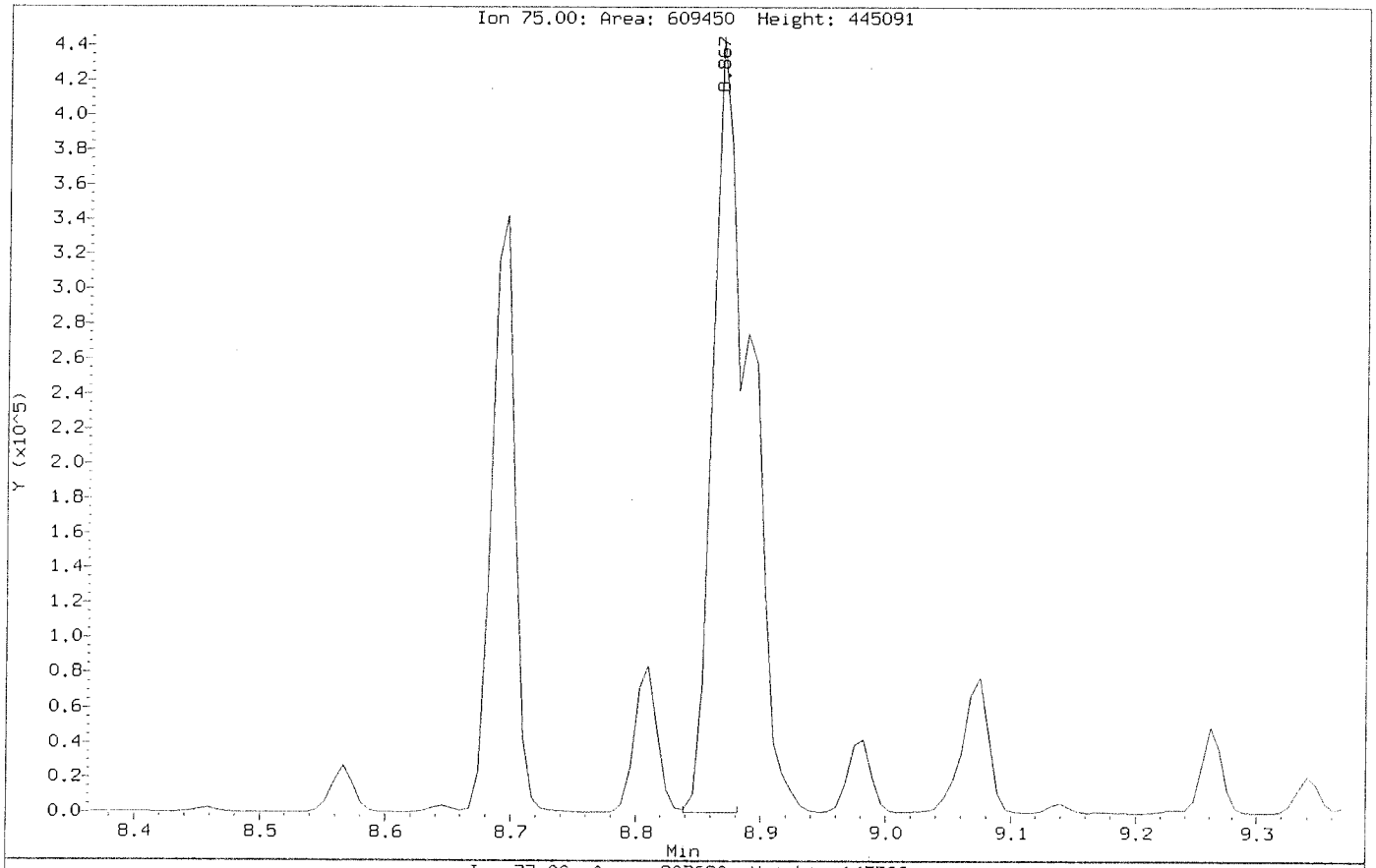
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CAS Number: 96-18-4

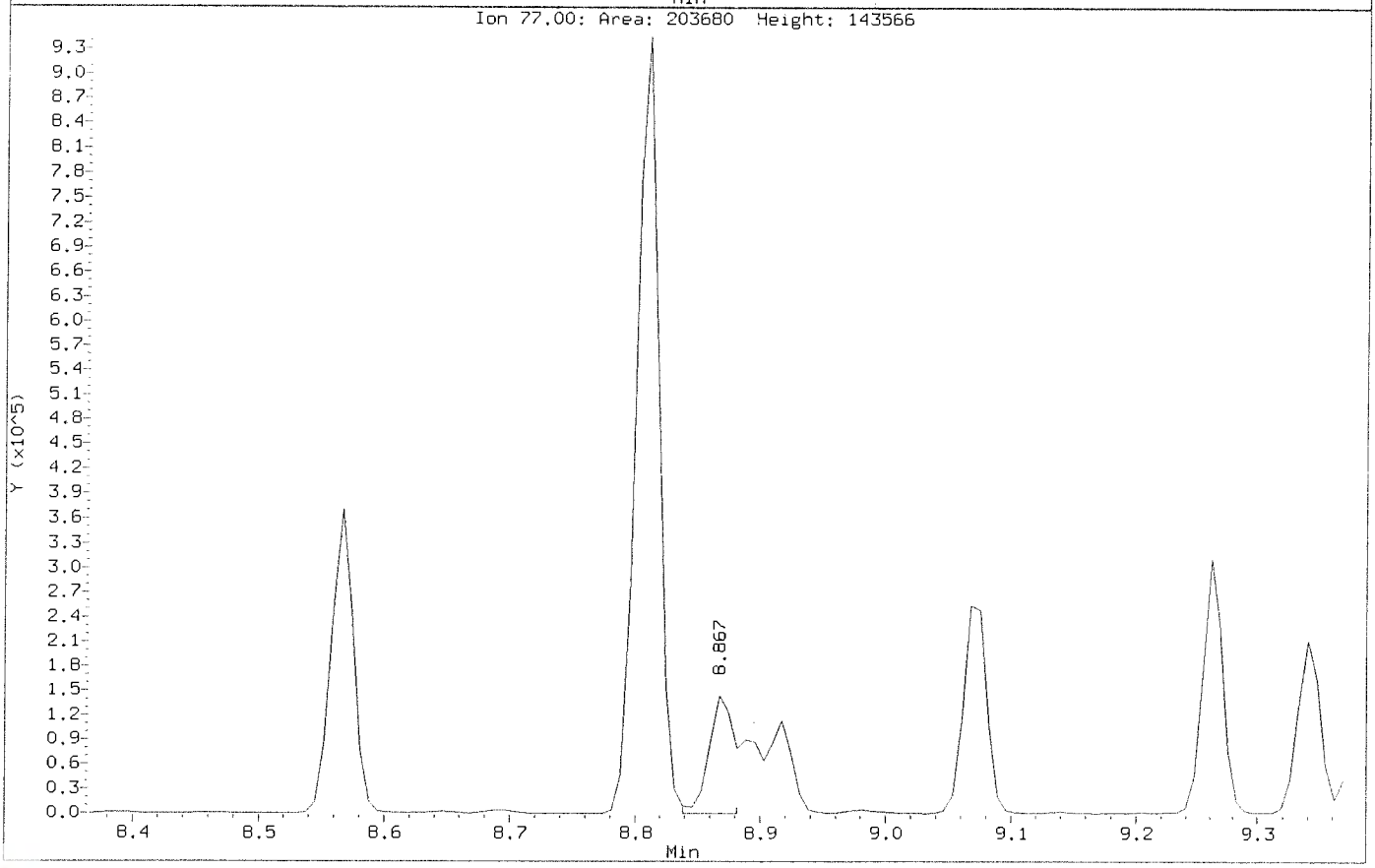




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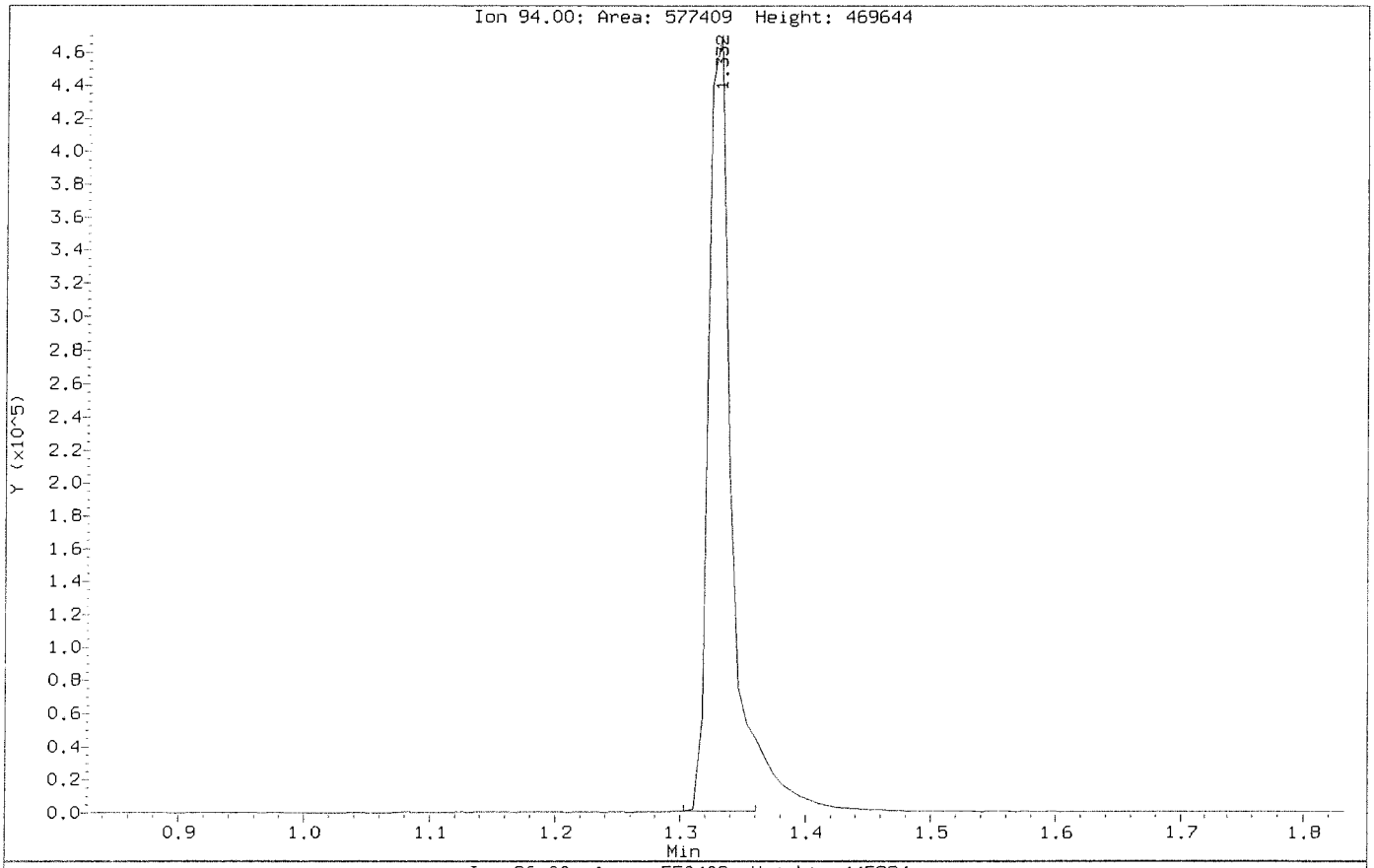
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CAS Number: 96-18-4

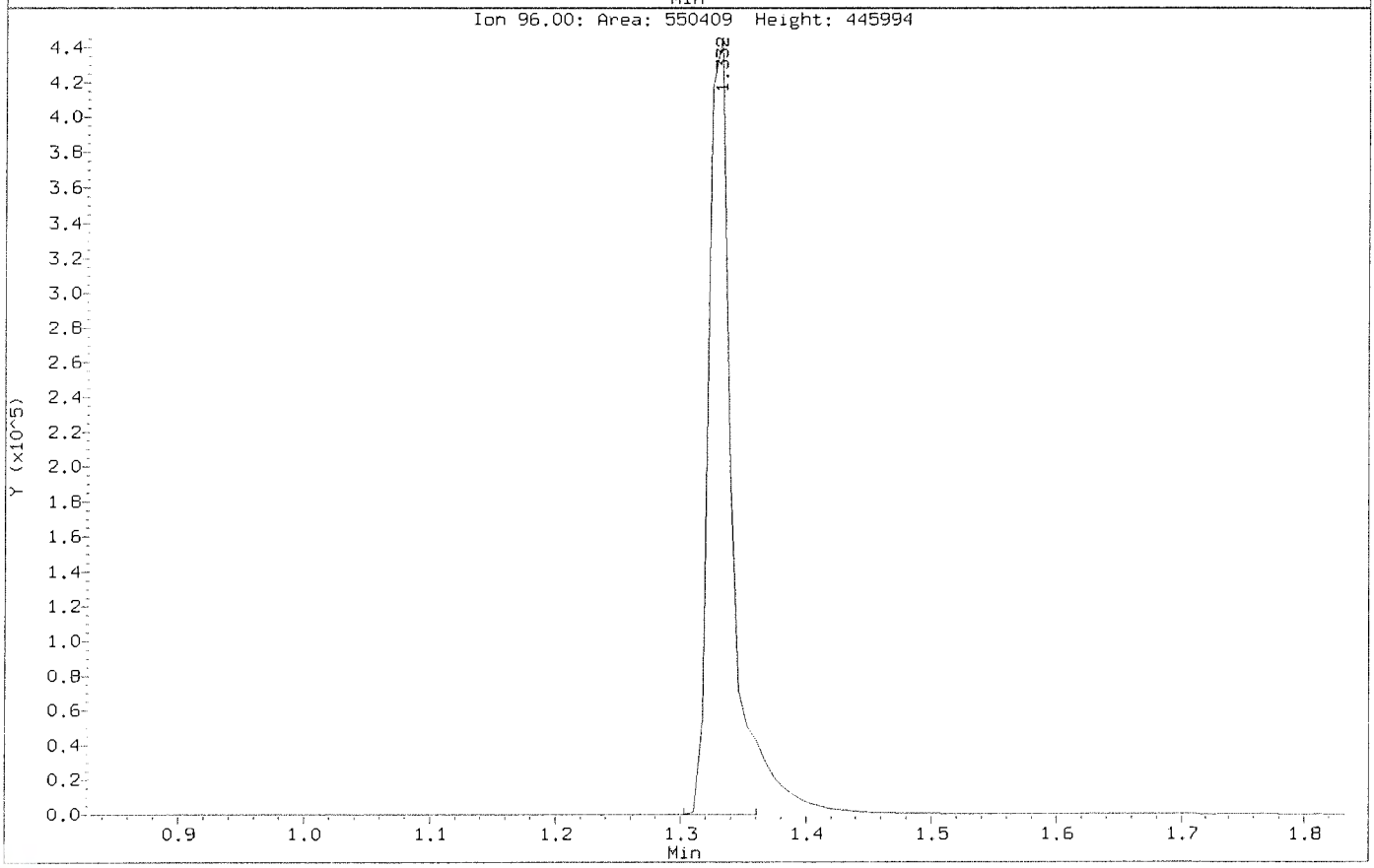




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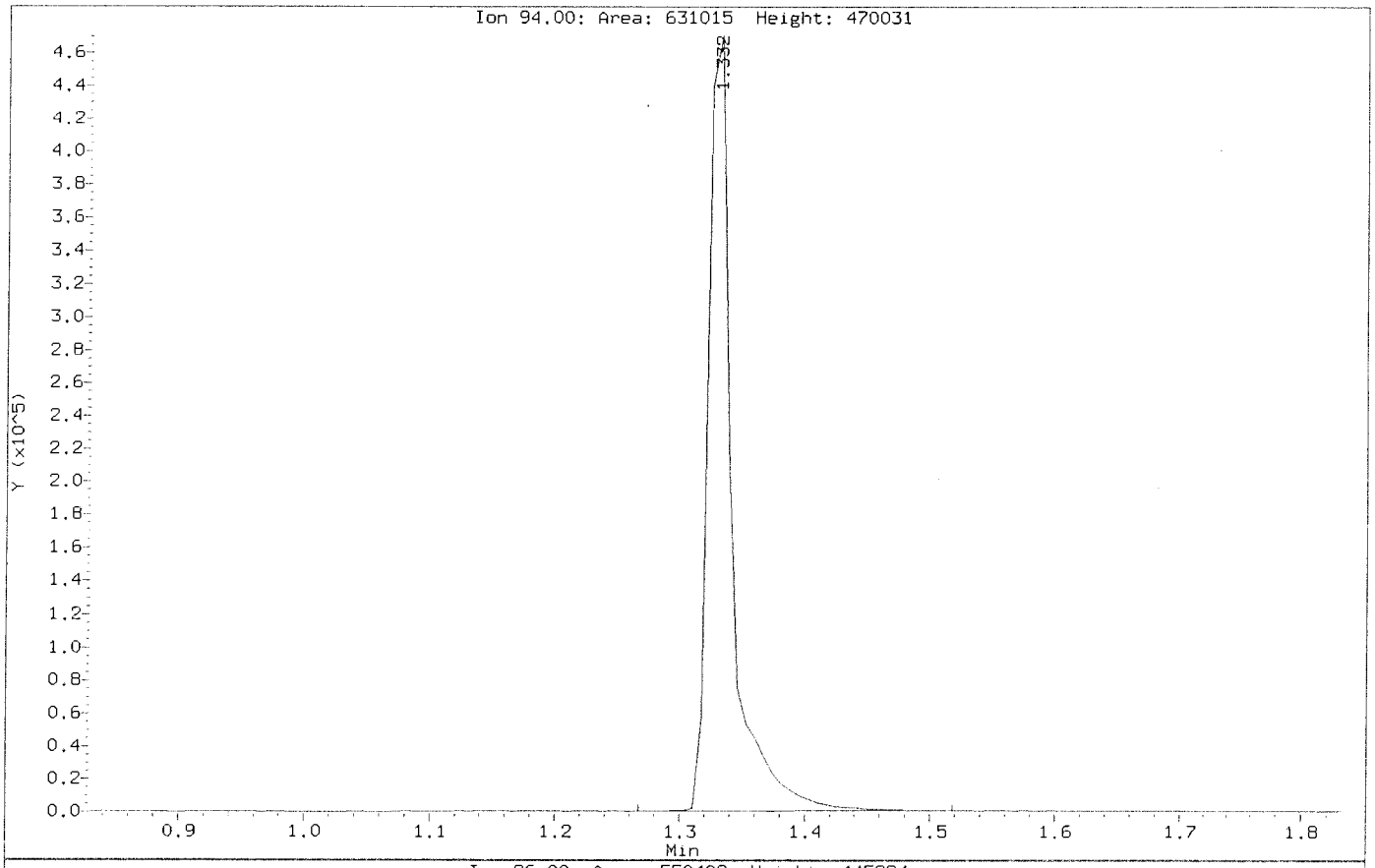
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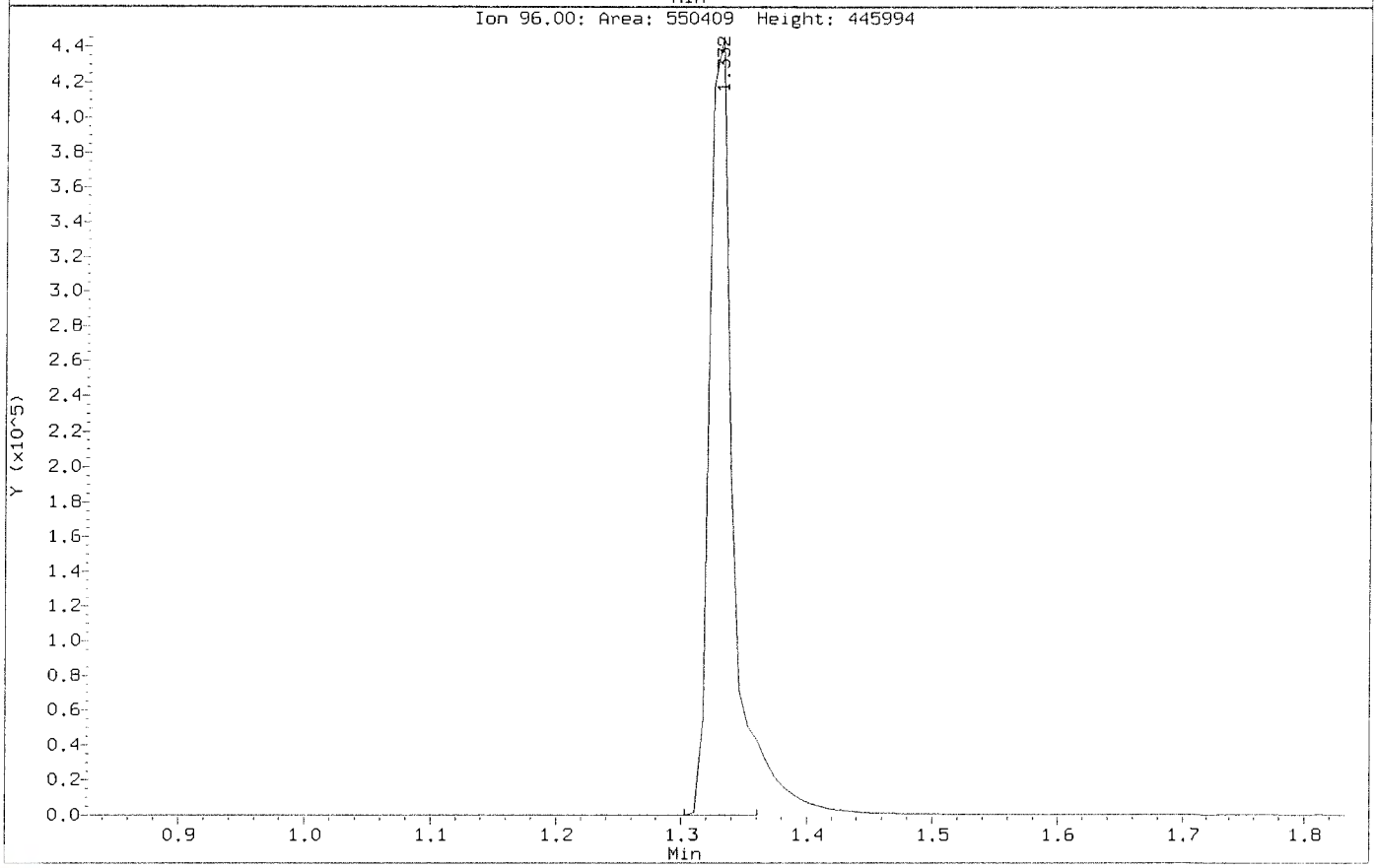




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Instrument: voa6.i
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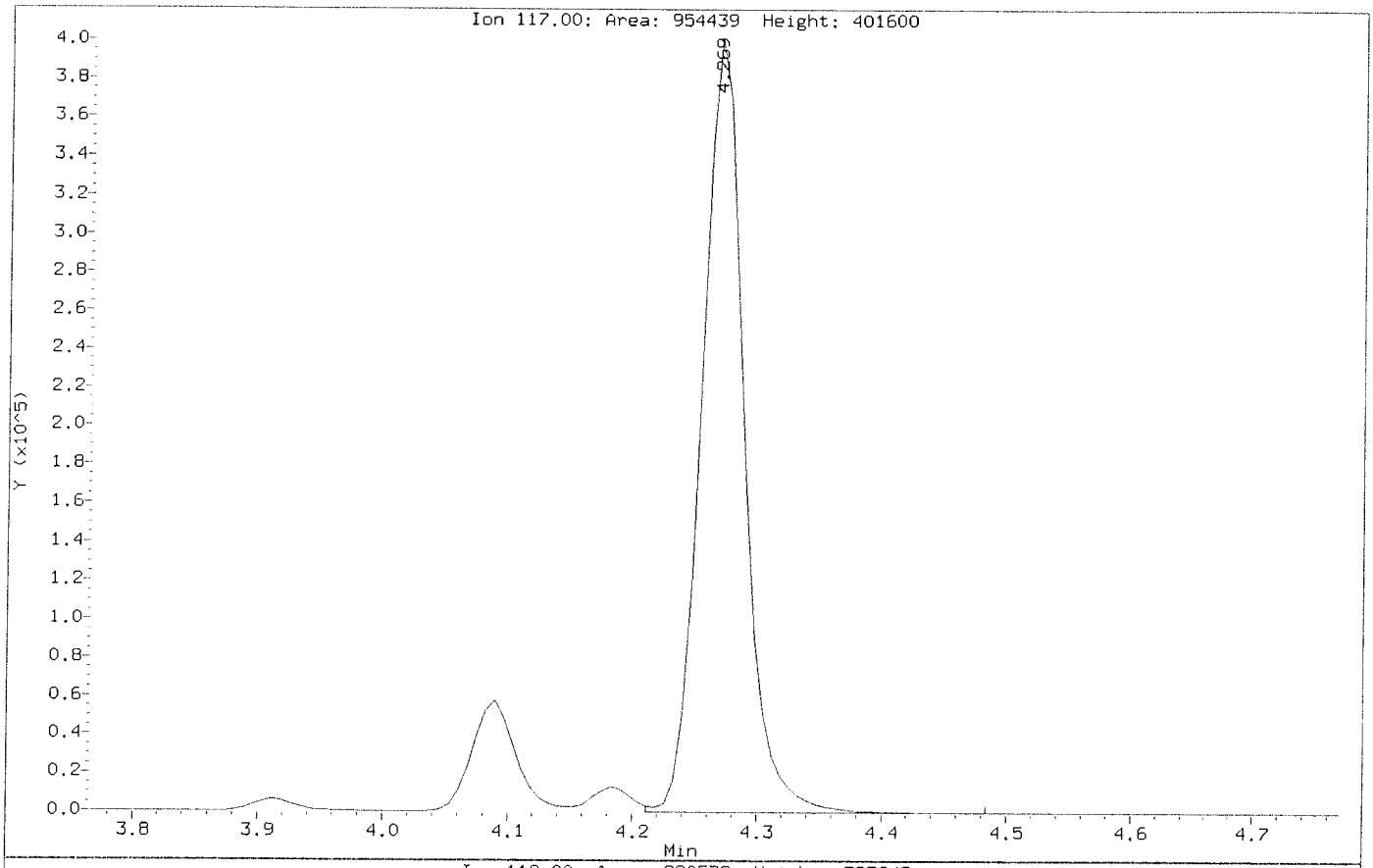
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CAS Number: 74-83-9

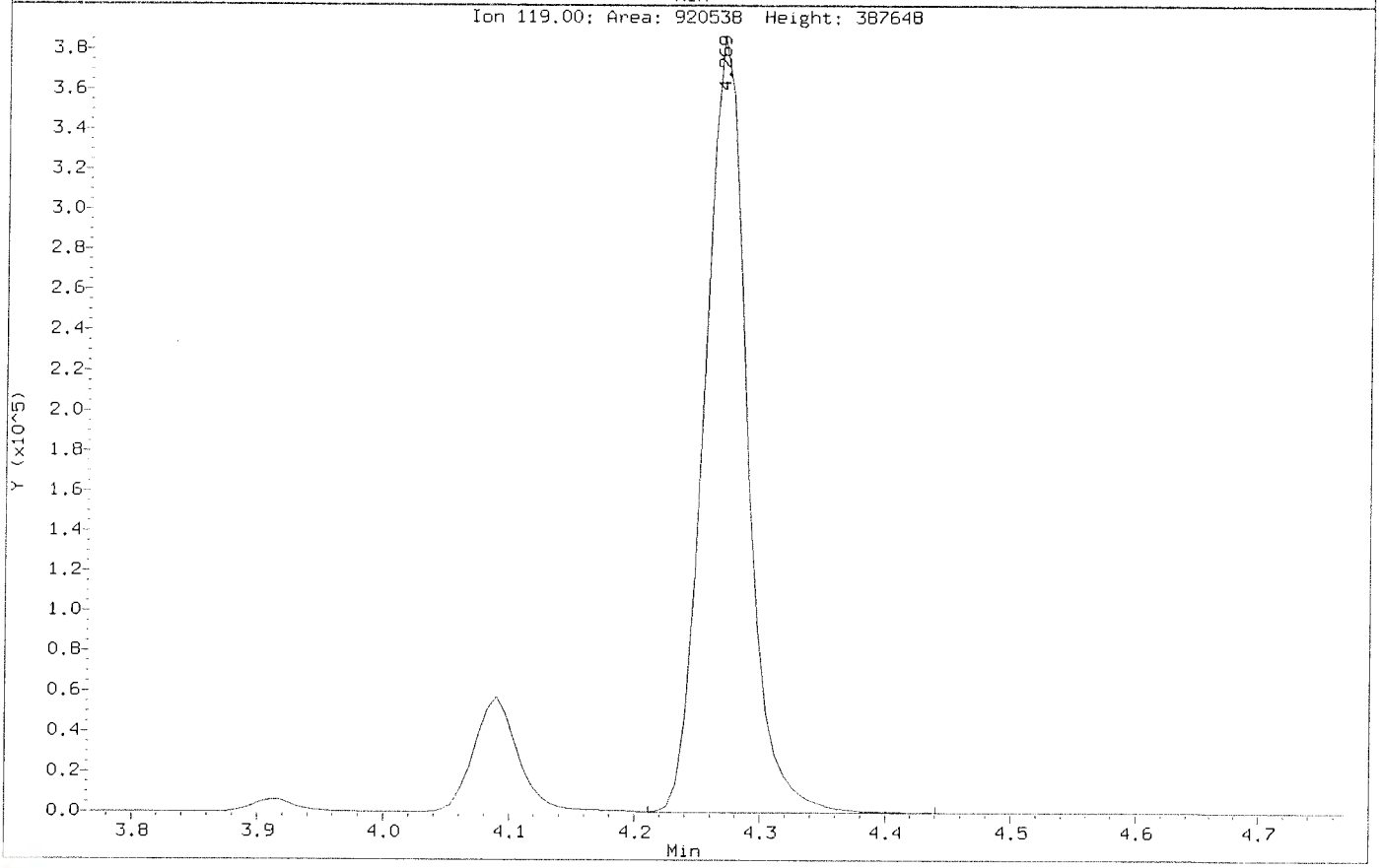




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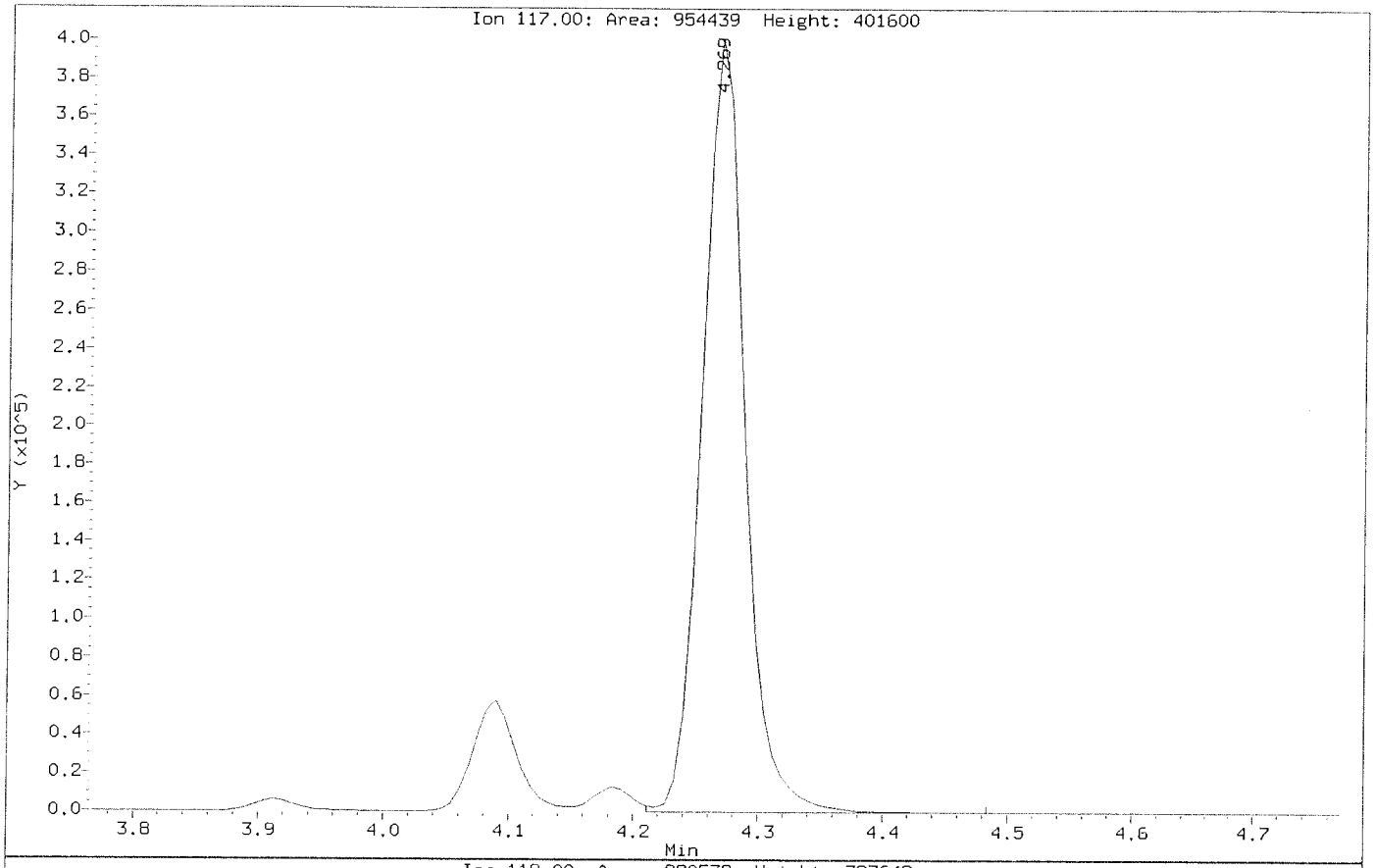
Compound: Carbon Tetrachloride
CAS Number: 56-23-5

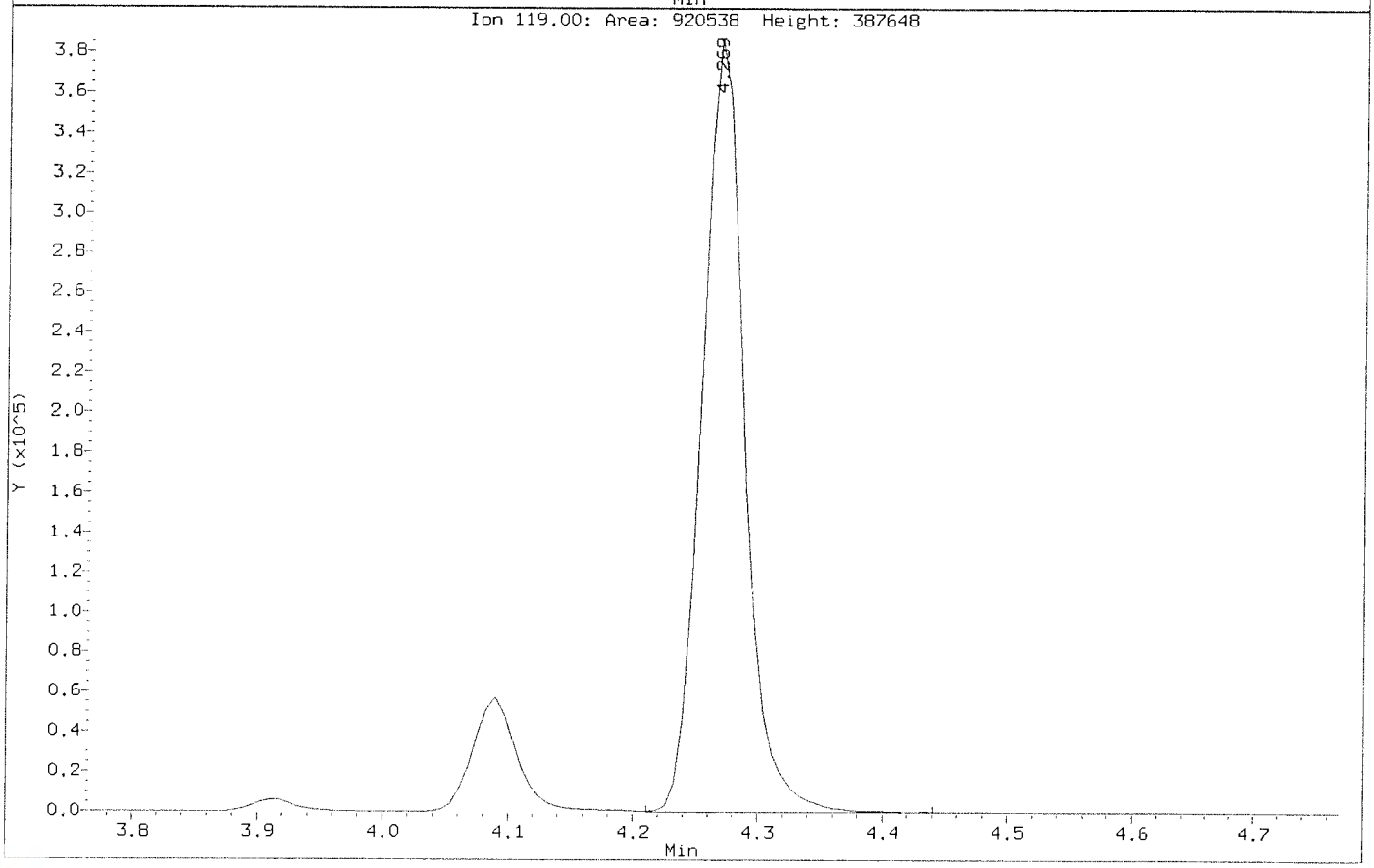




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Injection Date: 18-NOV-2019 17:46
Instrument: voa6.i
Client Sample ID: VSTD200

Compound: Carbon Tetrachloride
CAS Number: 56-23-5





Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111814.D Page 1
Report Date: 06-Dec-2019 19:56

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191118.b\X111814.D
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 18-NOV-2019 18:58
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\X191118.b\8260W.m
Meth Date : 06-Dec-2019 19:56 voa6.i Quant Type: ISTD
Cal Date : 18-NOV-2019 17:46 Cal File: X111811.D
Als bottle: 15 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

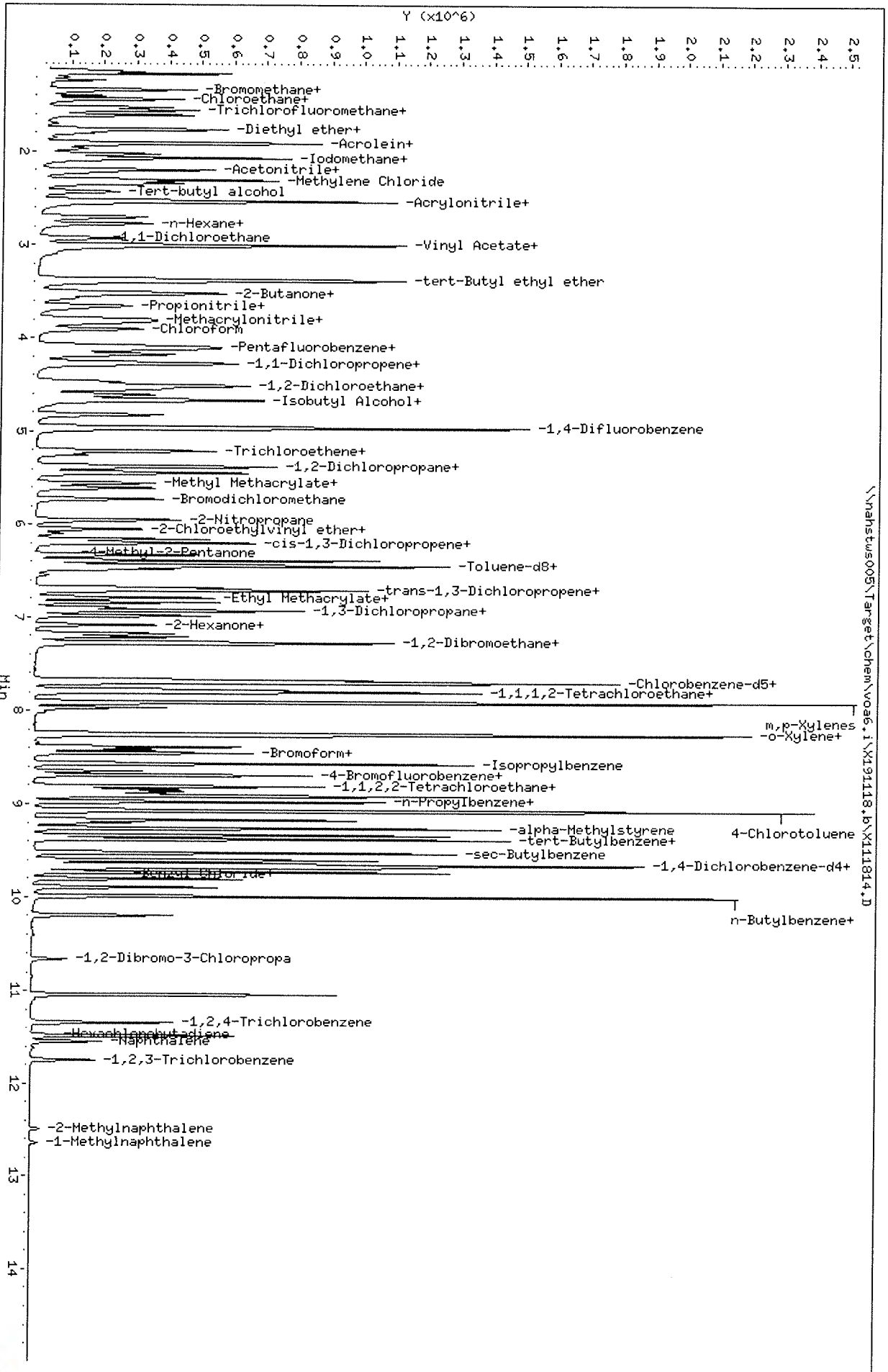
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	365284	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	526230	50.0000	
* 47 Chlorobenzene-d5	117	7.670	7.670	(1.000)	487659	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	262170	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	177715	51.6875	51.68
$ 69 4-Bromofluorobenzene	95	8.688	8.695	(1.133)	217553	47.9674	47.96
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	172534	51.9307	51.93
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	603087	46.9372	46.93
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	181751	51.3728	51.37
31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	259914	52.7430	52.74
68 1,1,2,2-Tetrachloroethane	83	8.845	8.845	(0.915)	183157	49.6822	49.68
138 Freon TF	101	1.919	1.911	(0.459)	177448	55.7980	55.79
53 1,1,2-Trichloroethane	83	6.840	6.847	(0.892)	125473	49.2205	49.22
22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	273555	51.4692	51.46
11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	164159	53.0287	53.02
32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	211745	49.8829	49.88
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	56746	58.2884	58.28
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	154338	49.4088	49.40(M)
90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	122229	55.3465	55.34
79 1,2,4-Trimethylbenzene	105	9.382	9.382	(0.970)	627033	50.4058	50.40
89 1,2-Dibromo-3-Chloropropane	155	10.657	10.657	(1.102)	20914	51.3981	51.39
57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	171012	50.0005	50.00

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111814.D Page 2
Report Date: 06-Dec-2019 19:56

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
88	1,2-Dichlorobenzene	146	9.998	9.998	(1.034)	343886	49.4226	49.42
33	1,2-Dichloroethane	62	4.555	4.562	(0.916)	214666	51.3880	51.38
42	1,2-Dichloropropane	63	5.436	5.443	(1.094)	155619	49.5052	49.50
75	1,3,5-Trimethylbenzene	105	9.067	9.074	(0.938)	621241	52.0454	52.04
83	1,3-Dichlorobenzene	146	9.604	9.612	(0.993)	380305	50.5823	50.58
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	254579	49.1895	49.18
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	379206	49.6335	49.63
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	252567	52.3575	52.35
24	2-Butanone	43	3.573	3.580	(0.854)	117980	105.260	105.25
76	2-Chlorotoluene	91	8.974	8.981	(0.928)	475545	50.4166	50.41
52	2-Hexanone	43	7.090	7.090	(0.924)	192493	96.0902	96.09
77	4-Chlorotoluene	91	9.074	9.074	(0.939)	578291	50.5814	50.58
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	664137	51.7722	51.77
45	4-Methyl-2-Pentanone	43	6.324	6.331	(0.824)	279109	97.6823	97.68
10	Acetone	43	1.969	1.976	(0.471)	104925	111.376	111.37
37	Benzene	78	4.512	4.512	(0.908)	612198	50.8565	50.85
74	Bromobenzene	156	8.809	8.809	(0.911)	233126	51.1647	51.16
29	Bromochloromethane	128	3.795	3.795	(0.908)	101596	51.3407	51.34
39	Bromodichloromethane	83	5.729	5.729	(1.153)	222106	51.0024	51.00
66	Bromoform	173	8.415	8.415	(1.097)	142491	49.0895	49.08
6	Bromomethane	94	1.338	1.331	(0.320)	208417	57.7314	57.73
19	Carbon Disulfide	76	2.069	2.069	(0.495)	924383	109.763	109.76
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	237498	51.0754	51.07
59	Chlorobenzene	112	7.699	7.699	(1.004)	468418	49.2009	49.20
7	Chloroethane	64	1.403	1.396	(0.336)	118785	51.6484	51.64
28	Chloroform	83	3.910	3.910	(0.935)	292027	49.3641	49.36
3	Chloromethane	50	1.073	1.073	(0.257)	200113	50.4397	50.43
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	184183	53.1686	53.16
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	267228	52.0716	52.07
55	Dibromochloromethane	129	7.176	7.183	(0.936)	184910	49.9303	49.93
44	Dibromomethane	93	5.557	5.557	(1.118)	112351	50.5059	50.50
2	Dichlorodifluoromethane	85	0.973	0.966	(0.233)	176572	52.9949	52.99
61	Ethylbenzene	106	7.799	7.807	(1.017)	247055	50.2234	50.22
91	Hexachlorobutadiene	225	11.481	11.488	(1.187)	113053	61.6918	61.69(R)
67	Isopropylbenzene	105	8.566	8.566	(1.117)	730633	50.1455	50.14
62	m,p-Xylenes	106	7.907	7.907	(1.031)	603641	101.692	101.69
17	Methylene Chloride	84	2.305	2.305	(0.551)	164000	49.6528	49.65
87	n-Butylbenzene	91	9.998	9.998	(1.034)	555875	52.0702	52.07
73	n-Propylbenzene	91	8.917	8.917	(0.922)	841108	51.9034	51.90
92	Naphthalene	128	11.546	11.546	(1.194)	144573	51.0408	51.04
63	o-Xylene	106	8.243	8.244	(1.075)	291303	49.7239	49.72
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	728868	51.7743	51.77
64	Styrene	104	8.258	8.265	(1.077)	512981	50.3548	50.35
78	tert-Butylbenzene	119	9.339	9.339	(0.966)	525095	51.3776	51.37
56	Tetrachloroethene	164	6.933	6.933	(0.904)	169030	49.3314	49.33
50	Toluene	91	6.446	6.453	(0.840)	685240	49.5512	49.55
20	trans-1,2-Dichloroethene	96	2.527	2.527	(0.604)	157233	52.3156	52.31
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	242451	51.8354	51.83
38	Trichloroethene	130	5.206	5.206	(1.048)	190582	51.7868	51.78
8	Trichlorofluoromethane	101	1.560	1.553	(0.373)	314898	55.5726	55.57
5	Vinyl Chloride	62	1.138	1.138	(0.272)	193522	51.9818	51.98

QC Flag Legend

R - Spike/Surrogate failed recovery limits.
M - Compound response manually integrated.

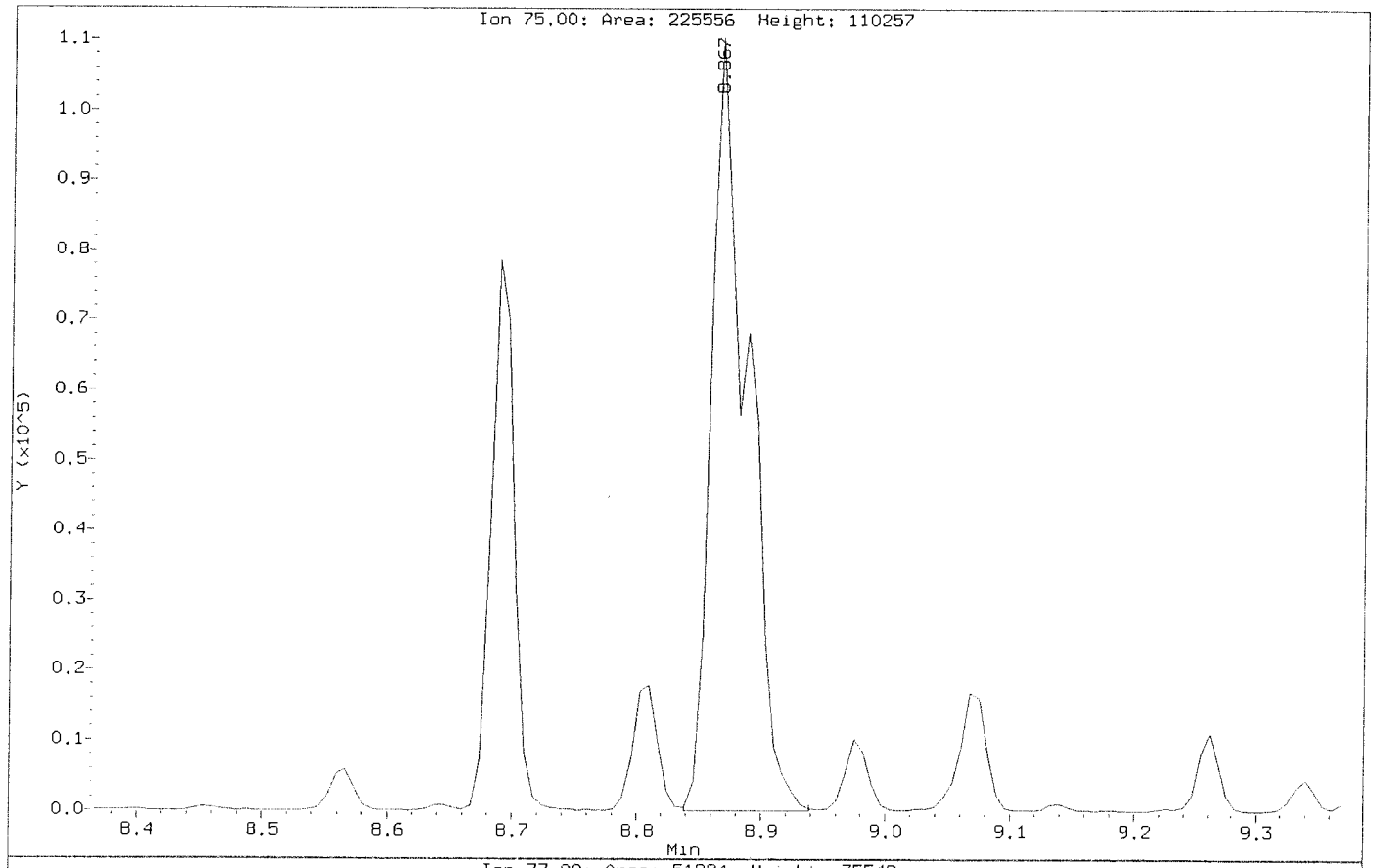


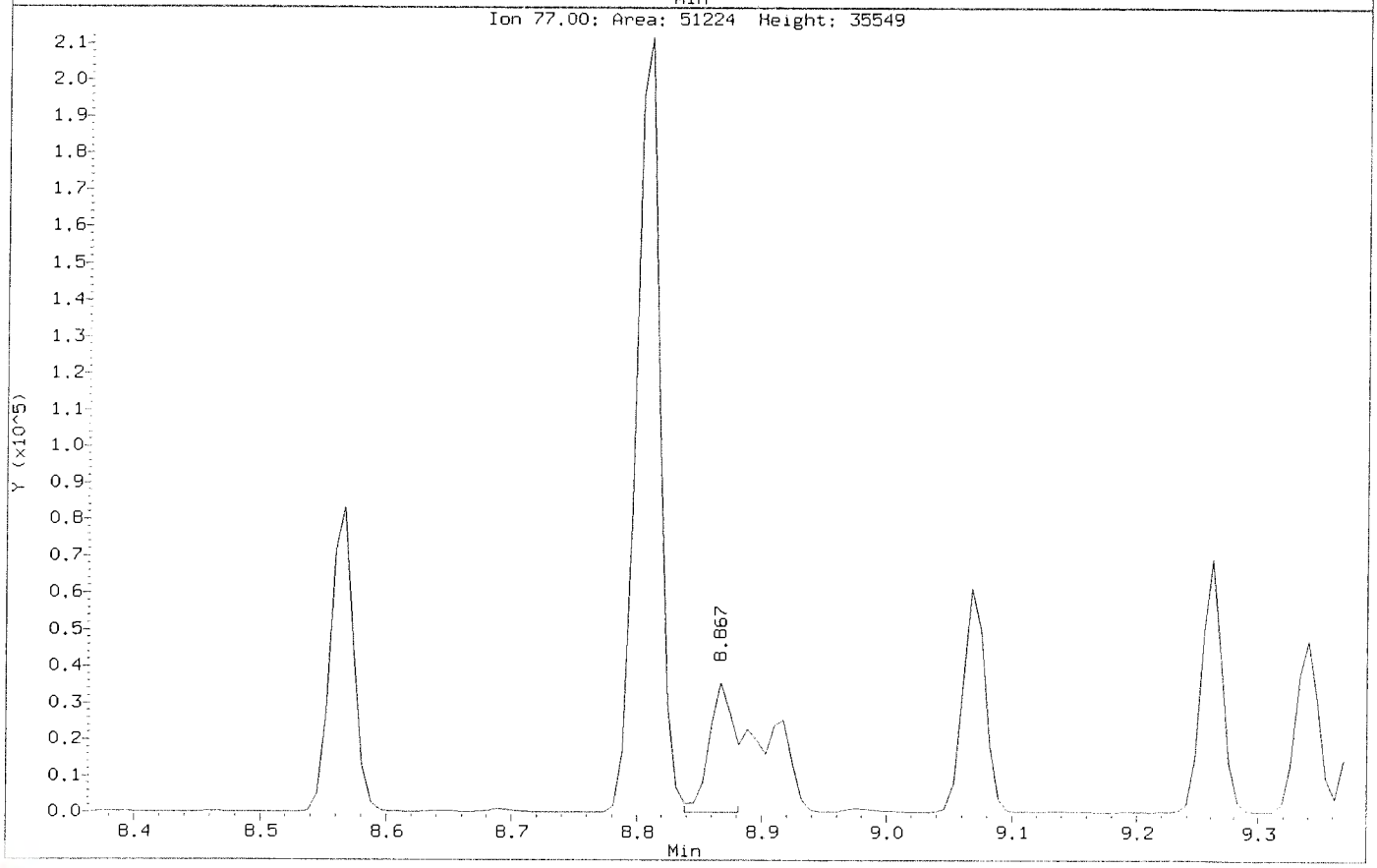
Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111814.D
Date : 18-NOV-2019 18:58
Client ID: ICV
Sample Info: CCV;CCV;2;;ICV
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\BEFORE\X111814.D
Injection Date: 18-NOV-2019 18:58
Instrument: voa6.i
Client Sample ID: ICV

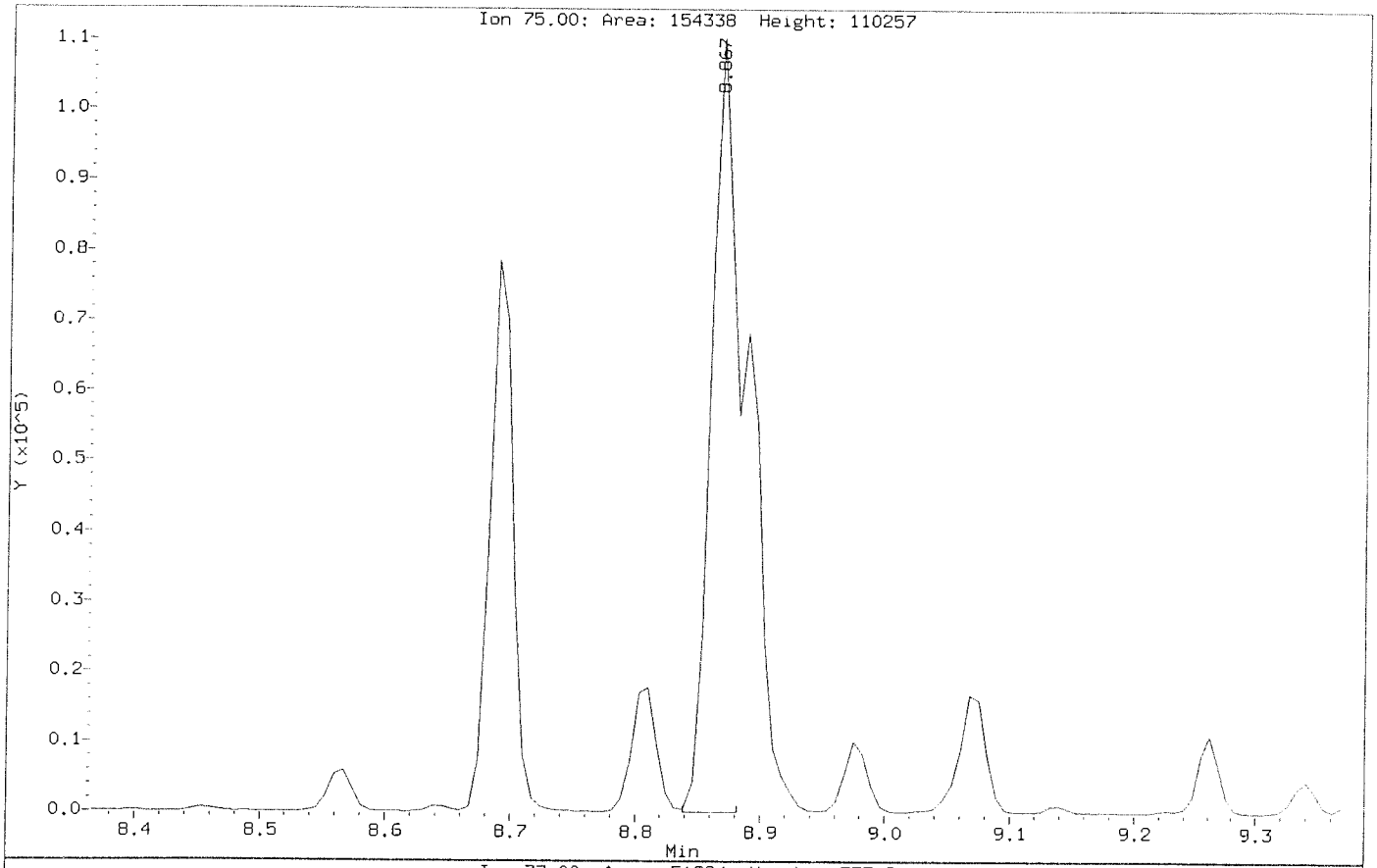
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4

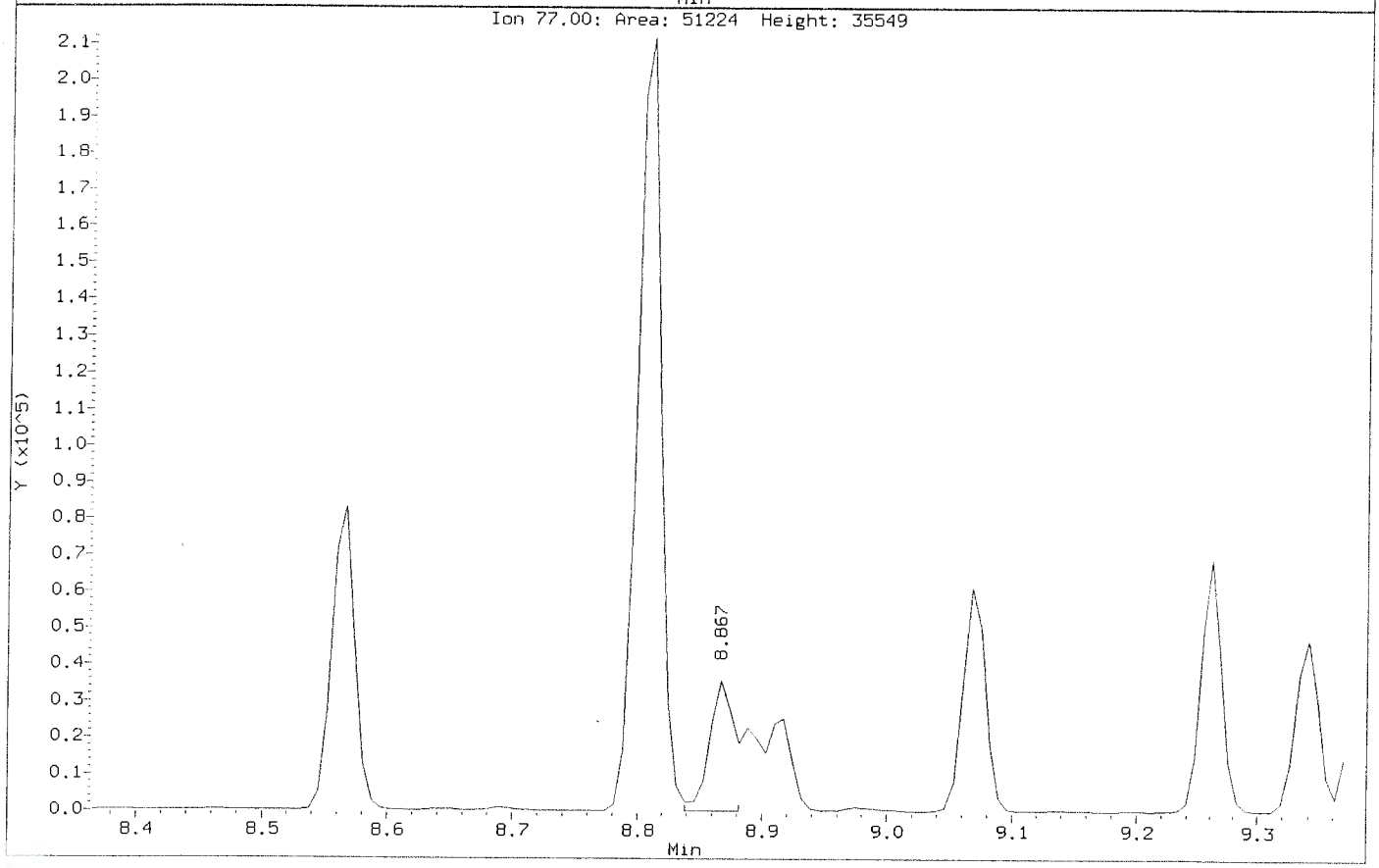




Data File: \\nahstws005\Target\chem\voa6.i\X191118.b\X111814.D
Injection Date: 18-NOV-2019 18:58
Instrument: voa6.i
Client Sample ID: ICV

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4





MSVOA06 -Logbook

Batch: 38368 **Analyst:** Presenta Cabascango

Date: 11-19-2019 **Reviewer:**

Method: 8260 **Laboratory:** Houston

Comments:

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	11-19-2019 09:37 am	1.00	50 mL	50 mL	X111901.D	Liquid	Y	na
	Auto find/ purged									
2	CCV	CCV	11-19-2019 10:01 am	1.00	50 mL	50 mL	X111902a.D	Liquid	Y	na
	10 uL cal std/50 mL DI/not used									
3	CCV	CCV	11-19-2019 10:25 am	1.00	50 mL	50 mL	X111903.D	Liquid	Y	na
	10 uL cal std/50 mL DI									
4	CCB	SAMP	11-19-2019 10:49 am	1.00	50 mL	50 mL	X111904.D	Liquid	Y	na
5	VLCSW-191119	LCS	11-19-2019 11:13 am	1.00	50 mL	50 mL	X111905.D	Liquid	Y	na
	4.0 uL cal std/50 mL DI									
6	BLK	SAMP	11-19-2019 11:37 am	1.00	50 mL	50 mL	X111906.D	Liquid	Y	na
7	VBLKW-191119	MBLK	11-19-2019 12:01 pm	1.00	50 mL	50 mL	X111907.D	Liquid	Y	na
8	HS19110684-05	SAMP	11-19-2019 12:25 pm	1.00	50 mL	50 mL	X111908.D	Liquid	Y	>2
9	HS19110684-01	SAMP	11-19-2019 12:49 pm	1.00	50 mL	50 mL	X111909.D	Liquid	Y	>2
10	HS19110684-04	SAMP	11-19-2019 01:13 pm	1.00	50 mL	50 mL	X111910.D	Liquid	Y	>2
11	HS19110684-02	SAMP	11-19-2019 01:37 pm	1.00	50 mL	50 mL	X111911.D	Liquid	Y	>2
12	HS19110684-03	SAMP	11-19-2019 02:01 pm	25.00	2 mL	50 mL	X111912.D	Liquid	Y	>2
13	HS19110684-04MS	MS	11-19-2019 02:25 pm	1.00	50 mL	50 mL	X111913.D	Liquid	Y	>2
	3.5 uL cal std/40 mL samp									
14	HS19110684-04MSD	MSD	11-19-2019 02:49 pm	1.00	50 mL	50 mL	X111914.D	Liquid	Y	>2
	3.5 uL cal std/40 mL samp									
15	HS19110684-03	SAMP	11-19-2019 03:13 pm	250.0(	200 µL	50 mL	X111915.D	Liquid	Y	>2
16	CCV-END	CCV	11-19-2019 03:37 pm	1.00	50 mL	50 mL	X111916.D	Liquid	Y	na
	10 uL cal std/50 mL DI									
17	HS19110839-04	SAMP	11-19-2019 04:01 pm	1.00	50 mL	50 mL	X111917.D	Liquid	Y	>2
18	HS19110757-15	SAMP	11-19-2019 04:25 pm	1.00	50 mL	50 mL	X111918.D	Liquid	Y	>2
19	HS19110913-01	SAMP	11-19-2019 04:50 pm	1.00	50 mL	50 mL	X111919.D	Liquid	Y	>2
20	HS19110913-02	SAMP	11-19-2019 05:14 pm	1.00	50 mL	50 mL	X111920.D	Liquid	Y	>2
21	HS19110830-09	SAMP	11-19-2019 05:38 pm	1.00	50 mL	50 mL	X111921.D	Liquid	Y	>2
22	HS19110749-06	SAMP	11-19-2019 06:02 pm	1.00	50 mL	50 mL	X111922.D	Liquid	Y	>2
23	HS19110749-07	SAMP	11-19-2019 06:26 pm	1.00	50 mL	50 mL	X111923.D	Liquid	Y	>2
24	HS19110749-01	SAMP	11-19-2019 06:50 pm	1.00	50 mL	50 mL	X111924.D	Liquid	Y	>2
25	HS19110749-03	SAMP	11-19-2019 07:14 pm	1.00	50 mL	50 mL	X111925.D	Liquid	Y	>2
26	HS19110749-04	SAMP	11-19-2019 07:38 pm	5.00	10 mL	50 mL	X111926.D	Liquid	Y	>2
27	HS19110749-04	SAMP	11-19-2019 08:02 pm	50.00	1 mL	50 mL	X111927.D	Liquid	Y	>2
28	HS19110749-02	SAMP	11-19-2019 08:26 pm	100.0(	500 µL	50 mL	X111928.D	Liquid	Y	>2
29	HS19110749-02	SAMP	11-19-2019 08:50 pm	2500.0	20 µL	50 mL	X111929.D	Liquid	Y	>2
30	HS19110749-05	SAMP	11-19-2019 09:14 pm	1000.0	50 µL	50 mL	X111930.D	Liquid	Y	>2
31	BLK	SAMP	11-19-2019 09:38 pm	1.00	50 mL	50 mL	X111940.D	Liquid	Y	>2
32	BFB	TUNE	11-19-2019 10:02 pm	1.00	50 mL	50 mL	Y111901.D	Liquid	Y	na
	Auto find/ purged									
33	CCV	CCV	11-19-2019 10:26 pm	1.00	50 mL	50 mL	Y111902a.D	Liquid	Y	na
	10 uL cal std/50 mL DI/not used									
34	CCV	CCV	11-19-2019 10:50 pm	1.00	50 mL	50 mL	Y111903.D	Liquid	Y	na
	10 uL cal std/50 mL DI									
35	CCB	SAMP	11-19-2019 11:14 pm	1.00	50 mL	50 mL	Y111904.D	Liquid	Y	na
36	VLCSW-191119	LCS	11-19-2019 11:38 pm	1.00	50 mL	50 mL	Y111905.D	Liquid	Y	na

MSVOA06 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
37	BLK	SAMP	11-20-2019 12:02 am	1.00	50 mL	50 mL	Y111906.D	Liquid	Y	na
38	VBLKW-191119	MBLK	11-20-2019 12:26 am	1.00	50 mL	50 mL	Y111907.D	Liquid	Y	na
39	HS19110937-03	SAMP	11-20-2019 12:50 am	1.00	50 mL	50 mL	Y111908.D	Liquid	Y	>2
40	HS19110839-02	SAMP	11-20-2019 01:14 am	1.00	50 mL	50 mL	Y111909.D	Liquid	Y	>2
41	HS19110839-02MS	MS	11-20-2019 01:38 am	1.00	50 mL	50 mL	Y111910.D	Liquid	Y	>2
	3.5 uL cal std/40 mL samp									
42	HS19110839-02MSD	MSD	11-20-2019 02:03 am	1.00	50 mL	50 mL	Y111911.D	Liquid	Y	>2
	3.5 uL cal std/40 mL samp									
43	HS19110749-05	SAMP	11-20-2019 02:27 am	10000.(	5 µL	50 mL	Y111912.D	Liquid	Y	>2
44	HS19110839-03	SAMP	11-20-2019 02:51 am	1.00	50 mL	50 mL	Y111913.D	Liquid	Y	>2
45	HS19110775-12	SAMP	11-20-2019 03:15 am	1.00	50 mL	50 mL	Y111914.D	Liquid	Y	>2
46	HS19110775-24	SAMP	11-20-2019 03:39 am	1.00	50 mL	50 mL	Y111915.D	Liquid	Y	>2
47	HS19110797-01	SAMP	11-20-2019 04:03 am	1.00	50 mL	50 mL	Y111916.D	Liquid	Y	>2
48	HS19110797-02	SAMP	11-20-2019 04:27 am	1.00	50 mL	50 mL	Y111917.D	Liquid	Y	>2
49	HS19110797-03	SAMP	11-20-2019 04:51 am	1.00	50 mL	50 mL	Y111918.D	Liquid	Y	>2
50	HS19110797-04	SAMP	11-20-2019 05:15 am	1.00	50 mL	50 mL	Y111919.D	Liquid	Y	>2
51	HS19110775-04	SAMP	11-20-2019 05:39 am	1.00	50 mL	50 mL	Y111920.D	Liquid	Y	>2
52	HS19110775-08	SAMP	11-20-2019 06:03 am	1.00	50 mL	50 mL	Y111921.D	Liquid	Y	>2
53	HS19110775-16	SAMP	11-20-2019 06:27 am	1.00	50 mL	50 mL	Y111922.D	Liquid	Y	>2
54	HS19110775-20	SAMP	11-20-2019 06:51 am	1.00	50 mL	50 mL	Y111923.D	Liquid	Y	>2
55	HS19110758-05	SAMP	11-20-2019 07:15 am	1.00	50 mL	50 mL	Y111924.D	Liquid	Y	>2
56	HS19110758-01	SAMP	11-20-2019 07:39 am	1.00	50 mL	50 mL	Y111925.D	Liquid	Y	>2
57	HS19110758-02	SAMP	11-20-2019 08:03 am	1.00	50 mL	50 mL	Y111926.D	Liquid	Y	>2
58	HS19110758-03	SAMP	11-20-2019 08:28 am	1.00	50 mL	50 mL	Y111927.D	Liquid	Y	>2
59	HS19110758-04	SAMP	11-20-2019 08:52 am	1.00	50 mL	50 mL	Y111928.D	Liquid	Y	>2
60	HS19110758-04	SAMP	11-20-2019 09:16 am	10.00	5 mL	50 mL	Y111929.D	Liquid	Y	>2

Chemical	Value
SURR SPK ID	31106-04-03
IS ID	31106-04-04
ICV STD ID	30603-92-01
LCS/MS ID	30603-92-01
CAL STD ID	31106-04-01/02
BFB ID	31106-04-03
pH Paper	634-64-11

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

	CLIENT SAMPLE NO.	SMC1 #	SMC2 #	SMC3 (TOL) #	OTHER (DCE) #	TOT OUT
01	VLCSW-19119	95	102	94	99	0
02	VBLKW-191119	92	94	95	88	0
03	HS19110684-05	91	94	96	88	0
04	HS19110684-01	92	94	96	88	0
05	HS19110684-04	94	93	95	89	0
06	HS19110684-02	93	95	98	90	0
07	HS19110684-03	92	94	96	88	0
08	HS19110684-04	93	93	96	87	0
09	HS19110684-04	93	93	96	87	0
10	HS19110684-03	93	94	95	88	0
11						
12						
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25						
26						
27						
28						

		QC LIMITS
SMC1	= 4-Bromofluorobenzene	(70-130)
SMC2	= Dibromofluoromethane	(70-130)
SMC3 (TOL)	= Toluene-d8	(0-130)
OTHER(DCE)	= 1,2-Dichloroethane-d4	(0-130)

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-191119

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Lab File ID: X111907 Lab Sample ID: VBLKW-191119

Date Analyzed: 11/19/19 Time Analyzed: 1201

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-19119	VLCSW-191119	X111905	1113
02	HS19110684-0	HS19110684-05	X111908	1225
03	HS19110684-0	HS19110684-01	X111909	1249
04	HS19110684-0	HS19110684-04	X111910	1313
05	HS19110684-0	HS19110684-02	X111911	1337
06	HS19110684-0	HS19110684-03	X111912	1401
07	HS19110684-0	HS19110684-04M	X111913	1425
08	HS19110684-0	HS19110684-04M	X111914	1449
09	HS19110684-0	HS19110684-03	X111915	1513
10				
11				
12				
13				
14				
15				
16				
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25				
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27				
28				
29				
30				

COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Lab File ID: X111901 BFB Injection Date: 11/19/19

Instrument ID: VOA6 BFB Injection Time: 0937

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	22.8
75	30.0 - 60.0% of mass 95	53.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.9
173	Less than 2.0% of mass 174	0.5 (0.7)1
174	Greater than 50.0% of mass 95	69.4
175	5.0 - 9.0% of mass 174	6.0 (8.6)1
176	95.0 - 101.0% of mass 174	67.0 (96.5)1
177	5.0 - 9.0% of mass 176	5.4 (8.0)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	X111903	11/19/19	1025
02	VLCSW-19119	VLCSW-191119	X111905	11/19/19	1113
03	VBLKW-191119	VBLKW-191119	X111907	11/19/19	1201
04	HS19110684-0	HS19110684-05	X111908	11/19/19	1225
05	HS19110684-0	HS19110684-01	X111909	11/19/19	1249
06	HS19110684-0	HS19110684-04	X111910	11/19/19	1313
07	HS19110684-0	HS19110684-02	X111911	11/19/19	1337
08	HS19110684-0	HS19110684-03	X111912	11/19/19	1401
09	HS19110684-0	HS19110684-04M	X111913	11/19/19	1425
10	HS19110684-0	HS19110684-04M	X111914	11/19/19	1449
11	HS19110684-0	HS19110684-03	X111915	11/19/19	1513
12	CCV-END	CCV-END	X111916	11/19/19	1537
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Instrument ID: VOA6 Calibration Date: 11/19/19 Time: 1025

Lab File ID: X111903 Init. Calib. Date(s): 11/18/19 11/18/19

Init. Calib. Times: 1347 1746

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
cis-1,3-Dichloropropene	0.4880000	0.4919329	0.4919329	0.2	-0.80	20.00	AVRG
trans-1,3-Dichloropropene	0.4440000	0.4432824	0.4432824	0.1	0.16	20.00	AVRG
1,3-Dichlorobenzene	1.4340000	1.4375902	1.4375902	0.6	-0.25	20.00	AVRG
2,2-Dichloropropane	0.6600000	0.6285545	0.6285545	0.1	4.76	20.00	AVRG
1,1-Dichloropropene	0.4030000	0.3901003	0.3901003	0.1	3.20	20.00	AVRG
Dibromomethane	0.2110000	0.2119306	0.2119306	0.1	-0.44	20.00	AVRG
1,2-Dibromoethane	0.3510000	0.3414779	0.3414779	0.1	2.71	20.00	AVRG
trans-1,2-Dichloroethene	0.4110000	0.4228727	0.4228727	0.1	-2.89	20.00	AVRG
1,1,1,2-Tetrachloroethane	0.3630000	0.3664626	0.3664626	0.1	-0.95	20.00	AVRG
1,1,1-Trichloroethane	0.6740000	0.6794586	0.6794586	0.1	-0.81	20.00	AVRG
1,1,2,2-Tetrachloroethane	0.7030000	0.6601221	0.6601221	0.3	6.10	20.00	AVRG
Toluene	1.4180000	1.3612251	1.3612251	0.4	4.00	20.00	AVRG
1,1,2-Trichloroethane	0.2610000	0.2559248	0.2559248	0.1	1.94	20.00	AVRG
1,1-Dichloroethane	0.7270000	0.7200085	0.7200085	0.2	0.96	20.00	AVRG
1,1-Dichloroethene	0.4240000	0.4366206	0.4366206	0.1	-2.98	20.00	AVRG
Trichlorofluoromethane	0.7760000	0.8117605	0.8117605	0.1	-4.61	20.00	AVRG
1,2,3-Trichlorobenzene	51.877649	50.000000	0.2112888	0.1	-3.76	20.00	2RDR
Tetrachloroethene	0.3510000	0.3402810	0.3402810	0.2	3.05	20.00	AVRG
1,2,4-Trichlorobenzene	0.4210000	0.4733127	0.4733127	0.2	-12.42	20.00	AVRG
1,2,4-Trimethylbenzene	2.3720000	2.2935046	2.2935046	0.1	3.31	20.00	AVRG
tert-Butylbenzene	1.9490000	1.9137088	1.9137088	0.1	1.81	20.00	AVRG
Trichloroethene	0.3500000	0.3651605	0.3651605	0.2	-4.33	20.00	AVRG
1,2-Dichlorobenzene	1.3270000	1.3069189	1.3069189	0.4	1.51	20.00	AVRG
1,2-Dichloroethane	0.3970000	0.3888905	0.3888905	0.1	2.04	20.00	AVRG
1,2-Dichloropropane	0.2990000	0.2895608	0.2895608	0.1	3.16	20.00	AVRG
1,3,5-Trimethylbenzene	2.2760000	2.2465506	2.2465506	0.1	1.29	20.00	AVRG
1,3-Dichloropropane	0.5310000	0.5010009	0.5010009	0.1	5.65	20.00	AVRG
1,4-Dichlorobenzene	1.4570000	1.4517824	1.4517824	0.4	0.36	20.00	AVRG
2-Butanone	0.1530000	0.1384779	0.1384779	0.1	9.49	20.00	AVRG
2-Chlorotoluene	1.7990000	1.7940638	1.7940638	0.1	0.27	20.00	AVRG
2-Hexanone	0.2050000	0.1788006	0.1788006	0.1	12.78	20.00	AVRG
4-Chlorotoluene	2.1800000	2.1094276	2.1094276	0.1	3.24	20.00	AVRG
Styrene	1.0440000	1.0071877	1.0071877	0.3	3.53	20.00	AVRG
4-Methyl-2-Pentanone	0.2930000	0.2677475	0.2677475	0.1	8.62	20.00	AVRG
Acetone	98.975006	100.00000	0.1219462	0.1	1.02	20.00	LINR
Benzene	1.1440000	1.1619445	1.1619445	0.5	-1.57	20.00	AVRG
Bromobenzene	0.8690000	0.9038706	0.9038706	0.1	-4.01	20.00	AVRG
Bromochloromethane	0.2710000	0.2748605	0.2748605	0.1	-1.42	20.00	AVRG
Bromodichloromethane	0.4140000	0.4202453	0.4202453	0.2	-1.51	20.00	AVRG
Bromoform	49.334856	50.000000	0.2952561	0.1	1.33	20.00	LINR
Bromomethane	50.497820	50.000000	0.5538166	0.1	-1.00	20.00	LINR
Carbon Disulfide	1.1530000	1.1929301	1.1929301	0.1	-3.46	20.00	AVRG

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911068

Instrument ID: VOA6 Calibration Date: 11/19/19 Time: 1025

Lab File ID: X111903 Init. Calib. Date(s): 11/18/19 11/18/19

Init. Calib. Times: 1347 1746

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
Carbon Tetrachloride	0.4420000	0.4453071	0.4453071	0.1	-0.75	20.00	AVRG
Chlorobenzene	0.9760000	0.9400404	0.9400404	0.5	3.68	20.00	AVRG
Chloroethane	0.3150000	0.3108430	0.3108430	0.1	1.32	20.00	AVRG
Chloroform	0.8100000	0.7740649	0.7740649	0.2	4.44	20.00	AVRG
Chloromethane	44.746344	50.000000	0.5126786	0.1	10.51	20.00	LINR
cis-1,2-Dichloroethene	0.4740000	0.4897663	0.4897663	0.1	-3.33	20.00	AVRG
Dibromochloromethane	0.3800000	0.3801550	0.3801550	0.1	-0.04	20.00	AVRG
Dichlorodifluoromethane	45.797017	50.000000	0.4386400	0.1	8.40	20.00	LINR
Ethylbenzene	0.5040000	0.4883754	0.4883754	0.1	3.10	20.00	AVRG
Hexachlorobutadiene	0.4020000	0.3962830	0.3962830	0.1	1.42	20.00	AVRG
Isopropylbenzene	1.4940000	1.4246950	1.4246950	0.1	4.64	20.00	AVRG
m,p-Xylenes	0.6080000	0.5884928	0.5884928	0.1	3.21	20.00	AVRG
Methylene Chloride	0.4520000	0.4388839	0.4388839	0.1	2.90	20.00	AVRG
n-Butylbenzene	2.0360000	1.9611117	1.9611117	0.5	3.68	20.00	AVRG
n-Propylbenzene	3.0900000	3.0634722	3.0634722	0.1	0.86	20.00	AVRG
Naphthalene	0.5400000	0.5366571	0.5366571	0.2	0.62	20.00	AVRG
o-Xylene	0.6000000	0.5745332	0.5745332	0.3	4.24	20.00	AVRG
sec-Butylbenzene	2.6850000	2.5907400	2.5907400	0.1	3.51	20.00	AVRG
Vinyl Chloride	0.5100000	0.4910809	0.4910809	0.1	3.71	20.00	AVRG
1,2,3-Trichloropropane	0.5960000	0.5686835	0.5686835	0.1	4.58	20.00	AVRG
p-Isopropyltoluene	2.4460000	2.3745902	2.3745902	0.1	2.92	20.00	AVRG
1,2-Dibromo-3-Chloropropane	48.878754	50.000000	8.05e-002	0.05	2.24	20.00	LINR
Freon TF	0.4350000	0.4434322	0.4434322	0.1	-1.94	20.00	AVRG
4-Bromofluorobenzene	47.365756	50.000000	0.4342580	0.1	5.27	20.00	LINR
Dibromofluoromethane	49.405108	50.000000	0.4664854	0.1	1.19	20.00	LINR
Toluene-d8	1.3170000	1.1979586	1.1979586	0.1	9.04	20.00	AVRG
1,2-Dichloroethane-d4	48.220115	50.000000	0.4628343	0.1	3.56	20.00	LINR

FORM VII VOA

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Instrument ID: VOA6 Calibration Date: 11/19/19 Time: 1537

Lab File ID: X111916 Init. Calib. Date(s): 11/18/19 11/18/19

Init. Calib. Times: 1347 1746

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
cis-1,3-Dichloropropene	0.4880000	0.4919329	0.4919329	0.2	-0.80	50.00	AVRG
trans-1,3-Dichloropropene	0.4440000	0.4432824	0.4432824	0.1	0.16	50.00	AVRG
1,3-Dichlorobenzene	1.4340000	1.4375902	1.4375902	0.6	-0.25	50.00	AVRG
2,2-Dichloropropane	0.6600000	0.6285545	0.6285545	0.1	4.76	50.00	AVRG
1,1-Dichloropropene	0.4030000	0.3901003	0.3901003	0.1	3.20	50.00	AVRG
Dibromomethane	0.2110000	0.2119306	0.2119306	0.1	-0.44	50.00	AVRG
1,2-Dibromoethane	0.3510000	0.3414779	0.3414779	0.1	2.71	50.00	AVRG
trans-1,2-Dichloroethene	0.4110000	0.4228727	0.4228727	0.1	-2.89	50.00	AVRG
1,1,1,2-Tetrachloroethane	0.3630000	0.3664626	0.3664626	0.1	-0.95	50.00	AVRG
1,1,1-Trichloroethane	0.6740000	0.6794586	0.6794586	0.1	-0.81	50.00	AVRG
1,1,2,2-Tetrachloroethane	0.7030000	0.6601221	0.6601221	0.3	6.10	50.00	AVRG
Toluene	1.4180000	1.3612251	1.3612251	0.4	4.00	50.00	AVRG
1,1,2-Trichloroethane	0.2610000	0.2559248	0.2559248	0.1	1.94	50.00	AVRG
1,1-Dichloroethane	0.7270000	0.7200085	0.7200085	0.2	0.96	50.00	AVRG
1,1-Dichloroethene	0.4240000	0.4366206	0.4366206	0.1	-2.98	50.00	AVRG
Trichlorofluoromethane	0.7760000	0.8117605	0.8117605	0.1	-4.61	50.00	AVRG
1,2,3-Trichlorobenzene	56.887923	50.000000	0.2112888	0.1	-13.78	50.00	2RDR
Tetrachloroethene	0.3510000	0.3402810	0.3402810	0.2	3.05	50.00	AVRG
1,2,4-Trichlorobenzene	0.4210000	0.4733127	0.4733127	0.2	-12.42	50.00	AVRG
1,2,4-Trimethylbenzene	2.3720000	2.2935046	2.2935046	0.1	3.31	50.00	AVRG
tert-Butylbenzene	1.9490000	1.9137088	1.9137088	0.1	1.81	50.00	AVRG
Trichloroethene	0.3500000	0.3651605	0.3651605	0.2	-4.33	50.00	AVRG
1,2-Dichlorobenzene	1.3270000	1.3069189	1.3069189	0.4	1.51	50.00	AVRG
1,2-Dichloroethane	0.3970000	0.3888905	0.3888905	0.1	2.04	50.00	AVRG
1,2-Dichloropropane	0.2990000	0.2895608	0.2895608	0.1	3.16	50.00	AVRG
1,3,5-Trimethylbenzene	2.2760000	2.2465506	2.2465506	0.1	1.29	50.00	AVRG
1,3-Dichloropropane	0.5310000	0.5010009	0.5010009	0.1	5.65	50.00	AVRG
1,4-Dichlorobenzene	1.4570000	1.4517824	1.4517824	0.4	0.36	50.00	AVRG
2-Butanone	0.1530000	0.1384779	0.1384779	0.1	9.49	50.00	AVRG
2-Chlorotoluene	1.7990000	1.7940638	1.7940638	0.1	0.27	50.00	AVRG
2-Hexanone	0.2050000	0.1788006	0.1788006	0.1	12.78	50.00	AVRG
4-Chlorotoluene	2.1800000	2.1094276	2.1094276	0.1	3.24	50.00	AVRG
Styrene	1.0440000	1.0071877	1.0071877	0.3	3.53	50.00	AVRG
4-Methyl-2-Pentanone	0.2930000	0.2677475	0.2677475	0.1	8.62	50.00	AVRG
Acetone	93.984956	100.00000	0.1219462	0.1	6.02	50.00	LINR
Benzene	1.1440000	1.1619445	1.1619445	0.5	-1.57	50.00	AVRG
Bromobenzene	0.8690000	0.9038706	0.9038706	0.1	-4.01	50.00	AVRG
Bromochloromethane	0.2710000	0.2748605	0.2748605	0.1	-1.42	50.00	AVRG
Bromodichloromethane	0.4140000	0.4202453	0.4202453	0.2	-1.51	50.00	AVRG
Bromoform	49.593517	50.000000	0.2952561	0.1	0.81	50.00	LINR
Bromomethane	55.967920	50.000000	0.5538166	0.1	-11.94	50.00	LINR
Carbon Disulfide	1.1530000	1.1929301	1.1929301	0.1	-3.46	50.00	AVRG

FORM 7B
VOLATILE CALIBRATION VERIFICATION SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS1911068

Instrument ID: VOA6 Calibration Date: 11/19/19 Time: 1537

Lab File ID: X111916 Init. Calib. Date(s): 11/18/19 11/18/19

Init. Calib. Times: 1347 1746

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
Carbon Tetrachloride	0.4420000	0.4453071	0.4453071	0.1	-0.75	50.00	AVRG
Chlorobenzene	0.9760000	0.9400404	0.9400404	0.5	3.68	50.00	AVRG
Chloroethane	0.3150000	0.3108430	0.3108430	0.1	1.32	50.00	AVRG
Chloroform	0.8100000	0.7740649	0.7740649	0.2	4.44	50.00	AVRG
Chloromethane	47.215401	50.000000	0.5126786	0.1	5.57	50.00	LINR
cis-1,2-Dichloroethene	0.4740000	0.4897663	0.4897663	0.1	-3.33	50.00	AVRG
Dibromochloromethane	0.3800000	0.3801550	0.3801550	0.1	-0.04	50.00	AVRG
Dichlorodifluoromethane	48.171213	50.000000	0.4386400	0.1	3.66	50.00	LINR
Ethylbenzene	0.5040000	0.4883754	0.4883754	0.1	3.10	50.00	AVRG
Hexachlorobutadiene	0.4020000	0.3962830	0.3962830	0.1	1.42	50.00	AVRG
Isopropylbenzene	1.4940000	1.4246950	1.4246950	0.1	4.64	50.00	AVRG
m,p-Xylenes	0.6080000	0.5884928	0.5884928	0.1	3.21	50.00	AVRG
Methylene Chloride	0.4520000	0.4388839	0.4388839	0.1	2.90	50.00	AVRG
n-Butylbenzene	2.0360000	1.9611117	1.9611117	0.5	3.68	50.00	AVRG
n-Propylbenzene	3.0900000	3.0634722	3.0634722	0.1	0.86	50.00	AVRG
Naphthalene	0.5400000	0.5366571	0.5366571	0.2	0.62	50.00	AVRG
o-Xylene	0.6000000	0.5745332	0.5745332	0.3	4.24	50.00	AVRG
sec-Butylbenzene	2.6850000	2.5907400	2.5907400	0.1	3.51	50.00	AVRG
Vinyl Chloride	0.5100000	0.4910809	0.4910809	0.1	3.71	50.00	AVRG
1,2,3-Trichloropropane	0.5960000	0.5686835	0.5686835	0.1	4.58	50.00	AVRG
p-Isopropyltoluene	2.4460000	2.3745902	2.3745902	0.1	2.92	50.00	AVRG
1,2-Dibromo-3-Chloropropane	51.900781	50.000000	8.05e-002	0.05	-3.80	50.00	LINR
Freon TF	0.4350000	0.4434322	0.4434322	0.1	-1.94	50.00	AVRG
4-Bromofluorobenzene	46.703437	50.000000	0.4342580	0.1	6.59	50.00	LINR
Dibromofluoromethane	51.292864	50.000000	0.4664854	0.1	-2.58	50.00	LINR
Toluene-d8	1.3170000	1.1979586	1.1979586	0.1	9.04	50.00	AVRG
1,2-Dichloroethane-d4	49.207801	50.000000	0.4628343	0.1	1.58	50.00	LINR

FORM VII VOA

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Lab File ID (Standard): X111903 Date Analyzed: 11/19/19

Instrument ID: VOA6 Time Analyzed: 1025

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS1(DCB) AREA #	IS1(DCB) RT #	IS2(CBZ) AREA #	IS2(CBZ) RT #	IS3(DFB) AREA #	IS3(DFB) RT #
	12 HOUR STD	262913	9.67	484108	7.67	524351	4.97
	UPPER LIMIT	525826	10.17	968216	8.17	1048702	5.47
	LOWER LIMIT	131457	9.17	242054	7.17	262176	4.47
	CLIENT SAMPLE NO.						
01	VLCSW-19119	267051	9.67	486348	7.67	529453	4.97
02	VBLKW-191119	291135	9.67	556551	7.67	627579	4.97
03	HS19110684-05	274759	9.67	552032	7.67	623429	4.97
04	HS19110684-01	285264	9.66	559862	7.67	632045	4.97
05	HS19110684-04	299698	9.67	566180	7.67	636598	4.97
06	HS19110684-02	279604	9.67	540920	7.67	625554	4.97
07	HS19110684-03	285503	9.67	553484	7.67	630084	4.97
08	HS19110684-04	290575	9.67	545776	7.67	615407	4.97
09	HS19110684-04	287897	9.67	538138	7.67	602341	4.97
10	HS19110684-03	293417	9.67	552854	7.67	620016	4.97
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (CBZ) = Chlorobenzene-d5
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: ALS HOUSTON Contract:

Lab Code: Case No.: SAS No.: SDG No.: HS19110684

Lab File ID (Standard): X111903 Date Analyzed: 11/19/19

Instrument ID: VOA6 Time Analyzed: 1025

GC Column: DB624 ID: 0.18 (mm) Heated Purge: (Y/N) N

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	378846	4.18				
	UPPER LIMIT	757692	4.68				
	LOWER LIMIT	189423	3.68				
	CLIENT SAMPLE NO.						
01	VLCSW-19119	385313	4.18				
02	VBLKW-191119	472639	4.18				
03	HS19110684-05	471210	4.18				
04	HS19110684-01	475333	4.18				
05	HS19110684-04	482327	4.18				
06	HS19110684-02	470610	4.18				
07	HS19110684-03	475982	4.18				
08	HS19110684-04	468918	4.18				
09	HS19110684-04	456262	4.18				
10	HS19110684-03	468404	4.18				
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.

FORM VIII VOA

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111901.D Page 1

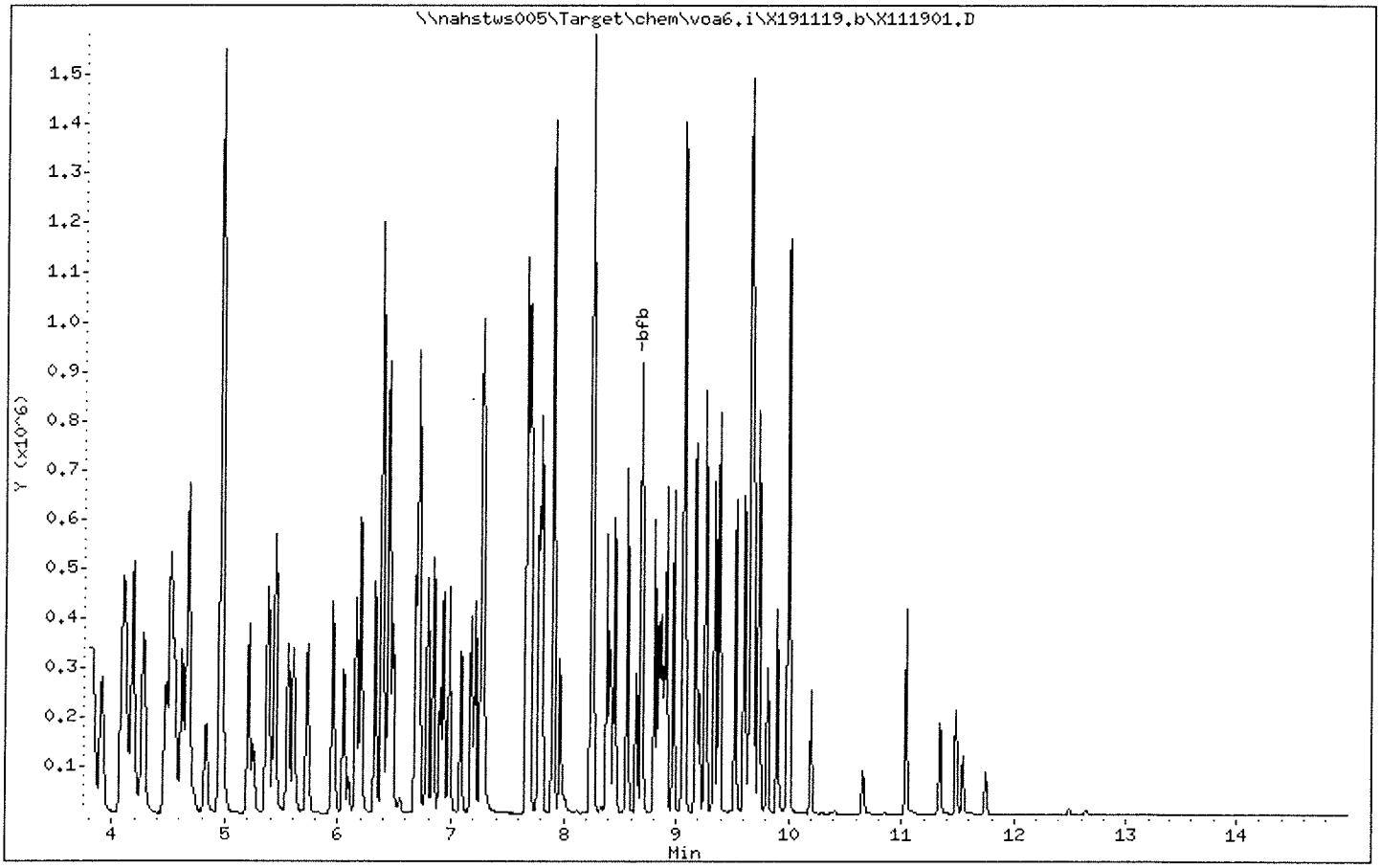
Date : 19-NOV-2019 09:37

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\X191119.b\X111901.D

Date : 19-NOV-2019 09:37

Client ID: BFB

Instrument: voa6.i

Sample Info: BFB;BFB;3;;BFB

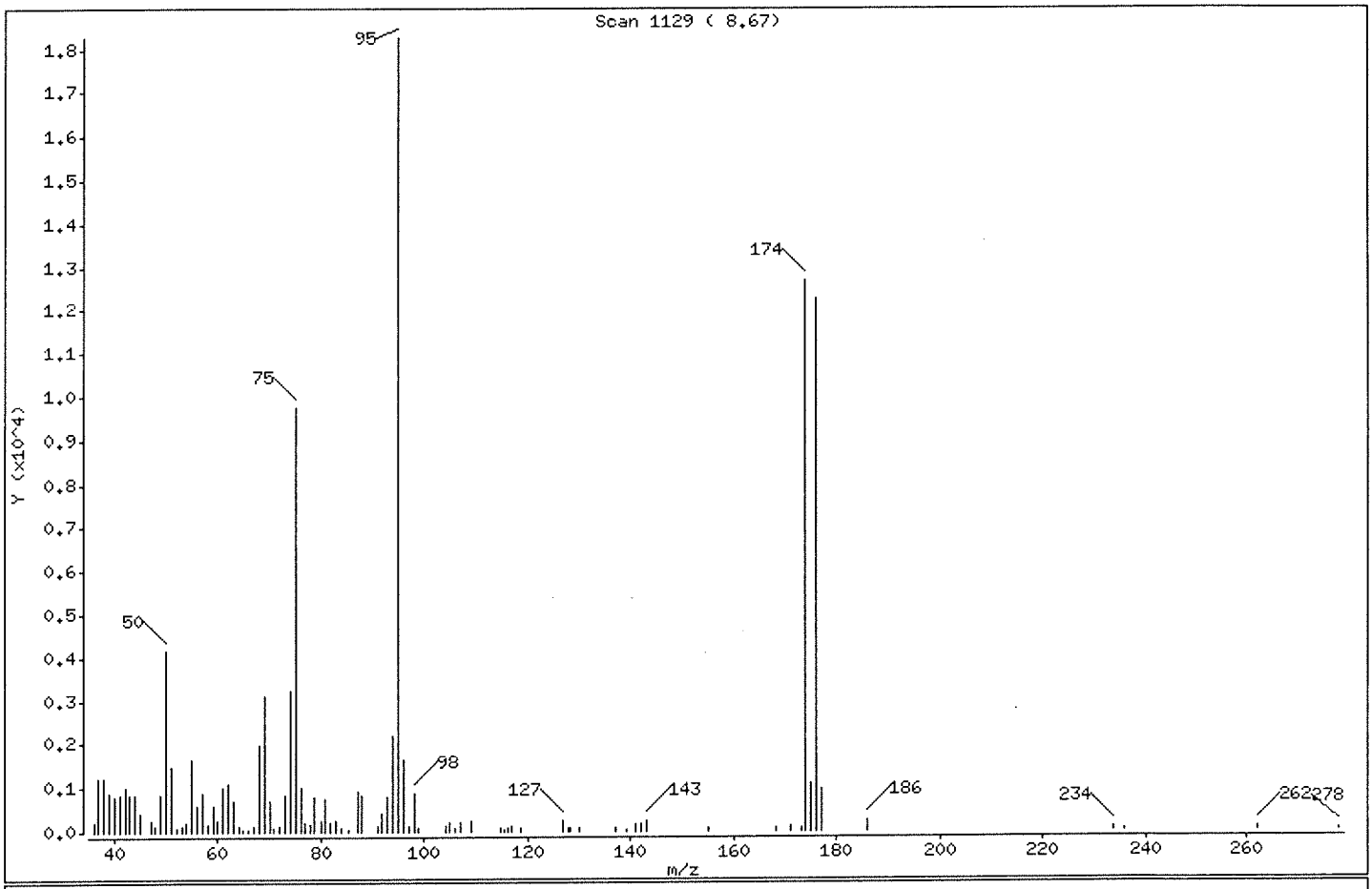
Volume Injected (uL): 2.0

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	22.80
75	30.00 - 60.00% of mass 95	53.34
96	5.00 - 9.00% of mass 95	8.87
173	Less than 2.00% of mass 174	0.48 (0.69)
174	Greater than 50.00% of mass 95	69.44
175	5.00 - 9.00% of mass 174	5.96 (8.59)
176	95.00 - 101.00% of mass 174	67.01 (96.50)
177	5.00 - 9.00% of mass 176	5.38 (8.03)

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111901.D

Date : 19-NOV-2019 09:37

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: X111901.D
Spectrum: Scan 1129 (8.67)
Location of Maximum: 95.00
Number of points: 93

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	205	61.00	1003	85.20	58	127.70	80
37.00	1214	62.00	1096	87.00	935	128.20	80
38.00	1219	63.00	727	87.90	857	129.80	87
39.00	889	64.00	115	91.10	145	137.00	68
40.00	789	65.00	61	91.90	439	139.10	58
41.00	861	65.90	50	92.90	797	140.90	175
42.10	999	67.10	145	94.00	2205	142.00	167
43.00	833	68.00	1968	95.00	18280	142.90	269
44.00	825	69.00	3091	96.00	1621	155.00	94
45.00	425	70.10	711	96.90	108	168.10	68
47.10	235	71.00	88	97.20	110	171.00	131
47.90	146	71.80	116	98.10	880	173.00	87
49.00	850	73.00	825	98.80	96	173.90	12694
50.00	4167	74.00	3244	104.10	136	174.90	1090
51.00	1478	75.00	9751	105.00	192	175.90	12250
52.20	66	76.00	991	105.90	94	176.90	984
53.00	147	77.00	212	107.10	198	186.00	252
54.00	217	78.00	184	109.00	266	233.70	90
55.00	1651	78.80	809	114.80	66	235.70	61
56.00	600	79.90	270	115.60	63	262.00	77
57.00	868	80.90	770	116.00	84	278.00	63
58.00	166	81.90	211	116.80	137		
59.00	577	83.00	270	118.70	97		
59.90	263	84.00	98	126.90	241		

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111903.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111903.D
Lab Smp Id: CCV Client Smp ID: CCV
Inj Date : 19-NOV-2019 10:25
Operator : PC Inst ID: voa6.i
Smp Info : CCV;CCV;2;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:22 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 3 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

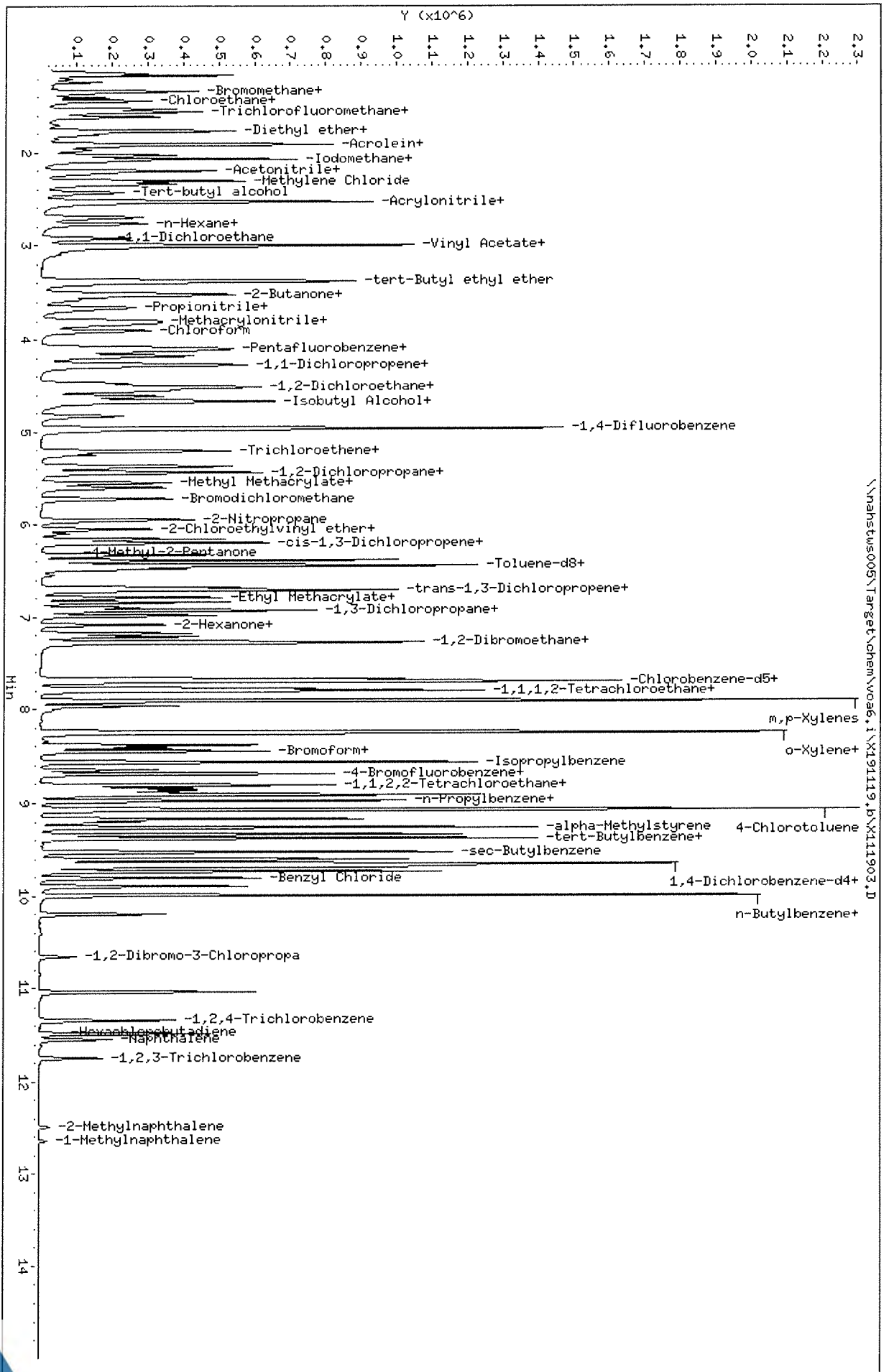
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	378846	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	524351	50.0000	
* 47 Chlorobenzene-d5	117	7.670	7.671	(1.000)	484108	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	262913	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	171770	50.0000	48.22
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	213236	50.0000	47.36
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	170175	50.0000	49.40
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	583986	50.0000	45.78
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	175047	50.0000	49.84
31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	246574	50.0000	48.24
68 1,1,2,2-Tetrachloroethane	83	8.838	8.845	(0.914)	174109	50.0000	47.09
138 Freon TF	101	1.919	1.919	(0.459)	163294	50.0000	49.50
53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	120647	50.0000	47.67
22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	261030	50.0000	47.35
11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	157561	50.0000	49.07
32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	197217	50.0000	46.62
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	50702	50.0000	51.87
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	145114	50.0000	46.32(M)
90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	108272	50.0000	48.88
79 1,2,4-Trimethylbenzene	105	9.382	9.382	(0.970)	606845	50.0000	48.64
89 1,2-Dibromo-3-Chloropropane	155	10.657	10.658	(1.102)	19952	50.0000	48.87
57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	164115	50.0000	48.33
88 1,2-Dichlorobenzene	146	9.998	9.991	(1.034)	343925	50.0000	49.28

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111903.D Page 2
Report Date: 07-Dec-2019 09:23

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33 1,2-Dichloroethane	62	4.555	4.562	(0.916)	200790	50.0000	48.23
42 1,2-Dichloropropane	63	5.443	5.436	(1.095)	147068	50.0000	46.95
75 1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	582729	50.0000	48.68
83 1,3-Dichlorobenzene	146	9.604	9.612	(0.993)	372155	50.0000	49.35
54 1,3-Dichloropropane	76	6.983	6.983	(0.910)	241351	50.0000	46.97
84 1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	378505	50.0000	49.40
26 2,2-Dichloropropane	77	3.516	3.516	(0.841)	239389	50.0000	47.84
24 2-Butanone	43	3.573	3.573	(0.854)	104790	100.000	90.14
76 2-Chlorotoluene	91	8.974	8.974	(0.928)	462653	50.0000	48.91
52 2-Hexanone	43	7.090	7.083	(0.924)	180085	100.000	90.55
77 4-Chlorotoluene	91	9.074	9.074	(0.939)	550215	50.0000	47.98
82 p-Isopropyltoluene	119	9.655	9.655	(0.999)	617901	50.0000	48.03
45 4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	261637	100.000	92.23
10 Acetone	43	1.976	1.976	(0.473)	97110	100.000	98.97
37 Benzene	78	4.512	4.512	(0.908)	590714	50.0000	49.24
74 Bromobenzene	156	8.809	8.809	(0.911)	227721	50.0000	49.83
29 Bromochloromethane	128	3.795	3.795	(0.908)	98973	50.0000	48.22
39 Bromodichloromethane	83	5.729	5.729	(1.153)	211704	50.0000	48.78
66 Bromoform	173	8.415	8.415	(1.097)	142175	50.0000	49.33
6 Bromomethane	94	1.338	1.338	(0.320)	190134	50.0000	50.49
19 Carbon Disulfide	76	2.069	2.069	(0.495)	861544	100.000	98.63
34 Carbon Tetrachloride	117	4.268	4.268	(0.859)	226042	50.0000	48.78
59 Chlorobenzene	112	7.699	7.699	(1.004)	450722	50.0000	47.68
7 Chloroethane	64	1.403	1.403	(0.336)	112161	50.0000	47.02
28 Chloroform	83	3.910	3.910	(0.935)	279013	50.0000	45.47
3 Chloromethane	50	1.073	1.073	(0.257)	184029	50.0000	44.74
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	177411	50.0000	49.38
46 cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	253125	50.0000	49.50
55 Dibromochloromethane	129	7.176	7.176	(0.936)	182704	50.0000	49.69
44 Dibromomethane	93	5.557	5.557	(1.118)	109516	50.0000	49.40
2 Dichlorodifluoromethane	85	0.973	0.973	(0.233)	157834	50.0000	45.79
61 Ethylbenzene	106	7.799	7.799	(1.017)	234845	50.0000	48.09
91 Hexachlorobutadiene	225	11.481	11.488	(1.187)	88228	50.0000	41.75
67 Isopropylbenzene	105	8.566	8.566	(1.117)	680527	50.0000	47.04
62 m,p-Xylenes	106	7.907	7.907	(1.031)	566470	100.000	96.13
17 Methylene Chloride	84	2.305	2.305	(0.551)	157211	50.0000	45.89
87 n-Butylbenzene	91	9.998	9.999	(1.034)	513085	50.0000	47.92
73 n-Propylbenzene	91	8.917	8.917	(0.922)	782545	50.0000	48.15
92 Naphthalene	128	11.546	11.546	(1.194)	136570	50.0000	48.07
63 o-Xylene	106	8.244	8.244	(1.075)	276358	50.0000	47.51
81 sec-Butylbenzene	105	9.526	9.526	(0.985)	669747	50.0000	47.44
64 Styrene	104	8.258	8.258	(1.077)	494220	50.0000	48.86
78 tert-Butylbenzene	119	9.339	9.340	(0.966)	492000	50.0000	48.00
56 Tetrachloroethene	164	6.933	6.933	(0.904)	161871	50.0000	47.58
50 Toluene	91	6.446	6.446	(0.840)	653600	50.0000	47.60
20 trans-1,2-Dichloroethene	96	2.527	2.527	(0.604)	151362	50.0000	48.55
51 trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	230748	50.0000	49.51
38 Trichloroethene	130	5.206	5.206	(1.048)	184416	50.0000	50.29
8 Trichlorofluoromethane	101	1.560	1.560	(0.373)	292717	50.0000	49.80
5 Vinyl Chloride	62	1.138	1.138	(0.272)	179238	50.0000	46.42

QC Flag Legend

M - Compound response manually integrated.

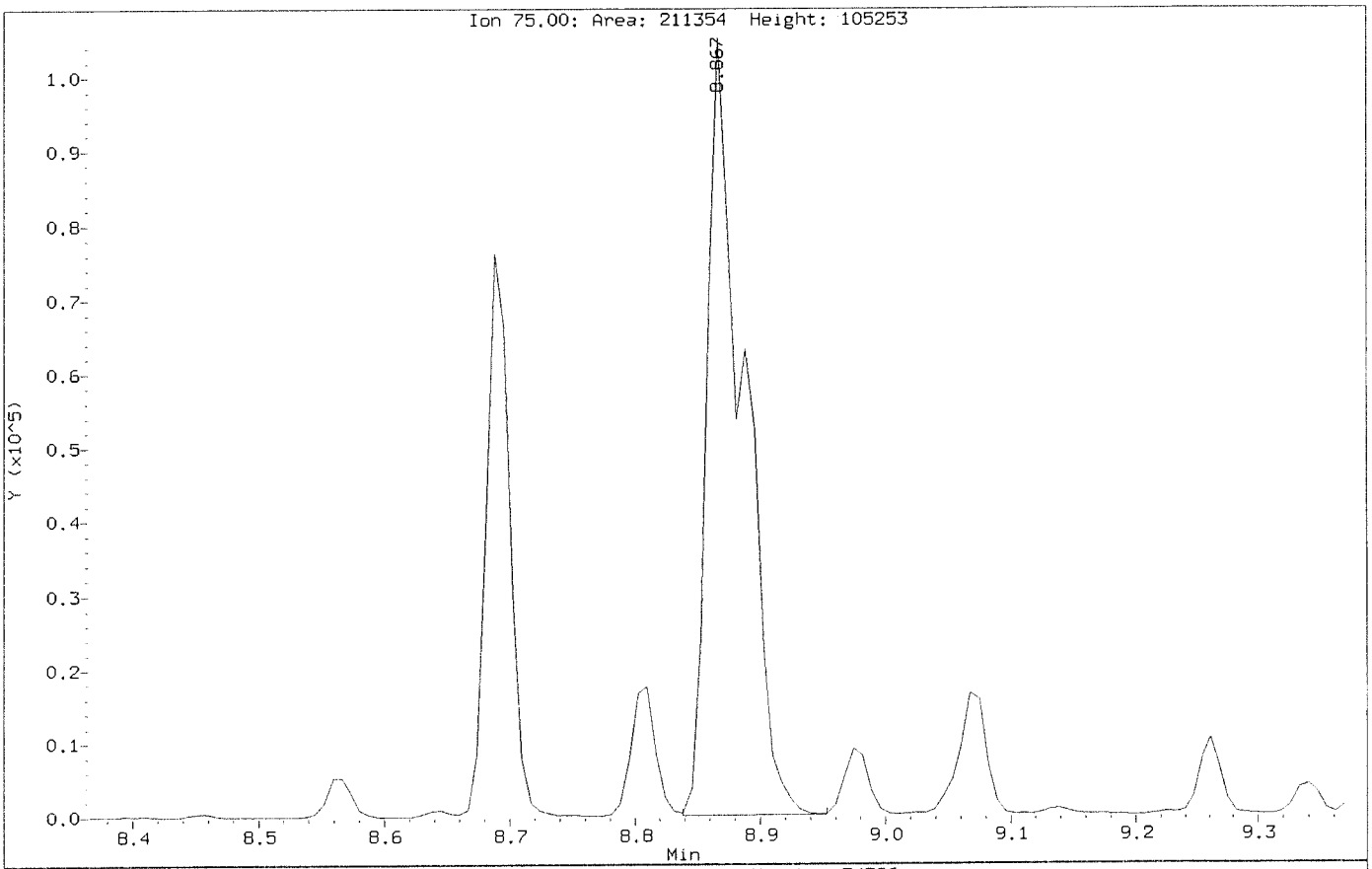


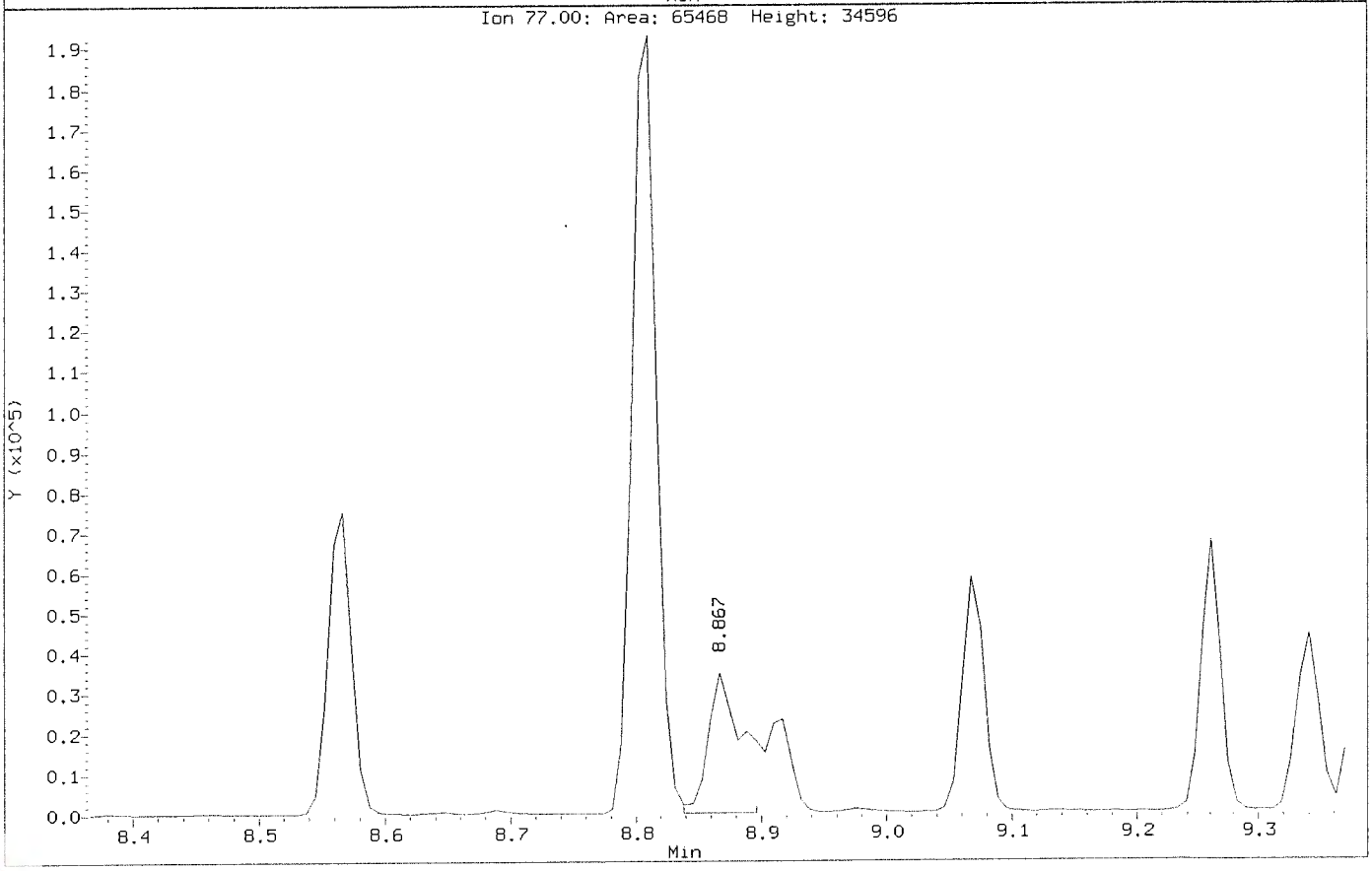
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Sample Info: CCV;CCV;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\BEFORE\X111903.D
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Instrument: voa6.i
Client Sample ID: CCV

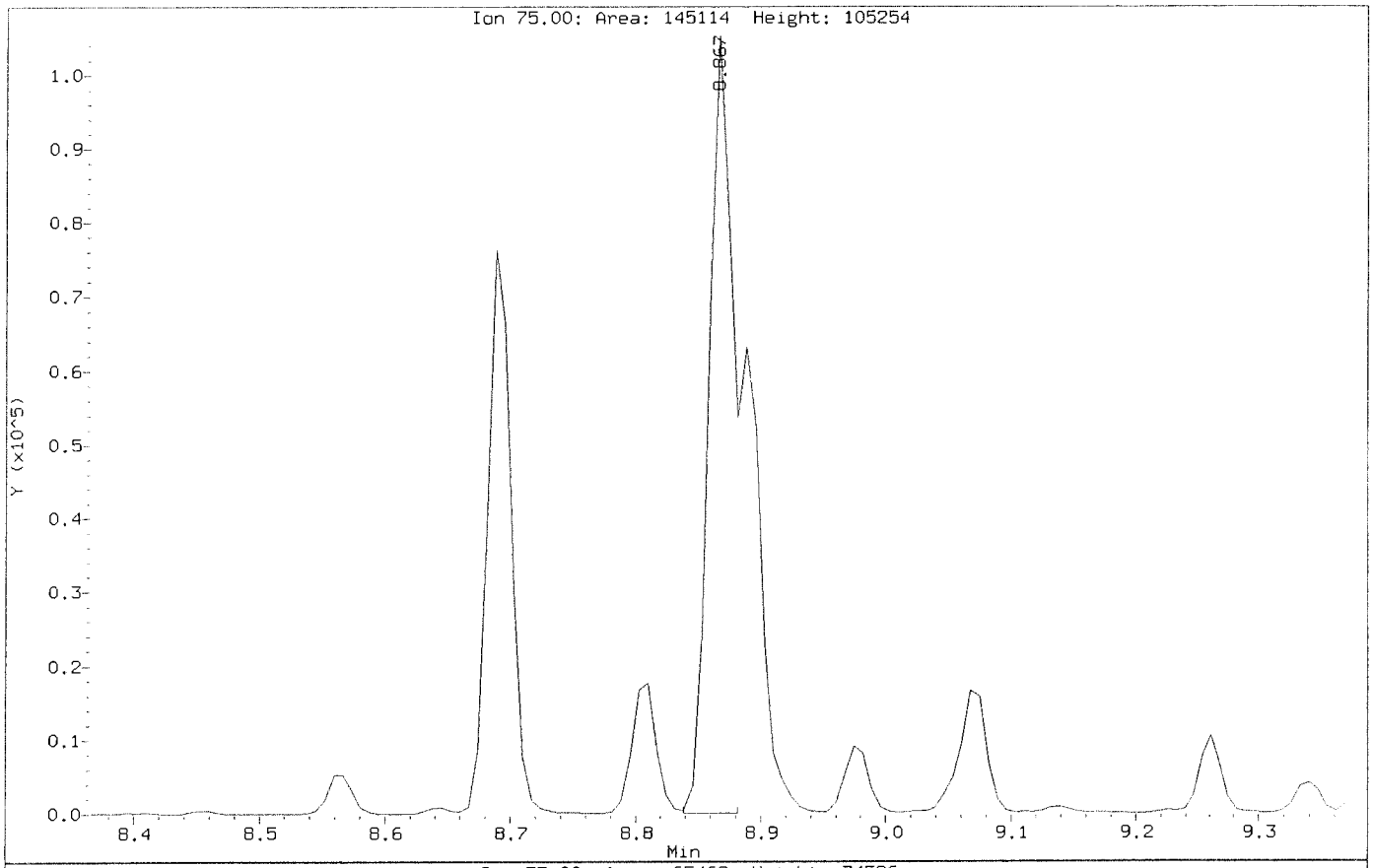
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4

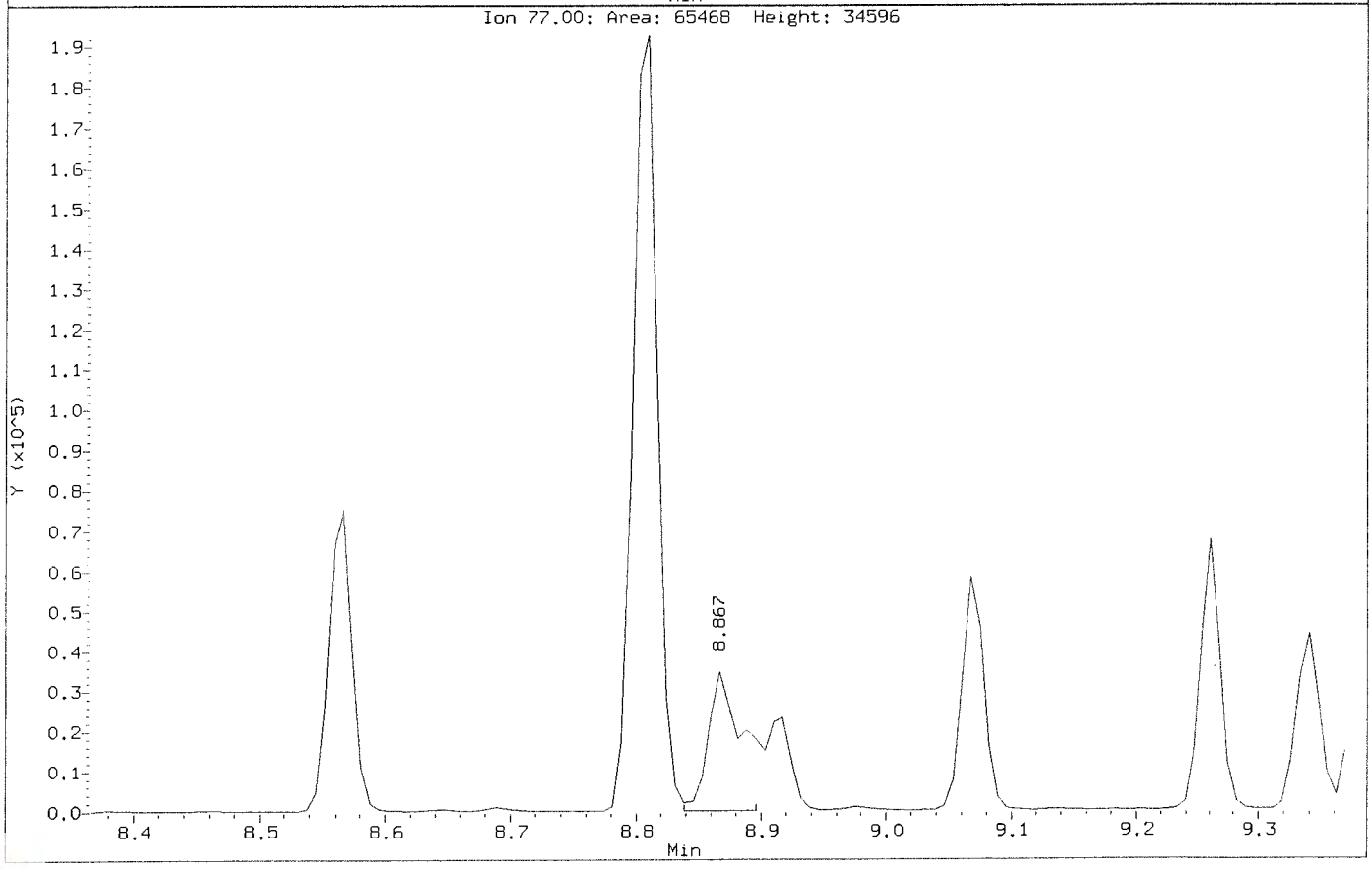




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Injection Date: 19-NOV-2019 10:25
Instrument: voa6.i
Client Sample ID: CCV

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4





Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111905.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111905.D
Lab Smp Id: VLCSW-191119 Client Smp ID: VLCSW-19119
Inj Date : 19-NOV-2019 11:13
Operator : PC Inst ID: voa6.i
Smp Info : VLCSW-191119;VLCSW-19119;3;;LCS
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:22 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 5 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

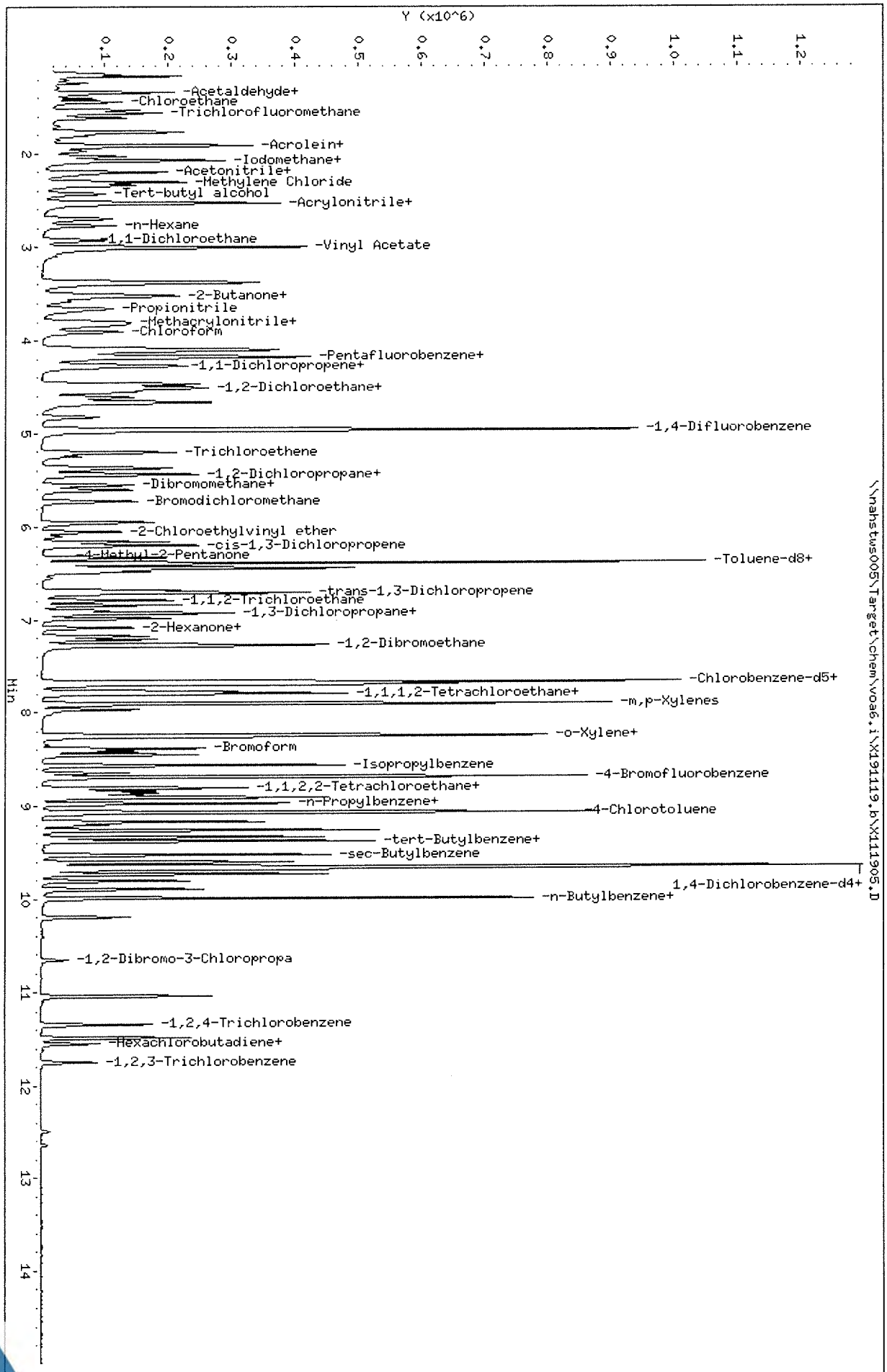
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	385313	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	529453	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	486348	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	267051	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	179200	49.4426	49.44
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	215351	47.6130	47.61
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	178367	50.9030	50.90
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	600527	46.8639	46.86
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	70302	19.9247	19.92
31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	99215	19.0866	19.08
68 1,1,2,2-Tetrachloroethane	83	8.838	8.845	(0.914)	70950	18.8938	18.89
138 Freon TF	101	1.919	1.919	(0.459)	62883	18.7455	18.74
53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	49799	19.5878	19.58
22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	104779	18.6893	18.68
11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	63382	19.4102	19.41
32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	80096	18.7542	18.75
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	25746	25.5825	25.58
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	60230	18.9292	18.92(M)
90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	52071	23.1473	23.14
79 1,2,4-Trimethylbenzene	105	9.383	9.382	(0.970)	228315	18.0183	18.01
89 1,2-Dibromo-3-Chloropropane	155	10.658	10.658	(1.102)	8892	21.2552	21.25
57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	67491	19.7862	19.78
88 1,2-Dichlorobenzene	146	9.999	9.991	(1.034)	135041	19.0531	19.05

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111905.D Page 2
Report Date: 07-Dec-2019 09:23

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	81283	19.3395	19.33
42	1,2-Dichloropropane	63	5.436	5.436	(1.094)	60295	19.0642	19.06
75	1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	221978	18.2567	18.25
83	1,3-Dichlorobenzene	146	9.605	9.612	(0.993)	146588	19.1405	19.14
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	98703	19.1227	19.12
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	149073	19.1552	19.15
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	95572	18.7824	18.78
24	2-Butanone	43	3.580	3.573	(0.856)	44864	37.9463	37.94
76	2-Chlorotoluene	91	8.974	8.974	(0.928)	180350	18.7710	18.77
52	2-Hexanone	43	7.090	7.083	(0.924)	77275	38.6787	38.67
77	4-Chlorotoluene	91	9.074	9.074	(0.939)	211849	18.1911	18.19
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	233000	17.8313	17.83
45	4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	106728	37.4532	37.45
10	Acetone	43	1.976	1.976	(0.473)	46270	44.3163	44.31
37	Benzene	78	4.512	4.512	(0.908)	240010	19.8167	19.81
74	Bromobenzene	156	8.809	8.809	(0.911)	91948	19.8112	19.81
29	Bromochloromethane	128	3.795	3.795	(0.908)	41715	19.9846	19.98
39	Bromodichloromethane	83	5.729	5.729	(1.153)	85383	19.4872	19.48
66	Bromoform	173	8.415	8.415	(1.097)	58104	20.6617	20.66
6	Bromomethane	94	1.338	1.338	(0.320)	84150	20.6425	20.64
19	Carbon Disulfide	76	2.069	2.069	(0.495)	346782	39.0371	39.03
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	90102	19.2590	19.25
59	Chlorobenzene	112	7.699	7.699	(1.004)	181082	19.0715	19.07
7	Chloroethane	64	1.403	1.403	(0.336)	45242	18.6489	18.64
28	Chloroform	83	3.910	3.910	(0.935)	115465	18.5036	18.50
3	Chloromethane	50	1.073	1.073	(0.257)	74922	18.0238	18.02
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	72407	19.8154	19.81
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	102627	19.8760	19.87
55	Dibromochloromethane	129	7.176	7.176	(0.936)	73642	19.9388	19.93
44	Dibromomethane	93	5.557	5.557	(1.118)	45061	20.1333	20.13
2	Dichlorodifluoromethane	85	0.973	0.973	(0.233)	61894	18.1994	18.19
61	Ethylbenzene	106	7.799	7.799	(1.017)	90541	18.4556	18.45
91	Hexachlorobutadiene	225	11.481	11.488	(1.187)	43097	20.0811	20.08
67	Isopropylbenzene	105	8.566	8.566	(1.117)	264161	18.1790	18.17
62	m,p-Xylenes	106	7.907	7.907	(1.031)	222280	37.5474	37.54
17	Methylene Chloride	84	2.305	2.305	(0.551)	64384	18.4797	18.47
87	n-Butylbenzene	91	9.999	9.999	(1.034)	193225	17.7690	17.76
73	n-Propylbenzene	91	8.917	8.917	(0.922)	299037	18.1158	18.11
92	Naphthalene	128	11.546	11.546	(1.194)	61370	21.2704	21.27
63	o-Xylene	106	8.244	8.244	(1.075)	109241	18.6971	18.69
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	253771	17.6969	17.69
64	Styrene	104	8.258	8.258	(1.077)	192806	18.9771	18.97
78	tert-Butylbenzene	119	9.340	9.340	(0.966)	188390	18.0960	18.09
56	Tetrachloroethene	164	6.933	6.933	(0.904)	65143	19.0632	19.06
50	Toluene	91	6.446	6.446	(0.840)	262007	18.9974	18.99
20	trans-1,2-Dichloroethene	96	2.527	2.527	(0.604)	60979	19.2347	19.23
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	92006	19.5509	19.55
38	Trichloroethene	130	5.206	5.206	(1.048)	74497	20.1198	20.11
8	Trichlorofluoromethane	101	1.560	1.560	(0.373)	117005	19.5755	19.57
5	Vinyl Chloride	62	1.138	1.138	(0.272)	72192	18.3835	18.38

QC Flag Legend

M - Compound response manually integrated.

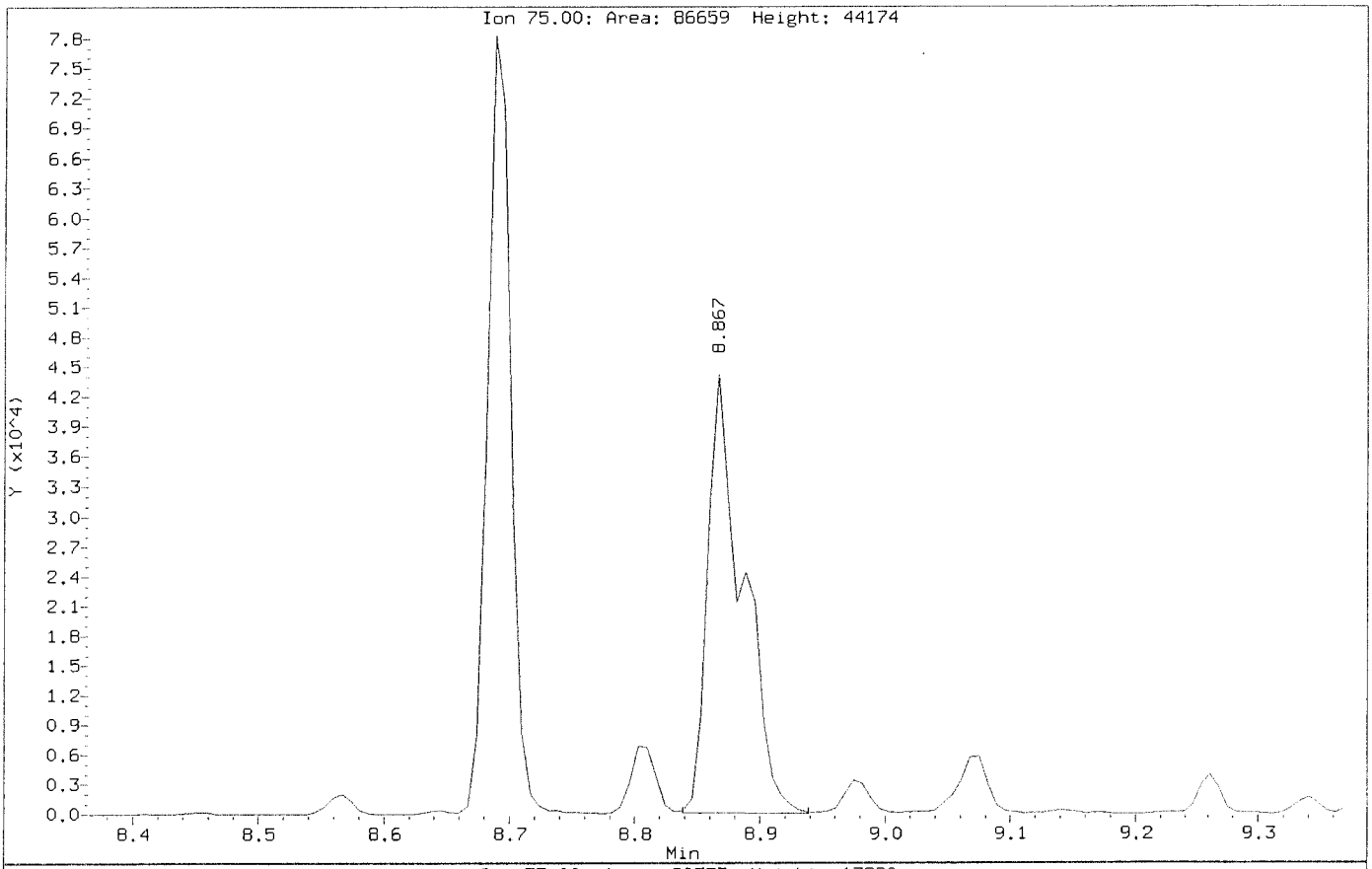


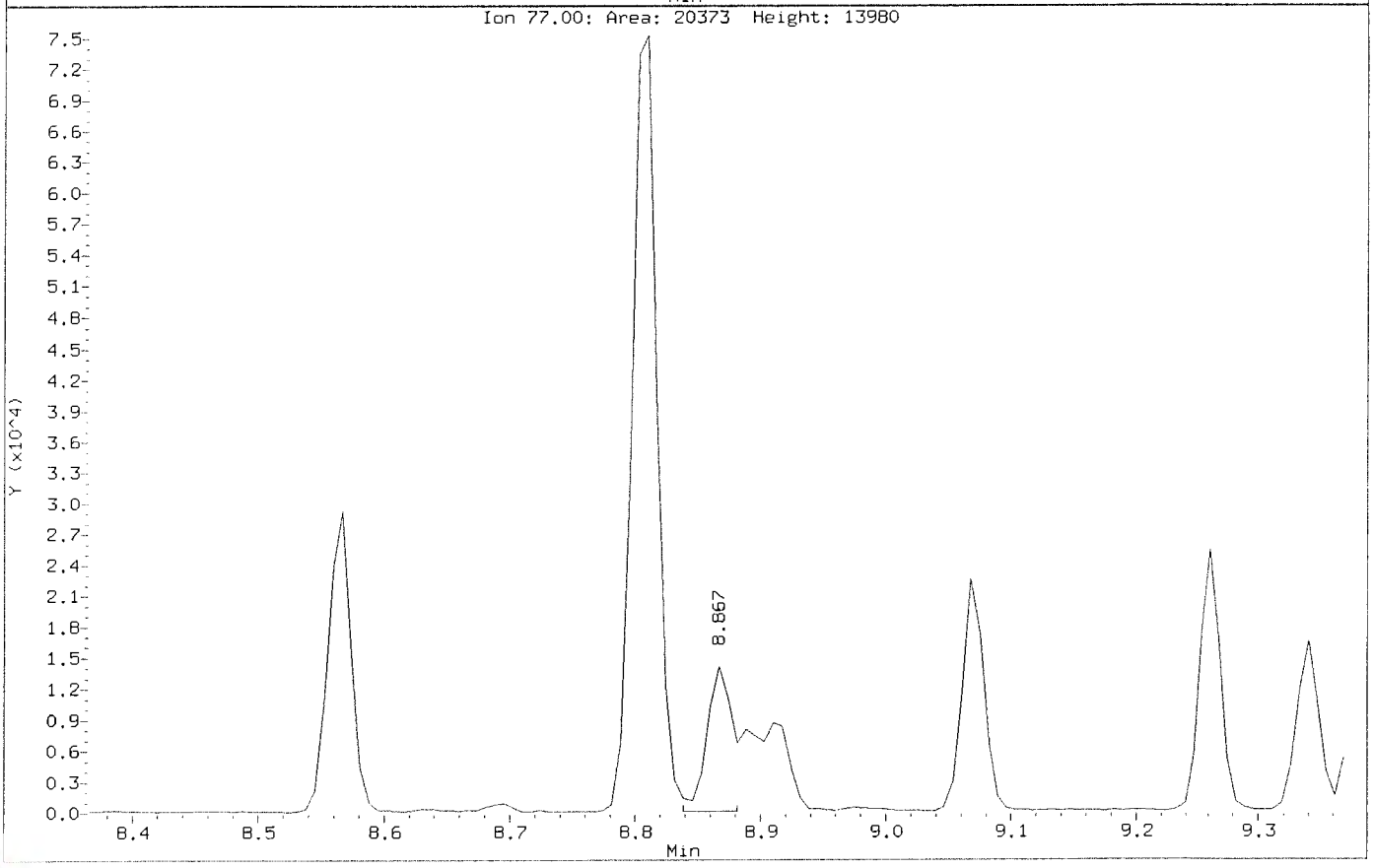
Data File: \\nahstws005\Target\chem\voa6,i\X191119,b\X111905,D
Date : 19-NOV-2019 11:13
Client ID: VLCSW-19119
Sample Info: VLCSW-191119;VLCSW-19119;3;;LCS
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6,i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\BEFORE\X111905.D
Injection Date: 19-NOV-2019 11:13
Instrument: voa6.i
Client Sample ID: VLCSW-19119

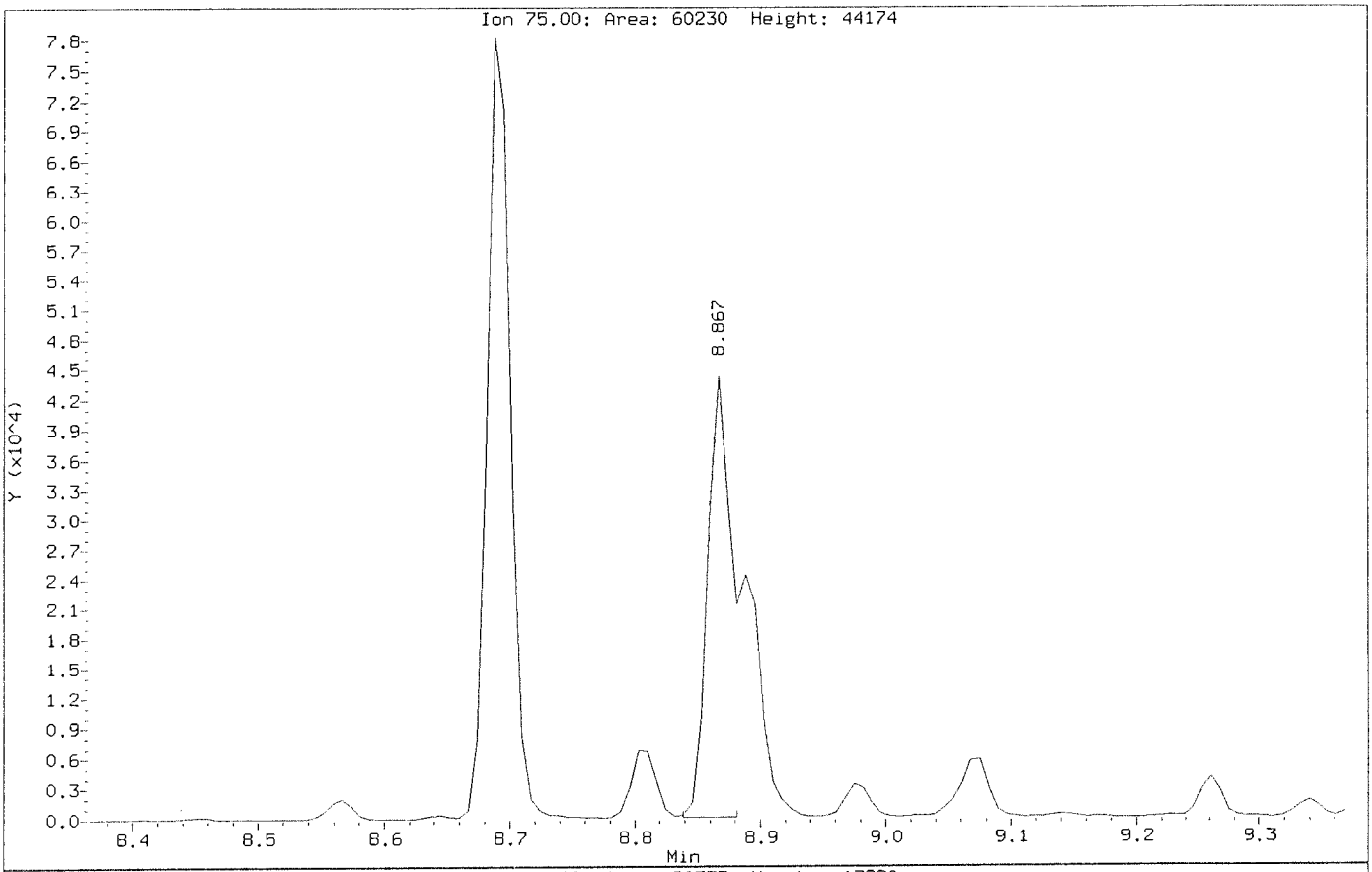
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4

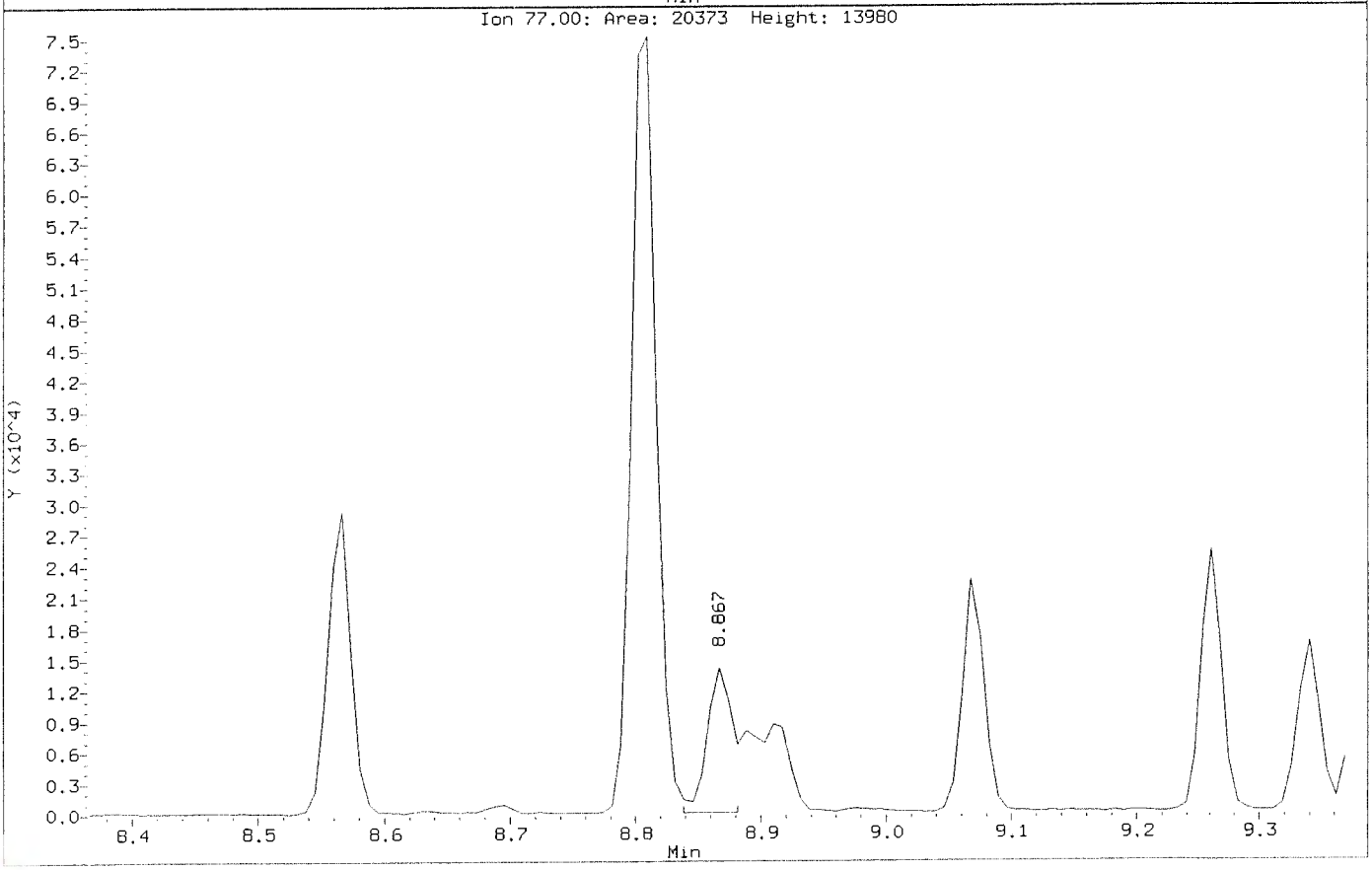




Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111905.D
Injection Date: 19-NOV-2019 11:13
Instrument: voa6.i
Client Sample ID: VLCSW-19119

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4





Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111907.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111907.D
Lab Smp Id: VBLKW-191119 Client Smp ID: VBLKW-191119
Inj Date : 19-NOV-2019 12:01
Operator : PC Inst ID: voa6.i
Smp Info : VBLKW-191119;VBLKW-191119;3;;BLANK
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:22 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	472639	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	627579	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	556551	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	291135	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	195436	44.0411	44.04
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	237439	45.8900	45.88
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	201249	46.8512	46.85
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	699858	47.7263	47.72

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111907.D

Date : 19-NOV-2019 12:01

Client ID: VBLKW-191119

Instrument: voa6.i

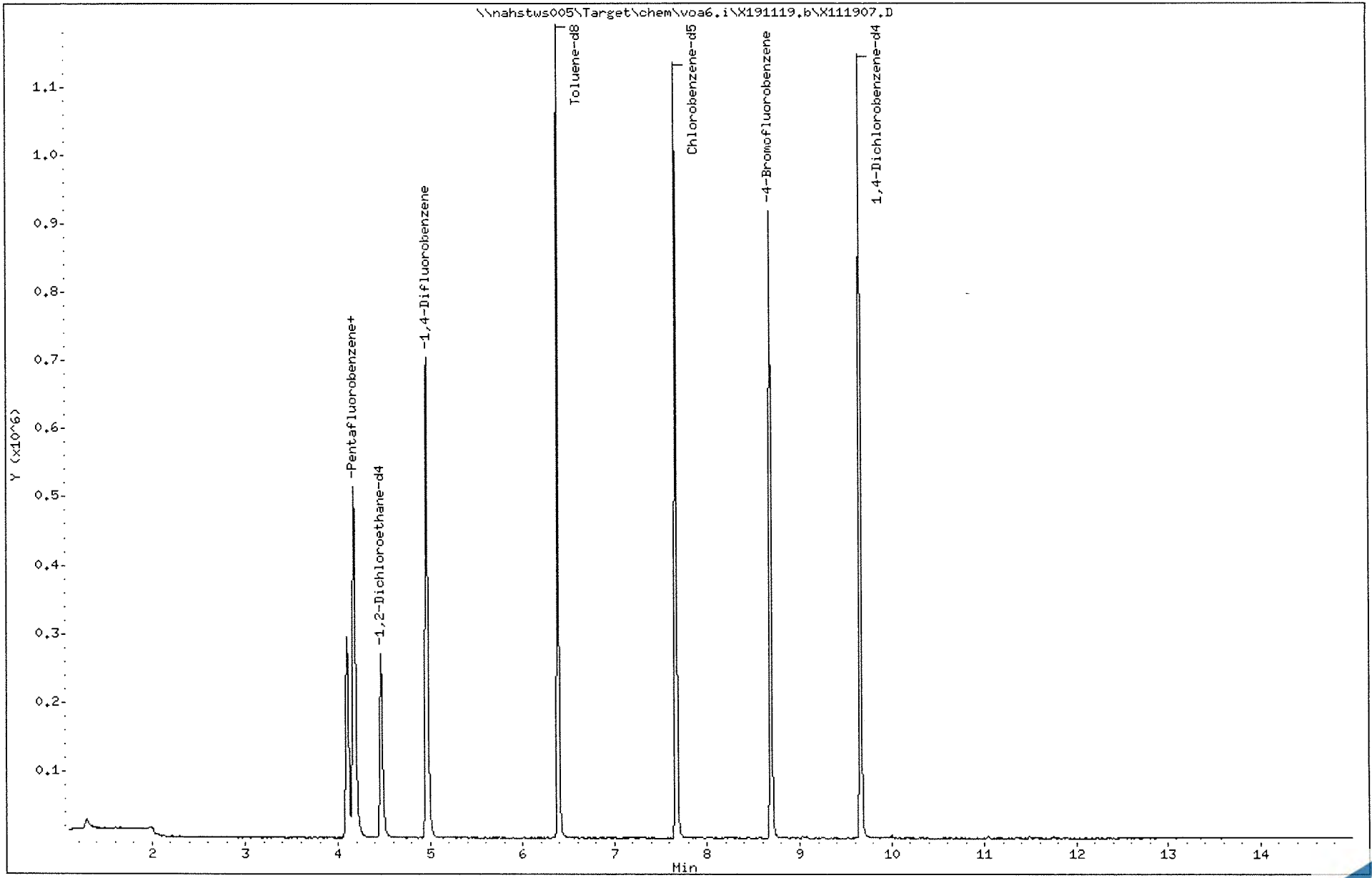
Sample Info: VBLKW-191119;VBLKW-191119;3;;BLANK

Purge Volume: 5.0

Operator: PC

Column phase: DB624

Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111908.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111908.D
Lab Smp Id: HS19110684-05 Client Smp ID: HS19110684-05
Inj Date : 19-NOV-2019 12:25
Operator : PC Inst ID: voa6.i
Smp Info : HS19110684-05;HS19110684-05;;;
Misc Info : HS18090001;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:23 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

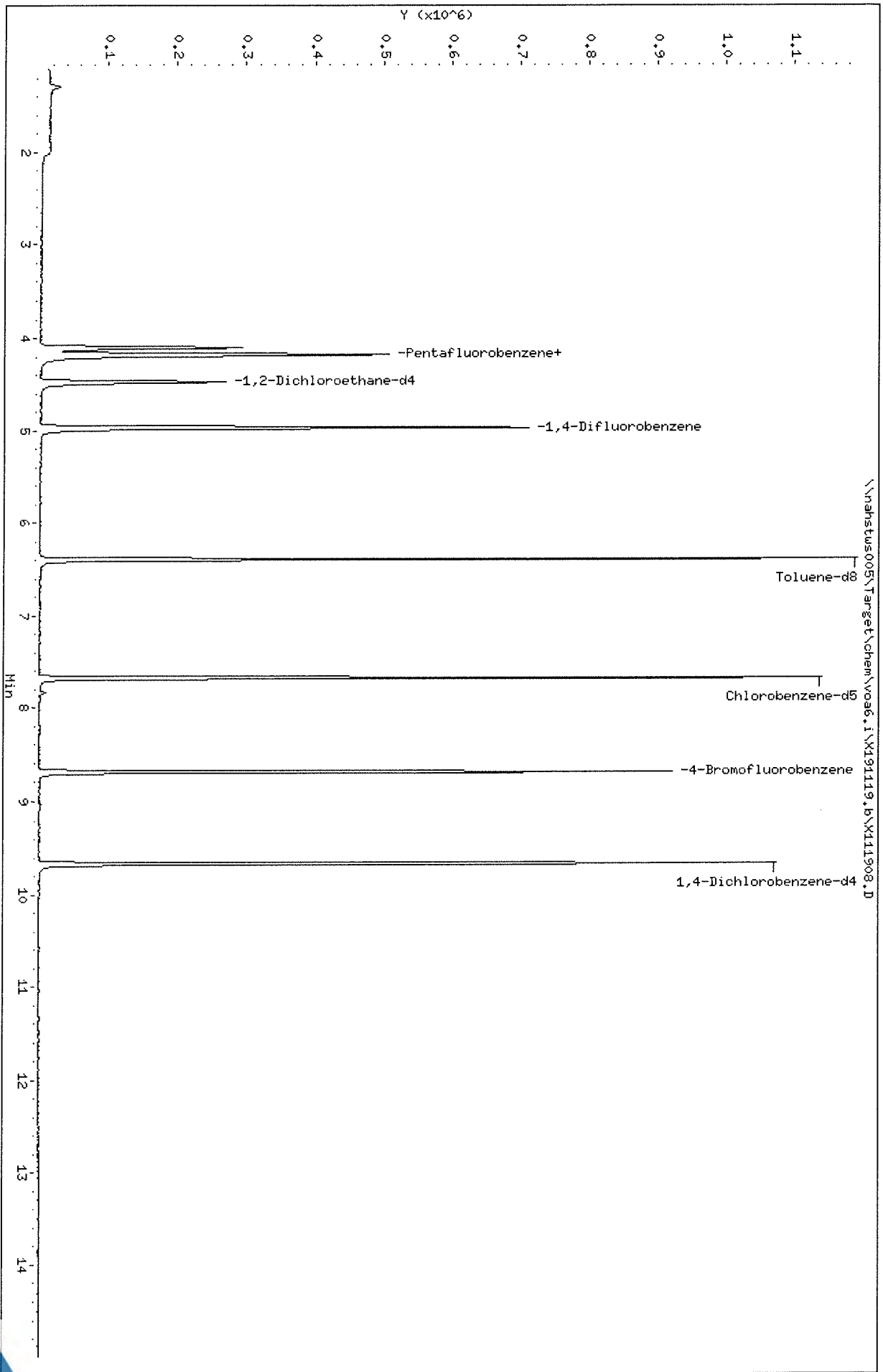
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	471210	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	623429	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	552032	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	274759	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	195853	44.2651	44.26
$ 69 4-Bromofluorobenzene	95	8.695	8.688	(1.134)	233058	45.4163	45.41
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	200890	46.9090	46.90
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	701446	48.2262	48.22

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111908.D
Date : 19-NOV-2019 12:25
Client ID: HS19110684-05
Sample Info: HS19110684-05;HS19110684-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111909.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111909.D
Lab Smp Id: HS19110684-01 Client Smp ID: HS19110684-01
Inj Date : 19-NOV-2019 12:49
Operator : PC Inst ID: voa6.i
Smp Info : HS19110684-01;HS19110684-01;;;
Misc Info : HS18090001;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:23 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

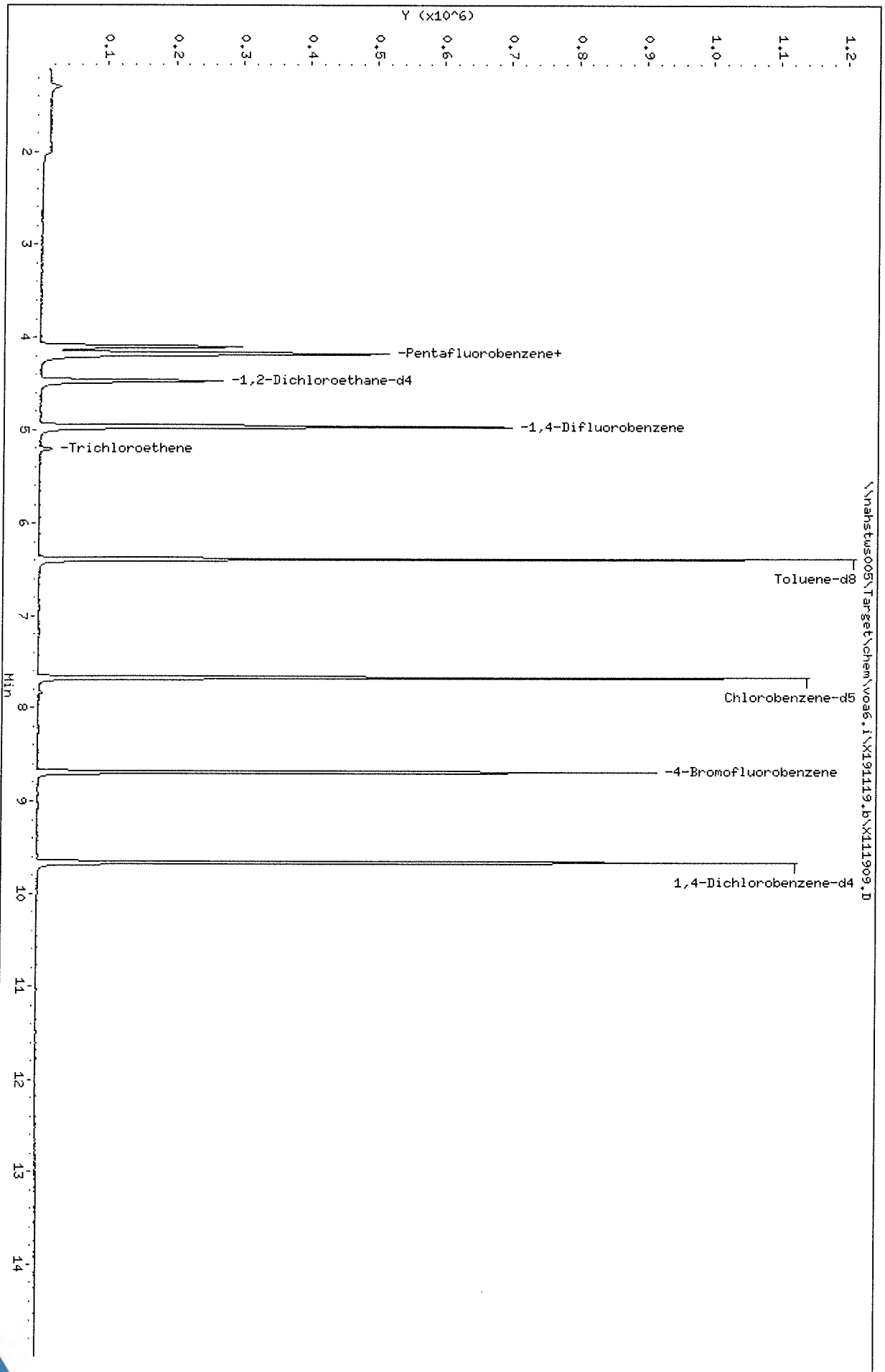
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	475333	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	632045	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	559862	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.662	9.669	(1.000)	285264	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	195607	43.8334	43.83
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	238670	45.8554	45.85
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	202638	46.9067	46.90
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	709778	48.1166	48.11
38 Trichloroethene	130	5.214	5.206	(1.049)	6499	1.47032	1.47(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).


Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111909.D
Date : 19-NOV-2019 12:49
Client ID: HS19110684-01
Sample Info: HS19110684-01;HS19110684-01;;;
Purge Volume: 5.0
Column phase: DB624
Instrument: voa6.i
Operator: PC
Column diameter: 0.18
Y (x10^6)
-Pentafluorobenzene+
-1,2-Dichloroethane-d4
-1,4-Difluorobenzene
-Trichloroethene
Toluene-d8
Chlorobenzene-d5
-4-Bromofluorobenzene
1,4-Dichlorobenzene-d4
\\nahstws005\Target\chem\voa6.i\X191119.b\X111909.D
Min

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111909.D

Date : 19-NOV-2019 12:49

Client ID: HS19110684-01

Instrument: voa6.i

Sample Info: HS19110684-01;HS19110684-01;;;

Purge Volume: 5.0

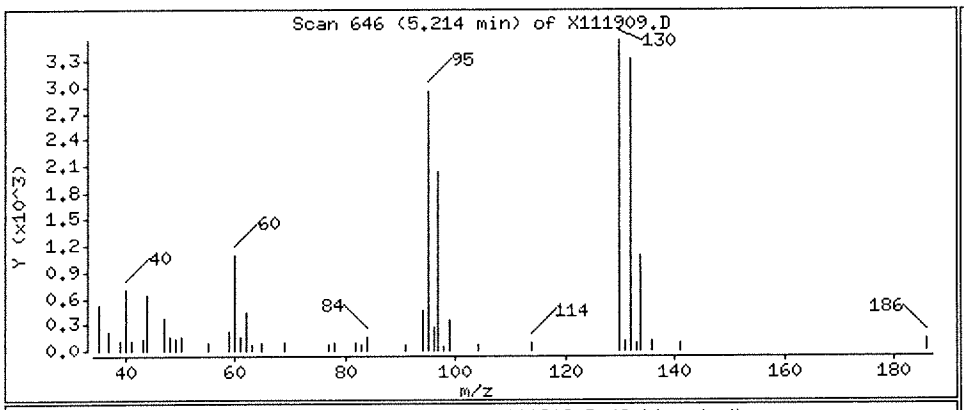
Operator: PC

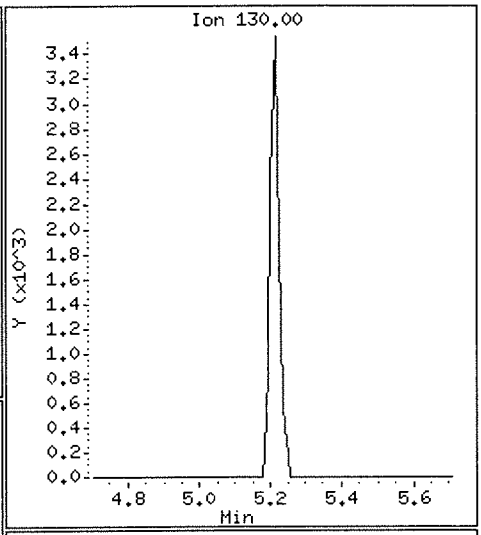
Column phase: DB624

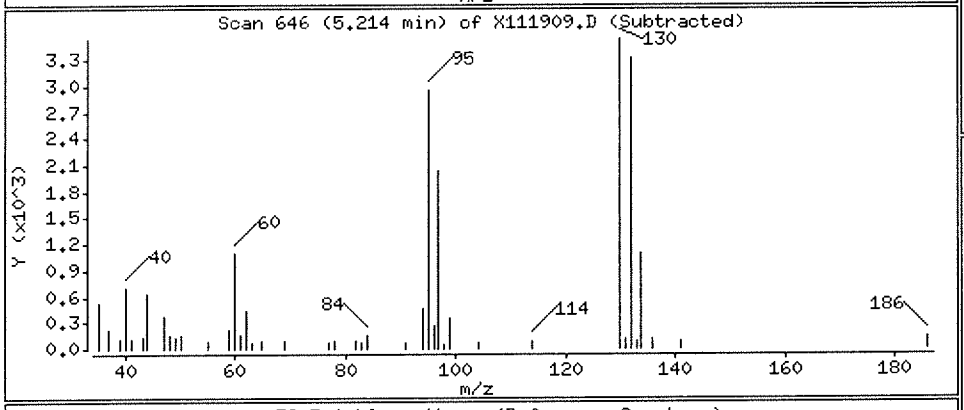
Column diameter: 0.18

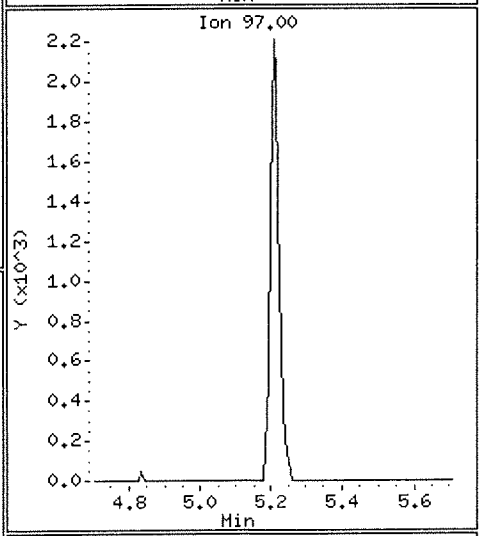
38 Trichloroethene

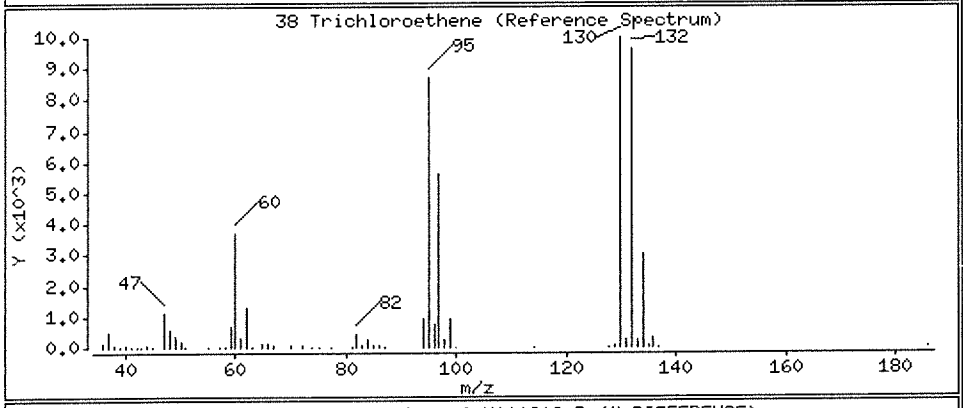
Concentration: 1.47 ug/l

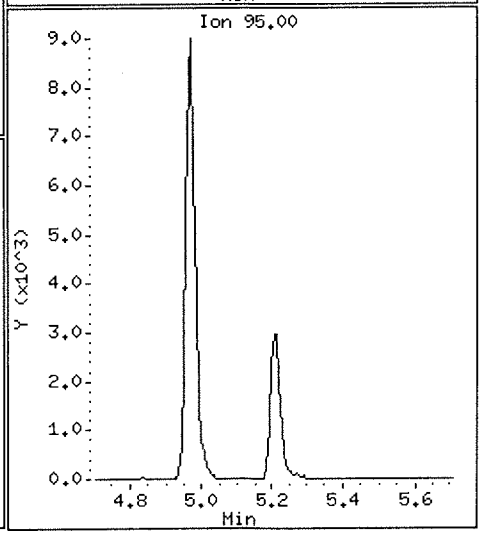


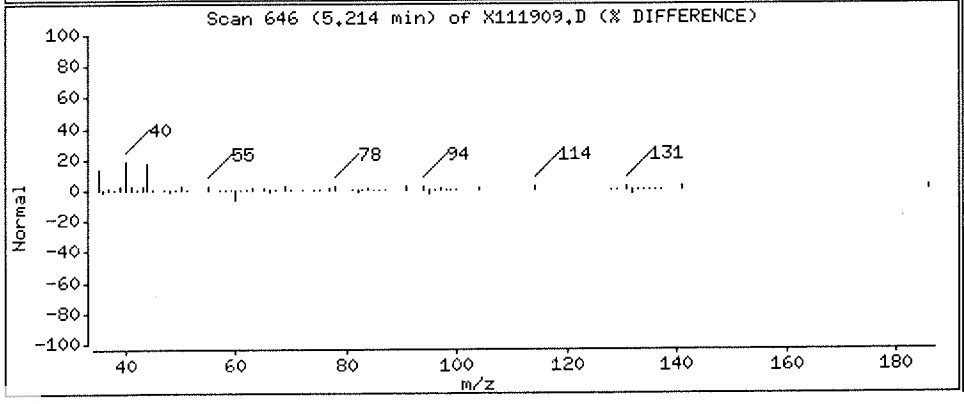












Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111910.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111910.D
Lab Smp Id: HS19110684-04 Client Smp ID: HS19110684-04
Inj Date : 19-NOV-2019 13:13
Operator : PC Inst ID: voa6.i
Smp Info : HS19110684-04;HS19110684-04;;;
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:23 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

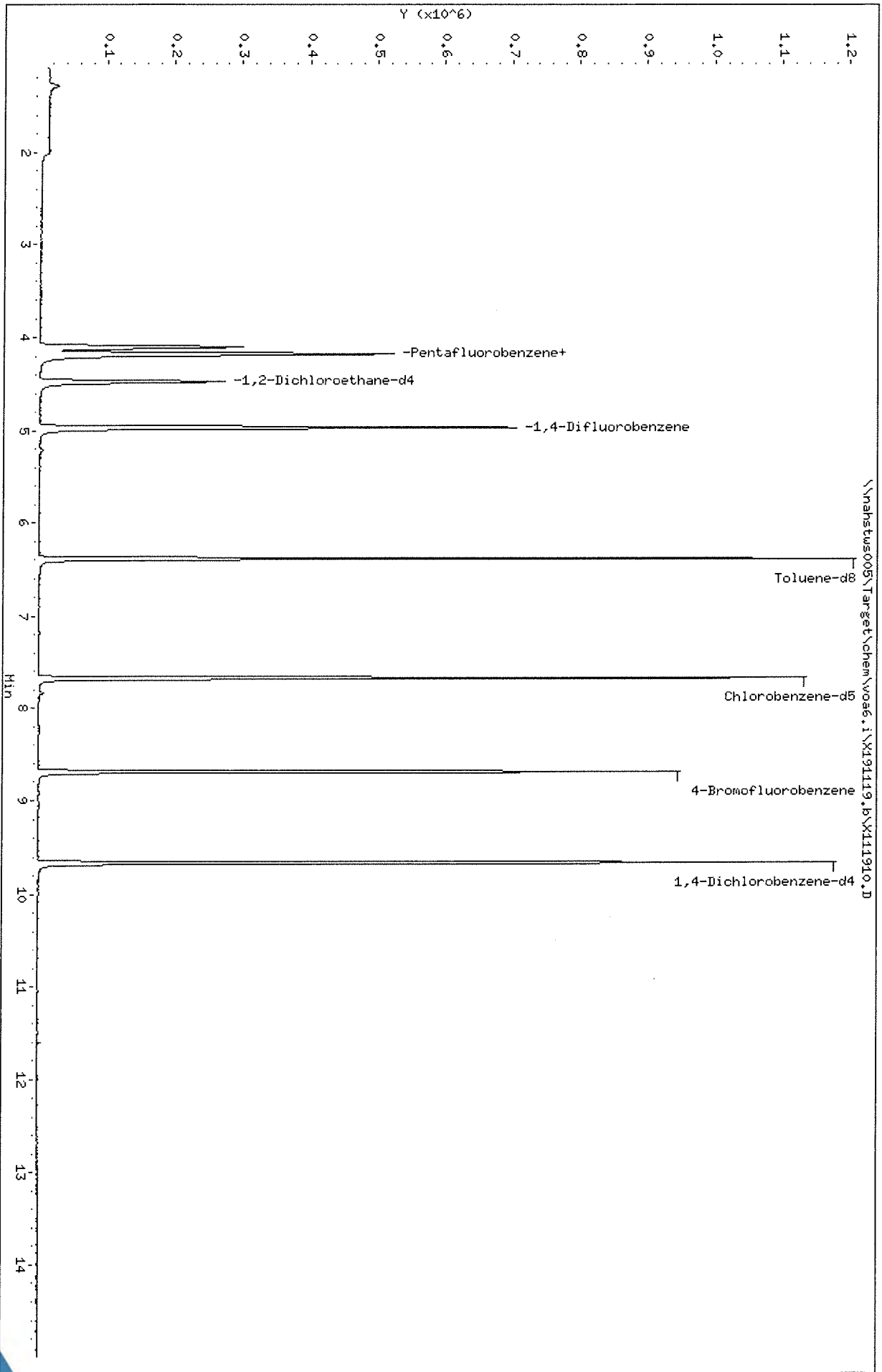
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

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)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	482327	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	636598	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	566180	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	299698	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	200658	44.3052	44.30
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	247141	46.9430	46.94
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	203779	46.4902	46.49
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	709105	47.5345	47.53

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111910.D
Date : 19-NOV-2019 13:13
Client ID: HS191106684-04
Sample Info: HS191106684-04;HS191106684-04;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111911.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111911.D
Lab Smp Id: HS19110684-02 Client Smp ID: HS19110684-02
Inj Date : 19-NOV-2019 13:37
Operator : PC Inst ID: voa6.i
Smp Info : HS19110684-02;HS19110684-02;;;
Misc Info : HS18090001;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:23 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

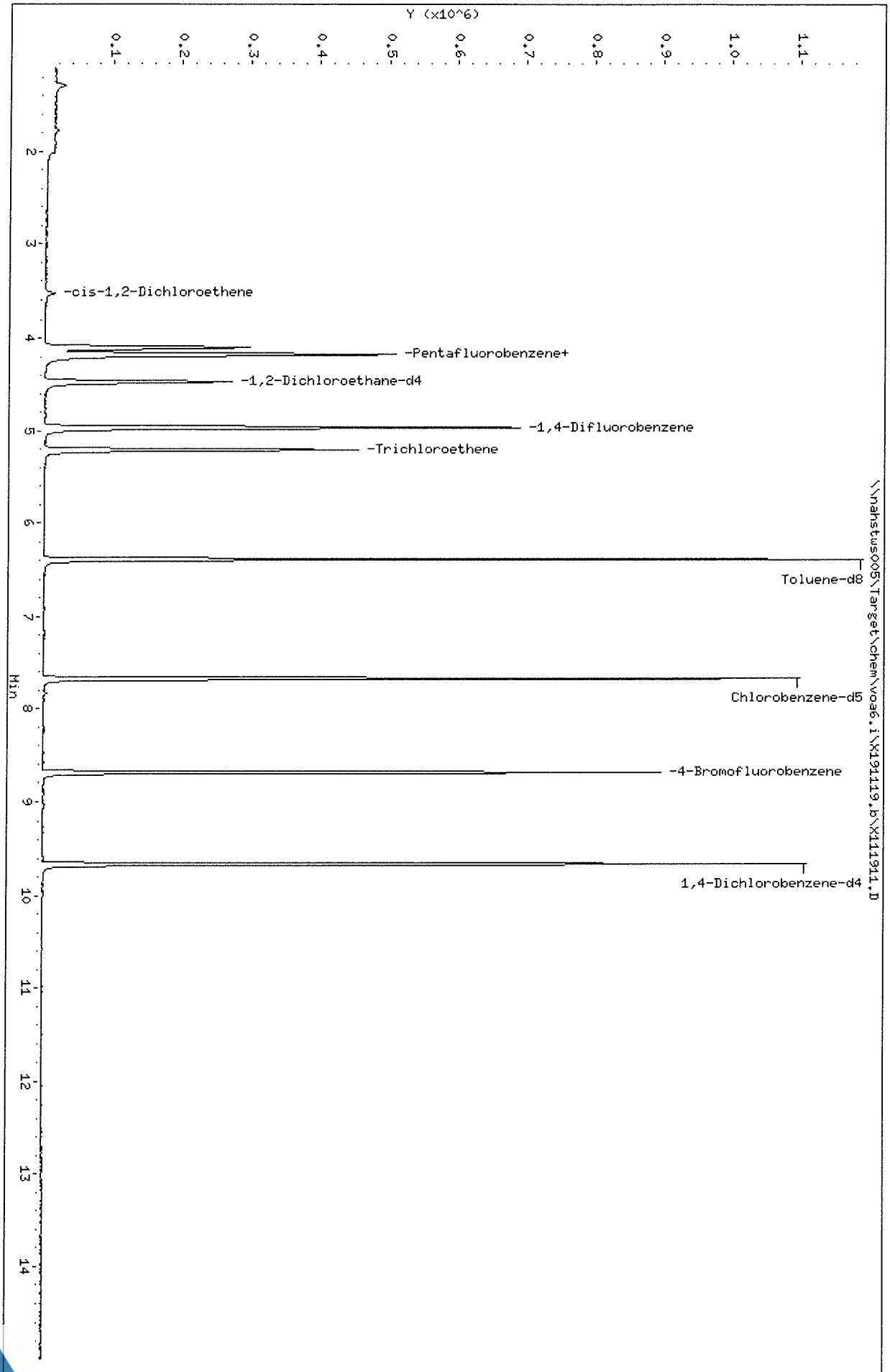
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	470610	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	625554	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	540920	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	279604	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	198063	44.8124	44.81
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	234006	46.5275	46.52
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	203823	47.6487	47.64
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	700216	49.1306	49.13
27 cis-1,2-Dichloroethene	96	3.523	3.530	(0.842)	7623	1.70805	1.70(a)
38 Trichloroethene	130	5.207	5.206	(1.048)	161158	36.8383	36.83

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111911.D
Date : 19-NOV-2019 13:37
Client ID: HS19110684-02
Sample Info: HS19110684-02;HS19110684-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111911.D

Date : 19-NOV-2019 13:37

Client ID: HS19110684-02

Instrument: voa6.i

Sample Info: HS19110684-02;HS19110684-02;;;

Purge Volume: 5.0

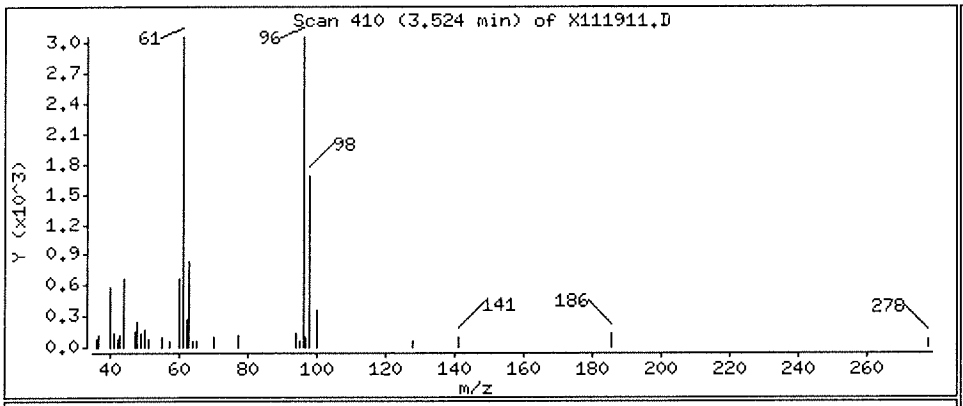
Operator: PC

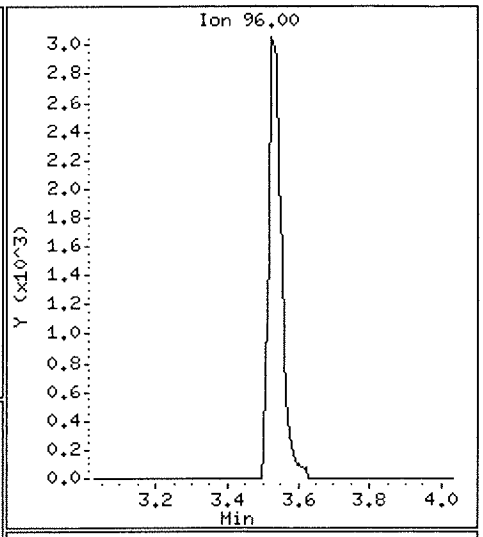
Column phase: DB624

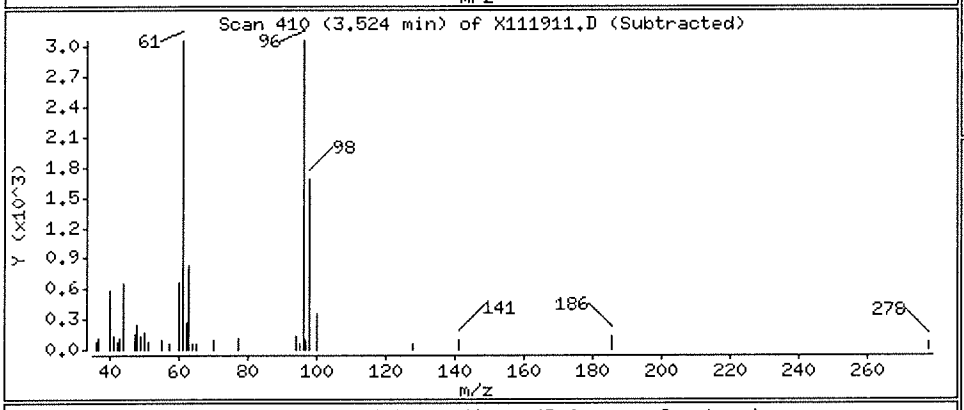
Column diameter: 0.18

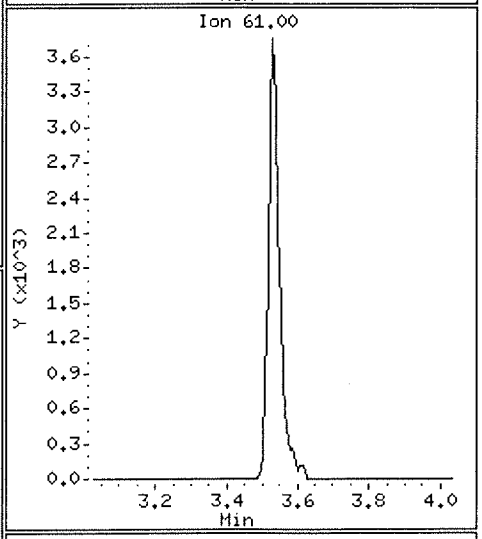
27 cis-1,2-Dichloroethene

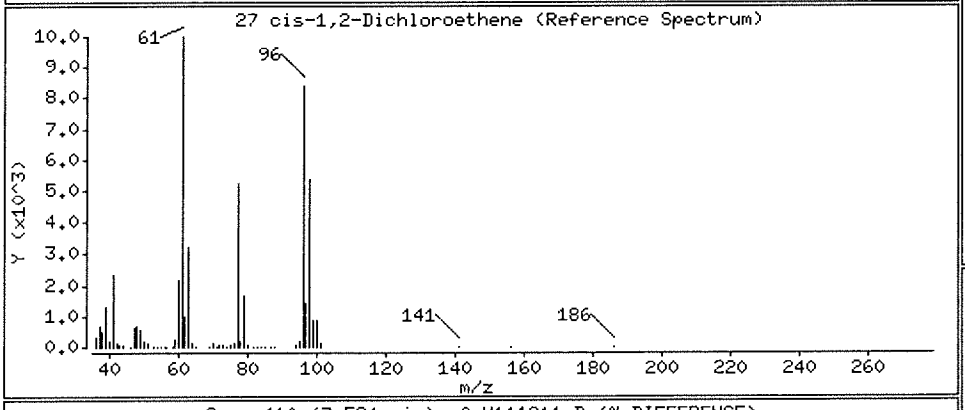
Concentration: 1.70 ug/l

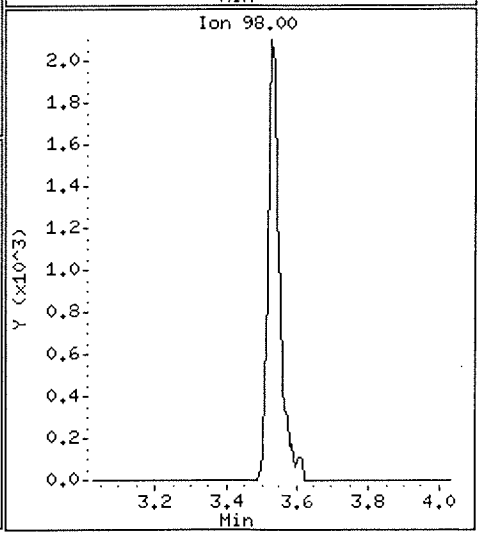


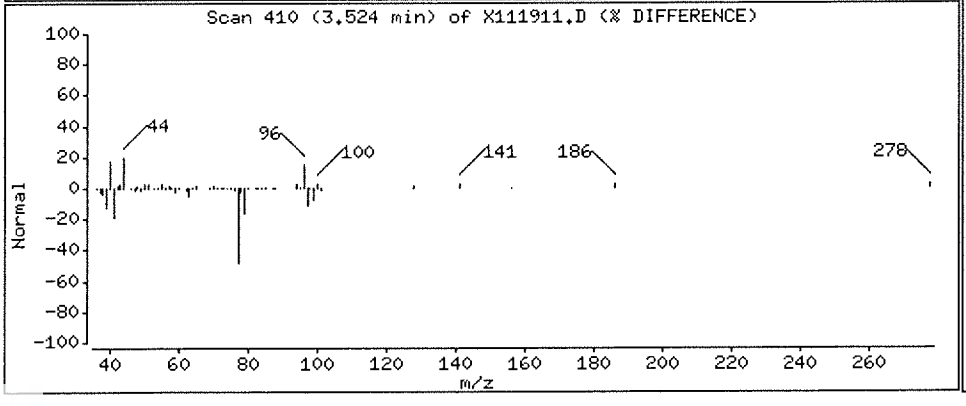












Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111911.D Page 4

Date : 19-NOV-2019 13:37

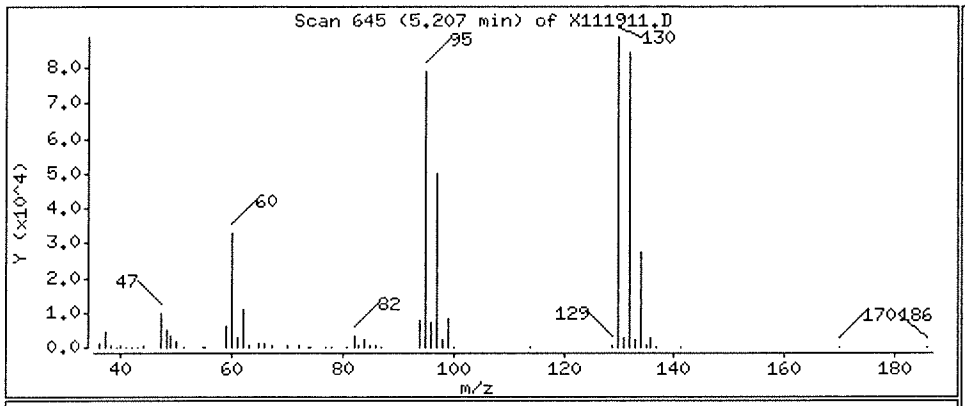
Client ID: HS19110684-02 Instrument: voa6.i

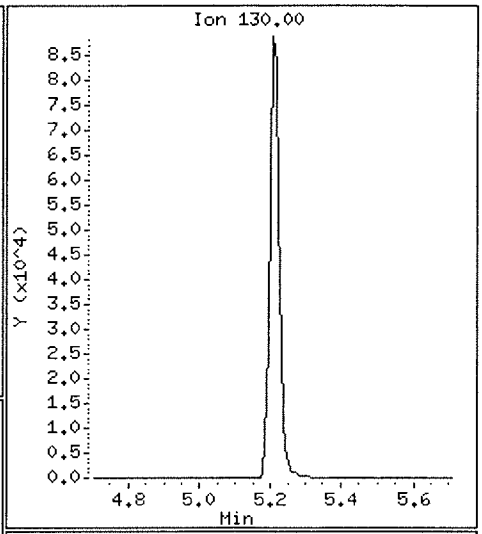
Sample Info: HS19110684-02;HS19110684-02;;;

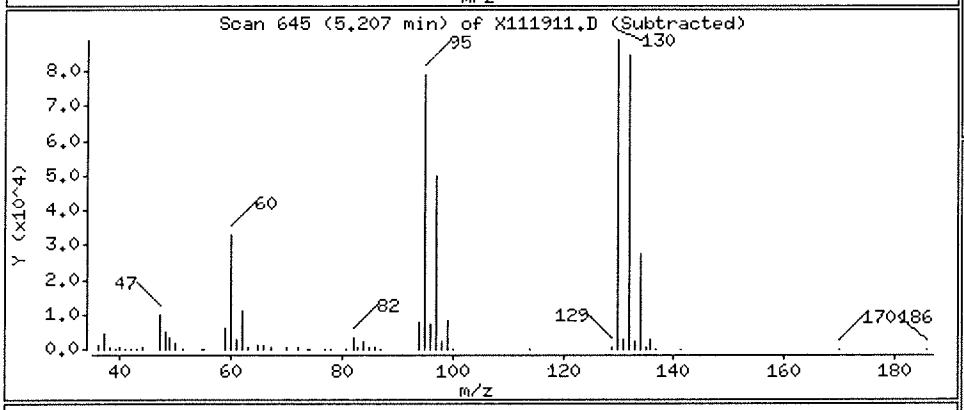
Purge Volume: 5.0 Operator: PC

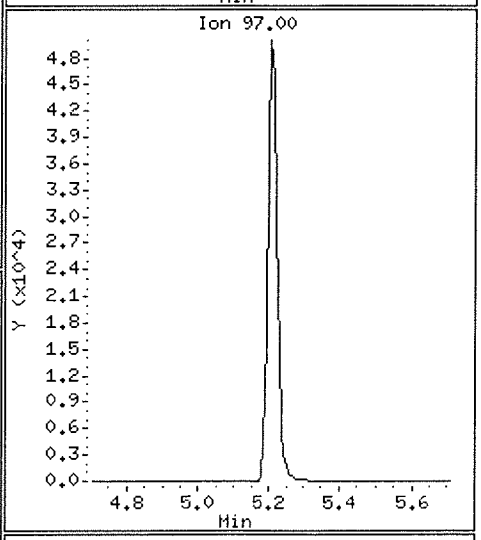
Column phase: DB624 Column diameter: 0.18

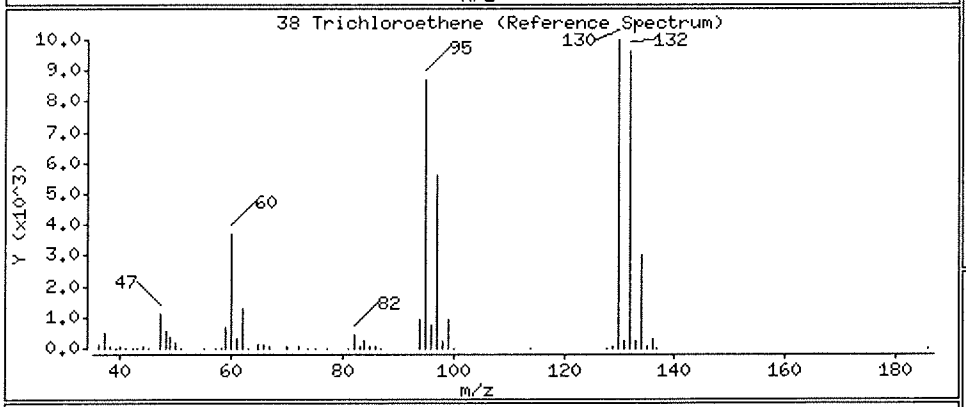
38 Trichloroethene Concentration: 36.83 ug/l

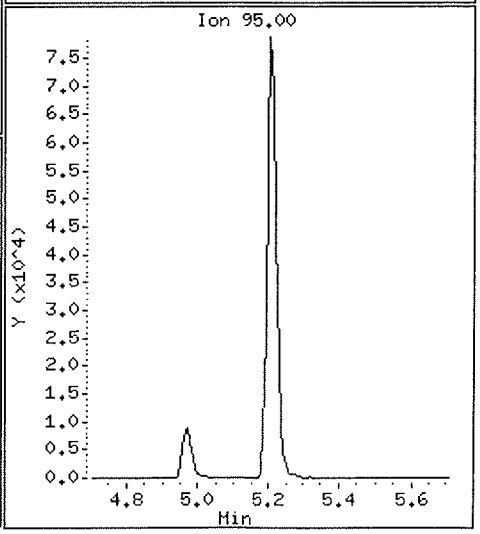


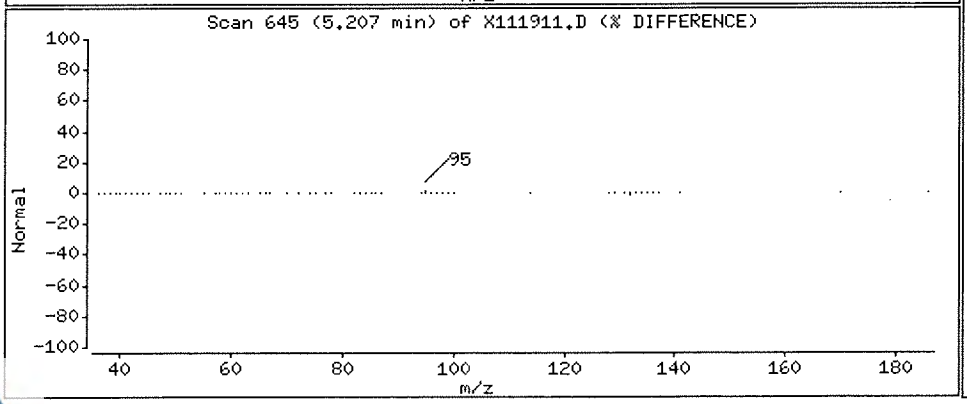












Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111912.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111912.D
Lab Smp Id: HS19110684-03 Client Smp ID: HS19110684-03
Inj Date : 19-NOV-2019 14:01
Operator : PC Inst ID: voa6.i
Smp Info : HS19110684-03;HS19110684-03;;;
Misc Info : HS18090001;WATER;0;25;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:23 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 12
Dil Factor: 25.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14
Processing Host: NAHSTW7056

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

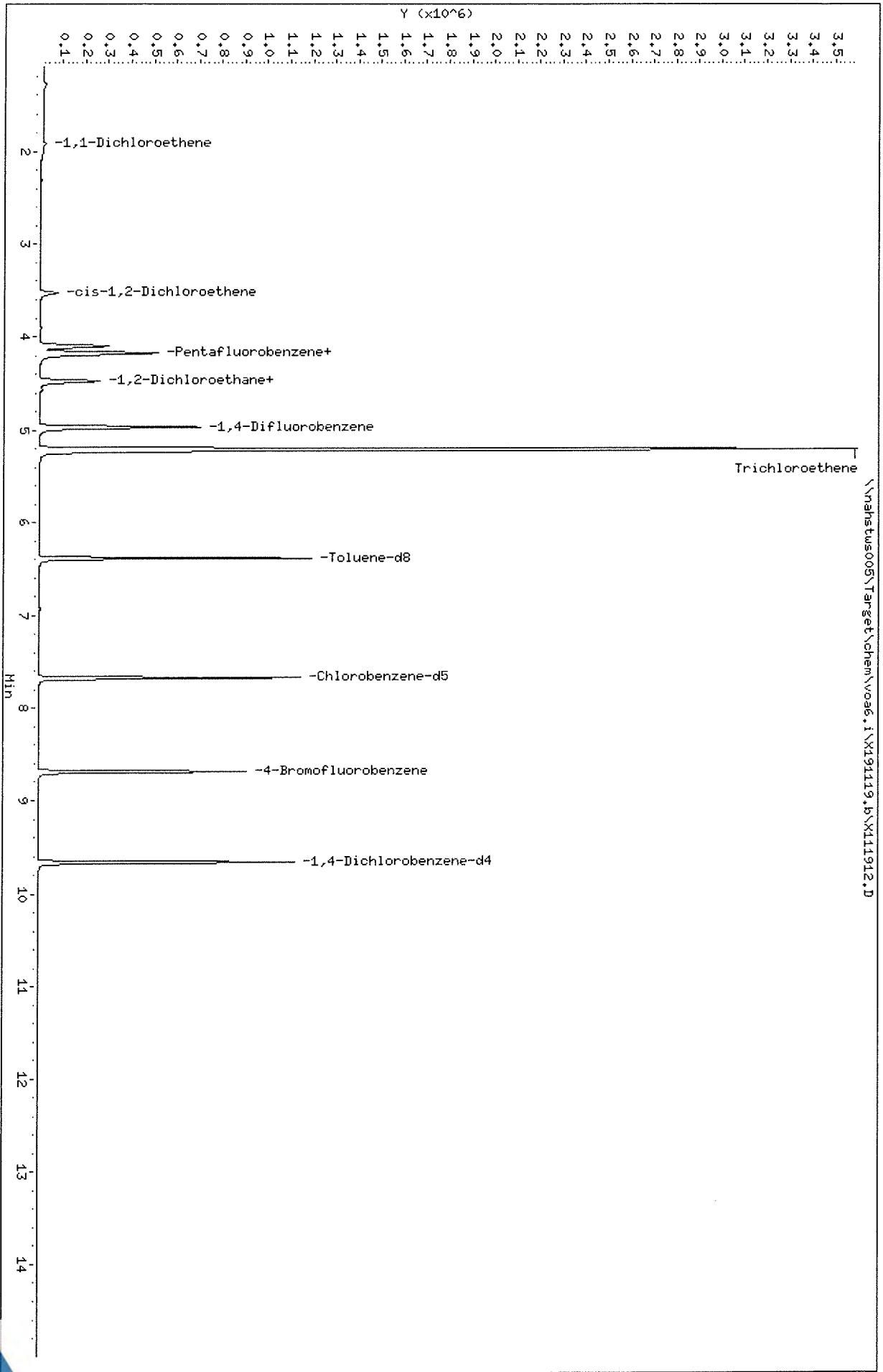
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	475982	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	630084	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	553484	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	285503	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	196257	43.9176	43.91
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	236408	45.9434	45.94
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	204032	47.1630	47.16
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	702211	48.1521	48.15
11 1,1-Dichloroethene	96	1.919	1.911	(0.459)	2713	0.67257	16.81(a)
33 1,2-Dichloroethane	62	4.562	4.562	(0.918)	7744	1.54825	38.70(a)
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	41521	9.19843	229.96
38 Trichloroethene	130	5.207	5.206	(1.048)	1252105	284.155	7103.87(A)

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\X191119.b\X111912.D
Date : 19-NOV-2019 14:01
Client ID: HS19110684-03
Sample Info: HS19110684-03;HS19110684-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18



Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111912.D Page 3

Date : 19-NOV-2019 14:01

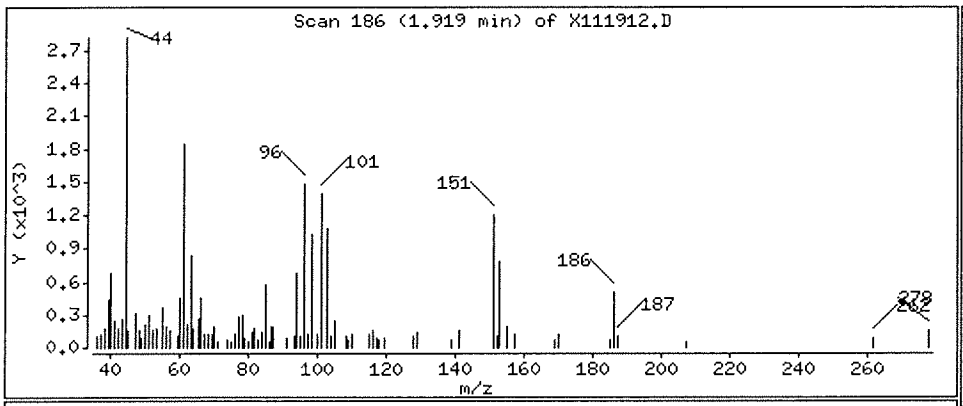
Client ID: HS19110684-03 Instrument: voa6.i

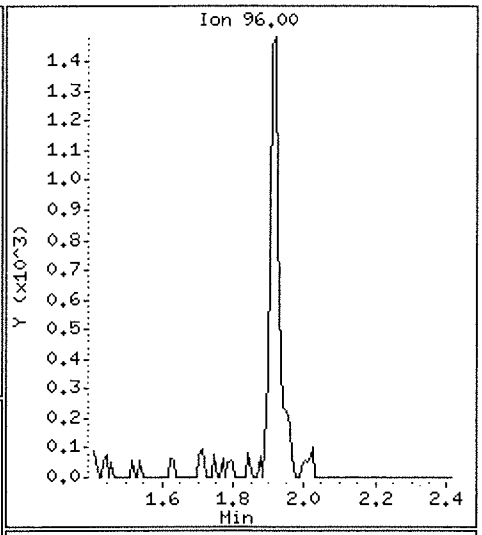
Sample Info: HS19110684-03;HS19110684-03;;;

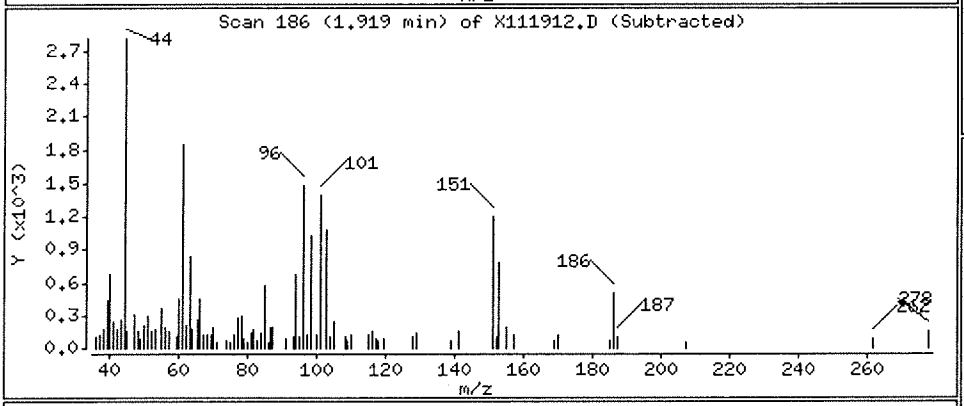
Purge Volume: 5.0 Operator: PC

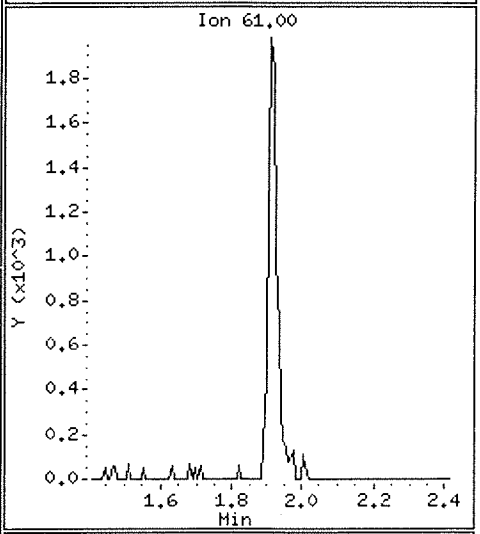
Column phase: DB624 Column diameter: 0.18

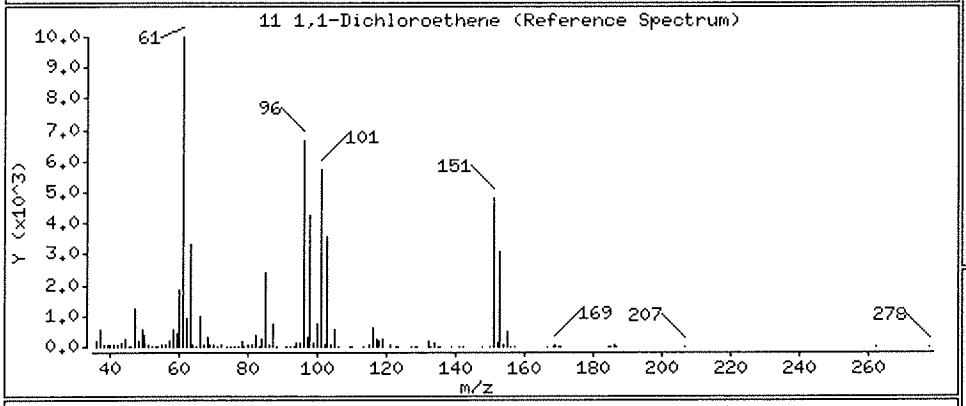
11 1,1-Dichloroethene Concentration: 16.81 ug/l

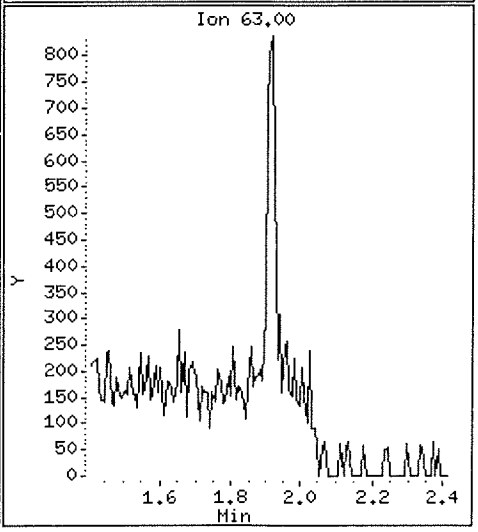


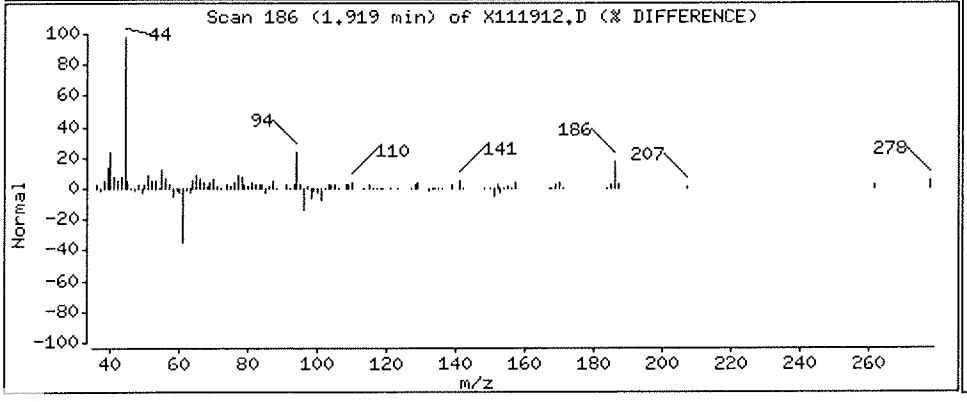












Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111912.D

Date : 19-NOV-2019 14:01

Client ID: HS19110684-03

Instrument: voa6.i

Sample Info: HS19110684-03;HS19110684-03;;;

Purge Volume: 5.0

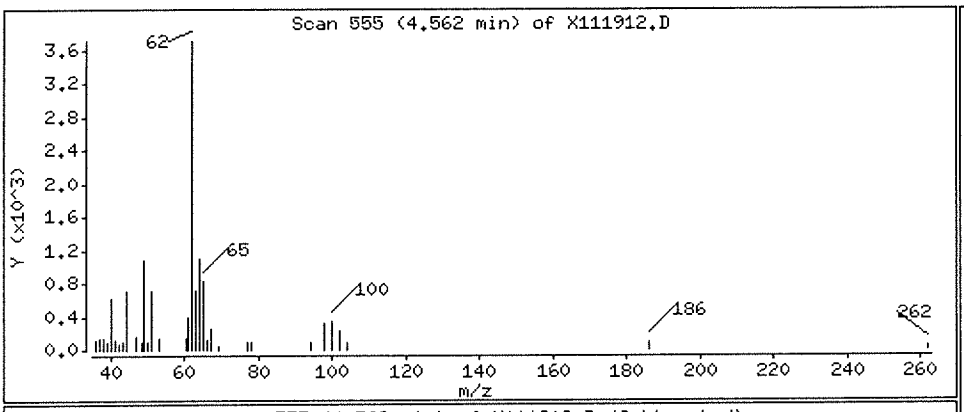
Operator: PC

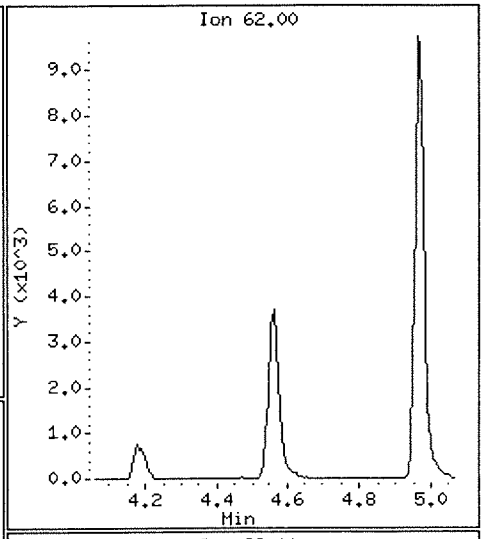
Column phase: DB624

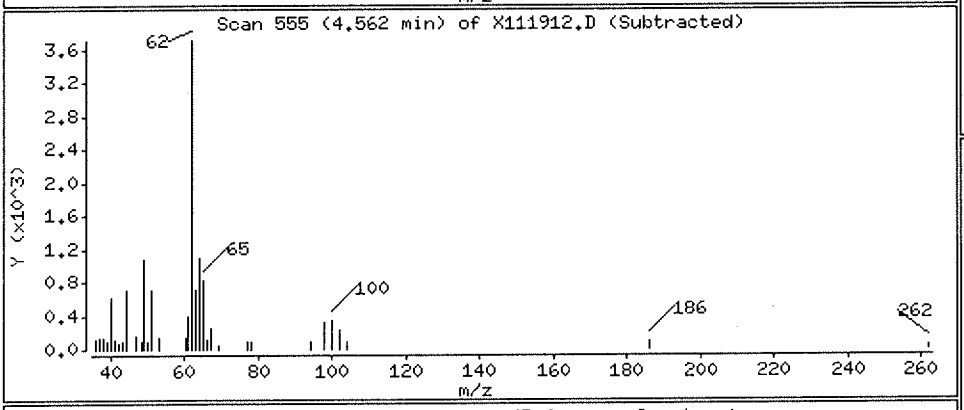
Column diameter: 0.18

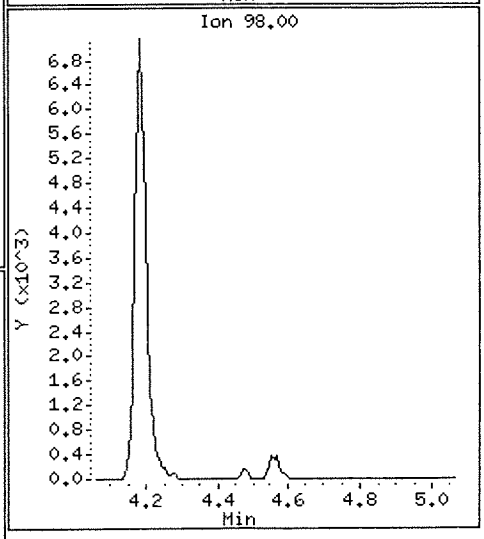
33 1,2-Dichloroethane

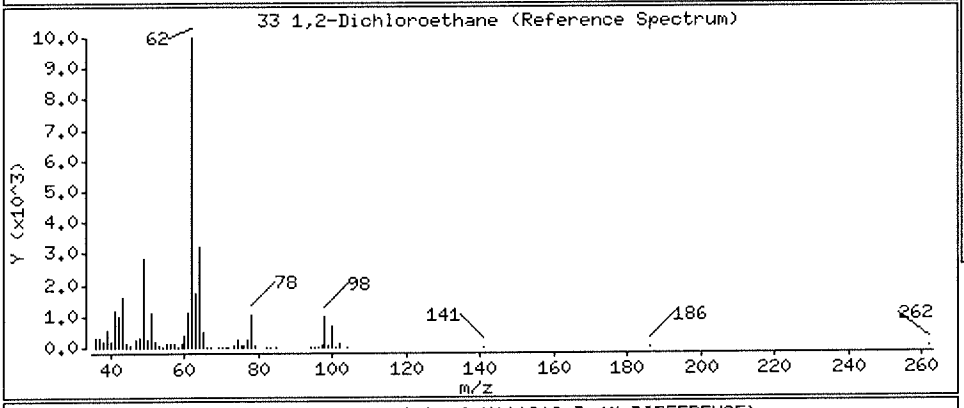
Concentration: 38.70 ug/l

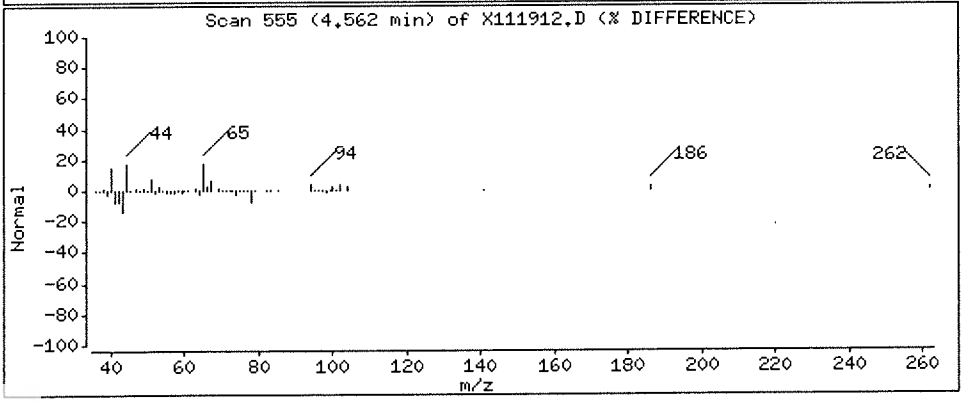












Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111912.D Page 5

Date : 19-NOV-2019 14:01

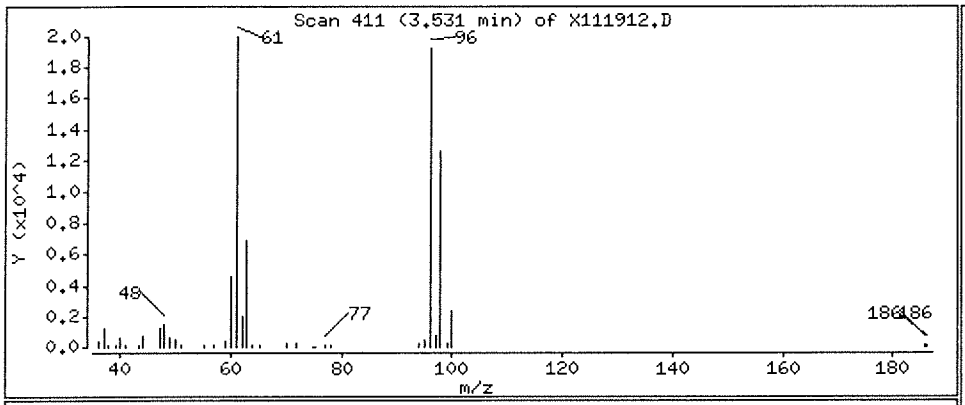
Client ID: HS19110684-03 Instrument: voa6.i

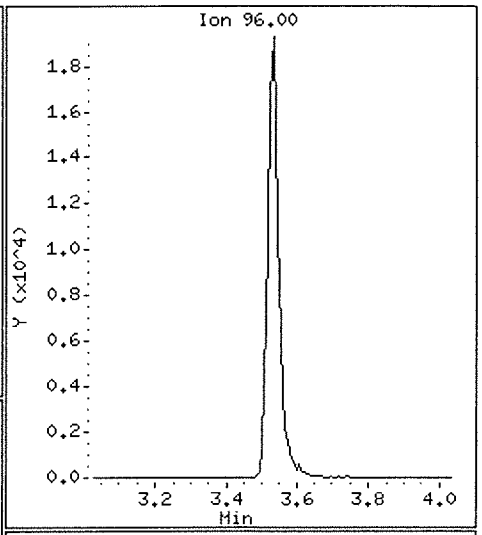
Sample Info: HS19110684-03;HS19110684-03;;;

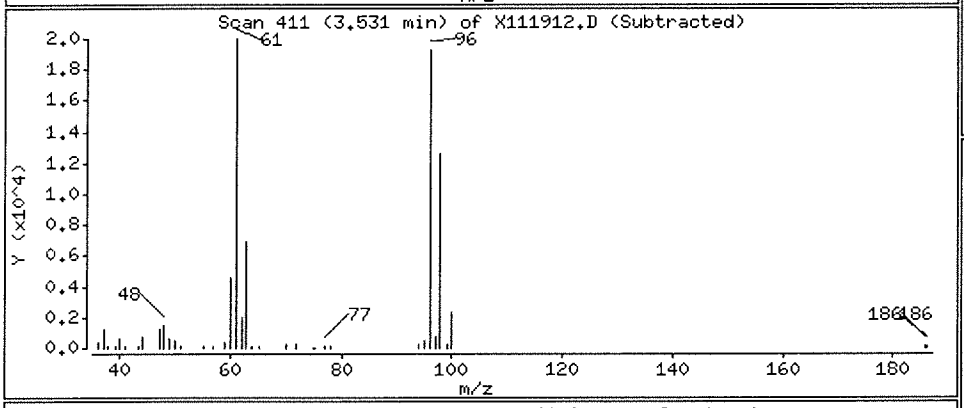
Purge Volume: 5.0 Operator: PC

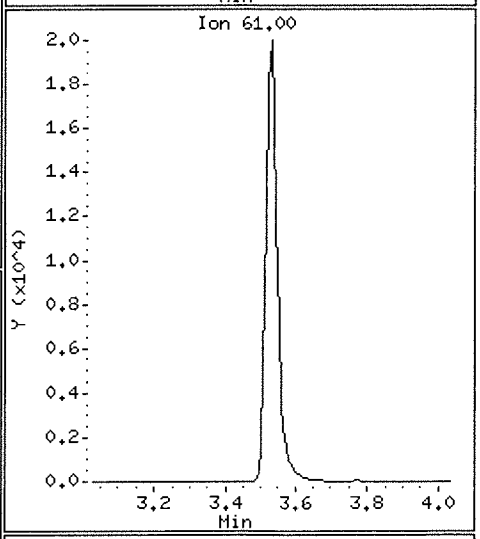
Column phase: DB624 Column diameter: 0.18

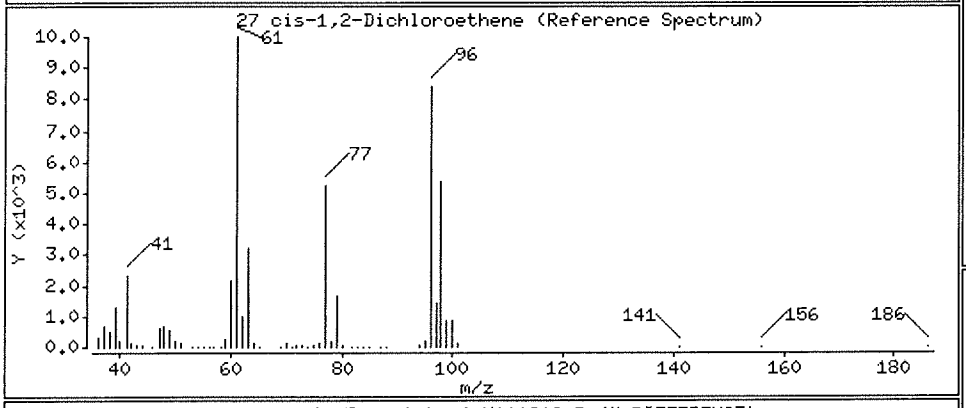
27 cis-1,2-Dichloroethene Concentration: 229.96 ug/l

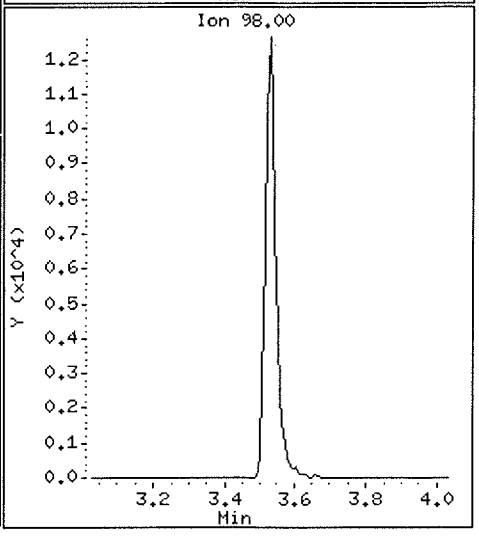


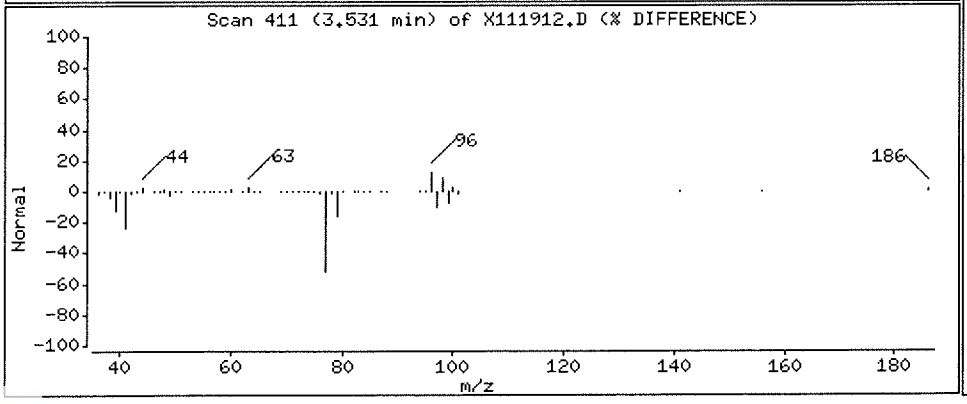












Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111912.D

Date : 19-NOV-2019 14:01

Client ID: HS19110684-03

Instrument: voa6.i

Sample Info: HS19110684-03;HS19110684-03;;;

Purge Volume: 5.0

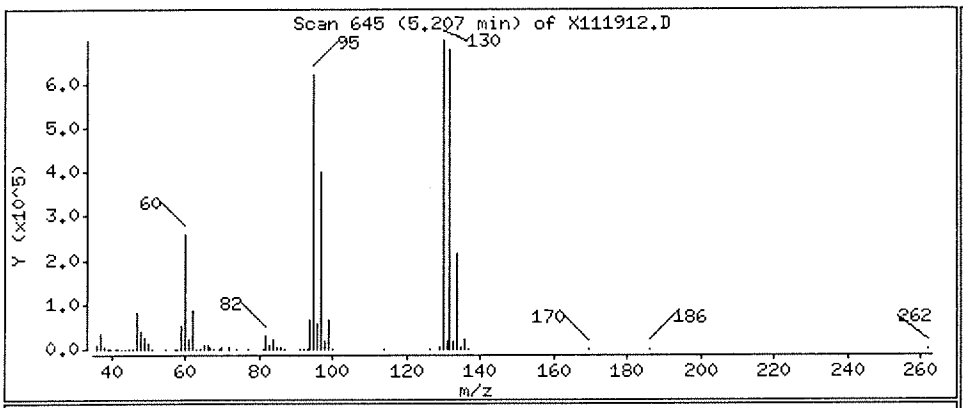
Operator: PC

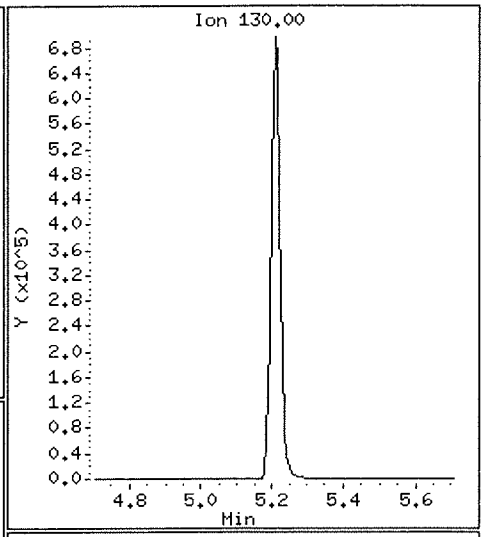
Column phase: DB624

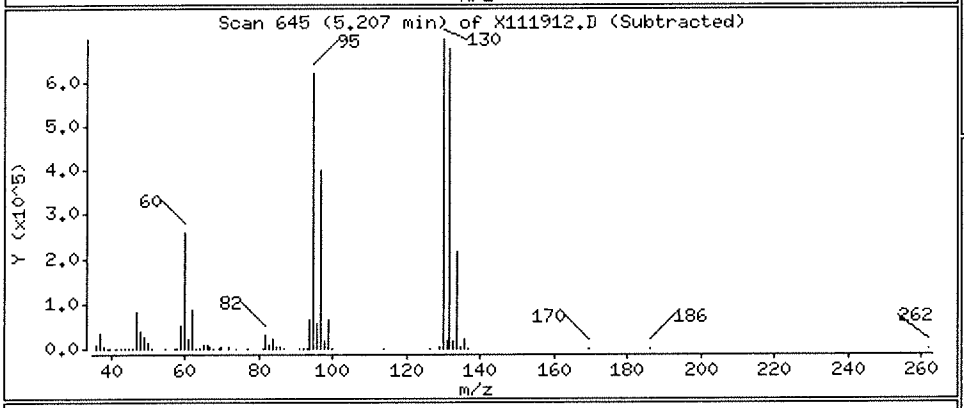
Column diameter: 0.18

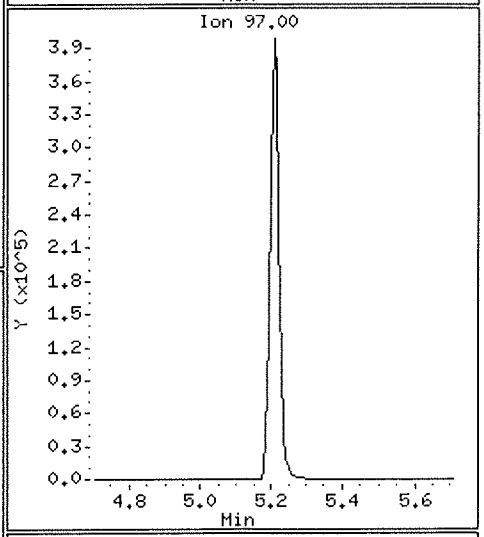
38 Trichloroethene

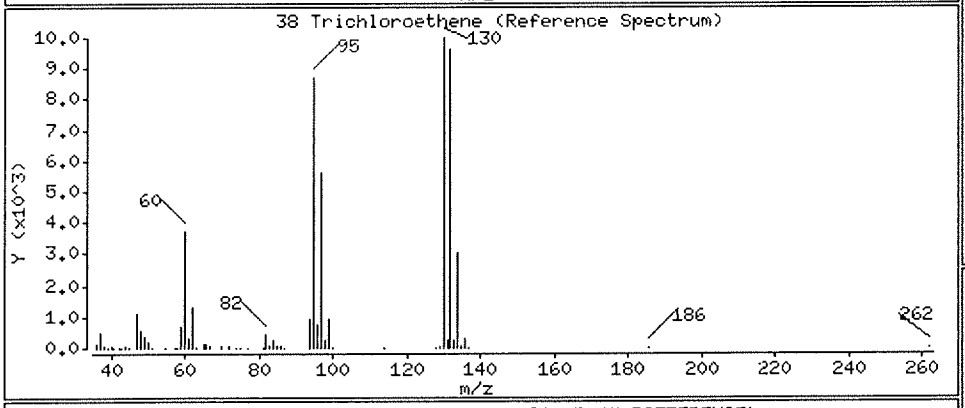
Concentration: 7103.87 ug/l

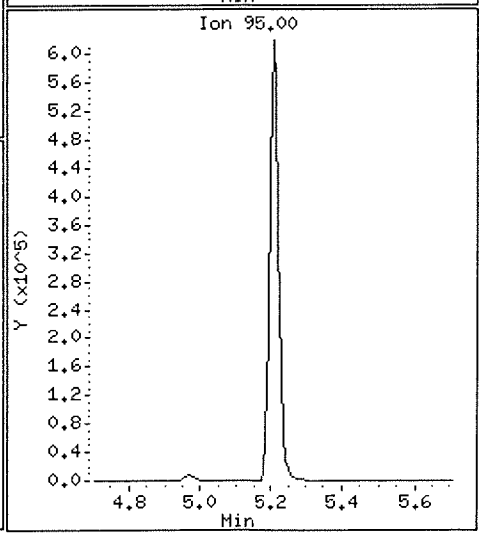


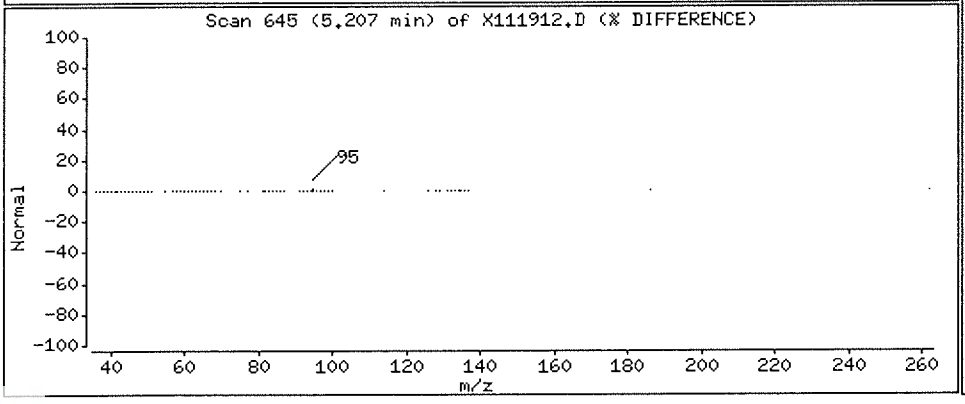












Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111913.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111913.D
Lab Smp Id: HS19110684-04MS Client Smp ID: HS19110684-04MS
Inj Date : 19-NOV-2019 14:25
Operator : PC Inst ID: voa6.i
Smp Info : HS19110684-04MS;HS19110684-04MS;3;;MS
Misc Info : HS18090001;WATER;0;1;
Comment :
Method : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:22 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 13 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.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

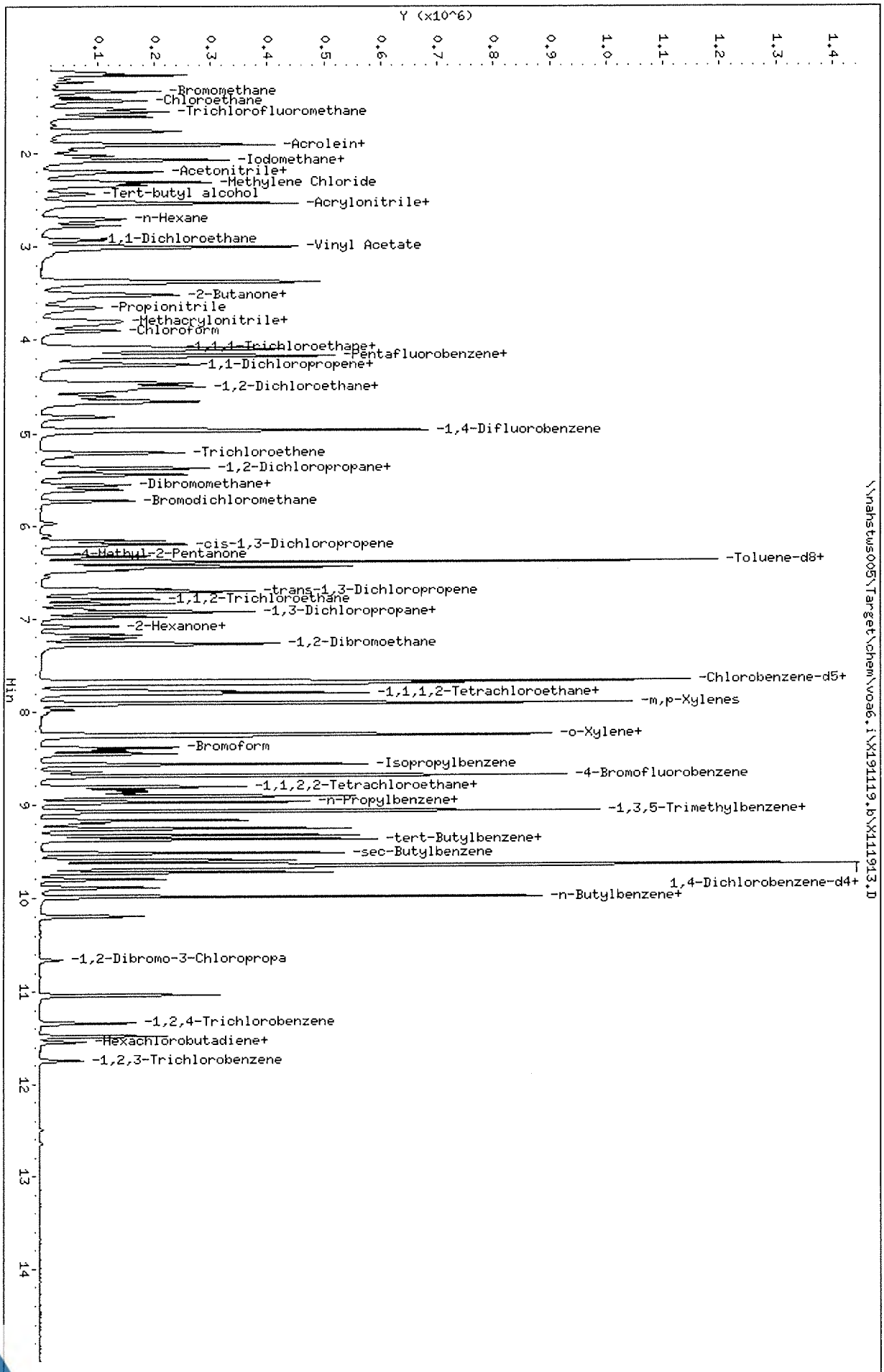
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	468918	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	615407	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	545776	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	290575	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	192590	43.7492	43.74
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	235401	46.3897	46.38
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	198624	46.6089	46.60
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	689820	47.9705	47.97
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	78451	19.8133	19.81
31 1,1,1-Trichloroethane	97	4.082	4.089	(0.976)	117675	18.6017	18.60
68 1,1,2,2-Tetrachloroethane	83	8.838	8.845	(0.914)	73988	18.1077	18.10
138 Freon TF	101	1.919	1.919	(0.459)	76461	18.7293	18.72
53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	54081	18.9558	18.95
22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	119653	17.5372	17.53
11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	75102	18.8987	18.89
32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	95484	19.2346	19.23
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	22019	19.9365	19.93
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	61906	17.8809	17.88(M)
90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	48269	19.7201	19.72
79 1,2,4-Trimethylbenzene	105	9.383	9.382	(0.970)	265901	19.2857	19.28
89 1,2-Dibromo-3-Chloropropane	155	10.658	10.658	(1.102)	8251	18.0762	18.07
57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	71917	18.7880	18.78
88 1,2-Dichlorobenzene	146	9.999	9.991	(1.034)	150877	19.5640	19.56

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111913.D Page 2
Report Date: 07-Dec-2019 09:23

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	88623	18.1409	18.14
42	1,2-Dichloropropane	63	5.436	5.436	(1.094)	66426	18.0692	18.06
75	1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	262313	19.8275	19.82
83	1,3-Dichlorobenzene	146	9.605	9.612	(0.993)	165937	19.9129	19.91
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	105887	18.2808	18.28
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	165137	19.5015	19.50
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	109209	17.6358	17.63
24	2-Butanone	43	3.580	3.573	(0.856)	41270	28.6829	28.68
76	2-Chlorotoluene	91	8.974	8.974	(0.928)	210697	20.1542	20.15
52	2-Hexanone	43	7.083	7.083	(0.923)	75061	33.4796	33.47
77	4-Chlorotoluene	91	9.075	9.074	(0.939)	242667	19.1505	19.15
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	277913	19.5467	19.54
45	4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	109268	34.1694	34.16
10	Acetone	43	1.976	1.976	(0.473)	35633	26.6268	26.62
37	Benzene	78	4.512	4.512	(0.908)	269522	19.1453	19.14
74	Bromobenzene	156	8.810	8.809	(0.911)	102754	20.3471	20.34
29	Bromochloromethane	128	3.795	3.795	(0.908)	44726	17.6068	17.60
39	Bromodichloromethane	83	5.729	5.729	(1.153)	94129	18.4828	18.48
66	Bromoform	173	8.416	8.415	(1.097)	60685	19.2990	19.29
6	Bromomethane	94	1.338	1.338	(0.320)	99680	20.0296	20.02
19	Carbon Disulfide	76	2.069	2.069	(0.495)	404668	37.4314	37.43
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	109990	20.2264	20.22
59	Chlorobenzene	112	7.699	7.699	(1.004)	202654	19.0194	19.01
7	Chloroethane	64	1.403	1.403	(0.336)	52324	17.7227	17.72
28	Chloroform	83	3.910	3.910	(0.935)	127829	16.8326	16.83
3	Chloromethane	50	1.073	1.073	(0.257)	86555	17.1193	17.11
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	81356	18.2949	18.29
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	112387	18.7261	18.72
55	Dibromochloromethane	129	7.176	7.176	(0.936)	80750	19.4826	19.48
44	Dibromomethane	93	5.557	5.557	(1.118)	48387	18.5998	18.59
2	Dichlorodifluoromethane	85	0.973	0.973	(0.233)	75491	18.2379	18.23
61	Ethylbenzene	106	7.800	7.799	(1.017)	108860	19.7735	19.77
91	Hexachlorobutadiene	225	11.481	11.488	(1.187)	40971	17.5450	17.54
67	Isopropylbenzene	105	8.566	8.566	(1.117)	322494	19.7768	19.77
62	m,p-Xylenes	106	7.907	7.907	(1.031)	260529	39.2164	39.21
17	Methylene Chloride	84	2.305	2.305	(0.551)	70633	16.6587	16.65
87	n-Butylbenzene	91	9.999	9.999	(1.034)	226205	19.1178	19.11
73	n-Propylbenzene	91	8.917	8.917	(0.922)	365176	20.3316	20.33
92	Naphthalene	128	11.546	11.546	(1.194)	53044	16.8963	16.89
63	o-Xylene	106	8.244	8.244	(1.075)	125977	19.2138	19.21
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	310564	19.9040	19.90
64	Styrene	104	8.258	8.258	(1.077)	216224	18.9647	18.96
78	tert-Butylbenzene	119	9.340	9.340	(0.966)	230996	20.3922	20.39
56	Tetrachloroethene	164	6.933	6.933	(0.904)	78623	20.5027	20.50
50	Toluene	91	6.446	6.446	(0.840)	300805	19.4356	19.43
20	trans-1,2-Dichloroethene	96	2.528	2.527	(0.604)	70518	18.2777	18.27
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	98192	17.9511	17.95
38	Trichloroethene	130	5.206	5.206	(1.048)	90664	21.0662	21.06
8	Trichlorofluoromethane	101	1.561	1.560	(0.373)	143197	19.6861	19.68
5	Vinyl Chloride	62	1.138	1.138	(0.272)	85729	17.9384	17.93

QC Flag Legend

M - Compound response manually integrated.

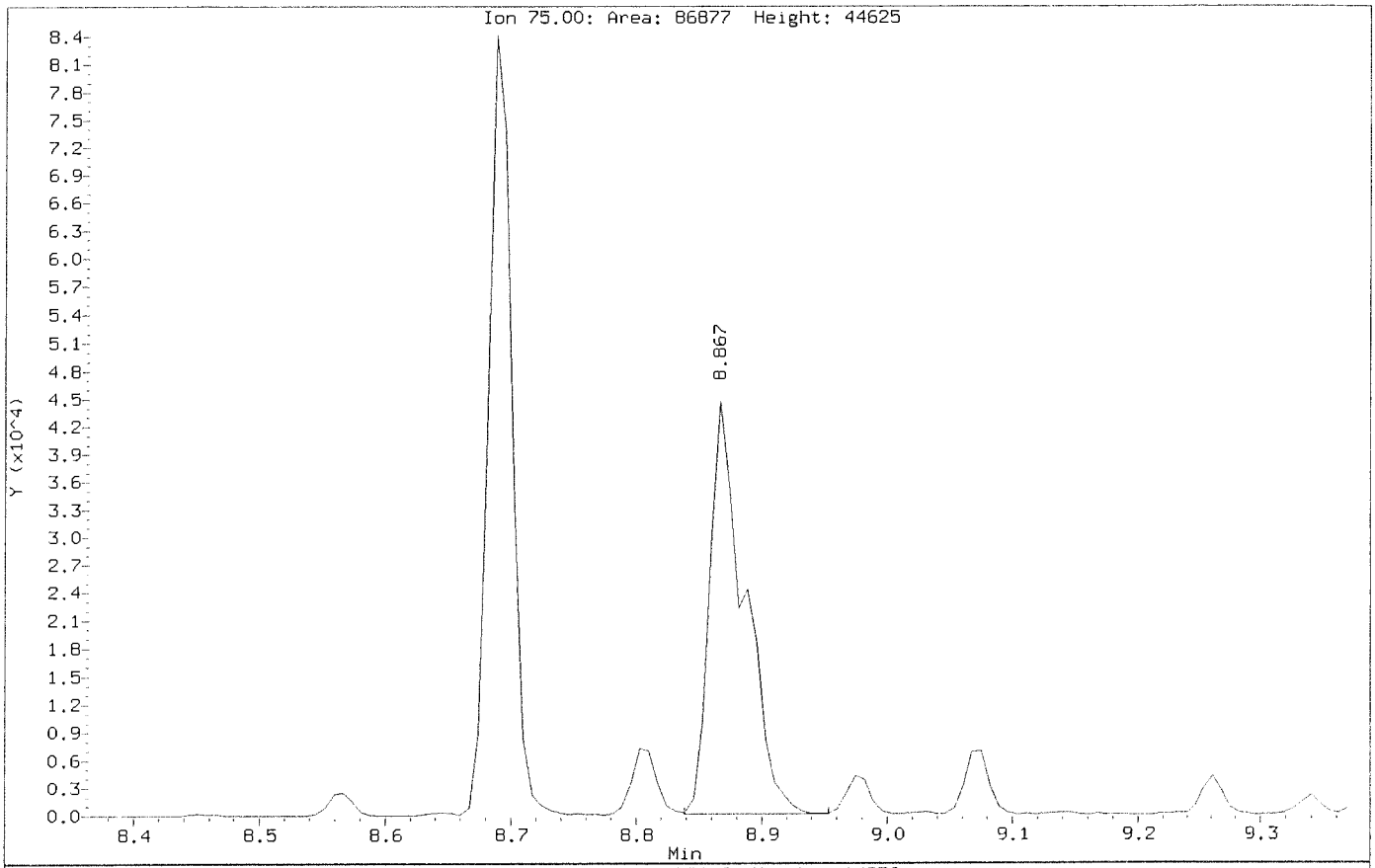


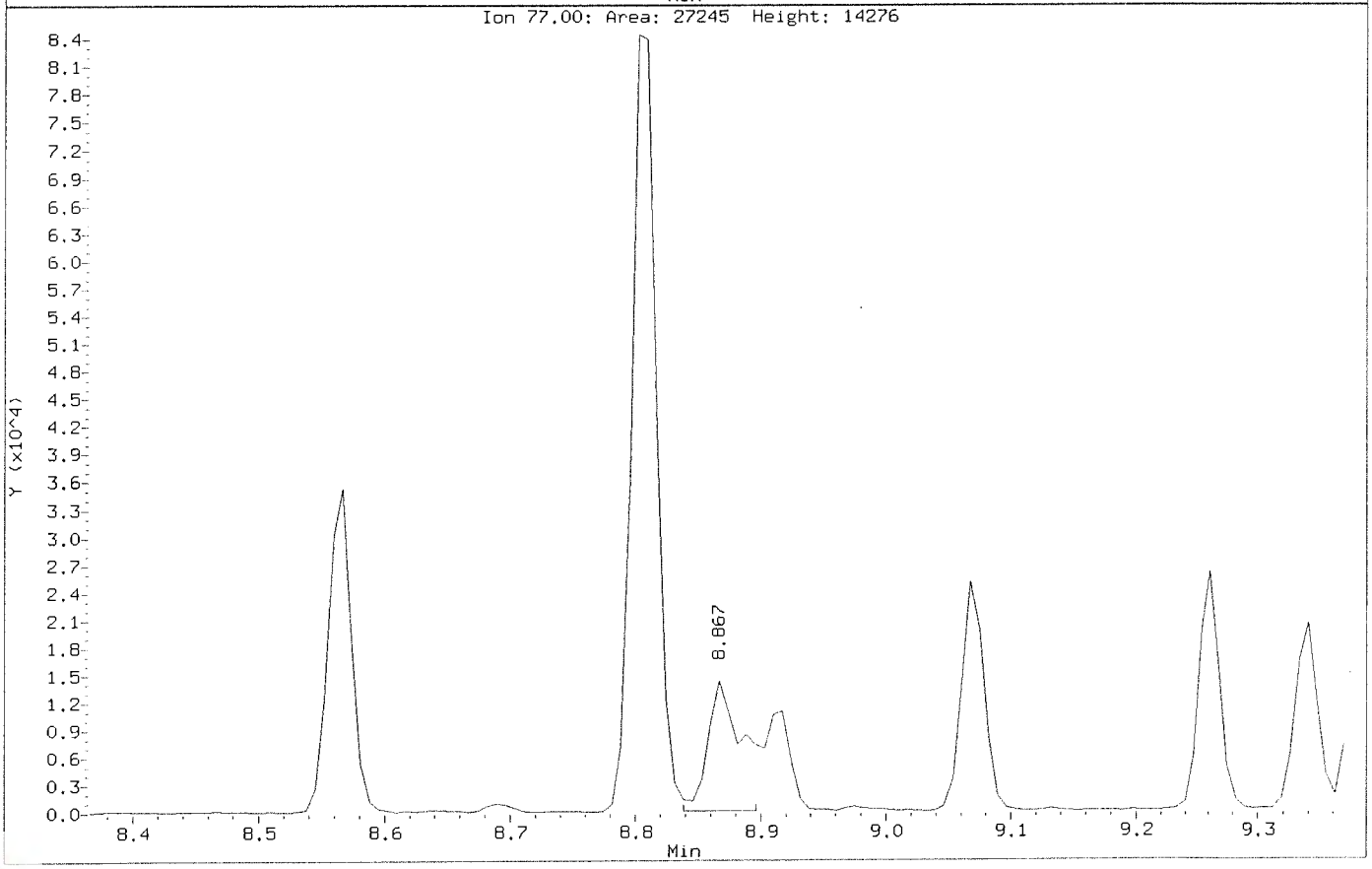
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Sample Info: HS19110684-04MS;HS19110684-04MS;3;;MS
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

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Injection Date: 19-NOV-2019 14:25
Instrument: voa6.i
Client Sample ID: HS19110684-04MS

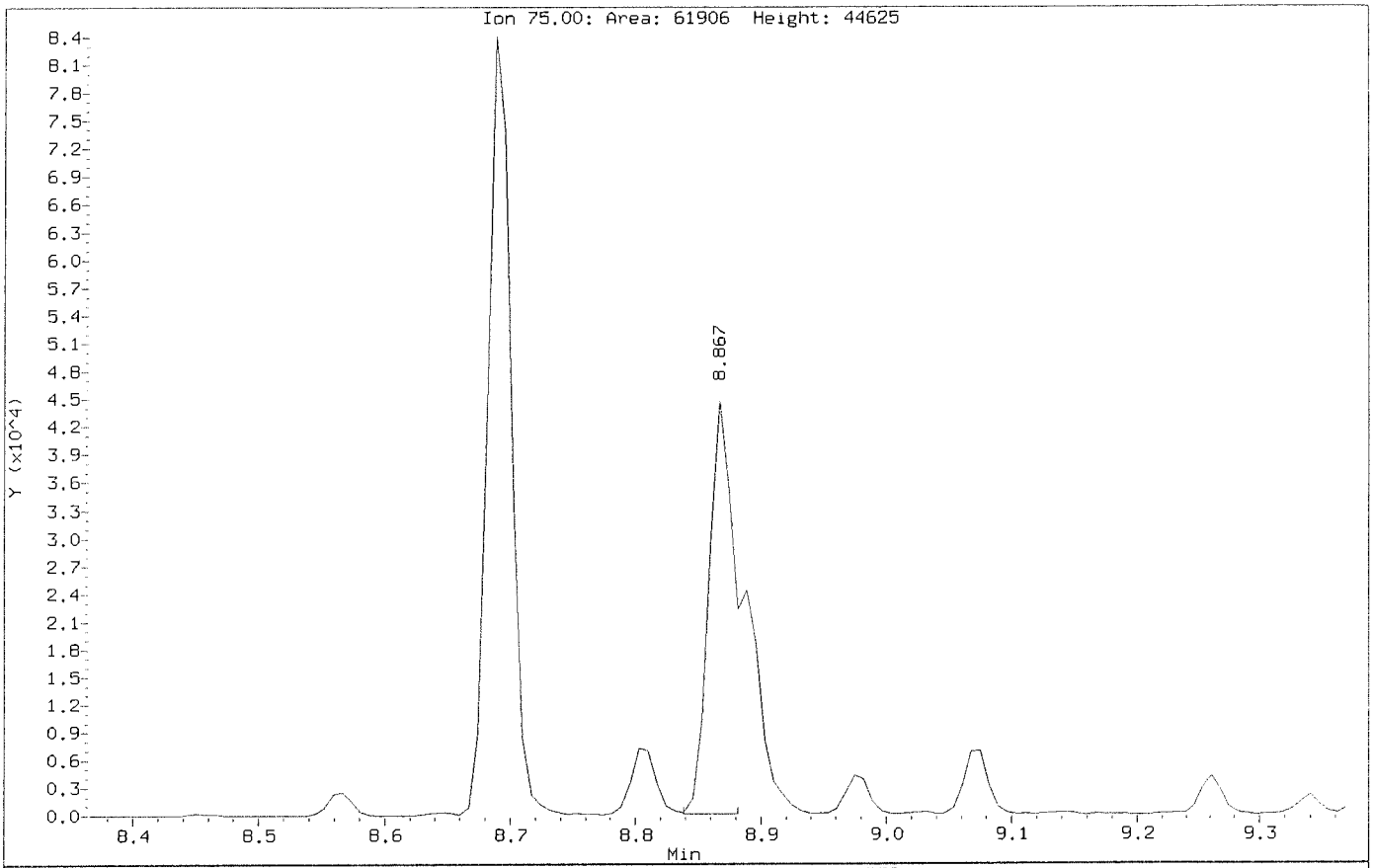
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4

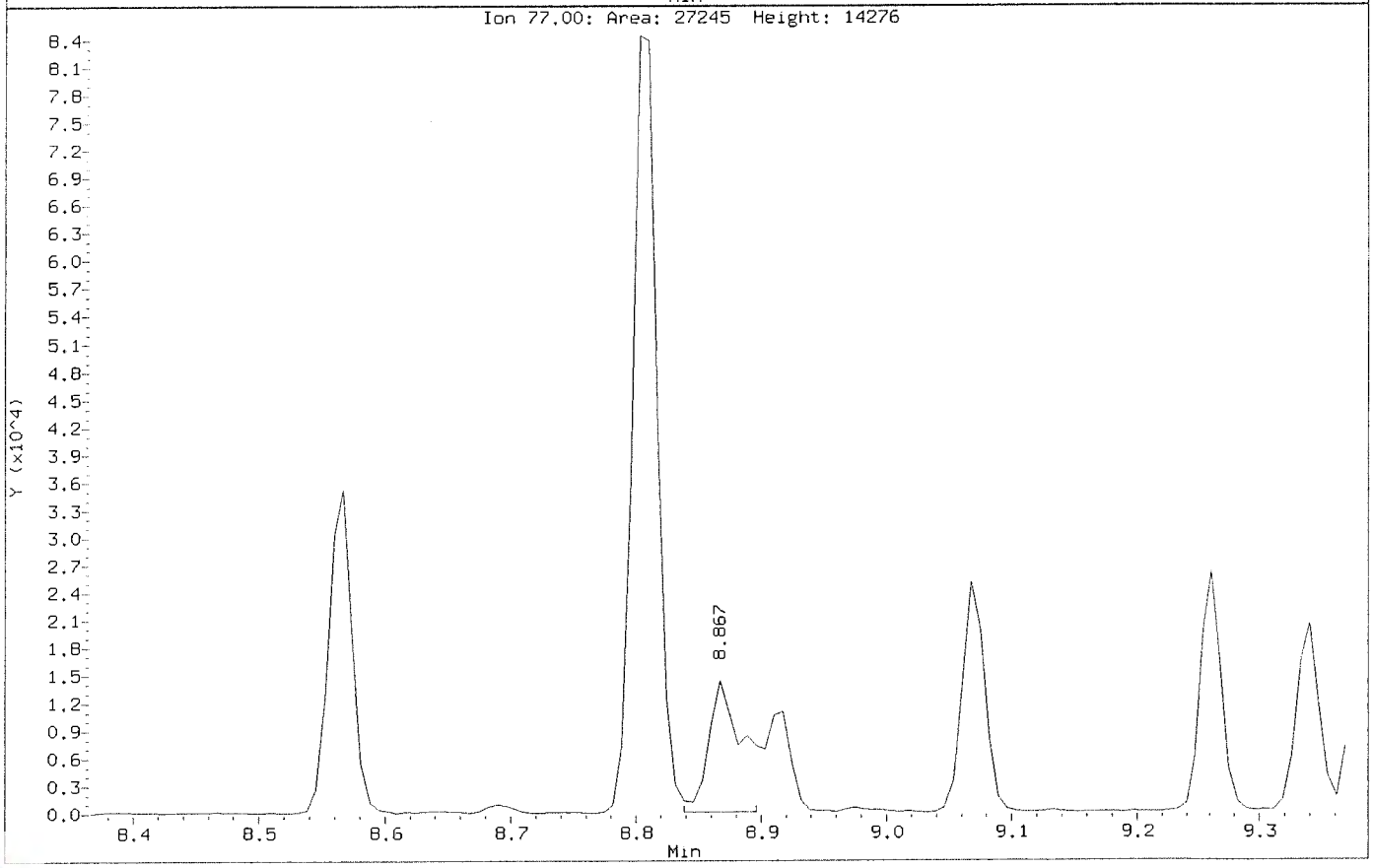




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Injection Date: 19-NOV-2019 14:25
Instrument: voa6.i
Client Sample ID: HS19110684-04MS

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4





Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111914.D Page 1
Report Date: 07-Dec-2019 09:23

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Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111914.D
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Inj Date : 19-NOV-2019 14:49
Operator : PC Inst ID: voa6.i
Smp Info : HS19110684-04MSD;HS19110684-04MSD;3;;MSD
Misc Info : HS18090001;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa6.i\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:22 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 13 QC Sample: MSD
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
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Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

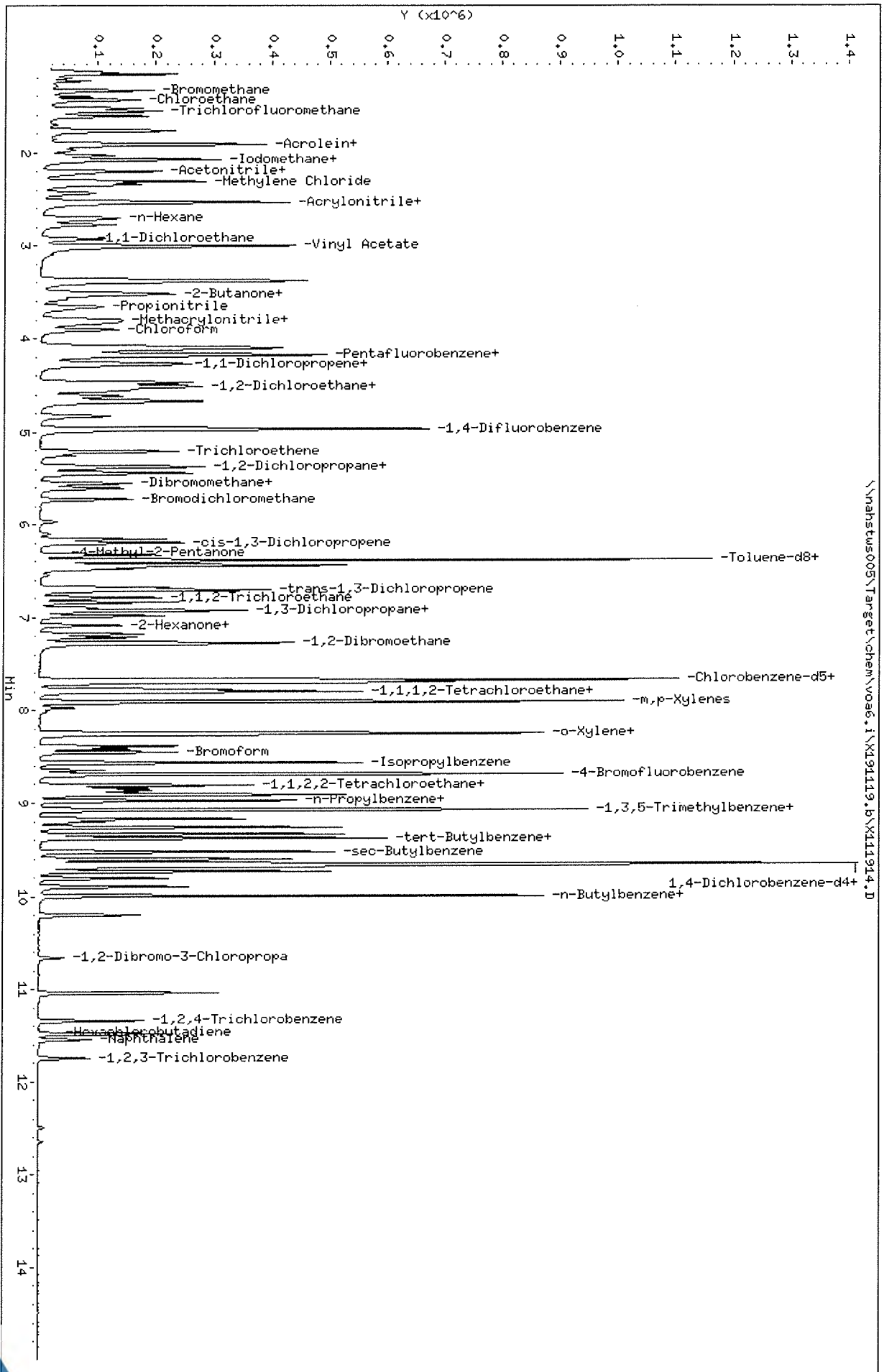
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	456262	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	602341	50.0000	
* 47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	538138	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	287897	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	187025	43.6649	43.66
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	233911	46.7471	46.74
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	193550	46.6776	46.67
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	680006	47.9592	47.95
60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	76521	19.6001	19.60
31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	111531	18.1195	18.11
68 1,1,2,2-Tetrachloroethane	83	8.838	8.845	(0.914)	74732	18.4599	18.45
138 Freon TF	101	1.919	1.919	(0.459)	71679	18.0450	18.04
53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	53029	18.8509	18.85
22 1,1-Dichloroethane	63	2.922	2.921	(0.699)	113644	17.1185	17.11
11 1,1-Dichloroethene	96	1.912	1.911	(0.457)	70176	18.1489	18.14
32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	89913	18.5052	18.50
93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	25463	23.4040	23.40
71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	63104	18.3965	18.39(M)
90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	52505	21.6502	21.65
79 1,2,4-Trimethylbenzene	105	9.383	9.382	(0.970)	261706	19.1580	19.15
89 1,2-Dibromo-3-Chloropropane	155	10.658	10.658	(1.102)	9081	20.1173	20.11
57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	71756	19.0120	19.01
88 1,2-Dichlorobenzene	146	9.999	9.991	(1.034)	148143	19.3882	19.38

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111914.D Page 2
Report Date: 07-Dec-2019 09:23

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	86578	18.1067	18.10
42	1,2-Dichloropropane	63	5.443	5.436	(1.095)	64231	17.8512	17.85
75	1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	255203	19.4695	19.46
83	1,3-Dichlorobenzene	146	9.605	9.612	(0.993)	163523	19.8058	19.80
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	104830	18.3551	18.35
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	163931	19.5392	19.53
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	101496	16.8449	16.84
24	2-Butanone	43	3.581	3.573	(0.856)	42444	30.3171	30.31
76	2-Chlorotoluene	91	8.974	8.974	(0.928)	202649	19.5647	19.56
52	2-Hexanone	43	7.090	7.083	(0.924)	74233	33.5802	33.58
77	4-Chlorotoluene	91	9.075	9.074	(0.939)	235193	18.7333	18.73
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	270694	19.2160	19.21
45	4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	108892	34.5351	34.53
10	Acetone	43	1.976	1.976	(0.473)	36609	28.3305	28.33
37	Benzene	78	4.512	4.512	(0.908)	256097	18.5863	18.58
74	Bromobenzene	156	8.810	8.809	(0.911)	100908	20.1675	20.16
29	Bromochloromethane	128	3.795	3.795	(0.908)	44277	17.9135	17.91
39	Bromodichloromethane	83	5.729	5.729	(1.153)	93208	18.6989	18.69
66	Bromoform	173	8.416	8.415	(1.097)	61166	19.7058	19.70
6	Bromomethane	94	1.338	1.338	(0.320)	94449	19.4432	19.44
19	Carbon Disulfide	76	2.069	2.069	(0.495)	378238	35.9572	35.95
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	103115	19.3735	19.37
59	Chlorobenzene	112	7.699	7.699	(1.004)	196589	18.7120	18.71
7	Chloroethane	64	1.403	1.403	(0.336)	49802	17.3364	17.33
28	Chloroform	83	3.910	3.910	(0.935)	122640	16.5973	16.59
3	Chloromethane	50	1.073	1.073	(0.257)	81748	16.6226	16.62
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	76564	17.6948	17.69
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	107598	18.3171	18.31
55	Dibromochloromethane	129	7.176	7.176	(0.936)	78547	19.2201	19.22
44	Dibromomethane	93	5.557	5.557	(1.118)	47991	18.8477	18.84
2	Dichlorodifluoromethane	85	0.973	0.973	(0.233)	70177	17.4636	17.46
61	Ethylbenzene	106	7.800	7.799	(1.017)	104637	19.2762	19.27
91	Hexachlorobutadiene	225	11.488	11.488	(1.188)	42385	18.3193	18.31
67	Isopropylbenzene	105	8.566	8.566	(1.117)	306980	19.0926	19.09
62	m,p-Xylenes	106	7.907	7.907	(1.031)	251822	38.4438	38.44
17	Methylene Chloride	84	2.305	2.305	(0.551)	68780	16.6717	16.67
87	n-Butylbenzene	91	9.999	9.999	(1.034)	220279	18.7902	18.79
73	n-Propylbenzene	91	8.917	8.917	(0.922)	347448	19.5245	19.52
92	Naphthalene	128	11.546	11.546	(1.194)	61129	19.6527	19.65
63	o-Xylene	106	8.244	8.244	(1.075)	121839	18.8464	18.84
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	299617	19.3811	19.38
64	Styrene	104	8.258	8.258	(1.077)	210910	18.7611	18.76
78	tert-Butylbenzene	119	9.340	9.340	(0.966)	221845	19.7666	19.76
56	Tetrachloroethene	164	6.933	6.933	(0.904)	74638	19.7398	19.73
50	Toluene	91	6.446	6.446	(0.840)	289053	18.9414	18.94
20	trans-1,2-Dichloroethene	96	2.528	2.527	(0.604)	66811	17.7972	17.79
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	97358	18.1848	18.18
38	Trichloroethene	130	5.207	5.206	(1.048)	85246	20.2369	20.23
8	Trichlorofluoromethane	101	1.561	1.560	(0.373)	132489	18.7192	18.71
5	Vinyl Chloride	62	1.138	1.138	(0.272)	78670	16.9179	16.91

QC Flag Legend

M - Compound response manually integrated.

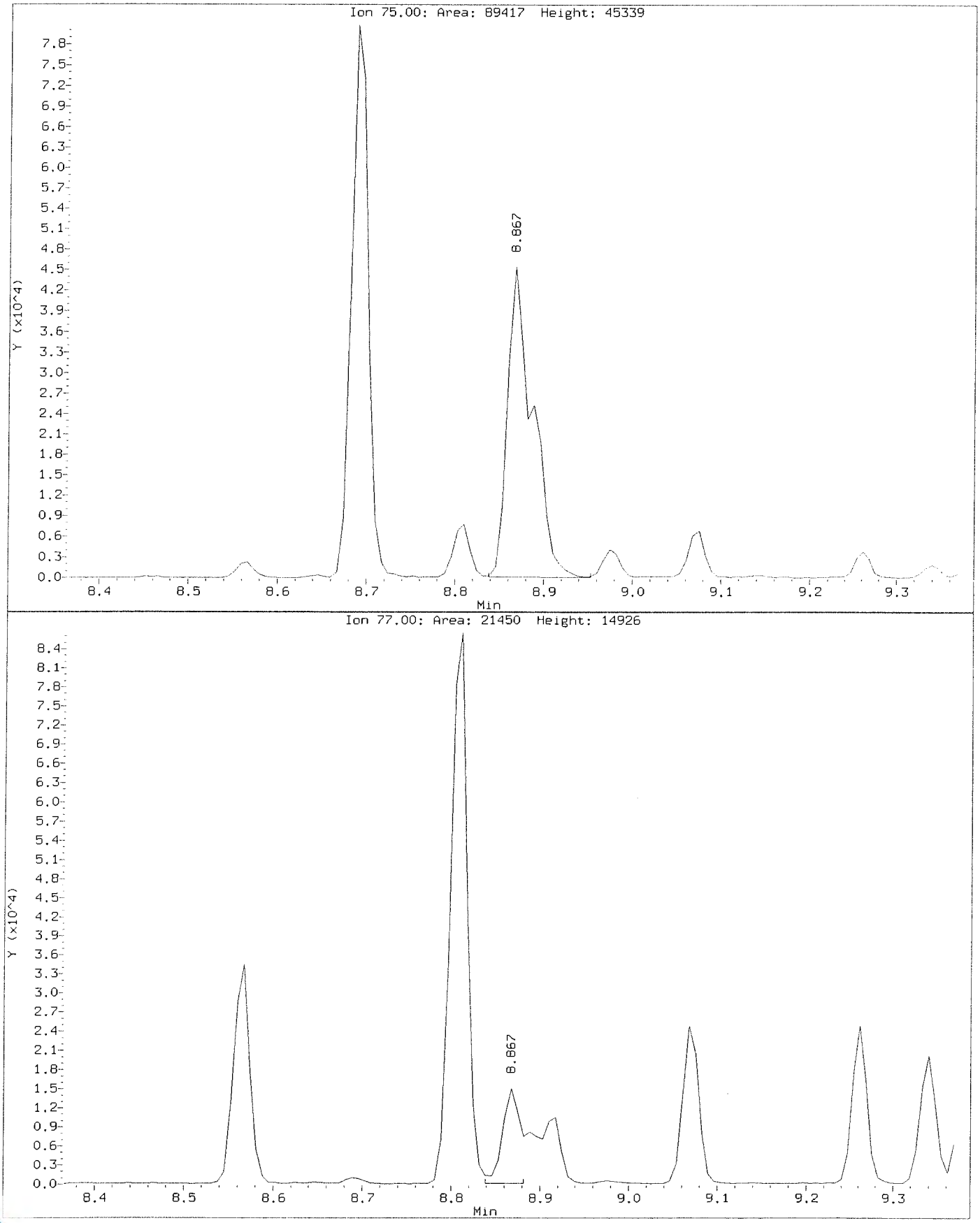


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Instrument: voa6.i
Operator: PC
Column diameter: 0.18

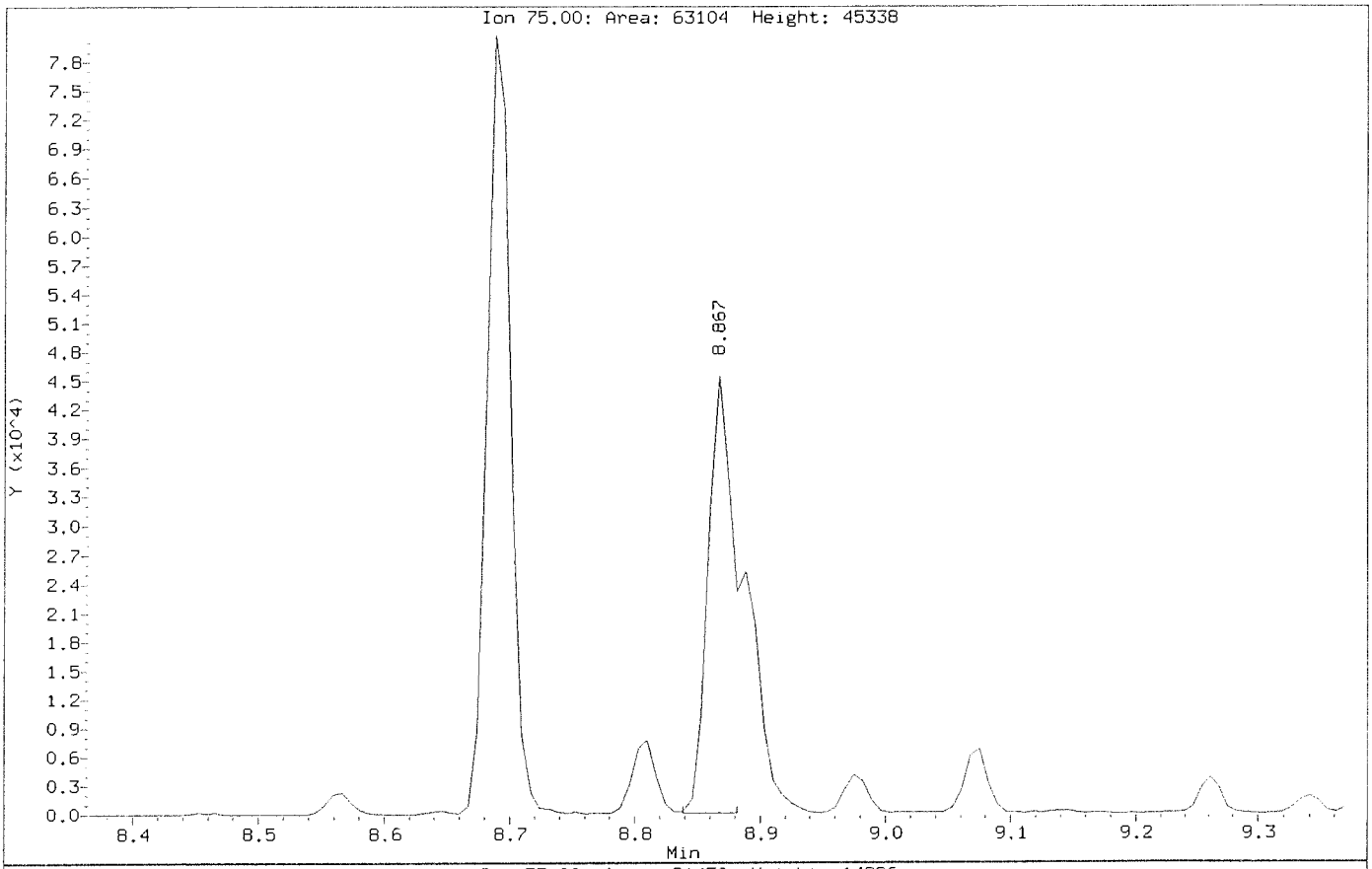
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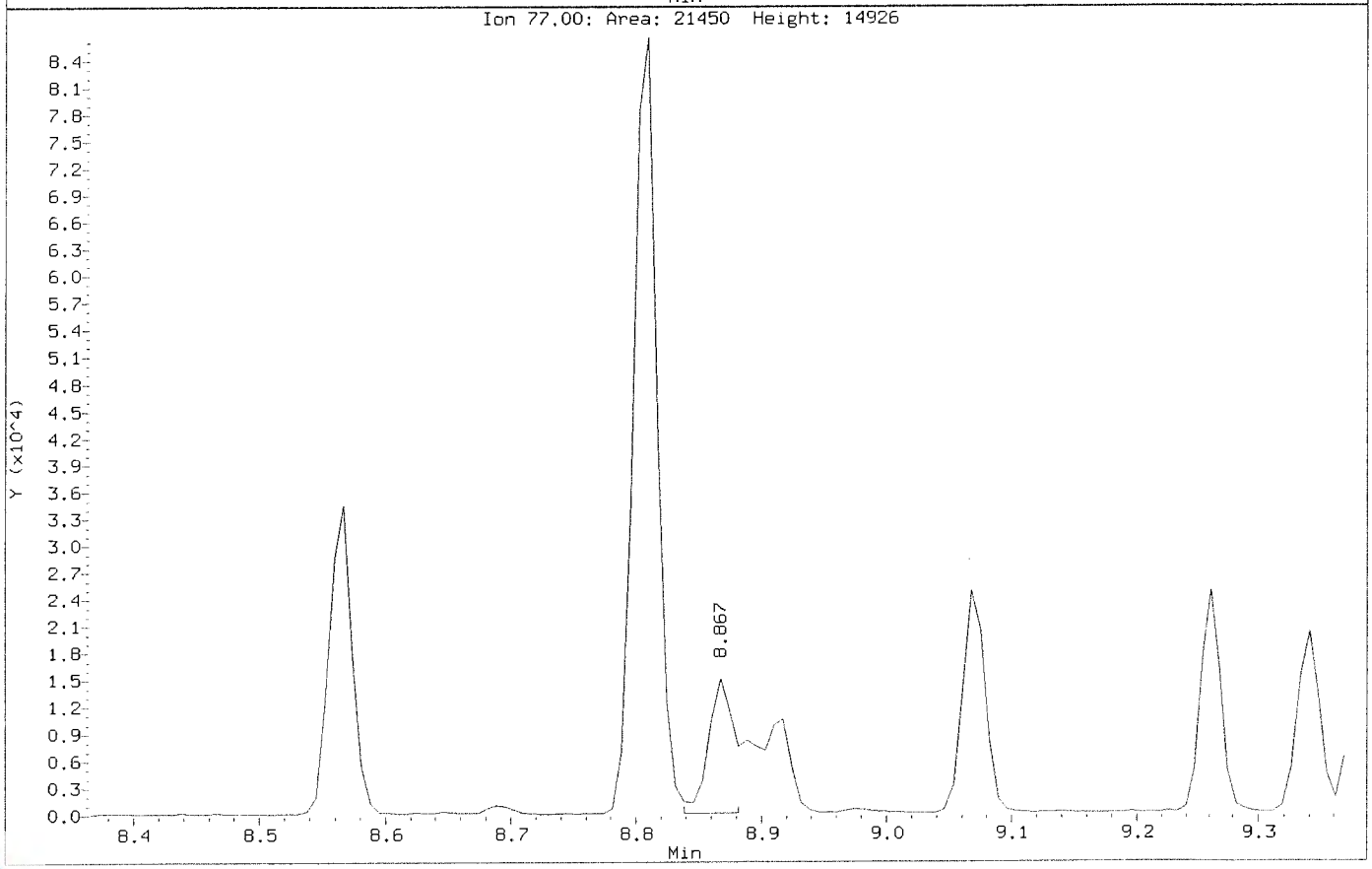
Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4



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Injection Date: 19-NOV-2019 14:49
Instrument: voa6.i
Client Sample ID: HS19110684-04MSD

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4





Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111915.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111915.D
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Target Version: 4.14
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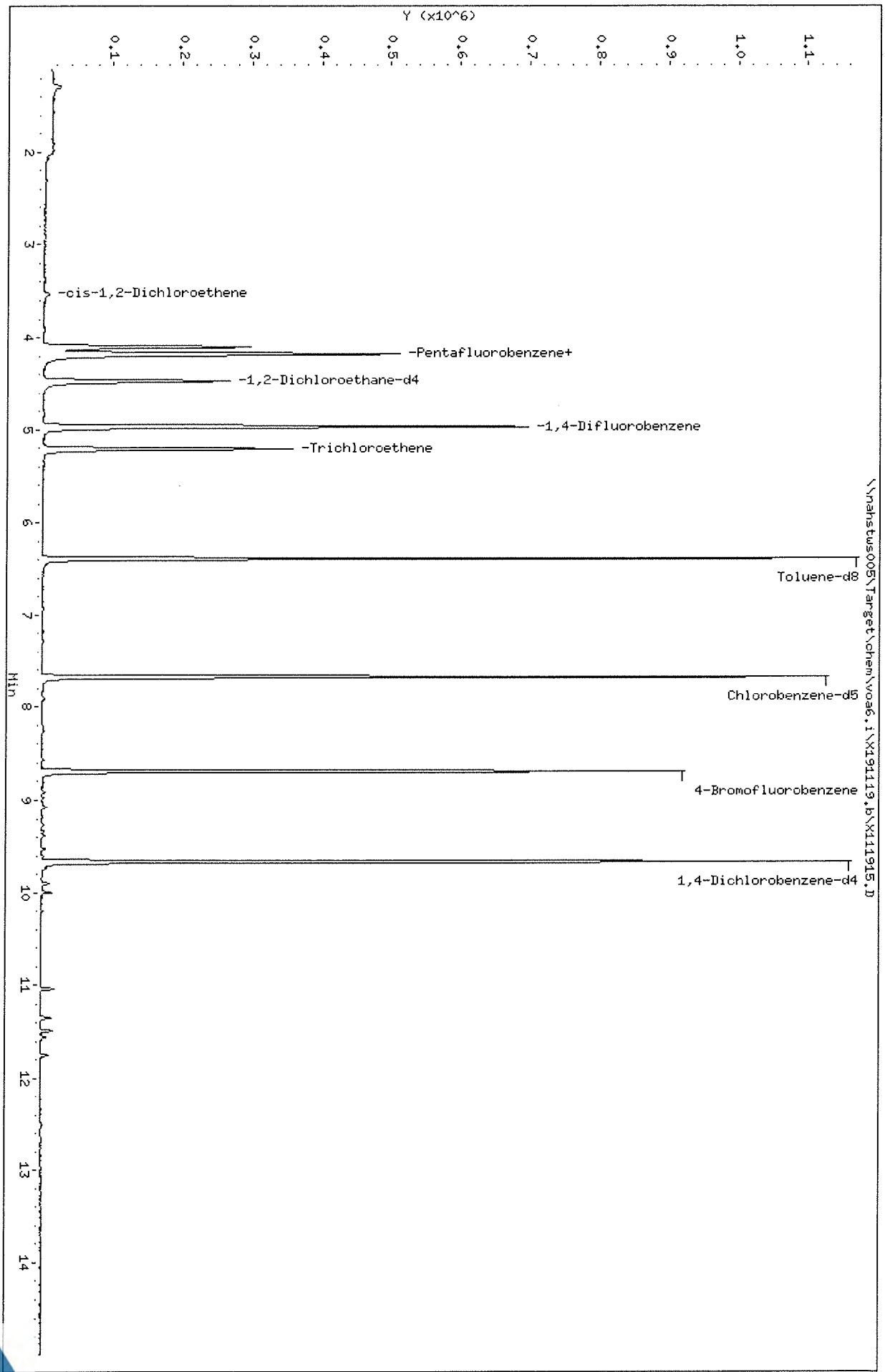
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Name	Value	Description
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Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.182	4.182	(1.000)	468404	50.0000	
* 36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	620016	50.0000	
* 47 Chlorobenzene-d5	117	7.670	7.671	(1.000)	552854	50.0000	
* 70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	293417	50.0000	
$ 35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	193846	44.0772	44.07
$ 69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	238916	46.4788	46.47
$ 30 Dibromofluoromethane	113	4.103	4.103	(0.981)	199363	46.8319	46.83
$ 48 Toluene-d8	98	6.388	6.388	(0.833)	692416	47.5346	47.53
27 cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	4196	0.94461	236.15(a)
38 Trichloroethene	130	5.206	5.206	(1.048)	126263	29.1197	7279.91

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).



Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111915.D
Date : 19-NOV-2019 15:13
Client ID: HS19110684-03
Sample Info: HS19110684-03;HS19110684-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111915.D

Date : 19-NOV-2019 15:13

Client ID: HS19110684-03

Instrument: voa6.i

Sample Info: HS19110684-03;HS19110684-03;;;

Purge Volume: 5.0

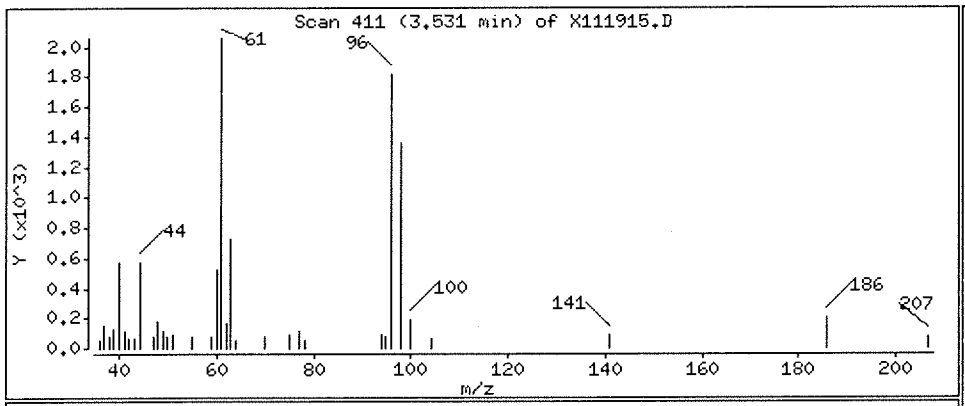
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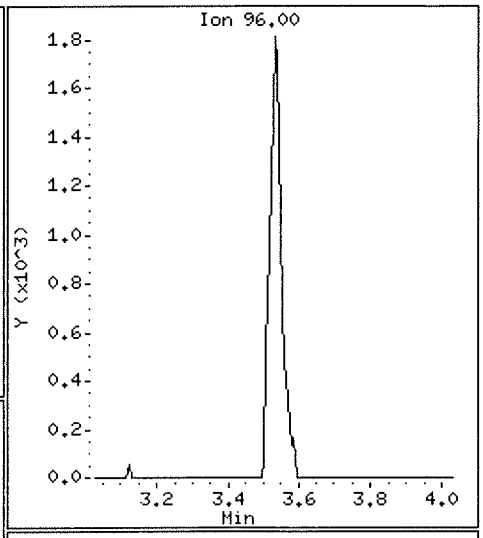
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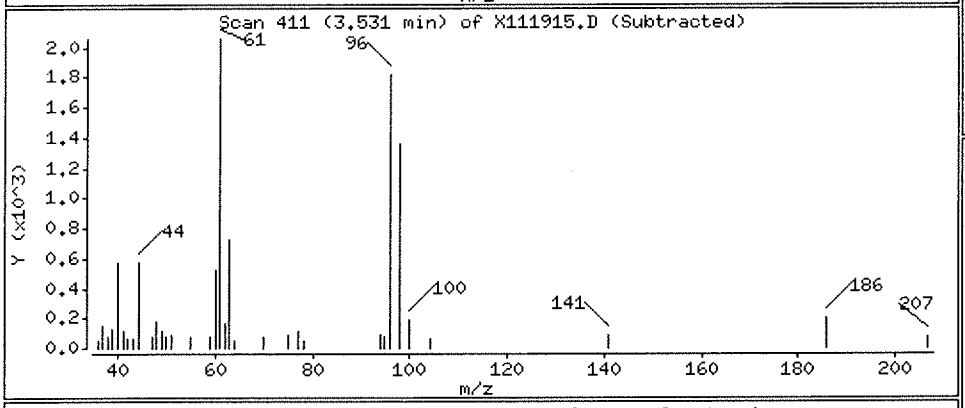
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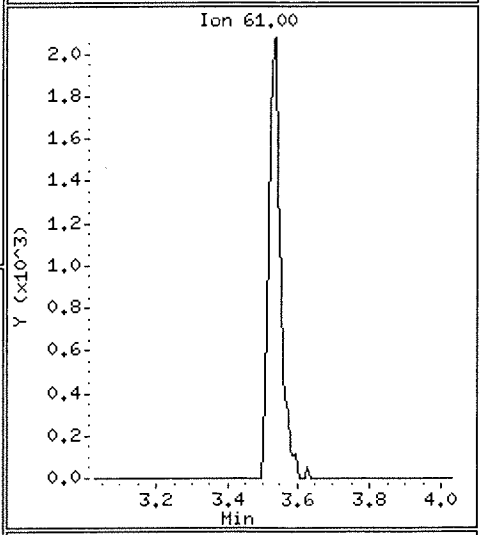
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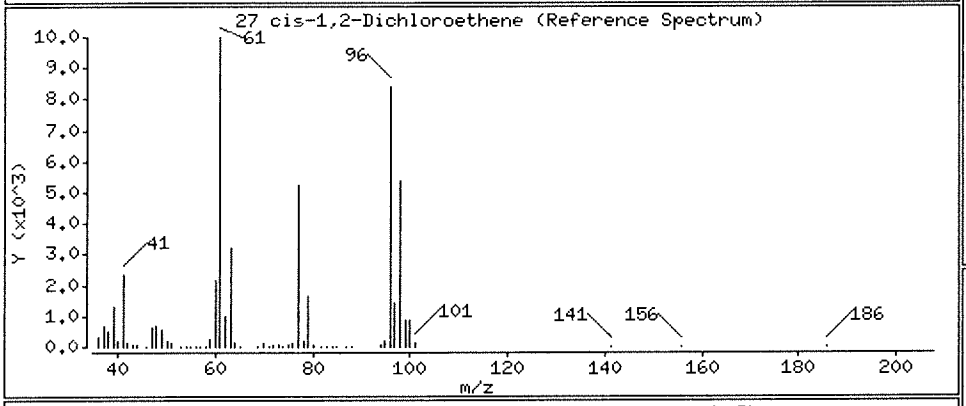
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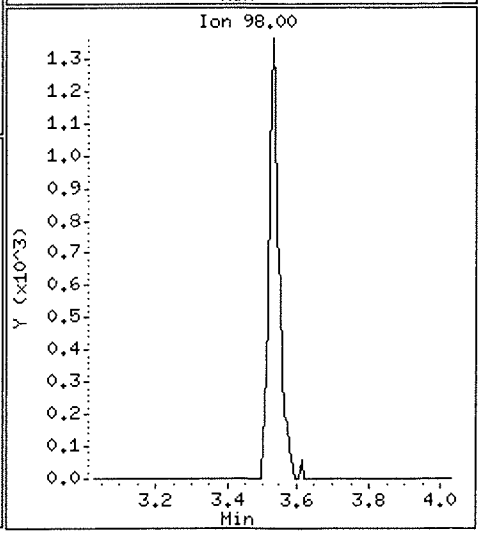


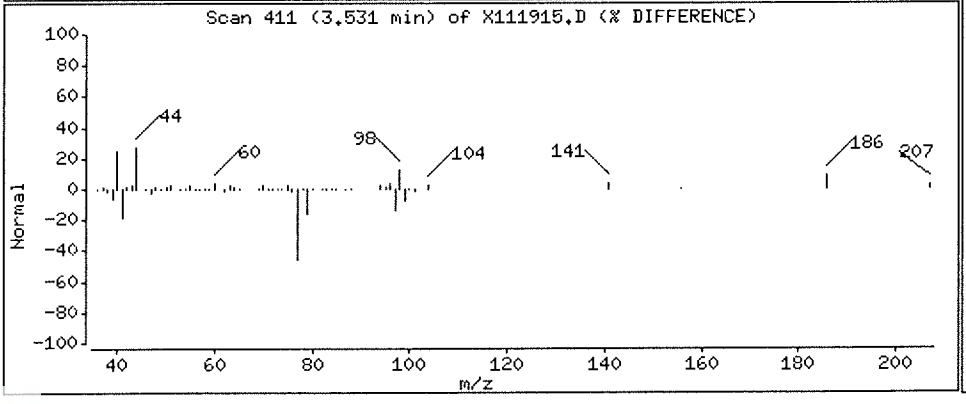












Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111915.D

Date : 19-NOV-2019 15:13

Client ID: HS19110684-03

Instrument: voa6.i

Sample Info: HS19110684-03;HS19110684-03;;;

Purge Volume: 5.0

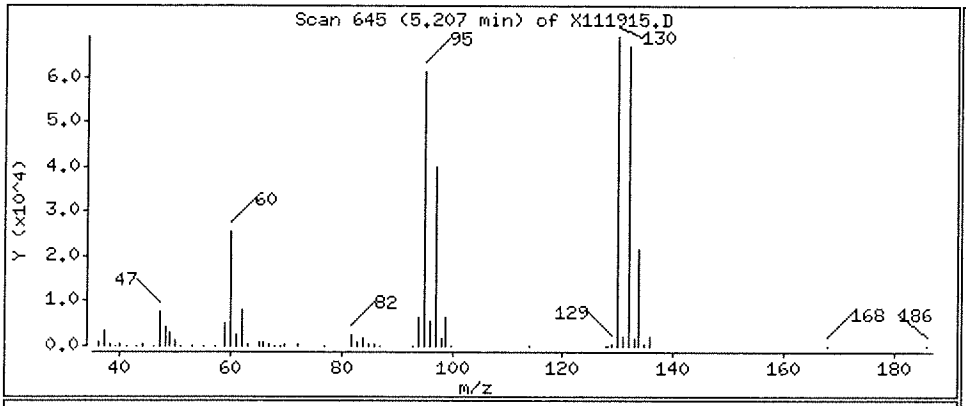
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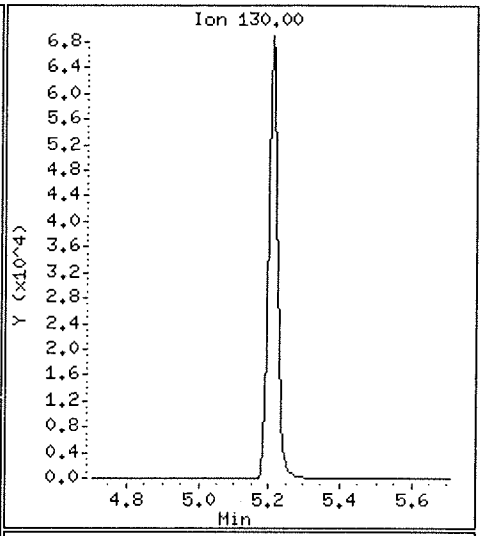
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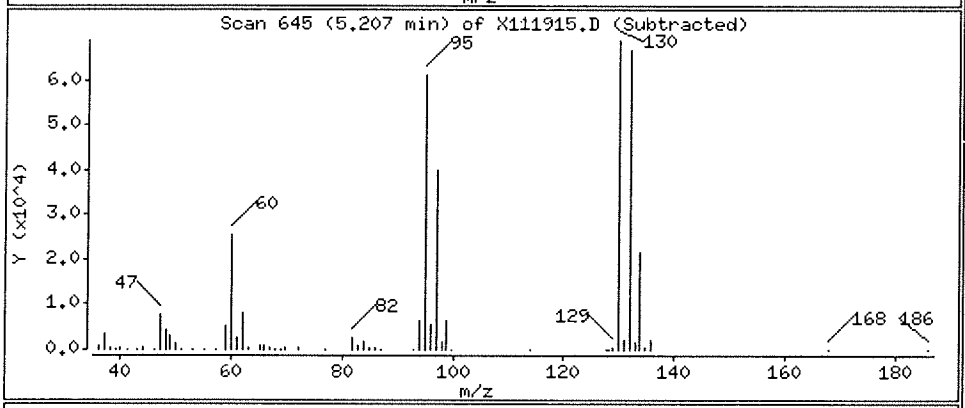
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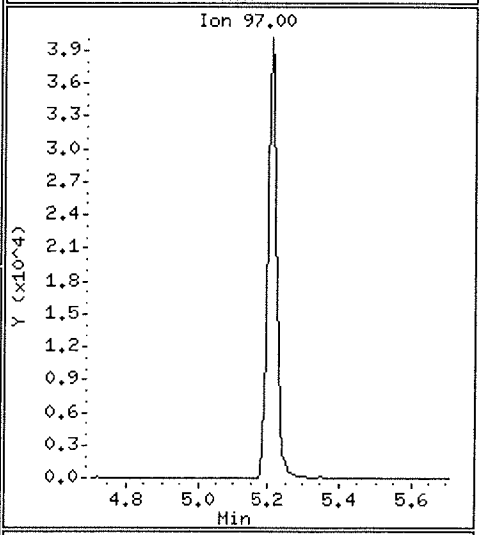
38 Trichloroethene

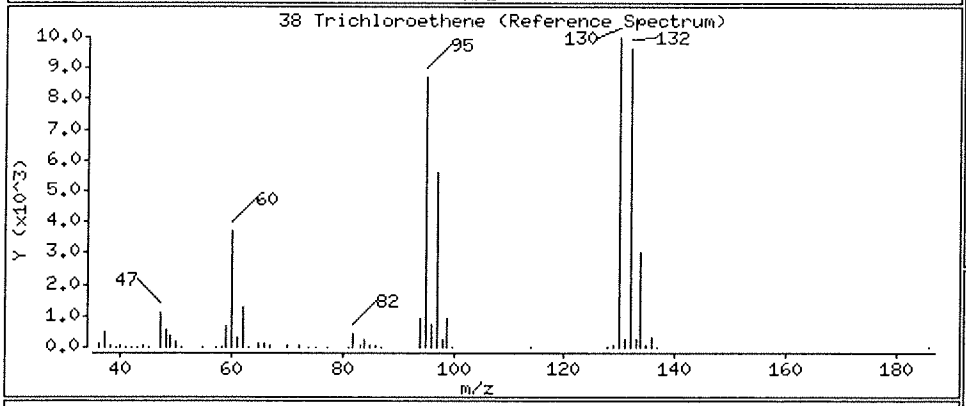
Concentration: 7279.91 ug/l

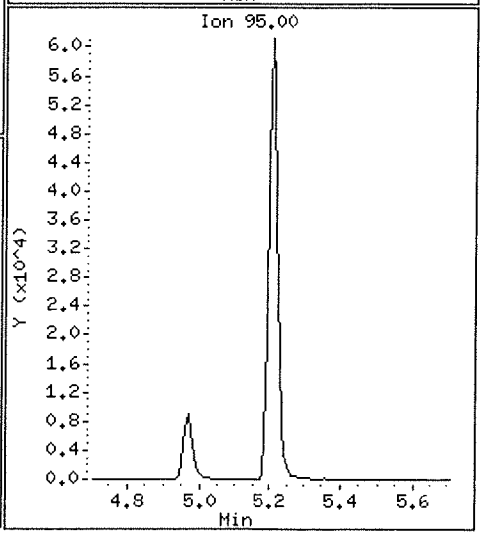


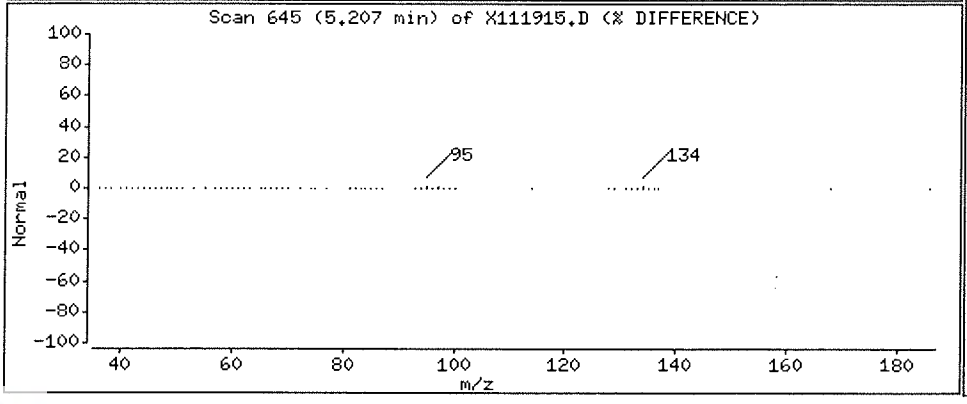












Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111916.D Page 1
Report Date: 07-Dec-2019 09:23

ALS Laboratory Group

Data file : \\nahstws005\Target\chem\voa6.i\X191119.b\X111916.D
Lab Smp Id: CCV-END Client Smp ID: CCV-END
Inj Date : 19-NOV-2019 15:37
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\X191119.b\8260W.m
Meth Date : 07-Dec-2019 09:22 DevakG Quant Type: ISTD
Cal Date : 18-NOV-2019 16:35 Cal File: X111808.D
Als bottle: 15 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: CBIHOUSTONDOD.sub
Target Version: 4.14

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
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Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

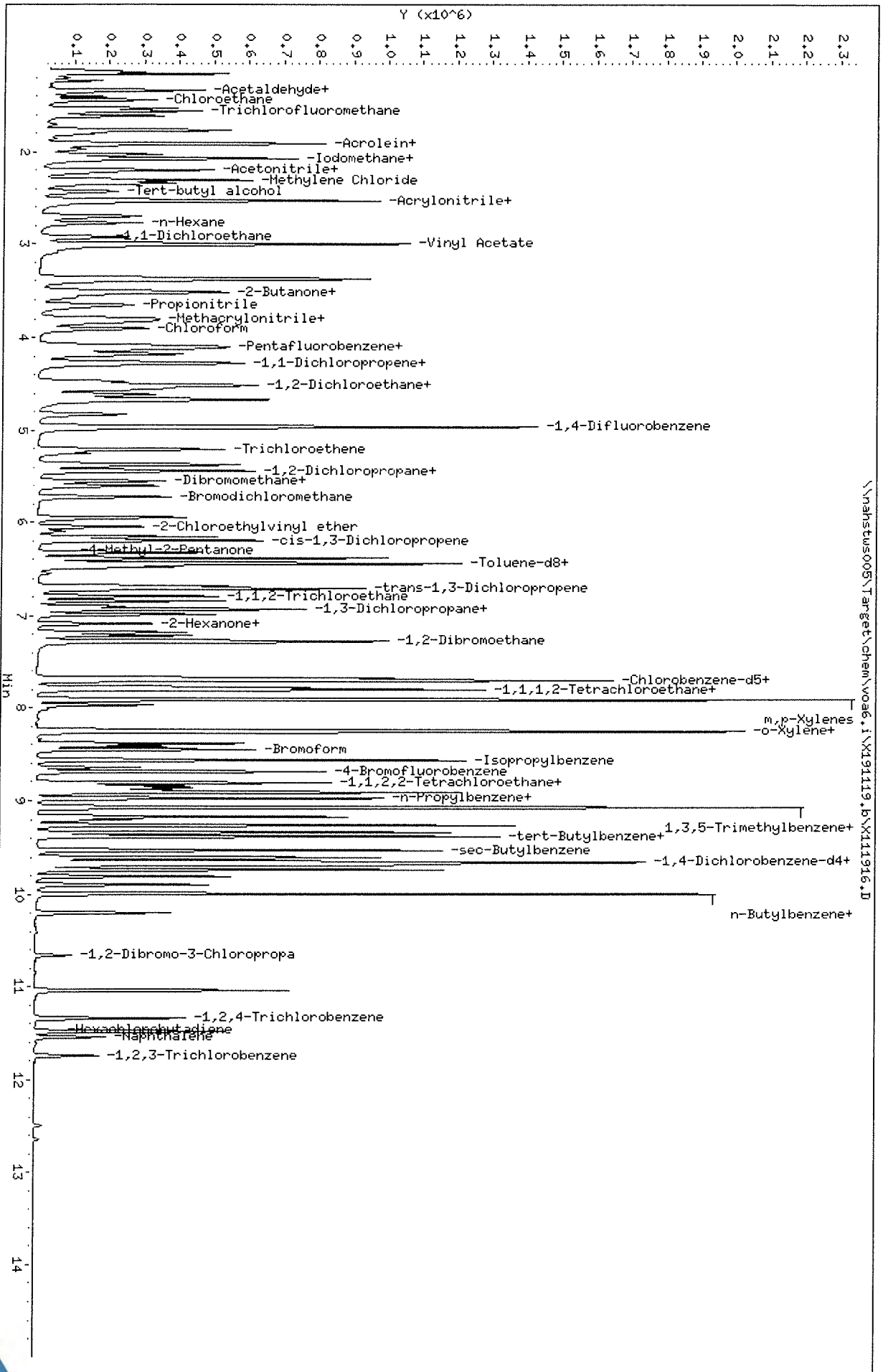
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.182	4.182	(1.000)	368929	50.0000	
*	36 1,4-Difluorobenzene	114	4.970	4.970	(1.000)	516603	50.0000	
*	47 Chlorobenzene-d5	117	7.671	7.671	(1.000)	484576	50.0000	
*	70 1,4-Dichlorobenzene-d4	152	9.669	9.669	(1.000)	258381	50.0000	
$	35 1,2-Dichloroethane-d4	65	4.476	4.476	(1.070)	170753	50.0000	49.20
$	69 4-Bromofluorobenzene	95	8.688	8.688	(1.133)	210431	50.0000	46.70
$	30 Dibromofluoromethane	113	4.103	4.103	(0.981)	172100	50.0000	51.29
$	48 Toluene-d8	98	6.388	6.388	(0.833)	580502	50.0000	45.46
	60 1,1,1,2-Tetrachloroethane	131	7.778	7.778	(1.014)	177579	50.0000	50.51
	31 1,1,1-Trichloroethane	97	4.089	4.089	(0.978)	250672	50.0000	50.36
	68 1,1,2,2-Tetrachloroethane	83	8.845	8.845	(0.915)	170563	50.0000	46.94
	138 Freon TF	101	1.919	1.919	(0.459)	163595	50.0000	50.93
	53 1,1,2-Trichloroethane	83	6.840	6.840	(0.892)	124015	50.0000	48.95
	22 1,1-Dichloroethane	63	2.921	2.921	(0.699)	265632	50.0000	49.48
	11 1,1-Dichloroethene	96	1.911	1.911	(0.457)	161082	50.0000	51.52
	32 1,1-Dichloropropene	75	4.282	4.282	(0.862)	201527	50.0000	48.36
	93 1,2,3-Trichlorobenzene	180	11.746	11.746	(1.215)	54593	50.0000	56.88
	71 1,2,3-Trichloropropane	75	8.867	8.867	(0.917)	146937	50.0000	47.72(M)
	90 1,2,4-Trichlorobenzene	180	11.338	11.338	(1.173)	122295	50.0000	56.18
	79 1,2,4-Trimethylbenzene	105	9.382	9.382	(0.970)	592598	50.0000	48.33
	89 1,2-Dibromo-3-Chloropropane	155	10.658	10.658	(1.102)	20812	50.0000	51.90
	57 1,2-Dibromoethane	107	7.262	7.262	(0.947)	165472	50.0000	48.68
	88 1,2-Dichlorobenzene	146	9.991	9.991	(1.033)	337683	50.0000	49.24

Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111916.D Page 2
Report Date: 07-Dec-2019 09:23

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
33	1,2-Dichloroethane	62	4.562	4.562	(0.918)	200902	50.0000	48.98
42	1,2-Dichloropropane	63	5.436	5.436	(1.094)	149588	50.0000	48.47
75	1,3,5-Trimethylbenzene	105	9.067	9.067	(0.938)	580466	50.0000	49.34
83	1,3-Dichlorobenzene	146	9.612	9.612	(0.994)	371446	50.0000	50.12
54	1,3-Dichloropropane	76	6.983	6.983	(0.910)	242773	50.0000	47.20
84	1,4-Dichlorobenzene	146	9.683	9.683	(1.001)	375113	50.0000	49.81
26	2,2-Dichloropropane	77	3.516	3.516	(0.841)	231892	50.0000	47.59
24	2-Butanone	43	3.573	3.573	(0.854)	102177	100.000	90.26
76	2-Chlorotoluene	91	8.974	8.974	(0.928)	463552	50.0000	49.86
52	2-Hexanone	43	7.083	7.083	(0.923)	173285	100.000	87.05
77	4-Chlorotoluene	91	9.074	9.074	(0.939)	545036	50.0000	48.37
82	p-Isopropyltoluene	119	9.655	9.655	(0.999)	613549	50.0000	48.53
45	4-Methyl-2-Pentanone	43	6.324	6.324	(0.824)	259488	100.000	91.39
10	Acetone	43	1.976	1.976	(0.473)	89979	100.000	93.98
37	Benzene	78	4.512	4.512	(0.908)	600264	50.0000	50.79
74	Bromobenzene	156	8.809	8.809	(0.911)	233543	50.0000	52.00
29	Bromochloromethane	128	3.795	3.795	(0.908)	101404	50.0000	50.73
39	Bromodichloromethane	83	5.729	5.729	(1.153)	217100	50.0000	50.78
66	Bromoform	173	8.415	8.415	(1.097)	143074	50.0000	49.59
6	Bromomethane	94	1.338	1.338	(0.320)	204319	50.0000	55.96
19	Carbon Disulfide	76	2.069	2.069	(0.495)	880213	100.000	103.48
34	Carbon Tetrachloride	117	4.268	4.268	(0.859)	230047	50.0000	50.39
59	Chlorobenzene	112	7.699	7.699	(1.004)	455521	50.0000	48.15
7	Chloroethane	64	1.403	1.403	(0.336)	114679	50.0000	49.37
28	Chloroform	83	3.910	3.910	(0.935)	285575	50.0000	47.79
3	Chloromethane	50	1.073	1.073	(0.257)	189142	50.0000	47.21
27	cis-1,2-Dichloroethene	96	3.530	3.530	(0.844)	180689	50.0000	51.64
46	cis-1,3-Dichloropropene	75	6.159	6.159	(1.239)	254134	50.0000	50.44
55	Dibromochloromethane	129	7.176	7.176	(0.936)	184214	50.0000	50.05
44	Dibromomethane	93	5.557	5.557	(1.118)	109484	50.0000	50.13
2	Dichlorodifluoromethane	85	0.973	0.973	(0.233)	161827	50.0000	48.17
61	Ethylbenzene	106	7.799	7.799	(1.017)	236655	50.0000	48.41
91	Hexachlorobutadiene	225	11.488	11.488	(1.188)	102392	50.0000	49.31
67	Isopropylbenzene	105	8.566	8.566	(1.117)	690373	50.0000	47.68
62	m,p-Xylenes	106	7.907	7.907	(1.031)	570339	100.000	96.69
17	Methylene Chloride	84	2.305	2.305	(0.551)	161917	50.0000	48.53
87	n-Butylbenzene	91	9.999	9.999	(1.034)	506714	50.0000	48.16
73	n-Propylbenzene	91	8.917	8.917	(0.922)	791543	50.0000	49.56
92	Naphthalene	128	11.546	11.546	(1.194)	138662	50.0000	49.67
63	o-Xylene	106	8.244	8.244	(1.075)	278405	50.0000	47.82
81	sec-Butylbenzene	105	9.526	9.526	(0.985)	669398	50.0000	48.24
64	Styrene	104	8.258	8.258	(1.077)	488059	50.0000	48.21
78	tert-Butylbenzene	119	9.340	9.340	(0.966)	494466	50.0000	49.09
56	Tetrachloroethene	164	6.933	6.933	(0.904)	164892	50.0000	48.42
50	Toluene	91	6.446	6.446	(0.840)	659617	50.0000	48.00
20	trans-1,2-Dichloroethene	96	2.527	2.527	(0.604)	156010	50.0000	51.39
51	trans-1,3-Dichloropropene	75	6.682	6.682	(1.344)	229001	50.0000	49.87
38	Trichloroethene	130	5.206	5.206	(1.048)	188643	50.0000	52.21
8	Trichlorofluoromethane	101	1.560	1.560	(0.373)	299482	50.0000	52.32
5	Vinyl Chloride	62	1.138	1.138	(0.272)	181174	50.0000	48.18

QC Flag Legend

M - Compound response manually integrated.

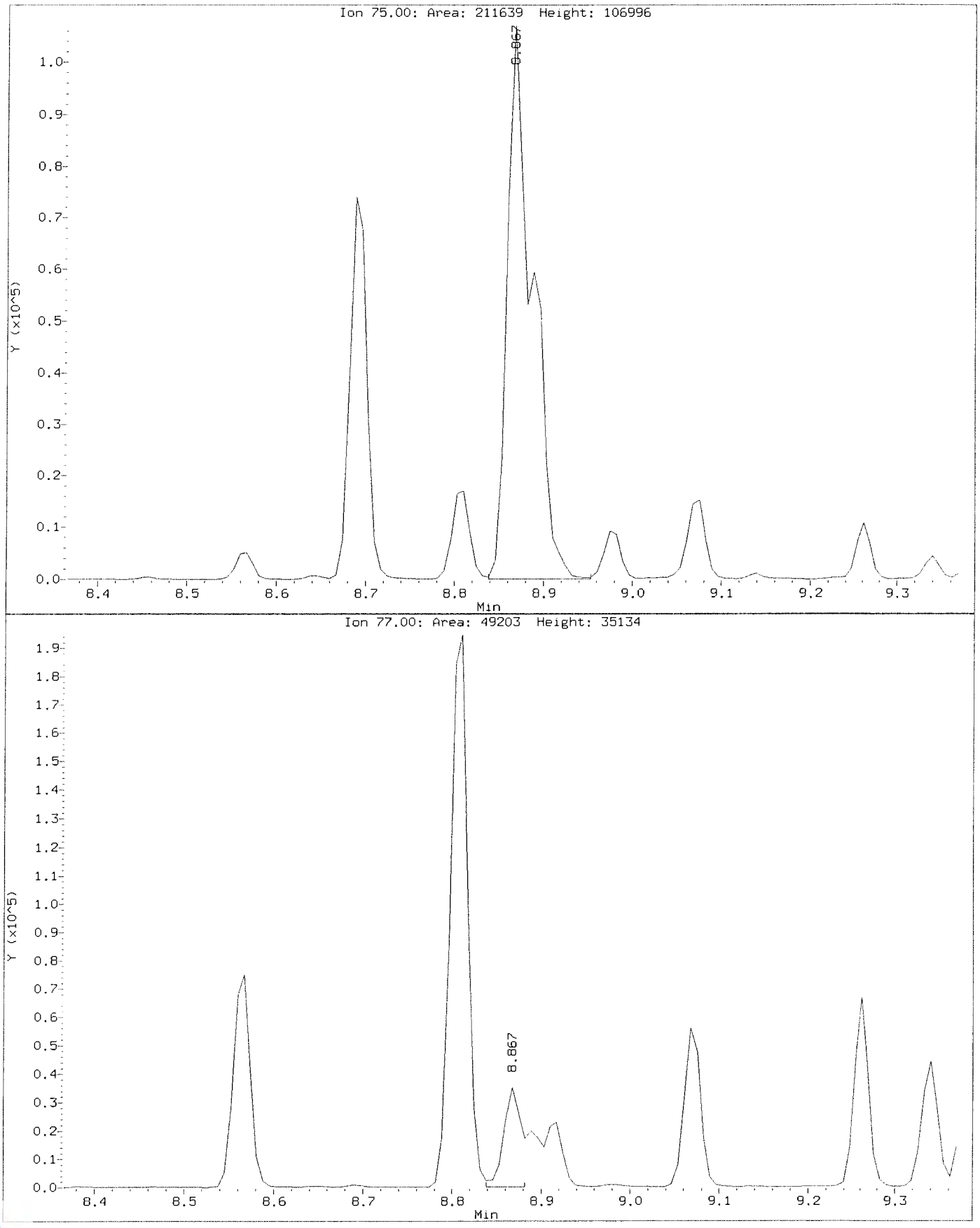


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Client ID: CCV-END
Sample Info: CCV-END;CCV-END;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa6.i
Operator: PC
Column diameter: 0.18

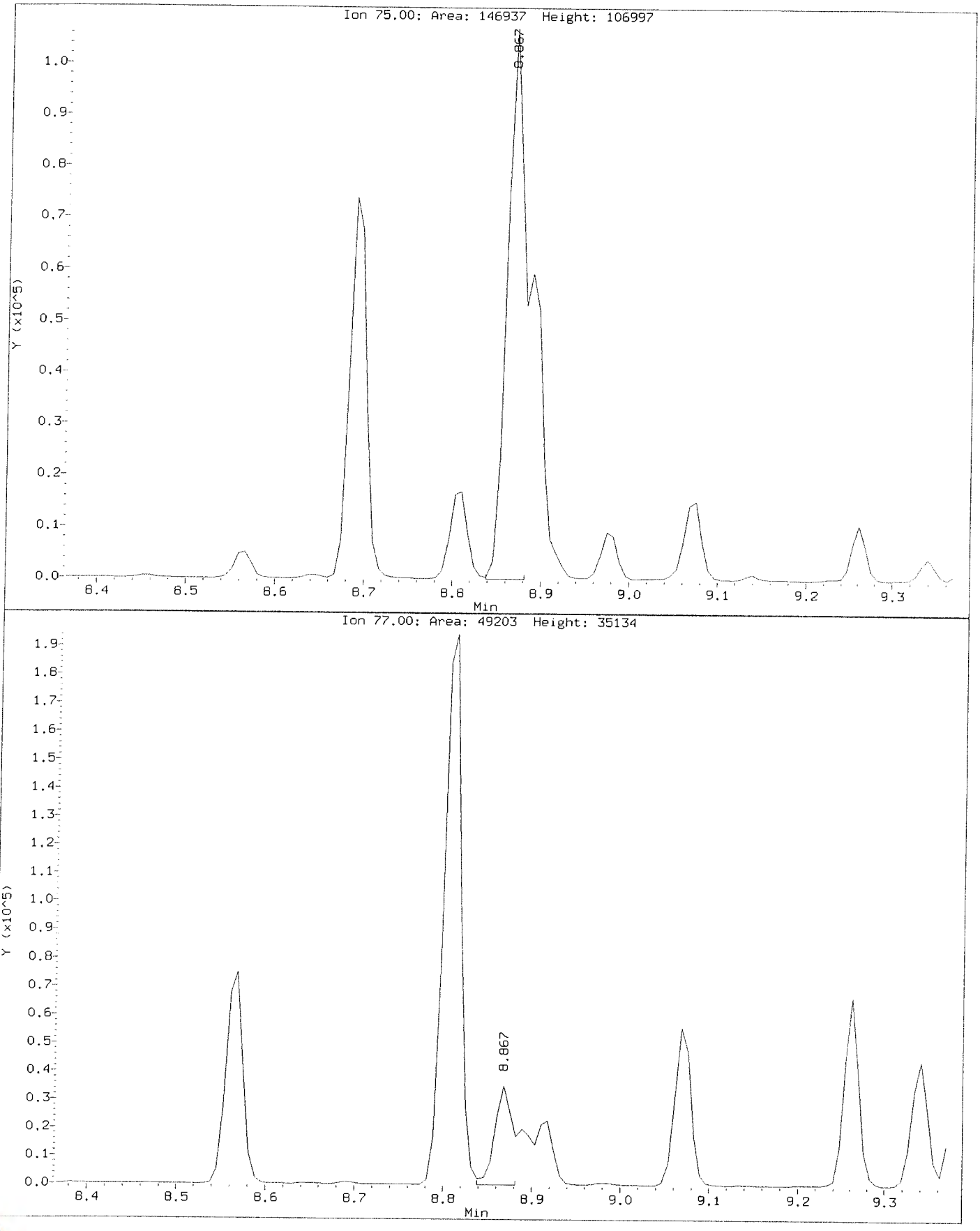
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Instrument: voa6.i
Client Sample ID: CCV-END

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4



Data File: \\nahstws005\Target\chem\voa6.i\X191119.b\X111916.D
Injection Date: 19-NOV-2019 15:37
Instrument: voa6.i
Client Sample ID: CCV-END

Compound: 1,2,3-Trichloropropane
CAS Number: 96-18-4

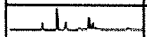


HS19110684 Wet Chem Raw Data

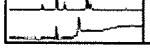
ALS WO# HS19110684

Sequence: 111319
Last Update Operator: alshs.nouser

HS19110684

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	me	Status	Inject Time
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	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 10PPN	Calibration	GB8	1.0000	6	Anions Pro	Anions Pr	5.0	Finished	8/12/2019 6:37:32 PM -05:00
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	ICB		Unknown	GB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	8/12/2019 7:29:52 PM -05:00
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	HS19110682-02DF10		Unknown	RA7	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 6:17:22 PM -06:00
	HS19110682-03		Unknown	RA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 6:33:58 PM -06:00
	HS19110682-03DF10		Unknown	RB1	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 6:50:34 PM -06:00
	HS19110684-01		Unknown	RB8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 7:07:14 PM -06:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 7:23:57 PM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 7:40:32 PM -06:00
	HS19110684-02		Unknown	RC1	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 7:57:13 PM -06:00
	HS19110684-02DF10		Unknown	RC2	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 8:13:52 PM -06:00
	HS19110684-03		Unknown	RC3	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 8:30:30 PM -06:00
	HS19110684-03DF10		Unknown	RC4	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 8:47:06 PM -06:00
	HS19110684-04		Unknown	RC5	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 9:03:41 PM -06:00
	HS19110684-04MS		Unknown	RC6	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 9:20:16 PM -06:00
	HS19110684-04MSD		Unknown	RC7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 9:36:54 PM -06:00
	HS19110684-04DF20		Unknown	RC8	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 9:53:29 PM -06:00
	HS19110684-04MSDF20		Unknown	RD1	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 10:10:05 PM -06:00
	HS19110684-04MSDDF20		Unknown	RD2	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 10:26:40 PM -06:00
	CCV		Unknown	BA5	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 10:43:22 PM -06:00
	CCB		Unknown	BA6	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 10:59:58 PM -06:00
	HS19110684-01DF10		Unknown	RD7	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 11:16:34 PM -06:00
	HS19110386-12DF20		Unknown	RD4	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 11:33:08 PM -06:00
	HS19110386-13DF20		Unknown	RD5	20.0000		Anions Pro	Anions Pr	5.0	Finished	11/14/2019 11:49:45 PM -06:00
	HS19110386-14DF10		Unknown	RD6	10.0000		Anions Pro	Anions Pr	5.0	Finished	11/15/2019 12:06:20 AM -06:00
	HS19110682-04DF5		Unknown	RB2	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/15/2019 12:22:55 AM -06:00

Sequence: 111319
Last Update Operator: alshs.nouser

CD	Name	Comment	Type	Position	Dilution	Level	Instrument Method	ng	me	Status	Inject Time
	HS19110682-04DF50		Unknown	RB3	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/15/2019 12:39:30 AM -06:00
	HS19110682-04DF500		Unknown	RB4	500.0000		Anions Pro	Anions Pr	5.0	Finished	11/15/2019 12:56:08 AM -06:00
	HS19110682-05DF5		Unknown	RB5	5.0000		Anions Pro	Anions Pr	5.0	Finished	11/15/2019 1:12:43 AM -06:00
	HS19110682-05DF50		Unknown	RB6	50.0000		Anions Pro	Anions Pr	5.0	Finished	11/15/2019 1:29:18 AM -06:00
	HS19110682-05DF100		Unknown	RB7	100.0000		Anions Pro	Anions Pr	5.0	Finished	11/15/2019 1:45:53 AM -06:00
	CCV1		Unknown	BA7	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/15/2019 2:02:31 AM -06:00
	CCB		Unknown	BA8	1.0000		Anions Pro	Anions Pr	5.0	Finished	11/15/2019 2:19:06 AM -06:00

Sequence: 111319
Injection #6: STD6

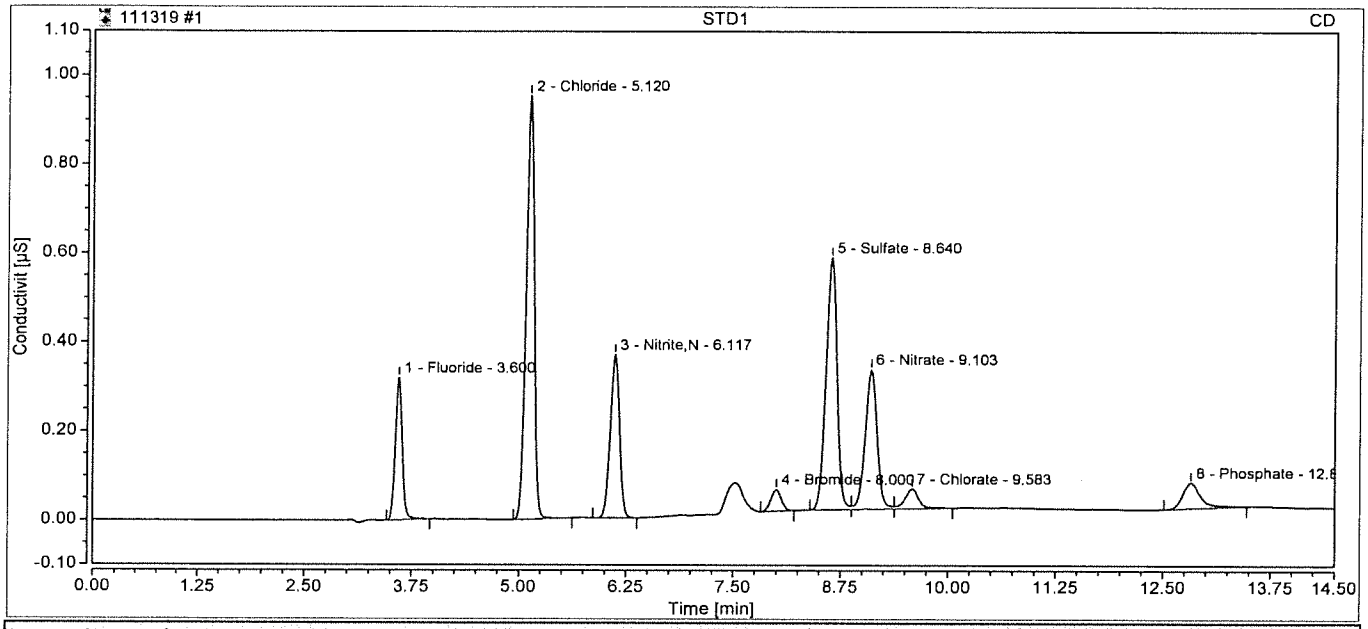
Calibration

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:



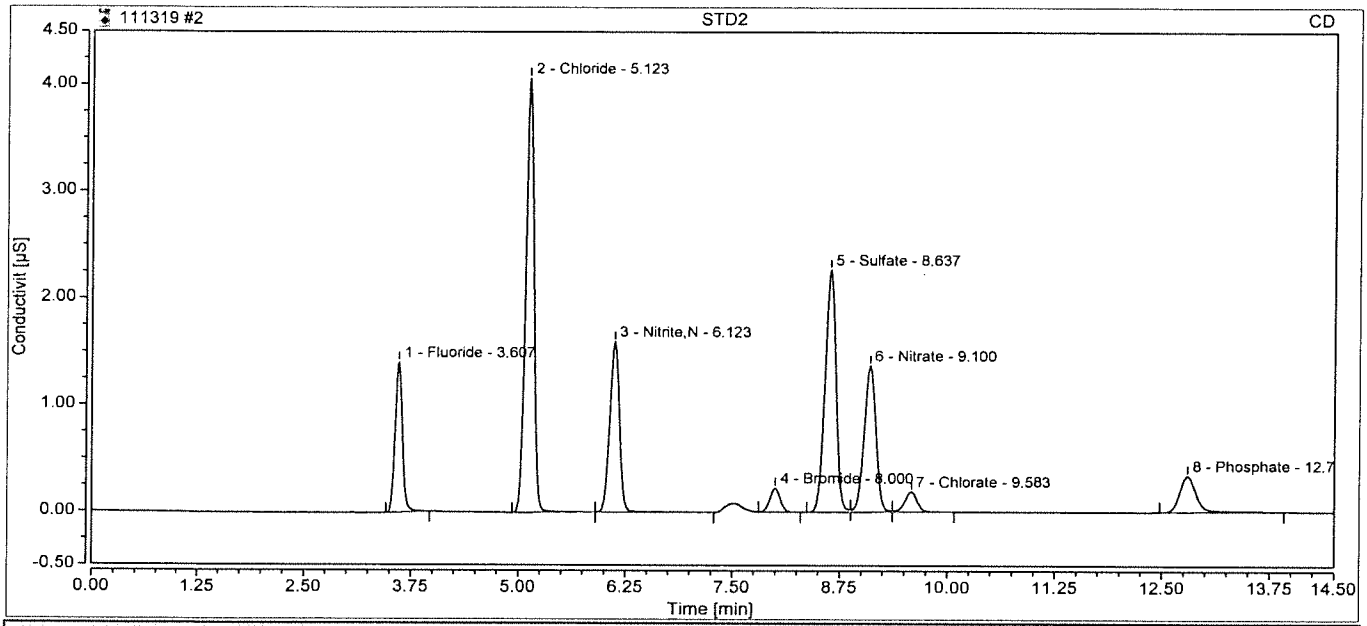
Integration Results

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:



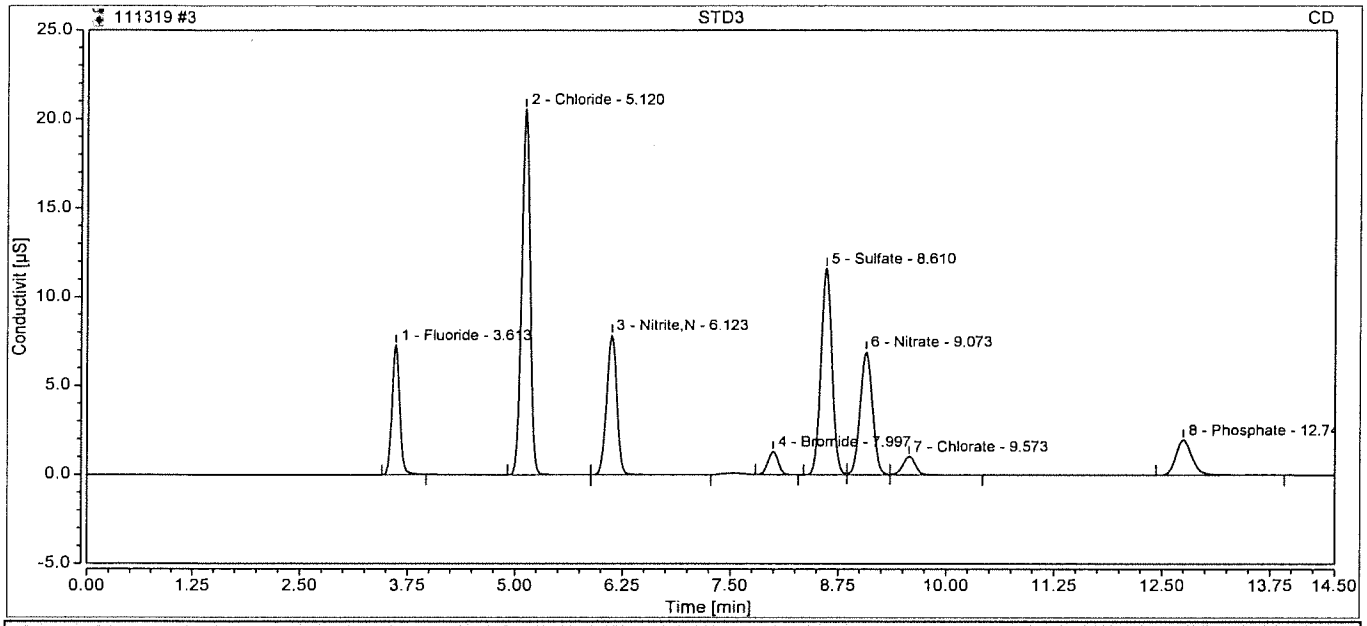
Integration Results

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:



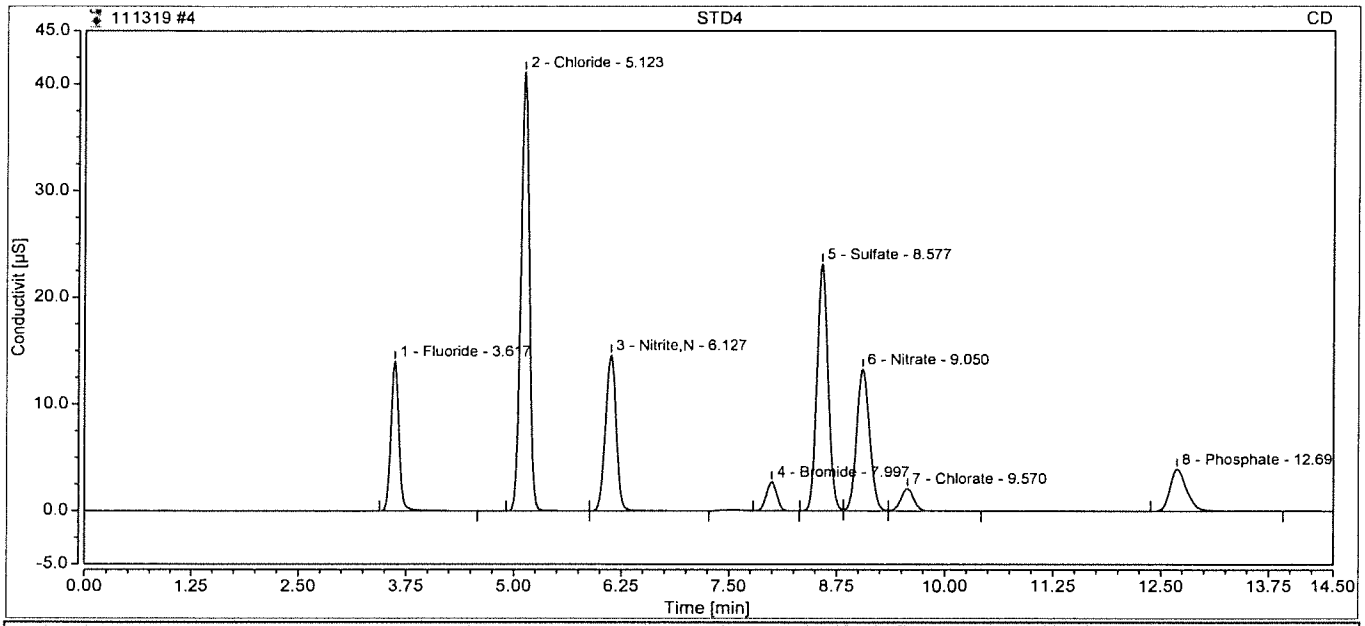
Integration Results

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:



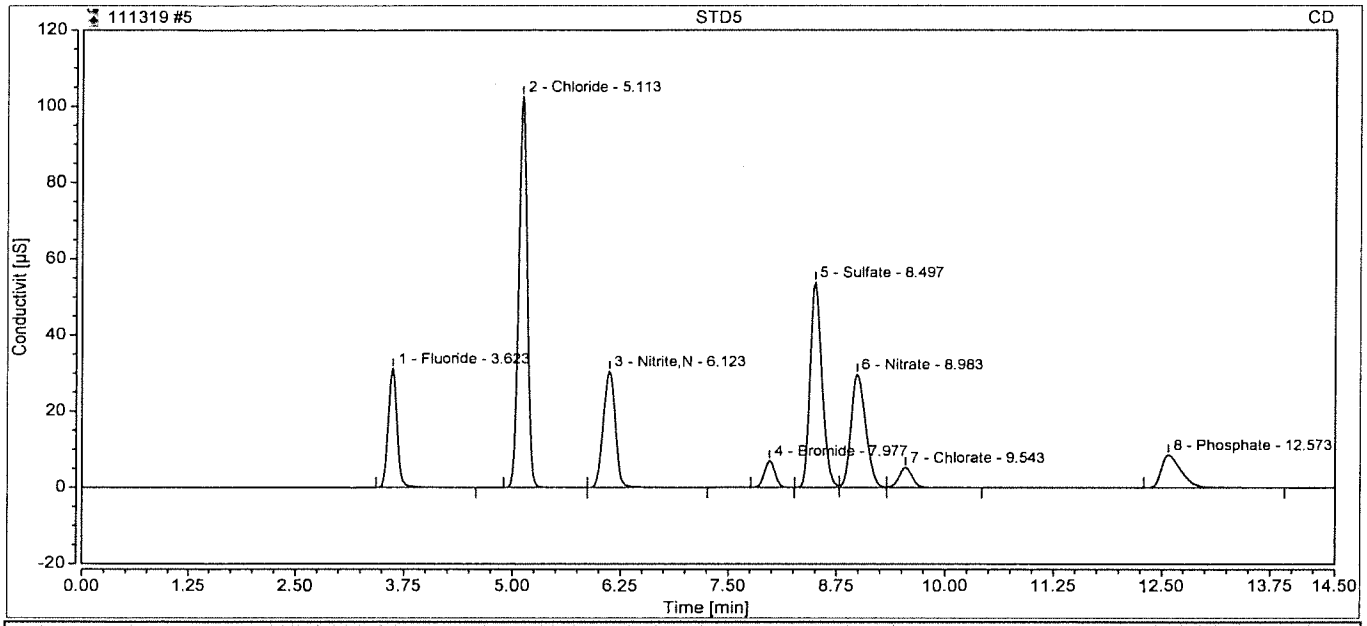
Integration Results

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:



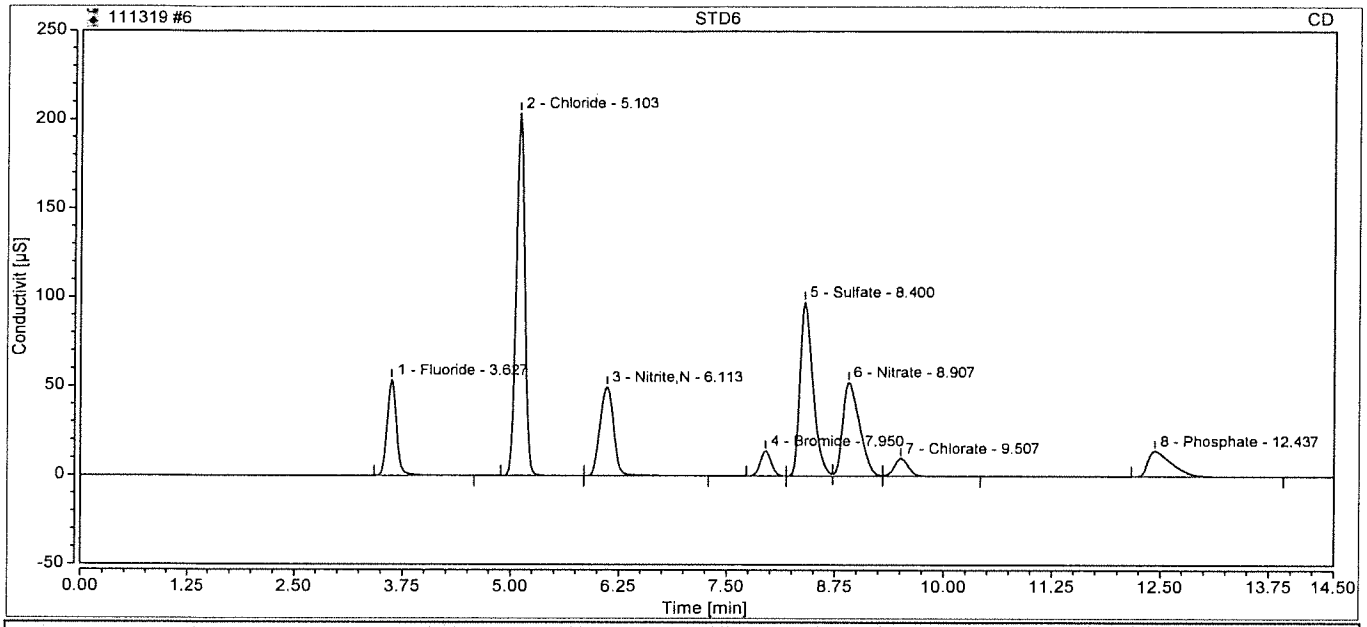
Integration Results

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:



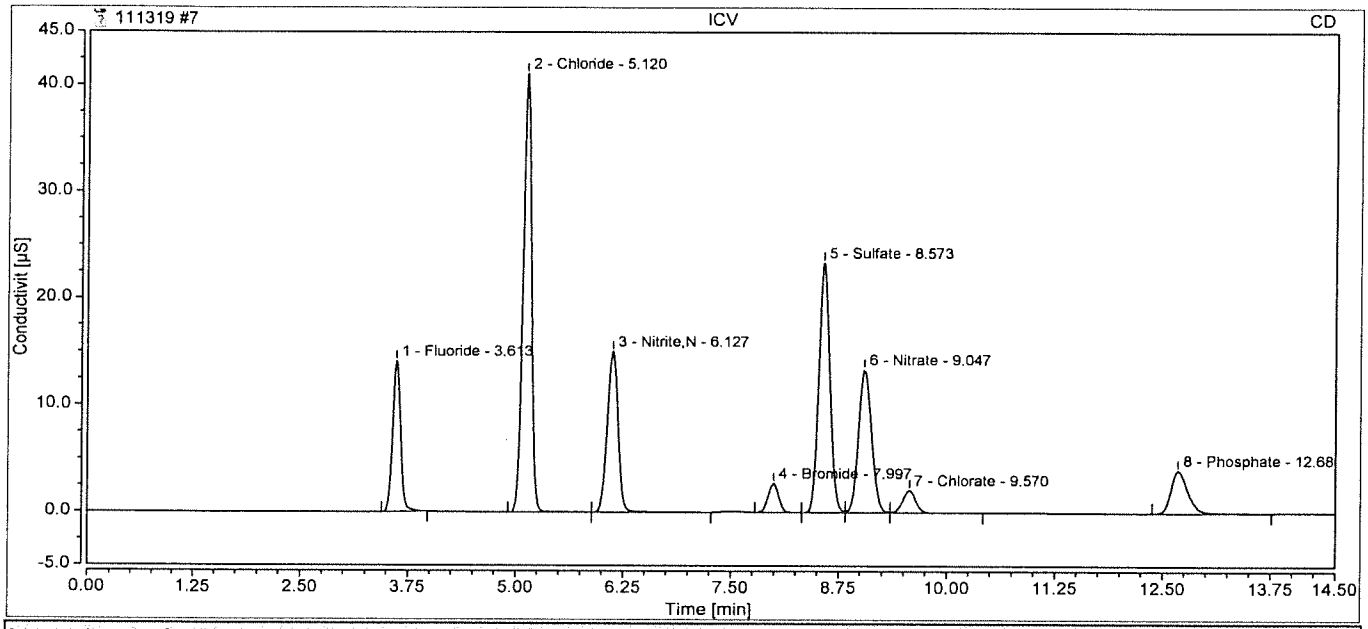
Integration Results

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:



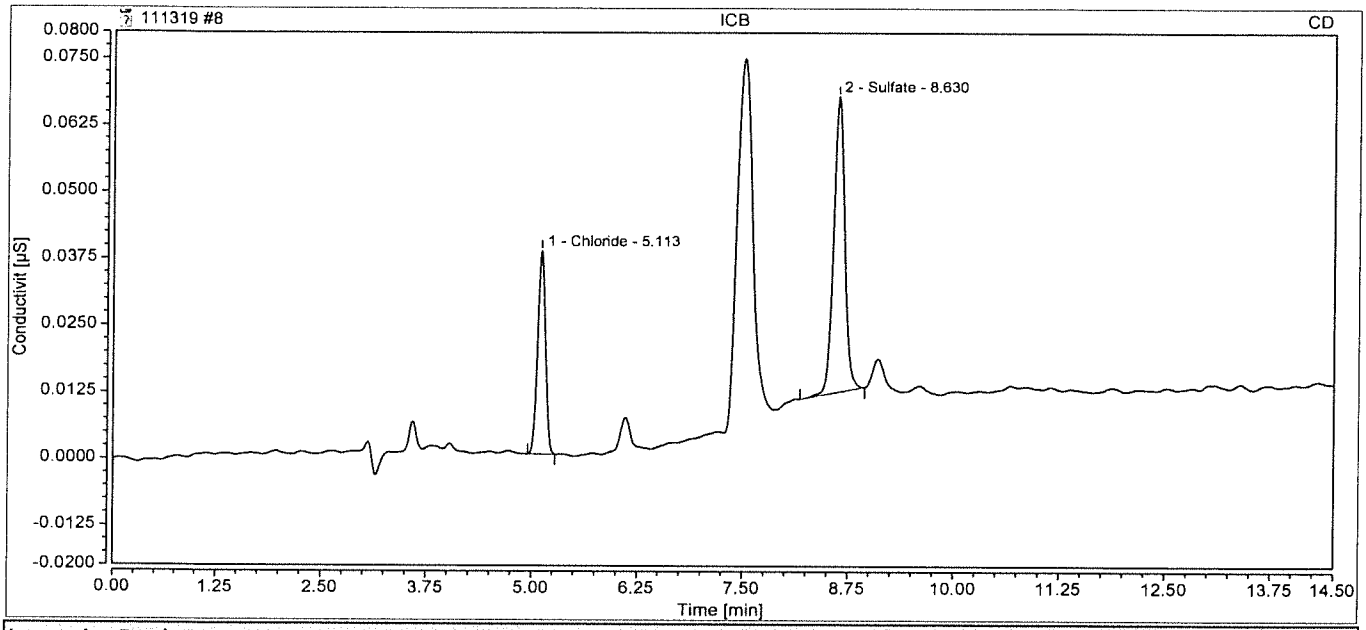
Integration Results

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:



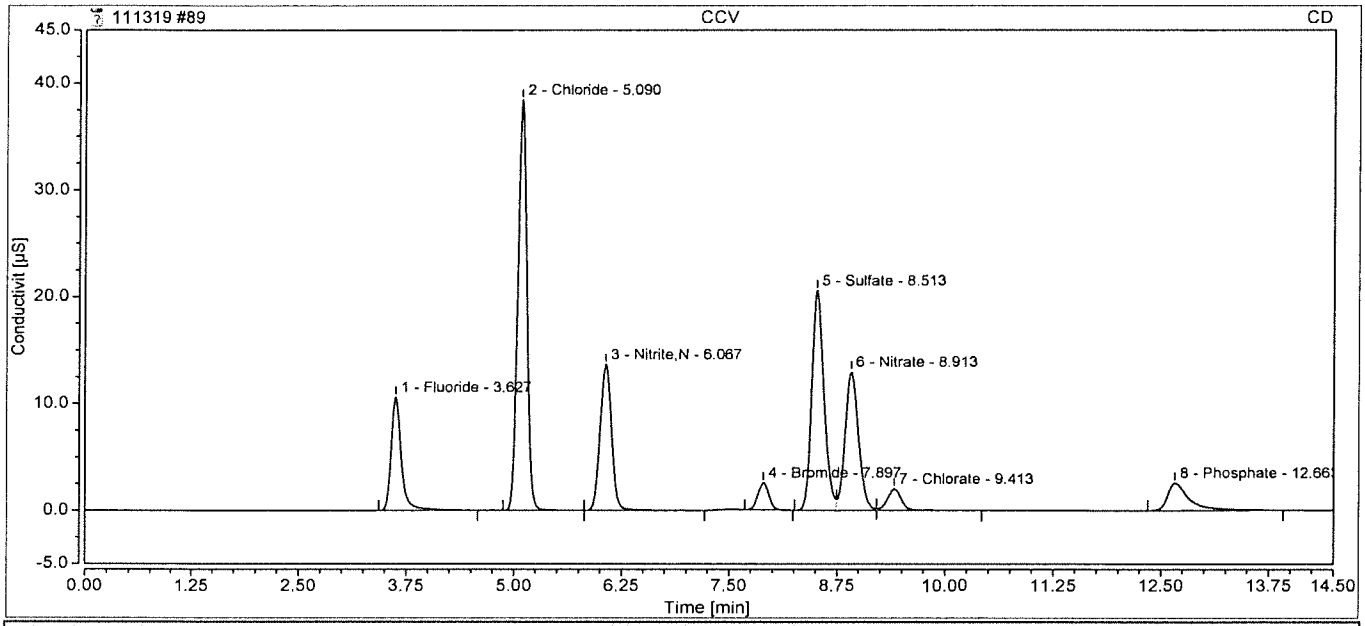
Integration Results

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**	

89 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:	**11/14/2019 14:49**	*Sample Weight:*	**1.0000**

Run Time:



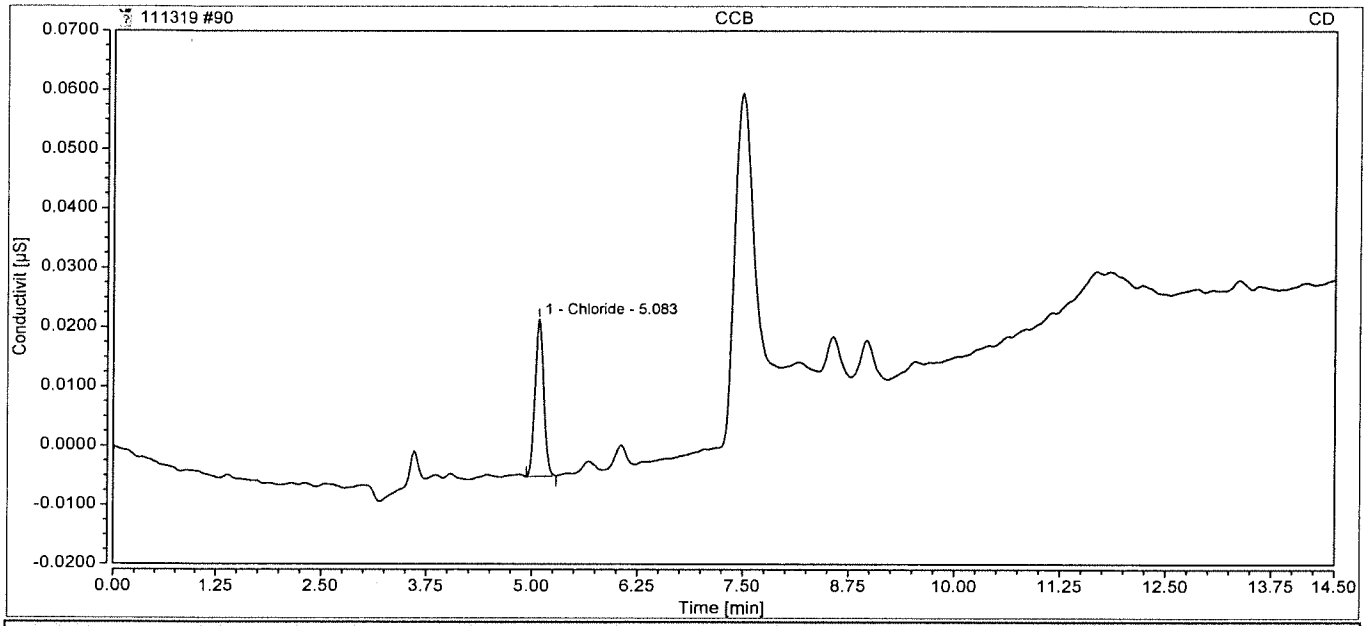
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.465	3.9574	3.9574	1.0000
2	5.09	Chloride	BMB	4.701	20.0174	20.0174	1.0000
3	6.07	Nitrite,N	BMB	2.118	4.1359	4.1359	1.0000
4	7.90	Bromide	BMB	0.375	3.7658	3.7658	1.0000
5	8.51	Sulfate	BM	3.368	19.6224	19.6224	1.0000
6	8.91	Nitrate	M	2.364	4.0402	4.0402	1.0000
7	9.41	Chlorate	MB	0.378	4.0339	4.0339	1.0000
8	12.66	Phosphate	BMB	0.768	3.3581	3.3581	1.0000
Total:			**0.000**	**15.536**		**62.93**	

90 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:	**11/14/2019 15:06**	*Sample Weight:*	**1.0000**

Run Time:



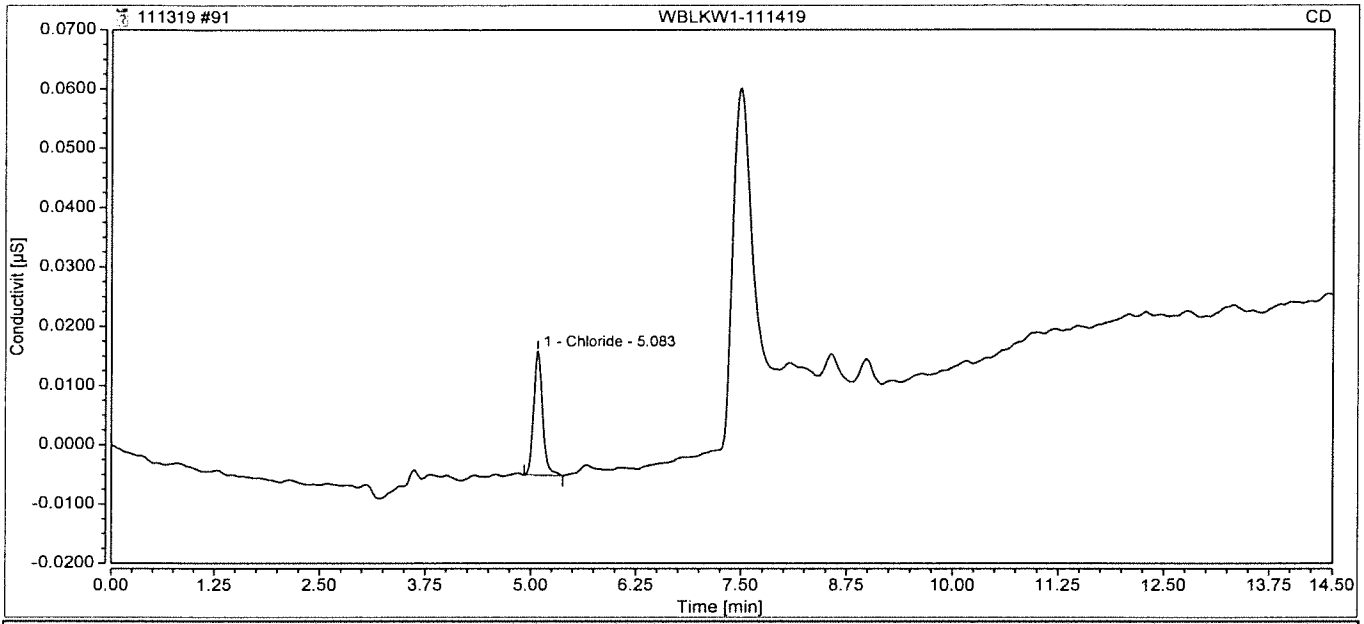
Integration Results

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	5.08	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**	

91 WBLKW1-111419

Sample Name:	**WBLKW1-111419**	*Injection Volume:*	**5.00**
Vial Number:	**RA1**	*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:	**11/14/2019 15:22**	*Sample Weight:*	**1.0000**

Run Time:



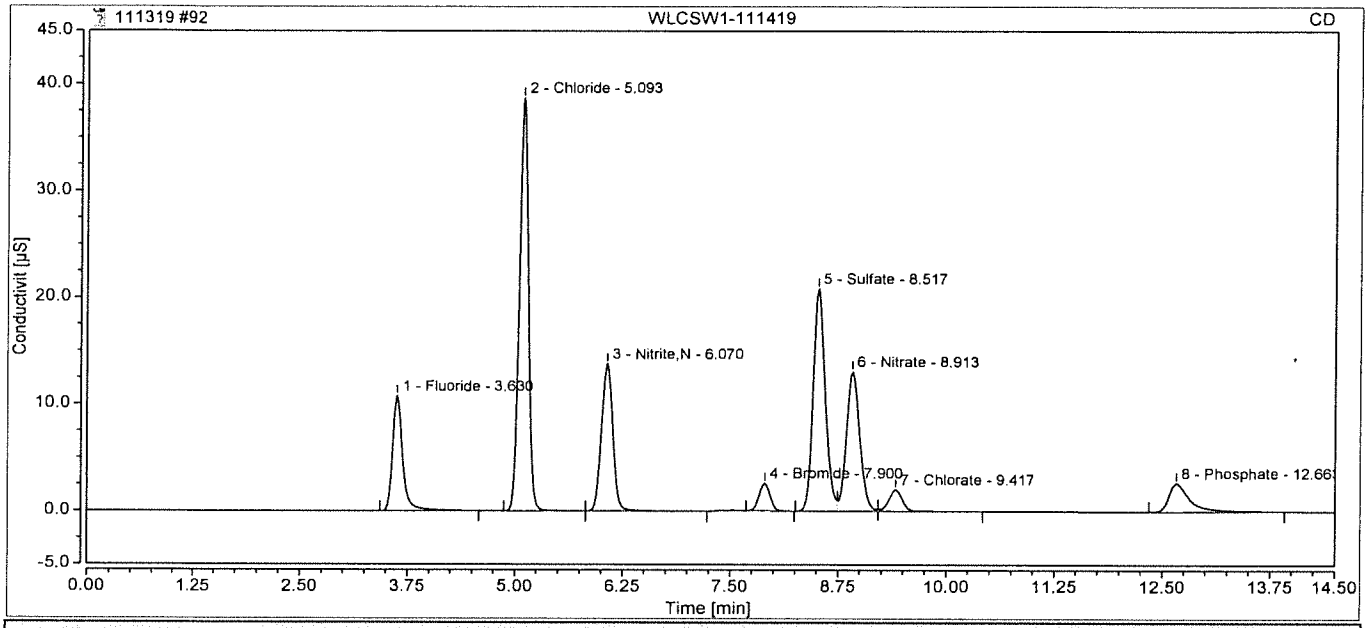
Integration Results

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	5.08	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
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**	

92 WLCSW1-111419

Sample Name:	**WLCSW1-111419**	*Injection Volume:*	**5.00**
Vial Number:	**RA2**	*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:	**11/14/2019 15:39**	*Sample Weight:*	**1.0000**

Run Time:



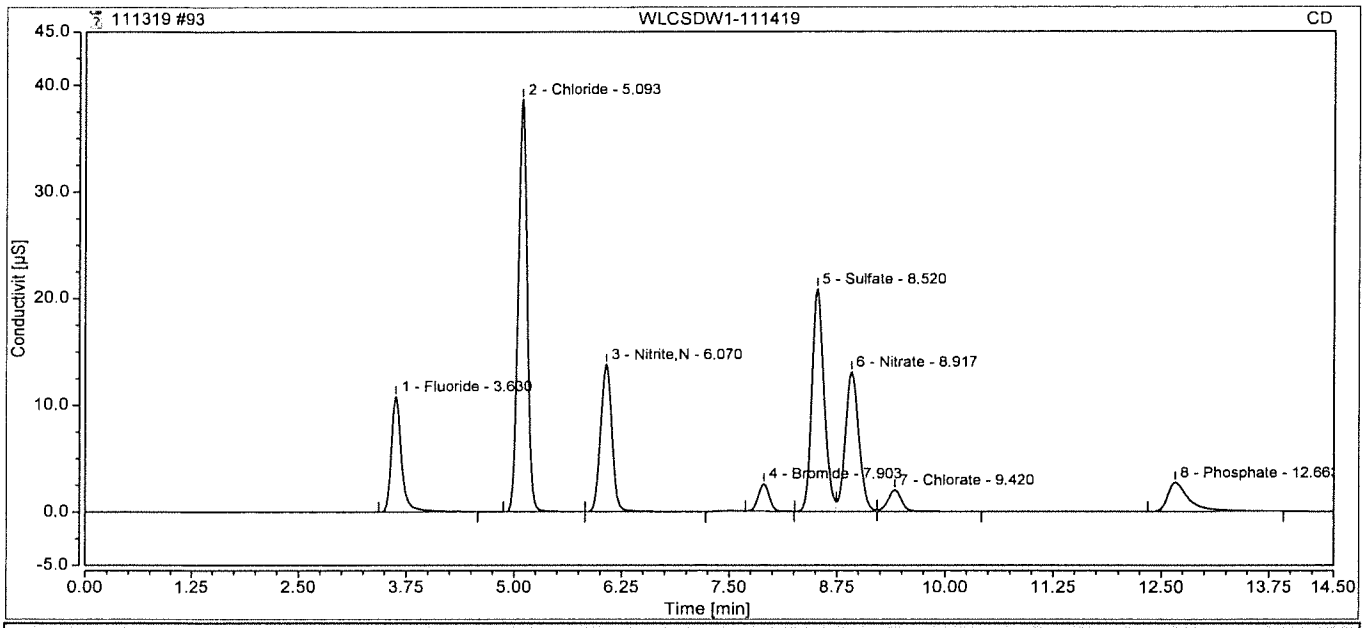
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.477	3.9893	3.9893	1.0000
2	5.09	Chloride	BMB	4.729	20.1375	20.1375	1.0000
3	6.07	Nitrite,N	BMB	2.139	4.1768	4.1768	1.0000
4	7.90	Bromide	BMB	0.380	3.8148	3.8148	1.0000
5	8.52	Sulfate	BM	3.396	19.7846	19.7846	1.0000
6	8.91	Nitrate	M	2.379	4.0660	4.0660	1.0000
7	9.42	Chlorate	MB	0.379	4.0451	4.0451	1.0000
8	12.66	Phosphate	BMB	0.783	3.4224	3.4224	1.0000
Total:			**0.000**	**15.661**		**63.44**	

93 *WLCSDW1-111419*

Sample Name:	**WLCSDW1-111419**	*Injection Volume:*	**5.00**
Vial Number:	**RA3**	*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:	**11/14/2019 15:56**	*Sample Weight:*	**1.0000**

Run Time:



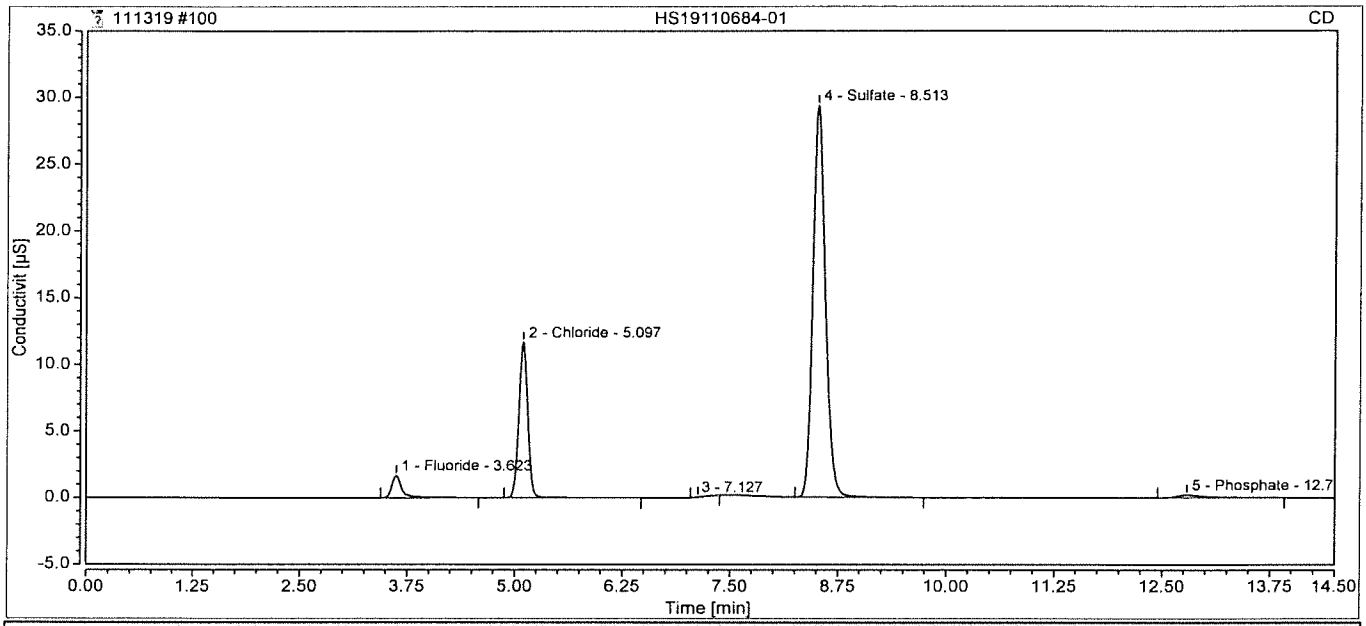
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.475	3.9851	3.9851	1.0000
2	5.09	Chloride	BMB	4.719	20.0972	20.0972	1.0000
3	6.07	Nitrite,N	BMB	2.140	4.1787	4.1787	1.0000
4	7.90	Bromide	BMB	0.379	3.8129	3.8129	1.0000
5	8.52	Sulfate	BM	3.397	19.7898	19.7898	1.0000
6	8.92	Nitrate	M	2.378	4.0651	4.0651	1.0000
7	9.42	Chlorate	MB	0.379	4.0412	4.0412	1.0000
8	12.66	Phosphate	BMB	0.798	3.4850	3.4850	1.0000
Total:			**0.000**	**15.666**		**63.46**	

100 HS19110684-01

Sample Name:	**HS19110684-01**	*Injection Volume:*	**5.00**
Vial Number:	**RB8**	*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:	**11/14/2019 19:07**	*Sample Weight:*	**1.0000**

Run Time:



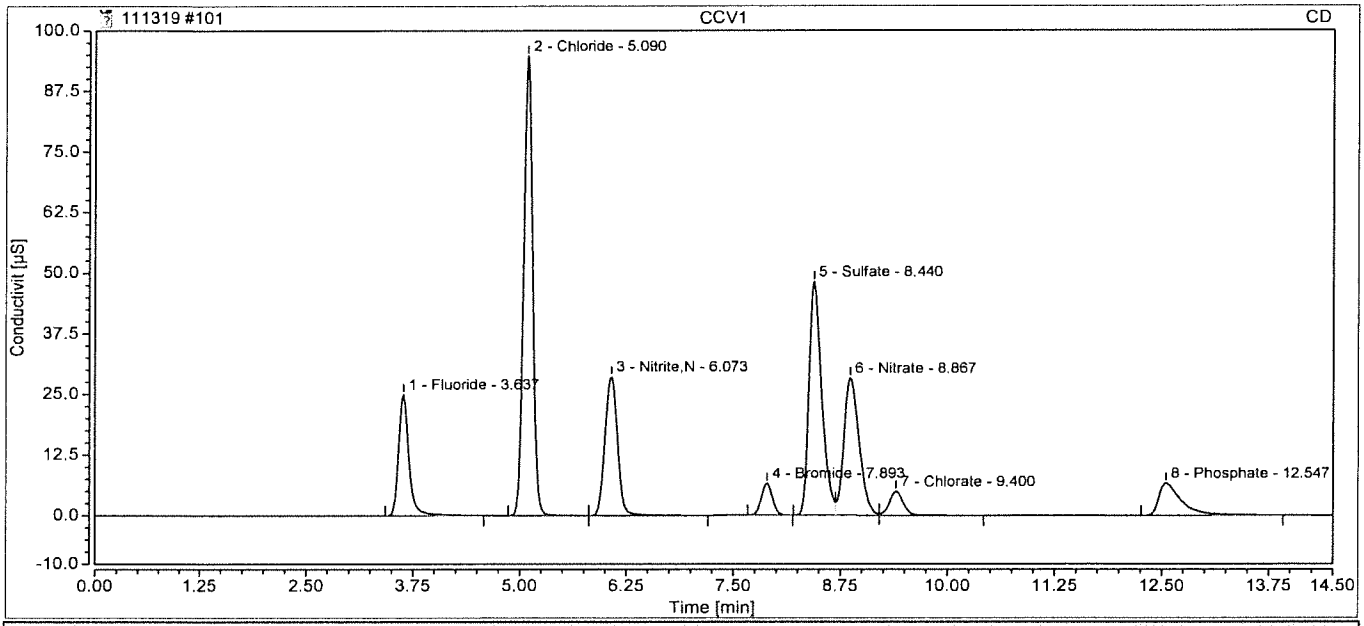
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.235	0.6484	0.6484	1.0000
2	5.10	Chloride	BMB	1.417	6.0727	6.0727	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
4	8.51	Sulfate	BMB	4.922	28.6725	28.6725	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
5	12.79	Phosphate	BMB	0.087	0.4206	0.4206	1.0000
Total:			**0.000**	**6.661**		**35.81**	

101 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:	**11/14/2019 19:23**	*Sample Weight:*	**1.0000**

Run Time:



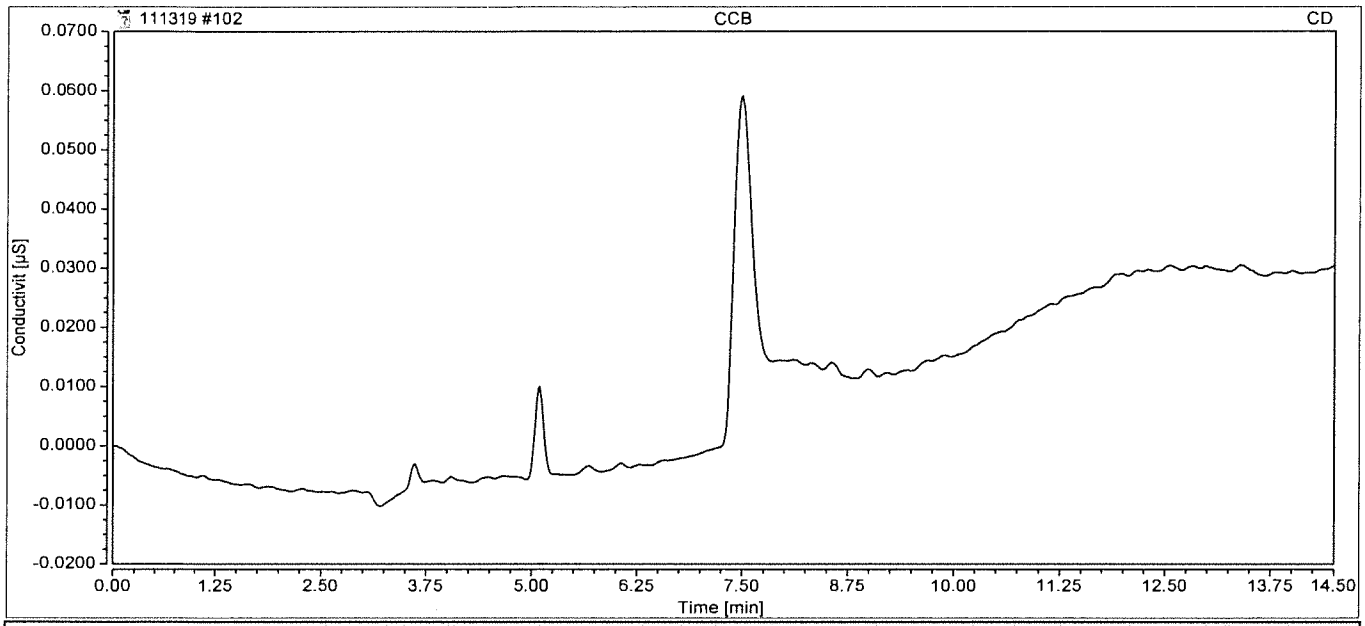
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.64	Fluoride	BMB	3.545	9.5550	9.5550	1.0000
2	5.09	Chloride	BMB	11.654	49.5437	49.5437	1.0000
3	6.07	Nitrite,N	BMB	4.915	9.5988	9.5988	1.0000
4	7.89	Bromide	BMB	0.980	9.7647	9.7647	1.0000
5	8.44	Sulfate	BM	8.373	48.7634	48.7634	1.0000
6	8.87	Nitrate	M	5.896	10.0514	10.0514	1.0000
7	9.40	Chlorate	MB	0.946	10.0416	10.0416	1.0000
8	12.55	Phosphate	BMB	2.079	9.0071	9.0071	1.0000
Total:			**0.000**	**38.387**		**156.33**	

102 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:	**11/14/2019 19:40**	*Sample Weight:*	**1.0000**

Run Time:

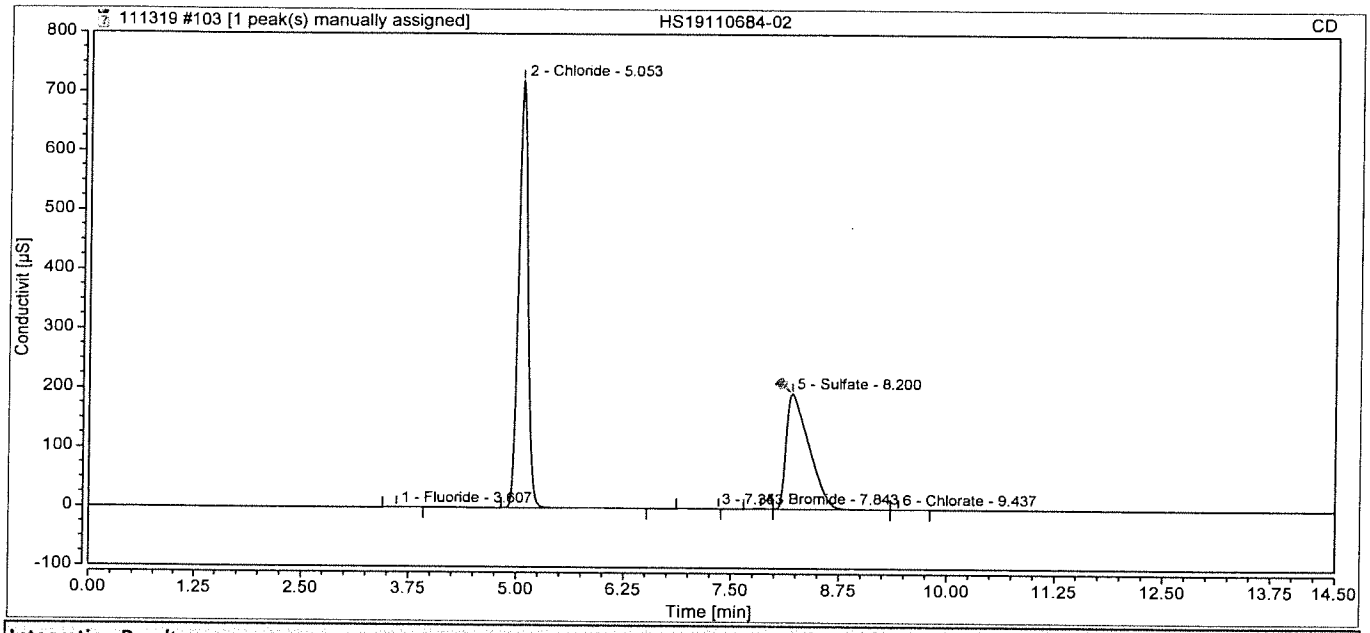


Integration Results

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
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**	

103 HS19110684-02

Sample Name:	**HS19110684-02**	*Injection Volume:*	**5.00**
Vial Number:	**RC1**	*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:	**11/14/2019 19:57**	*Sample Weight:*	**1.0000**
Run Time:			

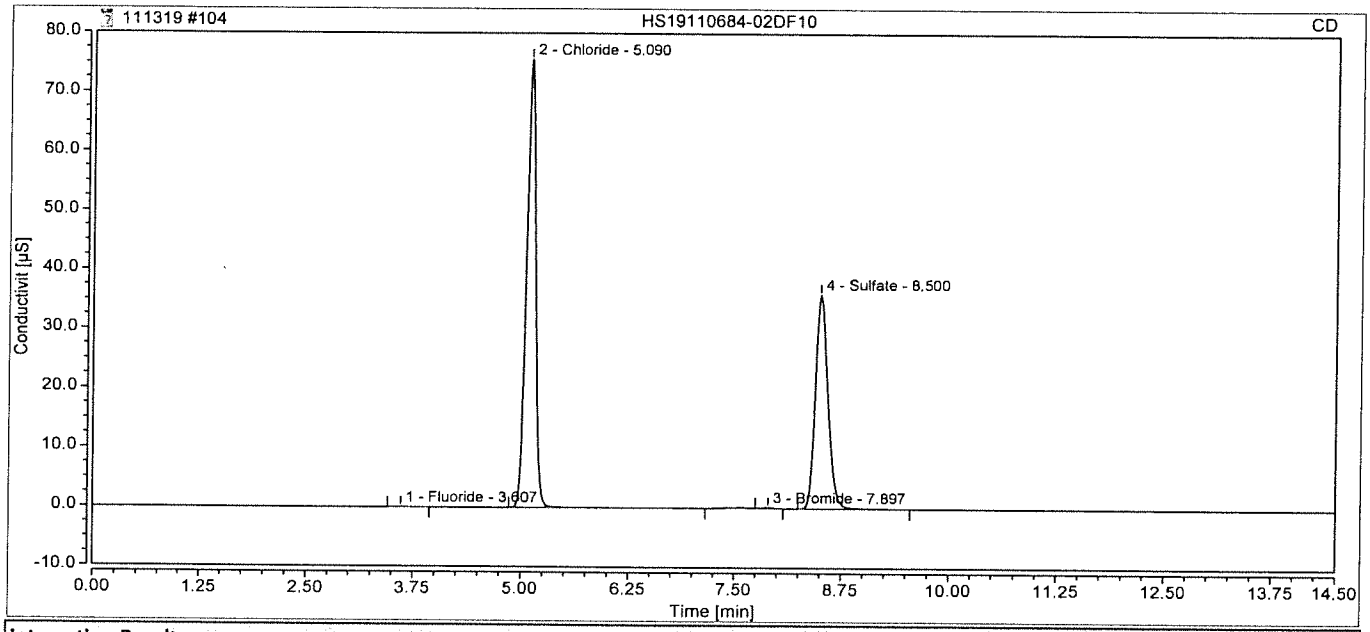


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.053	0.1564	0.1564	1.0000
2	5.05	Chloride	BMB	91.785	389.8014	389.8014	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
4	7.84	Bromide	BM	0.187	1.9062	1.9062	1.0000
5	8.20	Sulfate	M ^	59.884	348.6938	348.6938	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
6	9.44	Chlorate	MB	0.005	0.0828	0.0828	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**151.915**		**740.64**	

104 HS19110684-02DF10

Sample Name:	**HS19110684-02DF10**	*Injection Volume:*	**5.00**
Vial Number:	**RC2**	*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:	**11/14/2019 20:13**	*Sample Weight:*	**1.0000**
Run Time:			



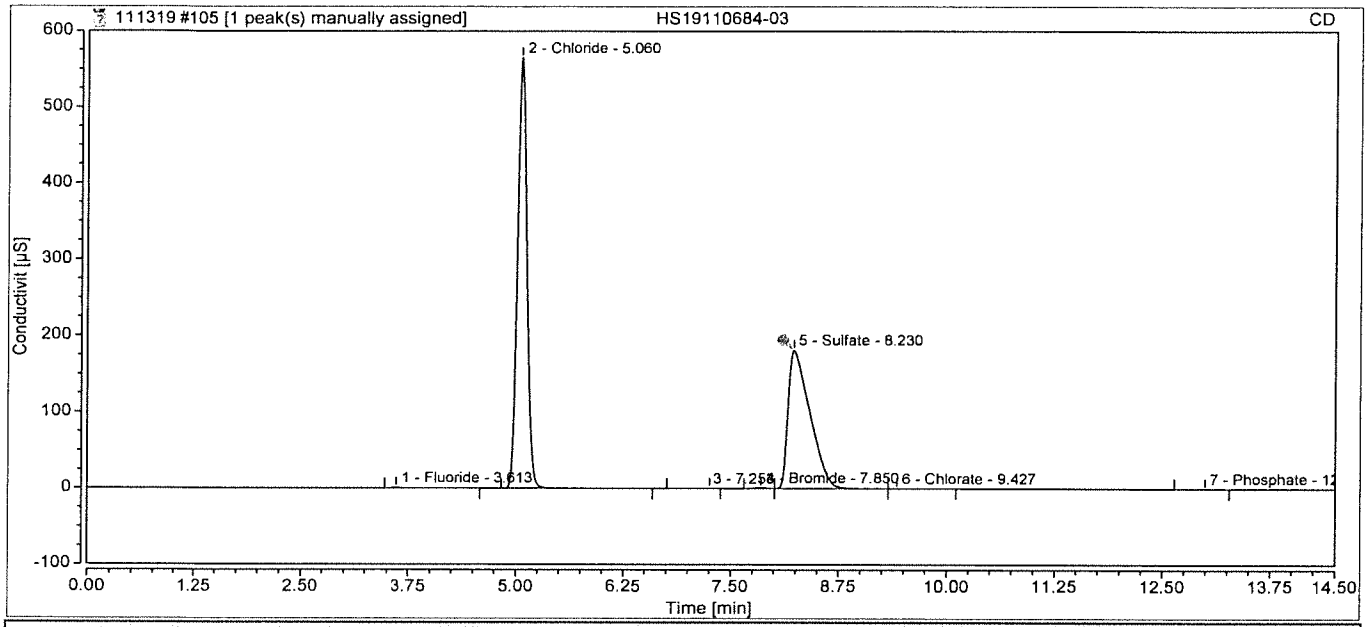
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.005	0.0274	0.2736	10.0000
2	5.09	Chloride	BMB	9.291	39.5077	395.0774	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
3	7.90	Bromide	BMB	0.013	0.1791	1.7906	10.0000
4	8.50	Sulfate	BMB	6.132	35.7145	357.1452	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**	**15.440**		**754.29**	

105 HS19110684-03

Sample Name:	**HS19110684-03**	*Injection Volume:*	**5.00**
Vial Number:	**RC3**	*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:	**11/14/2019 20:30**	*Sample Weight:*	**1.0000**

Run Time:

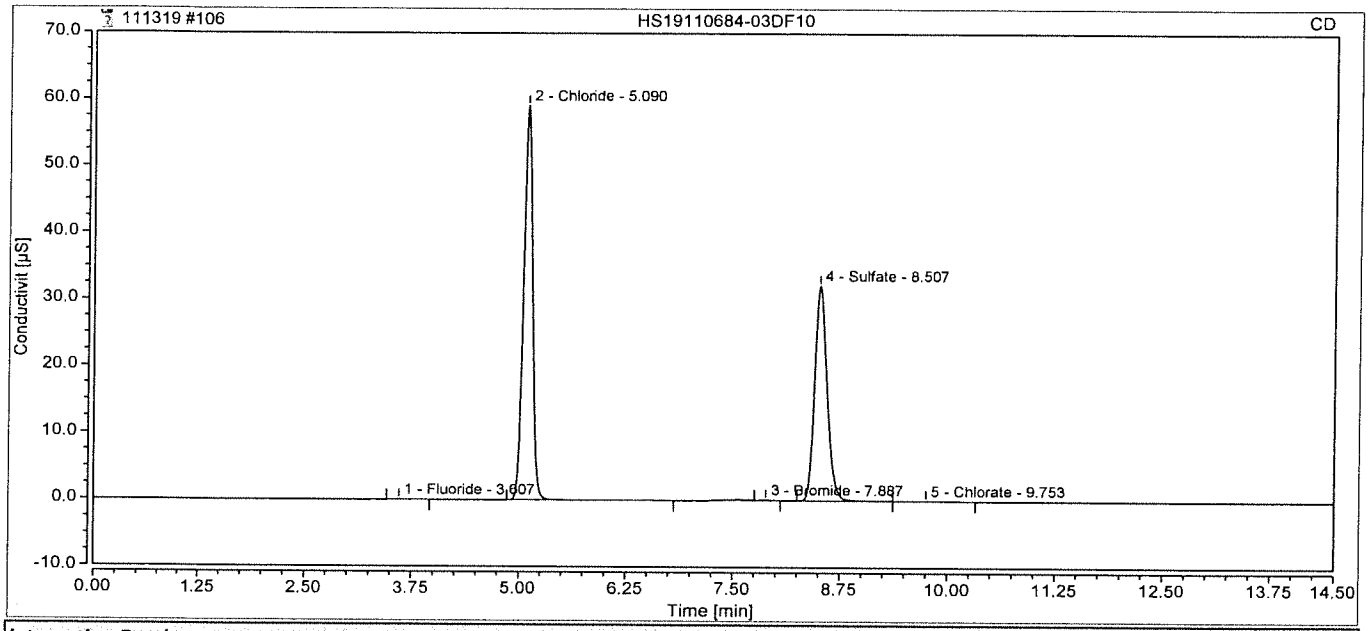


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.128	0.3591	0.3591	1.0000
2	5.06	Chloride	BMB	71.637	304.2447	304.2447	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
4	7.85	Bromide	BMB	0.118	1.2192	1.2192	1.0000
5	8.23	Sulfate	BM ^	53.149	309.4757	309.4757	1.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	1.0000
6	9.43	Chlorate	MB	0.011	0.1422	0.1422	1.0000
7	12.99	Phosphate	BMB	0.005	0.0705	0.0705	1.0000
Total:			**0.000**	**125.047**		**615.51**	

106 HS19110684-03DF10

Sample Name:	**HS19110684-03DF10**	*Injection Volume:*	**5.00**
Vial Number:	**RC4**	*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:	**11/14/2019 20:47**	*Sample Weight:*	**1.0000**
Run Time:			



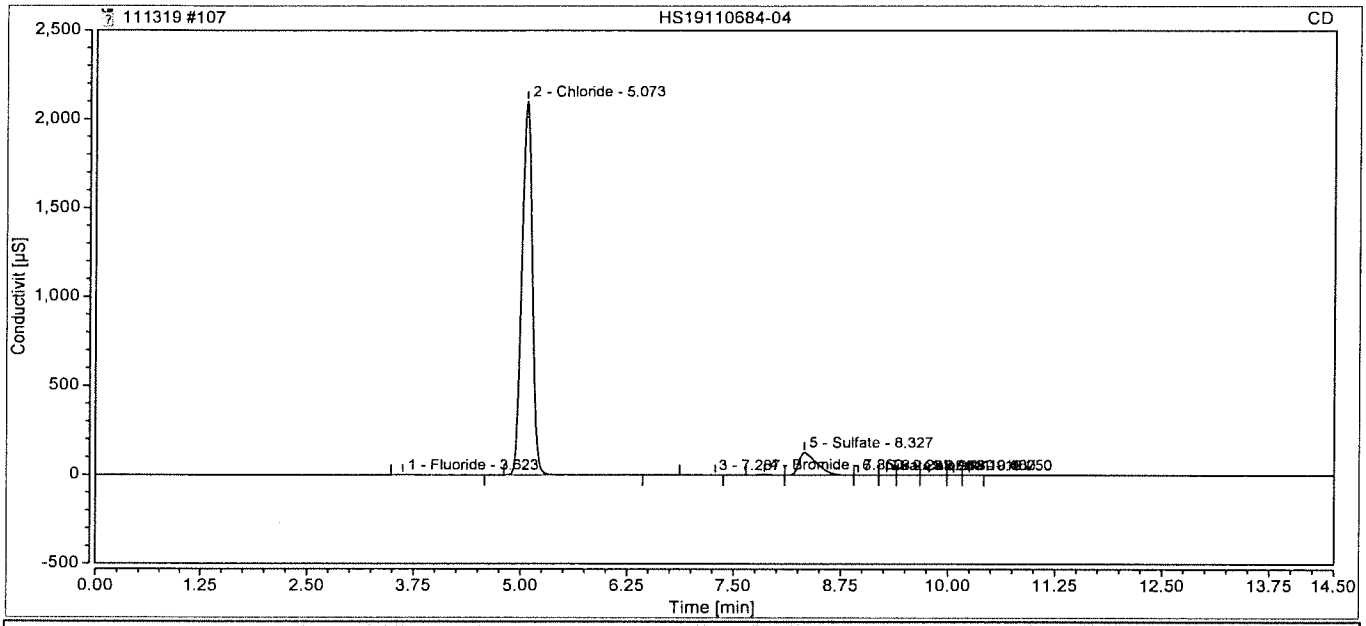
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.009	0.0394	0.3940	10.0000
2	5.09	Chloride	BMB	7.252	30.8498	308.4981	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
3	7.89	Bromide	BMB	0.007	0.1261	1.2609	10.0000
4	8.51	Sulfate	BM	5.431	31.6361	316.3609	10.0000
n.a.	n.a.	Nitrate	n.a.	n.a.	n.a.	n.a.	10.0000
5	9.75	Chlorate	MB	0.020	0.2341	2.3405	10.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	10.0000
Total:			**0.000**	**12.719**		**628.85**	

107 HS19110684-04

Sample Name:	**HS19110684-04**	*Injection Volume:*	**5.00**
Vial Number:	**RC5**	*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:	**11/14/2019 21:03**	*Sample Weight:*	**1.0000**

Run Time:

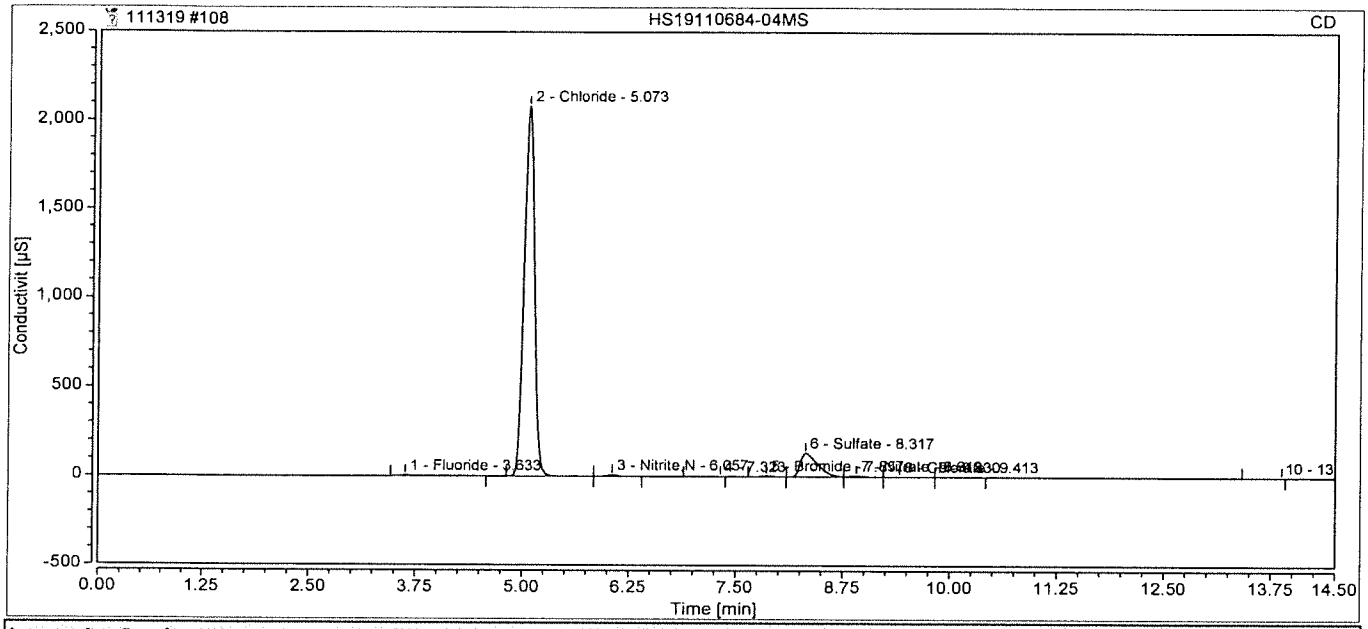


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.049	0.1464	0.1464	1.0000
2	5.07	Chloride	BMB	297.088	1261.5684	1261.5684	1.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	1.0000
4	7.86	Bromide	BMB	0.612	6.1231	6.1231	1.0000
5	8.33	Sulfate	BM	31.002	180.5262	180.5262	1.0000
6	8.95	Nitrate	M	0.051	0.1042	0.1042	1.0000
8	9.40	Chlorate	M	0.011	0.1441	0.1441	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**328.814**		**1448.61**	

108 HS19110684-04MS

Sample Name:	**HS19110684-04MS**	*Injection Volume:*	**5.00**
Vial Number:	**RC6**	*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:	**11/14/2019 21:20**	*Sample Weight:*	**1.0000**
Run Time:			



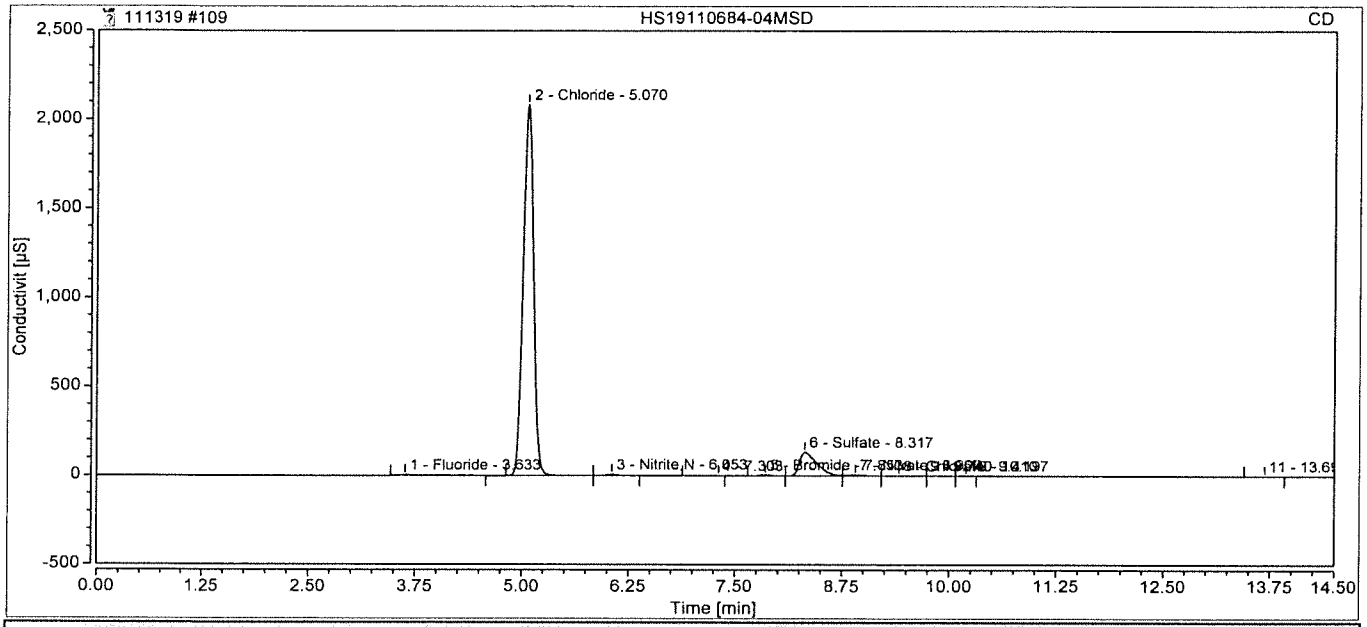
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	0.704	1.9104	1.9104	1.0000
2	5.07	Chloride	BMB	293.214	1245.1201	1245.1201	1.0000
3	6.06	Nitrite,N	BMB	1.034	2.0182	2.0182	1.0000
5	7.86	Bromide	BMB	0.796	7.9392	7.9392	1.0000
6	8.32	Sulfate	BM	31.988	186.2652	186.2652	1.0000
7	8.91	Nitrate	M	1.258	2.1583	2.1583	1.0000
8	9.41	Chlorate	M	0.204	2.1875	2.1875	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**329.198**		**1447.60**	

109 HS19110684-04MSD

Sample Name:	**HS19110684-04MSD**	*Injection Volume:*	**5.00**
Vial Number:	**RC7**	*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:	**11/14/2019 21:36**	*Sample Weight:*	**1.0000**

Run Time:



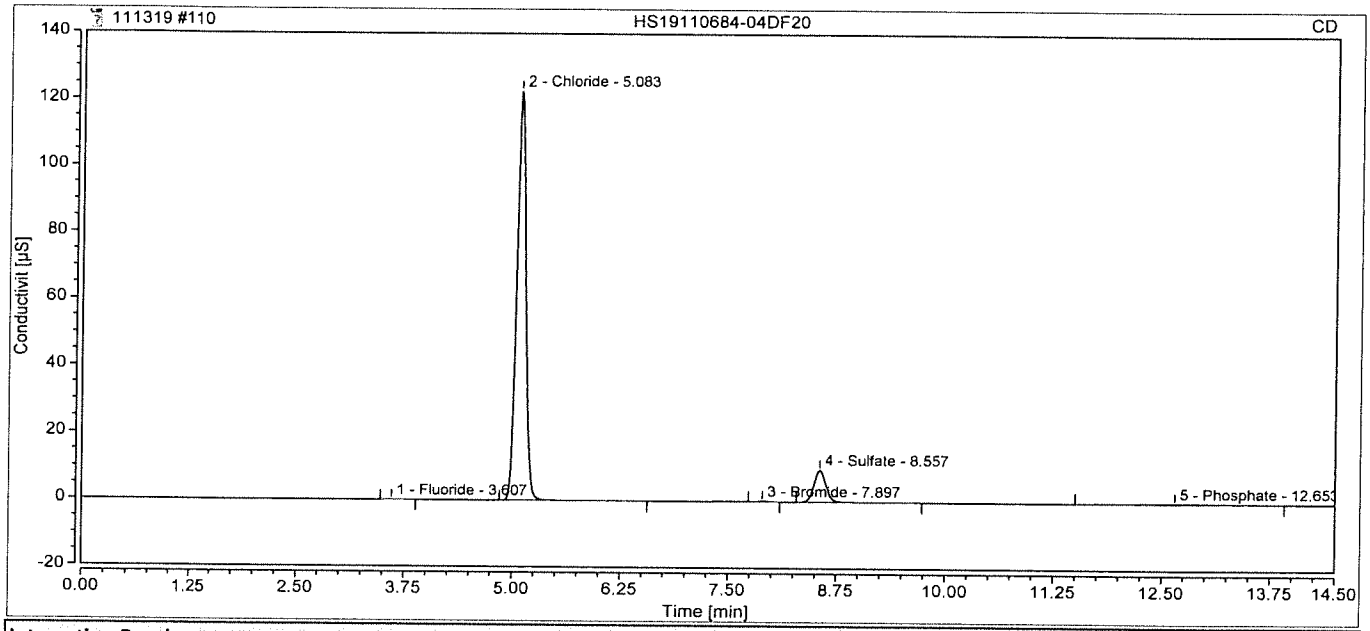
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	0.699	1.8968	1.8968	1.0000
2	5.07	Chloride	BMB	293.345	1245.6734	1245.6734	1.0000
3	6.05	Nitrite,N	BMB	1.027	2.0046	2.0046	1.0000
5	7.85	Bromide	BMB	0.797	7.9522	7.9522	1.0000
6	8.32	Sulfate	BM	32.002	186.3456	186.3456	1.0000
7	8.91	Nitrate	M	1.234	2.1172	2.1172	1.0000
8	9.41	Chlorate	M	0.192	2.0543	2.0543	1.0000
n.a.	n.a.	Phosphate	n.a.	n.a.	n.a.	n.a.	1.0000
Total:			**0.000**	**329.294**		**1448.04**	

110 HS19110684-04DF20

Sample Name:	HS19110684-04DF20	Injection Volume:	5.00
Vial Number:	RC8	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:	11/14/2019 21:53	Sample Weight:	1.0000

Run Time:

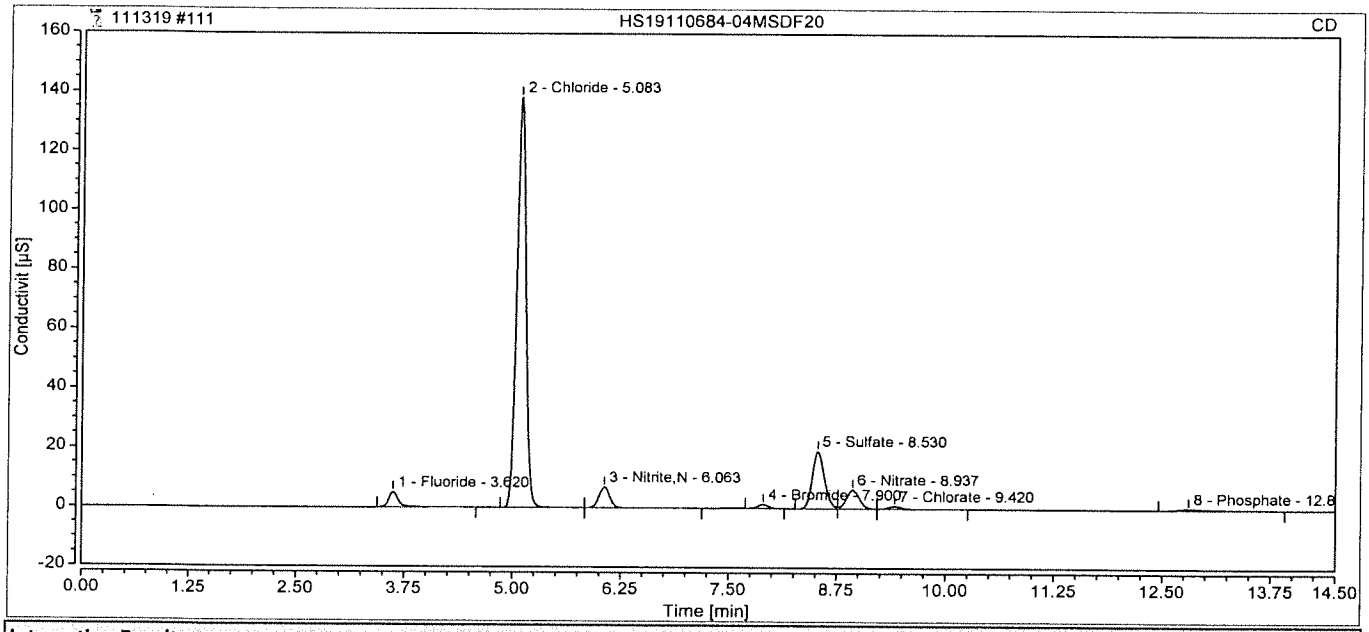


Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.003	0.0228	0.4557	20.0000
2	5.08	Chloride	BMB	15.157	64.4186	1288.3721	20.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	20.0000
3	7.90	Bromide	BMB	0.020	0.2519	5.0373	20.0000
4	8.56	Sulfate	BMB	1.556	9.0731	181.4617	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
5	12.65	Phosphate	BMB	0.162	0.7434	14.8687	20.0000
Total:			**0.000**	**16.898**		**1490.20**	

111 HS19110684-04MSDF20

Sample Name:	**HS19110684-04MSDF20**	*Injection Volume:*	**5.00**
Vial Number:	**RD1**	*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:	**11/14/2019 22:10**	*Sample Weight:*	**1.0000**
Run Time:			



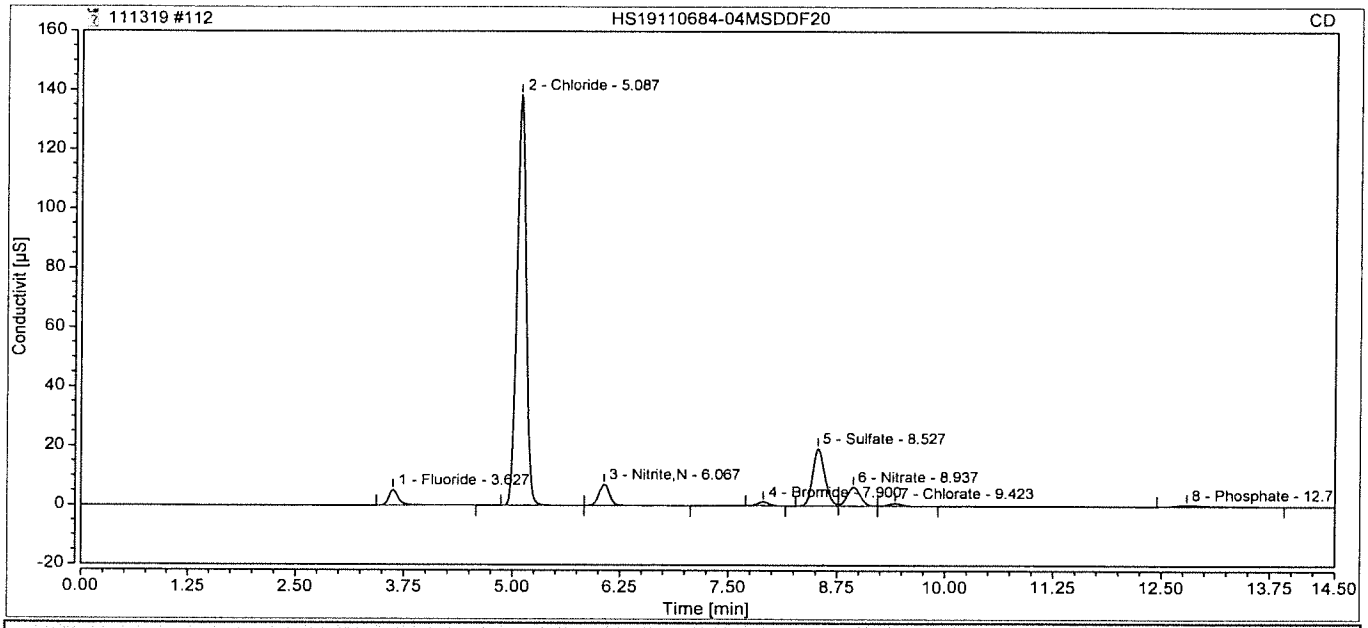
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.62	Fluoride	BMB	0.699	1.8963	37.9263	20.0000
2	5.08	Chloride	BMB	17.098	72.6591	1453.1829	20.0000
3	6.06	Nitrite,N	BMB	1.046	2.0430	40.8610	20.0000
4	7.90	Bromide	BMB	0.195	1.9849	39.6977	20.0000
5	8.53	Sulfate	BM	3.153	18.3726	367.4525	20.0000
6	8.94	Nitrate	M	1.138	1.9548	39.0954	20.0000
7	9.42	Chlorate	MB	0.176	1.8918	37.8353	20.0000
8	12.81	Phosphate	BMB	0.254	1.1407	22.8136	20.0000
Total:			**0.000**	**23.760**		**2038.86**	

112 HS19110684-04MSDDF20

Sample Name:	**HS19110684-04MSDDF20**	*Injection Volume:*	**5.00**
Vial Number:	**RD2**	*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:	**11/14/2019 22:26**	*Sample Weight:*	**1.0000**

Run Time:



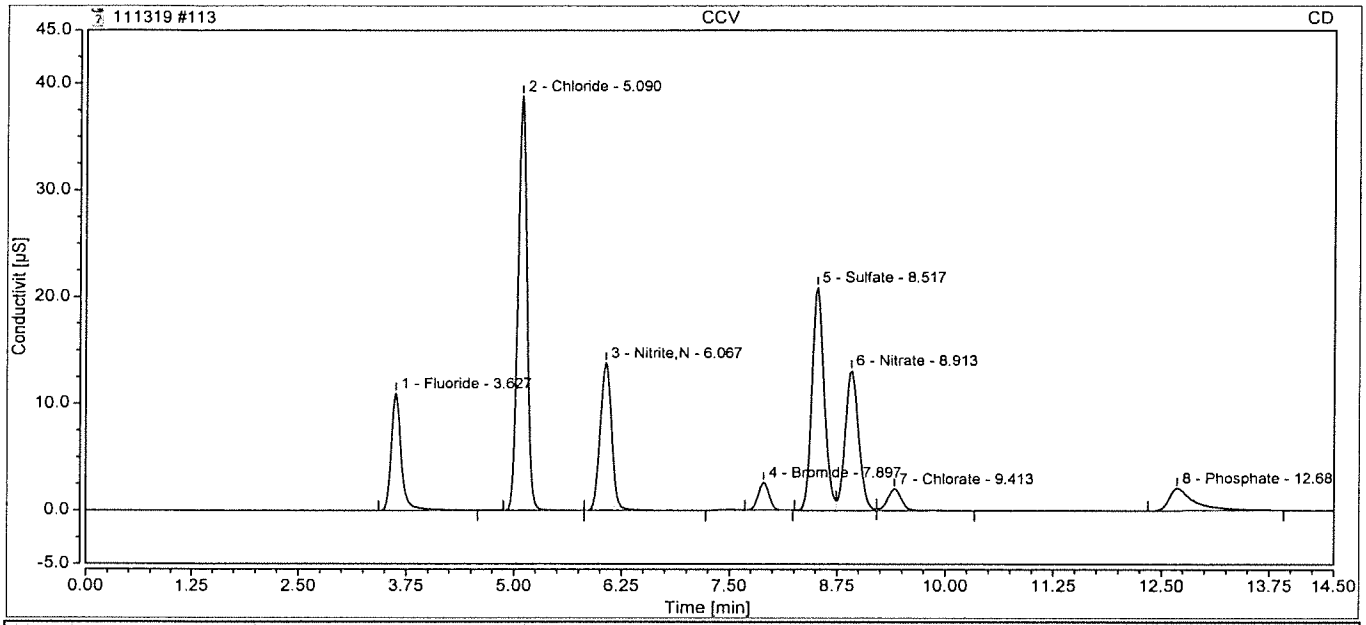
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	0.702	1.9053	38.1052	20.0000
2	5.09	Chloride	BMB	17.079	72.5798	1451.5960	20.0000
3	6.07	Nitrite,N	BMB	1.050	2.0498	40.9951	20.0000
4	7.90	Bromide	BMB	0.195	1.9894	39.7883	20.0000
5	8.53	Sulfate	BM	3.154	18.3799	367.5978	20.0000
6	8.94	Nitrate	M	1.141	1.9601	39.2015	20.0000
7	9.42	Chlorate	MB	0.170	1.8219	36.4375	20.0000
8	12.79	Phosphate	BMB	0.271	1.2155	24.3098	20.0000
Total:			**0.000**	**23.763**		**2038.03**	

113 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:	**11/14/2019 22:43**	*Sample Weight:*	**1.0000**

Run Time:



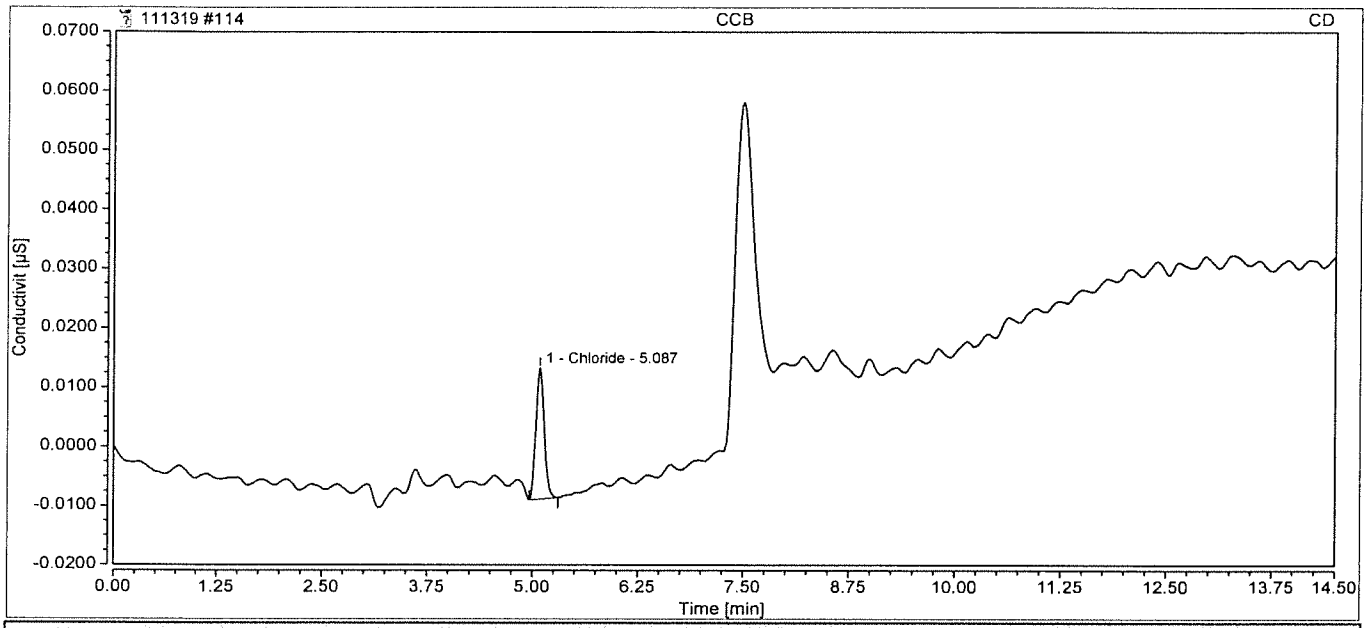
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	1.486	4.0134	4.0134	1.0000
2	5.09	Chloride	BMB	4.742	20.1913	20.1913	1.0000
3	6.07	Nitrite,N	BMB	2.145	4.1895	4.1895	1.0000
4	7.90	Bromide	BMB	0.381	3.8251	3.8251	1.0000
5	8.52	Sulfate	BM	3.418	19.9135	19.9135	1.0000
6	8.91	Nitrate	M	2.377	4.0635	4.0635	1.0000
7	9.41	Chlorate	MB	0.379	4.0423	4.0423	1.0000
8	12.68	Phosphate	BMB	0.744	3.2527	3.2527	1.0000
Total:			**0.000**	**15.672**		**63.49**	

114 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:	**11/14/2019 22:59**	*Sample Weight:*	**1.0000**

Run Time:



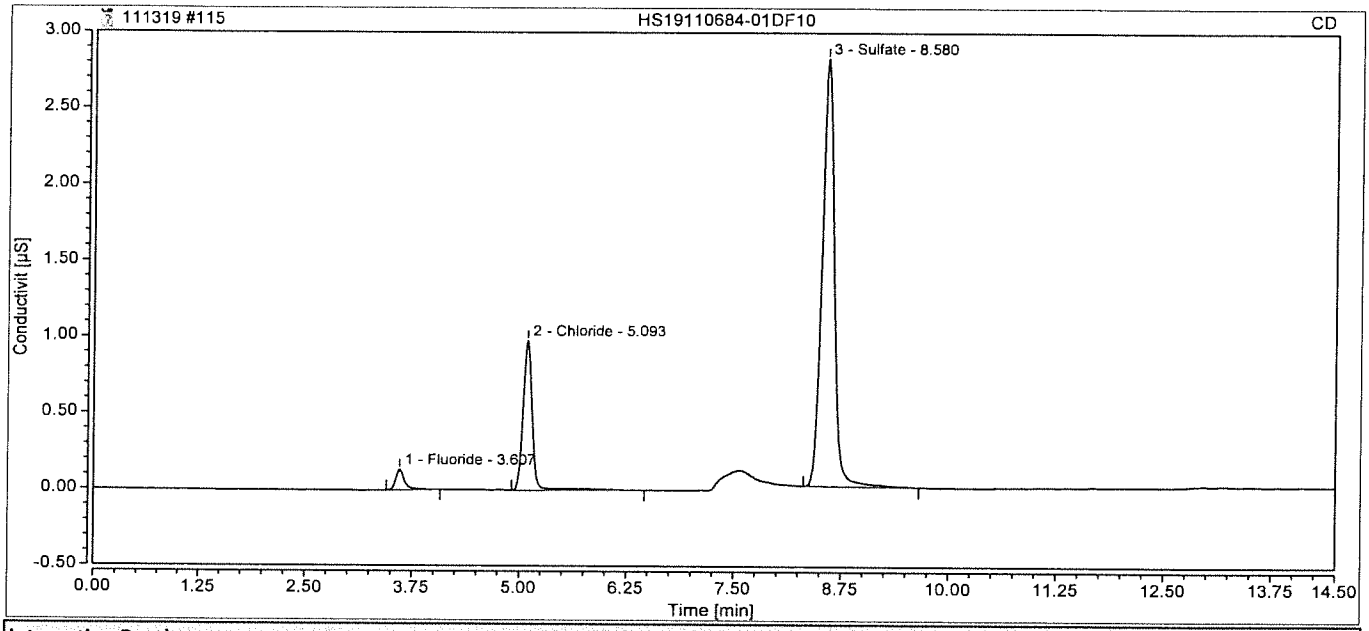
Integration Results

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	0.0681	0.0681	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**	

115 HS19110684-01DF10

Sample Name:	**HS19110684-01DF10**	*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:*	**10.0000**
Recording Time:	**11/14/2019 23:16**	*Sample Weight:*	**1.0000**

Run Time:



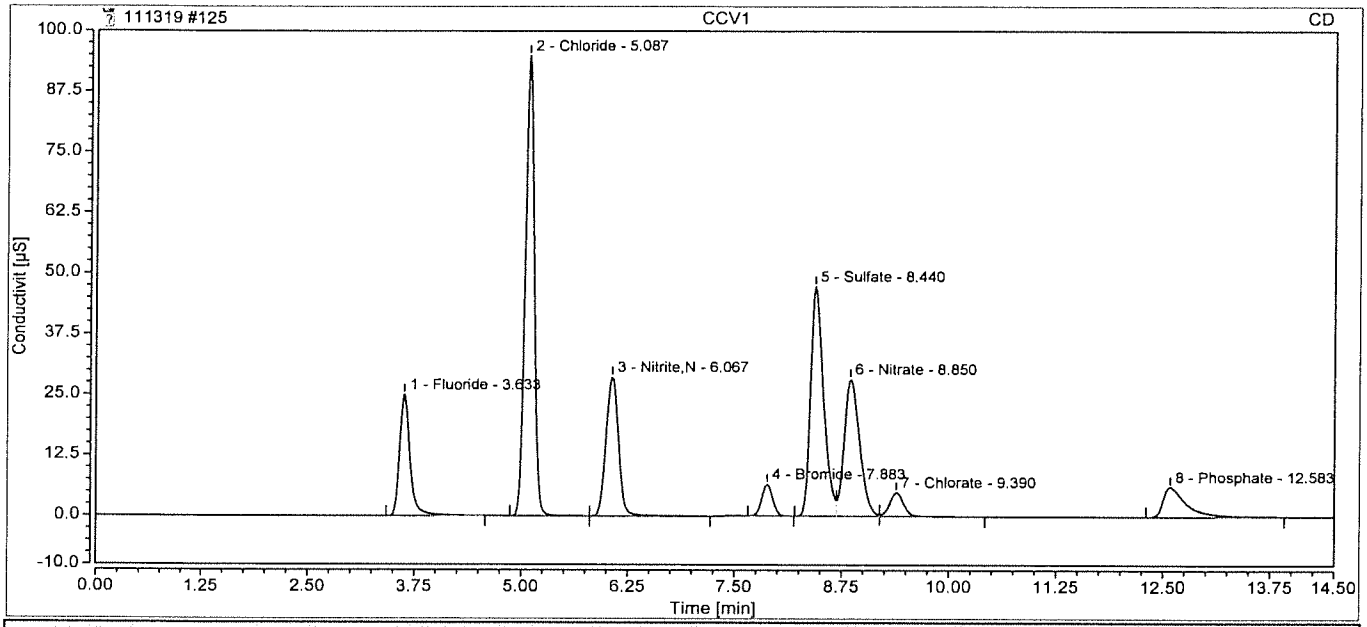
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.61	Fluoride	BMB	0.017	0.0598	0.5977	10.0000
2	5.09	Chloride	BMB	0.126	0.5927	5.9266	10.0000
n.a.	n.a.	Nitrite,N	n.a.	n.a.	n.a.	n.a.	10.0000
n.a.	n.a.	Bromide	n.a.	n.a.	n.a.	n.a.	10.0000
3	8.58	Sulfate	BMB	0.465	2.7187	27.1869	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**	**0.607**		**33.71**	

125 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:	**11/15/2019 02:02**	*Sample Weight:*	**1.0000**

Run Time:



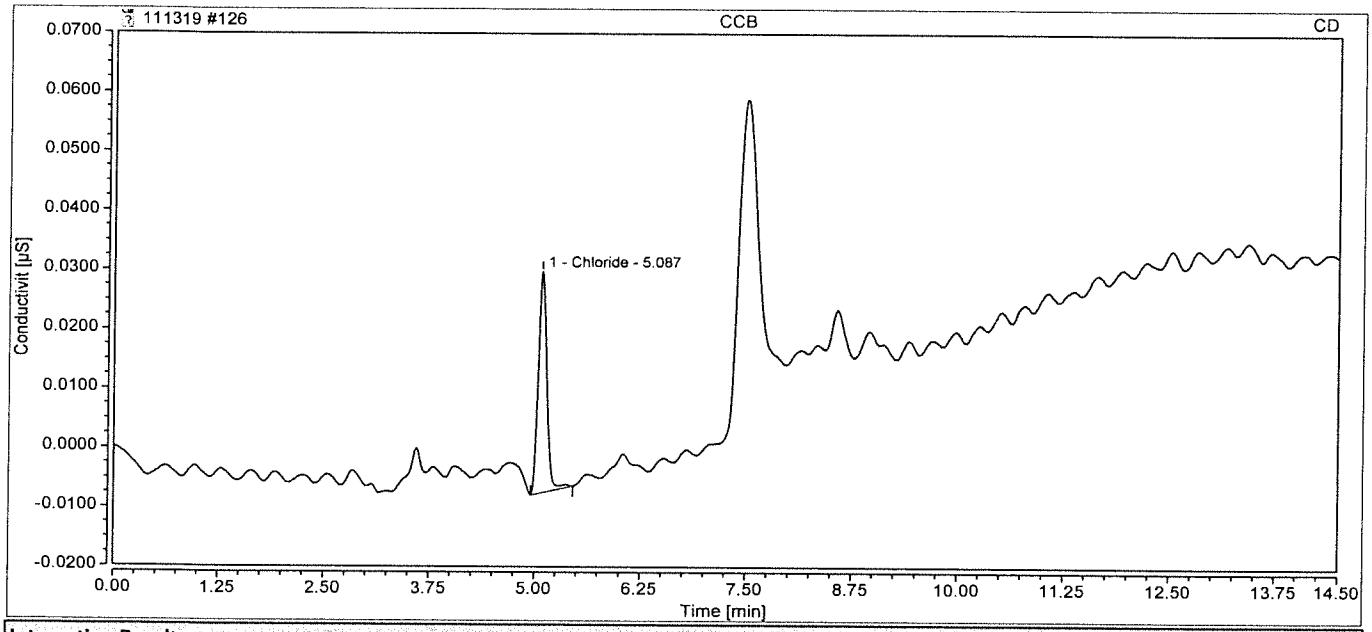
Integration Results

No.	Retention min	Peak Name	Peak Type	Area µS*min	Amount ppm	Concentration ppm	Dilution
1	3.63	Fluoride	BMB	3.535	9.5283	9.5283	1.0000
2	5.09	Chloride	BMB	11.635	49.4634	49.4634	1.0000
3	6.07	Nitrite,N	BMB	4.913	9.5944	9.5944	1.0000
4	7.88	Bromide	BMB	0.977	9.7318	9.7318	1.0000
5	8.44	Sulfate	BM	8.323	48.4728	48.4728	1.0000
6	8.85	Nitrate	M	5.921	10.0946	10.0946	1.0000
7	9.39	Chlorate	MB	0.949	10.0733	10.0733	1.0000
8	12.58	Phosphate	BMB	2.003	8.6801	8.6801	1.0000
Total:			**0.000**	**38.255**		**155.64**	

126 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:	**11/15/2019 02:19**	*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	5.09	Chloride	BMB	0.004	0.0759	0.0759	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**		**0.08**	

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

February 10, 2021

DAIN-ODB-LO

Ms. Lauren Poulos
U.S. Environmental Protection Agency
1201 Elm Street, Suite 500
Dallas, TX 75270-2002

Re: Draft Remedial Action Completion Report, LHAAP-03 Former Waste Collection Pad, Building 722-P Paint Shop, Longhorn Army Ammunition Plant, Karnack, Texas, February 2021

Dear Ms. Poulos,

An electronic copy of the above referenced document has been added to the project portal's "Documents" folder at the following address for your review: (https://docs.cbifederalservices.com/sites/501032/regulators/Shared%20Documents/Forms/AllItems.aspx). An electronic copy of this letter and download instructions for the electronic file have been sent via email. Review comments are requested by March 12, 2021.

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

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

Sincerely,

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

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

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

February 10, 2021

DAIN-ODB-LO

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

Re: Draft Remedial Action Completion Report, LHAAP-03 Former Waste Collection Pad, Building 722-P Paint Shop, Longhorn Army Ammunition Plant, Karnack, Texas, February 2021

Dear Ms. Palmie,

An electronic copy of the above referenced document has been added to the project portal's "Documents" folder at the following address for your review: (https://docs.cbifederalservices.com/sites/501032/regulators/Shared%20Documents/Forms/AllItems.aspx). An electronic copy of this letter and download instructions for the electronic file have been sent via email. Review comments are requested by March 12, 2021.

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

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L. Poulos, USEPA Region 6, Dallas, TX
P. Bruckwicki, USFWS, Caddo Lake NWR, TX (1 Hard Copy and 1 CD)
R. Smith, USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
A. Maly, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX

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

February 16, 2021

DAIM-ODB-LO

Ms. Lauren Poulos
U.S. Environmental Protection Agency
Federal Facilities Section R6
1201 Elm Street, Suite 500
Dallas, TX 75202-2102

Re: Final Pre-Design Investigation Work Plan, LHAAP-29, Former TNT Production Area Group 2, Longhorn Army Ammunition Plant, Karnack, Texas

Dear Ms. Poulos,

An electronic copy of the above-referenced document is being transmitted to you for your records. The document includes revisions based upon the Texas Commission on Environmental Quality (TCEQ) and Environmental Protection Agency's (EPA) comments on the Draft received December 15, 2020 and December 16, 2020, respectively, and revisions based upon the TCEQ comments on the Draft Final received January 27, 2021. Response to comments on the Draft and Draft Final versions of the document are included within this Final.

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

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

Sincerely,

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

Copies furnished:
A. Palmie, TCEQ, Austin, TX (1 electronic only)
A. Williams, USACE, Tulsa District, OK (1 electronic only)
R. Smith, USACE, Tulsa District, OK (1 electronic only)
A. Maly, USAEC, San Antonio, TX (1 electronic only)
T. Toudouze, USAEC, San Antonio, TX (1 electronic only)
L. Zographos, USAEC, San Antonio, TX (1 electronic only)

P. Bruckwicki, Caddo Lake NWR, TX (1 electronic only)
T. Burton, EPA ORD (1 electronic only)
K. Becher, USGS (1 electronic only)
K. Nemmers, Bhate CNTR (1 electronic only)

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

February 16, 2021

DAIM-ODB-LO

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

Re: Final Pre-Design Investigation Work Plan, LHAAP-29, Former TNT Production Area Group 2, Longhorn Army Ammunition Plant, Karnack, Texas

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Sincerely,

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

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L. Zographos, USAEC, San Antonio, TX (1 electronic only)

P. Bruckwicki, Caddo Lake NWR, TX (1 electronic only)
K. Nemmers, Bhate CNTR, (1 electronic only)

Comments Response Matrix
Draft Report: Pre-Design Investigation Work Plan, LHAAP-29, Former TNT Production Area Group 2, Longhorn Army Ammunition Plant, Karnack, Texas
Submitted: November 2, 2020

-

Submitted by: William Rhotenberry EPA RPM Superfund Division Region 6
Responded by: Phil Werner, HDR
Date Responded: 12/16/2020

1. **Respondent concurs (C) or does not concur (D)**
2. **Commenter agrees (A) or does not agree (D) with response.**

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
Reviewer #1:						
1	Figure 1		See typo on figure "Ammunition" spelled wrong on pop out name	C	Concur. Per a comment submitted by TCEQ, Figure 1 will be removed altogether and replaced with current Figure 2.	
2	Page 1-1	Section 1.1	First paragraph, suggest adding a figure here that just shows the different production pipelines.	C	Concur. The LHAAP location map (Figure 1) will be replaced by current Figure 2 and a new figure (Figure 2 revised) will be added to show the site features, solely.	
3	Page 1-1	Section 1.1, first paragraph, last sentence	Sentence states that site features are located on figure 2. However, figure 2 is just the location on LHAAP.	C	Concur. The LHAAP location map (Figure 1) will be replaced by current Figure 2 and a new figure (Figure 2 revised) will be added to show the site features, solely.	
4	Page 1-2	1st paragraph	Please add MNA to acronym list. Please add period to last sentence of paragraph. Suggest referring to figure that identifies plumes described at end of paragraph.	C D	Concur. MNA added to the acronym list. Since this is primarily a soil investigation to determine extent and estimated volume of explosives-impacted soils, a reference map showing groundwater plumes may be confusing or misleading. As such, the following text will be deleted from the work plan, "The depth of the shallow groundwater zone generally ranges from 17 to 45 ft bgs because of variable ground surface elevations across the site. The intermediate zone is less defined, but its depth has been measured to approximately 88 ft bgs. There are 3 shallow and one intermediate zone plumes at LHAAP-29."	

Comments Response Matrix
Draft Report: Pre-Design Investigation Work Plan, LHAAP-29, Former TNT Production Area Group 2, Longhorn Army Ammunition Plant, Karnack, Texas
Submitted: November 2, 2020

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
5	Page 1-2	Section 1.2	Please add MSC GWP-Ind to acronym list.	C	Concur. The acronym GWP-Ind has been revised in the acronym list to state, "medium-specific concentration for industrial use based on groundwater protection" per TCEQ comment to follow the Final LHAAP-29 ROD description.	
6	Figure 3		Figure is extremely busy. Suggest having figure of with just the water lines and its features. Then a figure with historic data associated with those water lines. Then figure showing new proposed locations. Also, some things hard to read on figure such as last line in key for color coded standards, such as the gray one. Hard to tell when water line samples were collected and if there is data associated with them. Looks like manholes include data, but don't see any data for water lines. After further review there are other individual DPT location maps which helps.	C	The LHAAP location map (Figure 1) will be replaced by current Figure 2 and a new figure (Figure 2 revised) will be added to show the site features, solely. Figure 3 (current) will be retained with all information and site features but expanded onto 11 x 17 sized paper. The color scheme for the historic data will also be revised to enhance intensity, which will make the data easier to review. Separate maps already developed and included in the draft report will remain.	
7	Page 2-1	Building 812-F, First paragraph, third sentence	So are the four-feet intervals going to composited and if so, how is that being conducted?	C	Concur. The sentence has been revised to state, "Sample depths will be selected based on visual signs of contamination and/or presence of an odor, but will generally be collected *as a grab sample* within *the* 4 foot intervals (i.e., 0 - 4 ft bgs, 4 - 8 ft bgs, 8 - 12 ft bgs, and 12 - 16 ft bgs)."	
8	Page 2-1	Building 812-F, Second paragraph, first sentence	Suggest showing concentrations in same units as the MSC soil standard being uses, so convert these to mg/kg.	C	Concur. Units have been switched to milligrams per kilogram.	
9	Figure 3		Need to identify units for 29SG118 (mg/kg). Legend indicates a stream, but don't see one on the map. Suggest removing unless there is a stream within view of map.	C D	Concur. A note will be included in all three call out boxes that state units are in milligrams per kilogram (mg/kg). Do not concur. A stream is located on the base map at the eastern terminus of the TNT cooling water drain line (south) at sample location 29WL47 and in the pop up boxes for Cooling Water Outfall/Ditch B & C.	

Comments Response Matrix
Draft Report: Pre-Design Investigation Work Plan, LHAAP-29, Former TNT Production Area Group 2, Longhorn Army Ammunition Plant, Karnack, Texas
Submitted: November 2, 2020

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
10	Page 2-2	Cooling Water Outfall/Ditch	For the area near building 812-F, samples are being collected down to 16 feet and at 4 feet intervals. Here the total depth is 8 feet and samples collected every 2 feet. What is the rationale for depths and interval sampled? Based on historical data?		Correct, sample collection depths are based on historic data. Detected di- and trinitrotoluene's were detected between 0.5 and 2 feet below ground surface.	
11	Figure 5		Need to add units to figure for concentrations detected. In addition, assume green coloration is current known extend of soil contamination. Need to add identification within the legend for green areas. Red triangles and labels need to be identified in legend as well.	C	Concur. A note will be included in all three call out boxes that state units are in milligrams per kilogram (mg/kg). Correct, the green areas denote the extent of soil contamination identified in the 2010 Shaw Final Feasibility Study. The green areas and red triangles/labels will be added to the legend with descriptions.	
12	Page 2-3	First paragraph	For 2-aminao-4, 6-DNT concentration of 19 is qualified with a JH. Not sure what the H qualifier might be. Could it be more like J+ where estimated value is biased high?	C	Correct, the value is estimated and biased high. The Shaw 2010 Final Feasibility Study lists the qualifier for this result (and others) as "concentration is estimated and biased high". This text has been added to the sentence, [JH = estimated biased high].	
13	Figure 6		Same comment as figure 5 regarding identifying green shaded area. Should there be labels on points shown in Building 812-A-A pop out?	C D	Concur. Figure 6 has been revised to remove the call out boxes, since these are presented in Figure 3 and then again in separate figures dedicated to each area (812-F and Cooling water outfall/ditch. The green areas and units have been added to the legend on Figure 5	
14	Page 2-3	Last paragraph	Suggest including concentrations of exceedances to text as it was done in previous paragraphs.	C	Concur. Concentrations will be added to the text for each exceedance.	
15	Table 1		Are the numbers of samples collected and QA/QC correct in this table? For instance, text indicates 8 soil borings at the Cooling Water/Outfall/Ditch at 0 to 2 ft, 2-4 ft, 4 to 6 ft and 6-8 ft. So that would be 32 samples correct? Also, would need to have 3 duplicates if that was the case. Also, table label indicates soils and groundwater samples to be collected, but no water samples are listed in table.	C	The table has been revised to indicate 32 grab samples will be collected and the appropriate number of QA/QC samples (10% for duplicate samples and 5% for MS/MSD samples). "Groundwater" has been removed from the table.	

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Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
16	Table 3		Assume coordinates could be provided here from GIS for field team to locate when arriving on site and then a more accurate GPS location will be collected with the Trimble. Suggest adding anticipated sampling depths and intervals here as well.	D/E	Table 2 provides GPS coordinates that are known locations of the pipelines. These will be used by the field team to orient and locate the pipelines in the field. GPS coordinates will then be collected identifying the location where the sample was collected. Sample depths, as described in the work plan, will be collected based on the following, "Sample depths will be selected based on visual signs of contamination and/or presence of an odor, but generally a grab sample will be collected within every 4 foot interval (i.e., 0-4 ft bgs, 4-8 ft bgs, 8-12 ft bgs and 12-16 ft bgs)." As such, they will be determined in the field. However, the depth range will be added to each area header.	
17	Page 2-5	Section 2.4, first paragraph	Please add DQOs to acronym list.	C	Concur. Acronym added to list.	
18	Page 2-5	Section 2.4	Suggest including a discussion about equipment blanks since they are listed in Table 3.	C	Concur. A summary will be added on equipment blanks.	
19	Acronym list		Suggest removing NELAP since not used in text.	C	Concur. Acronym removed from list.	

Comments Response Matrix
Draft and Draft Final Report: Pre-Design Investigation Work Plan, LHAAP-29, Former TNT Production Area Group 2, Longhorn Army Ammunition Plant, Karnack, Texas
Draft Submitted: November 2, 2020
Draft Final Submitted: January 12, 2021

Document Submitted by: Rose Zeiler, BRAC Field Manager
Comments Submitted by: April Palmie, TCEQ Superfund Section
Responded by: Phil Werner, HDR EOC
Date Responded: Draft **December 18, 2020, Draft Final February 4, 2021**

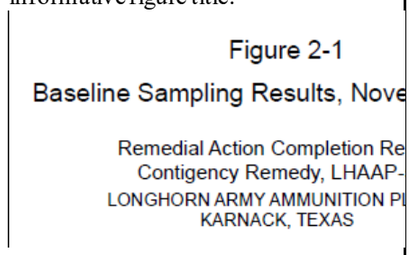
1. **Respondent concurs (C) or does not concur (D)**
2. **Commenter agrees (A) or does not agree (D) with response.**

Number	Section/ Page	Paragraph/ Line	Comment	C,D	Response	A,D	Draft Final Comments	C,D	Draft Final Response
April Palmie									
1.	Planning		Please plan to take photographs and include a photo log to document the field work in the PSI Report. I mention this because there was no photo log in the last 47 PSI report. Since we likely will not be able to join the field effort, please include photo documentation of line conditions and soil in vicinity.	C	Concur. Photographs will be taken of all lines where exposed and the soil conditions surrounding them and excavated soil. HDR will photograph all DPT cores per our SOP. Any other notable conditions will also be photographed. Text will be added to Section 2.5 to capture this.		Thank you for the notes on the photographic log. If you aren't already planning to, please also take some general photographs to show site conditions and field equipment.	C	Photographs will be taken of the general site conditions and field equipment used.
2.	General		Throughout document replace any "GWP Ind" with "GWP-Ind". It is helpful to include MSC in the text (GWP-Ind MSC) Define it this way on acronym list (copied from ROD): GWP-Ind medium-specific concentration for industrial use based on groundwater protection	C	Concur. All references to GWP Ind will be revised to GWP-Ind MSC. The acronym list will be revised per the comment.	A	None.		
3.	1.1/1-1	1st paragraph	Last sentence says Figure 2 has site features, which is not the case. It would be helpful to have a figure with the site features (lines, MW-s, and former buildings) without any data results. I don't think we need Figure 1 in this plan if you wanted to rename Figure 2 to 1 and add a new Figure 2.	C	Concur. The LHAAP location map will be replaced by current Figure 2 and a new figure (Figure 2 revised) will be added to show the site features, solely.	A	None.		
4.	2.1	General	The confirmation and other samples taken along the cooling and wastewater lines are all very far apart (about every 500 feet along a line). If contamination from the lines is found in soil above action levels, at what phase of work would these areas be delineated for soil removal?	C	Concur. If contamination is found in soil during the PDI investigation, a subsequent PDI Addendum investigation would be conducted to delineate area(s).	A	None.		

Comments Response Matrix
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Draft Submitted: November 2, 2020
Draft Final Submitted: January 12, 2021

Number	Section/ Page	Paragraph/ Line	Comment	C,D	Response	A,D	Draft Final Comments	C,D	Draft Final Response
April Palmie									
5.	2.1, 2-3		Isn't this paragraph also true for the wooden and transite wastewater lines? There is no comparable statement for highlighted portion in that discussion. *Samples collected along the lengths of the cooling water lines are intended to confirm that leaching from the lines has not occurred. Results from these confirmation samples may identify additional areas exceeding cleanup levels that would require soil excavation. The proposed cooling water line sample locations are shown in Figure 3 and Figure 6.*	C	The document does state the following concerning the wooden and transite wastewater lines, "Locations were selected based on historic sample results where nitrotoluene concentrations in soil, sediment or water (i.e., liquid and sediment/sludge collected from the pipelines) exceeded cleanup levels. These samples will confirm whether or not the pipelines have released COCs to the surrounding soil." However, the following text will be added for clarification, "These samples will confirm whether or not the pipelines have released COCs to the surrounding soil and identify additional areas exceeding cleanup levels that would require soil excavation."	A			
6.	2.4, 2-5		Spell out IAW (in accordance with). Revise this sentence: Upon completion of the data validation, a validated data package will be submitted prior to submittal of the Army Draft PSI Addendum Report.	C	Concur. IAW has been spelled out and the text revised to state Army Draft PDI Report.	A			
7.	2.5, 2-5		Correct these sentences: At the completion of the PDI Addendum field investigation, the HDR Project Chemist will review and validate the analytical results and prepare the data validation report. Figures will be prepared presenting nitrotoluene soil concentration maps and the extent of the exceedance of the TCEQ GWP-Ind MSC screening level in unsaturated soil.	C	Concur. Both sentences have been revised accordingly.	A			

Comments Response Matrix
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Draft Submitted: November 2, 2020
Draft Final Submitted: January 12, 2021

Number	Section/ Page	Paragraph/ Line	Comment	C,D	Response	A,D	Draft Final Comments	C,D	Draft Final Response
April Palmie									
8.	Figures		Please revise and replace the figures with higher resolution images that take up more of the space on the pages. Please add figure number to the title section below or by the legend. Example, Figure 1: Longhorn Army Ammunition Plant Location Map. Another example below from Army's other contractor for LHAAP with very informative figure title.  Add red triangle to map legends on relevant figures. Check figure legends for consistency. For example, 29SG118 is identified as "solid residue sample" on Figure 3 and "DPT soil sample" on Figure 4.	C	Concur. All figures will be checked and revised as necessary in conformance to the comments.	A			
9.	Figure 6		In addition to the general figure comments, please also: 1. Explain what "target/other" means in the legend. 2. Revise the soil boring color scheme. Pastel shades are difficult to distinguish against the yellow site background, especially the pale green for North TNT line. Why isn't there a SB near 32WL05?	C	Concur. All figures will be checked and revised as necessary in conformance to the comments. "Target/Other" has been removed from the legend, as have the Inserts A, B, and C since these have separate figures developed for them. Sample 29SB148 will be relocated to the 32WL05 area.		Thank you for moving a DPT point near 32WL05 but in the process of shuffling SBs, the DPT near MH02 was lost by moving 137 to replace where 148 was previously. Please consider adding an additional SB to cover MH02 location. If that will not work, please coordinate before dropping or moving an alternate sampling location.	C	An additional boring has been added to Figure 6 adjacent to MH02, and to Figure 3. Text has been added to Section 2.1, North and South Cooling Water Lines / Wooden and Transite TNT Wastewater Lines, that 33 samples will be collected. Tables 1 and 3 have been updated to indicate the new number of samples and location rationale, respectively.
10.	Table 1		Please revise the number of samples. For example, if there are 8 SB by building 812-F with 4 soil samples per boring, that means 32 soil samples. The QC totals will also change.	C	Concur. The table has been revised accordingly.	A			

Comments Response Matrix
Draft and Draft Final Report: Pre-Design Investigation Work Plan, LHAAP-29, Former TNT Production Area Group 2, Longhorn Army Ammunition Plant, Karnack, Texas
Draft Submitted: November 2, 2020
Draft Final Submitted: January 12, 2021

Number	Section/ Page	Paragraph/ Line	Comment	C,D	Response	A,D	Draft Final Comments	C,D	Draft Final Response
April Palmie									
11.	Table		Please add Cleanup Levels table for reference – this is Table 2-10 in the ROD.	C	Concur. The table will be added to the document for reference.	A			
		Draft Final Comments, 27 January 2021							
Number	**Section/ Page**	**Paragraph/ Line**	**Comment**	**C,D**	**Response**		**Draft Final Comments**	**C,D**	**Draft Final Response**
1.	Figure 3						In the Figures list page i, revise title to LHAAP-29 Planned DPT and Historic Sample Location Map to match title on the figure.	C	Figure title has been updated in the figures list in the Table of Contents.
2.	Figure 4						Please change the title on the Figure 4 to match title in the figures list on page i [Building 812-F -Planned DPT Soil Sample Location Map (Insert A – Figure 3)]. This is basically changing the title back to what was on the draft document with additional reference to inset. Also, having the units explanation as part of the color dot label is not consistent with the other figures. Please move mg/kg note below the list of features or below the pop out box with results.	C	The title on Figure 4 has been revised to state, "Building 812-F -Planned DPT Soil Sample Location Map (Insert A – Figure 3)". The "Units in milligrams per kilogram (mg/kg)" has been added to the pop out box.
3.	General						Thank you for the revisions to Figures and Table 3.	C	You're welcome.

Final
Pre-Design Investigation Work Plan

LHAAP-29, FORMER TNT PRODUCTION AREA GROUP 2
Longhorn Army Ammunition Plant
Karnack, Texas

February 2021

Prepared For:

U.S. Army Corps of Engineers – Tulsa District

Prepared By:

HDR
2650 Park Tower Drive, Suite 400
Vienna, VA 22180

Contract No. W912BV 19 D 0016
Task Order No. W912BV20F0096

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Final
Pre-Design Investigation
Work Plan
FOR
LHAAP-29, FORMER TNT PRODUCTION AREA GROUP 2
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Prepared For:

U.S. Army Corp of Engineers, Tulsa District

Prepared By:

HDR, Inc.
2650 Park Tower Drive, Suite 400
Vienna, VA 22180

Contract No. W912BV19D0016
Task Order No. W912BV20F0096

February 2021

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Acronyms and Abbreviations

2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dintrotoluene
2,4,6-TNT	2,4,6-Trinitrotoluene
AECOM	AECOM Technical Services, Inc.
bgs	below ground surface
CLP	Contract Laboratory Program
COC	Contaminant of Concern
DOT	Department of Transportation
DNAPL	dense non-aqueous phase liquid
DPT	direct push technology
DQOs	Data quality objectives
ft	feet
FS	Feasibility Study
GWP-Ind	medium-specific concentration for industrial use based on groundwater protection
GWTP	groundwater treatment plant
HDR	HDR Environmental, Operations and Construction, Inc.
IWWP	Installation Wide Work Plan
IDW	investigative derived waste
ISTD	in-situ thermal desorption
LHAAP	Longhorn Army Ammunition Plant
LUCs	Land Use Controls
mg/kg	milligrams per kilogram
MNA	monitored natural attenuation
MSCs	medium-specific concentrations
MS/MSD	matrix spike/matrix spike duplicate
PDI	Pre-Design Investigation
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SVOC	semi-volatile organic compounds
TCEQ	Texas Commission on Environmental Quality
TCLP	toxicity characteristic leaching procedure
TNT	trinitrotoluene
USACE	U.S. Army Corps of Engineers

Acronyms and Abbreviations

USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

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1 Introduction

HDR Environmental, Operations and Construction, Inc. (HDR) has prepared this Pre-Design Investigation (PDI) Work Plan to meet the objectives specified in the Final Record of Decision (ROD [HDR, 2019]) to further define soils impacted by explosives at the former Longhorn Army Ammunition Plant (LHAAP) site LHAAP-29, Former TNT Production Area, Group 2 located in Karnack, Texas. The purpose of this PDI Work Plan is to identify the activities to be completed to support development of the Remedial Design (RD) by defining the extent and estimated volume of explosives-impacted soils near former Building 812-F and the cooling water outfall/ditch. Further, this PDI Work Plan identifies soil sampling activities that will be completed to confirm that leaching from the North and South Cooling Water lines and wooden/transite trinitrotoluene (TNT) wastewater lines has not occurred and impacted adjacent soil. This document has been prepared under the U. S. Army Corps of Engineers (USACE) Tulsa District Contract Number W912BV19D0016 Task Order No. W912BV20F0096.

This document describes the PDI activities to be completed at LHAAP-29. The PDI field effort will be conducted in accordance with procedures outlined in relevant sections of the Installation Wide Work Plan (IWWP) (AECOM, 2014); specifically those procedures for conducting direct push technology drilling (DPT), soil sample collection, sample handling and laboratory analyses, decontamination, handling and disposal of investigation derived waste (IDW), and surveying. The IWWP was reviewed by and concurrence was obtained from the Texas Commission on Environmental Quality (TCEQ) and the U.S. Environmental Protection Agency (USEPA). The results of this investigation will be presented in a PDI Report, which will support development of the RD specification package and cost estimates.

1.1 Background

The Former TNT Production Area was in operation from April 1943 to August 1945 as a six-line plant with a supporting acid plant. The plant produced 180 million kilograms of TNT throughout the period of operation. A bulk toluene storage area servicing the TNT Production Area was located adjacent to the production area. TNT wastewater (red water) from the production of the TNT was sent through wooden pipelines to a storage tank and pump house, and then to the TNT Wastewater Treatment Plant (LHAAP-32). The wooden pipelines were taken out of service, clear flushed and abandoned in 1946. The transite TNT wastewater pipeline was added north of the wooden line to carry the TNT wastewater. Cooling water (blue water) from the production area ran through vitreous clay main lines and into an open ditch. The transite wastewater pipeline was made of concrete and asbestos material, while the vitreous clay piping also contained an asbestos wicking. The structures, except for the foundations, were demolished and removed in 1959. The transite wastewater pipeline and cooling water lines remain in place. The lines are buried at depths of 3 to 5 feet below ground surface (ft bgs) or deeper. Soak-out of out-of-specification rocket motors took place from 1959 to the mid-1970s and involved the use of methylene chloride-based industrial solvent at tank 801-F (USACE, 2020). The location of LHAAP-29 is provided in **Figure 1**, while the site features are provided in **Figure 2**.

Explosive compounds have been detected in soil, surface water, sediment, and groundwater samples. Volatile organic compounds (VOCs) have also been detected in groundwater. Perchlorate was first detected in soil and groundwater at this site in 2000. A Remedial Investigation (RI) for groundwater and soil was completed in 2002 and a Feasibility Study (FS) evaluating remedial

alternatives for groundwater and soil was finalized in 2010 (Shaw, 2010). Fieldwork to support an addendum to the RI/FS for LHAAP-29 was completed in 2013 and the RI addendum, which further defined the extent of soil and groundwater contamination and conducted additional treatability studies, received approval in August 2016. An FS Addendum evaluated additional remedial alternatives for groundwater and was completed in 2017. The Proposed Plan was completed in November 2018 and the Final ROD was signed in September 2019 that selected the final remedy, including excavation and off-site disposal of contaminated soils, flushing, inspection, and plugging of the TNT cooling water and wastewater lines, in situ thermal desorption (ISTD) treatment of the intermediate groundwater zone dense non-aqueous phase liquid (DNAPL) plume, monitored natural attenuation (MNA) for the shallow zone groundwater plumes and for the intermediate groundwater plume following ISTD, and land use controls (LUCs) for soil and groundwater (USACE, 2020).

The remedy for soils, per the Final ROD, dictates excavation and off-site disposal at a Resource Conservation and Recovery Act (RCRA) Subtitle D-permitted landfill. This action would remove explosives and perchlorate contaminated soils and achieve the following:

- Removal of soil that poses a direct risk to the hypothetical future maintenance worker, thereby protecting human health by preventing inhalation, ingestion, and dermal contact with the Contaminants of Concern (COCs);
- Removal of contaminated soil that is a potential source of contaminant migration to surface water and groundwater; and
- Removal of soil posing a risk to ecological receptors.

The FS Addendum (AECOM, 2017) and Final ROD state that additional soil sampling would be required during the RD phase to further define the final excavation extent and volume near former Building 812-F and at the cooling water outfall/ditch. Soil samples would also be collected adjacent to the North and South Cooling Water lines, as well as the wooden and transite TNT wastewater lines, to confirm that leaching from the lines has not occurred. The results from the confirmation soil sampling may identify additional areas exceeding the cleanup levels that would require soil excavation.

1.2 Objective

The primary objectives of this PDI field effort are as follows:

- Further evaluate the extent and volume of explosives-contaminated soil present at levels exceeding the TCEQ medium-specific concentration for industrial use based on groundwater protection (GWP-Ind MSC) at Building 812-F;
- Further evaluate the extent and volume of explosives-contaminated soil present at levels exceeding the TCEQ GWP-Ind MSC at the cooling water outfall/ditch;
- Further evaluate the extent and volume of explosives-contaminated soil, if present at levels exceeding the TCEQ GWP-Ind MSC, located adjacent to the north and south cooling water lines and wooden and transite TNT wastewater lines; and
- Provide extent and volume data for contaminated soil that supports development of the RD.

1.3 Scope

The scope of the field work will include the following activities:

- Advancement of 8 DPT boreholes adjacent to Building 812-F to 16 ft bgs;
- Collection of 4 soil samples per boring and analysis for explosives via method SW 8330A;
- Advancement of 8 DPT borings around the cooling water outfall/ditch to 8 ft bgs;

- Collection of 4 soil samples per boring and analysis for explosives via method SW 8330A;
- Advancement of 32 DPT borings adjacent to the north and south cooling water lines and wooden and transite TNT wastewater lines to 16 ft bgs;
- Collection of 4 soil samples per boring and analysis for explosives via method SW 8330A;
- Conducting a topographic survey of the LHAAP-29 site depicted at no more than a 1-foot contour interval to include the Refuge boundary; and
- Handling and disposal of IDW soil cuttings.

2 Field Investigation Activities and Methods

This section provides the activities and methods to be used to perform soil sampling and analyses, conduct a topographic survey of the site, handle and dispose of IDW, and quality control/quality assurance procedures and data validation.

Field efforts will focus on further delineating the spatial/vertical extent and volume of explosives contamination in unsaturated soil around Building 812-F, the cooling water outfall/ditch, and adjacent to the north and south cooling water lines, and wooden and transite TNT wastewater lines. For the purpose of characterization, soils will be compared to the TCEQ GWP-Ind MSC for 2,4-Dinitrotoluene (2,4-DNT) (0.042 milligrams per kilogram [mg/kg]); 2,6-Dinitrotoluene (2,6-DNT) (0.042 mg/kg); and 2,4,6-Trinitrotoluene (2,4,6-TNT) (5.1 mg/kg).

In total, soil borings will be advanced at 48 locations using a GeoProbe 7730 DT rig outfitted with dual sampling tubes. The methods and procedures are described below.

2.1 DPT Advancement: Soil Sampling and Analyses

The dual tube method uses two sets of probe rods to collect continuous soil cores, where the larger diameter set of rods is driven into the ground as an outer casing. These outer rods receive the driving force from the hammer and provide a sealed hole from which soil samples may be recovered without the threat of cross contamination. The second, smaller set of rods are placed inside the outer casing. The smaller rods hold the macro sample liner in place as the outer casing is driven one sampling interval (~4 ft bgs) at a time. The small rods are then retracted to retrieve the macro core sample liner. After retrieval, the acetate sleeve containing the soil core will be removed from the sample barrel and logged using the Unified Soil Classification System Standard Practice for Classification of Soils.

Building 812-F

Eight DPT borings will be advanced near Building 812-F to a maximum depth of 16 ft bgs. Four soil samples will be collected from each DPT boring and analyzed for explosives using method SW 8330A for a total of 32 samples. Sample depths will be selected based on visual signs of contamination and/or presence of an odor, but will generally be collected as a grab sample within the 4 foot intervals (i.e., 0 - 4 ft bgs, 4 - 8 ft bgs, 8 - 12 ft bgs, and 12 - 16 ft bgs).

The 8 DPT borings will be centered around historic sample location 29SG118 (AECOM 2014) where 2,4-DNT (0.138 milligrams per kilogram [mg/kg] at 6 ft bgs & 17.1 mg/kg at 10 ft bgs) and 2,6-DNT (3.42 mg/kg at 10 ft bgs) were detected above the soil cleanup levels. Four samples will be offset on a grid 10 ft and 20 ft, respectively, from 29SG118. Sample location 29SG118 is approximately 50 feet west of Building 812-F and adjacent to the TNT Cooling Water Drain Line (North). The PDI field effort will satisfy requirements for additional sampling specified in the Final ROD to further define explosives impacts addressed in the Selected Remedy for Soil Excavation (HDR, 2019). The proposed sample locations are shown in **Figure 3** (**Inset A**), with greater detail provided in **Figure 4**.

Cooling Water Outfall/Ditch

Eight DPT borings will be advanced along the Cooling Water Outfall/Ditch to a maximum depth of 8 ft bgs. Four soil samples will be collected from each DPT boring and analyzed for explosives using method SW 8330A for a total of 32 samples. Sample depths will be selected based on visual signs of contamination and/or presence of an odor, but generally will be collected within every 2 foot interval (i.e., 0 - 2 ft bgs, 2 - 4 ft bgs, 4 - 6 ft bgs and 6 - 8 ft bgs).

Two separate areas will be investigated along the Cooling Water Outfall/Ditch: the first will be centered on historic sample locations 29SD46 and 29SB112, while the second will be centered on historic sample location 29SD13. Historic sample location 29SD46 had detections of TNT (26,000 mg/kg), 2,4-DNT (8,000 mg/kg), and 2,6-DNT (15 mg/kg) at 0 – 0.5 ft bgs, while sample location 29SB112 had detections of 2,4-DNT (0.0544 J mg/kg [estimated] at 0.5 ft bgs) and 2,6-DNT (0.0862 mg/kg at 0.5 ft bgs and 0.0704 mg/kg at 2 – 4 ft bgs) that exceed cleanup levels. Historic sample location 29SD13 had a single detection of TNT (51 J mg/kg) at 0.5 ft bgs that exceeded the cleanup level. One sample will be offset 10 feet up gradient from 29SD46, while a second sample will be offset 10 feet down gradient from 29SB112. The remaining two samples will be offset 10 feet from a centerline connecting the two samples; one to the northwest and one to the southeast. The PDI field effort will satisfy requirements for additional sampling specified in the Final ROD to further define explosives impacts addressed in the Selected Remedy for Soil Excavation (HDR, 2019). The proposed sample locations are shown in **Figure 3** (**Inserts B** and **C**), with greater detail provided in **Figure 5**.

North and South Cooling Water Lines / Wooden and Transite TNT Wastewater Lines

Thirty-three (33) DPT borings will be advanced along the North and South Cooling Water Lines / Wooden and Transite TNT Wastewater Lines to a maximum depth of 16 ft bgs. Four soil samples will be collected from each DPT boring and analyzed for explosives using method SW 8330A for a total of 132 samples. Sample depths will be selected based on visual signs of contamination and/or presence of an odor, but generally a grab sample will be collected within every 4 foot interval (i.e., 0-4 ft bgs, 4-8 ft bgs, 8-12 ft bgs and 12-16 ft bgs). At excavated areas used to identify the location of the TNT wooden wastewater line, soil samples will be collected from 0 – 4 ft below the bottom of the pipeline and 4 – 12 feet below the bottom of the pipeline. The remaining two samples will be used to collect liquid and sediment/sludge samples, if present, by breaching the wooden line. If the line is collapsed, a sample of the collapsed material will be collected. Since the lines are buried at least 3 ft bgs, all samples will be collected from depths below the lines to a maximum depth of 16 ft bgs. This will ensure unsaturated soils will be collected for analysis, since the shallow zone water elevation is reported to vary between 17 and 45 ft bgs.

The north and south cooling water lines (blue cooling water lines) are constructed of vitrified clay with an asbestos wicking. There are approximately 5,000 feet of pipe in the main lines, approximately 1,680 linear feet of pipe from each production area to the main line, and 12 manholes. These lines were gravity fed and were fitted with manholes. Past investigations determined the lines contained solid residues that are contaminated with explosives at concentrations that are above the GWP-Ind MSC (solid residue). The liquid and solid residue were collected from the manholes. When unearthed, the lines were reported in good condition. The cooling water lines discharge to the cooling water outfall/ditch near the LHAAP-29 pump house.

The red liquor TNT wastewater line was originally installed as a wooden pipeline at a depth of 3 to 5 ft bgs and was taken out of service, clear-flushed and abandoned in 1946 (HDR, 2019). The pipeline

was approximately 4,800 feet in length, 12 inches in diameter, and coated with an asphalt material. Several trenches were excavated across the wooden line in 1993, and the wood was found to be soft and severely degraded at most locations (HDR, 2019). Liquid and sediment/sludge samples were collected from the TNT wooden wastewater line during this effort and after review, some of the data was deemed unusable for environmental decision making. However, two samples (liquid sample 29WL01 and sediment/sludge sample 29WL03) that identified high concentrations of 2,4,6-TNT (liquid – 3,500 µg/L and sediment – 3,700 mg/kg) were found to be acceptable The deteriorated condition of the line and the potential for residual explosives may present a continuing source of groundwater contamination. The transite TNT wastewater pipeline was added parallel to and north of the wooden line to carry the TNT wastewater. The transite TNT wastewater line had two solid residue samples with detections of explosives that were above the GWP-Ind MSC. Solid residue sample 29WL14, collected from the southwestern end of the pipeline, contained 2,4,6-TNT (58.4 mg/kg), 2,4-DNT (7.21 mg/kg), 2-amino-4,6-DNT (19 JH mg/kg [JH = estimated biased high]), and 4-amino-2,6-DNT (13.3 mg/kg), while solid residue sample 29WL13, collected from the mid-point of the pipeline, contained 2,4,6-TNT (526 mg/kg), 2,4-DNT (89 mg/kg), and 1,3-DNB (1.08 mg/kg). Samples collected from three soil borings located adjacent to the TNT wooden wastewater line were found to contain explosives that were above the GWP-Ind MSC. Soil boring 29SB09 and 29SB09R, collected from the southwestern end of the pipeline, contained 2,4,6-TNT (7.5 mg/kg and 14.7 mg/kg, respectively), while soil boring 29SB85, collected from the northwestern end of the pipeline, contained 2-amino-4,6-DNT (0.9 mg/kg) and 4-amino-2,6-DNT (0.3 J mg/kg).

Confirmation samples will be collected along the lengths of the two cooling water lines (north and south. Samples will be collected from locations where historic nitrotoluene concentrations in soil, sediment or water (collected from manholes on the pipelines) exceeded cleanup levels. The sediment and water samples were collected from manholes in the cooling water lines; these junctures tend to be low points in the lines that would be the most likely to accumulate sediment/water that could leach to adjacent soil. Samples will also be collected from locations along the pipelines where samples had not previously been collected. The intent of these samples is to provide coverage along the entire length of the pipelines. The cooling water lines will be identified in the field by locating and staking the exposed manholes along the entire length. Sample locations will then be marked and the horizontal coordinates (northing and easting) recorded using a Trimble Global Positioning Unit. The Trimble will have the capability of collecting horizontal coordinates with sub-meter accuracy. The data will be based on the North American Datum of 1983 and used to develop geospatially referenced site maps and figures.

Samples collected along the lengths of the cooling water lines are intended to confirm that leaching from the lines has not occurred. Results from these confirmation samples may identify additional areas exceeding cleanup levels that would require soil excavation. The proposed cooling water line sample locations are shown in **Figure 3**, with greater detail provided in **Figure 6**.

Samples will be collected along the lengths of the wooden and transite TNT wastewater lines. Locations were selected based on historic sample results where nitrotoluene concentrations in soil, sediment or water (i.e., liquid and sediment/sludge collected from the pipelines) exceeded cleanup levels. These samples will confirm whether or not the pipelines have released COCs to the surrounding soil and identify additional areas exceeding cleanup levels that would require soil excavation. The two detections of explosives in the transite wastewater line that exceeded the soil TCEQ GWP-Ind MSC cleanup levels include the explosives 2,4,6-TNT (58.4 mg/kg, 526 mg/kg) and

2,4-DNT (7.21 mg/kg, 89 mg/kg), as well as 2-amino-4,6-DNT (19.0 JH), 4-amino-2,6-DNT (13.3 mg/kg), and 1,3-dinitrobenzene (1,3-DNB [1.08 mg/kg]). The three soil samples collected adjacent to the TNT wooden wastewater line with detections of COCs that exceeded the soil TCEQ GWP-Ind MSC cleanup levels include the explosive 2,4,6-TNT (14.7 mg/kg), as well as 2-amino-4,6-DNT (0.9 mg/kg), and 4-amino-2,6-DNT (0.3 J) at concentrations below the cleanup levels. Additional samples will be collected from locations to provide coverage along the pipelines where samples had not previously been collected. Historic sample coordinates recorded by Shaw during an investigation conducted in 2006 will be used to locate the transite and wooden TNT wastewater lines in the field (Shaw, 2007). The locations will be confirmed by excavating trenches with a backhoe, then marked with stakes, and the horizontal coordinates (northing and easting) recorded using a Trimble Global Positioning Unit. A maximum of 8 trenches will be excavated along the length of the TNT wastewater pipelines until the entire length and direction has been determined. Where the TNT wooden wastewater line has been exposed by trenching, the wooden line, if intact, will be opened to collect liquid and sediment/sludge samples for explosives analysis. If the line is collapsed, a sample of the collapsed material will be collected. DPT soil samples collected from under the exposed wooden pipeline will be taken from 0 – 4 feet below the pipe and 4 - 8 feet below the pipe to confirm that leaching from the TNT wooden wastewater line has not occurred. Sample locations are shown in **Figure 3**, with greater detail provided in **Figure 6**. The list of analytes, minimum number of samples, and method are provided in **Table 1**. **Table 2** provides the samples where coordinates were recorded by Shaw. **Table 3** provides the list of samples by number, location, and the rationale for the selecting the location. **Table 4** provides the LHAAP-29 clean up levels presented in the ROD.

The DPT sampling equipment will be decontaminated after each interval to prevent cross contamination. Decontamination water will be containerized and disposed at the groundwater treatment plant (GWTP). Excess soil cuttings not collected for a sample will be containerized in Department of Transportation (DOT) approved 55-gallon open-top drums and left adjacent to the borehole until categorized as either hazardous or non-hazardous. A sample from the excess soils will be sent to a stationary lab and analyzed using the toxicity characteristic leaching procedure (TCLP) for the full suite of toxicity characteristics (i.e, VOCs, semi-volatile organic compounds [SVOCs], herbicides, pesticides, and metals/mercury), ignitability, corrosivity, and reactivity to determine hazardous waste characteristics. If the excess soil is determined to be non-hazardous it will be removed from the drums and spread on the ground adjacent to the borehole. The field work will follow methodologies and procedures described in the AECOM 2014 IWWP.

2.2 Surveying

A professional land surveyor licensed in the State of Texas will perform a topographic survey of LHAAP-29 and all associated structures (excluding wells) on the property. Topography shall be depicted at no more than a 1-foot contour interval. The topographic survey will include the Refuge boundary. The horizontal coordinates (northing and easing) will be based on the North American Datum of 1983. The vertical elevations will be based on the North American Vertical Datum of 1988.

HDR will collect the horizontal coordinates (northing and easting) at each borehole location using a Trimble Global Positioning Unit. The Trimble will have the capability of collecting horizontal coordinates with sub-meter accuracy. The data will be based on the North American Datum of 1983

and used to develop geospatially referenced site maps and figures. The topographic survey will be incorporated and support development of the RD.

2.3 Investigative Derived Waste Handling and Disposal

IDW generated during the investigation will include soil cuttings, disposable sampling equipment, development and purge water, equipment decontamination fluids, and personal protection equipment (PPE). IDW (except PPE, disposable sampling equipment, and decontamination fluids/development/purge water) will be containerized pending analytical results and waste profiling. The IDW management storage and disposal will be performed in accordance with the IWWP (AECOM, 2014).

2.4 Quality Assurance/Quality Control and Data Validation

To ensure defensible data, HDR will meet the project-specific Data Quality Objectives (DQOs) for sampling, analysis, and Quality Assurance/Quality Control (QA/QC) by collecting the proper quantities and types of samples, using the correct analytical methodologies, implementing field and laboratory QA/QC procedures, and using various data validation and evaluation processes.

Field QC will be performed during sample collection, shipping, and handling. Sample QC for the analytical samples will be assessed through the use of duplicate samples. Duplicate samples, which are used to evaluate field and laboratory precision, will be collected at a rate of 10%.

A matrix spike/matrix spike duplicate (MS/MSD) sample pair, which is used by the laboratory to measure matrix interference, will be collected at a rate of 5% for each analysis. Since the observed lithology is relatively heterogeneous across the site, the MS/MSD and QC sample locations will be selected in the field to achieve a representative distribution.

An equipment rinsate blank (i.e., “equipment blank”) will be collected by pouring analyte free source water poured over a decontaminated piece of field sampling equipment that is considered ready to collect or process an additional sample. Equipment rinsate blanks are to be collected from non-dedicated sampling equipment to assess the adequacy of the decontamination process. Typically, retail distilled water will be utilized for rinsate blank source water.

A temperature blank provided by the laboratory will be included in each sample cooler. A temperature blank is a sample of laboratory-grade distilled water that travels with the project cooler from the laboratory to the sampling site and back to the laboratory without being opened. The temperature of the blank is obtained by the laboratory when samples are received to verify that the temperature of the samples during transportation did not exceed 4°C.

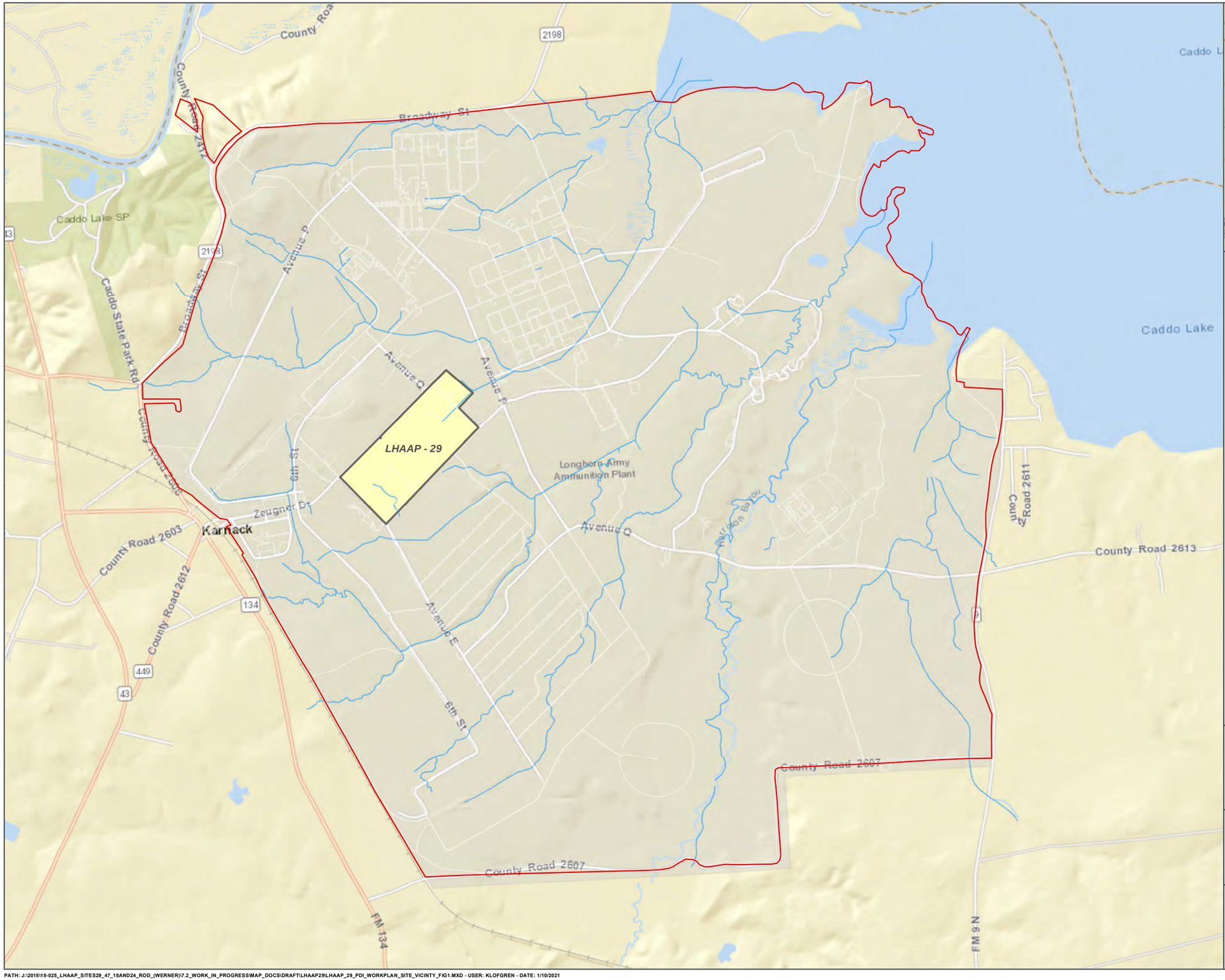
The HDR project chemist will complete a data quality review of all analytical results in accordance with the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review (USEPA, 2017).

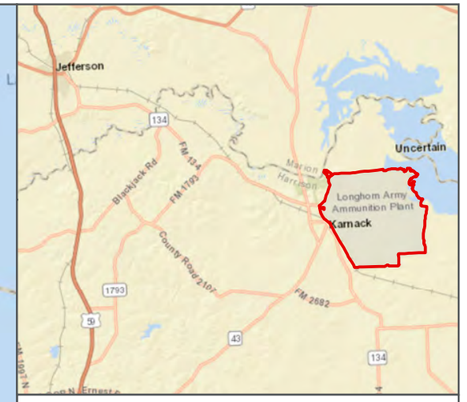
Review of the analytical data will be completed as a Stage 2AVM Validation as described in the USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (USEPA, 2009), while 10% will be completed as a Stage 3VM Validation. Upon completion of the data validation, a validated data package will be provided prior to submittal of the Army Draft PDI Report.

2.5 Reporting

At the completion of the PDI field investigation, the HDR Project Chemist will review and validate the analytical results and prepare the data validation report. HDR will then prepare the PDI Report. The report will contain an introduction, sampling approach, sample results and evaluation, and a conclusions section. Figures will be prepared presenting nitrotoluene soil concentration maps and the extent of the exceedance of the TCEQ GWP-Ind MSC screening level in unsaturated soil. The figures will be prepared to be consistent in content and format with the figures presented in the Revised Feasibility Study (AECOM, 2017). A photo-log of all investigative activities will be compiled and presented as an attachment to the PDI Report. Photographs will be taken of all DPT sample cores, wastewater and cooling lines where exposed, soil conditions surrounding the exposed lines, and excavated soil. Any other notable conditions will also be photographed. Results and conclusions from the report will be used to support development of the RD. Specifically, results from the confirmation samples collected at Building 812-F, Cooling Water Outfall/Ditch, and Cooling Water and Wastewater Lines may identify additional areas exceeding cleanup levels that would require soil excavation.

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LEGEND

- Roads
- Streams
- Site LHAAP-29
- LHAAP Installation Boundary

DATA SOURCES: AECOM, 2016, Draft Final Remedial Investigation Addendum LHAAP-29, Former TNT Production Area, Group 2 Longhorn Army Ammunition Plant, Karnack, Texas. July. ESRI

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

LHAAP-29 SITE LOCATION MAP

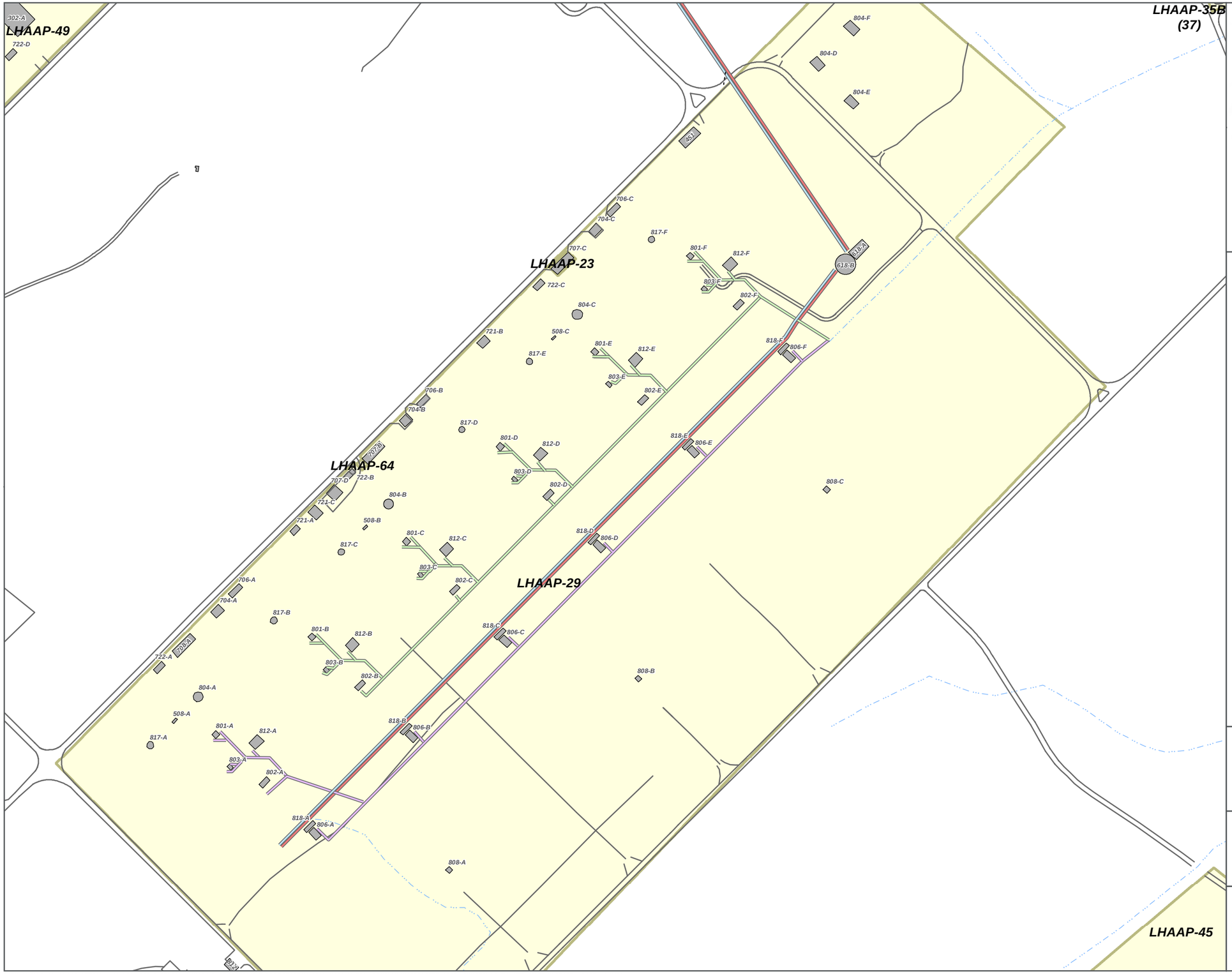
LHAAP-29 PDI WORK PLAN
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

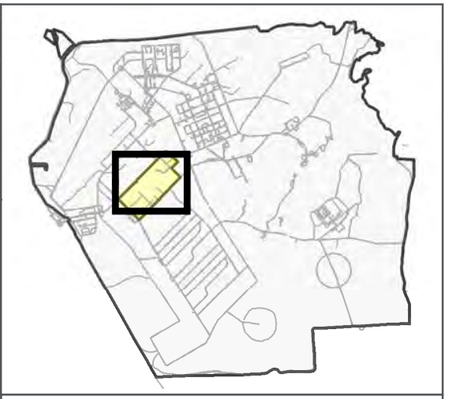
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FIGURE 1

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LEGEND

- TNT Cooling Water Drain Line (North)
- TNT Cooling Water Drain Line (South)
- TNT Wooden Wastewater Line
- TNT Transite Wastewater Line
- Stream
- Road
- Building
- Site LHAAP-29

DATA SOURCES: Shaw, 2010, Final Feasibility Study, LHAAP-29, Former TNT Production Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas, December.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

LHAAP-29 SITE FEATURES MAP

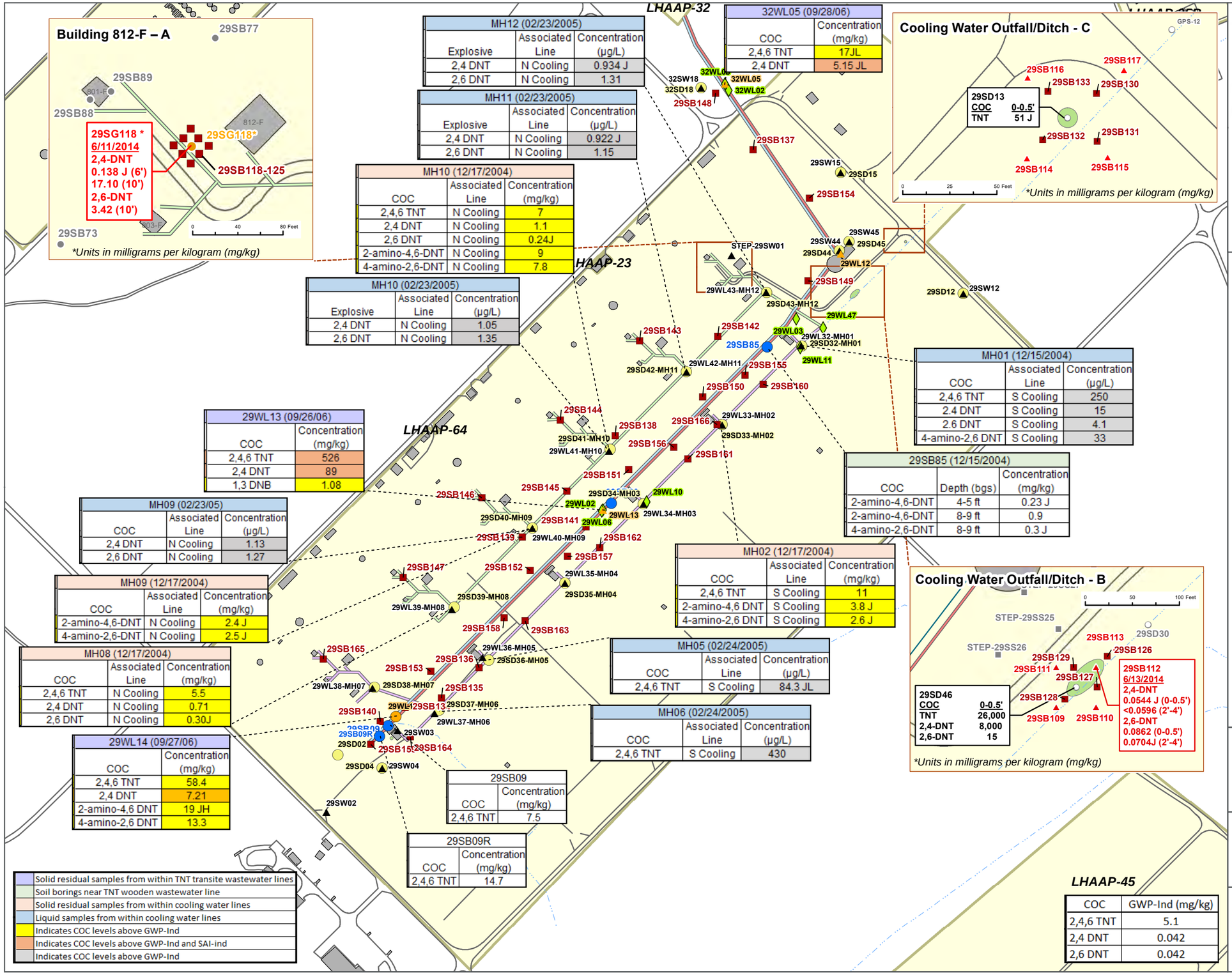
LHAAP-29 PDI WORK PLAN
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

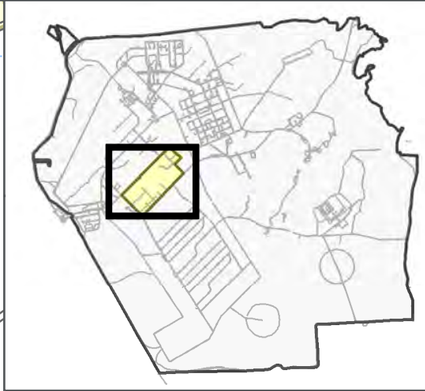
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FIGURE 2

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LEGEND

- Planned DPT Soil Boring Location

Historic TNT Wastewater Line Sample Location

- Water Sample from Line or Man Hole
- Solid residual Sample from Line or Man Hole
- Soil Boring
- Water Sample from Line or Man Hole
- Solid residual Sample from Line or Man Hole
- Water Line Sample
- Soil Sample from Cooling Water Outfall / Ditch
- Extent of Soil Contamination Identified in the 2010 Shaw Final Feasibility Study
- TNT Cooling Water Drain Line (North)
- TNT Cooling Water Drain Line (South)
- TNT Wooden Wastewater Line
- TNT Transite Wastewater Line
- Stream
- Road
- Building
- Site LHAAP-29

DATA SOURCES: Shaw, 2010, Final Feasibility Study, LHAAP-29, Former TNT Production Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas, December.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

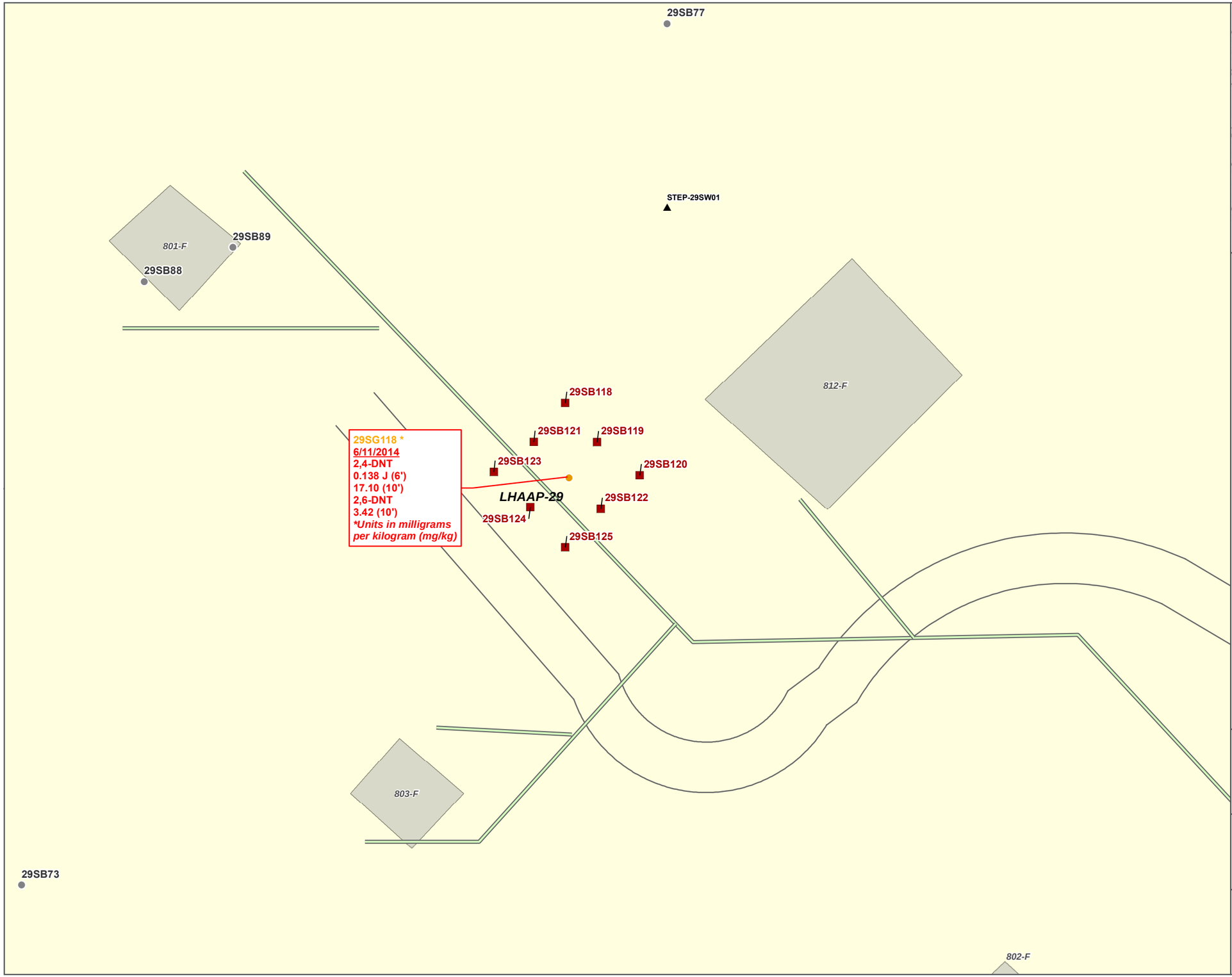
LHAAP-29 PLANNED DPT AND HISTORIC SAMPLE LOCATION MAP

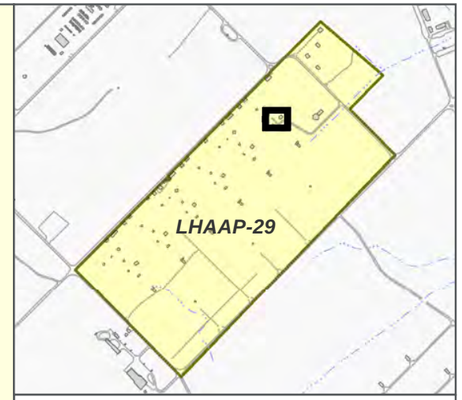
LHAAP-29 PDI WORK PLAN
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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FIGURE 3

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LEGEND

- Planned DPT Soil Boring Location

Historic TNT Wastewater Line Sample Location

- Solid Residual Sample from Line or Manhole
- Water Sample from Line or Man Hole
- Surface Soil Samples
- TNT Cooling Water Drain Line (North)
- Stream
- Road
- Building
- Site LHAAP-29

DATA SOURCES: Shaw, 2010, Final Feasibility Study, LHAAP-29, Former TNT Production Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas, December.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

BUILDING 812-F -PLANNED DPT SOIL SAMPLE LOCATION MAP (INSERT A – FIGURE 3)

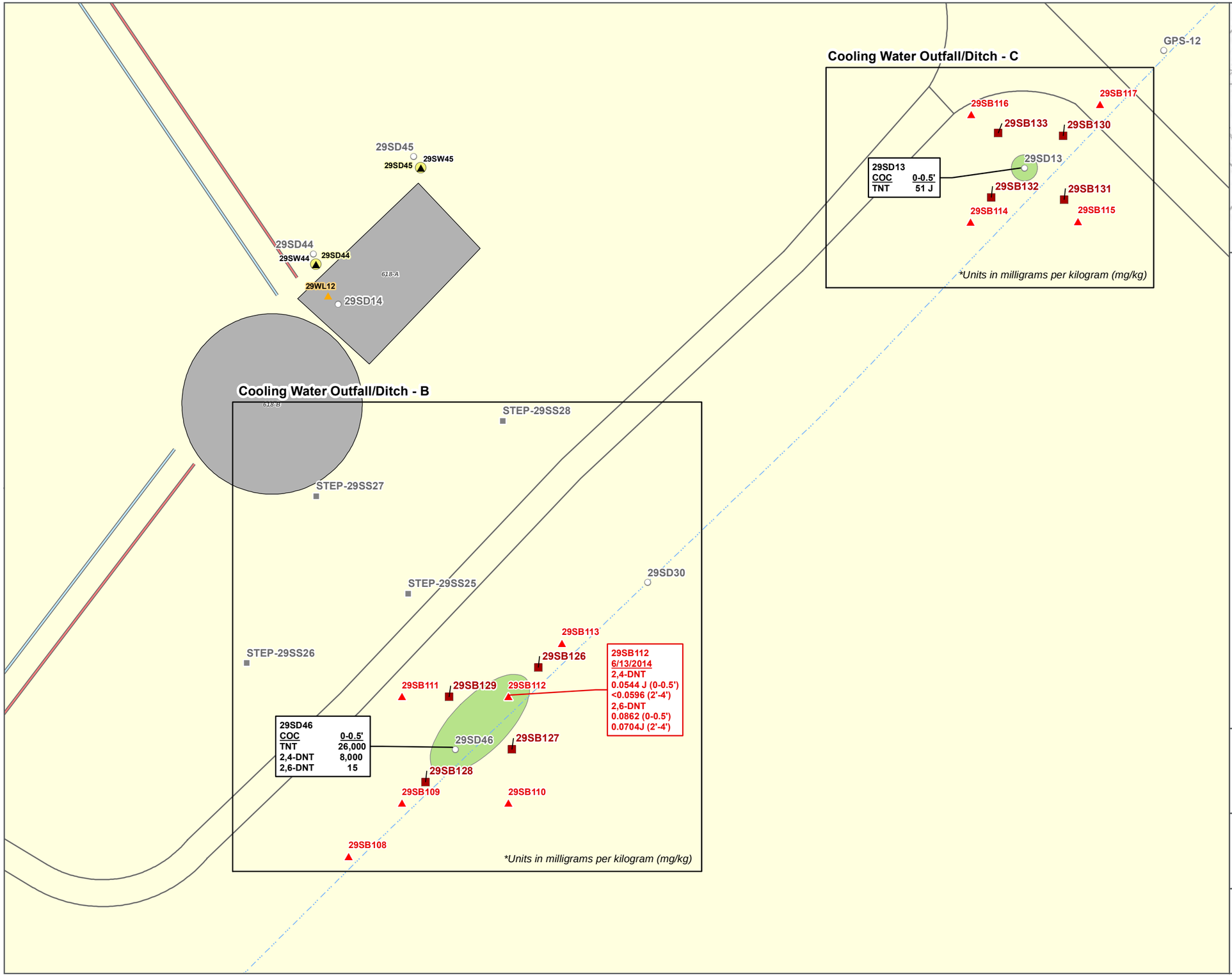
LHAAP-29 PDI WORK PLAN
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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FIGURE 4

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LEGEND

- Planned DPT Soil Boring Location

Historic TNT Wastewater Line Sample Location

- Water Sample from Line or Man Hole
- Water Sample from Line or Man Hole
- Solid residual Sample from Line or Man Hole
- Sediment Samples
- Surface Soil Samples
- Soil Sample from Cooling Water Outfall / Ditch
- Extent of Soil Contamination Identified in the 2010 Shaw Final Feasibility Study
- TNT Wooden Wastewater Line
- TNT Transite Wastewater Line
- Stream
- Road
- Building
- Site LHAAP-29

DATA SOURCES: Shaw, 2010, Final Feasibility Study, LHAAP-29, Former TNT Production Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas, December.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

COOLING WATER OUTFALL / DITCH PLANNED DPT SOIL SAMPLE LOCATION MAP (INSERT B & C - FIGURE 3)

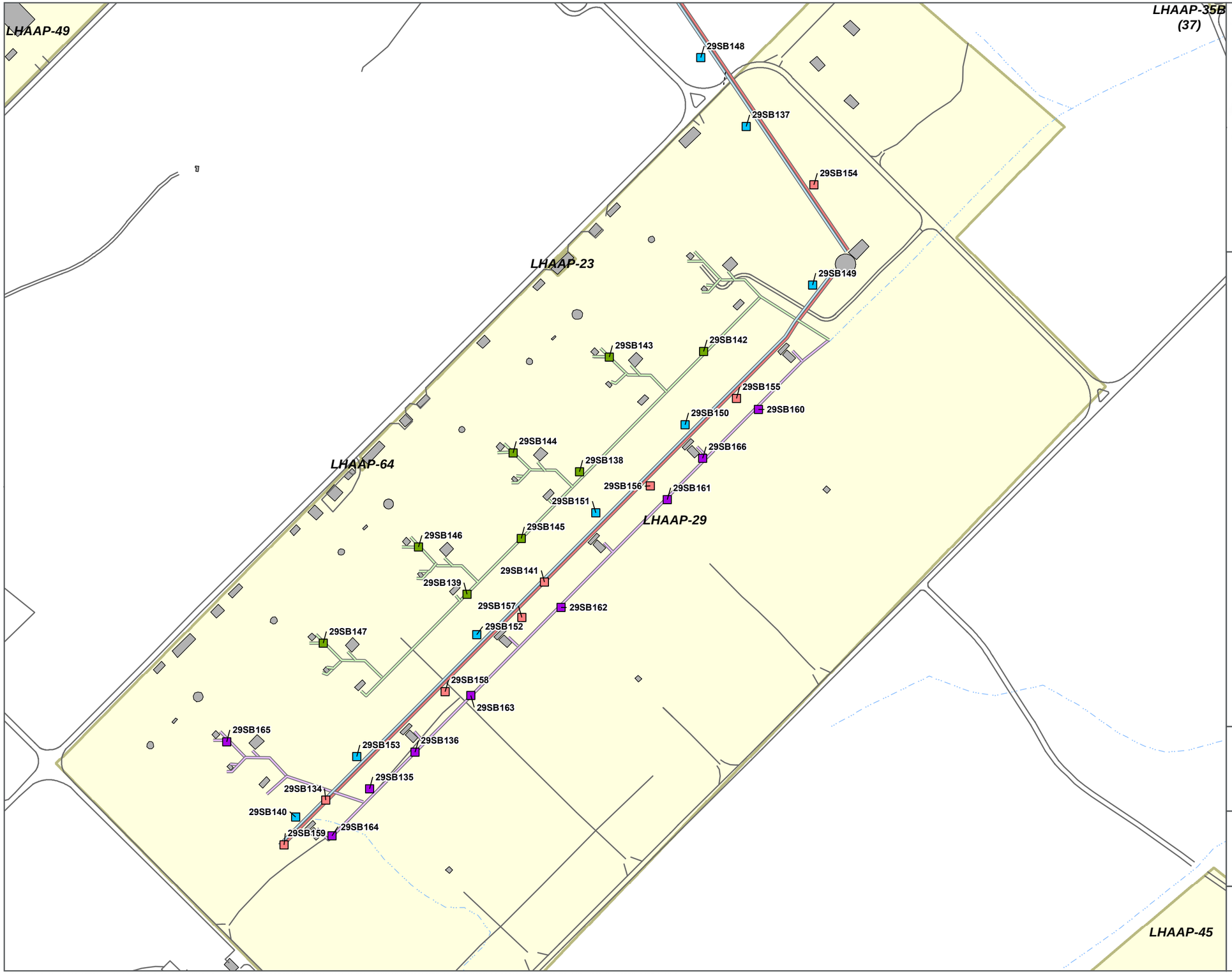
LHAAP-29 PDI WORK PLAN
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

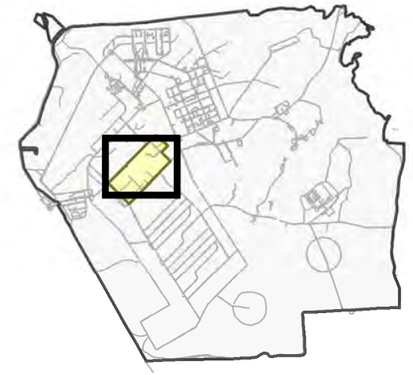
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FIGURE 5

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LEGEND

LEGEND - Planned DPT Soil Boring Location

- TNT Cooling Water Drain Line (North)
- TNT Cooling Water Drain Line (South)
- TNT Transite Wastewater Line
- TNT Wastewater Line
- TNT Cooling Water Drain Line (North)
- TNT Cooling Water Drain Line (South)
- TNT Wooden Wastewater Line
- TNT Transite Wastewater Line
- Stream
- Road
- Building
- Site LHAAP-29

DATA SOURCES: Shaw, 2010, Final Feasibility Study, LHAAP-29, Former TNT Production Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas, December.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

TNT COOLING WATER / WASTEWATER LINES PLANNED DPT SOIL SAMPLE LOCATION MAP

LHAAP-29 PDI WORK PLAN
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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FIGURE 6

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP29\LHAAP_29_PDI_WORKPLAN_WASTEWATER_COOLINGWATERLINE_PROPOSEDSAMPLES_FIG6.MXD - USER: KLOFGREN - DATE: 1/28/2021

Table 1. Soil Analytical Sample Summary

Parameter/Method	Matrix	Field Samples	No. of Dups	No. of MS	No. of MSD	Equipment Blanks	Total No. of Samples
Building 812-F							
Explosives SW 8330A	Soil	32	3	2	2	1	40
Cooling Water Outfall/Ditch							
Explosives SW 8330A	Soil	32	3	2	2	1	40
North and South Cooling Water Lines / Wooden and Transite TNT Wastewater Lines							
Explosives SW 8330A	Soil	132	13	6	6	6	163
IDW Waste Profile							
TCLP VOCs 1311/8260B	Soil	1	0	0	0	0	1
TCLP SVOCs 1311/8270C	Soil	1	0	0	0	0	1
TCLP Metals/Mercury 1311/6010C/7470A	Soil	1	0	0	0	0	1
TCLP Herbicides 1311/8151	Soil	1	0	0	0	0	1
TCLP Pesticides 1311/8081A/B	Soil	1	0	0	0	0	1
Ignitability (flash point)	Soil	1	0	0	0	0	1
Corrosivity	Soil	1	0	0	0	0	1
Reactivity	Soil	1	0	0	0	0	1

Table 2. Sample Locations and Coordinates for the TNT Wastewater Lines

Sample	Approximate Depth to Top of Pipe (feet bgs)	Sample Date	Sample Time	Past Sample from the Location	Northing	Easting	Comments on Sample
32WL05	3.33	9/28/2006	10:06	32WL03	6957115.7	3306449.5	Gel-like consistency
29WL13	3.67	9/28/2006	8:50	29WL06	6955304.7	3305931.6	Gel-like consistency
29WL12	NA	9/28/2006	8:15	Not applicable. 2006 sample was collected where open end of transite pipe was accessible at northwest side of pond.			Sample was collected at 3.5 to 4.0 feet inside the pipe. Solids were dry and gritty.
29WL14	4.00	9/27/2006	16:45	29WL05	6954425.6	3305050.8	Consistency of thin mud

Table 3. Sample Collection List and Rationale

Sample Number	Sample Location	Sample Collection Rationale
Building 812-F Sample Locations (0 - 4 ft bgs, 4 - 8 ft bgs, 8 - 12 ft bgs, and 12 - 16 ft bgs)		
29SB118	Offset from historic sample 29SG118 50 feet west of Building 812-F, production area feeder line, northern end of N. cooling water line	Further define explosives impacts
29SB119	Offset from historic sample 29SG118 50 feet west of Building 812-F, production area feeder line, northern end of N. cooling water line	Further define explosives impacts
29SB120	Offset from historic sample 29SG118 50 feet west of Building 812-F, production area feeder line, northern end of N. cooling water line	Further define explosives impacts
29SB121	Offset from historic sample 29SG118 50 feet west of Building 812-F, production area feeder line, northern end of N. cooling water line	Further define explosives impacts
29SB122	Offset from historic sample 29SG118 50 feet west of Building 812-F, production area feeder line, northern end of N. cooling water line	Further define explosives impacts
29SB123	Offset from historic sample 29SG118 50 feet west of Building 812-F, production area feeder line, northern end of N. cooling water line	Further define explosives impacts
29SB124	Offset from historic sample 29SG118 50 feet west of Building 812-F, production area feeder line, northern end of N. cooling water line	Further define explosives impacts
29SB125	Offset from historic sample 29SG118 50 feet west of Building 812-F, production area feeder line, northern end of N. cooling water line	Further define explosives impacts
Cooling Water Outfall/Ditch (0 - 2 ft bgs, 2 - 4 ft bgs, 4 - 6 ft bgs and 6 - 8 ft bgs)		
29SB126	Southern area of the cooling water outfall/ditch, Area B, offset from historic sample 29SB112	Further define explosives impacts
29SB127	Southern area of the cooling water outfall/ditch, Area B, offset from historic sample 29SB112	Further define explosives impacts
29SB128	Southern area of the cooling water outfall/ditch, Area B, offset from historic sample 29SB112	Further define explosives impacts
29SB129	Southern area of the cooling water outfall/ditch, Area B, offset from historic sample 29SB112	Further define explosives impacts
29SB130	Northern area of the cooling water outfall/ditch, Area C, offset from historic sample 29SD13	Further define explosives impacts
29SB131	Northern area of the cooling water outfall/ditch, Area C, offset from historic sample 29SD13	Further define explosives impacts
29SB132	Northern area of the cooling water outfall/ditch, Area C, offset from historic sample 29SD13	Further define explosives impacts
29SB133	Northern area of the cooling water outfall/ditch, Area C, offset from historic sample 29SD13	Further define explosives impacts

Table 3. Sample Collection List and Rationale

Sample Number	Sample Location	Sample Collection Rationale
North Cooling Water Line (0-4 ft bgs, 4-8 ft bgs, 8-12 ft bgs and 12-16 ft bgs)		
29SB138	Adjacent to mid-point of N. cooling water line adjacent to historic solid residue sample collected from pipeline at MH10	Targeted sample to confirm leaching has not occurred from the N. cooling water line
29SB139	Adjacent to mid-point of N. cooling water line adjacent to historic liquid and solid residue sample collected from pipeline at MH09	Targeted sample to confirm leaching has not occurred from the N. cooling water line
29SB142	Adjacent to northern end of N. cooling water line	Provide coverage for area not previously sampled
29SB143	Adjacent to production area feeder line, northern end of N. cooling water line	Provide coverage for area not previously sampled
29SB144	Adjacent to production area feeder line, northern end of N. cooling water line	Provide coverage for area not previously sampled
29SB145	Adjacent to mid-point of N. cooling water line	Provide coverage for area not previously sampled
29SB146	Adjacent to production area feeder line, southern end of N. cooling water line	Provide coverage for area not previously sampled
29SB147	Adjacent to production area feeder line, southern end of N. cooling water line	Provide coverage for area not previously sampled
South Cooling Water Line (0-4 ft bgs, 4-8 ft bgs, 8-12 ft bgs and 12-16 ft bgs)		
29SB135	Adjacent to southern end of S. cooling water line adjacent to historic liquid sample collected from pipeline at MH06	Targeted sample to confirm leaching has not occurred from the S. cooling water line
29SB136	Adjacent to southern end of S. cooling water line adjacent to historic liquid sample collected from pipeline at MH05	Targeted sample to confirm leaching has not occurred from the S. cooling water line
29SB160	Adjacent to northern end of S. cooling water line, south side	Provide coverage for area not previously sampled
29SB161	Adjacent to northern end of S. cooling water line, south side	Provide coverage for area not previously sampled
29SB162	Adjacent to mid-point of S. cooling water line, south side	Provide coverage for area not previously sampled
29SB163	Adjacent to southern end of S. cooling water line, south side	Provide coverage for area not previously sampled
29SB164	Adjacent to southern terminus of S. cooling water line, south side	Provide coverage for area not previously sampled
29SB165	Adjacent to production area feeder line, southern end of S. cooling water line	Provide coverage for area not previously sampled
29SB166	Adjacent to mid-point of S. cooling water line adjacent to historic solid residue sample collected from pipeline at MH02	Targeted sample to confirm leaching has not occurred from the S. cooling water line
TNT Transite Wastewater Line (0-4 ft bgs, 4-8 ft bgs, 8-12 ft bgs and 12-16 ft bgs)		
29SB137	Adjacent to northern branch of transite wastewater line, north side	Provide coverage for area not previously sampled
29SB140	Adjacent to southern end of transite wastewater line, , adjacent to historic residue sample collected from pipeline at 29WL14, north side	Targeted sample to confirm leaching has not occurred from the transite wastewater line
29SB148	Adjacent to northern branch of transite wastewater line, west side	Provide coverage for area not previously sampled
29SB149	Adjacent to northern end of transite wastewater line, north side	Provide coverage for area not previously sampled
29SB150	Adjacent to northern end of transite wastewater line, north side	Provide coverage for area not previously sampled

Table 3. Sample Collection List and Rationale

Sample Number	Sample Location	Sample Collection Rationale
29SB151	Adjacent to mid-point of transite wastewater line, north side	Provide coverage for area not previously sampled
29SB152	Adjacent to mid-point of transite wastewater line, north side	Provide coverage for area not previously sampled
29SB153	Adjacent to southern end of transite wastewater line, north side	Provide coverage for area not previously sampled
TNT Wooden Wastewater Lines (0-4 ft bgs, 4-8 ft bgs, 8-12 ft bgs and 12-16 ft bgs)		
29SB134	Adjacent to southern end of wooden wastewater line, adjacent to historic residue sample collected from pipeline at 29WL14, north side	Targeted sample to confirm leaching has not occurred from the wooden TNT line
29SB141	Adjacent to mid-point of wooden wastewater line, adjacent to historic residue sample collected from pipeline at 29WL13, north side	Targeted sample to confirm leaching has not occurred from the wooden TNT line
29SB154	Adjacent to northern branch of wooden wastewater line, east side	Provide coverage for area not previously sampled
29SB155	Adjacent to northern end of wooden wastewater line, south side	Provide coverage for area not previously sampled
29SB156	Adjacent to northern end of wooden wastewater line, south side	Provide coverage for area not previously sampled
29SB157	Adjacent to mid-point of wooden wastewater line, south side	Provide coverage for area not previously sampled
29SB158	Adjacent to mid-point of wooden wastewater line, south side	Provide coverage for area not previously sampled
29SB159	Adjacent to southern end of wooden wastewater line, south side	Provide coverage for area not previously sampled

Table 4. Cleanup Levels at LHAAP-29

Medium	Chemical of Concern	Cleanup Level
Soil		GWP-Ind (mg/kg)
	2,4,6-Trinitrotoluene	4.7[a] 5.1[b]
	2,4-Dinitrotoluene	0.042
	2,6-Dinitrotoluene	0.042
	Perchlorate**	7.2
Transite TNT Wastewater Line		GWP-Ind (mg/kg)
Solid Residue	1,3-Dinitrobenzene	1
	2,4,6-Trinitrotoluene	5.1
	2,4-Dinitrotoluene	0.042
	2-amino-4,6-Dinitrotoluene	1.7
	4-amino-2,6-Dinitrotoluene	1.7
Cooling Water Drain Line		GWP-Ind (mg/kg)
Solid Residue	2,4,6-Trinitrotoluene	5.1
	2,4-Dinitrotoluene	0.042
	2,6-Dinitrotoluene	0.042
	2-amino-4,6-Dinitrotoluene	1.7
	4-amino-2,6-Dinitrotoluene	1.7

Notes:

** Potential COC in soil due to high perchlorate concentration in groundwater

[a] applies to 0-3 feet below ground surface

[b] applies from 3 feet below ground surface to groundwater interface

GWP-Ind Texas Commission on Environmental Quality soil medium specific concentration for industrial use based on groundwater protection

mg/kg milligrams per kilogram

3 References

AECOM, 2014. Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant, Karnack, Texas. July, 2014.

AECOM, 2017. Revised Final Feasibility Study Addendum, LHAAP-29, Former TNT Production Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas. January, 2017.

HDR, 2019. Final Record of Decision for LHAAP-29, Former TNT Production Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas. August, 2019.

Shaw, 2007. Data Gaps Investigation Report, Longhorn Army Ammunition Plant, Karnack, Texas, Final, Houston, Texas, April.

Shaw, 2010. Final Feasibility Study, LHAAP-29, Former TNT Production Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas, December.

USACE, 2020. Scope of Work for Remedial Designs Longhorn Army Ammunition Plant, Karnack, Texas. July, 2020.

USEPA, 2009. Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. OSWER 9200.1 1-85. February 2009.

USEPA, 2017. National Functional Guidelines for Superfund Organic Methods Data Review. OLEM 9355.0-136. January 2017.

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

February 23, 2021

DAIM-ODB-LO

Ms. Lauren Poulos
U.S. Environmental Protection Agency
Federal Facilities Section R6
1201 Elm Street, Suite 500
Dallas, TX 75202-2102

Re: Final Post Screening Investigation Addendum No. 2 Report for LHAAP-47, Plant 3 Area, Solid Rocket Motor Fuel Production Longhorn Army Ammunition Plant, Karnack, Texas

Dear Ms. Poulos,

An electronic copy and 2 CD copies of the above-referenced document are being transmitted to you for your records.

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

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

Sincerely,

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

Copies furnished:
A. Palmie, TCEQ, Austin, TX (1 electronic only)
A. Williams, USACE, Tulsa District, OK (1 electronic only)
R. Smith, USACE, Tulsa District, OK (1 electronic only)
A. Maly, USAEC, San Antonio, TX (1 electronic only)
P. Bruckwicki, Caddo Lake NWR, TX (1 electronic only)
K. Nemmers, Bhate, CNTR (1 electronic only)

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

February 23, 2021

DAIM-ODB-LO

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

Re: Final Post Screening Investigation Addendum No. 2 Report for LHAAP-47, Plant 3 Area, Solid Rocket Motor Fuel Production Longhorn Army Ammunition Plant, Karnack, Texas

Dear Ms. Palmie,

An electronic copy of the above-referenced document is being transmitted to you for your records.

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

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

Sincerely,

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

Copies furnished:
L. Poulos, USEPA Region 6, Dallas, TX (1 electronic, 2 CDs)
A. Williams, USACE, Tulsa District, OK (1 electronic only)
R. Smith, USACE, Tulsa District, OK (1 electronic only)
A. Maly, USAEC, San Antonio, TX (1 electronic only)
P. Bruckwicki, Caddo Lake NWR, TX (1 electronic only)
K. Nemmers, Bhate, CNTR (1 electronic only)

Comments Response Matrix
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Draft Report Submitted: October 26, 2020
Draft Final Report Submitted January 11, 2021

Document Submitted by: Rose Zeiler - BRAC Field Manager
Comments Submitted by: April Palmie -TCEQ
Responded by: Joy Rogalla, Phil Werner - HDR
Date Responded: Draft 1/11/2021; Draft Final 2/11/2021

1. **Respondent concurs (C), does not concur (D), Takes Exception (E), or Delete (X)**
2. **Commenter agrees (A) or does not agree (D) with response.**

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D	Draft Final Comment	C,D	Draft Final Response
Reviewer #1: April Palmie, TCEQ									
1.	Page 4 of pdf	Attachments	Include a list of figures. In attachments list, be consistent with page numbers. Either include page numbers for everything (and correct table page numbers) or don't include page numbers for any attachments on pages 4 & 5. Please add pdf bookmarks for attachments 1 and 3-5.	C	A list of Figures will be added and figure and table page numbers will be included. Bookmarks will be added to the attachments as noted.		Most of the items listed above relate to the list of figures in comment one and my check to make sure all figure numbers were identified correctly following the changes.	C	Figure captions have been revised as noted. Refer to response to January 25, 2021 comment 2.
2.	Attachments (general)	Pdf bookmarks and formatting	Please add pdf bookmarks for Attachments where they are missing. Also, please add page numbers within the attachments where appropriate (for example on 2-number consecutive pages of a table).	C	Bookmarks will be added as requested, along with page numbers where appropriate	A			

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Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D	Draft Final Comment	C,D	Draft Final Response
3.	1.1/1	2nd Paragraph	Please clarify this sentence by including reference to 2018: TCE was reported in Upper Intermediate Zone replacement well 47WW25R, a replacement well for dry Shallow Zone well 47WW25 (installed during the first phase of the PSI), at a concentration of 120,000 µg/L.	C	A Reference to the PSI report has been added.	A			
4.	1.1.1/1	3rd and 4th Paragraphs	Please include Figures 7 and 8 from the March 2019 PSI Report (or similar new figures) and add reference the figures in these paragraphs.	C	The figures from the 2019 PSI report have been added and referenced in the text. In addition, Figure 4 has been replaced by 2 new figures showing the extent of TCE in the Shallow and Intermediate/Upper Intermediate Zones with the 2018 plumes overlaid on the 2020 plumes. The text has been revised to reference these figures.		First sentence of response, please add the figure numbers. Second sentence of response, after "two new figures" add (Figures 6 and 7).	C	The figures from the 2019 PSI report have been added as Figures 3 and 4, and are referenced in the text. In addition, the previous Figure 4 has been replaced by 2 new figures (Figures 6 and 7) showing the extent of TCE in the Shallow and Intermediate/Upper Intermediate Zones with the 2018 plumes overlaid on the 2020 plumes. The text has been revised to reference these figures. The text in Section 1.1.1 has been further revised to reference Figures 3 and 4 as well as the new Figures 6 and 7 showing the 2018 extent of TCE and perchlorate in the Shallow and Intermediate Zones.

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Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D	Draft Final Comment	C,D	Draft Final Response
5.	1.1.2/2-3	Soil and Groundwater	Add references to the relevant figures and tables.	C	Additional figure and table references have been added. As noted in response to comment 4, two new figures have been included (now Figures 6 and 7) to show the 2010 and 2019 TCE and perchlorate plumes. A reference to the 2019 PSI report has also been added.	A			
6.	1.1.2/3	1st Paragraph of GW	Revise as shown in red: Sample results were compared to the TCEQ Texas Risk Reduction Program (TRRP) Protective Concentration Level (PCL) for residential groundwater use ($^{GW}GW_{Ing}$) (TRRP PCL) and Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs). Global edit: Replace any other use of $^{GW}GW_{Ing}$ in the document with TRRP PCL. For example first sentence of next paragraph becomes: Six VOCs were detected at varying concentrations, of these, ~~2~~ two compounds (acetone and toluene) were detected at low estimated concentrations well below their respective ~~GWGWIng~~ TRRP PCL.	C	The text has been revised as requested. All references have been changed to TRRP PCL.		Text was not edited exactly as requested. Please correct "residential groundwater use" to put back "($^{GW}GW_{Ing}$)" before "(TRRP PCL)". There should be one initial complete reference to the TRRP groundwater ingestion pathway. This also should not have been removed from the acronym list, just from other occurrences in the narrative. Put this back in the acronym list: $^{GW}GW_{Ing}$ Tier 1 Residential Groundwater Protective Concentration Level (PCL).	C	The text and acronym list have been revised as requested. The text has been revised as: "Sample results were compared to the TCEQ Texas Risk Reduction Program Protective Concentration Level for residential groundwater use ($^{GW}GW_{ing}$) (TRRP PCL) and Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs)." $^{GW}GW_{ing}$ has also been added to the acronym list. These are the only locations in the document where this term occurs, and a global search has been completed to confirm there are no other occurrences and all references to the cleanup level reference the TRRP PCL.

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Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D	Draft Final Comment	C,D	Draft Final Response
7.	2.3/7	2nd Paragraph	Please clarify this sentence: The new monitoring existing monitoring well locations are shown on **Figure 6**.	C	The text has been clarified to state "new and existing monitoring well locations…."	A			
8.	2.3/7	4th Paragraph	Explain the exceptions noted in this sentence: The PVC well screen was constructed with 0.01 inch slots and were 10 feet in length, with the exception of wells 47WW50, 47WW51, 47WW53, and 47WW54.	C	The text has been clarified to state that 10-foot screens were installed in the Shallow Zone wells and 5-foot screens in the Upper Intermediate Zone wells.	A			
9.	2.5/8		Please include well abandonment documentation in the report attachments.	C	The well abandonment documentation has been added to Attachment 3.	A			
10.	3.1/10	1st Paragraph	Please say DPT borings were "completed" rather than "performed"	C	All references to the DPT borings have been changed to 'completed'.	A			
11.	3.2/12		Revise last sentence to be consistent with comment 6 notes (TRRP PCLs)	C	The PCL reference has been revised as requested.	A			
12.	3.2.2/15	3rd Paragraph	Add reference to Figure 10 with the residual DNAPL discussion	C	Reference to Figure 13 (formerly Figure 10) has been added.		Correct response to Figure 19 (Figure 10 is now Figure 19). Also, add to response that this section has now been renumbered due to addition of 3.2.1 section. These comments (12 and 13) for 3.2.2 are now for 3.2.3.	C	Reference to Figure 19 (formerly Figure 10) has been added. This section has been renumbered to Section 3.2.3 due to the addition of Section 3.2.1 presenting the discussion of groundwater elevations and cross-sections.
13.	3.2.2/17	1st and 2nd paragraphs	Last sentence of first complete paragraph should reference Figure 17. 2nd paragraph describes 47WW37 which is missing from	C/D	Reference to Figure 20 (formerly Figure 17) has been added.		a. See notes for comment 12 and add "additional text has been added the last paragraph of 3.2.3 to describe the difference".	C	a. 47WW37 is an intermediate zone well, 66 feet deep, approximately 20 feet deeper than the UI wells. Combining data from

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Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D	Draft Final Comment	C,D	Draft Final Response
			isoconcentration figures. Please add location of 47WW37 and include the concentration on Figure 17. Last sentence in paragraph is confusing since order of magnitude means X 10 – 180 is several orders of magnitude less than 120,000		47WW37 is an intermediate zone well, 66 feet deep, approximately 20 feet deeper than the UI wells. Combining data from different zones may be confusing so data for this well has not been added to Figure 20 but additional text has been added to describe the difference.		b. In response to the comment note, if 47WW37 is deeper intermediate, why does the 2019 narrative say: "Well 47WW37 is screened in the Upper Intermediate Zone, solely, and does not present the same limitations when evaluating the sample results." Perhaps this sentence should also be revised. c. Regardless or the narrative changes, the physical location of this well should be shown on the shallow and upper intermediate iso-concentration figures (now Figures 19 and 20). If the data is not applicable for contour due to screening that should be explained in a note. The physical location of the well should not be omitted. The red cross well symbol is for "Inter./Upper Inter. MW" per the figure legends, which includes this well. d. Also, the order of magnitude sentence was not corrected or noted (last paragraph in 3.2.3).	C C C	different zones may be confusing so data for this well has not been added to Figure 20 but additional text has been added to the last paragraph of Section 3.2.3 (formerly Section 3.2.2) to describe the difference. b. The reference to 47WW37 in the first paragraph of Section 3.2.2 (formerly Section 3.2.1) has been revised to state that this well is screened solely in the Intermediate Zone. This is now consistent with other references and discussion about this well. c. the well location has been added to Figures 19 and 20, and a note added to the legend on Figure 20 noting the concentration is not reflected in the Upper Intermediate Zone contour. The note states: "The TCE concentration for 47WW37 is not reflected in the isoconcentration contour since this Intermediate Zone well is screened 20 feet deeper than surrounding UI Zone wells"

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									d. The text has been revised to state that the 47WW37 TCE concentration is several hundred orders of magnitude less than that reported in 47WW25R.
14.	4.2/19	1st paragraph	Should reference Figure 17	C	The reference has been corrected to Figure 20 (formerly Figure 17).	A			
15.	4.2/20	3rd paragraph	Consider this revision for clarity: This result suggests ~~indicates~~ that the dissolved phase concentrations from the residual DNAPL ~~concentrations~~ decrease with depth.	C	The text has been revised as noted.	A			

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16.	4.3/20		Add references to Figures 8 and 9. Highest TCE was 59.6 (fixed lab) [1st paragraph and later same section]	C/D	References to Figures 11 and 12 (formerly Figures 8 and 9) have been added. The figures include only field lab results because there is a complete data set. Fixed lab analyses were only performed for a small subset of samples (10 percent) and the results do not always correlate well as discussed in Section 3.2.3. This is due primarily to the different dilution levels used in the fixed and field labs. Adding the results from the fixed labs may introduce more confusion into the interpretation so the data have not been added to the figures. The mobile data, as presented, provides a clear picture of the level of contamination.		The narrative (3.2.4) and figures should include explanation that only field lab results were included.	C	The text in Section 4.3 has been revised to state that the posted results on Figures 11 and 12 are the field lab results for the highest concentration in the saturated or unsaturated zone.
17.	Table 1		Table 1 – fix width of water level column	C	The table formatting has been adjusted. Ft ags definition has been added to the notes.	A			
18.	Table 2		DPT-035 Add intermediate exposed screen length DPT-037 Why is the shallow water level blank?	C	DPT-037 has been noted as dry in the water level column. The Upper Intermediate exposed screen length for DPT-035 is included in the table. the Screen depth has been corrected to 39.5-49.5.	A			

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19.	Table 4		Last column is not ft bgs. Please convert for consistency or add columns for well completion elevation.	C	The table has been corrected to indicate that groundwater elevation units are ft amsl, and a note added to define the units as feet above mean sea level.	A			
20.	Table 6		Please display results in mg/kg so the two soil tables are consistent. Or change table 5.	C	The Table 6 results have been converted to mg/kg.	A			
21.	Table 7		TRRP PCLs are updated every year. Please include reference to current year (sample year). Also this should reference Texas Risk Reduction Program (TRRP) Protective Concentration Level (PCL) for residential groundwater use	C	The PCL reference has been updated to November 2019. The PCL definition has been corrected to Protective Concentration Level.	A			
22.	Table 8		Is the methylene chloride lab contaminant? Can you add the dilution for some of-these results?	C	The laboratory data and data validation reports were reviewed to determine whether the methylene chloride can be attributed to laboratory contamination. Although there were trace detections in one lab blank and one trip blank, MC was not detected in the associated samples and no results were qualified due to blank contamination. Dilution factors are provided in the laboratory data files in Attachment 5 and reference to the detailed results has been added to table footnotes and text in Section 3.1.1.	A			

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23.	Table 9		There is column before DPT-030 10-11 – it is unclear what these results are for (5,880 TCE). For soil tables, please pick mg/kg or µg/kg and convert accordingly. Please don't switch back and forth between tables. Recommend mg/kg soil results. Also note mg/kg is what is used in the figures. It is helpful if figures and tables are consistent within a report.	C	The extra column was incorrectly included has been deleted. All soil units in the tables have been changed to mg/kg.	A			

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Draft Final Report Submitted January 11, 2021

24.	Figures 8-9		Add the depths for the reported concentrations. Also, please explain the rationale for which result is depicted on the figures. I would expect it to be the highest but that doesn't seem to be the case (for example DPT-030 10-11 fixed lab result = 59.6 field lab = 16).	C	These are now Figures 11 and 12. Sample depths have been added to both figures as requested. The fixed lab results have not been added because there is only a small subset of samples (10 percent) with fixed lab results. Section 3.2.4 discusses the fixed/field lab data comparison and notes a lack of correlation between the paired results due mostly to differences in dilution and including both results on the figures may be more confusing. The field lab results provide a consistent data set across all samples. A Note has been added to the legend noting that the posted results represent the highest concentration for the unsaturated/saturated zone.		Comment 24 – The response says a note was added to Figure 11 and 12 regarding the posted results but it is not on the figures. Please add the note and also include the red text (or similar) "the posted results represent the highest concentration from the field lab results for the unsaturated/saturated zone".	C	The note has been added to the figures and text. The note added to Figures 11 and 12 is: "The posted results represent the maximum field laboratory concentration for each boring". The following text has been added to Section 3.1: "The posted results on Figure 11 and Figure 12 are the highest reported field laboratory concentrations for each boring in the unsaturated and saturated zones, respectively." The following has been added to the 1st paragraph in Section 4.3: "The field laboratory sample results are shown on the figure, and represent the highest concentration reported in the unsaturated zone for each boring. The field laboratory results are shown since all samples were analyzed and provide a complete data set while the fixed laboratory analysis was performed for only a subset of samples." The following has been added to the 5th paragraph in Section 4.3: "The field laboratory sample results

Comments Response Matrix
Draft Report: LHAAP-47 Post-Screening Investigation Addendum No. 2 Report for LHAAP-47, Plant 3 Area, Solid Rocket Motor Fuel Production, Longhorn Army Ammunition Plant, Karnack, Harrison County, Texas
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Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D	Draft Final Comment	C,D	Draft Final Response
									are shown on the figure, and represent the highest concentration reported in the saturated zone for each boring. The field laboratory results are shown since all samples were analyzed and provide a complete data set while the fixed laboratory analysis was performed for only a subset of samples."
25.	Figure 10		The inset is confusing with 47WW14 shown in the top left corner. Please revise display area to remove the need for 47WW14 inset or move it to the right. Figure 17 is much easier to interpret. Please revise the title or add a note to include the date(s) of data collection depicted in the figure.	C	The inset has been moved to the right side of the figure (now Figure 19) to be consistent with the location relative to the main figure frame. The title has been revised to "2020 Shallow Groundwater TCE Iso-Concentration Contours"	A			
26.	Figures 15-17		Please revise the title or add a note to include the date(s) of data collection depicted in each figure.	C	The figure titles have been revised to note July 2020 for the Groundwater Elevation figures (now Figures 17 and 18) and to add 2020 to the iso-concentration figure (now Figure 20).	A			

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27.	Figures Cross Sections		Thank you for the detailed cross sections. Add note of the units (TCE soil in mg/kg and groundwater in µg/L). Could soil or water results be a different color?	C	The units for soil and groundwater results are included in the notes in the legend. The colors for the groundwater and results has been changed to red and blue to differentiate from the soil results and the legend has been clarified to note the arrows indicate the sample intervals and results.		Thank you for the edits. Please consider this format (or similar) for future efforts.	C	This format will be used for future cross-sections
28.	Photo log		Please include a photo log to document field work and completed wells.	C	General site photos were not taken. Photos of the soil cores were taken and are provided in a photo log as Attachment 6		For future field efforts (at 47, 29, and 18/24), please document site activities and include a comprehensive photo log. Thank you for the explanation.	C	Site photographs will be taken during any future field efforts and provided in a photo log.
29.	Attachment 3		In Attachment 3, please increase the size of the first batch of boring logs (DPT 001-011) so they take up more space on the page. Hopefully, this will improve legibility. If not, please check figures for legibility and replace as needed. The first page of each log has illegible parts.	C	The boring logs for DPT-001 through DPT-011 have been replaced with higher resolution versions.		Much better. Please check for this type of problem on future documents as the draft version of the logs made document review difficult.	C	The format and resolution for future boring logs will be verified to be as high quality as possible.
30.	Attachment 4		Pdf pages 219-221 are in the wrong attachment	C	The pages have been removed. The drilling log and well completion forms are for 47WW24 that was installed in 2000 and was inadvertently included.	A			
25 January comments, Submitted by April Palmie via email									

Comments Response Matrix
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Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D	Draft Final Comment	C,D	Draft Final Response
1.	Comment Response Matrices						On the comment response matrices for EPA and TCEQ, please complete all of the information for these sections: Submitted by, Responded by, Date responded, and Reviewer # name.	C	The information has been clarified and missing information has been added to the comment-response matrices. The heading information for this table has been revised to: Document Submitted by: Rose Zeiler, - BRAC Field Manager, January 11, 2021 Comments Submitted by: April Palmie, -TCEQ, 25 January 2021 Responded by: Joy Rogalla, Phil Werner - HDR Date Responded: 2/11/2021 Similar information has been added to the EPA comment table, with the exception that no further comments were received on the Draft Final report and no other additions to the table have been made.

Comments Response Matrix
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Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D	Draft Final Comment	C,D	Draft Final Response
2.	Figure List						Figures list – typos to correct on Figure 4 change 2019 to 2018, Figure 11 change TCT to TCE, Figure 12 change Saturated Soil to Saturated Zone, Figures 19 and 20 add 2020 before Shallow and Upper	C	The figure captions have been revised as noted. The captions have been revised to: "Figure 4 Sample Results for Intermediate Groundwater, July and September 2018; Figure 11 PSI No. 2 Unsaturated Zone DPT TCE Soil Contour Building 46A Area; Figure 12 PSI No. 2 Saturated Zone Soil DPT TCE Soil Results Building 46A Area; Figure 19 2020 Shallow Groundwater TCE Iso-Concentration Contours Building 46A Area: Figure 20 2020 Upper Intermediate Groundwater TCE Iso-Concentration Contours Building 46A Area".
3.	Figure 7						Legend for TCE darker blue line add July 2018	C	The figure legend has been revised as requested.
4.	Section 3.1						Last sentence, Figure 8 shows locations and Figure 10 shows results. This should probably reference Figure 10.	C	The figure reference has been revised to Figure 10.

Comments Response Matrix
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Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D	Draft Final Comment	C,D	Draft Final Response
5.	Section 3.1.2	Pg 13, last para					2nd sentence is not complete "As shown on Figure 11, while the extent of GWP-Ind MSC exceedances indicates an elongated area of contamination approximately 500 ft long extending from southwest of Building 46A to the northeast of the building." Remove "while" or combine with the next sentence.	C	The sentence has been revised as requested.
6.	Section 4.1						First paragraph incorrectly references Figure 10, probably should be Figure 19.	C	The figure reference has been corrected to Figure 19.
7.	Section 4.3						Section 4.3, reference to Figure 12 plume but there is no iso-contour for Figure 12. Suggest adding a contour to Figure 12 or adding reference to Figure 19.	C	The figure reference has been clarified and revised to also reference Figure 19 for the Shallow Zone DNAPL plumes and Figure 12 for the saturated soil results.
8.							All other comment responses accepted.	C	Acceptance for the other comments has been noted.

Final

LHAAP-47 Post Screening Investigation Addendum No. 2 Report

for LHAAP-47, Plant 3 Area,
Solid Rocket Motor Fuel Production
Longhorn Army Ammunition Plant
Karnack, Texas

February 2021

Prepared For:

U.S. Army Corps of Engineers – Tulsa District

Prepared By:

HDR
2650 Park Tower Drive, Suite 400
Vienna, VA 22180

Contract No. W912BV-15-D-0014
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Attachment 3 – Soil Boring and Monitoring Well Completion Logs, Well Abandonment and Registration Forms

Attachment 4 – Low Flow Groundwater Sample Logs

Attachment 5 – Data Validation Report & Raw Analytical Data Package

Attachment 6 – Photograph Log

Acronym List	
Army	United States Army
bgs	below ground surface
COC	contaminant of concern
C/UI	Clay/Upper Intermediate
DNAPL	Dense non-aqueous phase liquid
DoD	Department of Defense
DOT	Department of Transportation
DPT	direct push technology drilling
ELAP	Environmental Laboratory Accreditation Program
EPA	U. S. Environmental Protection Agency
ft	feet
FS	Feasibility Study
GC/MS	Gas chromatography/mass spectrometry
$^{GW}GW_{Ing}$	Texas Risk Reduction Program Protective Concentration Level for residential groundwater use
GWP-Ind	industrial groundwater protection MSC
GWTP	groundwater treatment plant
HSA	Hollow stem auger
IDW	Investigation derived waste
IWWP	Installation Wide Work Plan
J	estimated concentration
LHAAP	Longhorn Army Ammunition Plant
LOQ	Level of Quantitation
MCL	maximum contaminant level
MDL	method detection Limit
mg/kg	milligram per kilogram
Mg/L	Milligrams per liter
MSC	medium-specific concentrations
mV	millivolts
NELAP	National Environmental Laboratory Accreditation Program
NTU	Nephelometric turbidity unit
PAL	Project Action Limits
PCE	tetrachloroethene
PCL	Protective Concentration Level
PID	photoionization detector
PP	Proposed Plan
PSI No. 2	LHAAP-47 Interim Post-Screening Investigation Addendum No. 2

PVC	polyvinyl chloride
ROD	Record of Decision
RPD	Relative percent difference
SDWA	Safe Drinking Water Act
SVOC	semi-volatile organic compound
TAC	Texas Administrative Code
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
TCLP	toxicity characteristic leaching procedure
TRRP	Texas Risk Reduction Program
VC	Vinyl Chloride
VOC	volatile organic compound
°C	Degrees Celsius
µg/L	micrograms per liter
µS/cm	Micro Siemens per centimeter
1,1-DCE	1,1-dichloroethene
cis-1,2-DCE	cis-1,2-dichloroethene

1.0 Introduction

This Post-Screening Investigation Addendum No. 2 Report (PSI No. 2) has been prepared for the former Longhorn Army Ammunition Plant (LHAAP) site LHAAP-47 (Plant 3 Area), located in Karnack, Texas (**Figure 1** and **Figure 2**). This document has been prepared under the U. S. Army Corps of Engineers Tulsa District Contract Number W912BV-15-D-0014, Task Order No. W912BV18F0023.The purpose of this investigation was to further investigate the source and extent of the high trichloroethene (TCE) concentration identified at replacement well 47WW25R installed and sampled during the PSI field activities performed between April and September 2018 (HDR, 2019).

This PSI addendum reports the results of additional investigations conducted in November 2019, and May through July 2020, and provides a summary of the results of the initial PSI conducted in 2018. The PSI No. 2 activities focused on the area near Building 46A where Upper Intermediate Zone well 47WW25R is located.

The PSI No. 2 field efforts were conducted in accordance with procedures outlined in relevant sections of the Installation Wide Work Plan (IWWP) (AECOM, 2014); specifically those procedures for conducting direct push technology drilling (DPT), groundwater sample collection, soil sample collection, handling and laboratory analyses, decontamination, handling and disposal of investigation derived waste (IDW), and surveying. The IWWP was reviewed by and concurrence was obtained from the Texas Commission on Environmental Quality (TCEQ) and the U.S. Environmental Protection Agency (EPA). The initial PSI field efforts were conducted in accordance with the *Post-Screening Investigation Work Plan LHAAP-47, Plant Area 3 Longhorn Army Ammunition Plant* (AECOM, 2016). The PSI No. 2 November 2019 field efforts were conducted in accordance with the *Final Post Screening Investigation Addendum No. 2 Work Plan, LHAAP-47 Building 46A, Plant 3 Area, Solid Rocket Motor Fuel Production, Longhorn Army Ammunition Plant Karnack, Texas* (HDR, 2019a). The PSI No. 2 May through July 2020 field efforts were conducted in accordance with the *Final Post Screening Investigation Addendum No. 2 Work Plan Addendum, LHAAP-47 Building 46A, Plant 3 Area, Solid Rocket Motor Fuel Production Longhorn Army Ammunition Plant Karnack, Texas (*HDR, 2020).

1.1 Background

Prior to 2018, the most recent samples collected at LHAAP-47 were collected in 2009 and 2010 to support development of the Feasibility Study (FS) alternatives. Following preparation of the FS, a Proposed Plan (PP) was completed in 2012 (AECOM, 2012), and a Record of Decision (ROD) was completed to the Draft Final Version in 2013 (AECOM, 2013). The ROD completion was delayed until resolution of a dispute between the U.S. Army (Army) and EPA. At that point, the Army determined that due to aging and limited data, additional data were required to support preparation of the Final ROD. The PSI was planned to re-assess and update groundwater contaminant levels for Shallow and Intermediate Zone groundwater.

During the groundwater investigations in 2009 and 2010 that included the collection of groundwater samples around Building 46A, the results showed TCE concentrations of 13,900 micrograms per liter (µg/L) at DPT boring 47DPT14 (completed in the Shallow Zone) and 13,300 µg/L at well 47WW25. TCE was reported in Upper Intermediate Zone replacement well 47WW25R, a replacement well for dry Shallow Zone well 47WW25 (installed during the first

phase of the PSI), at a concentration of 120,000 µg/L (HDR, 2019). Follow up investigations were conducted in 2019 and 2020 to identify the source of TCE and further define the extent of contamination in the vicinity of Building 46A. The results of these follow up investigations are reported in this document. This data will be used to supplement the historical data, as necessary to re-assess TCE in Shallow Zone and Upper Intermediate Zone groundwater, to update the FS to identify additional technologies that may be appropriate to remediate the TCE source area, and to inform the ROD prior to its finalization.

1.1.1 2018 PSI Results

The results of the initial PSI field effort that was conducted in 2018 provided a snapshot of subsurface contamination throughout the site, and sampling of groundwater at multiple borings and monitoring wells. Perchlorate, metals, Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), and explosives are considered Contaminants of Concern (COCs) for the LHAAP-47 site, and groundwater samples were analyzed for these contaminants. From historical data, perchlorate and VOCs are known to be the most prominent contaminants at the site. A summary of the initial PSI results and findings is provided below. the results were reported in the PSI Report and detailed tables, figures and discussion are provided in that document (HDR, 2019)

The extent of contamination was re-evaluated based on the results of the initial phase of the PSI. Although extensive contamination remains at the site, the spatial extent of contamination in the Shallow and Intermediate Zone groundwater has changed. The majority of groundwater contamination now occurs within the Upper Intermediate Zone. **Figure 3** and **Figure 4** show the locations of monitoring wells and the extent of VOC and perchlorate plumes in 2018 in the Shallow and Upper Intermediate Zone groundwater, respectively.

The initial PSI conducted in 2018 indicated that a decline in water levels resulted in a large portion of the Shallow Zone going dry (**Figure 5**). As a result, the VOC extent of contamination in the Shallow Zone was substantially reduced when compared to the 2010 results. The contours indicating the extent of contamination in 2010 were presented in the 2011 FS. This change is evident as shown on **Figure 6**, showing the perchlorate plumes identified during previous investigations no longer exist and the TCE plume is much smaller. Based on the 2018 results, the extent of groundwater contamination in the Shallow Zone now consists of a single, small VOC plume in the vicinity of LHSMW44 and LHSMW45. **Figure 3** shows that the maximum extent of VOC contamination in the Shallow Zone is defined by TCE. Vinyl Chloride (VC) and cis-1.2-dichloroethene (DCE) were also detected in Shallow Zone well LHSMW45.

Due to the lack of groundwater in the Shallow Zone, replacement wells for dry Shallow Zone wells were completed through the sand-laminated clay underlying the Shallow Zone and into the Upper Intermediate groundwater zone (this zone is referenced as C/UI Zone) These replacement wells provided additional data points to define the contaminant plumes. Two separate VOC plumes depicted in 2010 (presented in the 2011 FS) are now shown to be connected as a result of analytical data obtained from replacement well 47WW11R (**Figure 7**). The eastward extent of contamination remains similar to that of 2010. The results of replacement wells 47WW11R and LHSMW43R also define the presence of an additional small perchlorate plume not defined by the 2010 data. **Figure 4** shows the maximum extent of VOC contamination in the Upper Intermediate/Intermediate Zone is defined by TCE, with smaller 1,2-

DCE, VC, cis-1,2-DCE, and tetrachloroethene (PCE) plumes within the maximum extent of the TCE plume.

The groundwater gradient in the Intermediate Zone has been verified to flow to the northeast toward Caddo Lake. The identified contaminant plumes reflect this in their orientation and shape.

1.1.2 2019 PSI Results

Soil Results - Eleven soil borings were completed and 33 soil samples were collected during this PSI field effort. All soil samples were analyzed for VOCs using EPA method SW8260B. Soil samples were collected to identify if a TCE source is present and identify the extent of TCE contamination in soil adjacent to Building 46A. This data will be used to supplement the historical data, as necessary, and to re-assess TCE in Upper Intermediate Zone groundwater to inform the ROD prior to its finalization. Through review of historical data, it was determined that the vadose (unsaturated) zone would be defined uniformly as 23 ft bgs. Based on this definition, all except 2 (the shallowest samples from DPT-006 and DPT-011) of the soil samples were collected deeper than 23 ft bgs and are considered to be within the saturated zone. For samples collected from the unsaturated zone, the results were compared to the TCEQ soil medium-specific concentrations (MSCs) for industrial use based on groundwater protection (GWP-Ind). The results for these borings are further discussed in **Section 3.1**, and tables and figures presenting the data are provided as part of that discussion.

Fourteen VOCs were detected at varying concentrations, of these, 10 compounds were detected at low, estimated concentrations. The remaining four VOCs with detectable concentrations above the method detection limit (MDL) included 1,1-DCE, cis-1,2-dichloroethene (cis-1,2-DCE), TCE, and VC. TCE was the most prevalent compound, and detected concentrations ranged from a high of 15.8 milligrams per kilogram (mg/kg) to a low of 0.0039 mg/kg. Boring locations with the highest detected TCE concentrations included DPT-003 (15.8 mg/kg at 29 – 30 ft bgs), DPT-007 (15.6 mg/kg at 31 – 32 ft bgs), DPT-001 (11.8 mg/kg at 27 – 28 ft bgs), DPT-004 (8.37 mg/kg at 28 – 29 ft bgs), DPT-010 (4.1 mg/kg at 32 – 33 ft bgs), and DPT-011 (3.81 mg/kg at 27 – 28 ft bgs). Based on these results, the depth interval with the highest TCE concentrations is between 27 and 33 ft bgs and centered on borings DPT-001, DPT-003, DPT-004, and DPT-007. Of the 2 unsaturated zone samples, the 22-23 ft bgs sample from DPT-011 exceeded the GWP-Ind MSC of 0.5 mg/kg, with a concentration of 1.1 mg/kg. The sample collected from DPT-006 from 20-21 ft bgs had a detected TCE concentration of 0.0684 mg/kg, less than the GWP-Ind MSC.

A more detailed discussion of the 2019 results is presented in **Section 3.1.**

Groundwater results - Groundwater samples were collected from all eleven DPT borings and wells 47WW25R and 47WW37 for VOC analysis, and from DPT borings DPT-001, DPT-005, and DPT-010, and well 47WW09 for 1,4-dioxane analysis. Samples from DPT-001 through DPT-011 and 47WW25R were collected from a screened interval set in the lower part of the laminated clay/sand unit and extended into the Upper Intermediate Zone sand layer (C/UI). All groundwater samples analyzed for VOCs were tested using EPA method SW8260B, while the

1,4-dioxane samples were analyzed using EPA method SW8270D. Sample results were compared to the TCEQ Texas Risk Reduction Program Protective Concentration Level for residential groundwater use ($^{GW}GW_{ing}$) (TRRP PCL) and Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs). Groundwater samples were collected to confirm an anomalously high concentration of TCE reported in well 47WW25R and to assess TCE concentrations in the UI Zone around Building 46A. This data will be used to supplement the historical data, as necessary, and to re-assess TCE in Upper Intermediate Zone groundwater to inform the ROD prior to its finalization.

Six VOCs were detected at varying concentrations, of these, two compounds (acetone and toluene) were detected at low estimated concentrations well below their respective TRRP PCL. The remaining four VOCs included cis-1,2-DCE, methylene chloride, TCE, and vinyl chloride (VC). The compound 1,4- dioxane was detected in one of the four samples collected for analysis. The following discussion focuses on these four compounds and the 1,4-dioxane detection. The VOC TCE was the most prevalent compound detected: all 14 samples analyzed had a detectable concentration above the MDL that exceeded the MCL of 5 µg/L. Concentrations ranged from a low estimated (J) value of 29 J µg/L to a high of 140,000 µg/L. Well 47WW25R had the highest concentrations of TCE at 140,000 µg/L, confirming the sample result from this well during the 2018 PSI (HDR, 2019). Well 47WW37 had a detected concentration of 190 µg/L, higher than the 29.4 µg/L detected in 2010. Well 47WW37 is located approximately 40 feet to the south of 47WW25R and is screened in the Intermediate Zone groundwater at 61 ft bgs. Boring locations with the highest detected concentrations included DPT-007 (77,000 µg/L), DPT-008 (36,000 µg/L), DPT-011 (22,000 µg/L), DPT-010 (18,000 µg/L), and DPT-005 (5,400 µg/L). Based on these results, the highest TCE groundwater concentrations appear to be centered on well 47WW25R and borings DPT-005, DPT-007, DPT-008, DPT-010, and DPT-011. When comparing the groundwater to the soil TCE results, only soil samples taken from DPT-007, DPT-010, and DPT- 011 had relatively high TCE concentrations.

The concentrations of TCE in groundwater near Building 46A are sufficiently high to indicate the possible presence of residual dense non-aqueous phase liquid (DNAPL) within the saturated zone. As noted in *An Introduction to Characterizing Sites Contaminated with DNAPLs* (ITRC, 2003), “one indication of the presence of DNAPL in the saturated zone in a monitoring well with a long well screen (at least 10 ft long), is that the concentration of the contaminant is greater than one to ten percent (1-10%) of the compound’s effective solubility.” Based on this definition, the estimated DNAPL threshold concentration for TCE is 11,000 µg/L. While this “rule of thumb” is not a conclusive indication of DNAPL, the reported concentrations of TCE near Building 46A indicate the potential presence of residual DNAPL. A TCE concentration of 10,000 µg/L was used as a conservative estimate for evaluating the presence of residual DNAPL for the PSI data.

A more detailed discussion of the 2019 results, including tables and figures is presented in **Section 3.2.**

2.0 Field Investigation Activities

This section describes the activities and methods used to perform soil sampling and analyses, groundwater sampling and analyses, surveying, and IDW management and disposal for PSI field activities completed in November 2019 (2019) and between May and July 2020 (2020).

2.1 DPT Advancement: Soil Sampling and Analyses

Soil borings installed in 2019 were advanced using a GeoProbe 7730 DT rig fitted with 5 foot Macro-cores® lined with acetate sleeves and completed at depths between 34 and 44 ft bgs, several feet into the Upper Intermediate Zone sand. Three soil samples were collected from each boring at varying depths and analyzed for VOCs. All soil samples were analyzed by EPA Method SW8260B. Method 8260B is a gas chromatography/mass spectrometry (GC/MS) analytical method used to determine VOCs in a variety of solid waste matrices, and was used by the mobile and stationary labs. Confirmation soil samples (and groundwater) were collected at a rate of 10 percent and sent to a fixed laboratory (MicroBac Laboratories) to correlate the mobile laboratory results. The mobile lab (PACE Analytical) is accredited under the Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) and TCEQ National Environmental Laboratory Accreditation Program (NELAP) programs. The samples were generally collected at the bottom of the upper sand (i.e. Shallow Zone), the middle of the upper clay, and the contact between the base of the clay and top of the lower sand; depths to these contacts varied between boreholes. Note: the middle of the upper clay and base of the clay are within the C/UI Zone.

After the core barrel was advanced to the target depth, the rods and core barrel were removed from the borehole. The acetate sleeve containing the soil core was then removed from the sample barrel and screened using a calibrated photoionization detector (PID). The VOC soil samples were collected using Terra Core™ kits based on the sample depth criteria listed above. Soil cores were then logged using the Unified Soil Classification System Standard Practice for Classification of Soils. Boring logs are provided in **Attachment 3**. A photo log showing the soil cores is provided as **Attachment 6**.

The DPT sampling equipment was decontaminated after each interval to prevent cross contamination. Decontamination water was containerized and disposed at the groundwater treatment plant (GWTP). Excess soil cuttings not collected for a sample were containerized in Department of Transportation approved 55-gallon open-top drums and left adjacent to the borehole until categorized as either hazardous or non-hazardous. One composite sample was collected and analyzed using the toxicity characteristic leaching procedure (TCLP) for VOCs, SVOCs, herbicides, pesticides, and metals/mercury, as well as ignitability, corrosivity, and reactivity; all results came back negative for hazardous characteristics and the soil was spread adjacent to the pertinent boring in accordance with the IWWP.

The DPT borings completed in 2020 were advanced using a GeoProbe 7822DT Rig to between 31 and 51 ft bgs. Twenty-seven borings were drilled and 4 soil samples were collected with the exception of 1 boring, which had 6 samples, and analyzed for selected VOCs in a field laboratory. Ten samples were selected for fixed laboratory analysis for a full suite of VOCs. The same sample collection and decontamination procedures were followed as for the 2019 samples. The 2020 DPT boring logs are provided in **Attachment 3**.

The DPT boring locations for 2019 and 2020, and historic DPT and soil boring locations are presented in **Figure 8**. Details of the DPT boring depths, groundwater zone, and water table elevations are provided in **Table 1 and Table 2**. The list of analytes, number of samples collected, and methods used for both investigations are provided in **Table 3.**

2.2 Temporary Well Installation and Groundwater Sample Collection

Temporary wells were installed at the DPT locations as specified in the *Final Post Screening Investigation Addendum No. 2 Work Plan, LHAAP-47 Building 46A, Plant 3 Area, Solid Rocket Motor Fuel Production, Longhorn Army Ammunition Plant Karnack, Texas* (HDR, 2019a) and *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant* (AECOM, 2014).

Temporary 1-inch polyvinyl chloride (PVC) wells with 10-foot screens and 0.01-inch slot size were installed in each 2019 DPT boring.

For the 2019 field effort, the screens were set at a depth that intercepted the clay unit (C/UI Zone) underlying the Shallow Zone sand extending into the Upper Intermediate Zone sand an average of approximately 5 feet. The well was then allowed to equilibrate over 10 to 24 hours.

One discrete grab groundwater sample was collected from each DPT boring using 0.5-foot bailers. One sample collected at well 47WW25R was collected at a depth consistent with the pump intake depth for the 2018 sample from 47WW25R, that is, at the base of the clay unit (35 ft bgs), while the second sample was collected at 38 ft bgs, two-feet above the boring termination depth. All samples collected from the temporary wells were analyzed for VOCs, while samples collected from DPT borings DPT-001, DPT-005, and DPT-010 were also analyzed for 1,4-dioxane. Groundwater samples were collected from wells 47WW25R and 47WW37 for VOCs analyses, and from 47WW25R and 47WW09 for 1,4-dioxane analysis. Samples collected for 1,4-dioxane analyses were to confirm the compound remains a COC based on historical sampling result at 47WW09 in 2015 of 27.4 ug/L and 47WW25R's high TCE concentration, which is an indicator for the potential presence of 1,4-dioxane.

The wells were purged using low flow techniques using a variable speed submersible bladder pump. IDW purge water was collected in 5-gallon buckets and disposed at the GWTP. Prior to purging the monitoring wells, water level measurements were collected and recorded. Purging was considered complete when measurements of temperature, pH, electrical conductivity, turbidity, dissolved oxygen and redox potential stabilized. Stabilization was defined as follows: 1) temperature ±10% degrees Celsius (°C); 2) pH ±0.1 units; 3) electrical conductivity ±3% micro Siemens/centimeter (µS/cm); 4) turbidity ±10% and <50 Nephelometric Turbidity Units (NTUs); 5) dissolved oxygen ±10% milligrams per liter (mg/L); and 6) redox potential ±10 millivolts (mV). With the exception of turbidity, measurements were collected using an inline flow cell and YSI 556 water quality meter. Turbidity was collected separately using a Hanna turbidity meter. Stabilization parameters and purge volumes from each well were recorded and are provided in **Attachment 4**.

For the 2020 DPT borings, shallow temporary wells were installed first to the target depth and samples collected. The DPT rig was then offset several feet and subsequently the Upper Intermediate borings were advanced. The Upper Intermediate Zone temporary wells were installed using a dual tube method to ensure that the Shallow Zone would be isolated from the deeper zone. For the Upper Intermediate Zone temporary wells, the larger diameter set of rods

was driven through the confining clay unit into the Upper Intermediate Zone sand to serve as an outer casing. Temporary 1-inch PVC wells with 10 foot screens and 0.01-inch slot size were then installed inside the inner rod. The inner rod was then pulled back to expose only the length of screen that penetrated into the Upper Intermediate Zone sand layer and at least one foot below the overlying confining clay unit. The exposed screen lengths are indicated in **Table 2**.

Borings with both Shallow and Upper Intermediate Zone temporary wells included DPT-015, DPT-016, DPT-017, DPT-018, DPT-019, DPT-020, DPT-021, DPT-022, DPT-023, DPT-024, DPT-026, DPT-028, DPT-029, DPT-032, DPT-033, and DPT-035. Several temporary wells in the Shallow zone were dry and samples were not collected; these include borings DPT-014, DPT-018, DPT-020, DPT-021, DPT022, DPT-028, DPT-036 and DPT-038. Borings with solely Shallow zone temporary wells include DPT-012, DPT-013, DPT-014, DPT-025, DPT-027, DPT-030, DPT-030, DPT-031, DPT-034, DPT-036, and DPT-037. **Table 2** presents the 2020 temporary well installation details. Groundwater samples were collected from each screened interval and analyzed in a field laboratory for selected VOCs. Four samples were collected and submitted for fixed laboratory analysis for the full suite of VOCs (refer to **Table 3**).

2.3 Monitoring Well Installation

Eight monitoring wells were installed between 23 June and 16 July 2020. Four wells were installed in the Shallow Zone, and 4 in the Upper Intermediate Zone. The Work Plan specified that the Upper Intermediate Zone wells were to be completed so that the top of the open interval was no less than one foot below the sand-laminated clay. Per the Work Plan, one Shallow Zone well was to be installed to replace 47WW25R and completed several feet into the underlying clay no deeper than two feet above the Upper Intermediate Zone sand; five Upper Intermediate Zone wells were to be installed to a maximum depth of 50 ft bgs with the top of the screens a minimum of 2 feet below the clay unit (a minimum of one, but up to two of these Upper Intermediate Zone wells were planned to be installed as Shallow Zone wells depending on data results); one Intermediate Zone well was to be installed to approximately 60 ft bgs; and one deep well was to be installed to 120 ft bgs. Based on discussions during the field investigation, agreement was reached with TCEQ and EPA that 4 Shallow Zone, 4 Upper Intermediate Zone wells would be installed rather than the planned depths identified in the Work Plan.

Shallow Zone wells include 47WW48, 47WW49, 47WW52, and 47WW55, while Upper Intermediate Zone wells include 47WW50, 47WW51, 47WW53, and 47WW54. Monitoring well 47WW25R was abandoned, replaced by 47WW49. The exploratory borings were advanced to identify depth of the underlying clay layer to determine well depths. The new and existing monitoring well locations are shown on **Figure 9**.

Monitoring wells 47WW48 through 47WW53 and associated exploratory borings were drilled using the Geoprobe 3230DT Hollow Stem Auger (HSA) rig. Monitoring wells 47WW54 and 47WW55 were drilled using the Geoprobe 8150LS sonic rig. The monitoring wells were installed in the annulus of the HSA of the 3230DT rig and inside the telescoping drill stem of the sonic rig to limit any drag-down of contamination. Well installation and development was performed following the procedures specified in the IWWP (AECOM, 2014). The well drilling and completion logs and well registration forms are provided in **Attachment 3**.

Each well was constructed with flush-joint threaded, schedule 40 PVC. The PVC well screen was constructed with 0.01 inch slots and were 10 feet in length, for the Shallow Zone wells. Five-foot screens were installed in Upper Intermediate Zone wells 47WW50, 47WW51, 47WW53, and 47WW54. The 5 foot screens were installed to monitor the upper part of the Upper Intermediate Zone and were placed in the sand unit underlying the multi-layered clay/silt layer separating the Shallow and Upper Intermediate Zones. A threaded PVC bottom cap was secured to the bottom of the screen interval. Solid PVC casing was installed from the top of the screen interval to approximately three feet above surface grade. A filter pack consisting of clean silica sand (20 to 40 size) was placed in the auger or drill stem annulus from the well bottom to approximately two feet above the screen interval. A two to three foot thick bentonite seal (pellets or chips) was placed above the sand filter pack and hydrated with portable water. The annular space from the top of the bentonite seal to the surface was filled with a bentonite-cement grout.

For the Intermediate Zone wells, the Shallow Zone groundwater was isolated using a suitable diameter schedule 40 PVC casing. The casing was installed from the surface grade to the top of the clay unit separating the Shallow Zone and Upper Intermediate Zone. The depths to the clay units were between 30 and 37 ft bgs. Upon grouting and setting of the surface casing, drilling proceeded into the intermediate zone.

The drilling equipment was decontaminated prior to the arrival at the site and between wells. Upon completion of drilling activities the drilling equipment was decontaminated prior to demobilizing and leaving the installation. Decontamination water was containerized and disposed at the GWTP. Excess soil cuttings not collected for a sample were containerized in Department of Transportation (DOT) approved 55-gallon open top drums and left adjacent to the borehole until categorized as either hazardous or non-hazardous.

Well surface completions were constructed for each monitoring well installed. Surface completion consists of a protective steel casing, with a hinged, lockable lid set in a concrete pad. Concrete-filled steel bollards were installed at the corners of the concrete pads. The monitoring wells and surface completions were installed in accordance with State of Texas requirements by a drilling subcontractor (Walker-Hill) licensed in the State of Texas. The monitoring wells comply with applicable technical requirements of 30 Texas Administrative Code (TAC) Chapter 76. State of Texas Well Reports were submitted to the Texas Department of Licensing and Regulation for each well installed. **Table 4** presents the monitoring well installation details.

Well development was performed by pumping and gentle surging of the screened interval. A minimum of three well borehole volumes of water was removed. The volume of groundwater removed from each well was calculated from the static water level measurement referenced from the top-of-casing. An electronic interface probe was used to measure the water levels.

Water quality parameters (temperature, pH, electrical conductivity, dissolved oxygen, and turbidity) were monitored during development. Development continued until the water quality parameters stabilized and the water was visually clear. Decontamination water was containerized and disposed at the GWTP.

One groundwater sample was collected from each newly installed well and sent to a fixed laboratory for analysis. The wells were purged using low flow techniques. Prior to purging the

monitoring wells, water level measurements were collected and recorded. Purging was considered complete when measurements of temperature, pH, electrical conductivity, and turbidity stabilized. Stabilization was defined as follows: 1) temperature ±10% °C; 2) pH ±0.1 units; 3) electrical conductivity ±3% µS/cm; and 4) turbidity ±10%. With the exception of turbidity, measurements were collected using an inline flow cell. Turbidity samples were collected separately and measured using a turbidity meter. Purge volume from each well was recorded. Again, purge water was containerized and disposed at the GWTP.

Once the groundwater samples were collected they were sent to the analytical laboratory (Microbac Laboratories, Inc.) for analysis of VOCs utilizing EPA Method SW8260B. Sample collection and handling was conducted in accordance with the IWWP (AECOM, 2014). The low-flow sampling logs are provided in **Attachment 4**.

2.5 Well Abandonment

After sampling, well 47WW25R was plugged and abandoned on June 16, 2020 in accordance with the District Rules, Pineywoods Groundwater Conservation District and pertinent requirements of 30 TAC 76.1004 and 30 TAC 76.1005. The well was open a few feet into the overlying clay confining unit (C/UI), which is believed to contain residual TCE DNAPL. Therefore, concentrations of TCE observed at 47WW25R may not be representative of groundwater in the Upper Intermediate Zone and the potential for cross contamination existed, and abandoning the well was deemed necessary. In general, the well was abandoned in place by grouting from bottom to top with a cement-bentonite grout. When completed, a well abandonment report and notice required by the Texas Water Development Board and Texas Department of Licensing and Regulation was prepared and submitted. The well abandonment documentation is provided in **Attachment 3**.

2.4 Surveying

HDR collected the horizontal coordinates (northing and easting) at each borehole location using a Trimble Global Positioning Unit. The data, based on the North American Datum of 1983, was used to develop geospatially referenced site maps and to update existing cross-sections provided in **Attachment 1**.

A professional land surveyor licensed in the State of Texas surveyed the locations and elevations of the newly installed monitoring wells. The horizontal coordinates (northing and easing) of the wells were surveyed to the nearest foot based on the North American Datum of 1983. The vertical elevations of the top of the wells (top-of-casing) were based on the North American Vertical Datum of 1988 and were surveyed to the nearest 0.01 feet at a reference point (i.e., groove or marking on the north side of the well casing) used to collect water level measurements. The ground surface elevation at each well location was surveyed to the nearest 0.1 foot.

3.0 Investigation Findings

3.1 Soil Sample Results

Eleven DPT borings were completed and soil samples collected during the 2019 field activities. Soil sample locations and collection procedures described in the IWWP (AECOM, 2014) and *Final Post Screening Investigation Addendum No. 2 Work Plan, LHAAP-47 Building 46A, Plant 3 Area, Solid Rocket Motor Fuel Production, Longhorn Army Ammunition Plant Karnack, Texas* (HDR, 2019a). Based on the results, additional borings were determined necessary to delineate the extent of VOC contamination in the vicinity of Building 46A, so an additional 27 DPT borings were completed and soil samples collected during the 2020 field activities as described in the *Final Post Screening Investigation Addendum No. 2 Work Plan Addendum for LHAAP-47, Plant 3 Area* (HDR, 2020). This data will be used to supplement the historical data, as necessary, and to re-assess TCE in Shallow Zone, C/UI, and Upper Intermediate Zone groundwater to inform the ROD prior to its finalization.

Existing data were evaluated to determine the historical depth to groundwater and depth of the unsaturated zone. A uniform depth of 23 ft bgs was determined to represent the depth of the unsaturated zone soil to be used to evaluate the PSI data. Soil samples were collected from both the saturated and unsaturated zone during the PSI No. 2 investigations, however only the results from less than 23 ft bgs are considered to represent unsaturated soil and the results were compared with the GWP-Ind MSC to identify locations with exceedances. Since the samples from depths greater than 23 ft bgs are within the saturated zone, those results are considered to be associated with groundwater contamination. **Figure 8** shows all Addendum 2 DPT locations, and the results are shown on **Figure 10**.

3.1.1 2019 Soil Sample Results

Eleven soil borings were completed and 33 soil samples collected during the 2019 field investigation (**Figure 10**). All soil samples were analyzed for VOCs using EPA method SW8260B. Sample results from depths to 23 ft bgs were compared to the TCEQ MSCs for industrial use, GWP-Ind. Soil samples were collected to identify if a TCE source is present and identify the extent of TCE contamination in soil adjacent to Building 46A.

Fourteen VOCs were detected at various concentrations, of these, 10 compounds were detected at low estimated concentrations. The remaining four VOCs with detectable concentrations above the MDL included 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), TCE, and vinyl chloride. The following discussion focuses on these four compounds.

Trichloroethene was the most prevalent compound detected: 24 out of 33 samples analyzed had a detectable concentration above the MDL, while another 5 samples had estimated values. The remaining 14 detections were from the saturated zone soil samples ranged from a high of 15.8 mg/kg to a low of 0.000894 mg/kg. Boring locations with the highest detected concentrations included DPT-003 (15.8 mg/kg at 29 – 30 ft bgs), DPT-007 (15.6 mg/kg at 31 – 32 ft bgs), DPT-001 (11.8 mg/kg at 27 – 28 ft bgs), DPT-004 (8.37 mg/kg at 28 – 29 ft bgs), DPT-010 (4.1 mg/kg at 32 – 33 ft bgs), and DPT-011 (3.81 mg/kg at 27 – 28 ft bgs). Based on these results, the depth interval with the highest TCE concentrations are within the saturated soil in the clay unit between 27 and 33 ft bgs and centered on borings DPT-001, DPT-003, DPT-

004, and DPT-007. This is the clay with fine sand lamination above the Upper Intermediate Zone. As shown in the boring logs in **Attachment 3**, the lithology for this depth range is predominantly clay, interspersed with thinner lenses of sand and silt.

The VOCs 1,1-DCE, cis-1,2-DCE, and vinyl chloride were all detected at concentrations above their respective MDLs. Cis-1,2-DCE was the second most prevalent VOC detected in soil samples. In the saturated zone samples, cis-1,2-DCE concentrations ranged from a low of 0.00426 mg/kg to a high of 0.285 mg/kg. Vinyl chloride was detected in 11 samples above the MDL, with a range between 0.00456 mg/kg and 0.0103 mg/kg. The VOC 1,1-DCE was reported in 16 samples at concentrations that ranged from a low of 0.00188 mg/kg to a high of 0.00894 mg/kg.

Two of the samples, the shallowest samples from DPT-006 (0.0684 mg/kg) and DPT-011 (1.1 mg/kg) were collected from depths less than 23 ft bgs and are from the unsaturated zone. The DPT-011 sample had TCE concentrations that exceeded the GWP-Ind of 0.5 mg/kg. In addition to TCE, cis-1,2-DCE was detected in the two unsaturated zone samples at concentrations well below the GWP-Ind MSC. No other VOCs were detected in the unsaturated zone samples.

Fixed laboratory analytical results for the soil samples are presented in **Table 5**, while the raw analytical data packages and data validation report are provided in **Attachment 5**. Note: Soils were analyzed without dilution, and reanalyzed at dilution for high concentration analytes. The undiluted soil reporting limits (as Levels of Quantitation (LOQs)) were below the project action limits (PALs), which are the TCEQ GWP-Ind MSC. The laboratory data files provided in **Attachment 5** include additional details for the analyses, including sample-specific dilution factors, detection limits, limits of quantitation and detection, quality control samples and results, and other analytical information such as extraction and analysis dates.

3.1.2 2020 Soil Sample Results

Twenty seven soil borings were completed during the 2020 field effort. Four samples were collected from each boring with the exception of DPT-027 which had 6 samples collected. In total, 110 soil samples were collected and analyzed during the 2020 field effort. All soil samples were analyzed in a field laboratory for 8 selected VOCs using EPA method SW8260B. Ten samples were selected for fixed laboratory analysis by EPA Method SW8260B. Results for samples collected from the unsaturated zone (up to 23 ft bgs) were compared to the TCEQ soil MSCs for industrial use based on groundwater protection, GWP-Ind. The DPT boring locations expanded outward in all directions from the 2019 DPT locations, primarily to the north and east. The initial 2020 boring locations were selected based on the results from samples collected from the 2019 borings, and the subsequent locations were selected based on review of the field analysis results with concurrence of the regulators. The objective of these borings was to further define the extent of TCE contamination and to determine if the unsaturated soil (depths less than 23 ft bgs) overlying the historical high groundwater levels in the Shallow Zone in this area have been impacted. TCE is the target compound and is the primary focus of the discussion of results and represented in figures. The analytical results for the 2020 soil samples are provided in **Table 5** (fixed laboratory results) and **Table 6** (field laboratory results). The TCE results and boring locations are shown on **Figure 10**.

TCE and cis-1,2-DCE were the only analytes detected in the field laboratory results. Cis-1,2-DCE was detected in 6 unsaturated zone samples, with concentrations ranging from 0.034

mg/kg to 0.074 mg/kg, well below the GWP-Ind MSC of 7 mg/kg. TCE was detected in 20 unsaturated zone samples from 9 borings, with concentrations ranging from 0.027 mg/kg to 16 mg/kg. Ten of the reported concentrations from 5 borings exceeded the GWP-Ind MSC of 0.5 mg/kg.

DPT-013 was located within the existing extent of saturated zone TCE contamination determined based on the 2019 DPT results. The sample from 20-21 feet bgs had a TCE concentration of 0.5 mg/kg. This boring was located near DPT-007 that was completed in 2019, and showed one of the highest concentrations reported to date of 15.6 mg/kg at 31-32 ft bgs. DPT-012 and DPT-014 were also located within the previously identified area of contamination near Building 46A and were adjacent to previous saturated zone borings DPT-003 and DPT-011. TCE was not detected in the unsaturated zone samples from either of these borings. The 25-26 ft sample from DPT-014 showed TCE at 0.63 mg/kg, less than the concentrations reported in the DPT-011 samples from this depth range (between 1.1 mg/kg and 3.81 mg/kg). The results for DPT-013 indicated that there are TCE concentrations at the MSC in the unsaturated zone overlying higher TCE concentrations in the saturated zone.

Other borings with unsaturated zone sample exceedances included DPT-030 and DPT-031, both located to the southwest of Building 46A. The exceedances in DPT-030 occurred in samples collected from shallower depths, 16 mg/kg in the 10-11 ft bgs sample, and 7.9 mg/kg in the 15-16 ft bgs sample. TCE was not detected in the two deeper samples from this boring. DPT-031 was located further southwest of DPT-030 and Building 46A and showed increasing concentrations with depth, from .065 mg/kg and .027 mg/kg in the samples from 3-4 ft bgs and 12-13 ft bgs. The sample from 16-17 ft bgs showed TCE at 0.560 mg/kg, and the deepest sample from 21-22 ft bgs showed TCE at 2.0 mg/kg. These results extend the area of TCE contamination to approximately 100 ft to the south/southwest of Building 46A.

The remaining 2 borings that had unsaturated zone samples with TCE concentrations exceeding 0.5 mg/kg included DPT-028, and DPT-033, located east and northeast of Building 46A. The exceedances in these borings indicate that the extent of TCE contamination exceeding the GWP-Ind MSC extends approximately 200 ft further to the east/northeast of the previously defined extent. DPT-028 and DPT-033 had TCE concentrations greater than 0.5 mg/kg in one or two of the deepest samples from each boring, DPT-028 had TCE detected in all 4 samples, but only the two deepest samples from 16-17 ft bgs and 21-22 ft bgs samples had concentrations that exceeded 0.5 mg/kg (1.3 mg/kg and 3.3 mg/kg, respectively). DPT-033 had TCE reported at 0.52 mg/kg in the 19-20 ft bgs sample and 1.7 mg/kg in the 22-23 ft bgs sample.

The remaining outlying DPT borings in all directions from Building 46A did not have TCE detected or the reported concentrations in the unsaturated zone were less than 0.5 mg/kg, and the extent of TCE concentrations exceeding the GWP-Ind MSC of 0.5 mg/kg has been defined. The highest TCE concentrations reported in the unsaturated soil are orders of magnitude less than the EPA guidance that concentrations of chemicals in soil greater than 1% by mass or 10,000 mg/kg may indicate the presence of DNAPL (EPA, 1994). This indicates that there is not a point source of residual TCE DNAPL in the unsaturated zone, or that it is a small, localized area not located by the DPT borings.

Saturated zone samples were collected from 7 borings, and TCE was reported in 6 of these samples, the deepest samples from each boring, at concentrations ranging from 0.069 mg/kg to 15 mg/kg. The highest concentration of 15 mg/kg was reported in the 32-33 ft bgs sample from DPT-018. The unsaturated zone samples in this boring all had TCE detected at much lower concentrations (0.058 mg/kg to 0.47 mg/kg). Cis-1-2-DCE was also detected in 5 of these saturated zone samples, with concentrations ranging from 0.032 to 0.480 mg/kg. The TCE detected in these borings was the only sample where TCE was detected or was the highest concentration reported in each boring.

The unsaturated zone soil sample TCE results and contour showing the extent of GWP-Ind MSC exceedances are shown on **Figure 11** and the saturated zone TCE results are shown on **Figure 12**. The posted results on **Figure 11** and **Figure 12** are the highest reported field laboratory concentrations for each boring in the unsaturated and saturated zones, respectively. As shown on **Figure 11**, the extent of GWP-Ind MSC exceedances indicates an elongated area of contamination approximately 500 ft long extending from southwest of Building 46A to the northeast of the building. Most of the concentrations only slightly exceed the MSC, with a few isolated locations of higher concentrations (greater than 10 mg/kg). These isolated locations may represent source areas from spills, sumps, or dumping. An additional consideration is that the shape of the exceedance area follows the general direction of groundwater flow and indicates that the soil contamination may represent a smear zone of soil contamination that remained as groundwater levels dropped. The results for the outlying samples (e.g. DPT-030 and DPT-031) may also indicate there are additional sources of TCE southwest of Building 46A that had not been previously identified.

3.2 Groundwater Sample Results

During the 2019 and 2020 field activities, groundwater samples were collected from temporary wells and monitoring wells to confirm an anomalously high concentration of TCE reported in well 47WW25R, to define the extent of residual DNAPL, and to assess the extent of TCE concentrations around Building 46A. This data will be used to supplement the historical data, as necessary, and to re-assess TCE in Upper Intermediate Zone groundwater to inform the ROD prior to its finalization.

The groundwater results presented in this section have been compared to SDWA MCLs, where they exist. Where an MCL has not been promulgated, the TRRP Tier 1 Groundwater PCL (TRRP PCL) comparison levels were used.

3.2.1 Groundwater Elevations and Cross Sections

Geologic cross sections were prepared to represent the lithology of the Shallow and Intermediate Zones, contacts between lithologic units, depths where soil and groundwater samples were collected, and groundwater elevations for both zones. Cross sections were prepared for the long axis (A – A') of the plumes, traversing from the southwest to the northeast and smaller perpendicular cross sections traversing from the northwest to the southeast. The cross sections are shown in **Figure 13** through **Figure 16**. The cross sections show undulating discontinuous silty sand layers across the site, with clay and clay mixed with fine sand, silt, and sandy/silty mixtures, which is the dominant unit in the Shallow Zone. The undulant nature of the sand and clay units is especially evident between the contact between the Shallow Zone bottom clay and the underlying Upper Intermediate sand where the contact depth varies greatly. The

presence of groundwater in the Shallow Zone appears related to sandy units. Several shallow DPT borings and wells completed in the Shallow Zone were either dry or contained a minimal amount of water (i.e., less than one foot). These borings and/or wells were typically screened in, or mostly in, clay units. One example where the shallow zone was dry is DPT-023, where the shallow DPT boring was set across the very shallow sand and into the clay laminated sand, this boring was a very poor producer of groundwater and was left open overnight. It is believed that the groundwater came from the clay laminated sand zone and not the overlying silty sand, sand clay mixture, resulting in a lower water table. It is possible that there are confining conditions and that there is a vertical gradient as a result. This would explain the differences in measured water elevations. All Upper Intermediate Zone DPT borings and wells contained groundwater ranging in depth below ground surface between 26 and 29 ft bgs. Higher groundwater elevations in the Upper Intermediate Zone were associated with borings/wells where the Upper Intermediate Zone sand was encountered closer to the ground surface. The direction of groundwater flow is to the northeast in both the Shallow and Upper Intermediate Zones; generally in agreement with previous findings (**Figure 17** and **Figure 18**).

3.2.2 2019 Groundwater Sampling and Results

Groundwater samples were collected from all eleven DPT borings and wells 47WW25R and 47WW37 for VOC analysis, and from DPT borings DPT-001, DPT-005, and DPT-010, and well 47WW09 for 1,4-dioxane analysis. All groundwater samples analyzed for VOCs were tested using EPA method SW8260B, while the 1,4-dioxane samples were analyzed using EPA method SW8270D. All eleven DPT borings were screened across the sand-laminated clay underlying the Shallow Zone and into the Upper Intermediate Zone (C/UI) sand unit, confounding evaluation of the results and limiting the ability to determine whether contamination is present through the entire open interval or is from a more limited zone within the interval. Well 47WW25R was also screened across this sand-clay interval into the Upper Intermediate Zone causing the same limitations determining the source of the VOC contamination. Well 47WW37 is screened in the Intermediate Zone, solely, and does not present the same limitations when evaluating the sample results. Six VOCs were detected at varying concentrations, of these, 2 compounds (acetone and toluene) were detected at low estimated concentrations well below their respective TRRP PCL. The remaining four VOCs included cis-1,2-DCE, methylene chloride, TCE, and vinyl chloride. The compound 1,4-dioxane was detected in one of the four samples collected for analysis. The following discussion focuses on these four compounds and the 1,4-dioxane detection.

The VOC TCE was the most prevalent compound detected: all 14 samples analyzed had a detectable concentration above the MDL that exceeded the MCL of 5 µg/L. Concentrations ranged from a low estimated (J) value of 29 J µg/L to a high of 140,000 µg/L.

Well 47WW25R had the highest concentrations of TCE at 140,000 µg/L, confirming the sample result from this well during the 2018 PSI (HDR, 2019b). Well 47WW37 had a detected concentration of 190 µg/L, higher than the 29.4 µg/L detected in 2010. Well 47WW37 is located approximately 40 feet to the south of 47WW25R and is screened in the Intermediate Zone groundwater at 61 ft bgs. Boring locations with the highest detected concentrations included DPT-007 (77,000 µg/L), DPT-008 (36,000 µg/L), DPT-011 (22,000 µg/L), DPT-010 (18,000 µg/L), and DPT-005 (5,400 µg/L). Based on these results, the highest TCE groundwater concentrations appear to be centered on well 47WW25R and borings DPT-005, DPT-007, DPT-

008, DPT-010, and DPT-011. When comparing the groundwater to the soil TCE results, only soil samples taken from DPT-007, DPT-010, and DPT-011 had relatively high TCE concentrations (up to 15.5 mg/kg). However, even the highest concentrations of TCE in soil were much lower than the 10,000 mg/kg suggested threshold for the presence of DNAPL.

The VOC cis-1,2-DCE was detected in 12 samples, seven with concentrations that exceeded the MCL of 70.0 µg/L. Concentrations ranged from a low estimated value of 0.99 J µg/L to a high of 2,600 µg/L.

Well 47WW25R had the highest concentrations of cis-1,2-DCE at 2,600 µg/L, while well 47WW37 had a relatively low value of 13 µg/L. Boring locations with the highest detected concentrations included DPT-011 (1,500 µg/L), DPT-010 (13,000 µg/L), DPT-007 (840 J µg/L), and DPT-008 (820 µg/L). Based on these results, the highest cis-1,2-DCE groundwater concentrations appear to be centered on well 47WW25R and borings DPT-007, DPT-008, DPT-010, and DPT-011, similar to the TCE results. When comparing the groundwater to the soil cis-1,2-DCE results, soil samples taken from DPT-007, DPT-008, DPT-010, and DPT-011 all had relatively high cis-1,2-DCE concentrations. The detection of cis-1,2-DCE, and to a lesser extent vinyl chloride, suggest natural attenuation of TCE.

Methylene chloride was detected in seven samples at estimated concentrations, all of which had concentrations that exceeded the MCL of 5 µg/L. Concentrations ranged from a low estimated value of 6.1 J µg/L to a high of 210 µg/L.

Methylene chloride went undetected in well 47WW25R, while well 47WW37 had a detection of 6.1 J µg/L. Boring locations with the highest detected concentrations included DPT-008 (210 J µg/L), DPT-010 (200 J µg/L), DPT-005 (94 J µg/L), DPT-004 (24 J µg/L), and DPT-003 (23 J µg/L). Based on these results, the highest methylene chloride groundwater concentrations appear to be centered on borings DPT-003, DPT-004, DPT-005, DPT-008, and DPT-010, which has a farther areal extent than the cis-1,2-DCE and TCE plume. When comparing the groundwater to the soil methylene chloride results, only one soil sample taken from DPT-008 had a soil detection.

Vinyl chloride was only detected in the sample collected from boring DPT-010 at an estimated concentration of 97 J µg/L. This concentration exceeded the MCL of 2.0 µg/L. The compound 1,4-dioxane was only detected in well 47WW09 at a concentration of 37 µg/L, which exceeded the TRRP PCL of 9.1 µg/L. Samples collected from borings DPT-001, DPT-005, and DPT-010 did not have detectable concentrations above the MDL.

Fixed laboratory analytical results for TCE and its primary degradation products for the 2019 groundwater samples are presented in **Table 7**, while the raw analytical data package and data validation report are provided in **Attachment 5**. Note: For groundwater samples that were analyzed undiluted, the LOQs were below the PALs, MCL, and TRRP Groundwater PCL except for 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, and 1,2-dibromoethane, as was noted in the data validation report.

Some of the groundwater samples were analyzed at dilutions, which resulted in LOQs for a number of analytes that were above the PALs. However, for all the samples analyzed at dilution, all had TCE results above the PALs, and some of the samples also had methylene chloride, cis-1,2-DCE, and/or vinyl chloride results above the PALs. The samples that were run at dilutions

had been previously analyzed at other dilutions and were reanalyzed at the reported dilutions because the TCE results were within the instrument's calibration curve.

3.2.3 2020 Groundwater Sampling and Results

Groundwater samples were collected from the temporary wells installed in the DPT borings, as well as from existing and newly installed monitoring wells during the 2020 field effort. As described in **Sections 2.2** and **2.3**, temporary wells were installed in all of the DPT borings except for DPT-038. Eight new monitoring wells were installed and sampled, and 6 existing monitoring wells were sampled. The samples collected from all of the temporary and existing monitoring wells were analyzed by EPA Method SW826B for a selected suite of 8 VOCs in the field laboratory. Samples from the newly installed monitoring wells and 4 selected temporary well samples were analyzed for VOCs by EPA Method SW826B in a fixed laboratory. The field laboratory groundwater sample results are presented in **Table 8** and the fixed laboratory results for TCE and its primary degradation products are presented in **Table 7**. **Figure 19** presents the TCE results for the Shallow Zone temporary well and monitoring well samples.

For the Shallow Zone samples, field laboratory results showed TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, PCE, and vinyl chloride were detected in one or more samples. PCE and trans-1,2-DCE were detected in 1 and 4 samples, respectively, and the reported concentrations did not exceed their MCLs. Methylene chloride was detected in one sample at 0.99 µg/L in 47WW48. Methlyene chloride was not detected in any other Shallow Zone monitoring well or temporary well samples. TCE and cis-1,2-DCE were detected most frequently. Thirteen of the temporary well samples and 3 of the existing monitoring well samples had TCE concentrations greater than the MCL of 5 µg/L. The detected TCE concentrations ranged from 6.6 µg/L to 120,000 µg/L. Four of the new monitoring wells are screened in the Shallow Zone (47WW48, 47WW49, 47WW52, and 47WW55) and the samples were analyzed at the fixed laboratory. The TCE concentrations reported in each of these wells also exceeded the MCL, ranging from 2,410 µg/L to 54,100 µg/L.

The highest reported TCE (120,000 µg/L) and cis-1,2-DCE (2,500 µg/L) were reported in 47WW25R, and are consistent with the previously reported concentrations. The other borings located in the immediate vicinity of 47WW25R also had TCE concentrations greater than 10,000 µg/L (DPT-014, 30 feet to the southeast, was dry and could not be sampled). DPT-013, located approximately 20 feet to the northwest had a TCE concentration of 57,000 µg/L, and new monitoring well 47WW49 located adjacent to DPT-013 had a TCE concentration of 10,200 µg/L. The other 2 borings near Building 46A and 47WW25R included DPT-026 (14,000 µg/L) and DPT-012 (21,000 µg/L). DPT-026 is located approximately 60 feet south of 47WW25R and DPT-012 is located approximately 100 feet west/southwest, on the other side of Building 46A.

The remaining DPT borings were placed farther away from Building 46A to define the extent of the TCE plume, and indicated additional possible hot spots or source areas distant from the initially identified hot spot. These include DPT-031 southwest of Building 46A that had a TCE concentration of 41,000 µg/L and DPT-029 to the northeast where TCE was reported at 22,000 µg/L. Monitoring well 47WW48 located adjacent to DPT-031 also had a high TCE concentration of 54,100, similar to the concentration reported in DPT-031. Other borings with TCE concentrations greater than 1,000 µg/L included DPT-027 (3,500 µg/L), DPT-023 (2,500 µg/L), DPT-033 (5,700 µg/L), and DPT-017 (3,000 µg/L). Shallow Zone monitoring well 47WW52, located approximately 50 feet northeast of DPT-023 had a similar TCE concentration of 5,990

µg/L. Monitoring well 47WW55, located adjacent to 47WW54 (Upper Intermediate Zone) and approximately 40 feet north of 47WW52 had a TCE concentration of 2,410 µg/L, indicating decreasing TCE concentrations farther north of the plume center around DPT-029, however concentrations still significantly exceed the MCL.

The overall results for the Shallow Zone temporary wells and monitoring wells show 3 distinct plumes with TCE concentrations greater than the MCL of 5 µg/L, separated by dry zones, as shown on **Figure 19.** The largest plume is centered on Building 46A, with two smaller plumes, one to the east and one north of Building 46A. In addition to indicating the extent of TCE concentrations greater than the MCL, the extent of the areas with TCE concentrations greater than 10,000 µg/L is shown on **Figure 19**. These areas may indicate the presence of residual DNAPL. As noted in *An Introduction to Characterizing Sites Contaminated with DNAPLs* (ITRC, 2003), "one indication of the presence of DNAPL in the saturated zone in a monitoring well with a long well screen (at least 10 ft long), is that the concentration of the contaminant is greater than one to ten percent (1-10%) of the compound's effective solubility." Based on this definition, the estimated DNAPL threshold concentration for TCE is 11,000 µg/L. While this "rule of thumb" is not a conclusive indication of DNAPL, recent concentrations of TCE indicate the potential presence of residual DNAPL. A concentration of 10,000 µg/L is being used as a conservative indicator of the possible presence of residual DNAPL. Based on this definition, there are also 3 separate areas of residual DNAPL in the Shallow Zone. The largest is centered on Building 46A, and the other two are each defined by a single location, DPT-031 to the southwest and DPT-029 to the northeast (**Figure 19**).

The Upper Intermediate Zone temporary wells installed during the 2020 field effort were all constructed as described in **Section 2.2** and are all considered to be isolated from the Shallow Zone and that the sample results to represent the Upper Intermediate Zone (not the C/UI). Although some of the well screens were placed within the C/UI, the exposed screen depths were in the sand unit below the confining clay to ensure that the samples would represent the Upper Intermediate Zone. For the Upper Intermediate Zone groundwater samples, results for the temporary wells and monitoring wells showed that TCE and cis-1,2-DCE were detected most frequently. PCE, 1,2-DCA, and methylene chloride were not detected in any of the field laboratory samples, including 47WW37 that had methylene chloride detected in 2019. Vinyl chloride was detected in one sample (DPT-017 at 7.80 µg/L), and trans-1,2-DCE was detected in 2 samples at concentrations less than the MCL. Some of the groundwater samples were analyzed at dilutions, which resulted in LOQs for a number of analytes that were above the MCLs. However, for all the samples analyzed at dilution, all had TCE results that exceeded the MCL.

The fixed laboratory results also showed TCE and cis-1,2-DCE were most frequently detected. 1,1-DCE was detected in 7 samples, with 1 sample exceeding the MCL of 7 µg/L (47WW48 – 25.4 µg/L). Vinyl chloride was detected in 5 samples, with one result exceeding the MCL of 2 µg/L (47WW48 – 5.93 µg/L). Additional VOCs were detected in the fixed laboratory samples, however most of the detections were in a single sample and none exceeded their respective MCLs or TRRP PCL. **Figure 20** presents the TCE results for the Upper Intermediate Zone temporary wells and monitoring wells.

Three of the highest TCE and cis-1,2-DCE concentrations in Upper Intermediate temporary or monitoring wells were reported in the same or nearby temporary wells that had high Shallow

Zone concentrations. TCE concentrations greater than 10,000 µg/L were reported in DPT-026 (40,000 µg/L) and DPT-029 (11,000 µg/L). Comparison of the Shallow and Upper Intermediate Zone concentrations indicate increasing concentrations with depth at DPT-029. The Upper Intermediate Zone concentrations were less than the corresponding Shallow zone concentrations in the other wells, however, all of these locations indicate the presence of residual TCE DNAPL in both the Shallow and Upper Intermediate Zones.

Three additional Upper Intermediate Zone temporary wells that were dry in the shallow zone had TCE reported greater than 10,000 µg/L, including DPT-018 (41,000 µg/L), DPT-022 (66,000 µg/L) and DPT-028 (11,000 µg/L). It is possible that since some of the shallow zone temporary wells were screened in tight clay soils that they may be been within the saturated zone, but that no water accumulated by the time sampling was attempted. The cis-1.2-DCE concentrations in all of these wells also exceeded the MCL. Collectively these results indicate a residual DNAPL plume that extends from the southeastern corner of Building 46A approximately 300 feet to the north/northeast. **Figure 20** shows the iso-concentration contour indicating the extent of residual TCE DNAPL in the Upper Intermediate Zone.

Six Upper Intermediate Zone temporary wells and 3 monitoring wells had TCE reported at concentrations between 1,000 µg/L and 10,000 µg/L. Three of these locations had no corresponding shallow temporary well samples because the Shallow Zone well was dry (DPT-020, DPT-021, and DPT-028). The remaining Upper Intermediate Zone locations had corresponding Shallow Zone samples. Two of these wells had higher TCE concentrations in the Upper Intermediate Zone than in the corresponding Shallow Zone samples (DPT-023, DPT-035). Concentrations decreased with depth at DPT-033.

Based on the results for the Upper Intermediate Zone temporary wells and monitoring wells, a TCE residual DNAPL plume can be defined except in the north and a small part of the boundary to the east, and the full extent of TCE concentrations that exceed the MCL of 5 µg/L is not bounded by locations where TCE was not detected or was less than 5 µg/L. SB01 and SB02 were borings completed during the initial PSI and these locations were used to bound the extent to the southwest and southeast. The samples from the two Upper Intermediate Zone monitoring wells north of DPT-023 had higher TCE concentrations reported, 5,540 µg/L in 47WW53 and 4,860 µg/L in 47WW54. These wells are located approximately 50 and 100 ft north of DPT-023, which had an Upper Intermediate Zone TCE concentration of 4,400 µg/L, indicating that the extent of TCE is unbounded to the north. **Figure 20** shows iso-concentration contours for TCE in the Upper Intermediate Zone.

There were limited data available for the Intermediate Zone. One existing well, 47WW37 was sampled to provide data for the Intermediate Zone. The TCE concentration was greater than the MCL, 180 µg/L in 47WW37. Monitoring well 47WW37 is located adjacent to 47WW25R, near Building 46A and near the presumed source of TCE. The TCE concentration was 180 µg/L, greater than the MCL but several hundred orders of magnitude less than the concentration reported in the C/UI Zone (120,000 µg/L in the 47WW25R sample). 47WW37 is screened between 56-66 ft bgs, approximately 20 feet deeper than the Upper Intermediate Zone wells. The detected TCE at this depth indicates that the TCE contamination has migrated to depth. Due to the much greater depth than the Upper Intermediate Zone wells, the TCE concentration for this well was not considered representative of the Upper Intermediate Zone and was not used to develop the TCE isoconcentration contours shown on **Figure 20**.

3.2.4 Field/Fixed Laboratory Data Comparison

Ten soil samples were analyzed by both the field and fixed laboratories. TCE was reported in 7 of the 10 samples, and 2 of the field laboratory samples, with the results for DPT-028 (5.88 mg/kg in the 16-17 ft bgs sample) and DPT-030 (59.6 mg/kg in the 10-11 ft bgs sample) exceeding the GWP-Ind MSC of 0.5 mg/kg. These results generally correlate with the field laboratory results for these borings, in that the field laboratory results for these samples also exceeded 0.5 mg/kg, however the field laboratory concentrations were both less than those reported by the fixed laboratory (1.3 mg/kg for DPT-028 and 16.0 mg/kg for DPT-030). The other detected TCE concentrations in the fixed laboratory samples were reported from DPT-029, DPT-021, DPT-020, and DPT-017 at concentrations ranging from 0.005 mg/kg to 0.324 mg/kg. TCE was not detected in any of the corresponding field laboratory samples for these samples. The differences in sample dilution between the fixed and field laboratory results influence the individual sample LOQs and is likely the cause for the difference in detected vs. undetected results. Cis-1,2-DCE was detected at concentrations ranging from 0.001 mg/kg to 0.467 mg/kg in 4 samples, from DPT-017, DPT-021, DPT-028, and DPT-030. All of these samples also had TCE detected, and all concentrations were well below the GWP-Ind MSC of 7.0 mg/kg. Two other VOCs, toluene and bromoform, were detected in one sample each, and the reported concentrations were well below the respective GWP-Ind MSCs.

The relative percent difference (RPD) was calculated for samples that had the analytes detected in both the fixed and field laboratory samples. The RPDs higher than 50% also reflect differences in dilution. **Table 9** presents a comparison of the paired field and fixed laboratory soil sample results.

Four temporary well groundwater samples were analyzed in both the field and fixed laboratory. **Table 10** presents the paired results for groundwater samples analyzed in both the field laboratory and fixed laboratory. TCE and cis-1,2-DCE were both detected in all of the sample pairs. Three of the field/fixed laboratory pairs had similar TCE concentrations, with RPDs less than 10%, while the fixed laboratory result was significantly higher in the samples from DPT-025 (1,510 µg/L vs. 660 µg/L). The cis-1,2-DCE results also showed generally good agreement. Vinyl chloride and methylene chloride were detected at concentrations less than 1 µg/L in the fixed laboratory sample from DPT-025 but were not detected in the field laboratory sample. In general, there was very good correlation between the field and fixed laboratory analytical results. There were several sample pairs where the correlation was lower, but can be attributed to the fixed laboratory analyzing additional diluted samples.

4.0 Investigation Summary

The results of the PSI No. 2 field results are summarized in the following discussion.

4.1 Shallow Zone Groundwater

The Shallow Zone groundwater table in the vicinity of Building 46A occurs at depths between approximately 25 ft bgs and 32 ft bgs. Temporary wells screened at depths shallower than 20 ft bgs were all dry, as were several of the wells screened at depths greater than 23 ft bgs (**Table 1**), the depth determined to represent the historical depth of the unsaturated/saturated zone interface. As shown on **Figure 19**, the dry temporary well locations separate the Shallow Zone TCE plume into 3 distinct plumes, separated by dry zones. Review of the boring logs for the dry wells shows that nearly all of these wells had screens set in the sand-laminated clay. DPT-018, DPT-022 and DPT-036 were the only locations that had screens set nearly exclusively in clay or silty clay, while the other dry locations had sand lenses logged at varying thicknesses. The largest Shallow Zone groundwater plume is centered on Building 46A, with two smaller plumes, one to the east and one to the northeast of Building 46A.

The extent of TCE contamination exceeding the MCL of 5 µg/L in the plume centered on Building 46A is fully defined. The plume is bounded by dry wells or locations with reported TCE concentrations less than the MCL or where TCE went undetected. Results for monitoring wells or soil borings sampled during the initial PSI in 2018 were used to help define the extent of this plume. The extent of the smaller plume to the east, encompassing DPT-033, DPT-017, and DPT-032 is defined except to the northeast. This plume may extend toward 47WW13, however LHSMW50 had a TCE concentration of 0.6 ug/L in 2018, indicating that the reported TCE in 47WW13 may be from a different source. The extent of the northern Shallow Zone plume is defined by dry temporary wells to the south, and 47WW24 to the north, but the extent of the plume in the other directions is not defined. The dry wells separating this plume (DPT-018, DPT-019, DPT-022, DPT-028, and DPT-036) from the other plumes were screened in the sand-laminated clay or in clay and silty clay. The clay-dominated soil conditions may explain the lack of water at these locations and it is possible that water would have been present if the wells had been open for a longer period before attempting to collect samples.

There are 3 areas of residual TCE DNAPL within the Shallow Zone, defined as TCE concentrations greater than 10,000 µg/L. The largest area is near Building 46A, with concentrations reported at 57,000 µg/L in temporary well DPT-013. A smaller area of residual DNAPL is defined within the larger TCE plume and southwest of Building 46A, centered on DPT-031 (41,000 µg/L) and 47WW48 (54,100 µg/L). The third, and smallest area of residual DNAPL is centered on DPT-029 (22,000 µg/L) within the northern Shallow Zone plume. The extent of these three residual DNAPL plumes are defined within the extent of the larger plumes exceeding the MCL. The TCE samples with concentrations indicative of residual DNAPL were taken from intervals with predominantly clay soils, with some interspersed sand lenses within the screened intervals.

4.2 Upper Intermediate Zone Groundwater

The Upper Intermediate Zone groundwater results indicate a single TCE plume defined by TCE concentrations exceeding 5 µg/L that extends from the southeastern corner of Building 46A

toward the north and east (**Figure 20**). The extent of the plume with concentrations exceeding the MCL is defined to the south and southwest, and is partially defined along the estimated northeastern boundary, but is not defined to the southeast, north, and northwest.

The results for 47WW25R and DPT-001 through DPT-011 may represent contamination at least partially contributed by a shallower source in the clay-dominated layer overlying the Upper Intermediate zone and are therefore considered separately from the results for the other Upper Intermediate Zone temporary and monitoring wells. All of these locations are within the larger TCE plume defined by other temporary wells and monitoring wells screened in the Upper Intermediate Zone. Concentrations in samples from 47WW25R and DPT-005, -007, -008, -010 and -011 all exceeded 5,000 µg/L; all except DPT-005 had sample concentrations exceeding 10,000 µg/L.

A single residual DNAPL plume is defined within the larger plume, and extends from DPT-026 in the south to DPT-028 and DPT-029 to the northeast and north. TCE concentrations in samples collected from these wells screened solely in the Upper Intermediate Zone ranged from 11,000 µg/L in DPT-028 and DPT-029 to 66,000 µg/L in DPT-022. Unlike the Shallow Zone residual DNAPL plumes, these results were reported in samples taken from the sand unit underlying the clay-dominated unit separating the Shallow and Upper Intermediate Zones. The estimated southern extent of the residual DNAPL is defined by DPT-026 with a TCE concentration of 40,000 µg/L.

One confounding result is for 47WW50, located near 47WW25R. This well is screened from 45 ft bgs to 50 ft bgs that had a TCE concentration of 471 µg/L, and is screened deeper than any of the C/UI wells (DPT-005, screen interval 24-34 ft bgs, and DPT-007, screen interval 26-36 ft bgs) in the vicinity. This result suggests that the dissolved phase concentrations from the residual DNAPL decrease with depth. This is supported by comparison with the concentration of 10,200 µg/L that was reported in nearby Shallow Zone well 47WW49 (screen interval 19-29 ft bgs).

The highest concentration of TCE that has been reported was from 47WW25R and several of the other highest concentrations were reported in samples from the nearby C/UI temporary wells as noted above. These combined results indicate the primary TCE source is centered in this area and has migrated to the northeast, consistent with the groundwater flow direction, however there is uncertainty about the depth of the source since the high concentrations in the Upper Intermediate Zone wells may reflect cross-contamination from the C/UI wells or long-term migration from the overlying clay unit.

4.3 Soil

The unsaturated zone soil results indicate an area of contamination with TCE concentrations exceeding the GWP-Ind MSC of 0.5 mg/kg (**Figure 11**) that generally overlies the extent of the Shallow Zone groundwater plume centered on Building 46A and the smaller plume to the northeast, trending from southwest of Building 46A to the northeast. The field laboratory sample results are shown on **Figure 11**, and represent the highest concentration reported in the unsaturated zone for each boring. The field laboratory results are shown since all samples were analyzed and provide a complete data set while the fixed laboratory analysis was performed for only a subset of samples. The extent of unsaturated soil contamination is defined by locations

where TCE was not detected or was less than 0.5 mg/kg. TCE concentrations for the soil exceedances ranged from 0.5 mg/kg to 16 mg/kg. Except for the high concentration of 16 mg/kg reported in DPT-030, all other exceedances ranged from 0.5 to 3.3 mg/kg. The shallow zone well at DPT-30 was dry, and no Upper Intermediate Zone well was installed, so no conclusion can be drawn about whether the high concentration in the unsaturated soil may have impacted groundwater.

The highest TCE concentrations reported in soil are orders of magnitude less than the EPA guidance that concentrations of chemicals in soil greater than 1% by mass or 10,000 mg/kg may indicate the presence of DNAPL (EPA, 1994). The reported TCE concentrations in both unsaturated and saturated soil do not identify a potential DNAPL source, indicating that the TCE source may be a small, localized point source not identified by DPT boring locations.

The unsaturated soil results indicate that TCE concentrations exceed the GWP-Ind MSC overlying a portion of the residual DNAPL plumes, but unsaturated soil TCE concentrations in the DPT borings with Shallow Zone groundwater concentrations indicative of residual DNAPL were not detected or were less than the MSC in DPT-012 and DPT-026, and 0.5 mg.kg in the DPT-013 sample. These three DPT borings define the extent of the Shallow Zone groundwater residual DNAPL plume near Building 46A. The unsaturated soil sample results were not detected for all depths sampled in DPT-029, the residual DNAPL location in the northern plume. The third area of residual DNAPL in groundwater is defined near DPT-031.The unsaturated soil concentrations in DPT-031 increased with depth to a maximum of 2 mg/kg in the 21-22 ft bgs sample. These results may indicate a potential source area that has impacted groundwater, however the soil concentration is still much lower than what would be expected to represent DNAPL in soil. The results for DPT-030 and DPT-031 may also indicate an additional source southwest of Building 46A that was not previously identified.

Since the overall extent of the unsaturated soil TCE contamination overlies a portion of the maximum extent of the Shallow Zone groundwater plumes, the area may be generally considered to reflect a dispersed source area, but the relatively low concentrations throughout the area do not indicate a significant point source that is impacting groundwater, and most exceedances are limited to depths just above the historical saturated depth or are isolated in lateral extent where exceedances are present at shallower depths.

Most of the highest (greater than 10 mg/kg) TCE concentrations reported in the saturated soils coincide with the Shallow Zone residual DNAPL plume extent around Building 46A (saturated soil results are shown on **Figure 12,** residual DNAPL plumes are shown on **Figure 19**). The field laboratory sample results are shown on **Figure 12**, and represent the highest concentration reported in the saturated zone for each boring. The field laboratory results are shown since all samples were analyzed and provide a complete data set while the fixed laboratory analysis was performed for only a subset of samples. Locations outside of this plume with higher saturated soil concentrations include DPT-001 at the northern end of Building 46A, just outside of the Shallow Zone residual DNAPL plume. The other saturated zone soil sample with the highest reported TCE concentrations was from DPT-018 to the northeast of Building 46A and overlies the Upper Intermediate Zone residual DNAPL plume. These isolated soil hot spot areas may be targeted for further investigation and possible remediation as part of the Remedial Design process.

5.0 References

AECOM, 2012. AECOM Technology Inc. (AECOM), 2012. Final Proposed Plan for LHAAP-47, Plant 3 Area, Longhorn Army Ammunition Plant, Texas, December.

AECOM, 2013. Draft Final Record of Decision, LHAAP-47, Longhorn Army Ammunition Plant, Karnack, Texas. July

AECOM, 2014. Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant, Karnack, Texas, July.

AECOM, 2016. Draft Final Post Screening Investigation Work Plan LHAAP-47, Plant 3 Area. Longhorn Army Ammunition Plant, Karnack Texas. December.

HDR, 2019a. Final Post Screening Investigation Addendum No. 2 Work Plan, LHAAP-47 Building 46A, Plant 3 Area, Solid Rocket Motor Fuel Production, Longhorn Army Ammunition Plant Karnack, Texas. October.

HDR, 2019b. Final Post Screening Investigation Report, LHAAP-47, Longhorn Army Ammunition Plant, Karnack, Texas, March 2019.

HDR, 2020 Final Post Screening Investigation Addendum No. 2 Work Plan Addendum, LHAAP-47 Building 46A, Plant 3 Area, Solid Rocket Motor Fuel Production, Longhorn Army Ammunition Plant Karnack, Texas, May.

IRTC, 2003 An Introduction to Characterizing Sites Contaminated with DNAPLs. September.

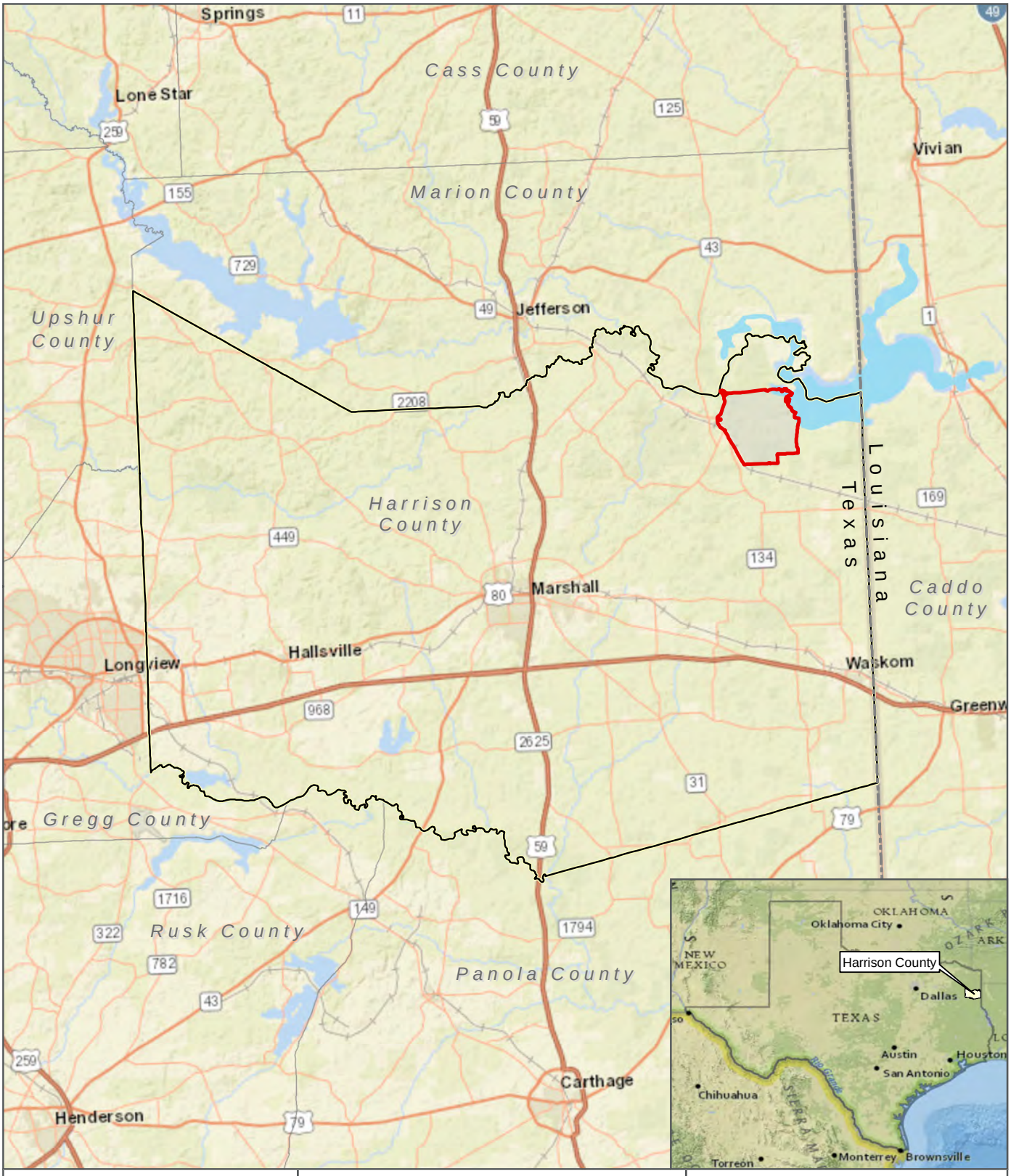
Shaw, 2011. Final Feasibility Study LHAAP-47, Plant 3 Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas. July 2011.

U.S. Environmental Protection Agency (EPA), 1994. DNAPL Site Characterization. OSWER Publication 9355.4-16FS.

Attachment 1

Figures

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MILES

LEGEND

- LHAAP Installation Boundary
- Harrison County
- State Boundary

SITE LOCATION

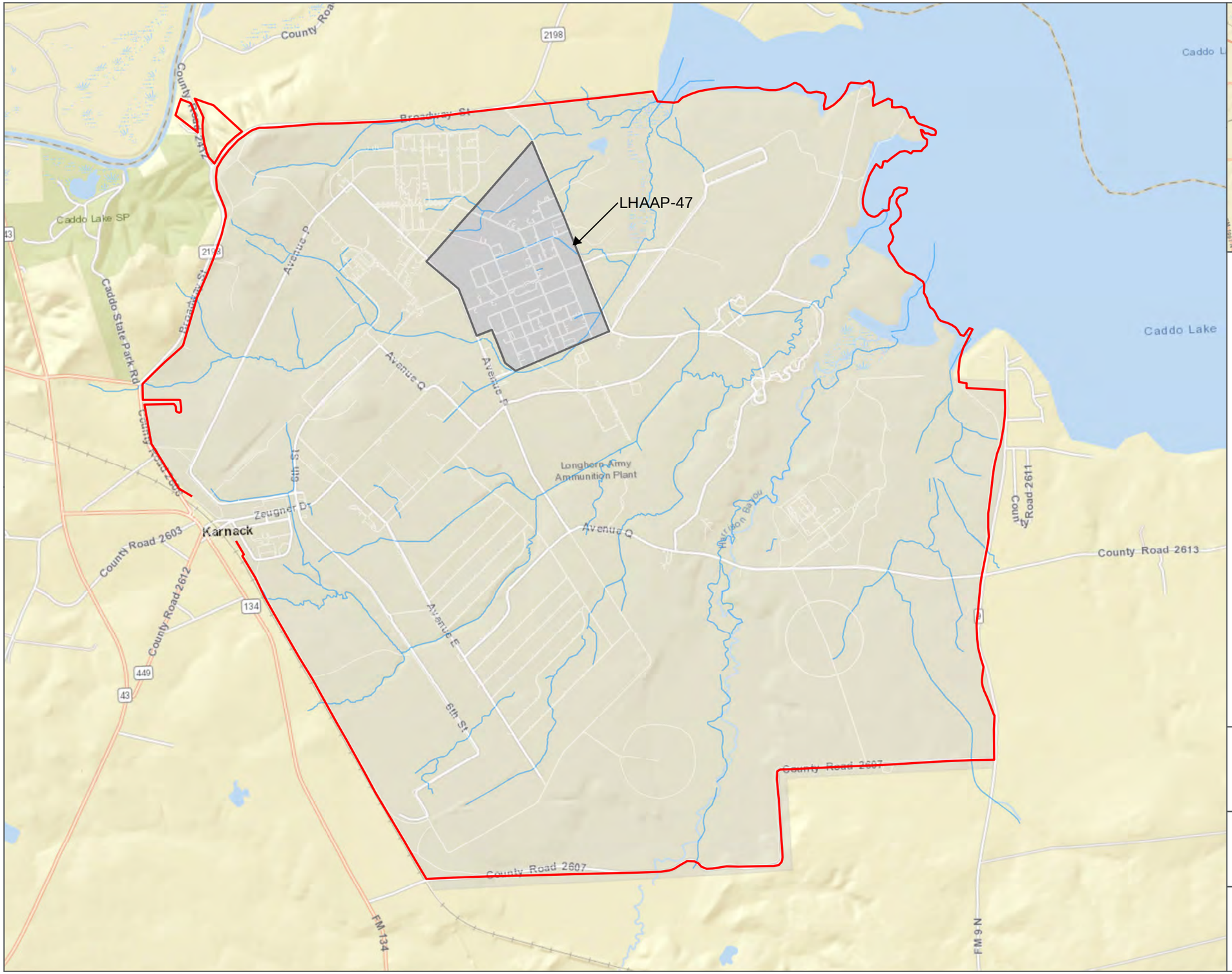
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

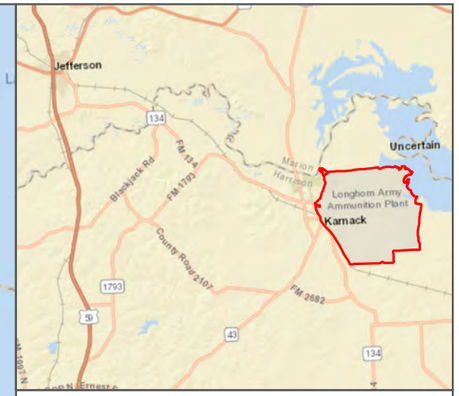
DATA SOURCES: USACE 2011, LHAAP-16 Record of Decision

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

FIGURE 1

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LEGEND

- LHAAP Installation Boundary
- Site
- Road
- Stream

DATA SOURCES: ESRI

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

LHAAP-47 SITE MAP

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

N

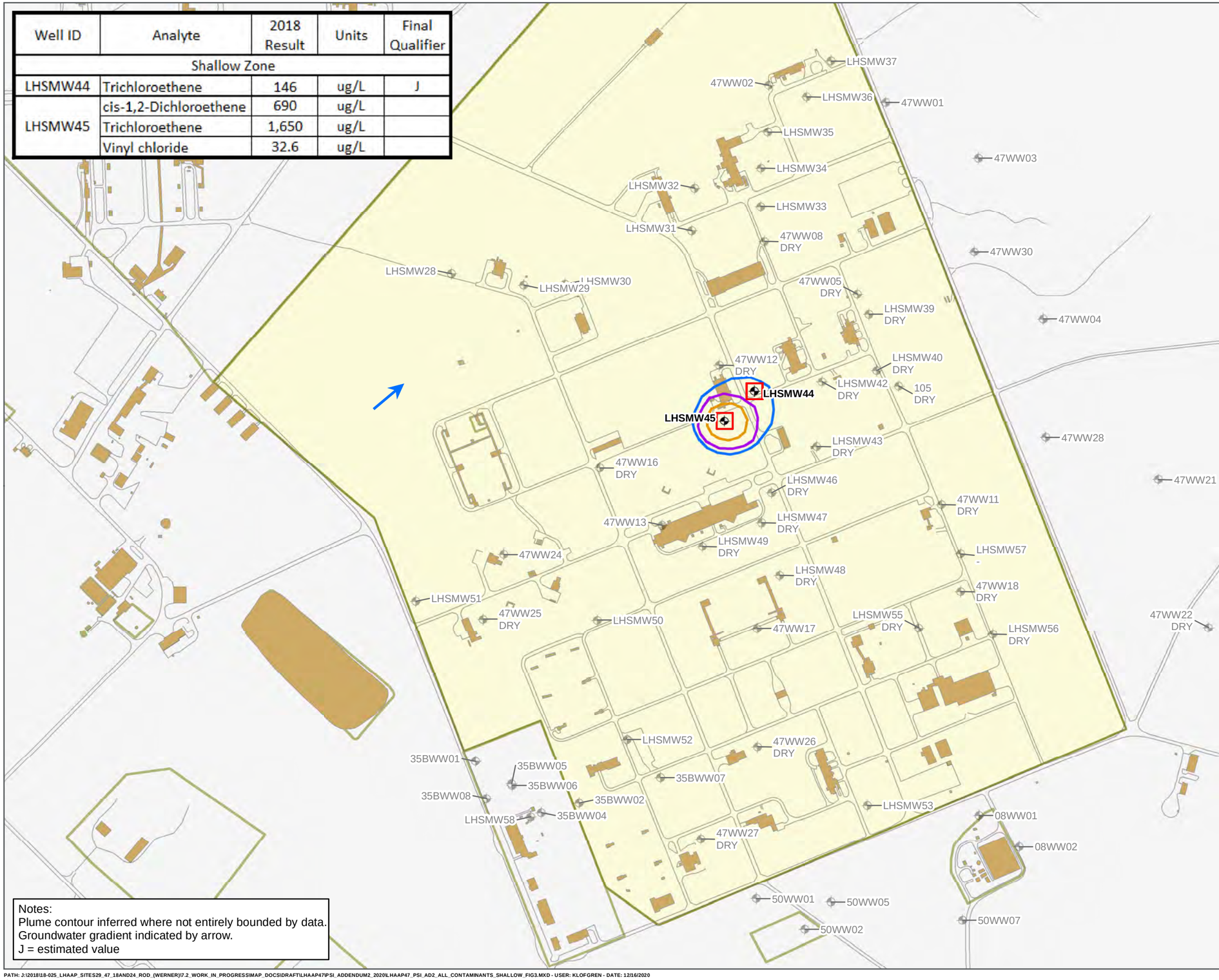
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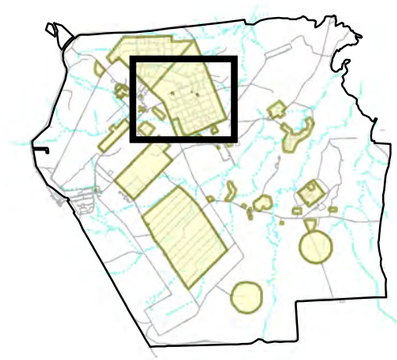
ON THE LINE

FIGURE 2

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_SITE_VICINITY_FIG2.MXD - USER: KLOFGREN - DATE: 12/16/2020

Well ID	Analyte	2018 Result	Units	Final Qualifier
Shallow Zone				
LHSMW44	Trichloroethene	146	ug/L	J
LHSMW45	cis-1,2-Dichloroethene	690	ug/L	
	Trichloroethene	1,650	ug/L	
	Vinyl chloride	32.6	ug/L	





LEGEND

- Monitoring Well With Contaminant That Exceeds Cleanup Criteria
- Shallow Monitoring Well (Not Sampled)
- Sampled Shallow Monitoring Well
- Vinyl Chloride Exceeding Shallow Zone USEPA MCL (2µg/L)
- cis-1,2-Dichloroethene Exceeding Shallow Zone USEPA MCL (70µg/L)
- Trichloroethene Exceeding Shallow Zone USEPA MCL (5µg/L)
- Road
- Building
- LHAAP-47
- LHAAP Site

Notes:
Plume contour inferred where not entirely bounded by data.
Groundwater gradient indicated by arrow.
J = estimated value

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

SAMPLE RESULTS FOR SHALLOW GROUNDWATER JULY 2018

LHAAP-47
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

N

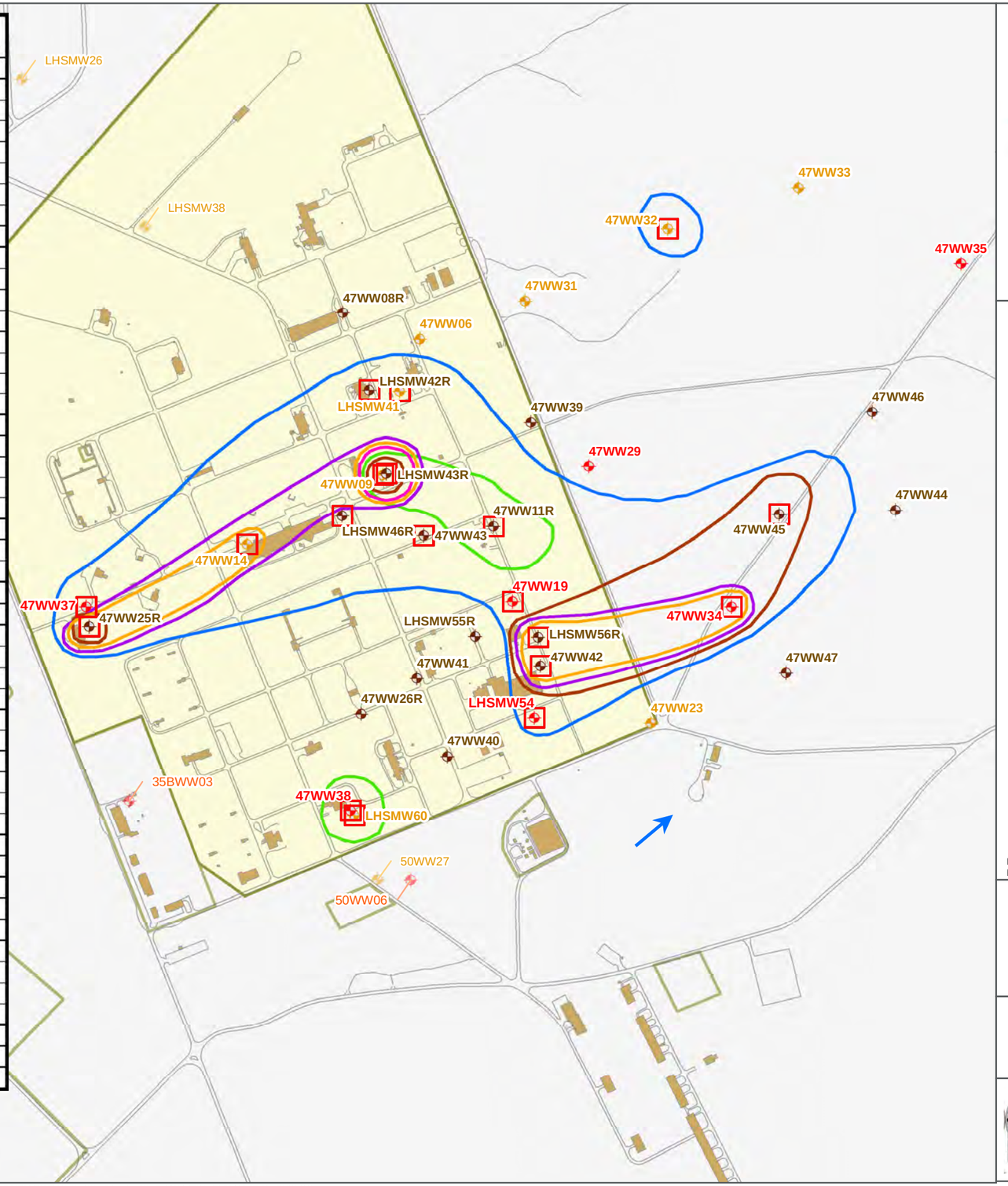
0 500 1,000
FEET

FIGURE 3

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_ALL_CONTAMINANTS_SHALLOW_FIG3.MXD - USER: KLOFGREN - DATE: 12/16/2020

Well ID	Analyte	2018 Result	Units	Final Qualifier
Shallow/Intermediate Zone				
47WW09	Nickel, Total	0.529	mg/L	
	Pentachlorophenol	46.1	ug/L	
	1,1-Dichloroethene	19.6	ug/L	
	cis-1,2-Dichloroethene	103	ug/L	
	Tetrachloroethene	9.99	ug/L	
	Trichloroethene	1,690	ug/L	
	Vinyl chloride	2.25	ug/L	
47WW11R	Perchlorate	824	ug/L	
47WW14	Chromium, Total	0.131	mg/L	
	cis-1,2-Dichloroethene	124	ug/L	
	Trichloroethene	203	ug/L	
	Vinyl chloride	24.8	ug/L	
47WW25R	1,1-Dichloroethene	20.8	ug/L	
	cis-1,2-Dichloroethene	2,550	ug/L	
	Trichloroethene	120,000	ug/L	
	Vinyl chloride	86.3	ug/L	
47WW32	Trichloroethene	43.5	ug/L	
47WW42	1,1-Dichloroethene	29.6	ug/L	
	cis-1,2-Dichloroethene	5,260	ug/L	
	Trichloroethene	2,660	ug/L	
	Vinyl chloride	1,190	ug/L	J+
47WW43	Trichloroethene	462	ug/L	J
47WW45	1,1-Dichloroethene	7.26	ug/L	
	Trichloroethene	1,840 (1,910)	ug/L	
LHSMW41	Trichloroethene	168	ug/L	
LHSMW42R	Trichloroethene	651	ug/L	
LHSMW43R	Perchlorate	59	ug/L	
	cis-1,2-Dichloroethene	74.1	ug/L	
	Trichloroethene	1,890	ug/L	
	Vinyl chloride	2.37	ug/L	
LHSMW46R	Pentachlorophenol	17	ug/L	J-
	Trichloroethene	463	ug/L	
LHSMW56R	1,1-Dichloroethene	176	ug/L	
	cis-1,2-Dichloroethene	95.9	ug/L	
	Trichloroethene	7,360	ug/L	
	Vinyl chloride	6.23	ug/L	
LHSMW60	Perchlorate	33,000 (38,400)	ug/L	
(Field duplicate result)				
Intermediate Zone				
47WW19	Manganese, Total	1.37	mg/L	
	Trichloroethene	5.91	ug/L	
47WW34	1,1-Dichloroethene	8.33	ug/L	
	cis-1,2-Dichloroethene	167	ug/L	
	Trichloroethene	1,710	ug/L	
	Vinyl chloride	2.32	ug/L	
47WW37	Trichloroethene	151	ug/L	
47WW38	Perchlorate	266	ug/L	
LHSMW54	Trichloroethene	71.2	ug/L	

Notes:
Plume contour inferred where not entirely bounded by data.
Groundwater gradient indicated by arrow.
J = estimated value
J- = estimated value, possibly biased low
J+ = estimated value, possibly biased high





LEGEND

- Monitoring Well With Contaminant That Exceeds Cleanup Criteria
- Sampled Shallow/Intermediate Monitoring Well
- Shallow/Intermediate Monitoring Well (Not Sampled)
- Intermediate Monitoring Well (Not Sampled)
- Sampled Intermediate Monitoring Well
- Sampled Intermediate (Upper) Monitoring Well
- 1,1-Dichloroethene Exceeding Shallow Zone USEPA MCL (7µg/L)
- Vinyl Chloride Exceeding Shallow Zone USEPA MCL (2µg/L)
- cis-1,2-Dichloroethene Exceeding Shallow Zone USEPA MCL (70µg/L)
- Trichloroethene Exceeding Shallow Zone USEPA MCL (5µg/L)
- Perchlorate Exceeding Shallow Zone TRRP PCL (17µg/L)
- Tetrachloroethene Exceeding Shallow Zone USEPA MCL (5µg/L)
- Road
- Building
- LHAAP-47
- LHAAP Site

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

SAMPLE RESULTS FOR INTERMEDIATE GROUNDWATER JULY AND SEPTEMBER 2018

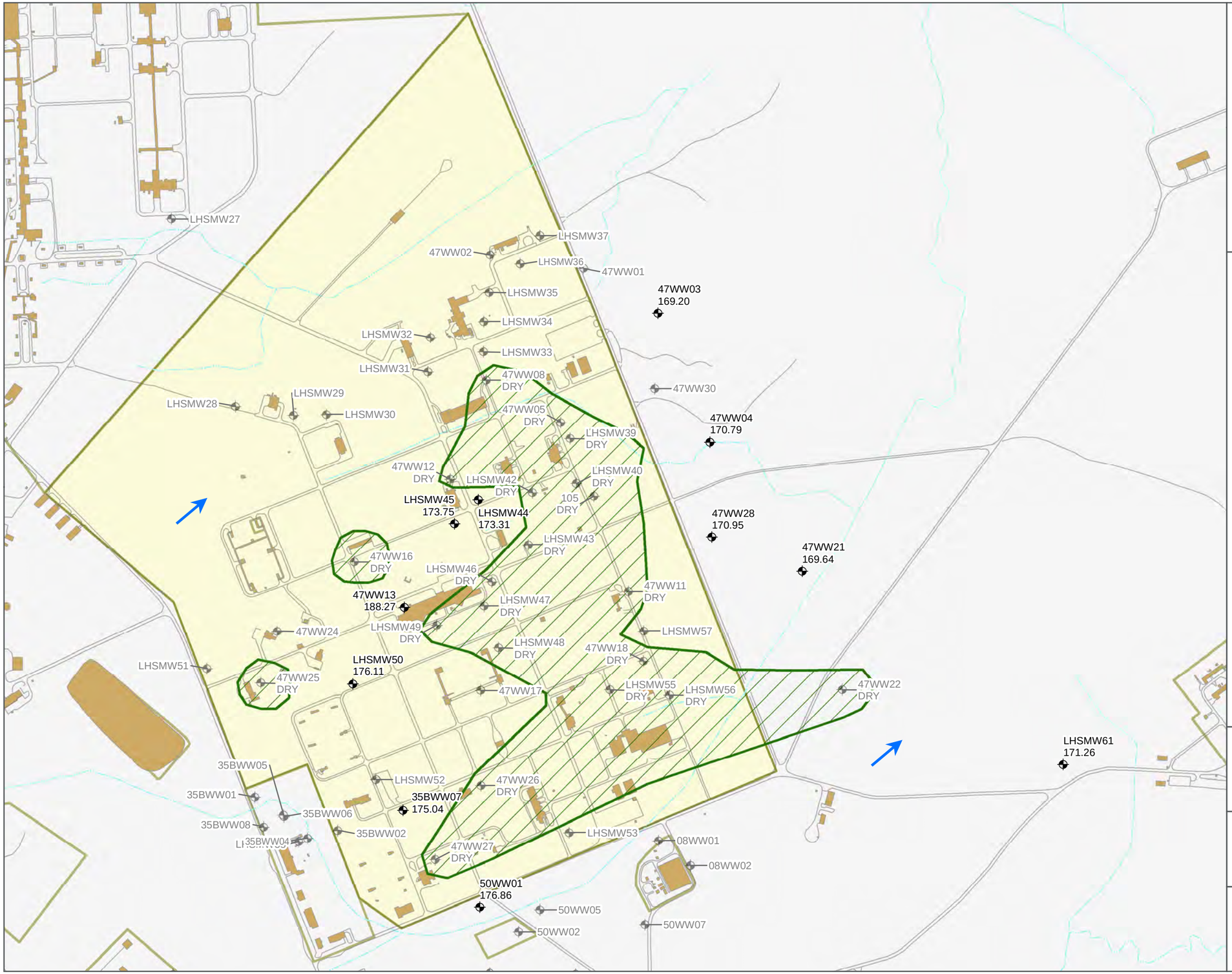
LHAAP-47
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

N

0 500 1,000
FEET

FIGURE 4

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_ALL_CONTAMINANTS_INTERMEDIATE_FIG4.MXD - USER: KLOFGREN - DATE: 12/16/2020





LEGEND

- Shallow Monitoring Well (Not Measured)
- Shallow Monitoring Well (with Groundwater Elevation)
- Dry Zone
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

NOTES:
Due to a majority of shallow wells being dry, no groundwater elevation contours were created
Groundwater gradient indicated by arrow.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GROUNDWATER ELEVATION MAP
SHALLOW ZONE SEPTEMBER 2018

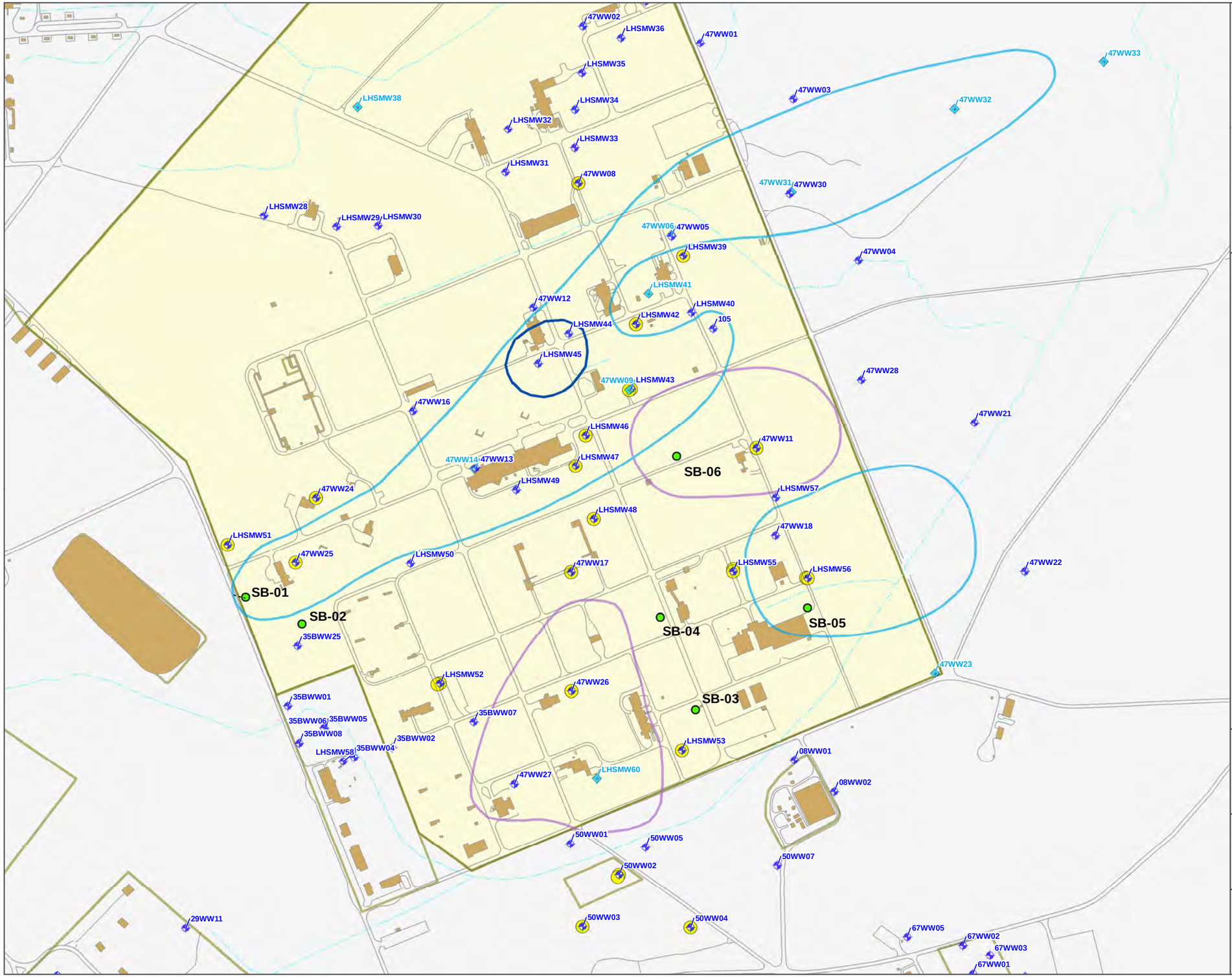
LHAAP-47
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

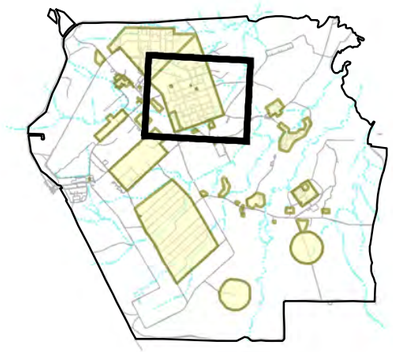
N

0 500 1,000
FEET

FIGURE 5

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_GW_ELEVATIONS_SHALLOW_FIG5.MXD - USER: KLOFGREN - DATE: 12/16/2020





LEGEND

- Soil Boring Location, Sampled 2018
- Shallow Monitoring Well
- Shallow/Intermediate Monitoring Well
- Well Dry in 2010
- Trichloroethene Exceeding Shallow Zone USEPA MCL (5µg/L), July 2018
- Perchlorate Exceeding Shallow Zone TRRP PCL (17 µg/L), 2010 and prior
- Trichloroethene Exceeding Shallow Zone MCL (5 µg/L), 2010 and prior
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

NOTE: Soil boring data blocks apply to groundwater grab samples. Map data and plume boundries apply to previous sampling results through 2010 .

2010 AND 2018 SHALLOW ZONE TCE AND PERCHLORATE PLUMES

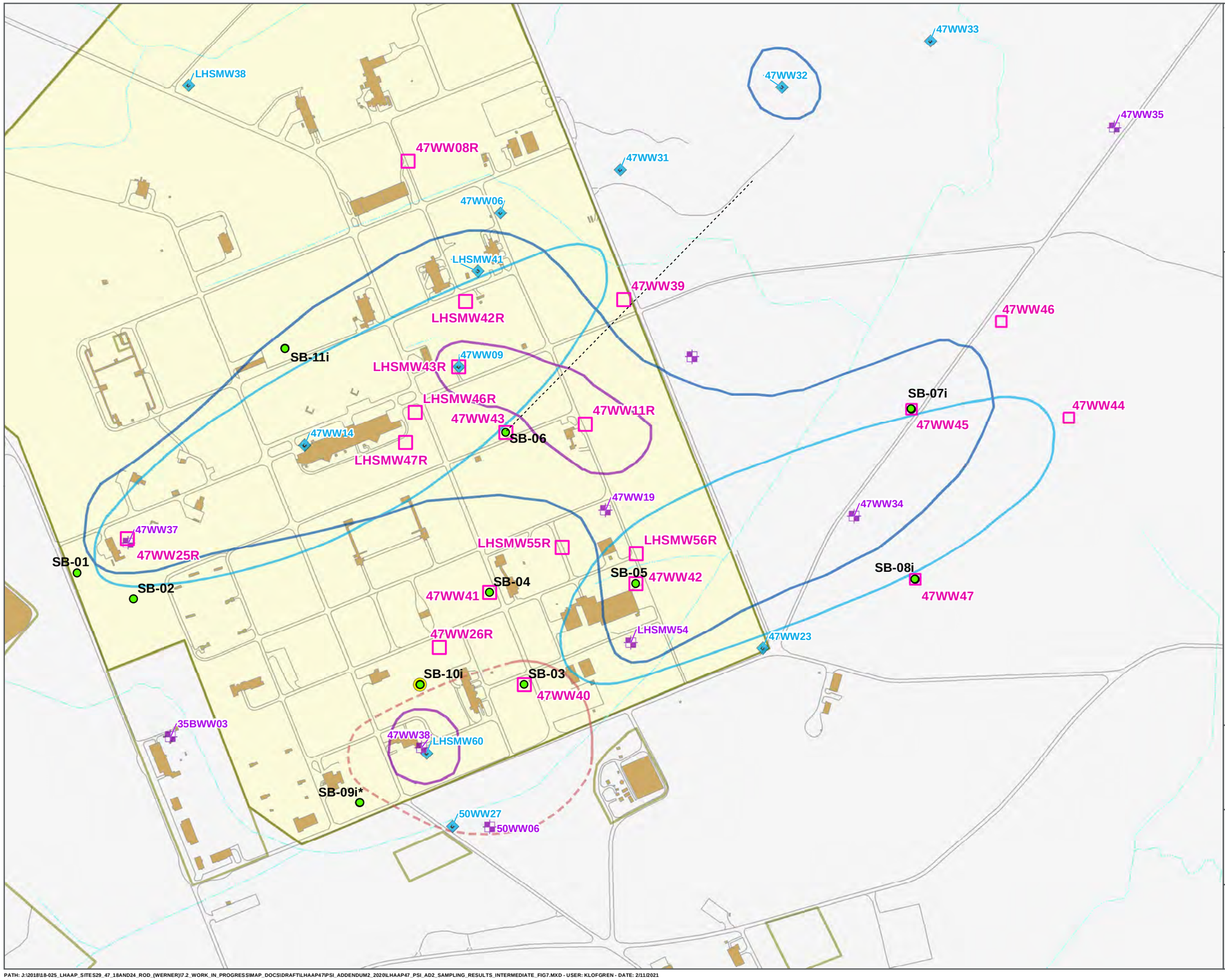
LHAAP-47
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

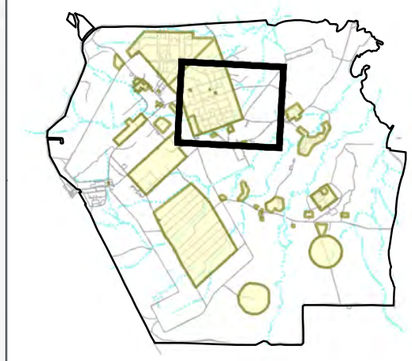
N

0 500 1,000
FEET

FIGURE 6

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_SAMPLING_RESULTS_SHALLOW_FIG6.MXD - USER: KLOFGREN - DATE: 12/16/2020





LEGEND

- Soil Boring Location, Sampled 2018
- Intermediate (Upper) Monitoring Well Location, Installed 2018
- Shallow/Intermediate Monitoring Well
- Intermediate Monitoring Well
- Soil Boring Dry in 2018
- Perchlorate Exceeding Shallow Zone TRRP PCL (17µg/L), July 2018
- Perchlorate Exceeding Intermediate Zone TRRP PCL (17 µg/L) (Dashed Where Inferred), 2010 and prior
- Trichloroethene Exceeding Shallow Zone USEPA MCL (5µg/L), July 2018
- Trichloroethene Exceeding Intermediate Zone MCL (5 µg/L), 2010 and prior
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

NOTES: SB-09i VOCs were reported as soil because lab could not get enough water to decant so ran as solid.
Soil boring data blocks apply to groundwater grab samples. Map data and plume boundaries apply to previous sampling results through 2010.

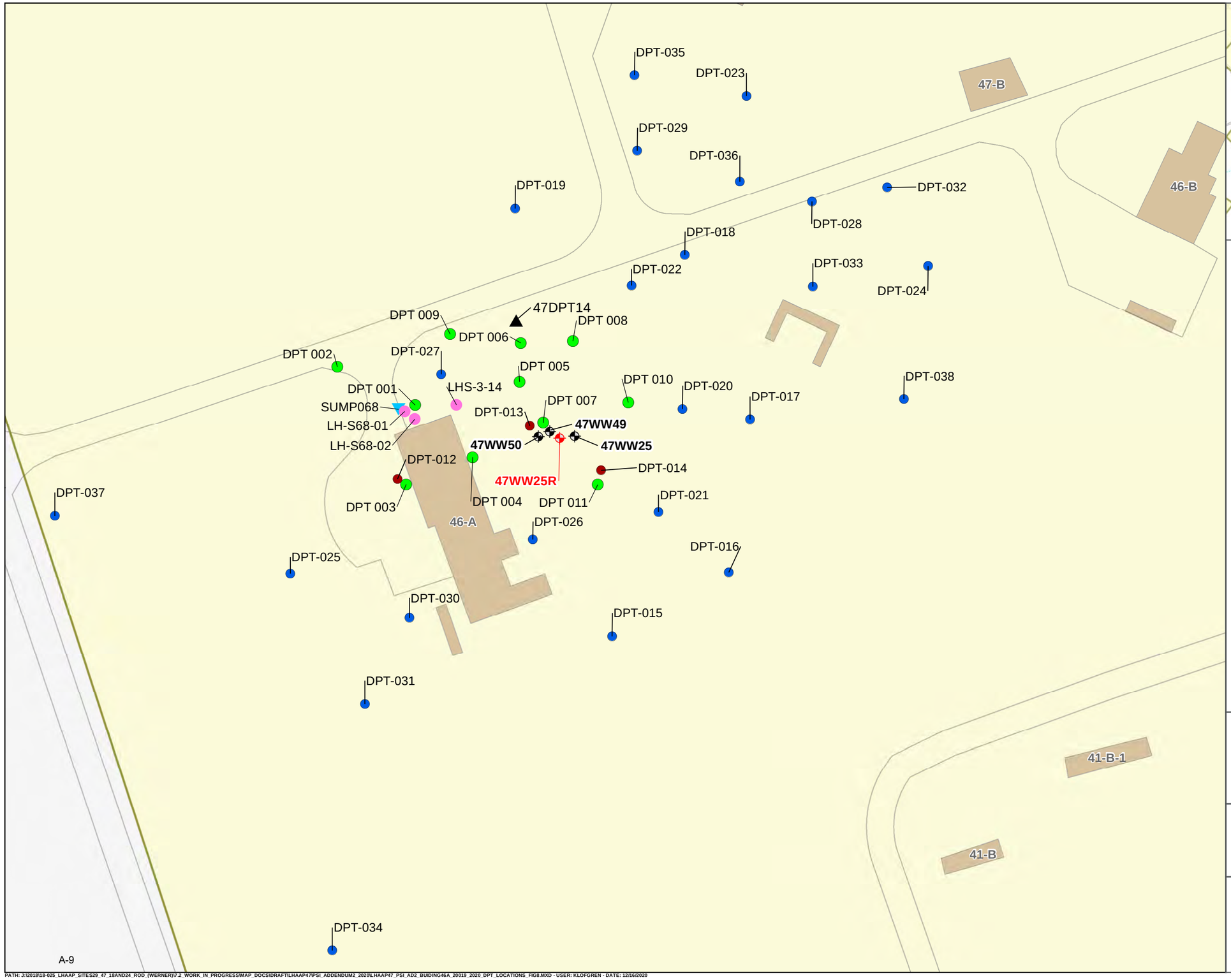
2010 AND 2018 INTERMEDIATE ZONE TCE AND PERCHLORATE PLUMES
LHAAP-47
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

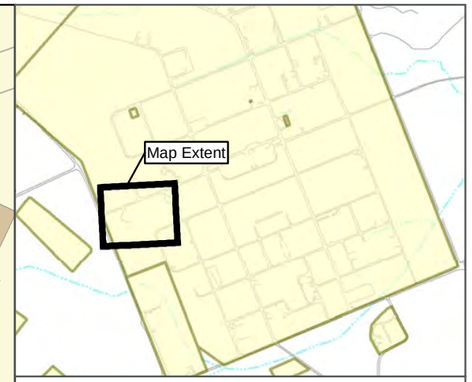
N

0 500 1,000
FEET

FIGURE 7

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_SAMPLING_RESULTS_INTERMEDIATE_FIG7.MXD - USER: KLOFGREN - DATE: 2/11/2021





LEGEND

- HDR November 2019 DPT Boring Locations (up to 40bgs)
- HDR 2020 Shallow DPT Boring Locations
- HDR 2020 Deep and Shallow DPT Boring Locations
- Inter./Upper Inter. MW
- Shallow/Inter. MW
- Shallow MW
- DPT (DPT Boring Shaw, 2011)
- SB (Soil Boring Shaw, 2011)
- SUMP
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

NOTES:
All units are in milligrams per kilogram (mg/kg)
TCE = ND indicates TCE was not detected at all depths
ft bgs = feet below ground surface NS = not sampled

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

PSI NO. 2 DPT LOCATIONS
BUILDING 46A AREA

LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

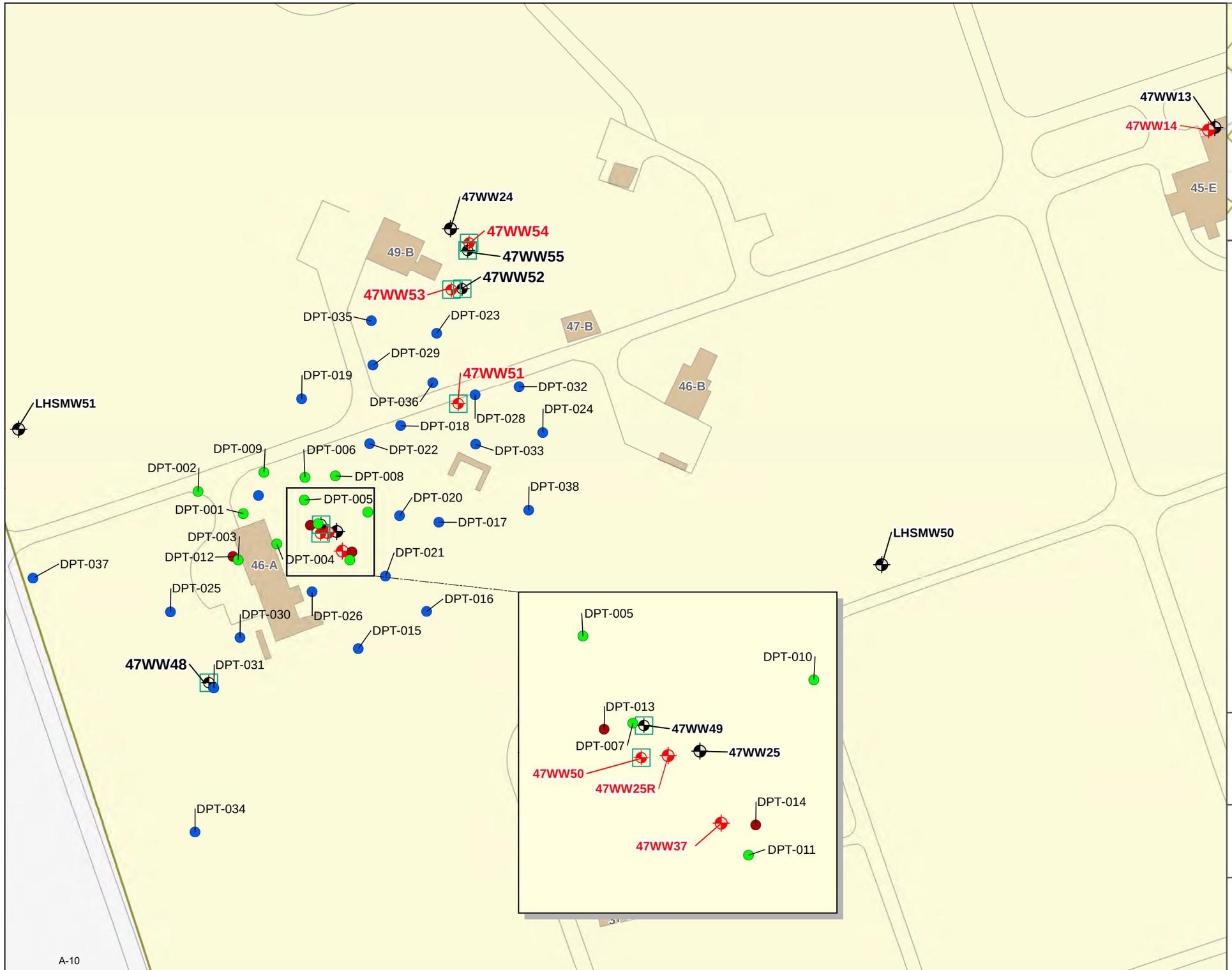
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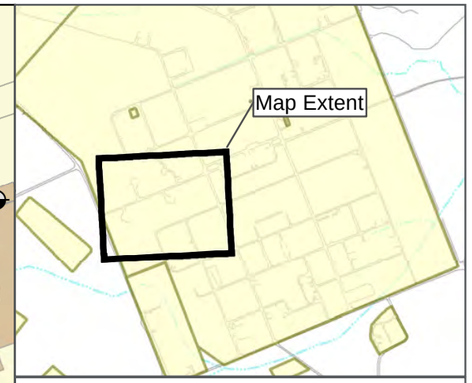
0 50 100
FEET

ON THE LINE

FIGURE 8

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_BUIDING46A_20019_2020_DPT_LOCATIONS_FIG8.MXD - USER: KLOFGREN - DATE: 12/16/2020





LEGEND

- New Well Location
- HDR November 2019 DPT Boring
- HDR 2020 Shallow DPT Boring Locations
- HDR 2020 Deep and Shallow DPT Boring Locations
- Existing Inter./Upper Inter. MW
- Existing Shallow MW
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

UI = Upper Intermediate

NOTES: 47WW25R was abandoned and replaced by 47WW50.

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

NEW AND EXISTING WELL LOCATIONS LHAAP-47 BUILDING 46A AREA

LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

N

0 100 200

FEET

ON THE LINE

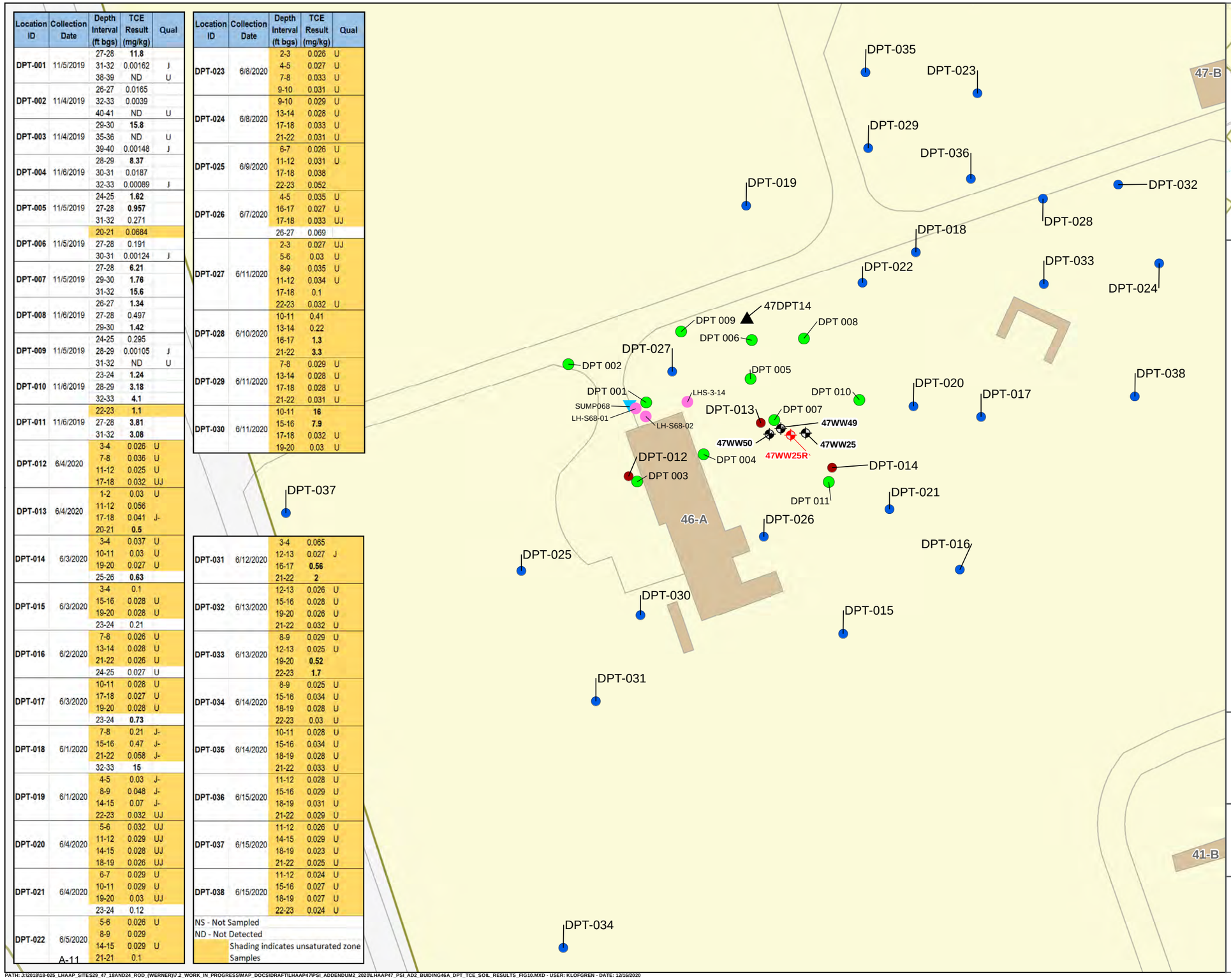
FIGURE 9

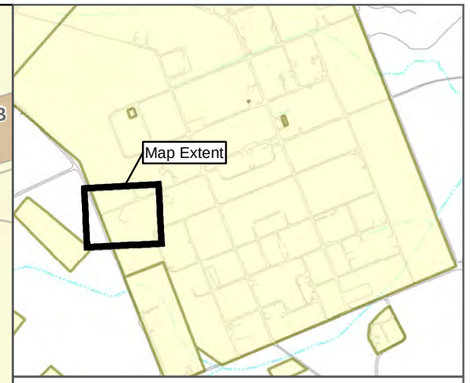
PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_BUIDING46A_NEW_EXISTING_WELLS_FIG9.MXD - USER: KLOFGREN - DATE: 12/16/2020

Location ID	Collection Date	Depth Interval (ft bgs)	TCE Result (mg/kg)	Qual
DPT-001	11/5/2019	27-28	**11.8**	
		31-32	0.00162	J
		38-39	ND	U
DPT-002	11/4/2019	26-27	0.0165	
		32-33	0.0039	
		40-41	ND	U
DPT-003	11/4/2019	29-30	**15.8**	
		35-36	ND	U
		39-40	0.00148	J
DPT-004	11/6/2019	28-29	**8.37**	
		30-31	0.0187	
		32-33	0.00089	J
DPT-005	11/5/2019	24-25	**1.62**	
		27-28	**0.957**	
		31-32	0.271	
DPT-006	11/5/2019	20-21	0.0684	
		27-28	0.191	
		30-31	0.00124	J
DPT-007	11/5/2019	27-28	**6.21**	
		29-30	**1.76**	
		31-32	**15.6**	
DPT-008	11/6/2019	26-27	**1.34**	
		27-28	0.497	
		29-30	**1.42**	
DPT-009	11/5/2019	24-25	0.295	
		28-29	0.00105	J
		31-32	ND	U
DPT-010	11/6/2019	23-24	**1.24**	
		28-29	**3.18**	
		32-33	**4.1**	
DPT-011	11/6/2019	22-23	**1.1**	
		27-28	**3.81**	
		31-32	**3.08**	
DPT-012	6/4/2020	3-4	0.026	U
		7-8	0.036	U
		11-12	0.025	U
		17-18	0.032	UJ
DPT-013	6/4/2020	1-2	0.03	U
		11-12	0.056	
		17-18	0.041	J-
		20-21	**0.5**	
DPT-014	6/3/2020	3-4	0.037	U
		10-11	0.03	U
		19-20	0.027	U
		25-26	**0.63**	
DPT-015	6/3/2020	3-4	0.1	
		15-16	0.028	U
		19-20	0.028	U
		23-24	0.21	
DPT-016	6/2/2020	7-8	0.026	U
		13-14	0.028	U
		21-22	0.026	U
		24-25	0.027	U
DPT-017	6/3/2020	10-11	0.028	U
		17-18	0.027	U
		19-20	0.028	U
		23-24	**0.73**	
DPT-018	6/1/2020	7-8	0.21	J-
		15-16	0.47	J-
		21-22	0.058	J-
		32-33	**15**	
DPT-019	6/1/2020	4-5	0.03	J-
		8-9	0.048	J-
		14-15	0.07	J-
		22-23	0.032	UJ
DPT-020	6/4/2020	5-6	0.032	UJ
		11-12	0.029	UJ
		14-15	0.028	UJ
		18-19	0.026	UJ
DPT-021	6/4/2020	6-7	0.029	U
		10-11	0.029	U
		19-20	0.03	UJ
		23-24	0.12	
DPT-022	6/5/2020	5-6	0.026	U
		8-9	0.029	
		14-15	0.029	U
		21-21	0.1	

Location ID	Collection Date	Depth Interval (ft bgs)	TCE Result (mg/kg)	Qual
DPT-023	6/8/2020	2-3	0.026	U
		4-5	0.027	U
		7-8	0.033	U
		9-10	0.031	U
DPT-024	6/8/2020	9-10	0.029	U
		13-14	0.028	U
		17-18	0.033	U
		21-22	0.031	U
DPT-025	6/9/2020	6-7	0.026	U
		11-12	0.031	U
		17-18	0.038	
		22-23	0.052	
DPT-026	6/7/2020	4-5	0.035	U
		16-17	0.027	U
		17-18	0.033	UJ
		26-27	0.069	
DPT-027	6/11/2020	2-3	0.027	UJ
		5-6	0.03	U
		8-9	0.035	U
		11-12	0.034	U
		17-18	0.1	
		22-23	0.032	U
DPT-028	6/10/2020	10-11	0.41	
		13-14	0.22	
		16-17	**1.3**	
		21-22	**3.3**	
DPT-029	6/11/2020	7-8	0.029	U
		13-14	0.028	U
		17-18	0.028	U
		21-22	0.031	U
DPT-030	6/11/2020	10-11	**16**	
		15-16	**7.9**	
		17-18	0.032	U
		19-20	0.03	U
DPT-031	6/12/2020	3-4	0.065	
		12-13	0.027	J
		16-17	**0.56**	
		21-22	**2**	
DPT-032	6/13/2020	12-13	0.026	U
		15-16	0.028	U
		19-20	0.026	U
		21-22	0.032	U
DPT-033	6/13/2020	8-9	0.029	U
		12-13	0.025	U
		19-20	**0.52**	
		22-23	**1.7**	
DPT-034	6/14/2020	8-9	0.025	U
		15-16	0.034	U
		18-19	0.028	U
		22-23	0.03	U
DPT-035	6/14/2020	10-11	0.028	U
		15-16	0.034	U
		18-19	0.028	U
		21-22	0.033	U
DPT-036	6/15/2020	11-12	0.028	U
		15-16	0.029	U
		18-19	0.031	U
		21-22	0.029	U
DPT-037	6/15/2020	11-12	0.026	U
		14-15	0.029	U
		18-19	0.023	U
		21-22	0.025	U
DPT-038	6/15/2020	11-12	0.024	U
		15-16	0.027	U
		18-19	0.027	U
		22-23	0.024	U

NS - Not Sampled
ND - Not Detected
Shading indicates unsaturated zone Samples





LEGEND

- HDR November 2019 DPT Boring Locations (up to 40bgs)
- HDR 2020 Shallow DPT Boring Locations
- HDR 2020 Deep and Shallow DPT Boring Locations
- Inter./Upper Inter. MW
- Shallow MW
- DPT (DPT Boring Shaw, 2011)
- SB (Soil Boring Shaw, 2011)
- SUMP
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

Uniform depth of 23 ft below ground surface based on historical data is used to define the depth of the Unsaturated Zone.

NOTES:
Bold Results indicate concentration greater than GWP-Ind MSC of 0.5 mg/kg.
All units are in milligrams per kilogram (mg/kg)
TCE = ND indicates TCE was not detected at all depths
ft bgs = feet below ground surface NS = not sampled

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

PSI NO. 2 DPT SOIL RESULTS BUILDING 46A AREA

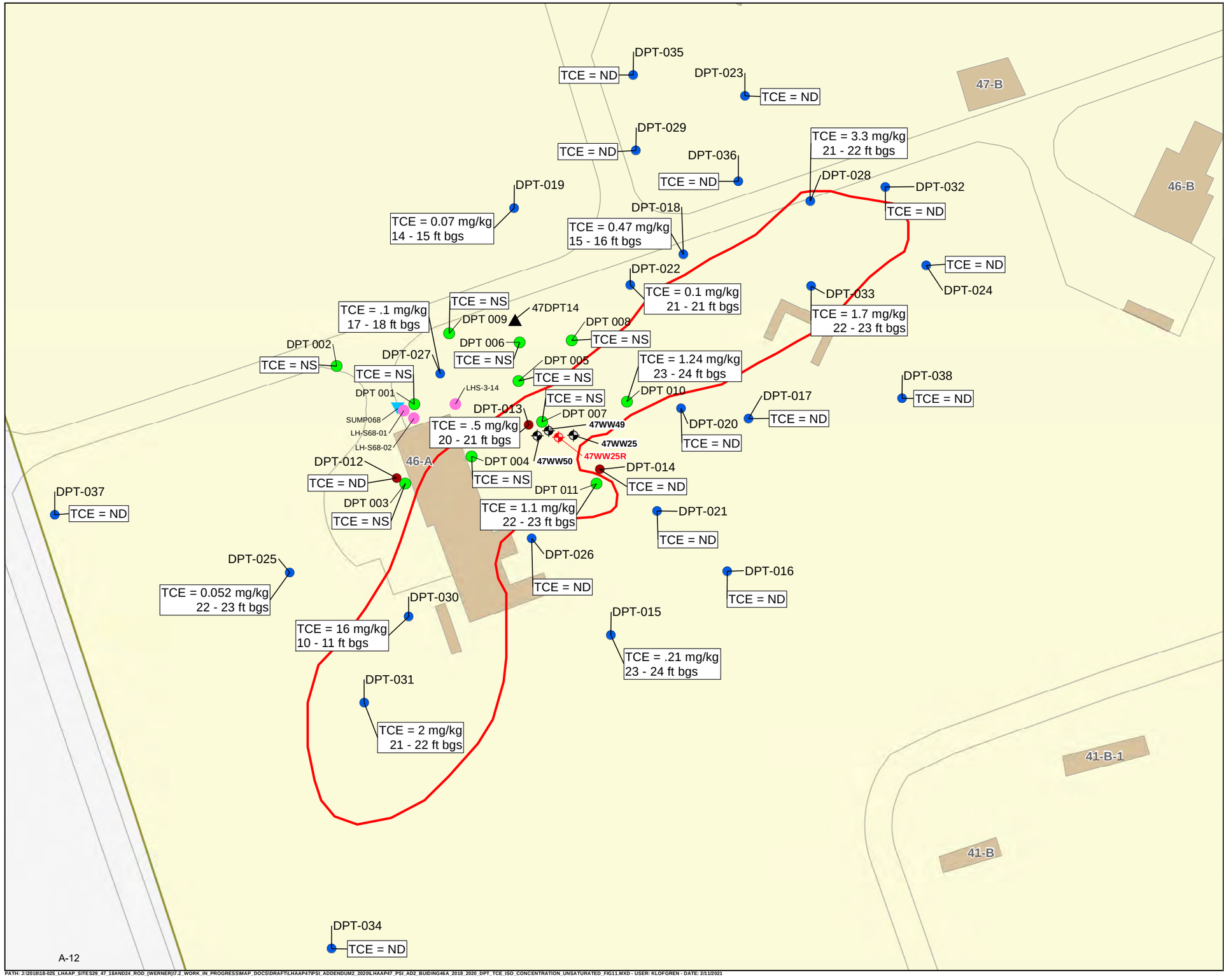
LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

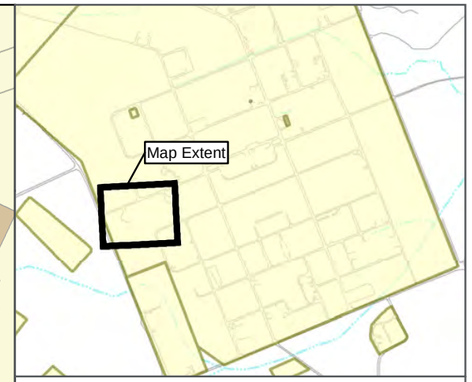
N
0 50 100
FEET

ON THE LINE

FIGURE 10

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_BUIDING46A_DPT_TCE_SOIL_RESULTS_FIG10.MXD - USER: KLOFGREN - DATE: 12/16/2020





LEGEND

- HDR November 2019 DPT Boring Locations (up to 40bgs)
- HDR 2020 Shallow DPT Boring Locations
- HDR 2020 Deep and Shallow DPT Boring Locations
- Inter./Upper Inter. MW
- Shallow MW
- DPT (DPT Boring Shaw, 2011)
- SB (Soil Boring Shaw, 2011)
- SUMP

Contaminant Level

- TCE > 0.5 mg/kg GWP-Ind-MSC
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

The posted results represent the maximum field laboratory concentration for each boring.

Unsaturated zone is defined as depths less than 23 ft below ground surface.

NOTES:
All units are in milligrams per kilogram (mg/kg)
TCE = ND indicates TCE was not detected at all depths
ft bgs = feet below ground surface NS = not sampled

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

PSI NO. 2 UNSATURATED ZONE
DPT TCE SOIL CONTOUR
BUILDING 46A AREA

LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

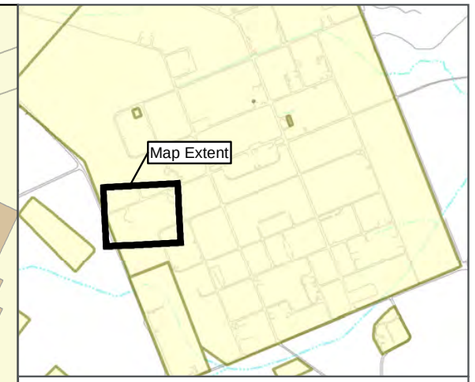
N

0 50 100
FEET

ON THE LINE

FIGURE 11

DPT-035
TCE = NS
DPT-023
TCE = NS
47-B
DPT-029
TCE = NS
DPT-036
TCE = NS
DPT-019
TCE = NS
TCE = NS
TCE = NS
DPT-032
46-B
DPT-028
TCE = 0.191 mg/kg
27 - 28 ft bgs
DPT 006
DPT-018
TCE = 15 mg/kg
32 - 33 ft bgs
DPT-033
TCE = NS
DPT-024
TCE = NS
TCE = 0.295 mg/kg
24 - 25 ft bgs
DPT-022
TCE = NS
DPT 008
47DPT14
TCE = 0.0165 mg/kg
26 - 27 ft bgs
DPT 009
TCE = NS
TCE = 1.42 mg/kg
29 - 30 ft bgs
DPT 002
DPT-027
TCE = 1.62 mg/kg
24 - 25 ft bgs
TCE = 4.1 mg/kg
32 - 33 ft bgs
DPT 005
DPT 010
DPT-038
TCE = NS
LHS-3-14
DPT-020
TCE = NS
DPT-017
TCE = 0.73 mg/kg
23 - 24 ft bgs
TCE = 11.8 mg/kg
27 - 28 ft bgs
DPT-013
TCE = NS
DPT 007
DPT 001
SUMP068
LH-S68-01
LH-S68-02
46-A
47WW49
47WW50
47WW25R
47WW25
TCE = 15.6 mg/kg
31 - 32 ft bgs
DPT-012
TCE = NS
DPT-014
TCE = 0.63 mg/kg
25 - 26 ft bgs
DPT-037
TCE = NS
DPT 003
DPT 004
TCE = 8.37 mg/kg
28 - 29 ft bgs
DPT-021
DPT 011
TCE = 0.12 mg/kg
23 - 24 ft bgs
TCE = 15.8 mg/kg
29 - 30 ft bgs
TCE = 3.81 mg/kg
27 - 28 ft bgs
DPT-025
TCE = NS
DPT-026
TCE = 0.069 mg/kg
26 - 27 ft bgs
DPT-016
TCE = ND
DPT-030
TCE = NS
DPT-015
TCE = 0.21 mg/kg
23 - 24 ft bgs
DPT-031
TCE = NS
41-B-1
41-B
DPT-034
TCE = NS
A-13



LEGEND

- HDR November 2019 DPT Boring Locations (up to 40bgs)
- HDR 2020 Shallow DPT Boring Locations
- HDR 2020 Deep and Shallow DPT Boring Locations
- Inter./Upper Inter. MW
- Shallow MW
- DPT (DPT Boring Shaw, 2011)
- SB (Soil Boring Shaw, 2011)
- SUMP
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

The posted results represent the maximum field laboratory concentration for each boring.

Maximum reported concentrations shown. Saturated Zone defined as depths greater than 23 ft below ground surface.

NOTES:
All units are in milligrams per kilogram (mg/kg)
NS = Not Sampled ND = Not Detected
ft bgs = feet below ground surface

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

PSI NO. 2 SATURATED ZONE DPT TCE SOIL RESULTS AND DEPTHS BUILDING 46A AREA

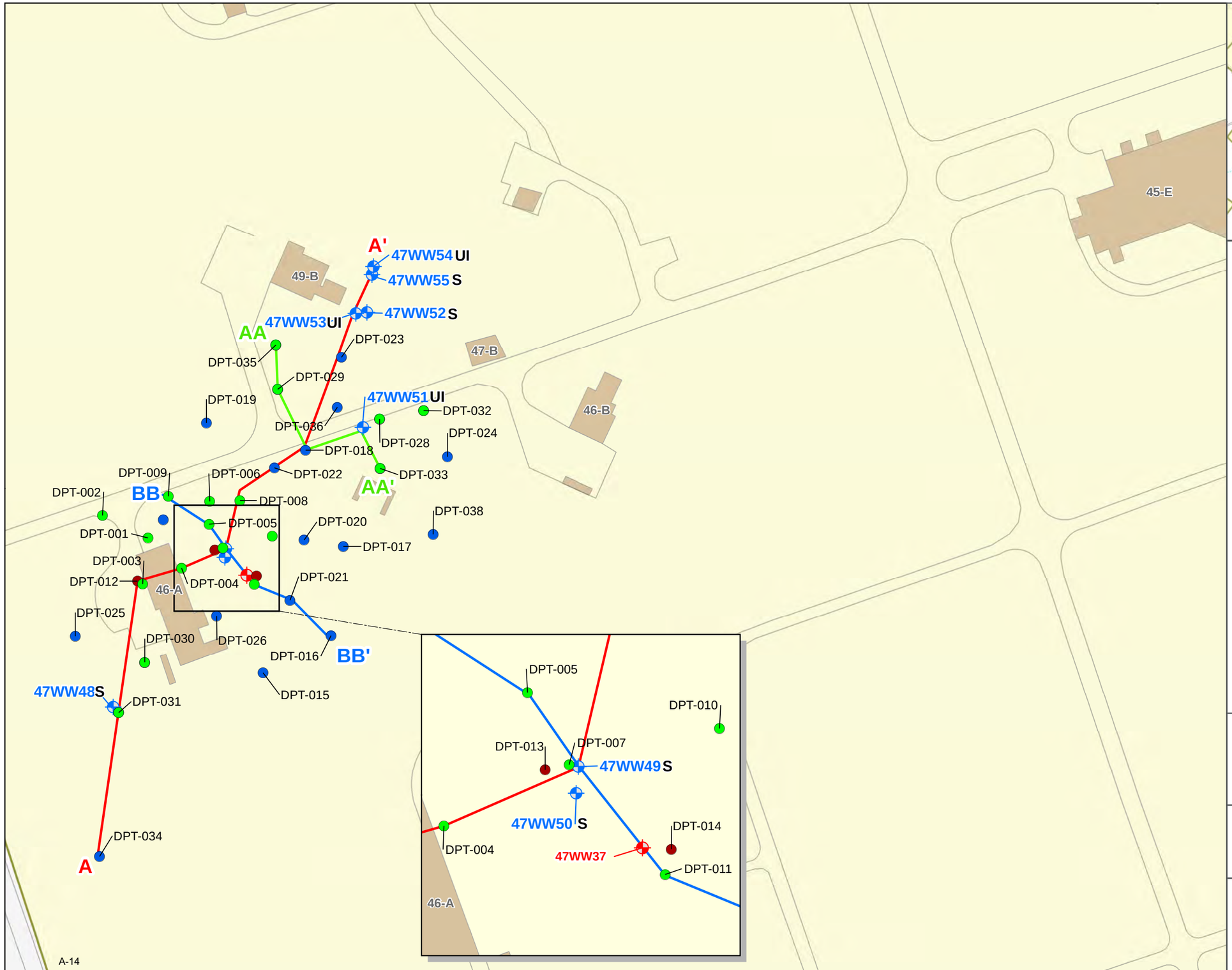
LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

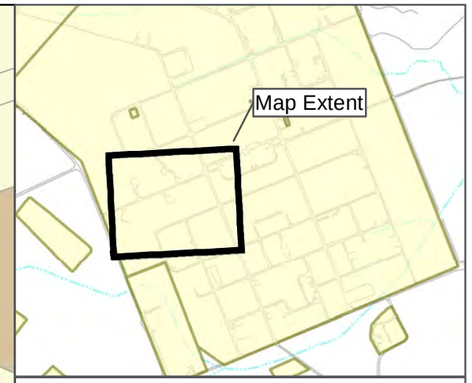
N

0 50 100
FEET

FIGURE 12

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_BUIDING46A_2019_2020_DPT_TCE_ISO_CONCENTRATION_SATURATED_FIG12.MXD - USER: KLOFGREN - DATE: 2/11/2021





LEGEND

- New Well Location
- HDR November 2019 DPT Boring
- HDR 2020 Shallow DPT Boring Locations
- HDR 2020 Deep and Shallow DPT Boring Locations
- UI Monitoring Well
- Existing Shallow MW
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

Cross Sections

- A-A'
- AA-AA'
- BB-BB'

NOTES: S- Shallow monitoring well
UI- Upper intermediate monitoring well

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GEOLOGIC CROSS SECTIONS
LHAAP-47 BUILDING 46A AREA

LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

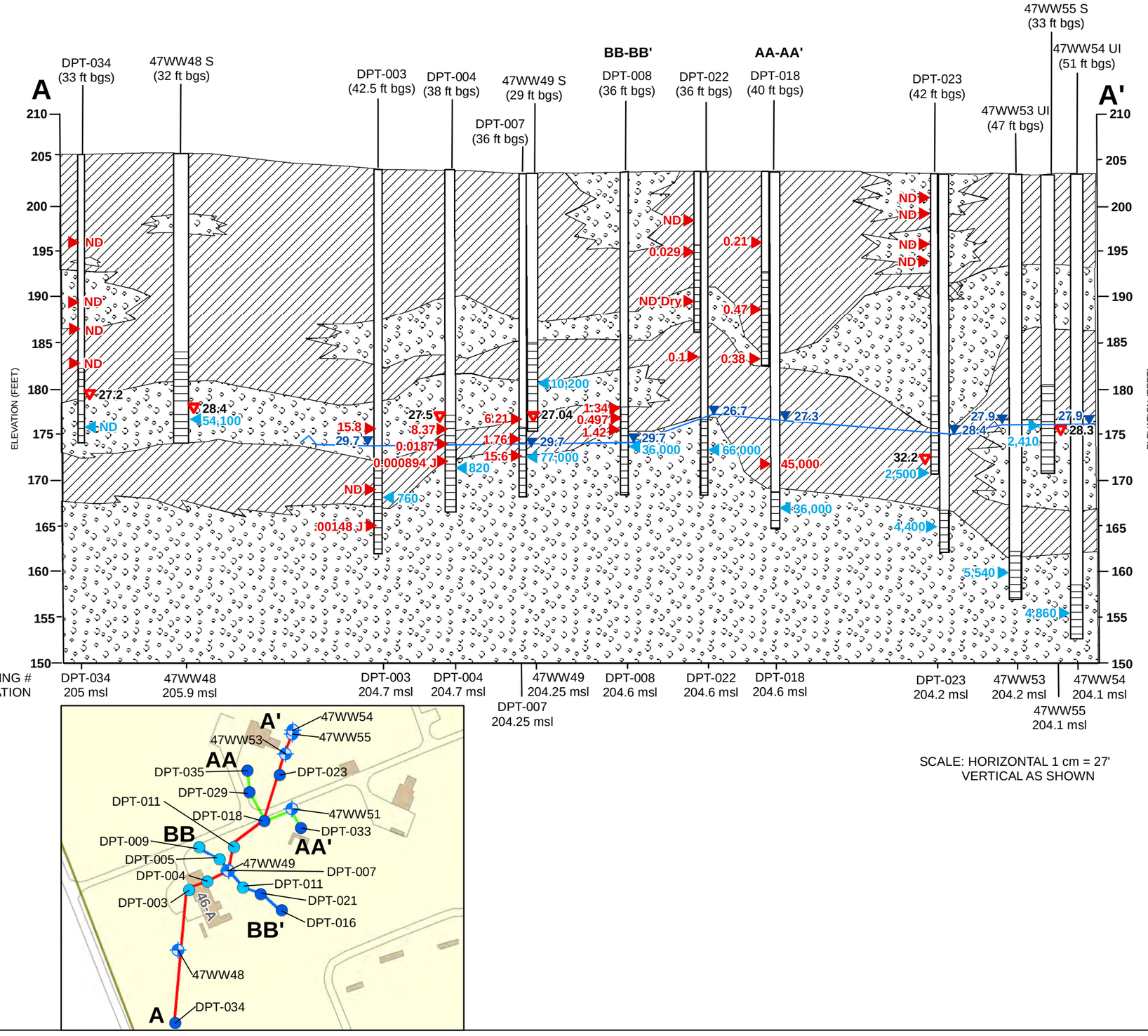
N

0 100 200
FEET

ON THE LINE

FIGURE 13

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_BUIDING46A_NEW_EXISTING_WELLS_UPDATED.MXD - USER: EBOWLIN - DATE: 12/14/2020



SCALE: HORIZONTAL 1 cm = 27'
VERTICAL AS SHOWN



LEGEND

- Clay, Clay with Fine Sand, Silt and Sand/Silty Lenses
- Silty Sands, Sand Silt Mixtures
- Well
- Screen
- No Recovery
- UI Groundwater Elevation (ft bgs)
- Shallow Groundwater Elevation (ft bgs)
- Groundwater TCE Sample Interval and Results
- Soil TCE Sample Interval and Results
- 2019 DPT Boring
- 2020 Deep and Shallow DPT Boring
- 2020 Newly Installed Wells
- Groundwater Table Line

Cross Sections

- A-A'
- AA-AA'
- BB-BB'

NOTES: Groundwater results reported in micrograms per liter
Soil results reported in milligrams per kilogram
ND- Nondetect
J- Estimated
S- Shallow monitoring well
UI- Upper Intermediate monitoring well

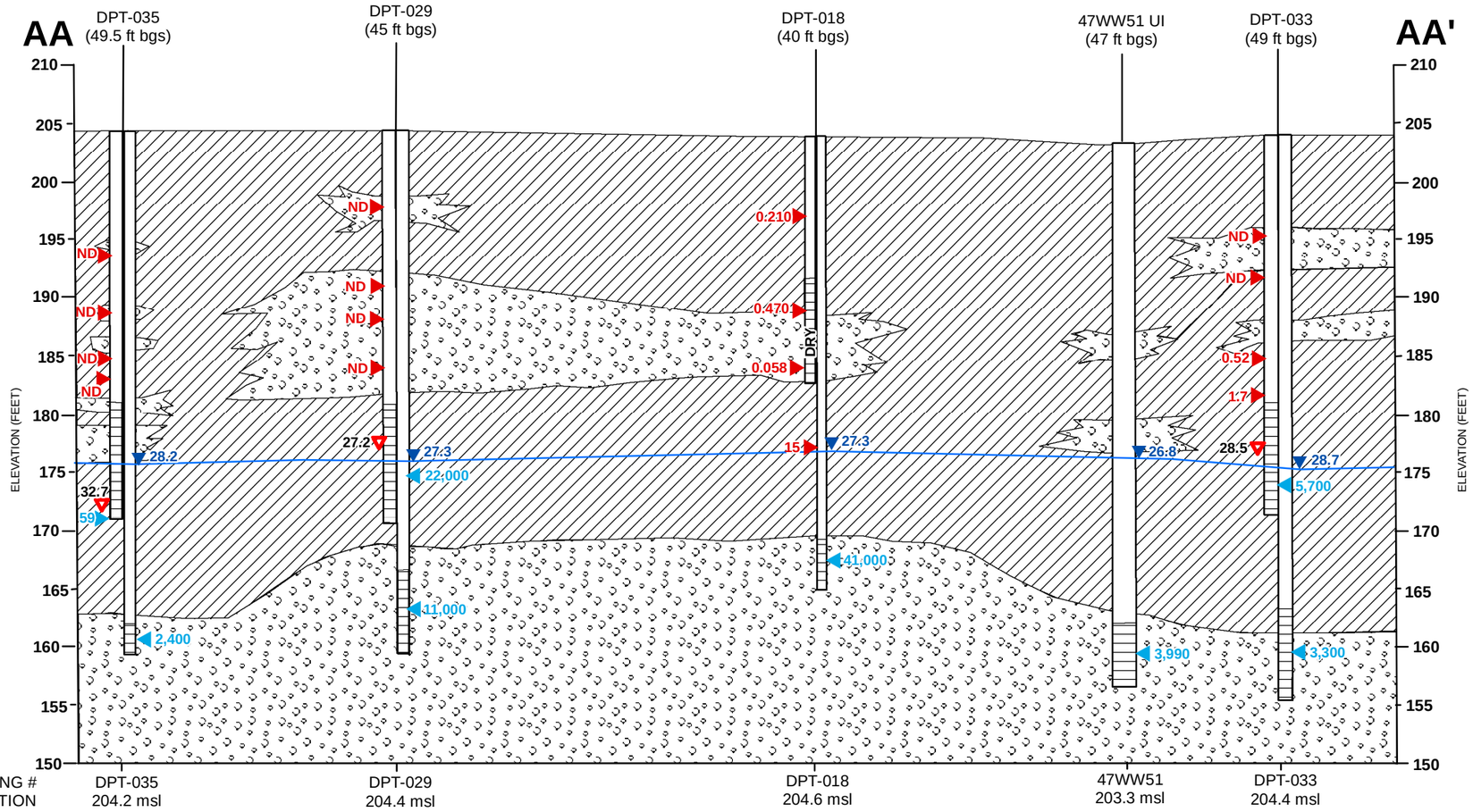
DATA SOURCES: HDR

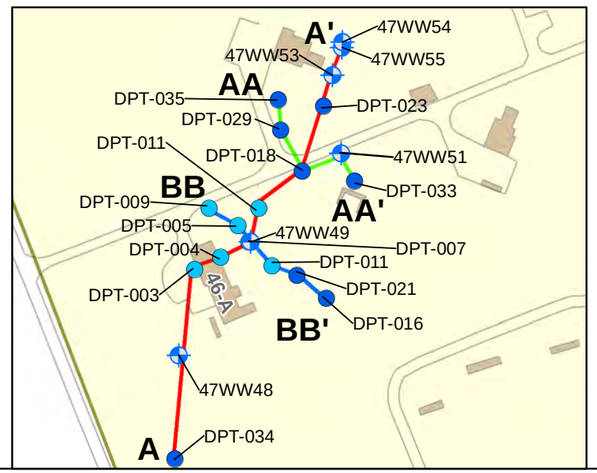
DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GEOLOGIC CROSS SECTION A-A'

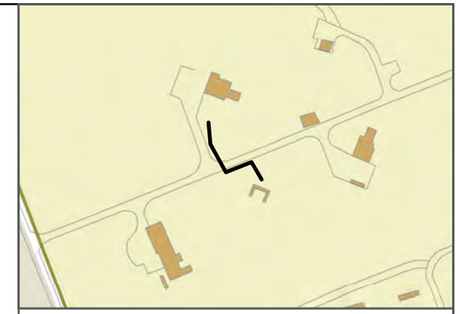
LHAAP-47 POST SCREENING INVESTIGATION ADDENDUM 2 REPORT

FIGURE 14





SCALE: HORIZONTAL 1 cm = 10'
VERTICAL AS SHOWN



LEGEND

- Clay, Clay with Fine Sand, Silt and Sand/Silty Lenses
- Silty Sands, Sand Silt Mixtures
- Well
- Screen
- UI Groundwater Elevation (ft bgs)
- Shallow Groundwater Elevation (ft bgs)
- Groundwater TCE Sample Interval and Results
- Soil TCE Sample Interval and Results
- 2019 DPT Boring
- 2020 Deep and Shallow DPT Boring
- 2020 Newly Installed Wells
- Groundwater Table Line

Cross Sections

- A-A'
- AA-AA'
- BB-BB'

NOTES: Groundwater results reported in micrograms per liter
Soil results reported in milligrams per kilogram
ND- Nondetect
J- Estimated
UI- Upper Intermediate monitoring well

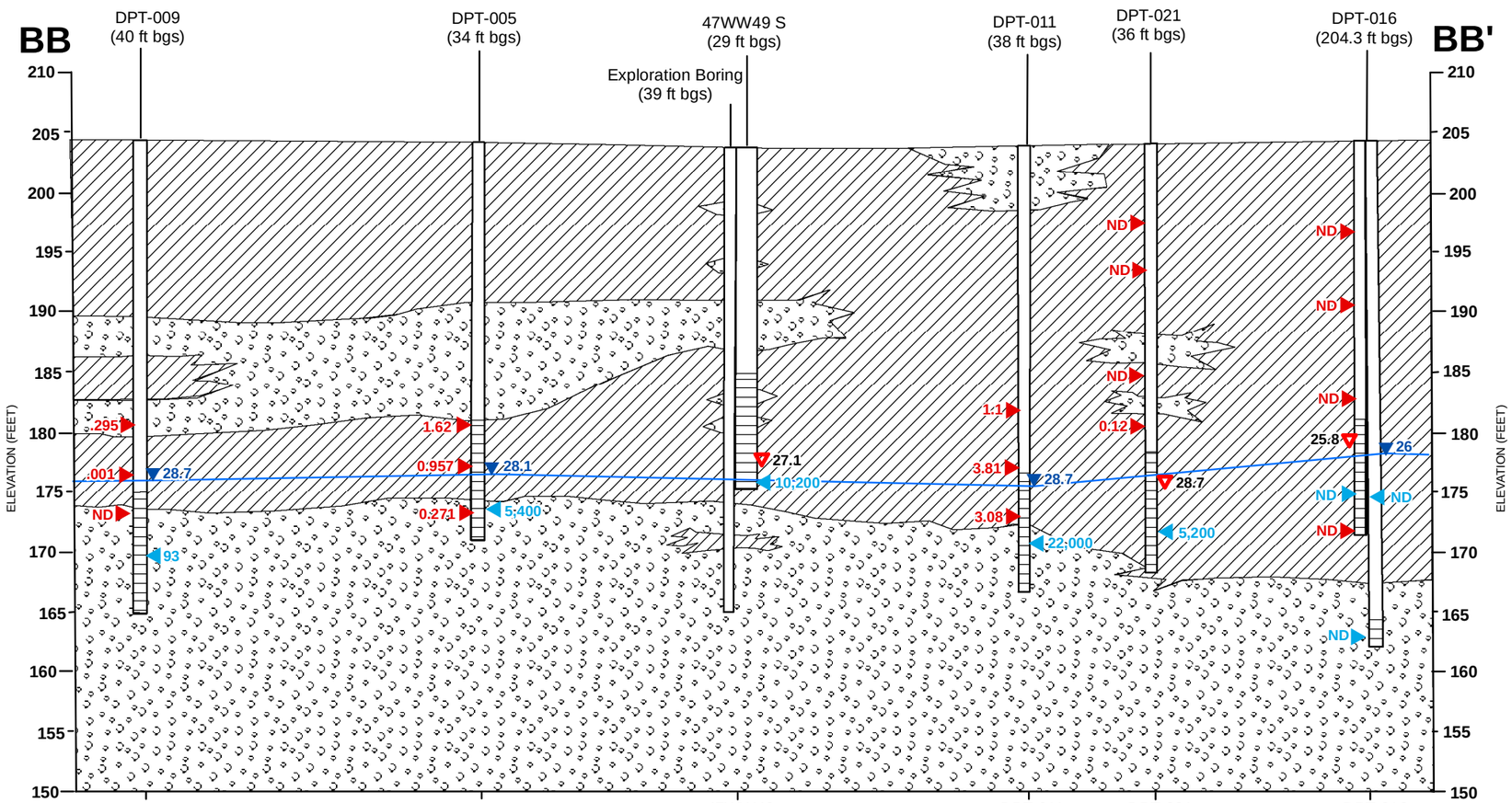
DATA SOURCES: HDR

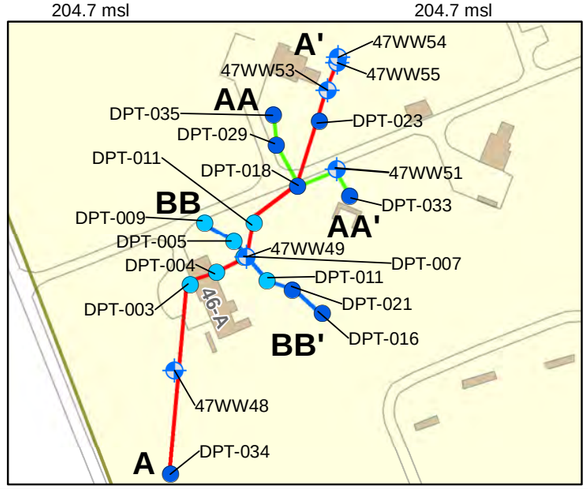
DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GEOLOGIC CROSS SECTION AA-AA'

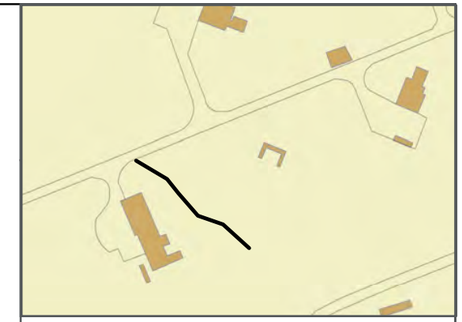
LHAAP-47 POST SCREENING
INVESTIGATION ADDENDUM 2 REPORT

FIGURE 15





SCALE: HORIZONTAL 1 cm = 10'
VERTICAL AS SHOWN



LEGEND

- Clay, Clay with Fine Sand, Silt and Sand/Silty Lenses
- Silty Sands, Sand Silt Mixtures
- Well
- Screen
- UI Groundwater Elevation (ft bgs)
- Shallow Groundwater Elevation (ft bgs)
- Groundwater TCE Sample Interval and Results
- Soil TCE Sample Interval and Results
- 2019 DPT Boring
- 2020 Deep and Shallow DPT Boring
- 2020 Newly Installed Wells
- Groundwater Table Line

Cross Sections

- A-A'
- AA-AA'
- BB-BB'

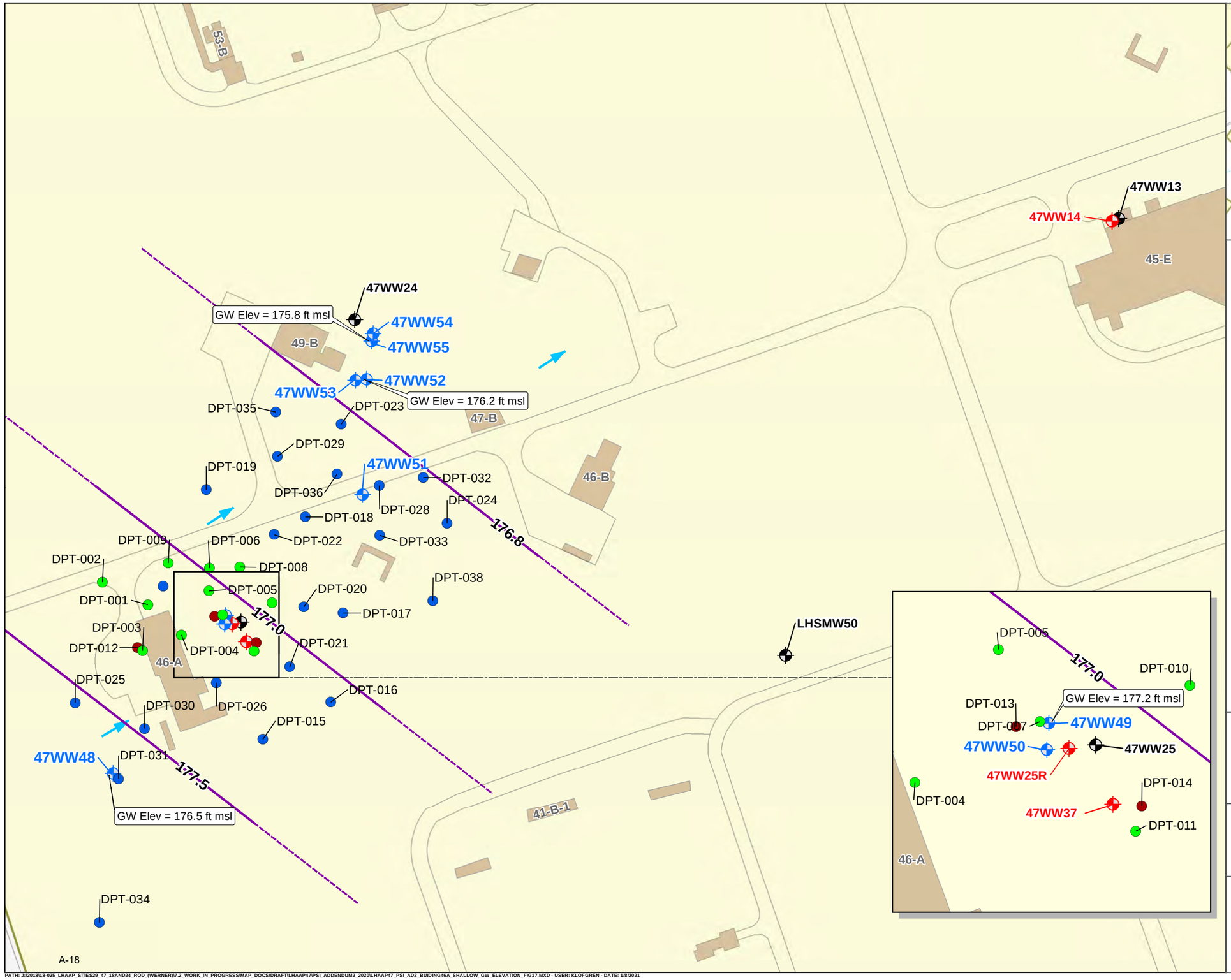
NOTES: Groundwater results reported in micrograms per liter
Soil results reported in milligrams per kilogram
ND- Nondetect
J- Estimated
S- Shallow monitoring well

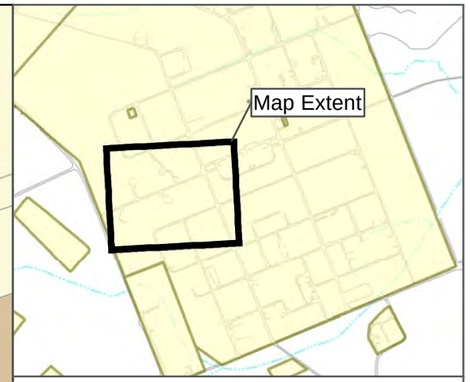
DATA SOURCES: HDR
DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

GEOLOGIC CROSS SECTION BB-BB'

LHAAP-47 POST SCREENING
INVESTIGATION ADDENDUM 2 REPORT

FIGURE 16





LEGEND

- New Well Location
- HDR November 2019 DPT Boring
- HDR 2020 Shallow DPT Boring Locations
- HDR 2020 Deep and Shallow DPT Boring Locations
- Inter./Upper Inter. MW
- Shallow MW
- Groundwater Flow Direction
- Groundwater Elevation Contours (ft, MSL)
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

SHALLOW GROUNDWATER ELEVATION
LHAAP-47 BUILDING 46A AREA

LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

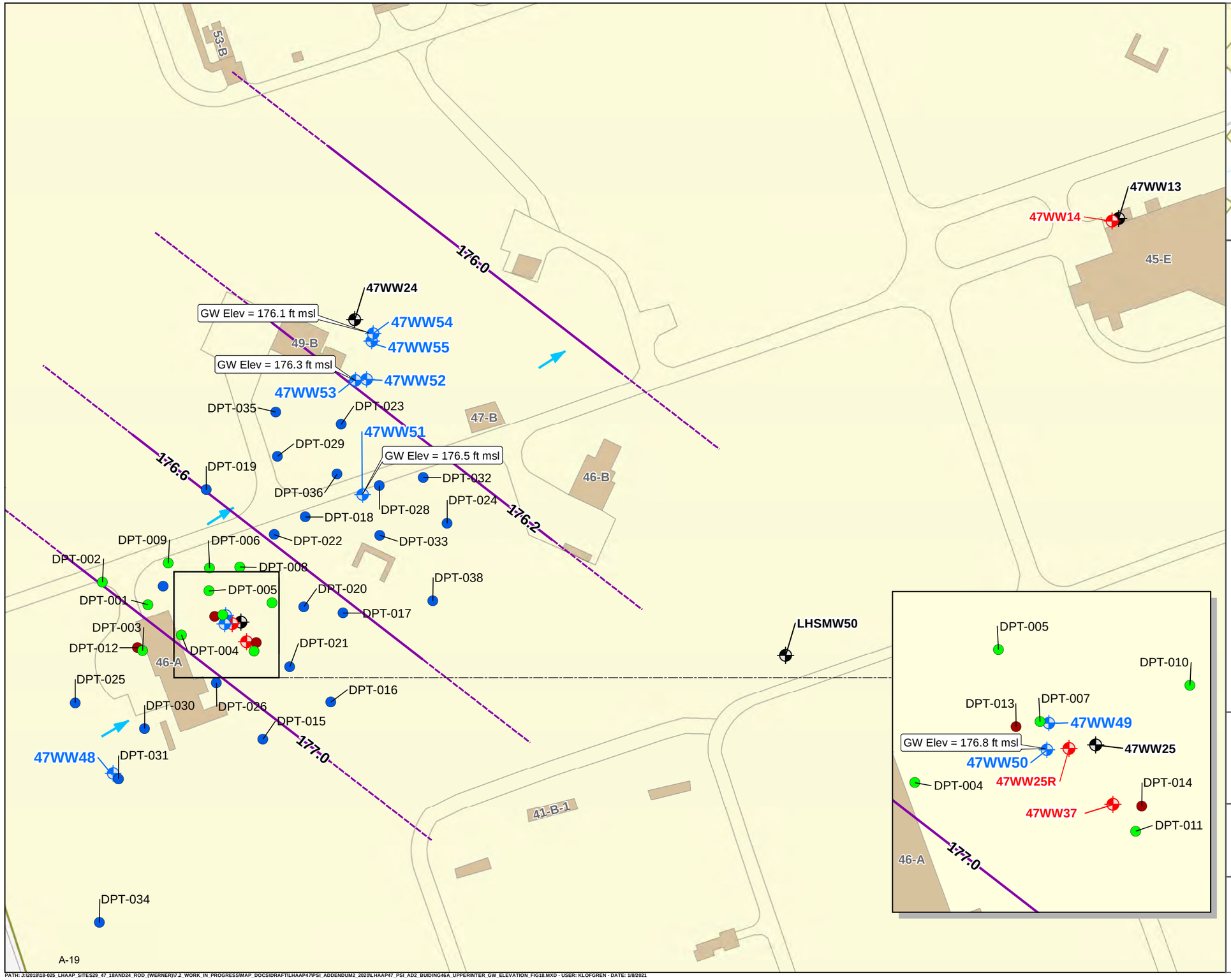
N

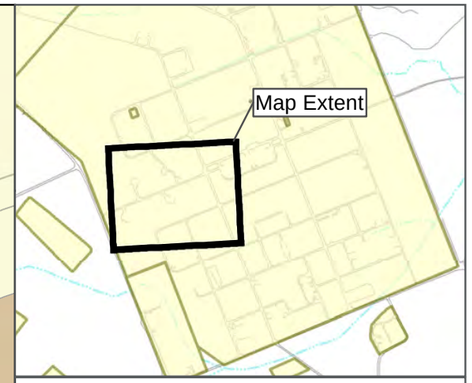
0 100 200
FEET

ON THE LINE

FIGURE 17

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_BUIDING46A_SHALLOW_GW_ELEVATION_FIG17.MXD - USER: KLOFGREN - DATE: 1/8/2021





LEGEND

- New Well Location
- HDR November 2019 DPT Boring
- HDR 2020 Shallow DPT Boring Locations
- HDR 2020 Deep and Shallow DPT Boring Locations
- Inter./Upper Inter. MW
- Shallow MW
- Groundwater Flow Direction
- Groundwater Elevation Contours (ft, MSL)
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

UPPER INTERMEDIATE GROUNDWATER ELEVATION LHAAP-47 BUILDING 46A AREA

LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

N

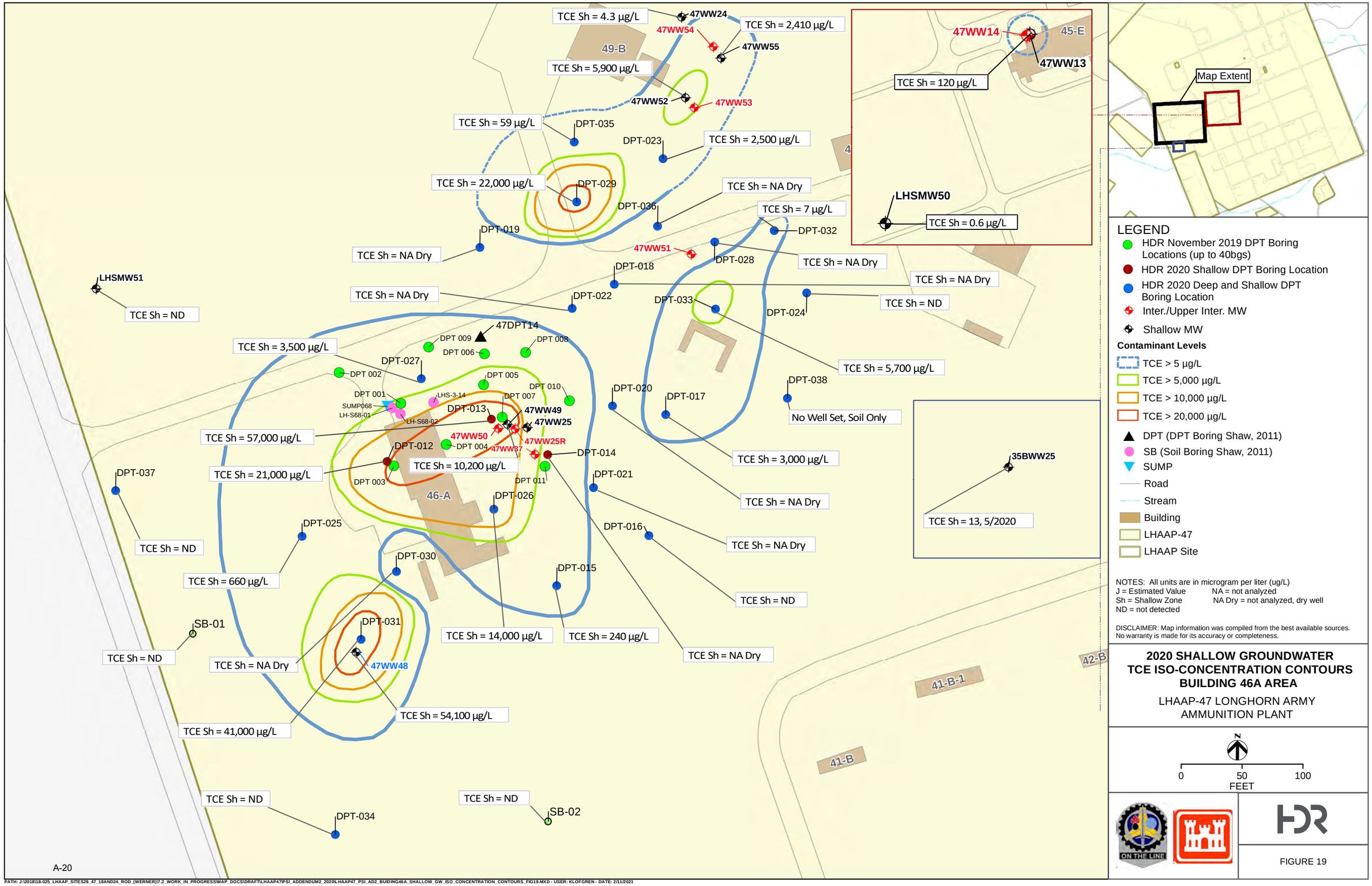
0 100 200

FEET

ON THE LINE

FIGURE 18

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_BUIDING46A_UPPERINTER_GW_ELEVATION_FIG18.MXD - USER: KLOFGREN - DATE: 1/8/2021



LEGEND

- HDR November 2019 DPT Boring Locations (up to 40bgs)
- HDR 2020 Shallow DPT Boring Location
- HDR 2020 Deep and Shallow DPT Boring Location
- Inter./Upper Inter. MW
- Shallow MW

Contaminant Levels

- TCE > 5 µg/L
- TCE > 5,000 µg/L
- TCE > 10,000 µg/L
- TCE > 20,000 µg/L
- DPT (DPT Boring Shaw, 2011)
- SB (Soil Boring Shaw, 2011)
- SUMP
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

NOTES: All units are in microgram per liter (ug/L)
J = Estimated Value NA = not analyzed
Sh = Shallow Zone NA Dry = not analyzed, dry well
ND = not detected

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

2020 SHALLOW GROUNDWATER TCE ISO-CONCENTRATION CONTOURS BUILDING 46A AREA

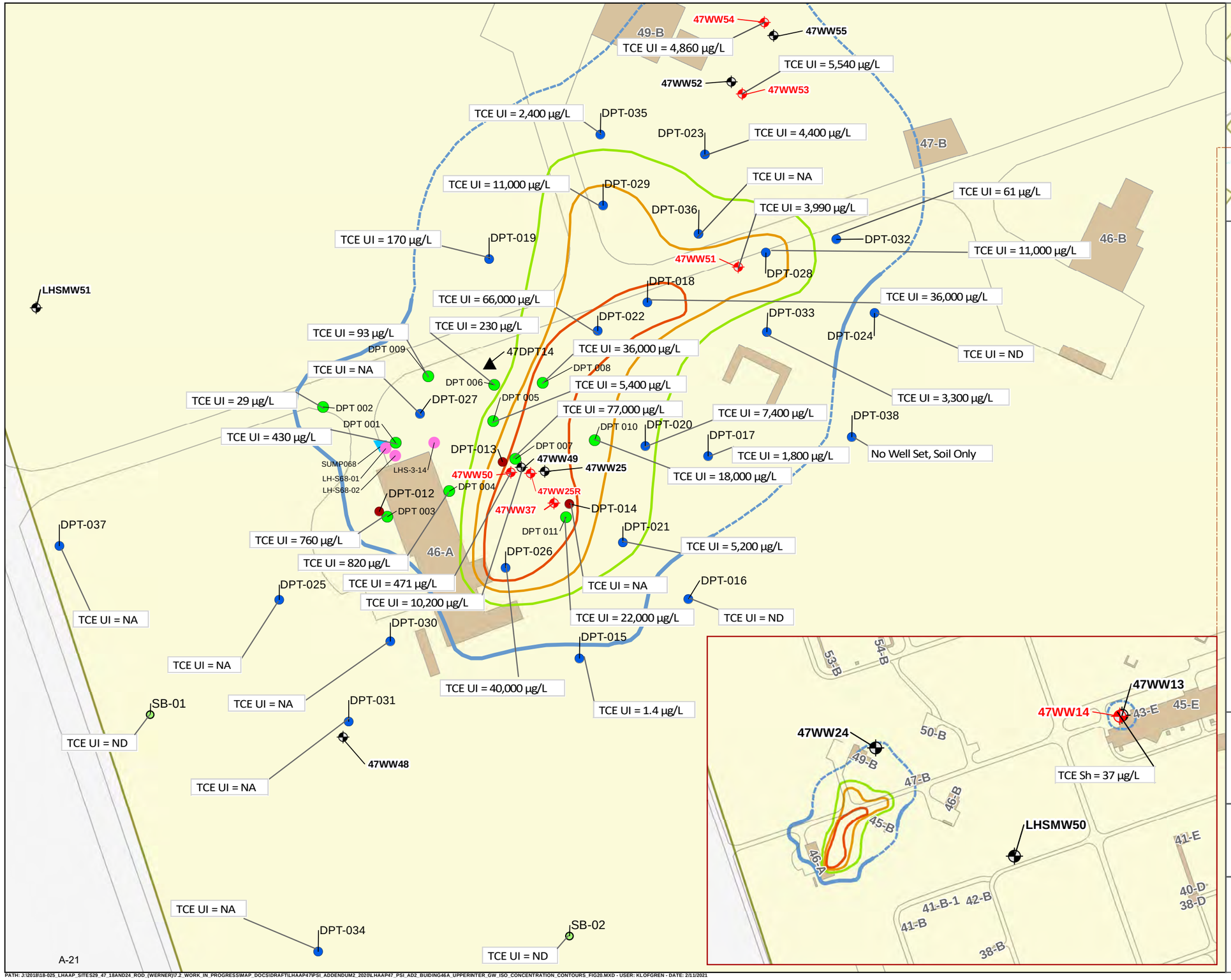
LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

N

0 50 100

FEET

FIGURE 19



LEGEND

- HDR November 2019 DPT Boring Locations (up to 40bgs)
- HDR 2020 Shallow DPT Boring Location
- HDR 2020 Deep and Shallow DPT Boring Location
- Inter./Upper Inter. MW
- Shallow MW

Contaminant Levels

- TCE > 5 µg/L
- TCE > 5,000 µg/L
- TCE > 10,000 µg/L
- TCE > 20,000 µg/L
- DPT (DPT Boring Shaw, 2011)
- SB (Soil Boring Shaw, 2011)
- SUMP
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

**The TCE concentration for 47WW37 is not reflected in the isoconcentration contour since this Intermediate Zone well is screened 20 feet deeper than surrounding UI Zone wells.*
**DPT-001 through DPT-011 and 47WW25R are screened in the Sand-laminated Clay/Upper Intermediate Zone.*

NOTES: All units are in microgram per liter (ug/L)
J = Estimated Value ND = not detected
UI = Upper Intermediate Zone NA = not analyzed
DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

2020 UPPER INTERMEDIATE GROUNDWATER TCE ISO-CONCENTRATION CONTOURS BUILDING 46A AREA

LHAAP-47 LONGHORN ARMY AMMUNITION PLANT

N

0 50 100
FEET

ON THE LINE

FIGURE 20

PATH: J:\2018\18-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47PSI_ADDENDUM2_2020\LHAAP47_PSI_AD2_BUIDING46A_UPPERINTER_GW_ISO_CONCENTRATION_CONTOURS_FIG20.MXD - USER: KLOFGREN - DATE: 2/11/2021



Attachment 2

Tables



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Table 1. 2019 DPT Boring Summary Data

Boring ID	Total Boring Depth (ft bgs)	Interpreted Upper Clay Contact Depth (ft bgs)	Interpreted Upper Intermediate Contact Depth (ft bgs)	Screen Completion Zone	Screen Interval (ft bgs)	Length of Screen Set Into Upper Intermediate Sand (ft)	Temp Casing Stickup (ft ags)	Water Level (ft btoc)	Water Level (ft bgs)
DPT-001	40	29.5	33.5	C/UI	30-40	6.5	0.3	28.94	28.64
DPT-002	44	27	40	C/UI	34-44	4	1.15	31.02	29.87
DPT-003	42.5	32.5	37.5	C/UI	30-40	2.5	2.9	31.29	28.39
DPT-004	38	29	32.5	C/UI	28-38	5.5	2.02	30.43	28.41
DPT-005	34	24	31	C/UI	24-34	3	1.06	29.07	28.01
DPT-006	35	24	30	C/UI	25-35	5	0.35	27.48	27.13
DPT-007	36	27.5	31.5	C/UI	26-36	4.5	4.1	32.21	28.11
DPT-008	36	26	29	C/UI	26-36	7	3.97	33.41	29.44
DPT-009	40	25	31.5	C/UI	30-40	8.5	0.4	29.08	28.68
DPT-010	36	23.5	33	C/UI	26-36	3	4.1	32.98	28.88
DPT-011	38	23	32	C/UI	28-38	6	1.85	30.58	28.73

ft ags = feet above ground surface
ft bgs = feet below ground surface
btoc = below top of casing
C/UI = Clay/Upper Intermediate Zone

Table 2. Temporary Well Summary Data

Boring ID	Total Boring Depth (ft bgs)	Shallow Temp Well Screen Depth (ft bgs)	Shallow Well Exposed Screen Length (ft)	Shallow Temp Well Water Level (ft bgs)	Upper Intermediate Temp Well Screen Depth (ft bgs)	Upper Intermediate Well Exposed Screen Length (ft)	Upper Intermediate Temp Well Water Level (ft bgs)
DPT-012	33	23-33	23-33 (10)	27.67	None	None	None
DPT-013	33	23-33	23-33 (10)	27.24	None	None	None
DPT-014	34	16-26	16-26 (10)	Dry	None	None	None
DPT-015	50	21-31	21-31 (10)	26.02	40-50	47-50 (3)	26.31
DPT-016	42	23-33	23-33 (10)	25.81	32-42	40-42 (2)	26
DPT-017	42	22-32	22-32 (10)	27.47	32-42	38-42 (4)	27.4
DPT-018	40	12-22	12-22 (10)	Dry	30-40	36-40 (4)	27.29
DPT-019	36.5	16-26	16-26 (10)	Dry	26.5-36.5	34.5-36.5 (2)	28.43
DPT-020	44	15-25	15-25 (10)	Dry	34-44	39-44 (5)	26.72
DPT-021	36	14-24	14-24 (10)	Dry	26-36	26-36 (10)	NA
DPT-022	36	08-18	8-18 (10)	Dry	26-36	28-36 (8)	26.67
DPT-023	42	23-33	23-33 (10)	32.23	32-42	36-42 (6)	28.35
DPT-024	44	23-33	23-33 (10)	28.03	34-44	38-44 (6)	27.85
DPT-025	36	26-36	26-36 (10)	27.86	None	None	None
DPT-026	45	26-36	26-36 (10)	28.14	35-45	38-45 (7)	27.8
DPT-027	33	23-33	23-33 (10)	30.45	None	None	NA
DPT-028	45	23-33	23-33 (10)	Dry	35-45	41-45 (4)	27.44
DPT-029	45	24-34	24-34 (10)	27.21	35-45	38-45 (7)	27.3
DPT-030	28.25	18.25-28.25	18.25-28.25 (10)	27.17	None	None	None
DPT-031	33	23-33	23-33 (10)	27.37	None	None	None
DPT-032	49.5	25-35	25-35 (10)	26.6	39.5-49.5	39.5-49.5 (10)	26.43
DPT-033	49	23-33	23-33 (10)	28.68	39-49	41-49 (8)	27.55
DPT-034	33	23-33	23-33 (10)	27.21	None	None	None
DPT-035	49.5	23-33	23-33 (10)	32.69	39.5-49.5	42-49.5	28.2
DPT-036	33	23-33	23-33 (10)	Dry	None	None	None
DPT-037	33	23-33	23-33 (10)	Dry	None	None	None
DPT-038	23	None	None	None	None	None	None

ft bgs = feet below ground surface

Table 3. PSI No. 2 Sample Collection Summary

Parameter/Method	Matrix	Field Samples	No. of Dups	No. of MS	No. of MSD	Equipment Blanks	Trip Blanks	Total No. of Samples
2019								
VOCs SW 8260B	Soil	33	3	2	2	2	2	44
VOCs SW 8260B	Water	13	1	1	1	1	1	18
1,4-Dioxane SW 8270D	Water	5	1	1	1	1	1	10
TCLP VOCs 1311/8260B	Soil	1	0	0	0	0	0	1
TCLP SVOCs 1311/8270C	Soil	1	0	0	0	0	0	1
TCLP Metals/Mercury 1311/6010C/7470A	Soil	1	0	0	0	0	0	1
TCLP Herbicides 1311/8151	Soil	1	0	0	0	0	0	1
TCLP Pesticides 1311/8081A/B	Soil	1	0	0	0	0	0	1
Ignitability (flash point)	Soil	1	0	0	0	0	0	1
Corrosivity	Soil	1	0	0	0	0	0	1
Reactivity	Soil	1	0	0	0	0	0	1
2020								
Field Laboratory: SW8260B (8 selected VOCs)	Soil	110	10	0	0	0	0	120
Field Laboratory: SW8260B (8 selected VOCs)	Water	38	4	0	0	4	0	46
Fixed laboratory: SW8260B (full analyte list	Soil	10	1	1	1	0	0	13
Fixed laboratory: SW8260B (full analyte list	Water	12	1	2	2	1	3	21

Dup = Duplicate
MS = matrix spike
MSD = matrix spike duplicate

Table 4. Monitoring Well Installation Summary

Well ID	Coordinates	Installation Date	Development Date	Zone	Well Completion Details						
					Total Depth (ft)	Screen Interval (ft)	Filter Pack (ft)	Screen Diameter (in)	Borehole Diameter (in)	GW Elevation (ft amsl)	Top of Casing (ft amsl)
47WW48	32.68228, -94.14591	6/23/2020	7/21/2020	Shallow	36.25	22-32	32-20	4	12	177.5	208.02
47WW49	32.68275, -94.1455	6/24/2020	7/13/2020	Shallow	31.7	29-19	29-17	4	12	177.1	207.306
47WW50	32.68274, -94.14552	7/7/2020	7/13/2020	UI	53.3	50-45	50-45	4	12	176.8	207.05
47WW51	32.68314, -94.14501	7/7/2020	7/20/2020	UI	50.4	47-42	47-42	4	12	176.5	206.149
47WW52	32.68349, -94.14500	7/2/2020	7/20/2020	Shallow	36.55	33-23	33-21	4	12	176.1	207.167
47WW53	32.68348, -94.14504	7/8/2020	7/20/2020	UI	50.64	47-42	47-42	4	12	176.3	207.306
47WW54	32.68363, -94.14498	7/16/2020	7/21/2020	Intermediate	51	51-46	51-44	2	8.75	176.1	206.834
47WW55	32.68361, -94.14498	7/15/2020	7/20/2020	Shallow	36	33-23	33-21	4	8.75	175.816	206.796

ft amsl – feet above mean sea level
GW – Groundwater
ft bgs – feet below ground surface
ft – feet
in – inches
UI – Upper Intermediate

Table 5. PSI No. 2 Fixed Laboratory Soil Sample Analytical Results

Chemical Abstracts Service Number	Chemical Name	Sample ID Collection Date Depth Interval (ft bgs)	DPT-001 11/5/2019 27-28	DPT-001 11/5/2019 31-32	DPT-001 11/5/2019 38-39	DPT-002 11/4/2019 26-27	DPT-002 11/4/2019 32-33	DPT-002 11/4/2019 40-41	DPT-003 11/4/2019 29-30	DPT-003 11/4/2019 35-36	DPT-003 11/4/2019 39-40	DPT-004 11/6/2019 28-29	DPT-004 11/6/2019 30-31	DPT-004 11/6/2019 32-33
All results mg/kg		Comparison Level [1]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
75-35-4	1,1-Dichloroethene	0.7	0.00493	<.002 U	<.0021 U	<.0022 U	<.0021 U	<.0025 U	0.00894	<.0019 U	<.0021 U	0.00264	<.0025 U	<.0016 U
156-59-2	cis-1,2-Dichloroethene	7	0.0738	<.002 U	<.0021 U	0.000561 J	0.00164 J	<.0025 U	0.0315	<0019 U	<.0021 U	0.0322	0.00211 J	<0016 U
156-60-5	trans-1,2-Dichloroethene	10	<.0022 U	<.002 U	<.0021 U	<.0022 U	<.0021 U	<.0025 U	<.0023 U	<.0019 U	<.0021 U	<.0021 U	<.0025 U	<.0016 U
79-01-6	Trichloroethene	0.5	**11.8**	0.00162 J	<.0021 U	0.0165	0.0039	<.0025 U	**15.8**	<.0019 U	0.00148 J	**8.37**	0.0187	0.000894 J
75-01-4	Vinyl Chloride	0.2	0.000985 J	<.002 U	<.0021 U	<.0022 U	<.0021 U	<.0025 U	0.000581 J	<.0019 U	<.0021 U	0.000633 J	<.0025 U	<.0016 U

Chemical Abstracts Service Number	Chemical Name	Sample ID Collection Date Depth Interval (ft bgs)	DPT-005 11/5/2019 24-25	DPT-005 11/5/2019 27-28	DPT-005 11/5/2019 31-32	DPT-006 11/5/2019 20-21	DPT-006 11/5/2019 27-28	DPT-006 11/5/2019 30-31	DPT-007 11/5/2019 27-28	DPT-007 11/5/2019 29-30	DPT-007 11/5/2019 31-32	DPT-008 11/6/2019 26-27	DPT-008 11/6/2019 27-28	DPT-008 11/6/2019 29-30
All results mg/kg		Comparison Level [1]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
75-35-4	1,1-Dichloroethene	0.7	0.000799 J+	0.000622 J+	<.002 U	<.0025 U	<.0022 U	<.0035 U	0.00297	0.000647 J	0.00046 J	0.00103 J	0.000524 J	0.00150 J
156-59-2	cis-1,2-Dichloroethene	7	0.0342	0.0487	0.00426	0.00199 J	0.0056	<.0035 U	0.0840 J	0.0541	0.0513	0.0826	0.0404	0.0746 J
156-60-5	trans-1,2-Dichloroethene	10	<.0018 U	<.0021 U	<.002 U	<.0025 U	<.0022 U	<.0035 U	<.0021 U	<.0022 U	<.0023 U	<.0021 U	<.0017 U	<.002 U
79-01-6	Trichloroethene	0.5	**1.62**	**0.957**	0.271	0.0684	0.191	0.00124 J	**6.21**	**1.76**	**15.6**	1.34	0.497	**1.42**
75-01-4	Vinyl Chloride	0.2	<.0018 U	<.0021 U	<.002 U	<.0025 U	<.0022 U	<.0035 U	0.00456	0.00129 J	0.00103 J	0.000825 J	<.0017 U	0.00160 J

Table 5. PSI No. 2 Fixed Laboratory Soil Sample Analytical Results (cont'd)

Chemical Abstracts Service Number	Chemical Name	Sample ID Collection Date Depth Interval (ft bgs)	DPT-009 11/5/2019 24-25		DPT-009 11/5/2019 28-29		DPT-009 11/5/2019 31-32		DPT-10 11/6/2019 23-24		DPT-10 11/6/2019 28-29		DPT-10 11/6/2019 32-33		DPT-11 11/6/2019 22-23		DPT-11 11/6/2019 27-28		DPT-11 11/6/2019 31-32		DPT-016 6/2/2020 24-25	
All results mg/kg		Comparison Level [1]	Result		Result		Result		Result		Result		Result		Result		Result		Result		Result	Qual
75-35-4	1,1-Dichloroethene	0.7	0.000613 J		<.0021 U		<.0017 U		<.0018 U		0.00199		0.00293		<.0015 U		0.000601 J		0.00188		<0.000965	U
156-59-2	cis-1,2-Dichloroethene	7	0.0445		<.0021 U		<.0017 U		0.028		0.205		0.285		0.0501		0.105		0.229		<0.000965	U
156-60-5	trans-1,2-Dichloroethene	10	<.0025 U		<.0021 U		<.0017 U		<.0018 U		0.000474 J		0.000756 J		<.0015 U		0.000430 J		0.000736 J		<0.000965	U
79-01-6	Trichloroethene	0.5	0.295		0.00105 J		ND		**1.24**		**3.18**		**4.1**		**1.1**		**3.81**		**3.08**		<0.000965	U
75-01-4	Vinyl Chloride	0.2	<.0025 U		<.0021 U		<.0017 U		<.0018 U		<.0019 U		0.0298 J		5 U		0.00103 J		0.0103		<0.00193	UJ

Chemical Abstracts Service Number	**Chemical Name**	**Sample ID Collection Date Depth Interval (ft bgs)**	**DPT-017 6/3/2020 19-20**		**DPT-020 6/4/2020 14-15**		**DPT-021 6/4/2020 10-11**		**DPT-024 6/8/2020 9-10**		**DPT-024 6/8/2020 21-22**		**DPT-028 6/10/2020 16-17**	
All results mg/kg		**Comparison Level [1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
75-35-4	1,1-Dichloroethene	0.7	<0.000782	U	<0.048.5	U	<0.000941	U	<0.000981	UJ	<0.000723	U	<0.114	UJ
156-59-2	cis-1,2-Dichloroethene	7	0.00107	J	<0.048.5	U	0.00284		<0.000981	UJ	<0.000723	U	0.0636	J
156-60-5	trans-1,2-Dichloroethene	10	<0.000782	U	<0.048.5	U	<0.000941	U	<0.000981	UJ	<0.000723	U	<0.114	UJ
79-01-6	Trichloroethene	0.5	0.0156		0.324		0.0276		<0.000981	UJ	<0.000723	U	**5.80**	J
75-01-4	Vinyl Chloride	0.2	<0.00156	UJ	<0.0971	UJ	<0.00188	UJ	<0.00196	UJ	<0.00145	UJ	<0.227	UJ

Table 5. PSI No. 2 Fixed Laboratory Soil Sample Analytical Results (cont'd)

Chemical Abstracts Service Number	Chemical Name	Sample ID Collection Date Depth Interval (ft bgs)	DPT-029 6/11/2020 7-8		DPT-029 6/11/2020 21-22		DPT-030 6/11/2020 10-11	
All results mg/kg		Comparison Level [1]	Result	Qual	Result	Qual	Result	Qual
75-35-4	1,1-Dichloroethene	0.7	<0.00110	U	<0.000986	U	<0.576	U
156-59-2	cis-1,2-Dichloroethene	7	<0.00110	U	<0.000986	U	0.467	J
156-60-5	trans-1,2-Dichloroethene	10	<0.00110	U	<0.000986	U	<0.576	U
79-01-6	Trichloroethene	0.5	0.0107		0.00521		59.6	
75-01-4	Vinyl Chloride	0.2	<0.00220	UJ	<0.00197	UJ	<1.150	U

U = not detected
[1] = GWP-Ind MSCs
Bolded result indicates exceedance of comparison level
mg/kg = milligrams per kilogram
J = estimated value
J+ = estimated value, possibly biased high
Refer to Attachment 5 for sample dilution factors
ft bgs = feet below ground surface

Table 6. PSI No. 2 Field Laboratory Soil Sample Results

CAS Number	Chemical Name	Location ID	DPT-012								DPT-013							
		Collection Date	6/4/2020		6/4/2020		6/4/2020		6/4/2020		6/4/2020		6/4/2020		6/4/2020		6/4/2020	
		Depth Interval (ft bgs)	3-4		7-8		11-12		17-18		1-2		11-12		17-18		20-21	
		PID (PPM)	7.1		1.0		31.4		0.0		2.9		5.1		10.1		16.0	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.026	U	.036	U	.025	U	.032	UJ	.030	U	.023	U	.030	UJ	.029	U
156-59-2	cis-1,2-Dichloroethene	7	.026	U	.036	U	.025	U	.032	UJ	.030	U	.023	U	.030	UJ	.062	
156-60-5	trans-1,2-Dichloroethene	10	.026	U	.036	U	.025	U	.032	UJ	.030	U	.023	U	.030	UJ	.029	U
75-01-4	Vinyl chloride	.2	.026	U	.036	U	.025	U	.032	UJ	.030	U	.023	U	.030	UJ	.029	U
75-09-2	Methylene chloride	.5	.110	U	.140	U	.100	U	.130	UJ	.120	U	.093	U	.120	UJ	.120	U
75-34-3	1,1-Dichloroethane	1,000	.026	U	.036	U	.025	U	.032	UJ	.030	U	.023	U	.030	UJ	.029	U
75-35-4	1,1-Dichloroethene	.7	.026	U	.036	U	.025	U	.032	UJ	.030	U	.023	U	.030	UJ	.029	U
79-01-6	Trichloroethene	.5	.026	U	.036	U	.025	U	.032	UJ	.030	U	.056		.041	J-	**.500**	

CAS Number	Chemical Name	Location ID	DPT-014								DPT-015							
		Collection Date	6/3/2020		6/3/2020		6/3/2020		6/3/2020		6/3/2020		6/3/2020		6/3/2020		6/3/2020	
		Depth Interval (ft bgs)	3-4		10-11		19-20		25-26		3-4		15-16		19-20		23-24	
		PID (PPM)	27.8		9.5		15.2		19.9		5.8		13.7		18.0		0.0	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.037	U	.030	U	.027	U	.030	U	.029	U	.028	U	.028	U	.030	U
156-59-2	cis-1,2-Dichloroethene	7	.037	U	.030	U	.027	U	.041		.029	U	.028	U	.028	U	.030	U
156-60-5	trans-1,2-Dichloroethene	10.	.037	U	.030	U	.027	U	.030	U	.029	U	.028	U	.028	U	.030	U
75-01-4	Vinyl chloride	.2	.037	U	.030	U	.027	U	.030	U	.029	U	.028	U	.028	U	.030	U
75-09-2	Methylene chloride	.5	.150	U	.120	U	.110	U	.120	U	.120	U	.110	U	.110	U	.120	U
75-34-3	1,1-Dichloroethane	1,000	.037	U	.030	U	.027	U	.030	U	.029	U	.028	U	.028	U	.030	U
75-35-4	1,1-Dichloroethene	.7	.037	U	.030	U	.027	U	.030	U	.029	U	.028	U	.028	U	.030	U
79-01-6	Trichloroethene	.5	.037	U	.030	U	.027	U	**.630**		.100		.028	U	.028	U	.210	

Table 6. PSI No. 2 Field Laboratory Soil Sample Results (cont'd)

CAS Number	Chemical Name	Location ID	DPT-016								DPT-017							
		Collection Date	6/2/2020		6/2/2020		6/2/2020		6/2/2020		6/3/2020		6/3/2020		6/3/2020		6/3/2020	
		Depth Interval (ft bgs)	7-8		13-14		21-22		24-25		10-11		17-18		19-20		23-24	
		PID (PPM)	0.0		0.0		0.0		0.0		8.3		21.8		15.9		3.5	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.026	U	.028	U	.026	U	.027	U	.028	U	.027	U	.028	U	.027	U
156-59-2	cis-1,2-Dichloroethene	7	.026	U	.028	U	.026	U	.027	U	.028	U	.027	U	.028	U	.032	
156-60-5	trans-1,2-Dichloroethene	10.	.026	U	.028	U	.026	U	.027	U	.028	U	.027	U	.028	U	.027	U
75-01-4	Vinyl chloride	.2	.026	U	.028	U	.026	U	.027	U	.028	U	.027	U	.028	U	.027	U
75-09-2	Methylene chloride	.5	.100	U	.110	U	.110	U	.110	U	.110	U	.110	U	.110	U	.110	U
75-34-3	1,1-Dichloroethane	1,000	.026	U	.028	U	.026	U	.027	U	.028	U	.027	U	.028	U	.027	U
75-35-4	1,1-Dichloroethene	.7	.026	U	.028	U	.026	U	.027	U	.028	U	.027	U	.028	U	.027	U
79-01-6	Trichloroethene	.5	.026	U	.028	U	.026	U	.027	U	.028	U	.027	U	.028	U	.730	

CAS Number	Chemical Name	Location ID	DPT-018								DPT-019							
		Collection Date	6/1/2020		6/1/2020		6/1/2020		6/1/2020		6/1/2020		6/1/2020		6/1/2020		6/1/2020	
		Depth Interval (ft bgs)	7-8		15-16		21-22		32-33		4-5		8-9		14-15		22-23	
		PID (PPM)	0.6		5.7		1.4		42.7		6.7		1.0		0.4		3.0	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.024	UJ	.030	UJ	.031	UJ	.027	UJ	.029	UJ	.024	UJ	.026	UJ	.032	UJ
156-59-2	cis-1,2-Dichloroethene	7	.024	UJ	.030	UJ	.031	UJ	.480	J-	.029	UJ	.024	UJ	.026	UJ	.032	UJ
156-60-5	trans-1,2-Dichloroethene	10.	.024	UJ	.030	UJ	.031	UJ	.027	UJ	.029	UJ	.024	UJ	.026	UJ	.032	UJ
75-01-4	Vinyl chloride	.2	.024	UJ	.030	UJ	.031	UJ	.027	UJ	.029	UJ	.024	UJ	.026	UJ	.032	UJ
75-09-2	Methylene chloride	.5	.096	UJ	.120	UJ	.120	UJ	.110	UJ	.120	UJ	.097	UJ	.100	UJ	.130	UJ
75-34-3	1,1-Dichloroethane	1,000	.024	UJ	.030	UJ	.031	UJ	.027	UJ	.029	UJ	.024	UJ	.026	UJ	.032	UJ
75-35-4	1,1-Dichloroethene	.7	.024	UJ	.030	UJ	.031	UJ	.027	UJ	.029	UJ	.024	UJ	.026	UJ	.032	UJ
79-01-6	Trichloroethene	.5	.210	J-	.470	J-	.058	J-	**15**		.030	J-	.048	J-	.070	J-	.032	UJ

Table 6. PSI No. 2 Field Laboratory Soil Sample Results (cont'd)

CAS Number	Chemical Name	Location ID	DPT-020								DPT-021							
		Collection Date	6/4/2020		6/4/2020		6/4/2020		6/4/2020		6/4/2020		6/4/2020		6/4/2020		6/4/2020	
		Depth Interval (ft bgs)	5-6		11-12		14-15		18-19		6-7		10-11		19-20		23-24	
		PID (PPM)	0.0		4.7		6.0		17.1		0.0		0.0		0.5		5.1	
	SW8260B-VOCs mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.032	UJ	.029	UJ	.028	UJ	.026	UJ	.029	U	.029	U	.030	UJ	.031	U
156-59-2	cis-1,2-Dichloroethene	7	.032	UJ	.029	UJ	.028	UJ	.026	UJ	.029	U	.029	U	.030	UJ	.037	
156-60-5	trans-1,2-Dichloroethene	10	.032	UJ	.029	UJ	.028	UJ	.026	UJ	.029	U	.029	U	.030	UJ	.031	U
75-01-4	Vinyl chloride	.2	.032	UJ	.029	UJ	.028	UJ	.026	UJ	.029	U	.029	U	.030	UJ	.031	U
75-09-2	Methylene chloride	.5	.130	UJ	.120	UJ	.110	UJ	.100	UJ	.110	U	.110	U	.120	UJ	.120	U
75-34-3	1,1-Dichloroethane	1,000	.032	UJ	.029	UJ	.028	UJ	.026	UJ	.029	U	.029	U	.030	UJ	.031	U
75-35-4	1,1-Dichloroethene	.7	.032	UJ	.029	UJ	.028	UJ	.026	UJ	.029	U	.029	U	.030	UJ	.031	U
79-01-6	Trichloroethene	.5	.032	UJ	.029	UJ	.028	UJ	.026	UJ	.029	U	.029	U	.030	UJ	.120	

CAS Number	Chemical Name	Location ID	DPT-022								DPT-023							
		Collection Date	6/5/2020		6/5/2020		6/5/2020		6/5/2020		6/8/2020		6/8/2020		6/8/2020		6/8/2020	
		Depth Interval (ft bgs)	5-6		8-9		14-15		21-21		2-3		4-5		7-8		9-10	
		PID (PPM)	0.0		0.0		4.4		3.2		3.8		0.0		0.0		0.0	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.026	U	.028	U	.029	U	.025	U	.026	U	.027	U	.033	U	.031	U
156-59-2	cis-1,2-Dichloroethene	7	.026	U	.028	U	.029	U	.025	U	.026	U	.027	U	.033	U	.031	U
156-60-5	trans-1,2-Dichloroethene	10	.026	U	.028	U	.029	U	.025	U	.026	U	.027	U	.033	U	.031	U
75-01-4	Vinyl chloride	.2	.026	U	.028	U	.029	U	.025	U	.026	U	.027	U	.033	U	.031	U
75-09-2	Methylene chloride	.5	.100	U	.110	U	.110	U	.099	U	.100	U	.110	U	.130	U	.130	U
75-34-3	1,1-Dichloroethane	1,000	.026	U	.028	U	.029	U	.025	U	.026	U	.027	U	.033	U	.031	U
75-35-4	1,1-Dichloroethene	.7	.026	U	.028	U	.029	U	.025	U	.026	U	.027	U	.033	U	.031	U
79-01-6	Trichloroethene	.5	.026	U	.029		.029	U	.100		.026	U	.027	U	.033	U	.031	U

Table 6. PSI No. 2 Field Laboratory Soil Sample Results (cont'd)

CAS Number	Chemical Name	Location ID	DPT-024								DPT-025							
		Collection Date	6/8/2020		6/8/2020		6/8/2020		6/8/2020		6/9/2020		6/9/2020		6/9/2020		6/9/2020	
		Depth Interval (ft bgs)	9-10		13-14		17-18		21-22		6-7		11-12		17-18		22-23	
		PID (PPM)	0.1		0.0		0.0		0.0		0.0		0.0		21.2		1.8	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.029	U	.028	U	.033	U	.031	U	.026	U	.031	U	.031	U	.026	U
156-59-2	cis-1,2-Dichloroethene	7	.029	U	.028	U	.033	U	.031	U	.026	U	.031	U	.031	U	.026	U
156-60-5	trans-1,2-Dichloroethene	10	.029	U	.028	U	.033	U	.031	U	.026	U	.031	U	.031	U	.026	U
75-01-4	Vinyl chloride	.2	.029	U	.028	U	.033	U	.031	U	.026	U	.031	U	.031	U	.026	U
75-09-2	Methylene chloride	.5	.110	U	.110	U	.130	U	.120	U	.110	U	.120	U	.120	U	.110	U
75-34-3	1,1-Dichloroethane	1,000	.029	U	.028	U	.033	U	.031	U	.026	U	.031	U	.031	U	.026	U
75-35-4	1,1-Dichloroethene	.7	.029	U	.028	U	.033	U	.031	U	.026	U	.031	U	.031	U	.026	U
79-01-6	Trichloroethene	.5	.029	U	.028	U	.033	U	.031	U	.026	U	.031	U	.038		.052	

CAS Number	Chemical Name	Location ID	DPT-026								DPT-027											
		Collection Date	6/7/2020		6/7/2020		6/7/2020		6/7/2020		6/11/2020		6/11/2020		6/11/2020		6/11/2020		6/11/2020		6/11/2020	
		Depth Interval (ft bgs)	4-5		16-17		17-18		26-27		2-3		5-6		8-9		11-12		17-18		22-23	
		PID (PPM)	0.0		2.1		2.4		2.8		0.0		0.0		0.0		0.0					
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.035	U	.027	U	.033	UJ	.030	U	.027	UJ	.030	U	.035	U	.034	U	.030	U	.032	U
156-59-2	cis-1,2-Dichloroethene	7	.035	U	.027	U	.033	UJ	.037		.027	UJ	.030	U	.035	U	.034	U	.030	U	.032	U
156-60-5	trans-1,2-Dichloroethene	10	.035	U	.027	U	.033	UJ	.030	U	.027	UJ	.030	U	.035	U	.034	U	.030	U	.032	U
75-01-4	Vinyl chloride	.2	.035	U	.027	U	.033	UJ	.030	U	.027	UJ	.030	U	.035	U	.034	U	.030	U	.032	U
75-09-2	Methylene chloride	.5	.140	U	.110	U	.130	UJ	.120	U	.110	UJ	.120	U	.140	U	.140	U	.120	U	.130	U
75-34-3	1,1-Dichloroethane	1,000	.035	U	.027	U	.033	UJ	.030	U	.027	UJ	.030	U	.035	U	.034	U	.030	U	.032	U
75-35-4	1,1-Dichloroethene	.7	.035	U	.027	U	.033	UJ	.030	U	.027	UJ	.030	U	.035	U	.034	U	.030	U	.032	U
79-01-6	Trichloroethene	.5	.035	U	.027	U	.033	UJ	.069		.027	UJ	.030	U	.035	U	.034	U	.100		.032	U

Table 6. PSI No. 2 Field Laboratory Soil Sample Results (cont'd)

CAS Number	Chemical Name	Location ID	DPT-028								DPT-029							
		Collection Date	6/10/2020		6/10/2020		6/10/2020		6/10/2020		6/11/2020		6/11/2020		6/11/2020		6/11/2020	
		Depth Interval (ft bgs)	10-11		13-14		16-17		21-22		7-8		13-14		17-18		21-22	
		PID (PPM)	15.0		28.8		16.2		40.2		9.3		1.1		1.1		8.5	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.023	U	.029	U	.032	U	.028	U	.029	U	.028	U	.028	U	.031	U
156-59-2	cis-1,2-Dichloroethene	7	.023	U	.029	U	.032	U	.038		.029	U	.028	U	.028	U	.031	U
156-60-5	trans-1,2-Dichloroethene	10	.023	U	.029	U	.032	U	.028	U	.029	U	.028	U	.028	U	.031	U
75-01-4	Vinyl chloride	.2	.023	U	.029	U	.032	U	.028	U	.029	U	.028	U	.028	U	.031	U
75-09-2	Methylene chloride	.5	.092	U	.120	U	.130	U	.110	U	.110	U	.110	U	.110	U	.130	U
75-34-3	1,1-Dichloroethane	1,000	.023	U	.029	U	.032	U	.028	U	.029	U	.028	U	.028	U	.031	U
75-35-4	1,1-Dichloroethene	.7	.023	U	.029	U	.032	U	.028	U	.029	U	.028	U	.028	U	.031	U
79-01-6	Trichloroethene	.5	.410		.220		**1.300**		**3.300**		.029	U	.0.28	U	.028	U	.031	U

CAS Number	Chemical Name	Location ID	DPT-030								DPT-031							
		Collection Date	6/11/2020		6/11/2020		6/11/2020		6/11/2020		6/12/2020		6/12/2020		6/12/2020		6/12/2020	
		Depth Interval (ft bgs)	10-11		15-16		17-18		19-20		3-4		12-13		16-17		21-22	
		PID (PPM)	256.2		585.4		396.1		310.6		31.1		7.5		14.4		38.4	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.028	U	.32	U	.032	U	.030	U	.028	U	.027	U	.026	U	.029	U
156-59-2	cis-1,2-Dichloroethene	7	.160		.074		.032	U	.030	U	.028	U	.027	U	.026	U	.034	
156-60-5	trans-1,2-Dichloroethene	10	.028	U	.032	U	.032	U	.030	U	.028	U	.027	U	.026	U	.029	U
75-01-4	Vinyl chloride	.2	.028	U	.032	U	.032	U	.030	U	.028	U	.027	U	.026	U	.029	U
75-09-2	Methylene chloride	.5	.110	U	.130	U	.130	U	.120	U	.110	U	.110	U	.100	U	.120	U
75-34-3	1,1-Dichloroethane	1,000	.028	U	.032	U	.032	U	.030	U	.028	U	.027	U	.026	U	.029	U
75-35-4	1,1-Dichloroethene	.7	.028	U	.032	U	.032	U	.030	U	.028	U	.027	U	.026	U	.029	U
79-01-6	Trichloroethene	.5	**16**		**7.9**		.032	U	.030	U	.065		.027	J	**.560**		**2.0**	

Table 6. PSI No. 2 Field Laboratory Soil Sample Results (cont'd)

CAS Number	Chemical Name	Location ID	DPT-032								DPT-033							
		Collection Date	6/13/2020		6/13/2020		6/13/2020		6/13/2020		6/13/2020		6/13/2020		6/13/2020		6/13/2020	
		Depth Interval (ft bgs)	12-13		15-16		19-20		21-22		8-9		12-13		19-20		22-23	
		PID (PPM)	14.8		82.5		10.6		21.2		35.5		6.4		127.2		53.9	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.026	U	.028	U	.026	U	.032	U	.029	U	.025	U	.027	U	.026	U
156-59-2	cis-1,2-Dichloroethene	7	.026	U	.028	U	.026	U	.032	U	.029	U	.025	U	.027	U	.039	
156-60-5	trans-1,2-Dichloroethene	10	.026	U	.028	U	.026	U	.032	U	.029	U	.025	U	.027	U	.026	U
75-01-4	Vinyl chloride	.2	.026	U	.028	U	.026	U	.032	U	.029	U	.025	U	.027	U	.026	U
75-09-2	Methylene chloride	.5	.100	U	.110	U	.100	U	.130	U	.120	U	.100	U	.110	U	.100	U
75-34-3	1,1-Dichloroethane	1,000	.026	U	.028	U	.026	U	.032	U	.029	U	.025	U	.027	U	.026	U
75-35-4	1,1-Dichloroethene	.7	.026	U	.028	U	.026	U	.032	U	.029	U	.025	U	.027	U	.026	U
79-01-6	Trichloroethene	.5	.026	U	.028	U	.026	U	.032	U	.029	U	.025	U	**.520**		**1.7**	

CAS Number	Chemical Name	Location ID	DPT-034								DPT-035							
		Collection Date	6/14/2020		6/14/2020		6/14/2020		6/14/2020		6/14/2020		6/14/2020		6/14/2020		6/14/2020	
		Depth Interval (ft bgs)	8-9		15-16		18-19		22-23		10-11		15-16		18-19		21-22	
		PID (PPM)	2.7		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.025	U	.034	U	.028	U	.030	U	.028	U	.034	U	.028	U	.033	U
156-59-2	cis-1,2-Dichloroethene	7	.025	U	.034	U	.028	U	.030	U	.028	U	.034	U	.028	U	.033	U
156-60-5	trans-1,2-Dichloroethene	10	.025	U	.034	U	.028	U	.030	U	.028	U	.034	U	.028	U	.033	U
75-01-4	Vinyl chloride	.2	.025	U	.034	U	.028	U	.030	U	.028	U	.034	U	.028	U	.033	U
75-09-2	Methylene chloride	.5	.1	U	.140	U	.110	U	.120	U	.110	U	.140	U	.110	U	.130	U
75-34-3	1,1-Dichloroethane	1,000	.025	U	.034	U	.028	U	.030	U	.028	U	.034	U	.028	U	.033	U
75-35-4	1,1-Dichloroethene	.7	.025	U	.034	U	.028	U	.030	U	.028	U	.034	U	.028	U	.033	U
79-01-6	Trichloroethene	.5	.025	U	.034	U	.028	U	.030	U	.028	U	.034	U	.0.28	U	.033	U

Table 6. PSI No. 2 Field Laboratory Soil Sample Results (cont'd)

CAS Number	Chemical Name	Location ID	DPT-036								DPT-037							
		Collection Date	6/15/2020		6/15/2020		6/15/2020		6/15/2020		6/15/2020		6/15/2020		6/15/2020		6/15/2020	
		Depth Interval (ft bgs)	11-12		15-16		18-19		21-22		11-12		14-15		18-19		21-22	
		PID (PPM)	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.028	U	.029	U	.031	U	./029	U	.026	U	.029	U	.023	U	.025	U
156-59-2	cis-1,2-Dichloroethene	7	.028	U	.029	U	.031	U	.029	U	.026	U	.029	U	.023	U	.025	U
156-60-5	trans-1,2-Dichloroethene	10	.028	U	.029	U	.031	U	.029	U	.026	U	.029	U	.023	U	.025	U
75-01-4	Vinyl chloride	.2	.028	U	.029	U	.031	U	.029	U	.026	U	.029	U	.023	U	.025	U
75-09-2	Methylene chloride	.5	.110	U	.120	U	.120	U	.120	U	.100	U	.120	U	.092	U	.100	U
75-34-3	1,1-Dichloroethane	1,000	.028	U	.029	U	.031	U	.029	U	.026	U	.029	U	.023	U	.025	U
75-35-4	1,1-Dichloroethene	.7	.028	U	.029	U	.031	U	.029	U	.026	U	.029	U	.023	U	.025	U
79-01-6	Trichloroethene	.5	.028	U	.029	U	.031	U	.029	U	.026	U	.029	U	.023	U	.025	U

CAS Number	Chemical Name	Location ID	DPT-038							
		Collection Date	6/15/2020		6/15/2020		6/15/2020		6/15/2020	
		Depth Interval (ft bgs)	11-12		15-16		18-19		22-23	
		PID (PPM)	0.0		0.0		0.0		0.0	
	SW8260B-VOCs (mg/kg-dry)	Comparison Levels (mg/kg)	Result	Qual	Result	Qual	Result	Qual	Result	Qual
127-18-4	Tetrachloroethene	.5	.024	U	.027	U	.027	U	.024	U
156-59-2	cis-1,2-Dichloroethene	7	.024	U	.027	U	.027	U	.024	U
156-60-5	trans-1,2-Dichloroethene	10	.024	U	.027	U	.027	U	.024	U
75-01-4	Vinyl chloride	.2	.024	U	.027	U	.027	U	.024	U
75-09-2	Methylene chloride	.5	.097	U	.110	U	.110	U	.098	U
75-34-3	1,1-Dichloroethane	1,000	.024	U	.027	U	.027	U	.024	U
75-35-4	1,1-Dichloroethene	.7	.024	U	.027	U	.027	U	.024	U
79-01-6	Trichloroethene	.5	.024	U	.027	U	.027	U	.024	U

Bolded result indicates exeedance of comparison level
mg/kg - milligrams per kilogram
U = not detected
J = estimated value
J- = estimated value, biased low
PID = photo ionization detector

Qual = Final Data Qualifier
PPM = parts per million
Comparison Levels are TRRP GWP-Ind MSCs
Refer to Attachment 5 for sample dilution factors
ft bgs = feet below ground surface

Table 7. PSI No. 2 Fixed Laboratory Groundwater Sample Results

Chemical Abstracts Service Number	Chemical Name	Location	DPT-001	DPT-002	DPT-003	DPT-004	DPT-005	DPT-006	DPT-007	DPT-008	DPT-009	DPT-010	DPT-011	47WW09
		Sample ID	DPT-001	DPT-002	DPT-003	DPT-004	DPT-005	DPT-006	DPT-007	DPT-008	DPT-009	DPT-010	DPT-011	47WW09
		Collection Date	11/7/2019	11/6/2019	11/6/2019	11/6/2019	11/7/2019	11/6/2019	11/6/2019	11/7/2019	11/6/2019	11/7/2019	11/7/2019	11/7/2019
		Groundwater Zone	C/UI	C/UI	C/UI	C/UI	C/UI	C/UI	C/UI	C/UI	C/UI	C/UI	C/UI	Shallow/ Intermediate
		Screened Interval/Sample Depth (ft bgs)	40	44	40	38	34	35	36	36	40	36	38	33
SW8260B-VOCs (µg/L)			Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
75-35-4	1,1-Dichloroethene	7	<40 U	<2 U	<100 U	<100 U	<400 U	<20 U	<4000 U	<1000 U	<2 U	<1000 U	<1000 U	NA
156-59-2	cis-1,2-Dichloroethene	70	<20 U	0.99 J	<50 U	24 J	93 J	4.2 J	840 J	820	3	1300	1500	NA
156-60-5	trans-1,2-Dichloroethene	100	<20 U	<1 U	<50 U	<50 U	<200 U	<10 U	<2000 U	<500 U	<1 U	<500 U	<500 U	NA
79-01-6	Trichloroethene	5	**430**	**29 J**	**760**	**820**	**5,400**	**230**	**77,000**	**36,000**	**93**	**18,000**	**22,000**	NA
75-01-4	Vinyl chloride	2	N<12 U	<.6 U	<30 U	<30 U	<120 U	<6 U	<1200 U	<300 U	<.6 U	97 J	<300 U	NA

Chemical Abstracts Service Number	Chemical Name	Location	47WW25 R-35	47WW25 R-38	47WW37	DPT-015		DPT-025		DPT-029		DPT-029		47WW48		47WW49	
		Sample ID	47WW25 R-35	47WW25 R-38	47WW37	DPT-015 (50)		DPT-025 (36)		DPT-029 (34)		DPT-029 (45)		47WW48		47WW49	
		Collection Date	11/8/2019	11/8/2019	11/8/2019	6/4/2020		6/10/2020		6/12/2020		6/12/2020		7/23/2020		7/23/2020	
		Groundwater Zone	C/UI	C/UI	Inter-mediate	Upper Intermediate		Shallow		Shallow		Upper Intermediate		Shallow		Shallow	
		Screened Interval/Sample Depth (ft bgs)	35	38	61	40-50		26-36		24-34		35-45		22-32		19-29	
SW8260B-VOCs (µg/L)			Result	Result	Result	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
75-35-4	1,1-Dichloroethene	7	<4000 U	<4000 U	<20 U	<1.00	U	2.41		<50.0	U	<50.0	U	**25.4**		<100	U
156-59-2	cis-1,2-Dichloroethene	70	2100 J	2600	13	<0.500	U	22.5		**1,140**		**673**		**352**		**505**	
156-60-5	trans-1,2-Dichloroethene	100	<2000 U	<2000 U	<10 U	<0.500	UJ	0.28	J	<25.0	U	<25.0	U	2.23		<50.0	U
79-01-6	Trichloroethene	5	**130,000**	**140,000**	**190**	1.53		**1,510**	J	**21,000**		**10,300**		**54,100**		**10,200**	
75-01-4	Vinyl chloride	2	<1200 U	<1200 U	>6 U	<0.500	U	0.28	J	<25.0	U	<25.0	U	**5.93**		<50.0	U

Table 7. PSI No. 2 Fixed Laboratory Groundwater Sample Results (cont'd)

Chemical Abstracts Service Number	Chemical Name	Location	47WW50		47WW51		47WW52		47WW53		47WW54		47WW55	
		Sample ID	47WW50		47WW51		47WW52		47WW53		47WW54		47WW55	
		Collection Date	7/23/2020		7/23/2020		7/23/2020		7/23/2020		7/23/2020		7/23/2020	
		Groundwater Zone	Upper Intermediate		Upper Intermediate		Shallow		Upper Intermediate		Upper Intermediate		Shallow	
		Screened Interval/Sample Depth (ft bgs)	45-50		42-47		23-33		42-47		46-51		23-33	
SW8260B-VOCs (µg/L)			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
75-35-4	1,1-Dichloroethene	7	<1.00	U	3.56		1.5	J	4.15		6.87		0.87	J
156-59-2	cis-1,2-Dichloroethene	70	24.7		**271**		5.49		23.8		**107**		3.51	
156-60-5	trans-1,2-Dichloroethene	100	<0.500	U	1.58		0.52	J	4.11		3.8		0.48	J
79-01-6	Trichloroethene	5	**471**		**3,990**		**5,990**		**5,540**		**4,860**		**2,410**	
75-01-4	Vinyl chloride	2	<0.500	U	0.51	J	0.39	J	0.29	J	1.32	U	<0.500	U

Bold Exceeds Comparison Level
µg/L micrograms per liter
ft bgs Feet below ground surface
MCL Safe Drinking Water Act (SDWA) maximum contaminant level
U Not Detected
J Estimated value
PCL TRRP Protective Concentration Level for Residential Groundwater Use, November 2019
MCL Safe Drinking Water Act (SDWA) maximum contaminant level
C/UI Clay/Upper Intermediate
Qual Final Data Qualifier
Comparison levels are SWDA MCLs if established, otherwise the TRRP PCL is used

Refer to Attachment 5 for sample dilution factors

Table 8. PSI No. 2 Field Laboratory Groundwater Sample Results

	Location	47WW13		47WW14		47WW24		47WW25R		47WW37		LHSMW50		DPT-012	
	sample ID	47WW13		47WW14		47WW24		47WW25R		47WW37		LHSMW50		DPT-012 (33)	
	Sample Date	5/28/2020		5/28/2020		5/29/2020		5/28/2020		5/28/2020		5/29/2020		6/9/2020	
	Location description	Shallow Zone		Shallow/Intermediate Zone		Shallow Zone		C/UI		Intermediate Zone		Shallow Zone		Shallow Zone	
	Screen Interval/Exposed Screen (ft bgs)	8-18		39-49		11-21		29.5-39.5		56-66		16.7-26.7		23-33	
Analyte	Units	MCL	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-Dichloroethane	ug/L	5	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	**1,000**	U
Tetrachloroethene	ug/L	5	0.50	U	0.50	U	0.50	U	0.90		0.50	U	0.50	U	**1,000**	U
cis-1,2-Dichloroethene	ug/L	70	**170**		60		0.50	U	**2,500**		12.00		0.50	U	**1,000**	U
trans-1,2-Dichloroethene	ug/L	100	1.30		8.20		0.50	U	7.80		0.50	U	0.50	U	**1,000**	U
Vinyl chloride	ug/L	2	**4.00**		0.80		0.50	U	**25**		0.50	U	0.50	U	**1,000**	U
Methylene chloride	ug/L	5	2.00	U	2.00	U	2.00	U	2.00	U	2.00	U	2.00	U	**4,000**	U
1,1-Dichloroethene	ug/L	7	0.81		0.50	U	0.50	U	**14**		0.50	U	0.50	U	**1,000**	U
Trichloroethene	ug/L	5	**120.00**		**37**		0.50	U	**120,000**		**180**		0.60		**21,000**	

	Location	DPT-013	DPT-015		DPT-015		DPT-016		DPT-016		DPT-017		DPT-017	
	sample ID	DPT-013 (33)	DPT-015 (31)		DPT-015 (50)		DPT-016 (33)		DPT-016 (42)		DPT-017 (32)		DPT-017 (42)	
	Sample Date	6/9/2020	6//4/2020		6/4/2020		6/3/2020		6/3/2020		6/4/2020		6/4/2020	
	Location description	Shallow Zone	Shallow Zone		Upper Intermediate Zone		Shallow Zone		Upper Intermediate Zone		Shallow Zone		Upper Intermediate Zone	
	Screen Interval/Exposed Screen (ft bgs)	23-33	21-31		40-50/47-50		23-33		32-42/40-42		22-32/10		32-42/38/42	
Analyte	Units	MCL	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-Dichloroethane	ug/L	5	**1,000**	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Tetrachloroethene	ug/L	5	**1,000**	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
cis-1,2-Dichloroethene	ug/L	70	**1,000**	U	5.00		0.50	U	0.50	U	0.50	U	**2,200**		**680**	
trans-1,2-Dichloroethene	ug/L	100	**1,000**	U	0.50	U	0.50	U	0.50	U	0.50	U	5.40		1.80	
Vinyl chloride	ug/L	2	**1,000**	U	0.50	U	0.50	U	0.50	U	0.50	U	**37**		**2.40**	
Methylene chloride	ug/L	5	**4,000**	U	2.00	U	2.00	U	2.00	U	2.00	U	2.00	U	2.00	U
1,1-Dichloroethene	ug/L	7	**1,000**	U	0.50	U	0.50	U	0.50	U	0.50	U	**20**		**7.80**	
Trichloroethene	ug/L	5	**57,000**		**240**		1.40		0.50	U	0.50	U	**23,000**		**6,300**	

Table 8. 2020 PSI Field Laboratory Groundwater Sample Results (cont'd)

	Location	DPT-018		DPT-019		DPT-020		DPT-021		DPT-022		DPT-023		DPT-023	
	sample ID	DPT-018 (40)		DPT-019 (36)		DPT-020 (44)		DPT-021 (36)		DPT-022 (36)		DPT-023 (33)		DPT-023 (42)	
	Sample Date	6/2/2020		6/2/2020		6/5/2020		6/5/2020		6/6/2020		6/9/2020		6/8/2020	
	Location description	Upper Intermediate Zone		Upper Intermediate Zone		Upper Intermediate Zone		Upper Intermediate Zone		Upper Intermediate Zone		Shallow Zone		Upper Intermediate Zone	
	Screen Interval/Exposed Screen (ft bgs)	30-40/36-40		26.5-36.5/34.5-36.5		34-44/39/44		26-36/26/36		26-36/28/36		23-33		34-44/36-42	
Analyte	Units	MCL	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-Dichloroethane	ug/L	5	**100**	U	0.50	U	**100**	U	**100**	U	**100**	U	**100**	U	**100**	U
Tetrachloroethene	ug/L	5	**100**	U	0.50	U	**100**	U	**100**	U	**100**	U	**100**	U	**100**	U
cis-1,2-Dichloroethene	ug/L	70	**1,400**		3.10		**570**		**410**		**1,500**		**100**	U	**100**	U
trans-1,2-Dichloroethene	ug/L	100	**100**	U	0.50	U	**100**	U	**100**	U	**100**	U	**100**	U	**100**	U
Vinyl chloride	ug/L	2	**100**	U	0.50	U	**100**	U	**100**	U	**100**	U	**100**	U	**100**	U
Methylene chloride	ug/L	5	**400**	U	2.00	U	**400**	U	**400**	U	**400**	U	**400**	U	**400**	U
1,1-Dichloroethene	ug/L	7	**100**	U	0.50	U	**100**	U	**100**	U	**100**	U	**100**	U	**100**	U
Trichloroethene	ug/L	5	**41,000**		**170**		**7,400**		**5,200**		**66,000**		**2,500**		**4,400**	

	Location	DPT-0-24	DPT-024	DPT-025	DPT-026	DPT-026	DPT-027	DPT-028
	sample ID	DPT-024 (33)	DPT-024 (44)	DPT-025 (36)	DPT-026 (36)	DPT-026 (45)	DPT-027 (33)	DPT-028 (48)
	Sample Date	6/9/2020	6/8/2020	6/10/2020	6/8/2020	6/8/2020	6/12/2020	6/10/2020
	Location description	Shallow Zone	Upper Intermediate Zone	Shallow Zone	Shallow Zone	Upper Intermediate Zone	Shallow Zone	Upper Intermediate Zone
	Screen Interval/ Exposed Screen (ft bgs)	23-33	34-44/38-44	26-36	26-36	35-45/38-45	23-33	35-45/41-45
Analyte	Units	MCL	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual	Result Qual
1,2-Dichloroethane	ug/L	5	0.50 U	0.50 U	5.00 U	**1,000** U	**100** U	**100** U	**250** U
Tetrachloroethene	ug/L	5	0.50 U	0.50 U	5.00 U	**1,000** U	**100** U	**100** U	**250** U
cis-1,2-Dichloroethene	ug/L	70	0.50 U	0.50 U	8.10 J	**1,400**	**340**	**100** U	**520**
trans-1,2-Dichloroethene	ug/L	100	0.50 U	0.50 U	5.00 U	**1,000** U	**100** U	**100** U	**250** U
Vinyl chloride	ug/L	2	0.50 U	0.50 U	5.00 U	**1,000** U	**100** U	**100** U	**250** U
Methylene chloride	ug/L	5	2.00 U	2.00 U	**20** U	**4,000** U	**400** U	**400** U	**1,000** U
1,1-Dichloroethene	ug/L	7	0.50 U	0.50 U	5.00 U	**1,000** U	**100** U	**100** U	**250** U
Trichloroethene	ug/L	5	0.50 U	0.50 U	**660** J	**14,000**	**40,000**	**3,500**	**11,000**

Table 8. 2020 PSI Field Laboratory Groundwater Sample Results (cont'd)

	Location	DPT-029		DPT-029		DPT-031		DPT-032		DPT-032		DPT-033		DPT-033	
	sample ID	DPT-029 (34)		DPT-029 (45)		DPT-031 (33)		DPT-032 (35)		DPT-032 (49.5)		DPT-033 (33)		DPT-033 (49)	
	Sample Date	6/12/2020		6/12/2020		6/12/2020		6/13/2020		6/13/2020		6/14/2020		6/14/2020	
	Location description	Shallow Zone		Upper Intermediate Zone		Shallow Zone		Shallow Zone		Upper Intermediate Zone		Shallow Zone		Upper Intermediate Zone	
	Screen Interval/Exposed Screen (ft bgs)	24-34		35-45/38-45		23-33		25-35		39.5-49.5/39.5-49.5		23-33		39-49/41-49	
Analyte	Units	MCL	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-Dichloroethane	ug/L	5	**250**	U	**10**	U	**100**	U	0.50	U	2.50	U	**500**	U	**500**	U
Tetrachloroethene	ug/L	5	**250**	U	**10**	U	**100**	U	0.50	U	2.50	U	**500**	U	**500**	U
cis-1,2-Dichloroethene	ug/L	70	**1,200**		**700**		**310**		0.50	U	7.40		**500**	U	**500**	U
trans-1,2-Dichloroethene	ug/L	100	**250**	U	10	U	**100**	U	0.50	U	2.50	U	**500**	U	**500**	U
Vinyl chloride	ug/L	2	**250**	U	**10**	U	**100**	U	0.50	U	**2.50**	U	**500**	U	**500**	U
Methylene chloride	ug/L	5	**1,000**	U	**40**	U	**400**	U	2.00	U	**10.00**	U	**2,000**	U	**2,000**	U
1,1-Dichloroethene	ug/L	7	**250**	U	**10**	U	**100**	U	0.50	U	2.50	U	**500**	U	**500**	U
Trichloroethene	ug/L	5	**22,000**		**11,000**		**41,000**		**6.60**		**61.00**		**5,700**		**3,300**	

	Location	DPT-034	DPT-035	DPT-035
	sample ID	DPT-034 (33)	DPT-035 (33)	DPT-035 (49.5)
	Sample Date	6/14/2020	6/16/2020	6/15/2020
	Location description	Shallow Zone	Shallow Zone	Upper Intermediate Zone
	Screen Interval/Exposed Screen (ft bgs)	23-33	23-33	39-49/42-49.5
Analyte	Units	MCL	Result	Qual	Result	Qual	Result	Qual
1,2-Dichloroethane	ug/L	5	0.50	U	2.50	U	0.50	U
Tetrachloroethene	ug/L	5	0.50	U	2.50	U	0.50	U
cis-1,2-Dichloroethene	ug/L	70	0.50	U	2.50	U	**78**	
trans-1,2-Dichloroethene	ug/L	100	0.50	U	2.50	U	0.94	
Vinyl chloride	ug/L	2	0.50	U	**2.50**	U	0.50	U
Methylene chloride	ug/L	5	2.00	U	**10.00**	U	2.00	U
1,1-Dichloroethene	ug/L	7	0.50	U	2.50	U	2.20	
Trichloroethene	ug/L	5	0.50	U	**59.00**		**2,400**	

Bold – exceeds comparison level
ft bgs – feet below ground surface
µg/L – micrograms per liter
MCL – Safe Drinking Water Act (SWDA) Maximum Contaminant Level
U – not detected
Qual – Final Data Qualifier
C/UI – Clay/Upper Intermediate Zone
Refer to Attachment 5 for sample dilution factors

Table 9. PSI No. 2 Fixed-Field Laboratory Data Comparison – Soil

Chemical Name	Location ID	DPT-016					DPT-017					DPT-020				
	Collection Date	6/2/2020					6/3/2020					6/4/2020				
	Depth Interval (ft bgs)	24-25					19-20					14-15				
All results mg/kg	Comparison Level (mg/kg)	Fixed Lab		Field Lab		RPD	Fixed Lab		Field Lab		RPD	Fixed Lab		Field Lab		RPD
		Result	Qual	Result	Qual	(%)	Result	Qual	Result	Qual	(%)	Result	Qual	Result	Qual	(%)
Tetrachloroethene	.5	<0.00965	U	.027	U	NC	<0.000782	U	.028	U	NC	<.0485	U	.028	UJ	NC
cis-1,2-Dichloroethene	7	<0.00965	U	.027	U	NC	.00107	J	.028	U	NC	<.0485	U	.028	UJ	NC
trans-1,2-Dichloroethene	10	<0.00965	U	.027	U	NC	<0.000782	U	.028	U	NC	<.0485	U	.028	UJ	NC
Vinyl chloride	.2	<.0193	UJ	.027	U	NC	<.00156	UJ	.028	U	NC	<.0971	UJ	.028	UJ	NC
Methylene chloride	.5	.00275	J	.110	U	NC	<.00156	U	.110	U	NC	<.0971	U	.110	UJ	NC
1,1-Dichloroethane	1,000	<.00193	U	.027	U	NC	<.00156	U	.028	U	NC	<.0971	U	.028	UJ	NC
1,1-Dichloroethene	.7	<0.000965	U	.027	U	NC	<0.000782	U	.028	U	NC	<.0485	U	.028	UJ	NC
Trichloroethene	.5	<0.000965	U	.027	U	NC	.0156		.028	U	NC	.324		.028	UJ	NC

Chemical Name	Location ID	DPT-021					DPT-024					DPT-024				
	Collection Date	6/4/2020					6/8/2020					6/8/2020				
	Depth Interval (ft bgs)	10-11					9-10					21-22				
All results mg/kg	Comparison Level (mg/kg)	Fixed Lab		Field Lab		RPD	Fixed Lab		Field Lab		RPD	Fixed Lab		Field Lab		RPD
		Result	Qual	Result	Qual	(%)	Result	Qual	Result	Qual	(%)	Result	Qual	Result	Qual	(%)
Tetrachloroethene	.5	<0.000941	U	.029	U	NC	<0.000981	UJ	.029	U	NC	<0.000723	U	.031	U	NC
cis-1,2-Dichloroethene	7	.00284		.029	U	NC	<0.000981	UJ	.029	U	NC	<0.000723	U	031	U	NC
trans-1,2-Dichloroethene	10	<0.000941	U	.029	U	NC	<0.000981	UJ	.029	U	NC	<0.000723	U	.031	U	NC
Vinyl chloride	.2	<.00188	UJ	.029	U	NC	<.00196	UJ	.029	U	NC	<.00145	UJ	.031	U	NC
Methylene chloride	.5	<.00188	U	.110	U	NC	<.00196	UJ	.110	U	NC	<.00145	U	.120	U	NC
1,1-Dichloroethane	1,000	<.00188	U	.029	U	NC	<00196	UJ	.029	U	NC	<.00145	U	.031	U	NC
1,1-Dichloroethene	.7	<0.000941	U	.029	U	NC	<0.000981	UJ	.029	U	NC	<0.000723	U	.031	U	NC
Trichloroethene	.5	.0276		.029	U	NC	<0.000981	UJ	.029	U	NC	<0.000723	U	.031	U	NC

Table 9. PSI No. 2 Fixed-Field Laboratory Data Comparison – Soil (cont'd)

Chemical Name	Location ID	DPT-028					DPT-029									
	Collection Date	6/10/2020					6/11/2020					6/11/2020				
	Depth Interval (ft bgs)	16-17					7-8					21-22				
All results mg/kg	Comparison Level (mg/kg)	Fixed Lab		Field Lab		RPD	Fixed Lab		Field Lab		RPD	Fixed Lab		Field Lab		RPD
		Result	Qual	Result	Qual	(%)	Result	Qual	Result	Qual	(%)	Result	Qual	Result	Qual	(%)
Tetrachloroethene	.5	<114.	UJ	.032	U	NC	<.00110	U	.029	U	NC	<0.000986	U	31	U	NC
cis-1,2-Dichloroethene	7	.0636	J	.032	U	NC	<.00110	U	.029	U	NC	<0.000986	U	31	U	NC
trans-1,2-Dichloroethene	10	<.114	UJ	.032	U	NC	<.00110	U	.029	U	NC	<0.000986	U	31	U	NC
Vinyl chloride	.2	<.227	UJ	.032	U	NC	<.00220	UJ	.029	U	NC	<.00197	UJ	31	U	NC
Methylene chloride	.5	<.227	UJ	.130	U	NC	<.00220	U	.110	U	NC	<.00197	U	130	U	NC
1,1-Dichloroethane	1,000	<.227	UJ	.032	U	NC	<.00220	U	.029	U	NC	<.00197	U	31	U	NC
1,1-Dichloroethene	.7	<.114	UJ	.032	U	NC	<.00110	U	.029	U	NC	<0.000986	U	31	U	NC
Trichloroethene	.5	5.880	J	1.300		128	.0107		.029	U	NC	.00521		31	U	NC

Chemical Name	Location ID	DPT-030				
	Collection Date	6/11/2020				
	Depth Interval (ft bgs)	10-11				
All results mg/kg	Comparison Level (mg/kg)	Fixed Lab		Field Lab		RPD
		Result	Qual	Result	Qual	(%)
Tetrachloroethene	.5	<,576	U	.028	U	NC
cis-1,2-Dichloroethene	7	,467	J	.160		98
trans-1,2-Dichloroethene	10	<,576	U	.028	U	NC
Vinyl chloride	.2	<1.150	U	.028	U	NC
Methylene chloride	.5	<1.150	U	.110	U	NC
1,1-Dichloroethane	1,000	<1.150	U	.028	U	NC
1,1-Dichloroethene	.7	<.576	U	.028	U	NC
Trichloroethene	.5	59		16		115

Comparison Levels are SWDA Maximum Contaminant Levels

Bold	Exceeds comparison level
mg/kg	milligrams per kilogram
J	Estimated value
NC	Not Calculated
U	Not Detected
ft bgs	Feet below ground surface
RPD	Relative percent difference

Refer to Attachment 5 for sample dilution factors

Table 10. PSI No. 2 Fixed-Field Laboratory Data Comparison - Groundwater

Chemical Name	Location sample ID	DPT-015 DPT-015 (50)					DPT-025 DPT-025 (36)				
	Sample Date	6/4/2020					6/10/2020				
	Location description	Upper Intermediate					Shallow				
	Screen Interval/Exposed Screen (ft bgs)	40-50/47-50					26-36				
	PCL/MCL	Fixed Lab		Field Lab		RPD	Fixed Lab		Field Lab		RPD
Analyte	µg/L	Result	Qual	Result	Qual	(%)	Result	Qual	Result	Qual	(%)
1,2-Dichloroethane	5	<0.500	U	0.50	U	NC	<0.500	U	5.00	U	NC
Tetrachloroethene	5	<0.500	U	0.50	U	NC	<0.500	U	5.00	U	NC
cis-1,2-Dichloroethene	70	<0.500	U	0.50	U	NC	22.5		8.10	J	94
trans-1,2-Dichloroethene	100	<0.500	UJ	0.50	U	NC	0.28	J	5.00	U	NC
Vinyl chloride	2	<0.500	U	0.50	U	NC	0.28	J	5.00	U	NC
Methylene chloride	5	<0.500	U	2.00	U	NC	<0.500	U	20	U	NC
1,1-Dichloroethene	7	<1.00	U	0.50	U	NC	2.41		5.00	U	NC
Trichloroethene	5	1.53		1.40		9	**1,510**	J	**660**	J	70

Chemical Name	Location sample ID	DPT-029 DPT-029 (34)					DPT-029 DPT-029 (45)				
	Sample Date	6/12/2020					6/12/2020				
	Location description	Shallow					Upper Intermediate				
	Screen Interval (ft bgs)	24-34					35-45/38-45				
	PCL/MCL	Fixed Lab		Field Lab		RPD	Fixed Lab		Field Lab		RPD
Analyte	µg/L	Result	Qual	Result	Qual	(%)	Result	Qual	Result	Qual	(%)
1,2-Dichloroethane	5	<25.0	U	250	U	NC	<25.0	U	10	U	NC
Tetrachloroethene	5	<25.0	U	250	U	NC	<25.0	U	10	U	NC
cis-1,2-Dichloroethene	70	**1,140**		1,200		5	**673**		700		4
trans-1,2-Dichloroethene	100	<25.0	U	250	U	NC	<25.0	U	10	U	NC
Vinyl chloride	2	<25.0	U	250	U	NC	<25.0	U	10	U	NC
Methylene chloride	5	<25.0	U	1,000	U	NC	<25.0	U	40	U	NC
1,1-Dichloroethene	7	<50.0	U	250	U	NC	<50.0	U	10	U	NC
Trichloroethene	5	**21,000**		22,000		5	**10,300**		11,000		7

All concentrations µg/L

Bold	Exceeds comparison level	NC	Not Calculated
µg/L	micrograms per liter	PCL	TRRP Protective Concentration Level for Residential Groundwater, November, 2019
ft bgs	Feet below ground surface	U	Not Detected
MCL	SWDA Maximum Contaminant Level	Refer to Attachment 5 for sample dilution factors	

Attachment 3

Soil Boring and Monitoring Well Development Logs, Well Abandonment and Registration Forms

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1. HOLE NUMBER: DPT-801

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION	
3. INSTALLATION: LHAAP	SHEET 1 OF 3 SHEETS
4. PROJECT: Bldg 46A	13. SIZE AND TYPE OF BIT: 2.25" core barrel
5. LOCATION (Coordinates or Station): —	14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —
	15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822 DT
6. DRILLING AGENCY: WHE	16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —
7. HOLE NUMBER (as shown on drawing title and title number): DPT-801	17. TOTAL NUMBER CORE BOXES: —
8. NAME OF DRILLER: Kerri Powell	18. ELEVATION GROUND WATER
9. DIRECTION OF HOLE: ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.	19. DATE HOLE (YYYYMMDD): a. STARTED 11/05/2019 b. COMPLETED 11/05/2019
10. THICKNESS OF OVERBURDEN: —	20. ELEVATION TOP OF HOLE (feet): —
11. DEPTH DRILLED INTO ROCK: —	21. TOTAL CORE RECOVERY FOR BORING %:
12. TOTAL DEPTH OF HOLE: 40'	22. SIGNATURE OF INSPECTOR:

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Clay with intermixed Sand and silt, plastic, v. moist, various red/gray, Sand from 9-12	3/4 %	0.0	
		2		75 %		
		3		%		
		4				
		5		3/4 %		
		6		75 %		
		7		%		
		8				
		9		%		
		10				

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE (Translucent) PROJECT HOLE NUMBER VERSI

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 2 OF 3 SHEETS
—	DPT-601	

3. PROJECT	4. INSTALLATION
LHAAP Bldg 1/6A	LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		11		3/4 75 %	0.0	
		12		%		
		13		2/2 100 %		
		14				
		15		2/2 % 100		
		16	Sand, loose, tan to white, dry, fine grained	%	0.3	
		17		2/2 100 %		
		18			0.6	
		19		2/2 100 %	1.1	
		20	Clay, red/grey, stiff, plastic			
		21		2/2 % 100	1.5	
		22		%	2.2	
		23		2/2 100 %	7.6	
		24		2/2 100 %	5.0	
		25				

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 3 OF 3 SHEETS
—	DPT-001	

3. PROJECT: LHAAD Bldg 46A

4. INSTALLATION: LHAAD

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		26	Sand with clay, wet, tan to red	%	3.6	
		27		2/2 100 %	4.8	Sample DPT-001 (27-28) at 0810
		28			5.6	
				2/2 %	1.4	
		29		100	0.7	
		30	Clay, very silty, dark brown, stiff, dry, some sand lenses	%	1.4	
		31		2/2 100 %	0.0	Sample DPT-001 (31-32) at 0820
		32			0.0	
		33		2/2 % 100	0.0	
		34	Sand w clay, dry, dark gray to brown, stiff, very loose at 38'		0.0	
		35		2/2 100 %	0.0	
		36			0.0	
		37		2/2 100 %	0.0	
		38			0.0	
		39		2/2 % 100	0.0	Sample DPT-001 (38-39) at 0830
		40			0.0	
				%	0.0	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1. HOLE NUMBER DPT-002

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION	—
3. INSTALLATION	LHAAP
SHEET 1 OF 4 SHEETS	
4. PROJECT	Bldg 46A
5. LOCATION (Coordinates or Station)	—
6. DRILLING AGENCY	WHE
7. HOLE NUMBER (as shown on drawing title and title number)	DPT-002
8. NAME OF DRILLER	Kori Powell
9. DIRECTION OF HOLE	☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.
10. THICKNESS OF OVERBURDEN	0.5' concrete
11. DEPTH DRILLED INTO ROCK	—
12. TOTAL DEPTH OF HOLE	44'
13. SIZE AND TYPE OF BIT	2.25" core barrel
14. DATUM FOR ELEVATION SHOWN (TBM or MSL)	—
15. MANUFACTURERS DESIGNATION OF DRILL	Geoprobe 7822 DT
16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN	a. DISTURBED — b. UNDISTURBED —
17. TOTAL NUMBER CORE BOXES	—
18. ELEVATION GROUND WATER	
19. DATE HOLE (YYYYMMDD)	a. STARTED 11/04/2019 b. COMPLETED 11/04/2019
20. ELEVATION TOP OF HOLE (feet)	—
21. TOTAL CORE RECOVERY FOR BORING %	
22. SIGNATURE OF INSPECTOR	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Silt, gray/brown, dry, gravel, loose 0 PID	2/4 %	0.0	
		2	Clay, silty, moist, gray-red-brown, 0 PID	50 %	0.0	
		3				
		4		%	0.0	
		5		3/4 %	0.0	
		6	Clay, very stiff, gray brown w/ red mottling. 0 PID v. plastic	75 %		
		7			0.0	
		8		%		
		9			0.0	
		10		%		

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DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-002
SHEET 2 OF 4 SHEETS
3. PROJECT: LHAAP Bldg 4GA
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		11		4/4 % 100	0.0	
		12		%		
		13	Clay/silt, stiff, gray/brown/red, dry, slight plastic	4/4 % 100	0.0	
		14	0 PID			
			Sand lense at 14'		0.0	
		15		%		
		16		2/2 % 100 %	0.0	
		17				
		18	Sand, loose, fine grain, tan, slight moist	2/2 100 %	0.0	
		19	0 PID		0.0	
		20				
		21		2/2 % 100 %	0.0	
		22	Clay/stiff, plastic, brown/red, slight moist			
		23	1.0 PID	2/2 100 %	1.0	
		24				
		25		2/2 100 %	0.0	

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6. PROJECT
7. HOLE NUMBER
VERSION 1.1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-002
SHEET 3 OF 4 SHEETS
3. PROJECT: LHAAP Bldg 416A
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	26		Sand, loose, moist, brown/gray/red	%		Sample DPT-002 (26-27) at 1400
			18.0 PID	2/2 100 %	18.0	
	27					
			Clay, stiff, plastic, moist, brown, silty		12.0	
	28			2/2 % 100		
	29				10.7	
	30			%		
				2/2 100 %	0.4	
	31				0.1	
	32				0.0	
				2/2 % 100	0.0	Sample DPT-002 (32-33) at 1410
	33					
	34				0.0	
				%		
	35			2/2 100 %	0.0	
					0.0	
	36		Silt, clayey, stiff, dry, black, organic matter			
	37			2/2 100 %	0.0	
					0.6	
	38				0.0	
				2/2 %		
	39				0.0	
				100 %		
	40				0.0	

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6. PROJECT
7. HOLE NUMBER
VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 4 OF 4 SHEETS
—	DPT-002	

3. PROJECT	4. INSTALLATION
LHRAP Bldg 46A	LHRAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		41	Silt, Sandy, loose, brown, Slight moist going to wet at 43'	2/2 %	0.0	Sample DPT-002 (40-41) at 1420
				100	0.0	
		42		%	0.0	
		43		2/2	0.0	
				100		
				%	0.0	
		44			0.0	
				%		Set screen
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

1. HOLE NUMBER DPT-003

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION —

3. INSTALLATION LHAAP

SHEET 1 OF 4 SHEETS

PROJECT Bldg 46A

LOCATION (Coordinates or Station) —

13. SIZE AND TYPE OF BIT 2.25" core barrel

14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —

15. MANUFACTURERS DESIGNATION OF DRILL Geoprobe 7822DT

5. DRILLING AGENCY WHE

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN — a. DISTURBED — b. UNDISTURBED —

7. HOLE NUMBER (as shown on drawing title and title number) DPT-003

17. TOTAL NUMBER CORE BOXES —

8. NAME OF DRILLER Kurt Powell

18. ELEVATION GROUND WATER

19. DATE HOLE (YYYYMMDD) a. STARTED 11/04/2019 b. COMPLETED 11/04/2019

9. DIRECTION OF HOLE [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

20. ELEVATION TOP OF HOLE (feet) —

10. THICKNESS OF OVERBURDEN 0.5' concrete

21. TOTAL CORE RECOVERY FOR BORING % —

11. DEPTH DRILLED INTO ROCK —

22. SIGNATURE OF INSPECTOR

12. TOTAL DEPTH OF HOLE 42.5'

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Clay, stiff, moist, plastic, gray with red mottling, silty at base		% 0.0	
		2		2/4 50 %	0.0	
		3			0.6	
		4			0.0	
		5		4/4 100 %	% 0.0	
		6			0.0	
		7			0.0	
		8			% 0.0	
		9		4/4 100 %	0.0	
		10			0.0	

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DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 2 OF 4 SHEETS
—	DPT-003	

3. PROJECT	4. INSTALLATION
Bldg 4LA	LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		11		%	0.0	
					0.0	
		12		%		
				2/2	0.0	
		13		100 %		
		14			0.0	
				2/2		
		15		100 %	0.0	
		16			0.0	
				%		
		17	Sand mixed with silt and clay, wet, loose, tan to red	2/2	0.0	
				100 %		
		18			0.0	
				2/2		
		19		100 %		
					0.0	
		20		%		
				2/2		
		21		100	0.0	
		22		%		
				2/2	0.0	
		23		100 %		
		24	Clay w/ interbedded silt, moist, plastic, stiff, tan to red	2/2	0.4	
		25		100 %		

ENG FORM 1836A, JUN 1967	PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*	6. PROJECT	7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-003
SHEET 3 OF 4 SHEETS
3. PROJECT: BldG 46A
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		26		%	1.6	
			Sand, loose, wet, tan to red	2/2		
		27		100 %	2.4	
					3.5	
		28	Silt with sand, stiff, moist, dark brown	%	5.5	
		29		2/2	6.3	Sample DPT-003(29-30) at 1540
				100		
		30		%	9.2	
				2/2	2.6	
		31		100 %		
					1.4	
		32				
		33	Clay, stiff, silty, black, plastic, moist to dry	2/2 %	0.0	
				100		
		34		%	0.0	
				2/2	0.0	
		35		100		Sample DPT-003(35-36) at 1550
				%		
		36			0.0	
				2/2	0.0	
		37		100 %		
					0.0	
		38	Sand with silt, black dry to moist			
				2/2 %	0.0	
		39		100	0.0	Sample DPT-003(39-40) at 1600
				%		
		40			0.0	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 4 OF 4 SHEETS
—	DPT-003	

3. PROJECT	4. INSTALLATION
Bldg 46A	LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		41		25/25 %		
				100		
		42		%		
		43		%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1. HOLE NUMBER: DPT-004

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP — SHEET 1 OF 3 SHEETS

4. PROJECT: LHAAP BIG 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-004

8. NAME OF DRILLER: Kerri Powell

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 38'

13. SIZE AND TYPE OF BIT: 2.25" core barrel

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 11/06/2019 b. COMPLETED 11/06/2019

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1 2 3 4 5 6 7 8 9 10	Clay, stiff, plastic, moist, red to brown to tan, silty	2/4 50 % 3/4 75 % 4/4 100 %	0.'	

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DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-004
SHEET 2 OF 3 SHEETS
3. PROJECT: Bldg 46A
4. INSTALLATION: CHARP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	11			%	0.0	
	12			%		
	13			4/4		
	14		Sand, loose, dry, tan with red staining	100 %	0.3	
	15			%	0.0	
	16				0.0	
	17			2/2 100 %	0.0	
	18				0.0	
	19			2/2 100 %	0.3	
	20				0.5	
	21		Clay, very silty, plastic, st. ff, moist,	2/2 100 %	0.0	
	22				0.0	
	23		Sand, clayey, loose, tan	2/2 100 %	0.0	
	24				5.0	
	25			2/2 100 %	12.8	
					20.7	
					55.0	
					39.1	

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-004
SHEET 3 OF 3 SHEETS
3. PROJECT: Bldg 46A
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	26			%	49.6	
	27			2/2 100 %	49.1 69.7	
	28				65.8	
	29			2/2 %	42.6	Sample DPT-004 (28-29) at 0900
	30		Clay, dark brown, silty, stiff, dry	100 %	38.4 22.9	
	31			2/2 100 %	3.4 0.0	Sample DPT-004 (30-31) at 0910
	32				0.0	
	33		Sand/clay, silt, dark gray, dry, termed at 37	2/2 % 100	0.0 0.0	Sample DPT-004 (32-33) at 0920
	34			%	0.0	
	35			2/2 100 %	0.0 0.0	
	36				0.0	
	37			2/2 % 100	0.0 0.0	
	38				0.0	
	39			%		
	40			%		

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6. PROJECT
7. HOLE NUMBER
VERSION 1.0

1. HOLE NUMBER: DPT-005

DRILLING LOG
For use of this form see EM 1110-1-1804 the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: Bldg U6A

5. LOCATION (Coordinates or Station): —

13. SIZE AND TYPE OF BIT: 2.25" Core bead

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822 DT

6. DRILLING AGENCY: WHE

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

7. HOLE NUMBER (as shown on drawing title and title number): DPT-005

17. TOTAL NUMBER CORE BOXES: —

8. NAME OF DRILLER: Kerr, Powell

18. ELEVATION GROUND WATER

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

19. DATE HOLE (YYYYMMDD): a. STARTED 11/05/2019; b. COMPLETED 11/05/2019

20. ELEVATION TOP OF HOLE (feet): —

10. THICKNESS OF OVERBURDEN: —

21. TOTAL CORE RECOVERY FOR BORING %

11. DEPTH DRILLED INTO ROCK: —

22. SIGNATURE OF INSPECTOR

12. TOTAL DEPTH OF HOLE: 34'

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Clay, sandy at top, brown to red to gray, stiff, plastic	2/4 50 %	0.0	
		2				
		3				
		4				
		5		4/4 100 %		
		6				
		7				
		8				
		9		4/4 100 %		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PR [illegible] HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-005
SHEET 2 OF 3 SHEETS
3. PROJECT: LHAAP BIG 46A
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	11				0.0 %	
	12				%	
	13			4/4	%	
	14		Sand, gray, loose, dry, red staining	100	%	
	15				%	
	16				% 1.4	
	17			4/4	% 5.8	
	18			100		
	19				% 1.9	
	20			2/2	% 0.5	
	21			100	0.4	
	22				% 1.1	
	23			2/2	4.9	
	24			100	% 4.3	
					10.3	
	24		Clay w/ sand, plastic, dark gray		6.4	Sample DPT-005 (24-25) at 1250
	25			2/2	%	
				100	2.1	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 3 OF 3 SHEETS
—	DPT-005	

3. PROJECT	4. INSTALLATION
LHAAP Bldg 46A	LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		26		%	2.2	
				2½	0.6	
		27		100 %	0.0	Sample DPT-005 (27-28) at 1300
		28			0.0	
				2½ %	0.0	
		29		100	0.0	
		30		%		
				2½	0.6	
		31	Sand, red, fine to	100 %		Sample DPT-005 (31-32) at 1310
		32	red, loose		0.9	
				2½ %	4.8	
		33		100		
		34		%	11.2	
		35		%		
		36		%		
		37		%		
		38		%		
		39		%		
		40		%		

1. HOLE NUMBER: DPT-006

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION	3. INSTALLATION: LHAAP	SHEET 1 OF 3 SHEETS	
4. PROJECT: Bldg 46A	13. SIZE AND TYPE OF BIT: 2.25" Core barrel		
5. LOCATION (Coordinates or Station): —	14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —		
	15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822DT		
6. DRILLING AGENCY: WHF	16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN	a. DISTURBED: —	b. UNDISTURBED: —
7. HOLE NUMBER (as shown on drawing title and title number): DPT-006	17. TOTAL NUMBER CORE BOXES: —		
8. NAME OF DRILLER: Kerri Powell	18. ELEVATION GROUND WATER		
9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.	19. DATE HOLE (YYYYMMDD)	a. STARTED: 11/05/2019	b. COMPLETED: 11/05/2019
10. THICKNESS OF OVERBURDEN: —	20. ELEVATION TOP OF HOLE (feet): —		
11. DEPTH DRILLED INTO ROCK: —	21. TOTAL CORE RECOVERY FOR BORING %:		
12. TOTAL DEPTH OF HOLE: 35'	22. SIGNATURE OF INSPECTOR:		

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Clay, sandy, stiff, moist, brown to red, plastic	3/4 75 %	0.0	
		2				
		3				
		4				
		5		4/4 100 %		
		6				
		7				
		8				
		9		4/4 100 %		
		10				

ENG FORM 1836, MAR 1971 — PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) — HOLE NUMBER — VERSION

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —

2. HOLE NUMBER: DPT- 006

SHEET 2 OF 3 SHEETS

3. PROJECT: LHAAP Bldg 46A

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		11		%	0.0	
		12	Sand, clayey, tan to red/brown, dry, loose	4/4 %		
		13		100 %		
		14				
		15		%		
		16		2/2 %		
		17		100		
		18		%	0.0	
		19	Clay, st. stf. sandy to silty, brown to red, dry, plastic	2/2 100 %	0.4	
		20			2.4	
		21	Sand, loose, tan to red, moist	2/2 % 100	2.6 2.0	Sample DPT-006 (20-21) at 1120
		22		%	5.0	
		23		2/2 100 %	12.4 5.0 6.4	
		24	Clay w sand, plastic, moist, red to brown	2/2 % 100	0.7 0.2	
		25				

ENG FORM 1836A, JUN 1967 — PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-006
SHEET 3 OF 3 SHEETS
3. PROJECT: LHAAP 13 Bldg UGA
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		26		%	0.3	
		27		2/2 100 %	0.0	
					0.0	Sample DPT-006 (27-28) at 1130
		28			0.0	
		29		2/2 100 %	0.0	
					0.0	
		30		%	0.0	Sample DPT-006 (29-31) at 1140
		31	Sand, loose, moist, tan	2/2 100 %	0.0	DUP-002 at 0830 MS/MSD
		32			0.0	
		33		2/2 100 %	0.0	
					0.0	
		34			0.0	
		35		1/1 100 %	0.0	
		36		%		
		37		%		
		38		%		
		39		%		
		40		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

1. HOLE NUMBER: DPT-007

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION: —

3. INSTALLATION: LHAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: LHAAP BLG 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-007

8. NAME OF DRILLER: Kerri Powell

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED ____ DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 36'

13. SIZE AND TYPE OF BIT: 2.25" core barrel

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 11/05/2019; b. COMPLETED 11/05/2019

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: [signature]

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Clay, stiff, plastic, brown/red/tan	2/4	6.0	
		2		50		
		3				
		4				
		5		2/4		
		6		50		
		7				
		8				
		9		4/4		
		10		100		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT — HOLE NUMBER — VERSION —

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —

2. HOLE NUMBER: DPT-007

SHEET 2 OF 3 SHEETS

3. PROJECT: Bldg 4CA

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	11				0.0	
	12			%		
	13			4/4 %		
	14			100		
	15			%		
	16				0.8	
	17		Sand, loose, tan, dry	2/2 %	1.1	
	18			100 %	0.8	
	19		Clay, sandy, stiff, plastic	2/2 %	0.1	
	20			100	2.1	
	21			2/2 %	1.5	
	22			100 %	1.7	
	23		Sand, loose, tan, moist	2/2 %	2.5	
	24			100	2.2	
	25			2/2 %	0.7	
				100	0.1	
				2/2 %	2.9	
				100	5.3	
				2/2 %	16.0	
				100	5.7	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-007
SHEET 3 OF 3 SHEETS
3. PROJECT: Bldg 4CA
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		26		%	2.8	
		27		2/2 %	6.8	
					6.2	Sample DPT-007 (27-28) at 1520
		28	Clay, stiff, sandy plastic, dry	100	2.1	
		29		2/2 %	12.0	
				100	8.4	Sample DPT-007 (29-30) at 1530
		30		%	4.2	
		31		2/2	14.7	
				100 %	21.7	Sample DPT-007 (31-32) at 1540
		32	Sand, wet, loose, tan to red		42.8	
		33		2/2 %	43.1	
				100	27.6	
		34			39.0	
				2/2 %	59.6	
		35		100	70.5	
		36		%	287.0	
		37		%		
		38		%		
		39				
		40		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

1. HOLE NUMBER: DPT-008

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION: —	3. INSTALLATION: LMAAP	SHEET 1 OF 3 SHEETS	
4. PROJECT: LMAAP 3Idg MCA	13. SIZE AND TYPE OF BIT: 2.25" core barrel		
5. LOCATION (Coordinates or Station): —	14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —		
	15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822DT		
6. DRILLING AGENCY: WHE	16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN	a. DISTURBED: —	b. UNDISTURBED: —
7. HOLE NUMBER (as shown on drawing title and title number): DPT-008	17. TOTAL NUMBER CORE BOXES: —		
8. NAME OF DRILLER: Kerri Powell	18. ELEVATION GROUND WATER		
9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.	19. DATE HOLE (YYYYMMDD)	a. STARTED: 11/06/2019	b. COMPLETED: 11/06/2019
10. THICKNESS OF OVERBURDEN: —	20. ELEVATION TOP OF HOLE (feet): —		
11. DEPTH DRILLED INTO ROCK: —	21. TOTAL CORE RECOVERY FOR BORING %:		
12. TOTAL DEPTH OF HOLE: 36'	22. SIGNATURE OF INSPECTOR:		

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Silt, st.ff. crumbly, dry, brown to red	3/4 %	0.0	
		2		75 %	6.0	
		3			0.0	
		4				
		5		3/4 %	2.6	
		6		75 %	3.8	
		7			1.1	
		8				
		9		4/4 %	7.5	
		10				

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. PR (Translucent) HOLE NUMBER VERSI

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-008
SHEET 2 OF 3 SHEETS
3. PROJECT: Bldg 46A
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	11		Clay, stiff, moist, plastic, silty, tan to red	%	5.3	
	12			%	0.5	
	13			4/4 % 100	0.6	
	14			%	5.5	
	15			%	6.5	
	16		Sand, loose, dry, silty/clayey, tan/red	2/2 % 100	6.3	
	17				3.1	
	18			%	3.4	
	19		Silt/clay, gray to red to tan, dry	2/2 % 100	4.9	
	20				1.9	
	21			2/2 % 100	2.4	
	22			%	4.7	
	23		Sand, loose, tan, dry going to wet at 24', clayey	2/2 % 100	0.1	
	24				3.3	
	25			4/4 % 100	5.1	
					19.2	
					7.1	
					17.6	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-008
SHEET 3 OF 3 SHEETS
3. PROJECT: Bldg 46A
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	26		Clay, stiff sandy, plastic, moist, stiff	%	4.6	Sample DPT-008 (26-27) at 1050
	27			%		Samp. DPT-008 (27-28) at 1100
	28				3.0	
	29		Sand, wet, tan to red, clayey, very loose and wet at 33'	2/2 100 %	0.3 9.6	Sample DPT-008 (29-30) at 1110
	30				9.6	
	31			2/2 100 %	12.6 0.3	
	32				4.4	
	33			2/2 100 %	8.3 19.3	
	34				48.7	
	35			2/2 100 %	11.2 32.0	
	36					
	37			%		
	38			%		
	39					
	40			%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

1. HOLE NUMBER: DPT-009

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LMAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: Bldg 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHS

7. HOLE NUMBER (as shown on drawing title and title number): DPT-009

8. NAME OF DRILLER: Kerri Powell

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 40'

13. SIZE AND TYPE OF BIT: 2.25" core barrel

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER

19. DATE HOLE (YYYYMMDD): a. STARTED 11/05/2019; b. COMPLETED 11/05/2019

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Clay, sand and silt, moist, red/gray/brown, plastic, stiff	3/4 75 %	0.0 PID	
		2				
		3		%		
		4				
		5		%		
		6		3/4 75 %		
		7				
		8		%		
		9				
		10				

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-009
SHEET 2 OF 3 SHEETS
3. PROJECT: LHAAP Bldg 46A
4. INSTALLATION: LHAAP

5. ELEVATION	6. DEPTH	7. LEGEND	C. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	11			4/4 100 %	0.0	
	12			%		
	13			4/4 100 %		
	14					
	15		Sand, tan, loose, dry, fine grained	%		
	16			2/2 100 %		
	17					
	18		Clay, silty, plastic, brown/red, some sand	2/2 100 %		
	19					
	20			2/2 100 %	0.1	
	21					
	22			%	1.2	
	23		Sand with clay, red to tan, moist, semi-loose	2/2 100 %	1.0 0.4	
	24				4.3	
	25			2/2 100 %	5.9 1.4	Sample DPT-009 (24-25) at 0940

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-009
SHEET 3 OF 3 SHEETS
3. PROJECT: LHAAP BLDG 4GA
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		26	Clay w/ sand, stiff, plastic, highly, [illegible] dark brown	%	1.9	
		27		2/2 100 %	1.0	
		28			0.0	
		29		2/2 100 %	0.0	Sample DPT-009 (28-29) at 0950
		30			0.0	
		31		2/2 100 %	0.0	
		32	Interbedded sand and clay, dark gray to brown, dry, stiff		0.0	
		33		2/2 100 %	0.0	Sample DPT-009 (31-32) at 1000 - DUP-001 at 0800 - MS/MSD
		34			0.0	
		35		2/2 100 %	0.0	
		36			0.0	
		37		2/2 100 %	0.0	
		38			0.0	
		39		2/2 100 %	0.0	
		40			0.0	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

1. HOLE NUMBER: DPT-010

DRILLING LOG
For use of this form see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION: —

3. INSTALLATION: LHAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: LHAAP Bldg 4LA

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHZ

7. HOLE NUMBER (as shown on drawing title and title number): DPT-010

8. NAME OF DRILLER: Kerri Powell

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 36'

13. SIZE AND TYPE OF BIT: 2.25" core barrel

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 11/06/2019 b. COMPLETED 11/06/2019

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: [signature]

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc. if significant)
	0–1		Silt, dry, red to tan, crumbly		0.4	
	1–2			2/4 50 %	1.5	
	2–3					
	3–4				0.0	
	4–5				2.7	
	5–6		Clay, stiff, plastic, gray/red, dry	4/4 100 %	0.0	
	6–7					
	7–8				0.0	
	8–9		Silt, SAA	4/4 100 %	0.0	
	9–10					

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. PAGE 1 (Translucent) HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-010
SHEET 2 OF 3 SHEETS
3. PROJECT: Bldg 4LA
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		11		%	0.9	
		12		%	1.2	
		13	Clay, stiff, dry, gray to red		0.6	
		14		4/4 % 100	0.2	
		15		%		
		16			5.2	
		17	Clay with interbedded silt zones, dry, brown to red	% 2/2 100 %	4.5 2.6	
		18				
		19		2/2 100 %	0.9 2.3	
		20				
		21		2/2 % 100 %	4.7 2.1	
		22				
		23		2/2 100 %	8.3 1.2	Sample DPT-010 (23-24) at 1200
		24	Clay, stiff, plastic, moist, red to gray			
		25		2/2 100 %	3.9 0.1	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-010
SHEET 3 OF 3 SHEETS
3. PROJECT: Bldg 4CA
4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		26		%	0.0	
		27		2½ 100 %	2.5 3.4	
		28			1.6	Sample DPT-010 (28-29) at 1210
		29		2½ % 100	0.8 0.6	
		30		%	1.2	
		31		2½ 100 %	9.2 13.0	
		32			7.5	
		33	Sand, clayey, wet, tan, cohesive	2½ % 100	5.7 11.8	Sample DPT-010 (32-33) at 1220
		34		%	5.8	DUP-003 at 0800
		35		2½ 100 %	12.4 8.2	
		36		%	11.9	
		37		%		
		38		%		
		39		%		
		40		%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

1. HOLE NUMBER: DPT-011

DRILLING LOG
For use of this form see EM 1110-1-1804 the proponent agency is CECW-EG.

2. DIVISION: —

3. INSTALLATION: LHAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: LHAAP Bldg 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-011

8. NAME OF DRILLER: Kerri Powell

9. DIRECTION OF HOLE: ☐ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 38'

13. SIZE AND TYPE OF BIT: 2.25" Core barrel

14. DATUM FOR ELEVATION SHOWN (TBM or MSL):

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822 DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER:

19. DATE HOLE (YYYYMMDD): a. STARTED 11/06/2019 b. COMPLETED 11/06/2019

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %:

22. SIGNATURE OF INSPECTOR:

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Silt, dry, brown to red, loose	3/4 75 %	0.0	
		2				
		3				
		4				
		5				
		6	Clay/silt, dry, stiff, gray/red	4/4 100 %		
		7				
		8			4.7	
		9		4/4 100 %		
		10			6.0	

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-011
SHEET 2 OF 3 SHEETS
3. PROJECT: BLDG 46A
4. INSTALLATION: HHAAD

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		11		%	3.4	
		12		%	0.7	
		13		%		
		14		4/4 %	3.1	
		15		100 %		
		16		%	1.8	
		17		2/2 %	0.4	
		18		100 %	0.1	
		19		2/2 %	1.4	
		20		100 %	3.0	
		21		2/2 %	0.8	
		22		100 %	6.0	
		23	Clay, stiff, plastic, moist, brown to red, sandy at 26'	2/2 %	3.0	Sample DPT-011 (22-23) at 1340
		24		100 %	2.1	
		25		2/2 %	2.9	
				100		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE: —
2. HOLE NUMBER: DPT-011
SHEET 3 OF 3 SHEETS
3. PROJECT: Bldg 4CA
4. INSTALLATION: LHAAD

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		26		%	2.0	
		27		2/2 100 %	05	Sample DPT-011 (27-28) at 1750
		28			2.0	
		29		2/2 100 %	3.6	
		30			3.3	
		31		2/2 100 %	1.9	
		32			4.9	Sample DPT-011 (31-32) at 1800
		33	Sand w/ clay, slight plastic, moist, tan to red, becomes loose at 38'	2/2 100 %	5.6	
		34			5.6	
		35		2/2 100 %	9.0	
		36			3.3	
		37		2/2 100 %	6.0	
		38			15.3	
		39		%	15.0	
		40		%	10.7	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*
6. PROJECT
7. HOLE NUMBER
VERSION 1.0

01010990

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF ~~2~~ 3 SHEETS

4. PROJECT: LHAAP BLDG. 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-012

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 24' BGS, 33' BGS

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/04/2020; b. COMPLETED 06/04/2020

20. ELEVATION TOP OF HOLE (feet): — CONT. DRILLING 06/08/

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: [signature]

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
			CONCRETE			
		1	SILTY CLAY, MOTTLED BROWN, RED, GREY, MED. STIFF, PLASTIC, MOIST	1.5/4 %		
		2		%		
		3		%	7.1	SAMPLE DPT-012(3-4) 0920
		4			2.4	
		5		%		
		6		4/4 %	1.7	
		7				SAMPLE DPT-012(7-8) 0945
		8		%	1.0	
		9		%		

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

PROJECT

HOLE NUMBER

VERSION 1.3

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-012

SHEET 2 OF ~~2~~ 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10		% 4/4	0.0	
		11		%	1.7	SAMPLE DPT-012 (11-12) 0925
		12			31.4	
		13		%	3.9	
		14		% 4/4	0.0	
		15		%		
		16	SILTY CLAY, SOME SAND LENSES, LT. BROWN TO GREY, MED. STIFF, PLASTIC, MOIST TO WET		0.0	
		17		% 2/2	0.1 0.0	SAMPLE DPT-012 (17-18) 0940
		18			0.0	
		19	SAND, LT. BROWN TO GREY, LOOSE, FINE, MOIST TO WET	% 2/2	1.7 1.5	
		20		%	2.3	
		21		% 2/2	0.0 0.0	
		22	SILTY CLAY, GREY, STIFF, PLASTIC, MOIST		0.6	SET WELL SCREEN 14'-24' BGS
		23		% 2/2	0.0 0.0	
		24		%	0.0	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-012

SHEET 3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
			SILTY CLAY W/ SAND, LT. BROWN, SOFT, PLASTIC, WET	2/2 %	0.0	06/08/2020: PULL EXISTING TEMP. WELL & DRILL DOWN TO 33' BGS
		25	CLAY, LT. BROWN TO GREY, STIFF, PLASTIC, MOIST		0.3	
		26	SAND W/ SOME CLAY, LT. BROWN TO GREY, MED. STIFF, PLASTIC, MOIST TO WET, LOOSE, FINE TO MED. GRAIN,	%	8.4	
			SANDY SILT WITH	2/2 %	2.7	
		27	CLAY, LOOSE, FINE, COHESIVE, LT. BROWN		15.9	
		28	TO DARK BROWN, MOIST TO WET		30.5	
					38.2	
		29		2/2 %	14.6	
					25.0	
		30		%	40.6	
		31		2/2 %	15.5	
					8.6	
		32	CLAY, DARK BROWN, V. STIFF, DRY TO MOIST, PLASTIC	1/1 %	0.4	VERY HARD CLAY 32'-33' BGS, DIFFICULT TO DRILL
		33		%		SET DPT-012 SCREEN 23' - 33' BGS
				%		
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

01010993

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: LHAAP BLDG. 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-013

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 26' BGS / 33' BGS

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/04/2020 b. COMPLETED 06/04/2020

20. ELEVATION TOP OF HOLE (feet): — CONT. DEEPER 06/08/2

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY, LT. BROWN, SOFT, PLASTIC, WET, W/ TRACE SAND	%	2.9	PID HARD TIME ZEROING IN HUMIDITY, MAY BE INACCURATE SAMPLE DPT-013(1-2) 0755
		2		2/4 %	2.3	
		3		%	0.9	
		4				
		5		%	0.5	
		6	CLAY, MOTTLED LT. BROWN, RED & GREY, STIFF, PLASTIC, DRY	3.5/4 %	0.8	
		7				
		8		%	0.4	
		9	SILTY CLAY, LT. BROWN TO GREY, STIFF, PLASTIC, DRY	4/4 %	4.4	

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-013

SHEET 2 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10		%	4.8	
		11		%		SAMPLE DPT-013(11-12) 0800
		12			5.1	
		13		%	4.4	
		14		4/4 %	6.3	
		15		%	6.6	
		16	SAND/ SILT, MOTTLED LT. BROWN, ORANGE & GREY, DRY, FINE GRAIN, SOME SMALL CLAY LENSES	2/2 %	3.0	
		17			2.5	SAMPLE DPT-013(17-18) 0810
		18		%	10.1	
		19	SILTY CLAY W/ SMALL SAND LENSES, LT. BROWN, STIFF, PLASTIC, DRY TO MOIST	2/2 %	7.1 9.4 3.1	
		20	SILTY CLAY, LT. BROWN TO GREY, STIFF, PLASTIC, DRY TO MOIST		16.0	SAMPLE DPT-013(20-21) 0835
		21		2/2 %	10.0	
		22			9.8	
		23	SAND, LT. BROWN, LOOSE, FINE GRAIN, DRY	2/2 %	8.5 22.5	
		24	SILTY CLAY, LT. BROWN TO GREY, STIFF, PLASTIC, DRY	%	92.2	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET
	DPT-013	3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	25		CLAY, LT. BROWN, MED. STIFF, PLASTIC, SLIGHTLY MOIST	%	63.0 66.0	SET WELL SCREEN @ ~16'-26'
	26			%	30.7	06/08: PULL EXISTING PVC TEMP. WELL & CONT. DRILLING TO 33' BGS
	27		SILTY CLAY WITH SAND, LT. BROWN TO GREY, SOFT, PLASTIC, WET	1.5/2	0.1 0.0	
	28			%	0.0	
	29			2/2	0.0 0.2	
	30		SANDY CLAY W/ SILT, DARK BROWN, STIFF, DRY TO MOIST, MED. PLASTIC	%	0.0 3.7	
	31			2/2	47.6	WELL SCREEN SET FROM 22'-33' BGS
	32		CLAYEY SAND, LOOSE, WET, FINE GRAIN, BROWN	%	71.4 54.9	
	33			1/1	37.1	
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION —

3. INSTALLATION: LHAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: LHAAP Bldg. 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-014

8. NAME OF DRILLER: Kerri Powell

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 34' BGS

13. SIZE AND TYPE OF BIT: 3.25" Core Barrel

14. DATUM FOR ELEVATION SHOWN (TBM or MSL):

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/03/2020 b. COMPLETED 06/03/2020

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: John Morgan

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	1		SANDY CLAY, LT. BROWN, SOFT, WET, MED. PLAST., FINE GRAIN	3/4 %	0.1	
	2				0.0	
	3		SILTY CLAY, LT. BROWN, SOFT, MOIST TO WET, PLASTIC			SAMPLE DPT-014 (3-4) 1540
	4			%	27.8	
	5		CLAY, LT. BROWN TO GREY, STIFF, MOIST, PLASTIC	3/4 %	0.1	
	6				0.0	
	7					
	8			%	1.1	
	9			4/4 %	4.2	

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-014

SHEET 2 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10		SILTY CLAY, LT. BROWN TO GREY, STIFF, DRY, LOW PLAST.	4/4 %	2.3	
	11			%	9.5	SAMPLE DPT-014 (10-11) 1620
	12			%	0.4	
	13		SILTY SAND, LT. BROWN, LOOSE, DRY, FINE GRAIN	4/4 %	2.9	
	14		SILTY CLAY, LT. BROWN TO GREY, STIFF, DRY, MED. PLAST.			
	15			%	0.6	
	16			%	3.0	
	17			4/4 %	3.9	
	18					
	19		SILT W/ CLAY, SAND THROUGHOUT, LT. BROWN, DRY, LOW PLAST., FINE	%	15.2	SAMPLE DPT-014 (19-20) 1550
	20			%	1.2	
	21			4/4 %	3.4	
	22			%		
	23					
	24			%	7.1	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-014

SHEET 3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		25	SILTY CLAY, LT. BROWN TO GREY, MED. STIFF, MOIST, PLASTIC	2/2 %	4.2 6.1	SAMPLE DPT-014 (25-26) 1600
			SAND, LT. BROWN, LOOSE, DRY TO MOIST, FINE GRAIN			
		26	SILTY CLAY, LT. BROWN TO GREY, MED. TO SOFT, MOIST, PLASTIC	%	19.9	
		27		2/2 %	3.0 3.1	
		28			2.2	
		29		2/2 %	1.3 2.8	
		30			3.7	
		31		2/2 %	0.0 1.0	PULLED OUT OF ORIGINAL HOLE, GROUT, DRIVE DOWN TO 26' @ NEW HOLE TO SET WELL SCREEN ~16'-26'
		32			3.1	
		33	SANDY CLAY, GREY TO ORANGE, SOFT, MOIST TO WET, MED. PLAST., FINE GRAIN	2/2 %	0.0 0.0	
		34			1.7	
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01010999

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION —

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP BLDG. 46A

5. LOCATION (Coordinates or Station) —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-015

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN —

11. DEPTH DRILLED INTO ROCK —

12. TOTAL DEPTH OF HOLE: 50' BGS

13. SIZE AND TYPE OF BIT: 2.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL) —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN — a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES —

18. ELEVATION GROUND WATER —

19. DATE HOLE (YYYYMMDD) a. STARTED 06/03/2020 b. COMPLETED 06/03/2020

20. ELEVATION TOP OF HOLE (feet) —

21. TOTAL CORE RECOVERY FOR BORING %

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. P.I.D. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY W/SAND, LT. BROWN, MED. STIFF, PLASTIC, WET	2/4 %	0	
		2			5.6	
		3			5.8	SAMPLE DPT-15(3-4) 0740
		4				
		5	SILTY CLAY, LT. BROWN TO GREY, STIFF, DRY	3/4 %	0.0	PID ERRATIC DUE TO HEAT/HUMIDITY
		6			0.0	
		7				
		8		%	0.0	
		9		%	0.0	

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-015

SHEET 2 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10		4/4 %	0.0	
		11			0.0	
		12			18.1	
		13		4/4 %		
		14			1.2	
		15		%		
		16	CLAYEY SAND, LT. BRWN. TO GREY. LOOSE, DRY, FINE		13.7	SAMPLE DPT-015(15-16) 0750
		17		2/2 %	11.5 25.2	
		18				
		19	SILTY CLAY, STIFF, LT. BROWN TO GREY, DRY, LOW PLAST., DRY	2/2 %	9.1 12.7	
		20	CLAYEY SAND W/ SILT, GREY TO ORANGE, LOOSE, FINE GRAIN, DRY, LOW PLAST.		18.0	SAMPLE DPT-015 (19-20) 0805
		21	SILTY CLAY, LT. BRWN. TO GREY, STIFF, DRY TO MOIST, PLASTIC	2/2 %	2.3 2.1	
		22			0.1	
		23		2/2 %	2.2 0.0	SAMPLE DPT-015 (23-24) 0900
		24			0.0	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-015

SHEET 3 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. P.I.D. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	25			2/2 %	0.0	P.I.D. NOW WORKING PROPERLY, READINGS ABOVE MAY BE INACCURATE
	26		CLAYEY SAND, LT. BROWN TO GREY, LOOSE, MED. PLAST., WET, FINE GRAIN		0.0	
	27		SAND, LT. BRWN. TO GREY, LOOSE, LOW PLAST., WET, FINE GRAIN	2/2 %	0.0	
	28		SANDY CLAY, LT. BROWN TO ORANGE, MED. STIFF, PLASTIC, MOIST, FINE		0.0	
	29		CLAYEY SAND, LT. BROWN, LOOSE, MOIST, FINE	2/2 %	0.0	
	30				0.0	
	31		SANDY CLAY, LT. BROWN TO ORANGE, MED. STIFF, PLASTIC, MOIST, FINE	% 2/2	0.0	
	32				0.0	
	33			2/2 %	0.0	
	34				0.0	
	35			2/2 %	0.0	
	36				0.0	
	37		CLAY, GREY TO LT. BRWN., MED. STIFF, PLASTIC, FINE	2/2 %	0.0	
	38				0.0	
	39			2/2 %	0.0	

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-015

SHEET 4 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		40		%	0.0	
			SILTY CLAY, LT. BROWN, MED. STIFF, MOIST, PLASTIC	2/2 %	0.0	
		41			0.0	
		42			0.0	
			SANDY CLAY, LT. BROWN, MED. STIFF, MOIST TO WET, MED. PLASTIC	1.5/2 %	0.0	
		43			0.0	
			CLAYEY SAND, LT. BROWN, LOOSE, MOIST TO WET, FINE GRAIN	%	0.0	
		44			0.0	
		45		2/2 %	0.0	
			SILTY CLAY, DARK GREY TO DARK BRWN., MED. STIFF, PLASTIC, WET		0.0	
		46			0.0	
			SAND, BROWN TO DARK GREY, LOOSE, FINE GRAIN, WET	2/2 %	0.0	
		47			0.0	
		48		%	0.0	PULLED RODS UP 3' DEEP WELL SCREEN SET 40'-50' BGS, SHALLOW WELL SCREEN SET ~21'-31' BGS
		49		2/2 %	0.0	
		50			0.0	
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01011003

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION —

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP Bldg. 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-016

8. NAME OF DRILLER: Karri Powell

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 42' BGS

13. SIZE AND TYPE OF BIT: 2.25" Core Barrel

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/02/2020; b. COMPLETED 06/02/2020

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	P.I.De. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	Silty Clay, Lt. Brown to Grey, Med. Stiff, Med. Plasticity, Fine Grain, Wet	2/4	% 0.0	DUP & MS/MSD TAKEN FOR MOBILE LAB
		2			% 0.0	
		3			% 0.0	
		4				
		5	Clay, Lt. Brown to Grey, Stiff, Med. Plast., Fine Grain, Moist	4/4	0.0 %	
		6			0.0 %	
		7				SAMPLE DPT-016(7-8) 1000
		8	Sandy Clay, Lt. Brown, Stiff, Low Plast., Fine Grain, Moist		% 0.0	
		9			% 0.0	

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-016

SHEET 2 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	11		SILTY CLAY, GREY, STIFF, PLASTIC, FINE, MOIST	4/4 %	0.0	
	12				0.0	
	13			2/2 %	0.0	SAMPLE DPT-016 (13-14) 1005
	14				0.0	
	15			2/2 %	0.0	
	16				0.0	
	17			2/2 %	0.0	
	18				0.0	
	19			2/2 %	0.0	
	20		SANDY CLAY, LT. BROWN TO ORANGE, STIFF, PLASTIC, FINE, DRY TO MOIST		0.0	
	21		CLAYEY SAND, GREY TO LT. BROWN, STIFF MED. PLAST., MOIST	2/2 %	0.0	SAMPLE DPT-016 (21-22) 1015
	22				0.0	
	23		SILTY CLAY, GREY TO ORANGE, STIFF, PLASTIC, MOIST	2/2 %	0.0	
	24				0.0	SAMPLE DPT-016 (24-25) 1050, CORES APPEAR WET @ ~25' BGS
	25					

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5. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-016

SHEET 3 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		26	CLAYEY SAND, LT. BROWN TO GREY, MED. STIFF, LOW PLAST., MOIST TO WET	2/2 %	0.0 0.0	
		27		2/2 %	0.0 0.0 0.0	
		28				
		29		2/2 %	0.0 0.0 0.0	
		30				
		31	SANDY CLAY, ORANGE TO GREY, STIFF, PLASTIC, MOIST TO WET	2/2 %	0.0 0.0	
		32				
		33	SILTY CLAY, LT. BROWN TO GREY, STIFF, PLASTIC DRY TO MOIST	2/2 %	0.0 0.0 0.0	
		34				
		35		2/2 %	0.0 0.0 0.0	
		36				
		37		2/2 %	0.0 0.0 0.0	
		38	CLAYEY SAND, LT. BROWN TO ORANGE, MED. STIFF, MED. PLAST., MOIST SAND, LT. BRWN TO GREY, SOFT, WET, FINE GRAIN, SOME CLAY			
		39		2/2 %	0.0 0.0	
		40				

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 4 OF 4 SHEETS
	DPT-016	

3. PROJECT	4. INSTALLATION
	LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		41		2/2 %		STOP DRILLING @ 42', SET TEMP WELL AFTER PULLING RODS UP 2', SET SHALLOW WELL @ 33' BGS
		42		%		Deep well screen set at ~32'-42' bgs
				%		Shallow well screen set at ~23'-33' bgs
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION —

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP BLDG. 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-017

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 42' BGS

13. SIZE AND TYPE OF BIT: 2.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/03/2020; b. COMPLETED 06/03/2020

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %:

22. SIGNATURE OF INSPECTOR: [signature]

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY, DARK BROWN, STIFF, PLASTIC, DRY TO MOIST	%	0.0	
		2		2/4 %	0.0	
		3		%		
		4		%	0.0	
		5		%	0.0	
		6		3/4 %	0.0	
		7	SAND W/ SILT, LT. BROWN TO ORANGE, MED. STIFF, FINE GRAIN, DRY	%	5.4	
		8		%	0.8	
		9		%		

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-017

SHEET 2 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10			4/4	% 8.3	SAMPLE DPT-017 (10-11) 1340
	11				%	
	12		SILT W/ TRACE CLAY, LT. BROWN, LOW PLAST, LOOSE, DRY		2.5	
	13				% 0.8	
	14			4/4	% 11.9	
	15				%	
	16				14.7	
	17		SANDY SILT W/ TRACE CLAY, LT. BROWN, LOW PLAST., LOOSE, DRY	4/4	% 2.2	SAMPLE DPT-017 (17-18) 1350
	18				% 21.8	
	19				% 15.9	SAMPLE DPT-017 (19-20) 1410
	20		SILTY CLAY, LT. BROWN, STIFF, PLASTIC, DRY TO MOIST		0.1	
	21			4/4	%	
	22				1.6 %	
	23					SAMPLE DPT-017 (23-24) 1405
	24				3.5 %	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-017

SHEET 3 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25	CLAY, LT. BROWN TO GREY/ORANGE, STIFF, PLASTIC, MOIST TO WET	4/4 %	8.0	
		26			1.2	
		27		%		
		28			2.5	
		29	SAND W/ LARGE AMOUNTS OF SILT & CLAY, MOTTLED GREY & ORANGE, MED. PLASTIC, FINE GRAIN, WET	%	10.3	
		30		4/4 %	4.8	
		31				
		32	SILTY CLAY, MOTTLED GREY & ORANGE, STIFF, PLASTIC MOIST TO WET	%	6.1	
		33		2/2 %	11.9 2.4	
		34			1.7	
		35	SILTY CLAY GREY TO ORANGE, SOFT, PLASTIC, MOIST	2/2 %	0.9 3.6	
		36		%	7.0	
		37		2/2 %	13.3 16.5	
		38	SILTY SAND, GREY TO ORANGE, LOOSE, FINE GRAIN, MOIST	%	21.6 3.6	
		39			1.8	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-017

SHEET 4 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
			SAND, LT. BROWN TO ORANGE, LOOSE, WET, FINE GRAIN	2/2 %	8.1	PULL RODS UP 4'
	40					DEEP WELL SCREEN @ ~32-42
					5.2	
	41		INCREASING CLAY CONTENT NEAR 41.5' BGS	2/2 %	1.2	SHALLOW WELL SCREEN ~22-32
	42				0.0	
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1. HOLE NUMBER

.OG
M 1110-1-1804;
s CECW-EG.

2. DIVISION —

3. INSTALLATION
LHAAP

SHEET 1 OF 3 SHEETS

4. [illegible]
LHAAP BLDG. 46A

5. LOCATION (Coordinates or Station)
—

6. DRILLING AGENCY
WHE

7. HOLE NUMBER (as shown on drawing title and title number)
DPT-018

8. NAME OF DRILLER
KARRI POWELL

9. DIRECTION OF HOLE
[X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN —

11. DEPTH DRILLED INTO ROCK —

12. TOTAL DEPTH OF HOLE 40' BGS

13. SIZE AND TYPE OF BIT 2.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL)
—

15. MANUFACTURERS DESIGNATION OF DRILL
GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN — a. DISTURBED — b. UNDISTURBED

17. TOTAL NUMBER CORE BOXES —

18. ELEVATION GROUND WATER —

19. DATE HOLE (YYYYMMDD) a. STARTED 06/01/2020 b. COMPLETED 06/01/2020

20. ELEVATION TOP OF HOLE (feet) —

21. TOTAL CORE RECOVERY FOR BORING % —

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. FOUND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	P.I.D. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	1		CLAYEY SILT, RED/LT. BROWN, WET, SLIGHTLY PLASTIC	%	0.0	
	2			4/4 %	1.0	
	3			%	0.0	
	4		CLAY, RED TO GREY, STIFF, MOIST, PLASTIC			
	5			%	0.0	
	6			4/4 %	0.3	
	7		SANDY CLAY, GREY TO LT. BROWN, FINE GRAIN, LOOSE, SLIGHTLY PLASTIC			SAMPLE DPT-018(7-8) 1505
	8			%	0.6	
	9		SILTY CLAY, GREY TO LT. BROWN, STIFF, MOIST TO DRY, PLASTIC	2/2 %	0.2 0.2 0.6	

ENG FORM 1836, MAR [illegible] PREVIOUS EDITIONS ARE OBSOLETE. (Translucent)

HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-018

SHEET 2 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	P.I.De. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		11		2/2 %	1.5	
					1.4	
		12			0.1	
		13			1.4	
		14		4/4 %	2.0	
		15			5.7	SAMPLE DPT-018(15-16) 1515
		16				
		17	CLAYEY SILT, MOTTLED LT. BROWN, ORANGE, GREY, DRY, HIGH PLASTICITY	%	3.4	
		18		4/4 %	2.4	
		19		%		
		20			3.1	
		21	SAND, ORANGE TO LT. BROWN, DRY, LOOSE, LOW PLAST.	2/2 %	1.7 1.4	SAMPLE DPT-018(21-22) 1525
		22	SILTY CLAY, ORANGE TO LT. BROWN, STIFF, DRY TO MOIST, HIGH PLAST.		0.2	
		23		2/2 %	0.1 0.2	
		24			0.6	
		25		%	1.5	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-018

SHEET 3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	P.I.D.e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		26		2/2 %	0.6	
					1.8	
		27		2/2 %	1.6	
					0.5	
		28			1.2	
		29		2/2 %	1.4	
					0.8	
		30		%	1.3	
		31		2/2 %	17.0	
					7.9	
		32			4.0	
		33		2/2 %	33.1	SAMPLE DPT-018(32-34) 1605
					42.7	
		34	~~SANDY CLAY, LIGHT BROWN TO GREY, STIFF, DRY TO MOIST, PLAST. FINE GRAIN~~ gm		11.4	
				%	11.7	
		35		2/2	12.8	PULL RODS UP 4'
				%	6.1	
		36	SAND W/ TRACE CLAY, LIGHT BROWN TO GREY, FINE, LOOSE, WET		1.6	~~SET DEEP WELL AFTER PULLING RODS UP 3' 11", @ 38' 35' gm~~
		37		2/2 %	12.8	SET SHALLOW WELL @ 22' BGS
					0.1	
		38		%	—	Deep well screen at ~30-40' bgs
		39		2/2	.	Shallow well screen at ~12-22' bgs
				%	—	
		40				

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION —	3. INSTALLATION LHAAP	SHEET 1 OF 3 SHEETS
4. PROJECT LHAAP Bldg 46A		13. SIZE AND TYPE OF BIT 2.25" core barrel	
5. LOCATION *(Coordinates or Station)* —		14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* —	
		15. MANUFACTURERS DESIGNATION OF DRILL Geoprobe 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —	
7. HOLE NUMBER *(as shown on drawing title and title number)* DPT-019		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER Kerri Powell		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE *(YYYYMMDD)*: a. STARTED 06/01/2020 b. COMPLETED 06/01/2020	
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE *(feet)* —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 36.5' BGS		22. SIGNATURE OF INSPECTOR	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	0–4		Sand and silt, clayey at 1', dang, red/brown slightly plastic	2/4 %	0.8 0.0 1.0	Sample DPT-019 (4-5) 0955
	4–7		Clay, stiff, silty, red to gray, moist	3/4 %	6.4 0.0	
	7–8		Silt, clayey, loose sand, tan to red	%	1.0	
	8–9		Clay, stiff, plastic, dry, tan, silty	2/2 %	0.4 0.1	Sample DPT-019 (8-9) 1015

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VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 2 OF 3 SHEETS
	DPT-019	

3. PROJECT	4. INSTALLATION
	LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	11			2/2 %	0.0	
					0.0	
	12				0.0	
			Silt w/ clay, stiff, dry, brown to gray		0.1	
	13			2/2 %	0.1	
	14				0.0	
					0.4	Sample DPT-019 (14-15) 1055
	15			2/2 %	0.2	
			Sand, red, silty, cohesive		0.2	
	16					
	17				0.0	
			Silty clay, dry, stiff, plastic, brown to gray	4/4 %	0.2	
	18				0.0	
	19					
					0.0	
	20				0.0	
	21		Sand, tan, loose, fine grain, silty	2/2	0.0	
					0.0	
	22				0.3	Sample DPT-019 (22-23) 1305
	23		Sand/clay, stiff, very moist, tan to red	2/2 %	3.0	
	24				1.0	
					0.2	
	25			2/2 %	0.1	

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6. PROJECT | 7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-019

SHEET 3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	26			%	0.0	
	27		Clay, silty, brown to gray, stiff, damp	2/2 %	0.3	
	28				0.0	
	29			2/2 %	0.0	
	30				0.0	
	31		Turns dark gray	2/2 %	0.0	
	32				0.0	
	33			2/2 %	0.0	
	34				0.0	
	35		Sand w/ some gravel loose, moist, red fine grain	1.5/2 %	0.0	
	36			%	0.0	Driller cannot get past 36.5'
				0.2/0.5	0.0	Set deep well after pulling rods up 2'
				%		Set shallow well at 26' bgs (Screen ~ 16-26' bgs)
				%		Deep screen ~ 26.5 - 36.5 bgs
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP BLDG. 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-020

8. NAME OF DRILLER: KERR, POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 44'

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822 DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/04/2020 b. COMPLETED 06/04/2020

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: John Mann

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SANDY/SILTY CLAY, LT. BROWN TO DARK BROWN, MED. STIFF, MOIST TO WET, PLASTIC		1.9	
		2		3/4 %	0.0	
		3		%	0.0	
		4				
		5			0.0	SAMPLE DPT-020(5-6) 1120
		6	SILTY CLAY, LT. BROWN TO GREY, STIFF, MOIST, PLASTIC	2.5/4 %	0.0	
		7				
		8		%	0.0	
		9	CLAYEY SILT W/ TRACE SAND, STIFF, LOW PLAST., DRY	%	0.2	

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-020

SHEET 2 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10			4/4	% 3.6	
	11				% 4.7	SAMPLE DPT-020 (11-12) 1025
	12					
	13				% 2.2	
	14		SILTY CLAY, LT. BRWN., STIFF, LOW PLAST., DRY	4/4	% 6.0	SAMPLE DPT-020 (14-15) 1100
	15					
	16				% 0.7	
	17				% 8.4	
	18			4/4	% 17.1	SAMPLE DPT-020 (18-19) 1035
	19					
	20				% 3.7	
	21		SILTY SAND, LT. BRWN. TO ORANGE, LOOSE, DRY		% 0.0	
	22			4/4	% 0.0	
	23					
	24		CLAY, DARK BROWN TO GREY, STIFF, PLASTIC MOIST		% 0.0	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-020

SHEET 3 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		25		2/2 %	7.0	
					9.2	
		26			18.6	
				%	24.9	
		27	CLAY, LT. BRWN. TO GREY, SOFT, PLASTIC, MOIST	2/2 %	7.6	
		28			2.0	
					11.3	
		29		2/2 %	14.0	
			CLAYEY SAND, LT. BRWN., GREY, ORANGE, FINE, WET		12.8	
		30		%	14.5	
		31	SILTY CLAY, ORANGE TO LT. BROWN, SOFT, PLASTIC, WET	2/2 %	4.9	
		32			20.7	
					12.5	
		33		2/2 %	9.4	
		34			10.6	
			SILTY CLAY W/ TRACE SAND, MOTTLED LT. BROWN, ORANGE & GREY, SOFT, MOIST TO WET	%	23.6	
		35		2/2	8.8	
		36	SAND/CLAY, ORANGE SOFT, PLASTIC, WET	%	13.8	
				2/2 %	2.8	
		37			15.4	
					16.9	
		38				
			SAND, ORANGE & GREY, LOOSE	2/2 %	16.3	
		39			0.8	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-020

SHEET 4 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	40			%	11.6	
					9.7	
	41			2/2 %	4.1	
						PULL UP RODS 5'
	42				1.4	SET DEEP WELL SCREEN 34'-44' BGS
				%	0.0	
	43			2/2	0.0	SET SHALLOW WELL SCREEN 15'-25' BGS
	44			%	0.0	
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01011021

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: LHAAP OLD6.46A

5. LOCATION (Coordinates or Station): ~

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-021

8. NAME OF DRILLER: ~~DPT-021~~ KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: ~

11. DEPTH DRILLED INTO ROCK: ~

12. TOTAL DEPTH OF HOLE

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): ~

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED ~ b. UNDISTURBED ~

17. TOTAL NUMBER CORE BOXES: ~

18. ELEVATION GROUND WATER: ~

19. DATE HOLE (YYYYMMDD): a. STARTED 06/04/2020 b. COMPLETED 06/04/2020

20. ELEVATION TOP OF HOLE (feet): ~

21. TOTAL CORE RECOVERY FOR BORING %: ~

22. SIGNATURE OF INSPECTOR: J. Moore

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	1		SILTY CLAY W/ SAND, LT. BROWN, STIFF, PLASTIC, MOIST	2/4 %	0.0	
	2					
	3		SILTY CLAY, LT. BROWN, MED. PLASTIC, SOFT, WET		0.0	
	4				0.0	
	5				0.0	
	6		SILTY CLAY W/ TRACE SAND, STIFF, PLASTIC, MOIST TO DRY, LT. BROWN TO GREY	3.5/4 %	0.0	SAMPLE DPT-021 (6-7) 14:15
	7					
	8				0.0	
	9					

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-021

SHEET 2 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10		4/4 %	0.0	SAMPLE DPT-021(10-11) 1430
		11			0.0	
		12			0.0	
		13		1.5/2 %	0.1	
		14			0.0	
		15		2/2 %	0.3	
		16			0.1	
		17	SILTY SAND, GREY, LOOSE, FINE GRAIN, DRY	4/4 %	0.0	
		18				
		19	SILTY CLAY, SAND LENSE @ 19.5, LT. BROWN TO GREY, SOFT, MOIST		0.5	SAMPLE DPT-021(19-20) 1450
		20			0.1	
		21		2/2 %		
		22	SILTY SAND, SOME CLAY LENSES, LT. BROWN, GREY & ORANGE, SOFT, DRY			
		23	SILTY CLAY, LT. BROWN, STIFF, DRY TO MOIST, PLASTIC	2/2 %	2.1	SAMPLE DPT-021(23-24) 1455
		24			1.0	
					5.1	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-021

SHEET 3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		25		2/2 %	12.3	
					13.5	
		26			20.8	
			SAND W/ CLAY ZONES, LT. BROWN TO ORANGE SOFT, FINE, WET	2/2 %	3.3	
		27			25.1	
					16.6	
		28		2/2 %	8.9	
		29			11.1	
					1.7	
		30		2/2 %	2.2	
		31			2.1	
					0.7	
		32	CLAY, LT. BROWN TO ORANGE, STIFF, PLASTIC, SLIGHTLY MOIST	2/2 %	2.9	
		33			0.0	
					1.2	PULL RODS UP 10', DEEP WELL SCREEN SET 26'-36' BGS, SHALLOW WELL SCREEN 14-24' BGS
		34		2/2 %	0.0	
		35			0.0	
					0.0	
		36		%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01011024

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 3 SHEETS
4. PROJECT LHAAP BLDG. 46A		13. SIZE AND TYPE OF BIT 3.25" CORE BARREL	
5. LOCATION *(Coordinates or Station)* —		14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —	
7. HOLE NUMBER *(as shown on drawing title and title number)* DPT-022		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER KERRI POWELL		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE *(YYYYMMDD)*: a. STARTED 06/05/2020 b. COMPLETED 06/05/2020	
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE *(feet)* —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 36' BGS		22. SIGNATURE OF INSPECTOR	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		1	CLAYEY SAND, LT. BROWN, SOFT, MED. PLASTIC, WET	1.5 %	0.0	
		2	CLAY W/ SILT, LT. BROWN TO GREY, STIFF, PLASTIC, MOIST, SAND LEASE @ 5.5' BGS	4 %	0.0	
		3		%	0.0	
		4				
		5		%	0.0	SAMPLE DPT-022(5-6) 0950
		6		4/4 %	0.0	
		7				
		8		%	0.0	SAMPLE DPT-022(8-9) 1005
		9		%	0.0	

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VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-022

SHEET 2 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10		4/4 %	0.0	
		11		%	1.7	
		12				
		13		%	0.0	
		14	SILT W/ CLAY & FINE GRAINED SAND, STIFF, MED. PLASTIC, DRY TO MOIST	4/4 %	4.4	SAMPLE DPT-022(14-15) 1000
		15		%		
		16			1.9	
		17	CLAY, LT. BROWN TO GREY, STIFF, PLASTIC, DRY TO MOIST	2/2 %	2.1	
		18			0.0	
		19		2/2 %	0.0	
		20			0.4	
			SILTY CLAY W/ TRACE SAND, LT. BROWN TO GREY, MED. STIFF, PLASTIC, DRY TO MOIST	2/2 %	0.0	SAMPLE DPT-022(20-21) 1030
		21	SILTY CLAY, LT. BROWN TO GREY, STIFF, PLASTIC, DRY TO MOIST		3.2	
		22			0.2	
		23	SILTY CLAY, ~~TRACE~~ SAND, MED. STIFF, PLASTIC, DRY TO MOIST	2/2 %	2.4	
		24			3.3	
				%	1.7	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-022

SHEET 3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		25		2/2 %	0.0	
					0.7	
		26			7.8	
				%	0.0	
		27		2/2 %	1.1	
		28	SAND, BROWN, LOOSE, FINE GRAIN, WET		5.6	
					19.3	
		29		2/2 %	12.0	
		30			83.4	
				%	73.0	
		31		2/2 %	88.6	
		32			224.6	PULL UP RODS 8', SET DEEP WELL SCREEN 26'-36' BGS
					584.6	
		33		2/2 %	202.4	
		34			295.2	SET SHALLOW WELL SCREEN 8'-18' BGS
				%		
		35		2/2 %		
		36		%		
		37		%		
		38		%		
		39				

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6. PROJECT

7. HOLE NUMBER

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP BLDG. 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-023

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 42' BGS

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/07/2020 b. COMPLETED 06/08/2020

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: Jacob Moore

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	1		SANDY SILT W/ CLAY, STIFF, LOW PLAST., DRY, LT. BROWN TO DARK BROWN	% 3/4	4.4	SAMPLE DPT-023(2-3) 1230
	2			%	3.8	
	3			%	0.0	
	4					SAMPLE DPT-023(4-5) 1330
	5		CLAY, DARK BROWN TO RED, STIFF, PLASTIC, DRY TO MOIST	% 4/4	0.0	
	6			%	0.0	
	7		SANDY SILT, LOOSE, FINE, DRY, LT. BROWN, SOME DRY, STIFF CLAY			SAMPLE DPT-023 (7-8) 1350
	8			%	0.0	
	9			%	0.0	

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-023

SHEET 2 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10			4/4 %	0.0	
	11			%	0.0	
	12		CLAY, STIFF, MED. PLASTIC, DRY, LT. BROWN TO GREY			
	13		NO RECOVERY 12'-14' (SAMPLER STUCK IN CORE BARREL)	0/2 %		
	14			%		
	15		SILTY SAND, LT. BROWN TO GREY, FINE, DRY, LOOSE	1/1	0.0	
	16			1/1 %	0.0	
	17			1/1 %	0.0	
	18			2/2 %	0.0 0.0 0.0	
	19					
	20			2/2 %	0.0 0.0 0.0	
	21			%		
	22		SAND W/ CLAY, MED. STIFF, MED. PLASTIC, MOIST	3/3 %	0.7 3.2	
	23					
	24			%	6.1	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-023

SHEET 3 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		25		2/2 %	3.4	
					4.7	
		26			3.3	
				2/2 %	3.6	
		27			3.5	
					2.5	
		28				
			CLAY, LT. BROWN, MED. STIFF, PLASTIC, MOIST	2/2 %	1.4	
		29			1.4	
					0.2	
		30				
				2/2 %	1.3	
		31			0.8	
					2.7	
		32				
				2/2 %	4.8	
		33			2.0	
					1.8	
		34				
				2/2 %	1.5	
		35			5.2	
					2.9	
		36				
				1.5/2 %	1.5	
		37			19.0	
			SAND, LT. BROWN TO ORANGE, FINE, WET		23.9	
		38				
				2/2 %	22.0	
		39			6.3	

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6. PROJECT

7. HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-023

SHEET 4 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		40		%	6.9	PULL RODS UP 5', SET DEEP WELL SCREEN @ 32'-42' BGS, SHALLOW WELL 19'-29' BGS, AFTER CONVERSATION W/ CORP. DECIDE TO SET SHALLOW WELL @ 23'-33' BGS
		41		2/2 %	0.9	
		42			0.0	
					0.0	
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: BLDG. 46A LHAAP

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-024

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 44' BGS

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/08/2020; b. COMPLETED 06/08/2020

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: Jack Moore

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	1		SILTY CLAY W/ SAND, LT. BROWN, MED. STIFF, PLASTIC, MOIST	2 1/4 %	6.1	PID MAY BE INACCURATE DUE TO HUMIDITY
	2				5.1	
	3					
	4			%	2.6	
	5				0.7	
	6		CLAY, RED TO LT. BROWN, STIFF, PLASTIC, DRY TO MOIST	2 1/4 %	0.2	
	7					
	8			%	0.3	
	9			2 1/2 %	0.0	
					0.0	

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-024

SHEET 2 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10	SILTY SAND W/ SOME CLAY, SLIGHTLY COHESIVE, FINE, DRY, LOOSE, LT. BROWN TO GREY	%	0.1	SAMPLE DPT-024(9-10) 1145
					0.8	
		11		2/2 %	2.9	
					0.2	
		12		%	0.0	
		13				SAMPLE DPT-024(13-14) 1200
		14		4/4 %	0.0	
		15		%		
		16			0.0	
		17		%	0.0	SAMPLE DPT-024(17-18) 1205
		18		4/4 %	0.0	
		19		%	0.0	
		20				
		21	SILTY SAND W/ CLAY STIFF, MED. PLASTIC, BROWN TO GREY, DRY TO MOIST	%	0.0	SAMPLE DPT-024(21-22) 1210
		22		4/4 %	0.0	
		23				
		24		%	0.0	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-024

SHEET 3 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAD

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25		%	0.0	
		26		4/4 %	0.0	
		27				
		28		%	0.0	
		29		%	0.0	
		30		4/4	0.0	
		31	CLAY, BROWN TO RED, STIFF, PLASTIC, DRY TO MOIST	%	0.0	
		32		%	0.0	
		33		2/2 %	0.0	
		34	SANDY CLAY, LT. BROWN, MED. STIFF, PLASTIC, MOIST		0.0	
		35		% 2/2	0.0	
		36		%	0.0	
		37		2/2 %	0.0	
		38			0.0	
		39	SAND W/ SOME CLAY, MOTTLED LT. BROWN, GREY & ORANGE, LOOSE, FINE, WET	2/2 %	0.0	

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6. PROJECT

7. HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-024

SHEET 4 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. PID BOX OR ~~SAMPLE~~ NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		40			0.0	
				%	0.0	
		41		2/2	0.0	PULL RODS UP 6' DEEP WELL SCREEN 34'-44' BGS, SHALLOW SCREEN 23'-33' BGS
				%	0.0	
		42			0.0	
				2/2	0.0	
		43		%	0.0	
		44		%		
				%		
				%		
				%		
				%		
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

01011035

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: BLDG. 46A LHAAP

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-025

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 36' 1"

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/09/20 b. COMPLETED 06/09/20

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: John Moore

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	1		SANDY CLAY, MED. STIFF, MED. PLASTIC, MOIST TO WET, LT. BROWN TO DARK BROWN	2/4 %	0.0	
	2				0.0	
	3			%	0.0	
	4		CLAY, LT. BROWN TO ORANGE, STIFF, PLASTIC, DRY TO MOIST, SAND LENSE @ 6.5', SILTY THROUGHOUT	3.75/4 %	0.0	
	5				0.0	SAMPLE DPT-025(6-7) 1155
	6					
	7			%	0.0	
	8				0.0	
	9			%	0.0	

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-025

SHEET 2 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10					
	11		SAND LENSE @ 11.5'	3/4 %	0.0	SAMPLE DPT-025(11-12) 1200
	12					
	13		CLAY/SILT, STIFF, LOW PLAST., DRY, LT. BROWN	2/2 %	0.0	
	14				0.0	
	15			2/2 %	0.5	
	16				0.9	
					0.0	
			SAND, LT. BROWN, V. FINE, DRY		15.3	
	17			2/2 %	0.4	
			CLAY/SILT, STIFF, LOW PLAST, DRY, LT. BROWN			SAMPLE DPT-025(17-18) 1205
	18				21.2	
			SAND, LT. BROWN, V. FINE, DRY		0.0	
	19			2/2 %	0.0	
	20				0.0	
			NO RECOVERY (SAMPLER STUCK IN CORE BARREL)	0/2 %	—	
	21				—	
	22					
			CLAY, STIFF, LT. BROWN TO DARK BROWN, PLASTIC, MOIST		1.8	SAMPLE DPT-025(22-23) 1250
	23			2/2 %	0.0	
	24				13.4	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-025

SHEET 3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	25		SAND W/ TRACE SILT & CLAY, LT. BROWN, FINE TO MED, WET, LOOSE	1/1 %	67.5	
	26			1/1 %	50.7	
	27			2/2 %	111.4	
	28				134.3	
	29		SANDY CLAY, LT. BROWN, MED. STIFF, LOW PLAST, WET	2/2 %	231.5	
	30				81.2	
	31		SAND W/ SOME CLAY, LOOSE, MOIST, LT. BROWN, FINE, MOIST TO WET	2/2 %	0.0	
	32		CLAY W/ TRACE SAND & SILT, LT. BROWN, MED. PLAST, STIFF, DRY TO MOIST	2/2 %	0.0	
	33		SAND LENSE @ ~33' BGS		0.0	
	34		SILTY CLAY W/ SAND, DARK BROWN TO DARK GREY, STIFF, SLIGHTLY PLASTIC, DRY TO MOIST	2/2 %	0.0	
	35				0.0	
	36				0.0	HIT REFUSAL @ 36' 1", PULL RODS & SET WELL SCREEN 26'-36' BGS
	37			%		
	38			%		
	39			%		

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6. PROJECT

7. HOLE NUMBER

01011038

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: LHAAP BLDG. 46A

5. LOCATION *(Coordinates or Station)*

6. DRILLING AGENCY: WHE

7. HOLE NUMBER *(as shown on drawing title and title number)*: DPT-026

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE
☑ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: ~45' BGS

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*: —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822 DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE *(YYYYMMDD)*: a. STARTED 06/07/2020; b. COMPLETED 06/07/2020

20. ELEVATION TOP OF HOLE *(feet)*: —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	1		SANDY CLAY W/ SILT, SOFT, PLASTIC, WET, LT. BROWN	2/4 %	0.0	
	2				0.0	
	3					SAMPLE DPT-026(3-4) 0735
	4			%	0.0	
	5		CLAY, LT. BROWN TO RED, STIFF, PLASTIC, DRY TO MOIST, TRACE SAND THROUGHOUT	2/4 %	0.0	
	6				0.0	
	7			%	0.0	
	8					
	9			%	0.0	

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PROJECT:

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-026

SHEET 2 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10		%	0.0	
				3.75/4		
		11		%	0.0	
		12				
				%	0.0	
		13				
		14		4/4 %	0.0	
		15		%	0.0	
		16				SAMPLE DPT-026(16-A) 0750
				2/2 %	2.1	
		17			0.6	
					2.4	SAMPLE DPT-026(17-18) 0755
		18		%		
				2/2	2.2	
		19			0.0	
				%	0.0	
		20				
				2/2	0.0	
		21		%	0.0	
					0.0	
		22				
				%	0.0	
				2		
		23		1/2	0.5	
				%	0.0	
		24				

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-026

SHEET 3 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25		2 1/2 %	1.9	
					2.4	
		26			0.0	
				%		
		27		2 1/2 %	0.0	SAMPLE DPT-026(26-28) 0800
			SAND LENSE @ 28'		2.8	
		28			0.0	
			CLAY W/ SILT AND TRACE SAND, MED. STIFF, PLASTIC, MOIST TO WET		4.8	
		29		2 1/2 %	0.6	
		30			1.0	
				%	1.0	
		31		2 1/2	0.0	
					14.0	
		32		%		
					13.5	
		33		2 1/2 %	53.4	
					2.2	
		34	SAND W/ SOME CLAY, LT. BROWN, LOOSE, MOIST TO WET, FINE		30.2	
				%		
		35	CLAY, LT. BROWN, STIFF, PLASTIC, MOIST	2 1/2	07.3	
					43.8	
		36		%		
					30.2	
		37		2 1/2 %	5.3	
					19.1	
		38				
			SAND, LT. BROWN, TO DARK BROWN, LOOSE, FINE, WET	%	35.9	

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6. PROJECT

7. HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-026

SHEET 4 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		40	SAND, LT. BROWN TO DARK BROWN, LOOSE, FINE, WET	2/2 %	26.1 49.3	
		41		2/2 %	19.0 32.6	
		42			0.0	
		43		2/2 %	5.9 124.7	PULL RODS UP 7'
		44			100.7	SET DPT-026(Deep), SCREEN ~35'-45' BGS,
		45		1/1 %	60.1	SHALLOW SCREEN SET ~26'-36' BGS
		46		%		
		47		%		
		48		%		
		49		%		
		50		%		
		51		%		
		52		%		
		53		%		
		54		%		

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6. PROJECT

7. HOLE NUMBER

01011042

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 3 SHEETS

4. PROJECT: LHAAP BLDG. 46A

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-027

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 32.5' BGS / 33' BGS

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/05/2020 b. COMPLETED 06/05/2020, 06/12,

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: John Mann

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY, MOTTLED GREY/REDDISH BRWN. SOFT, PLASTIC, WET	4/4 %	0.0	
		2			0.0	SAMPLE DPT-027(2-3) 1350
		3				
		4	CLAY, LT. BROWN TO GREY, STIFF, PLASTIC, MOIST	%	0.0	
		5		4/4 %	0.0	
		6				SAMPLE DPT-027(5-6) 1400
		7				
		8		%	0.0	
		9	SILTY CLAY, GREY, STIFF, PLASTIC, DRY	%	0.0	SAMPLE DPT-027(8-9) 1320

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-027

SHEET 2 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10			% 4/4	0.0	
	11		SAND W/ SILT, LT. BROWN, LOOSE, DRY, FINE GRAIN, CLAYEY ZONE ~12.0' BGS	%	0.0	SAMPLE DPT-027(11-17) 1325
	12			%	0.0	
	13			4/4		
	14			%	0.0	
	15			%	0.0	
	16					
	17		NO RECOVERY (SAMPLER STUCK IN CORE BARREL)	%	—	
	18			0/4 %	—	
	19			%	—	
	20					
	21		SILTY CLAY W/ SAND LENSES THROUGHOUT, LT. BROWN, MED. STIFF, MOIST, PLASTIC	2/2 %	2.5 49.2	
	22		CLAYEY SAND, LT. BRWN., LOOSE, DRY TO MOIST, FINE	%	15.6 6.2	
	23			2/2	23.5	
	24			%	83.4	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-027

SHEET 3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25		2/2 %	19.8 33.4 2.9	
		26			% 4.3	
		27	CLAY, DARK BRWN STIFF, DRY TO MOIST, PLASTIC	2/2 %	0.0	
		28			0.0	
		29	SILTY CLAY, DARK BRWN., MED. STIFF, PLASTIC, DRY TO MOIST	2/2 %	0.0	
		30			0.0	
		31	SANDY/SILTY CLAY, DARK BROWN, MED. STIFF, MED. PLASTIC, DRY TO MOIST	2/2 %	0.0	
		32	CLAY, DARK BROWN, STIFF, PLASTIC, MOIST		0.0	STOP DRILLING @ 32.5' BGS, HIT REFUSAL, SET SHALLOW WELL SCREEN 17'-27' BGS
		33		%		06/12/20: RETURN TO DPT-027 TO SET NEW WELL, HIT REFUSAL @ 33' BGS. SET WELL SCREEN 28'-38' BGS.
			TOP 4' OF NEW BORING (DIFFERENT INTERVALS B/C ELEVATION CHANGE)	%		
		1	SILTY CLAY W/ SAND, DARK BROWN, SOFT, PLASTIC, MOIST	1.5/4 %	0.0	PID HITS: 23'-5.1 24.5-4.5 25'-3.9 26'-66.9 27'-3.5 28'-13.6 29'-2.4 30'-7.9 (MAY BE INACCURATE B/C HUMIDITY)
		2				~4' ELEVATION DIFFERENCE BETWEEN NEW & ORIGINAL BORING
		3		%		
		4		%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01011045

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: BLDG. 46A LHAAP

5. LOCATION (Coordinates or Station): —

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-028

8. NAME OF DRILLER: MARCUS BURKHALTER

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 45' BGS

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED —; b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/10/20; b. COMPLETED 06/10/20

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: Jacob Moomaw

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	CLAY W/ TRACE SAND, MED. STIFF, PLASTIC, WET, LT. BROWN TO DARK BROWN	2.5/4 %	2.1	PID MAY BE INACCURATE DUE TO HUMIDITY
		2			2.2	
		3				
		4			2.6	
		5		2.5/4 %	3.0	
		6			5.8	
		7				
		8			6.1	
		9	SILTY CLAY, LT. BROWN TO GREY, STIFF, PLASTIC, DRY	%	5.5	

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PROJECT

HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-028

SHEET 2 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10		4/4	6.0 %	SAMPLE DPT-028(10-11) 740
		11			15.0 %	
		12	CLAY W/ SAND & SILT, STIFF, MED. PLASTIC, DRY, LT. BROWN TO GREY		28.8 %	
		13		4/4		SAMPLE DPT-028(13-14) 0745
		14			19.2 %	
		15			14.8 %	
		16			16.2 %	SAMPLE DPT-028(16-17) 0750
		17	SAND LENSE @ 17' BGS	2/2	9.1 %	
		18			12.8 %	
		19	SAND LENSE @ 18.5' BGS	2/2	24.1 %	
		20			31.3 %	
		21			41.9 %	SAMPLE DPT-028(21-22) 0800
		22		2/2	14.4 %	
		23	CLAY W/ SILT, SAND LENSES THROUGHOUT, SOFT, LOW PLAST., WET, LT. BROWN TO GREY		35.6 %	
		24			40.2 %	
					45.8 %	
					51.2 %	
					23.5 %	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-028

SHEET 3 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	25		SILTY SAND, LT. BROWN TO GREY, FINE, COHESIVE, WET	2/2 %	28.9	
					35.4	
	26				28.0	
				%	36.8	
	27			2/2 %	4.3	
	28		CLAY w/ SILT & TRACE SAND, LT. BROWN TO GREY, PLASTIC, MED. STIFF, MOIST TO WET		12.1	
					3.5	
	29			%		
				3/3	7.1	
	30		SANDY/SILTY LENSE @ 30' BGS	%		
	31				4.5	
			CLAY, LT. BROWN TO GREY. STIFF, PLASTIC, DRY TO MOIST	2/2 %	0.1	
	32				0.3	
					0.2	
	33			%		
				3/3	0.0	
	34				0.0	
				%	0.0	
	35					
					0.0	
	36			%	0.0	
				2/2 %	0.0	
	37				0.0	
					0.0	
	38					
					0.0	
	39			%	0.0	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-028

SHEET 4 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		40		%	0.1	
					2.2	
		41	SAND, LT. BROWN TO GREY, FINE GRAIN, WET.	2/2 %	5.9	
					2.0	
		42		%	2.2	
		43		2/2	2.7	HIT REFUSAL @ ~45' BGS
		44		%	2.5	PULL RODS UP 4',
				1/1	0.0	SET DEEP WELL 35'-45' BGS,
		45			0.0	SHALLOW WELL 23'-33' BGS
		46		%		
				%		
				%		
				%		
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01011049

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
4. PROJECT BLDG. 46A LHAAP		13. SIZE AND TYPE OF BIT 3.25" CORE BARREL	
5. LOCATION *(Coordinates or Station)* —		14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* —	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
7. HOLE NUMBER *(as shown on drawing title and title number)* DPT-029		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER MARCUS BURKHALTER		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE *(YYYYMMDD)* a. STARTED 06/11/2020 b. COMPLETED 06/11/2020	
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE *(feet)* —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 45' BGS		22. SIGNATURE OF INSPECTOR Jake Moore	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		1	CLAYEY SAND W/ SILT, LT. BROWN, FINE TO COARSE, LOOSE, DRY	%	12.7	PID MAY BE INACCURATE DUE TO HUMIDITY
		2		3/4 %	3.1	
		3		%	2.2	
		4				
		5	SILTY CLAY, DARK BROWN TO LT. BROWN, STIFF, PLASTIC, DRY	2/2 %	1.9 2.6	
		6			1.8	
		7	SILTY SAND W/ TRACE CLAY, LT. BROWN, LOOSE, DRY, FINE GRAIN	% 2/2	7.0 9.3	SAMPLE DPT-029(7-8) 0755
		8		%	1.7	
		9	SILTY CLAY SAND LENSES THROUGHOUT, STIFF, MED. PLASTIC, DRY, LT. BROWN TO GREY	%	2.0 0.6	

ENG FORM 1836, MAR 1971 PREVIOUS EDITIONS ARE OBSOLETE. (Translucent) PROJECT HOLE NUMBER

VERSION 1.9

DRILLING LOG (Continuation Sheet) For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	1. ELEVATION TOP OF HOLE	2. HOLE NUMBER DPT-029	SHEET 2 OF 4 SHEETS
3. PROJECT		4. INSTALLATION LHAAP	

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		10		4/4 %	1.2	
		11		%		
		12		%	0.0	
		13	SILTY SAND W/ TRACE CLAY, LT. BROWN TO GREY, LOOSE, FINE, DRY	4/4 %	1.1	SAMPLE DPT-029(13-14) 0810
		14				
		15		%	0.0	
		16		%	0.8	
		17		4/4 %	1.1	SAMPLE DPT-029(17-18) 0815
		18				
		19		%	1.2	
		20		%	7.3	
		21		4/4 %	8.5	SAMPLE DPT-029(21-22) 0820
		22				
		23	SILTY CLAY, LT. BROWN, MED. STIFF, PLASTIC, MOIST	%	7.9	
		24				

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-029

SHEET 3 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	25			%	2.1	
	26			4/4 %	3.1	
	27			%	3.1	
	28					
	29			4/4 %	9.4	
	30			%	11.7	
	31					
	32		SLIGHTLY MOIST @ 32' BGS	%	23.2	
	33			%	7.5	
	34		CLAY W/ TRACE SAND, LT. BROWN, SOFT, PLASTIC, MOIST	4/4 %	13.1	
	35					
	36			%	16.4	
	37		SAND W/ SILT & TRACE CLAY, ORANGE TO GREY, FINE, WET	3.5/4 %	69.2	
	38					
	39			%	30.4	

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6. PROJECT

7. HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE	2. HOLE NUMBER	SHEET 4 OF 4 SHEETS
	DPT-029	

3. PROJECT

4. INSTALLATION
LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	40			%	33.2	
	41		SAND, DARK BROWN, FINE TO MED. GRAIN, LOOSE, WET	% 2.5 / 4	21.8	
	42			%	34.3	
	43				109.4	
	44			% 1/1	56.2	HIT REFUSAL @ 45' BGS
	45			%	133.2	PULL RODS UP 7'
	46			%		DEEP WELL SCREEN 35'-45' BGS
	47			%		SHALLOW WELL SCREEN 24'-34' BGS
	48			%		
	49			%		
	50			%		
				%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01011053

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 3 SHEETS
4. PROJECT BLDG. 46A LHAAP		13. SIZE AND TYPE OF BIT 3.25" CORE BARREL	
5. LOCATION (Coordinates or Station)		14. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN	a. DISTURBED — b. UNDISTURBED —
7. HOLE NUMBER (as shown on drawing title and title number) DPT-030		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER MARCUS BURKHALTER		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE (YYYYMMDD)	a. STARTED 06/11/2020 b. COMPLETED 06/11/2020
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE (feet) —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 28.25'		22. SIGNATURE OF INSPECTOR Jacob Moore	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
	1		SILTY CLAY W/ SAND, SOFT, MED. PLASTIC, LT. BROWN, DRY TO MOIST	1.5/4 %	1.8	
	2				1.6	
	3					
	4			%	2.1	
	5		SILTY CLAY, LT. BROWN, MED. STIFF, PLASTIC, DRY TO MOIST, SAND LENSES THROUGHOUT.	2/4 %	12.0	
	6				53.7	
	7					
	8			%	36.8	
	9				29.6	
				%		

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-030

SHEET 2 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		10		3/4 %	256.2	DPT-030(10-11) 1345
		11		%	177.3	
		12		%	139.2	
		13		4/4 %	448.8	
		14	SILTY SAND, LT. BROWN TO GREY, LOOSE, FINE TO MED. GRAIN, DRY TO MOIST			SAMPLE DPT-030(15-16) 1355
		15		%	585.4	
		16		%	396.1	SAMLE DPT-030(17-18) 1405
		17		4/4 %	315.5	
		18				SAMPLE DPT-030(19-20) 1410
		19		%	310.6	
		20	CHANGES TO WET @ 20'		386.6	
		21	SILTY CLAY W/ SAND, LT. BROWN TO GREY, STIFF, PLASTIC, DRY TO MOIST	% 4/4 %	68.5	
		22				
		23		%	73.8	
		24				

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6. PROJECT

7. HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-030

SHEET 3 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25		%	98.7	
		26		4/4 %	146.6	
		27	SILTY SAND W/ TRACE CLAY, LT. BROWN TO GREY, LOOSE, MOIST, FINE			HIT REFUSAL @ 28.25", SET WELL 18.25'-28.25'
		28		%	67.5	
		29		%		
		30		%		
		31		%		
		32		%		
		33		%		
		34		%		
		35		%		
		36		%		
		37		%		
		38		%		
		39		%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01011056

1. HOLE NUMBER

DRILLING LOG For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.	2. DIVISION	3. INSTALLATION LHAAP	SHEET 1 OF 3 SHEETS
4. PROJECT BLDG. 46A LHAAP		13. SIZE AND TYPE OF BIT 3.25" CORE BARREL	
5. LOCATION *(Coordinates or Station)* —		14. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* —	
		15. MANUFACTURERS DESIGNATION OF DRILL GEOPROBE 7822DT	
6. DRILLING AGENCY WHE		16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN a. DISTURBED — b. UNDISTURBED —	
7. HOLE NUMBER *(as shown on drawing title and title number)* DPT-031		17. TOTAL NUMBER CORE BOXES —	
8. NAME OF DRILLER MARCUS BURKHALTER		18. ELEVATION GROUND WATER —	
9. DIRECTION OF HOLE ☒ a. VERTICAL ☐ b. INCLINED c. DEG. FROM VERT.		19. DATE HOLE *(YYYYMMDD)* a. STARTED 06/12/2020 b. COMPLETED 06/12/2020	
10. THICKNESS OF OVERBURDEN —		20. ELEVATION TOP OF HOLE *(feet)* —	
11. DEPTH DRILLED INTO ROCK —		21. TOTAL CORE RECOVERY FOR BORING % —	
12. TOTAL DEPTH OF HOLE 33' BGS		22. SIGNATURE OF INSPECTOR Jacob Moore	

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		1	SILTY CLAY W/ SAND, LT. BROWN TO DARK BROWN, LOOSE, MED. PLASTIC, MOIST	1.5/4	% 48.2	
		2			% 8.3	
		3				SAMPLE DPT-031(3-4) 1055
		4			% 31.1	
		5			% 0.9	
		6		2.5/4	% 3.2	
		7	SANDY SILT, LT. BROWN TO GREY, LOOSE, FINE, DRY			
		8			% 12.6	
		9			% 1.8	

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C-103

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-031

SHEET 2 OF 3 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
	10		SILTY CLAY W/SAND LENSES THROUGHOUT, LT. BROWN TO GREY, STIFF, PLASTIC, DRY TO MOIST	4/4 %	3.7	
	11			%	4.9	
	12			%	7.5	SAMPLE DPT-031 (12-13) 1050
	13		SAND LENSE ~13' BGS & ~14' BGS	4/4 %	2.0	
	14			%	5.0	
	15					
	16		SAND LENSE ~16' BGS	%	14.4	SAMPLE DPT-031 (16-17) 1100
	17			4/4 %	10.2	
	18		SAND LENSE ~18.5' BGS			
	19			%	26.5	
	20				8.7	
	21			2/2 %	38.4	SAMPLE DPT-031 (21-22) 1210
	22				21.2	
	23			2/2 %	11.7	
	24				67.7	
				%	21.1	
					65.9	

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-031

SHEET 3 OF 3 SHEETS

PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25		2/2 %	85.4	
		26	SILTY SAND W/ CLAY, LT. BROWN TO GREY, COHESIVE, WET, FINE TO MED. GRAIN	%	126.7	
		27		1.5/2 %	114.3	
					79.7	
		28			63.2	
					94.2	
		29		2/2 %	255.8	
		30			146.4	
				%	35.2	
		31		2/2	9.0	
				%	8.5	
		32	CLAY W/SAND, LT. BROWN, STIFF, PLASTIC, MOIST	1/1	4.0	SET WELL SCREEN 23'-33' BGS
		33			0.0	
				%		
				%		
				%		
				%		
				%		

ENG FORM 1836A, JUN 1967 PREVIOUS EDITIONS ARE OBSOLETE. *(Translucent)*

6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01011059

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: BLDG. 46A LHAAP

5. LOCATION (Coordinates or Station)

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-032

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN

11. DEPTH DRILLED INTO ROCK

12. TOTAL DEPTH OF HOLE: 49.5'

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL)

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED b. UNDISTURBED

17. TOTAL NUMBER CORE BOXES

18. ELEVATION GROUND WATER

19. DATE HOLE (YYYYMMDD): a. STARTED 06/13/2020 b. COMPLETED 06/13/2020

20. ELEVATION TOP OF HOLE (feet)

21. TOTAL CORE RECOVERY FOR BORING %

22. SIGNATURE OF INSPECTOR

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY W/ SAND, LT. BROWN TO DARK BROWN, MED. STIFF, PLASTIC, MOIST	%	11.9	PID MAY BE IMACCURATE DUE TO HUMIDITY
		2		2/4 %	15.8	
		3		%	9.3	
		4			6.1	
		5		%		
		6		4/4 %	22.8	
		7			24.0	
		8		%		
		9	SILTY SAND W/ TRACE CLAY, LT. BROWN, LOOSE, FINE GRAIN, DRY	%	6.5	

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PROJECT

HOLE NUMBER

C-106

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-032

SHEET 2 OF 4 SHEETS

3. PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		10		4/4 %	15.9	
		11		%	27.8	
		12		%	14.8	SAMPLE DPT-032(12-13) 0915
		13		4/4 %		
		14		%	28.5	
		15		%	82.5	SAMPLE DPT-032(15-16) 0920
		16		2/2 %	3.7 3.4	
		17			6.8	
		18		%	3.1	
		19		2/2 %	4.4 10.6	SAMPLE DPT-032(19-20) 0925
		20	SILTY CLAY W/ TRACE SAND, LT. BROWN TO GREY, STIFF, PLASTIC, MOIST		2.1	
		21		2/2 %	3.7 21.2	SAMPLE DPT-032(21-22) 0930
		22			2.1	
		23		2/2 %	4.7 8.1	
		24	SAND W/ TRACE CLAY, LT. BROWN TO GREY, LOOSE, FINE GRAIN, WET	%		

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6. PROJECT

7. HOLE NUMBER

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-032

SHEET 3 OF 4 SHEETS

PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	e. PID BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		25		2/2 %	2.1 2.9 17.0	
		26		2/2 %	2.7 2.6	
		27		%	2.1	
		28		2/2 %	2.2 0.0 3.8	
		29				
		30		2/2 %	0.0 0.0 0.2	
		31				
		32	CLAY W/ SILT & SAND, LT. BROWN TO GREY, STIFF, PLASTIC, MOIST TO WET	2/2 %	0.0 0.0 2.4	
		33				
		34		2/2 %	0.0 0.7 2.2	
		35				
		36		2/2 %	0.0 1.1 2.2	
		37				
		38		%	0.0 0.0	
		39				

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

DRILLING LOG *(Continuation Sheet)*
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

1. ELEVATION TOP OF HOLE

2. HOLE NUMBER: DPT-032

SHEET 4 OF 4 SHEETS

PROJECT

4. INSTALLATION: LHAAP

5. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS *(Description)*	d. % CORE RECOVERY	e. BOX OR SAMPLE NUMBER	f. REMARKS *(Drilling Time, water loss, depth of weathering, etc., if significant)*
		40	SAND, LT. BROWN TO GREY, LOOSE, FINE TO MED. GRAIN, WET	%	2.2	
				2/2 %	0.0	
		41			0.0	
					0.0	
		42		%	0.0	
				2/2	0.0	
		43			0.0	
		44		%	0.0	
				2/2 %	0.0	
		45			0.0	
					0.0	
		46		%	0.0	
				2/2	0.7	
		47			0.0	
				%	0.0	PULL RODS UP 10'
		48		1.5	0.0	SET DEEP WELL 39.5'-49.5'
				1.5		SET SHALLOW WELL
		49		%	0.0	25'-35'
		50		%		
				%		
				%		

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6. PROJECT

7. HOLE NUMBER

VERSION 1.0

01011063

1. HOLE NUMBER

DRILLING LOG
For use of this form, see EM 1110-1-1804; the proponent agency is CECW-EG.

2. DIVISION

3. INSTALLATION: LHAAP

SHEET 1 OF 4 SHEETS

4. PROJECT: BLDG. 46A LHAAP

5. LOCATION (Coordinates or Station)

6. DRILLING AGENCY: WHE

7. HOLE NUMBER (as shown on drawing title and title number): DPT-033

8. NAME OF DRILLER: KERRI POWELL

9. DIRECTION OF HOLE: [X] a. VERTICAL [ ] b. INCLINED c. DEG. FROM VERT.

10. THICKNESS OF OVERBURDEN: —

11. DEPTH DRILLED INTO ROCK: —

12. TOTAL DEPTH OF HOLE: 49' BGS

13. SIZE AND TYPE OF BIT: 3.25" CORE BARREL

14. DATUM FOR ELEVATION SHOWN (TBM or MSL): —

15. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 7822DT

16. TOTAL NO. OF OVER BURDEN SAMPLES TAKEN: a. DISTURBED — b. UNDISTURBED —

17. TOTAL NUMBER CORE BOXES: —

18. ELEVATION GROUND WATER: —

19. DATE HOLE (YYYYMMDD): a. STARTED 06/13/2020 b. COMPLETED 06/13/2020

20. ELEVATION TOP OF HOLE (feet): —

21. TOTAL CORE RECOVERY FOR BORING %: —

22. SIGNATURE OF INSPECTOR: JR Moore

23. ELEVATION	a. DEPTH	b. LEGEND	c. CLASSIFICATION OF MATERIALS (Description)	d. % CORE RECOVERY	PID e. BOX OR SAMPLE NUMBER	f. REMARKS (Drilling Time, water loss, depth of weathering, etc., if significant)
		1	SILTY CLAY W/ SAND, DARK BROWN TO LT. BROWN, MED. STIFF, PLASTIC, DRY TO MOIST	2.5/4 %	15.4	
		2			61.5	
		3			0.5	
		4			2.6	
		5		3.5/4 %	10.1	
		6				
		7			22.0	
		8	SILTY SAND, LT. BROWN TO GREY, LOOSE, FINE, DRY	4/4 %	35.5	SAMPLE DPT-033(8-9) 1220
		9			0.7	

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PROJECT

HOLE NUMBER

VERSION 1.0